Configuring Cisco Prime NAM

Cisco SRE NAM has an internal Gigabit Ethernet interface and an external interface. You can use either interface for Prime NAM management traffic such as the NAM web GUI, **telnet** or **ssh**, but not both. You can configure the Prime NAM internal interface to use either IP unnumbered or a routable subnet.

See the following sections for information about how to configure the Cisco SRE NAM internal interfaces for management:

Configuring the Internal Interface for Management—IP Unnumbered

This section describes how to configure the Cisco SRE NAM internal interface for IP unnumbered.

Note The addresses used for the interface address (Step 4), the NAM-Address (Steps 6 and 9), and the NAM-Default-Gateway-Address (Step 7) must all be in the same subnet.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface sm slot/0**
4. **ip unnumbered <interface> <number>**
5. **no shutdown**
6. **service-module ip address <NAM-Address> <subnetmask>**
7. **service-module ip default-gateway <NAM-Default-Gateway-Address>**
8. **exit**
9. **ip route <NAM-Address> 255.255.255.255 sm slot/0**
10. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable**	Enter IOS exec mode.
Step 2	**configure terminal**	Enter IOS configuration from terminal mode.
Step 3	**interface sm slot/0**	Enter IOS interface configuration mode for the service module interface.
Step 4	**ip unnumbered <interface> <number>** **Example:** `Router (config-if)#` **ip unnumbered gigabitethernet 0/1**	Borrow the address that was set at <interface>. In the example, interface sm 1/0 borrows the address set in gigabitethernet0/1 interface.
Step 5	**no shutdown**	Enable the sm interface.
Step 6	**service-module ip address <NAM-Address> <subnetmask>** **Example:** `Router (config-if)#` **service-module ip address 209.165.200.226 255.255.255.224**	Set <NAM-Address> to the NAM Internal interface.
Step 7	**service-module ip default-gateway <NAM-Default-Gateway-Address>** **Example:** `Router (config-if)#` **service-module ip default-gateway 209.165.200.225**	Set up the Prime NAM default gateway address.

	Command or Action	Purpose
Step 8	**exit**	Exit from the router interface configuration mode to the router global configuration mode.
Step 9	**ip route <NAM-Address> 255.255.255.255 sm slot/0** **Example:** `Router(config)#` **ip route 209.165.200.226 255.255.255.255 sm 1/0**	Set up a full 32-bit static route for the NAM management address.
Step 10	**end**	Exit the router configuration mode.

Configuration Example

In this configuration example:

- The internal NAM interface is used for management traffic.
- IP addresses from the same routable subnet are assigned to the service module interface and the Prime NAM system
- To conserve IP address space, the service module interface is configured as IP unnumbered to borrow the IP address of the Gigabit Ethernet interface.
- A static route to the Prime NAM through the service module interface is configured.
- The internal Prime NAM interface is used to monitor WAN traffic on interface Serial 0/0, and the external Prime NAM interface is used to monitor LAN traffic on interface Gigabit Ethernet 0/0.
- The SM-SRE is installed in router slot 2.

Router Configuration (Cisco IOS Software)

```
!
interface GigabitEthernet0/0
 ip address 209.165.200.225 255.255.255.224
 duplex auto
 speed auto
 analysis-module monitoring
!
interface Integrated-Service-Engine2/0
 ip unnumbered GigabitEthernet0/0
 ip nbar protocol-discovery
 no keepalive
!
!
ip route 209.165.200.226  255.255.255.255  Integrated-Service-Engine2/0
!
!
```

Prime NAM Configuration (Prime NAM Software)

```
root@myNAM.company.com# show ip
IP address:                  209.165.200.226
Subnet mask:                 255.255.255.224
IP Broadcast:                209.165.200.255
IP Interface:                Internal
DNS Name:                    myNAM.company.com
Default Gateway:             209.165.200.225
Nameserver(s):               171.69.2.133
HTTP server:                 Enabled
HTTP secure server:          Disabled
HTTP port:                   80
HTTP secure port:            443
TACACS+ configured:          No
Telnet:                      Enabled
SSH:                         Disabled
```

Configuring the Internal Interface for Management—Routable Subnet

This section describes how to configure the SM-SRE internal interface for management using a routable subnet method.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface sm** *slot*/**0**
4. **ip address <router-side-address> <subnetmask>**
5. **no shutdown**
6. **service-module ip address <NAM-Address> <subnetmask>**
7. **service-module ip default-gateway <router-side-address>**
8. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable**	Enter IOS exec mode.
Step 2	**configure terminal**	Enter IOS configuration from terminal mode.
Step 3	**interface sm** *slot*/**0**	Enter the IOS interface configuration mode for the integrated-service-engine interface.

	Command or Action	Purpose
Step 4	**ip address <router-side-address> <subnetmask>** **Example:** `Router (config-if)#` **ip address 209.165.200.225 255.255.255.224**	Set a routable address to the integrated-service-engine interface.
Step 5	**no shutdown**	Bring up the integrated-service-engine interface.
Step 6	**service-module ip address <NAM-Address> <subnetmask>** **Example:** `Router (config-if)#` **service-module ip address 209.165.200.226 255.255.255.224**	Set NAM-Address to the NAM Internal interface. **Note** The NAM-Address must be in the same subnet as router-side-address.
Step 7	**service-module ip default-gateway <router-side-address>** **Example:** `Router (config-if)#` **service-module ip default-gateway 209.165.200.225**	Set up NAM default gateway address to be the integrated-service-engine interface address, which is router-side-address.
Step 8	**end**	Exit the router configuration mode.

Configuration Example

In this configuration example:

- The internal Prime NAM interface is used for management traffic.
- IP addresses from the same routable subnet are assigned to the Integrated-Service-Engine interface and the Prime NAM system.
- A static route to the Prime NAM through the Integrated-Service-Engine interface is configured.
- The internal Prime NAM interface is used to monitor WAN traffic on interface Serial 0/0, and the external Prime NAM interface is used to monitor LAN traffic on interface Fast Ethernet 0/0.
- The SM-SRE is installed in router slot 2.

Router Configuration (Cisco IOS Software)

```
!
interface sm2/0
 ip address 209.165.200.225  255.255.255.224
ip route 209.165.200.226  255.255.255.255  Integrated-Service-Engine1/0
```

Prime NAM Configuration (Prime NAM Software)

```
root@myNAM.company.com# show ip
IP address:                  209.165.200.226
Subnet mask:                 255.255.255.224
IP Broadcast:                209.165.200.255
IP Interface:                Internal
DNS Name:                    myNAM.company.com
Default Gateway:             209.165.200.225
Nameserver(s):               171.69.2.133
HTTP server:                 Enabled
HTTP secure server:          Disabled
HTTP port:                   80
HTTP secure port:            443
TACACS+ configured:          No
Telnet:                      Enabled
SSH:                         Disabled
```

Configuring the External Interface for Management

This section describes how to configure the SM-SRE to use its external interface for Prime NAM management traffic.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface loopback <loopback-number>**
4. **ip address <bogus-address> <subnetmask>**
5. **no shutdown**
6. **exit**
7. **interface sm** *slot*/**0**
8. ip unnumbered loopback <number>
9. no shutdown
10. **service-module external ip address <NAM-Address> <subnetmask>**
11. **service-module ip default-gateway <NAM-Default-Gateway-Address>**
12. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable**	Enter IOS exec mode.
Step 2	**configure terminal**	Enter IOS configuration from terminal mode.

	Command or Action	Purpose
Step 3	**interface loopback <loopback-number>** **Example:** `Router (config)#` **interface loopback 0** `Router (config-if)#`	Create a loopback interface 0 on the router.
Step 4	**ip address <bogus-address> <subnetmask>** **Example:** `Router(config-if)#` **ip address 10.1.1.1 255.255.255.0**	Set a bogus address on the loopback interface. In the example, interface loopback0 is assigned with an address 10.1.1.1/24.
Step 5	**no shutdown**	Enable the loopback interface.
Step 6	**exit** **Example:** `Router(config-if)#` **exit** `Router(config)#`	Exit from interface configuration mode to the global configuration mode.
Step 7	**interface sm** *slot*/**0**	Enter the IOS interface configuration mode for the integrated-service-engine interface.
Step 8	ip unnumbered loopback <number> **Example:** `Router (config-if)#` **ip unnumbered loopback 0**	Borrow the address that was set to the loopback interface in **Step 4**.
Step 9	no shutdown	Bring up the integrated-service-engine interface.
Step 10	**service-module external ip address <NAM-Address> <subnetmask>** **Example:** `Router (config-if)#` **service-module external ip address 209.165.201.2 255.255.255.224**	Set <NAM-Address> to the Prime NAM External interface.
Step 11	**service-module ip default-gateway <NAM-Default-Gateway-Address>** **Example:** `Router (config-if)#` **service-module ip default-gateway 209.165.201.222**	Set up the Prime NAM default gateway address.
Step 12	**end**	Exit the router configuration mode.

Configuration Example

In this configuration example:

- The external Prime NAM interface is used for management traffic.
- The Integrated-Service-Engine interface is configured as IP unnumbered to borrow the IP address of the loopback interface.
- The borrowed loopback interface IP address is not routable.
- The Prime NAM system is configured with an IP address from the LAN subnet that is connected to the external Prime NAM interface.
- The internal Prime NAM interface is used to monitor WAN traffic on interface Serial 0/0, and the external Prime NAM interface is used to monitor LAN traffic on interface Fast Ethernet 0/0.
- The SM-SRE is installed in router slot 3.

Router Configuration (Cisco IOS Software)

```
!
interface loopback 0
 ip address 10.1.1.1 255.255.255.0
!
!
interface sm3/0
 ip unnumbered loopback 0
 no shutdown
!
```

Prime NAM Configuration (Prime NAM software)

```
root@myNAM.company.com# show ip
IP address:                 209.165.201.2
Subnet mask:                255.255.255.224
IP Broadcast:               209.165.201.223
IP Interface:               External
DNS Name:                   myNAM.company.com
Default Gateway:            209.165.201.222
Nameserver(s):              171.69.2.133
HTTP server:                Enabled
HTTP secure server:         Disabled
HTTP port:                  80
HTTP secure port:           443
TACACS+ configured:         No
Telnet:                     Enabled
SSH:                        Disabled
```

Disabling AAA Login Authentication on the Prime NAM Console Line

If you configured authentication, authorization, and accounting (AAA) on your router, then you might have to log in twice to open a Prime NAM console session from the router: first with your AAA username and password, and second with the Prime NAM login and password.

If you do not want to log in twice to open a Prime NAM console session from the router, then disable AAA login authentication on the router's Prime NAM console line by performing this procedure.

If your router contains both the SM-SRE and the NM-CIDS, the Cisco intrusion detection system network module, then AAA can be a useful tool for centrally controlling access to both network modules. For information about AAA, see the Cisco IOS Security Configuration Guide for your Cisco IOS release.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **aaa authentication login** *list-name* **none**
4. **line** *number*
5. **login authentication** *list-name*
6. **end**
7. **show running-config**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. Enter your password if prompted
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**aaa authentication login** *list-name* **none** **Example:** `Router(config)# aaa authentication login name none`	Creates a local authentication list. The **none** keyword specifies no authentication for this list

	Command or Action	Purpose
Step 4	**line** *number* **Example:** `Router(config)# line 33`	Enters line configuration mode for the line to which you want to apply the authentication list. The *number* value is determined by the slot number in which the SM-SRE is installed: number = (32 x *slot*) + 1 (for Cisco 3700 series) number = ((32 x *slot*) + 1) x 2 (for Cisco 2800 and Cisco 3800 series)
Step 5	**login authentication** *list-name* **Example:** `Router(config-line)# login authentication name`	Applies the authentication list to the line. Specify the authentication list name that you configured in Step 3.
Step 6	**end** **Example:** `Router(config-line)# end`	Returns to privileged EXEC mode.
Step 7	**show running-config** **Example:** `Router# show running-config`	Displays the contents of the currently running configuration file. • Verify that you configured the local authentication list and applied it to the line associated with the SM-SRE.

Configuring Cisco SRE NAM For Network Connectivity

This section describes how to configure the Cisco SRE NAM to establish network connectivity and configure IP parameters. This task must be performed from the Prime NAM CLI. For more advanced Prime NAM configuration, use the Prime NAM GUI or see the *Network Analysis Module Command Reference* for your Prime NAM software release.

Note You might have already done Steps 1 and 2 if you have configured the SM-SRE for management using eitherConfiguring the Internal Interface for Management—IP Unnumbered, on page 1 or Configuring the External Interface for Management, on page 6

Before You Begin

Before doing this procedure, access the Prime NAM console. See the Opening a Session.

SUMMARY STEPS

1. **ip interface** {**internal** | **external**}
2. **ip address** *ip-address subnet-mask*
3. **ip broadcast** *broadcast-address*
4. **ip gateway** *ip-address*
5. Do one of the following:
   - **exsession on**
   - **exsession on ssh**
6. **ip domain** *name*
7. **ip host** *name*
8. **ip nameserver** *ip-address* [*ip-address*][*ip-address*]
9. **ping** {*host* | *ip-address* }
10. **show ip**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**ip interface** {**internal** | **external**}
	
	Example:
	`root@localhost# ip interface internal`
	`root@localhost# ip interface external`
		Specifies which Prime NAM interface will handle management traffic.

Step 2	**ip address** *ip-address subnet-mask* **Example:** `root@localhost# ip address 172.20.104.126 255.255.255.248`	Configures the Prime NAM system IP address.
Step 3	**ip broadcast** *broadcast-address* **Example:** `root@localhost# ip broadcast 10.255.255.255`	(Optional) Configures the Prime NAM system broadcast address.
Step 4	**ip gateway** *ip-address* **Example:** `root@localhost# ip gateway 172.20.104.125`	Configures the Prime NAM system default gateway address.
Step 5	Do one of the following: • **exsession on** • **exsession on ssh**	(Optional) Enables outside logins. • **exsession on** enables Telnet access. • **exsession on ssh** enables SSH access.

	Command or Action	Purpose

	Example:
	`root@localhost# exsession on`
	`root@localhost# exsession on ssh`
		Note The Prime NAM software K9 cryptographic patch is required to configure the **ssh** option. Seehttp://www.cisco.com/en/US/products/products_security_advisory09186a00801c110e.shtml.

Step 6	**ip domain** *name* **Example:** `root@localhost# ip domain company.com`	(Optional) Sets the Prime NAM system domain name.
Step 7	**ip host** *name* **Example:** `root@localhost# ip host nam1`	(Optional) Sets the Prime NAM system hostname.
Step 8	**ip nameserver** *ip-address* [*ip-address*][*ip-address*] **Example:** `root@nam1# ip nameserver 209.165.201.1`	(Optional) Sets one or more Prime NAM system name servers. • We recommend that you configure a name server for the Prime NAM system to resolve Domain Name System (DNS) requests.
Step 9	**ping** {*host* | *ip-address* } **Example:** `root@nam1# ping 10.20.30.40`	Checks connectivity to a network device. • Verify connectivity to the router or another known host.
Step 10	**show ip** **Example:** `root@nam1# show ip`	Displays the Prime NAM IP parameters. • Verify that you properly configured SRE NAM.

Examples

This section provides the following examples:

- Configuring the SM-SRE, on page 13
- Checking Network Connectivity with Ping, on page 13
- Sample Output for the show ip NAM CLI Command , on page 13

Configuring the SM-SRE

In the following example, the external Prime NAM interface is used for management traffic. The HTTP server and Telnet access are enabled. The resulting Prime NAM CLI prompt is root@nam1.company.com# .

```
root@nam.domain.name# ip interface external
root@nam.domain.name# ip address 172.20.105.215 255.255.255.192
root@nam.domain.name# ip domain company.com
root@nam.company.com# ip host myNAM
root@myNAM.company.com# ip nameserver 209.165.201.29
root@myNAM.company.com# ip gateway 172.20.105.210
root@myNAM.company.com# exsession on
root@myNAM.company.com# ip http server enable
Enabling HTTP server...
No web users are configured.
Please enter a web administrator user name [admin]:
New password:
Confirm password:
User admin added.
Successfully enabled HTTP server.
```

Checking Network Connectivity with Ping

```
root@myNAM.company.com# ping 172.20.98.129
PING 172.20.98.129 (172.20.98.129) 56(84) bytes of data.
64 bytes from 172.20.98.129: icmp_seq=1 ttl=254 time=1.27 ms
64 bytes from 172.20.98.129: icmp_seq=2 ttl=254 time=1.13 ms
64 bytes from 172.20.98.129: icmp_seq=3 ttl=254 time=1.04 ms
64 bytes from 172.20.98.129: icmp_seq=4 ttl=254 time=1.08 ms
64 bytes from 172.20.98.129: icmp_seq=5 ttl=254 time=1.11 ms
--- 172.20.98.129 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4003ms
rtt min/avg/max/mdev = 1.043/1.129/1.278/0.090 ms
root@myNAM.company.com#
```

Sample Output for the show ip NAM CLI Command

```
root@nam1.company.com# show ip

IP address:             172.20.105.215
Subnet mask:            255.255.255.192
IP Broadcast:           10.255.255.255
IP Interface:           External
DNS Name:               nam1.company.com
Default Gateway:        172.20.105.210
Nameserver(s):          209.165.201.29
HTTP server:            Enabled
HTTP secure server:     Disabled
HTTP port:              80
HTTP secure port:       443
TACACS+ configured:     No
Telnet:                 Enabled
SSH:                    Disabled
root@nam1.company.com#
```

Configuring the Prime NAM System Time with an NTP Server

The Cisco SRE NAM gets the UTC (GMT) time from an external NTP server. After the Prime NAM acquires the time, you can set the local time zone using the Prime NAM System Time configuration screen.

Caution Both the client computer and the Prime NAM server must have the time set accurately for their respective time zones. If either the client or the server time is wrong, then the data shown in the GUI will be wrong.

To configure the Prime NAM system time with an NTP server:

Step 1 On the Prime NAM appliance GUI, choose **Administration > System > System Time**.

Step 2 Click the **NTP Server** radio button.

Step 3 Enter one or two NTP server names or IP address in the NTP server name/IP Address text boxes.

Step 4 Select the Region and local time zone from the lists.

Step 5 Do one of the following:

- To save the changes, click **Submit**.
- To leave the configuration unchanged, click **Reset**.

Enabling Prime NAM Packet Monitoring

This section describes how to enable Prime NAM packet monitoring on router interfaces that you want to monitor through the internal Prime NAM interface.

When you enable Prime NAM packet monitoring on an interface, Cisco Express Forwarding sends an extra copy of each IP packet that is received from or sent out on that interface to the Prime NAM through the Integrated-Service-Engine interface on the router and the internal Prime NAM interface.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip cef**
4. Do one of the following:
   - **interface** *type slot*/*port*
   - **interface** *type slot*/*wic-slot*/*port*
5. **analysis-module monitoring**
6. Repeat Step 5 and Step 5 for each interface that you want the Prime NAM to monitor through the internal Prime NAM interface.
7. **end**
8. **show running-config**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**ip cef** **Example:** `Router(config)# ip cef`	Enables the Cisco Express Forwarding switching path.
Step 4	Do one of the following: • **interface** *type slot/port* • **interface** *type slot/wic-slot/port* **Example:** `Router(config)# interface serial 0/0`	Selects an interface for configuration.
Step 5	**analysis-module monitoring** **Example:** `Router(config-if)# analysis-module monitoring`	Enables Prime NAM packet monitoring on the interface.
Step 6	Repeat Step 5 and Step 5 for each interface that you want the Prime NAM to monitor through the internal Prime NAM interface.	—

Step 7	**end**
	
	Example:
	`Router(config-if)# end`
	`Router#`
		Returns to privileged EXEC mode.

Step 8	**show running-config** **Example:** `Router# show running-config`	Displays the contents of the currently running configuration file. • Verify that you enabled the Cisco Express Forwarding switching path and enabled packet monitoring on the correct interfaces.

	Command or Action	Purpose

Examples

This section provides the following example:

• Enabling Prime NAM Packet Monitoring, on page 16

Enabling Prime NAM Packet Monitoring

In the following example, NAM packet monitoring is enabled on the serial interfaces:

```
interface Serial 0/0
 ip address 172.20.105.213 255.255.255.240
 ip route-cache flow
 speed auto
 full-duplex
 analysis-module monitoring
 no mop enabled
!
interface Serial 0/1
 ip address 172.20.105.53 255.255.255.252
 ip route-cache flow
 duplex auto
 speed auto
analysis-module monitoring
!
interface Integrated-Service-Engine 2/0
 ip address 10.1.1.1 255.255.255.0
 hold-queue 60 out
!
```