

## Chapter 6

# Configuring IP

This chapter describes how to configure IP interfaces and IP addresses on your E-series device using the NMC-RX application.

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### Overview

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TCP/IP is a suite of data communications protocols. Two of the more important protocols in the suite are the Transmission Control Protocol (TCP) and the Internet Protocol (IP).

IP provides the basic packet delivery service for all TCP/IP networks. It is a connectionless protocol, which means that it does not exchange control information to establish an end-to-end connection before transmitting data. A connection-oriented protocol exchanges control information with the remote computer to verify that it is ready to receive data before sending it.

IP relies on protocols in other layers to establish the connection if connection-oriented services are required and to provide error detection and error recovery. IP is sometimes called an unreliable protocol, because it contains no error detection or recovery code.

### Before You Configure IP Interfaces

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Before you configure an IP interface, you must configure a module. See the following chapters in the *NMC-RX User Guide, Vol. 1*:

- *Chapter 12, Configuring Channelized OC Modules*
- *Chapter 13, Configuring Unchannelized OC Modules*

- *Chapter 15, Configuring Ethernet Modules*
- *Chapter 16, Configuring T3/E3 and T1/E1 Modules*

You must also configure the lower-layer interfaces over which IP traffic flows. See the following chapters in the *NMC-RX User Guide, Vol. 1*:

- *Chapter 18, Configuring ATM*
- *Chapter 20, Configuring Bridged IP*
- *Chapter 23, Configuring Cisco HDLC*
- *Chapter 24, Configuring Frame Relay*
- *Chapter 25, Configuring MLPPP Bundles*
- *Chapter 27, Configuring PPP*
- *Chapter 28, Configuring PPP over Ethernet*

## Creating IP Interfaces

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Using the NMC-RX application, you can create an IP interface and its IP address(es) at the same time. You can create an IP interface with a(n):

- Numbered IP address and multiple secondary addresses
- Unnumbered IP address
- Loopback address

To create a numbered or unnumbered IP address, you need to navigate to the appropriate level (interface, subinterface). There are two ways to navigate to the interface or subinterface level.

- If you navigate by means of the Instance Explorer, you can display interfaces or subinterfaces that belong to a line interface of the module you select.
- If you navigate by means of the Device-wide Explorer, you can display all the interfaces or subinterfaces configured on a device.

Loopback interfaces are created from the system level of the Instance Explorer.

### **Creating an IP Interface with a Numbered or an Unnumbered IP Address**

To create an IP interface with a numbered or an unnumbered IP address:

1. In the Instance Explorer, navigate to the appropriate link-layer interface or subinterface level.
2. Click the interface or subinterface.

- Right-click, select Create, and click IP Address.


The Create IP Address dialog box appears.

- In the IP Major Interface group box, set parameters (Table 33).

**Table 33: IP Major Interface Group Box Parameters**


Parameter	Description
Name	Identifies the interface; generated automatically
Alias	Description of the interface; 0–256 characters; default: blank
IfIndex	Identifies the interface on the particular line interface; generated automatically
Operational	Current operational status of the interface
Administrative	Desired status of the interface: Up/Down; default: Up
Category	<ul style="list-style-type: none"> <li>■ other</li> <li>■ broadcast—Data is sent to all hosts on a particular physical network</li> <li>■ pointToPoint—Data is sent to directly connected hosts</li> <li>■ nbma—Nonbroadcast multiaccess; data is sent to interconnected hosts but is not broadcast to all hosts on the network</li> </ul>

**Table 33: IP Major Interface Group Box Parameters (continued)**

Parameter	Description
Virtual Router	<ul style="list-style-type: none"> <li>■ Virtual router with which you are associating the IP address and IP interface</li> <li>■ Displays a list of all the available virtual routers when you click . You can then select the virtual router with which you want to associate the IP interface you are creating.</li> </ul>
Interface Number	Number associated with the interface; selectable only when creating a loopback address

5. In the Policy Information group box, select policy names (Table 34). See *Chapter 2, Configuring Policy Management* for more information.

**Table 34: Policy Information Group Box Parameters**

Parameter	Description
Policy Information	<ul style="list-style-type: none"> <li>■ Input—Applies policy to data arriving at this interface</li> <li>■ Output—Applies policy to data leaving this interface</li> <li>■ Secondary-Input—Applies policy to secondary data arriving at this interface</li> </ul> <p>Click  and select a policy name from the dialog box.</p> <p>To enable statistics logging, select the Statistics Enabled check box after selecting a policy name.</p>

6. In the Address Information group box, select an address type, and do one of the following:
- If you selected Numbered, enter the IP address, net mask, and MTU values (Table 35).
  - If you selected UnNumbered, enter an MTU value, click the Select Interface Index button, and make a selection (Table 35).

**Table 35: Address Information Group Box Parameters**

Parameter	Description
IP Address	32-bit number consisting of a network number and a host number; available only when Numbered address type is selected.
Address Type	<ul style="list-style-type: none"> <li>■ Numbered (default): You can create multiple secondary IP addresses for a single IP interface (except on bridged IP).</li> <li>■ UnNumbered: There can be only one UnNumbered address on an IP interface. <ul style="list-style-type: none"> <li>■ If you select UnNumbered, the Select Interface Index button becomes active. Click this button to display the Select IP Interface dialog box, which allows you to select an Interface Index for the UnNumbered IP address.</li> <li>■ Unnumbered interfaces are often used in point-to-point connections.</li> </ul> </li> </ul>

**Table 35: Address Information Group Box Parameters (continued)**

Parameter	Description
Net Mask	<ul style="list-style-type: none"> <li>■ You can set a nondefault value only when you create the IP address; default value is 255.255.255.0; you cannot modify this parameter later.</li> <li>■ For an unnumbered IP address, the value for the mask is 255.255.255.255; you cannot edit this value.</li> <li>■ Within a virtual router, the subnet part of the IP address must be unique in relation to the other addresses on the router.</li> </ul>
MTU	Maximum transmission unit; range 0–65535; default is 0, which means that the size is limited by the underlying layer
UnNumbered Loop Interface Index	<ul style="list-style-type: none"> <li>■ Takes the ifindex value of another IP loopback interface with Category set as a loopback</li> <li>■ Available only when UnNumbered is selected as address type</li> </ul>
Secondary Address	Select to make the address the secondary IP address <b>NOTE:</b> You must create a primary IP address before creating a secondary IP address.

7. Complete the status settings in the lower portion of the Create IP Address dialog box by clicking the desired setting's checkbox (Table 36).

**Table 36: IP Status Settings**

Status Setting	Description
Administrative	IP interface is enabled or disabled by the administrator
ICMP Redirect	Enables the sending of redirect messages if the software is forced to resend a packet through the same interface on which it was received
Direct BCAST	Enables directed broadcast forwarding to physical broadcasts
Proxy ARP	<ul style="list-style-type: none"> <li>■ Proxy Address Resolution Protocol (ARP); can be enabled only for addresses on top of bridged IP or Ethernet interfaces</li> <li>■ Variation of ARP in which an intermediate device (a router, for example) sends an ARP response on behalf of an end node to the requesting host</li> <li>■ Can lessen bandwidth use on slow-speed WAN links</li> <li>■ ARP is used to map an IP address to a MAC address</li> </ul>
IRDP	Enables use of Internet Control Message Protocol (ICMP) Router Discovery Protocol (IRDP) processing on an interface
Access Route	Enables use of an access route

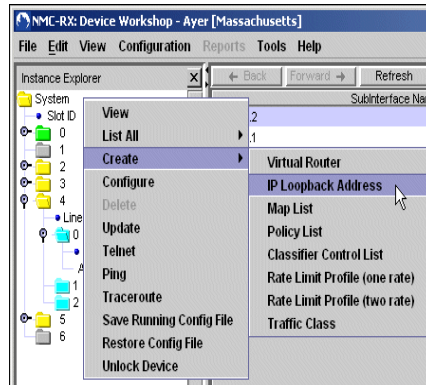
8. Click OK to create the IP interface. You have established an IP interface and IP address over the lower-layer interface.

To create additional IP addresses, see [Creating IP Addresses](#) on page 93.

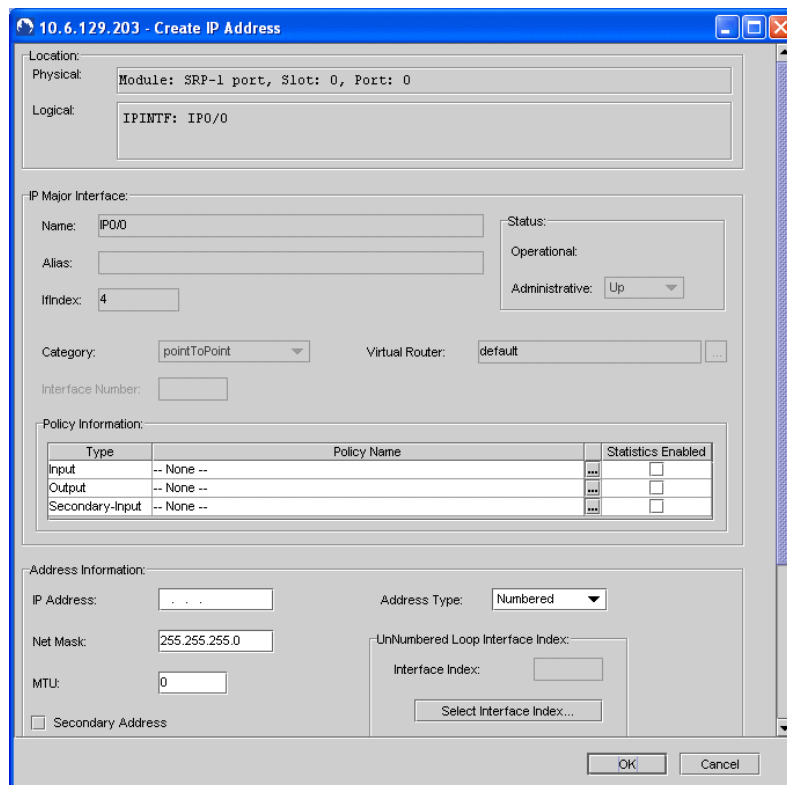
## Creating an IP Loopback Address

To create an IP loopback address:

1. In the Instance Explorer, click the System folder.
2. Right-click, select Create, and click IP Loopback Address.



The Create IP Address dialog box appears.



3. Perform Steps 4–8 in *Creating an IP Interface with a Numbered or an Unnumbered IP Address* on page 88.

## Creating IP Addresses

You can create numbered and unnumbered IP addresses for IP interfaces. Numbered addresses can be either primary or secondary addresses.



**NOTE:** You must create a primary IP address before creating a secondary IP address.

To create an IP address:

1. In the Device-wide Explorer, select IP Interfaces, right-click, and click List All.

A list of IP interfaces appears in the list area.

2. Select the interface for which you want to create an IP address, right-click, select Create, and click IP Address.

The Create IP Address dialog box appears. Note that previously configured settings in the IP Major Interface group box, such as logical name, are displayed and you cannot edit them.

10.6.129.203 - Create IP Address

Location:

Physical: Module: SERP-1 port, Slot: 0, Port: 0

Logical: IPINTF: IP0/0

IP Major Interface:

Name: IP0/0 Status: Operational

Alias: Administrative: Up

Ifindex: 4

Category: pointToPoint Virtual Router: default

Interface Number:

Policy Information:

Type	Policy Name	Statistics Enabled
Input	-- None --	<input type="checkbox"/>
Output	-- None --	<input type="checkbox"/>
Secondary-Input	-- None --	<input type="checkbox"/>

Address Information:

IP Address: . . . Address Type: Numbered

Net Mask: 255.255.255.0

MTU: 0

UnNumbered Loop Interface Index:

Interface Index:

Select Interface Index...

Secondary Address

OK Cancel

3. Set the Address Information parameters (see Steps 5-6, starting on page 90).



**NOTE:** Be sure to click the Secondary Address checkbox.

4. Click OK.

## Associating Customer Information with an IP Interface

When you configure an IP interface, you can associate customer information with the interface.

To associate customer information with an IP interface:

1. Select the IP interface that you want to associate with the customer information.
2. Right-click, and click Configure.

The IP Intf Configuration tab appears in the work area.

3. Click the Customer Information tab.

4. Click Associate Customer.

The Associate Customer dialog box appears.

Select Customer:

Customer Name	ID
Acme Communications	100100
Faber College	200200

Select Customer Site:

Customer Site Name	Site ID	City	State/Province/Region	Country
West Campus	200201	Amherst	MA	

Technical Contact | Administrative Contact | Notes

Contact: Sean McDonough Phone: 413-555-8920

email: sd@faber.edu

OK Cancel

5. Select a customer and customer site, and click OK.

The customer information is associated with the interface.



**NOTE:** See *NMC-RX User Guide, Vol. 1, Chapter 8, Configuring Customer Accounts*, for instructions about configuring customer profiles and customer sites.

To clear customer configuration settings, click the Clear Customer button on the Customer Information tab.

