

Chapter 14

Using Device Utilities

This chapter describes how to use the NMC-RX device utilities and contains the following sections:

- Overview on page 205
- Using Remote Login on page 206
- Using Ping on page 209
- Using Traceroute on page 215
- Using the Configuration Save and Restore Utilities on page 219

Overview

The NMC-RX device utilities are a group of common utilities that include:

- Remote Login—Enables you to log in to a remote system and use resources as if they were connected to your local system. You can use either Telnet or SSH for remote terminal connections. Telnet is a standard terminal emulation protocol in the TCP/IP protocol stack. Secure Shell Server (SSH) protocol version 2 is supported as a secure alternative to Telnet.
- Ping—Enables you to send an Internet Control Message Protocol (ICMP) echo request packet to an IP address that you specify.
- Traceroute—Traces the path a packet takes to a destination. A list of hosts that receive probe packets as they travel to the destination host is displayed in the order that the receiving hosts receive the packets. Traceroute is mostly used to debug routing problems between hosts.
- Config Save and Restore—Enables you to save, restore, and delete configuration files on a device.

Each utility is available in the Tools menu or on the pop-up menu of a selected device.

Both ping and traceroute commands can originate in two ways:

- From the NMC-RX host platform to a specified device address (default setting)
- From a specified device to an IP address

Table 63: NMC-RX Device Utilities

Used to Determine	Remote Login	Ping	Traceroute
Network connectivity (whether an address is considered valid)	x	x	x
Operational status of a destination host	x	x	x
Network loading and speed (how long it takes the replies to return)		x	x
Network errors (percentage of packets that are lost)		x	x
Path a packet takes to a destination		x	x

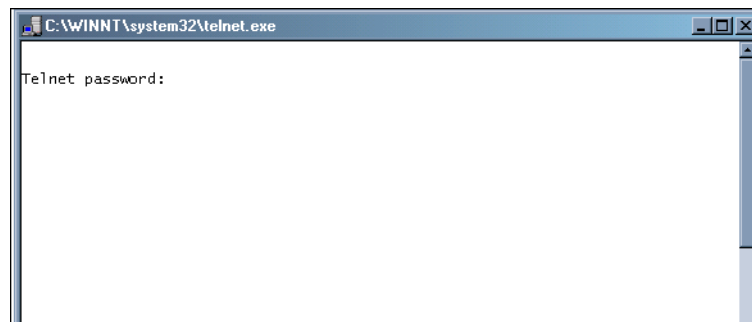
Using Remote Login

The NMC-RX administrator can configure the remote login to be Telnet or SSH, which is described in *NMC-RX User Guide, Vol. 1, Chapter 8, Configuring Security Settings*. Once the remote login is configured, you can start Telnet or SSH either from the Network Workshop or Device Workshop.

To automatically connect to a device:

- From the Network Workshop—Select the device, right-click, and select Remote Login.
- From the Device Workshop—Select the System folder, right-click, and select Remote Login.

The remote login window appears, and you are connected to the selected device. An example of a Telnet session is shown.



To connect to a device from the Tools menu from either the Network or Device Workshop:

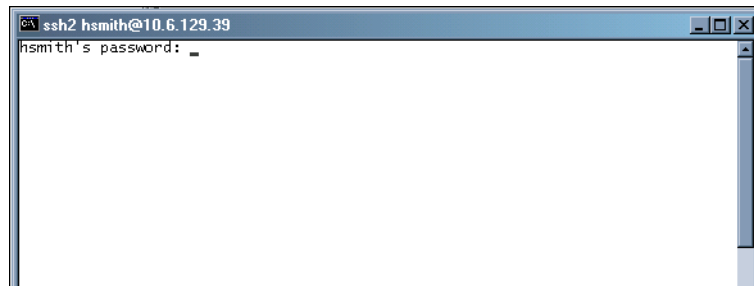
- SSH Login Example**
1. From the Tools menu, select Device Utilities, and click Remote Login.

The SSH Session dialog box appears.



2. Type the IP address of the device to which you want to connect.
3. Click OK.

The SSH login window appears.

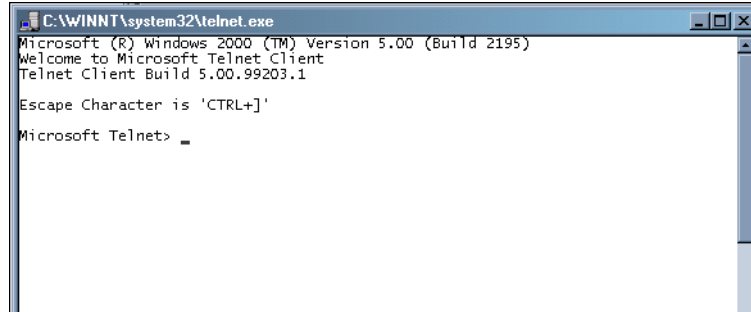


4. Enter your password.

You are logged into the system.

- Telnet Login Example** 1. From the Tools menu, select Device Utilities, and click Remote Login.

The Telnet login window appears.



2. Type the word “open” and the IP address of the device to which you want to connect. For example:

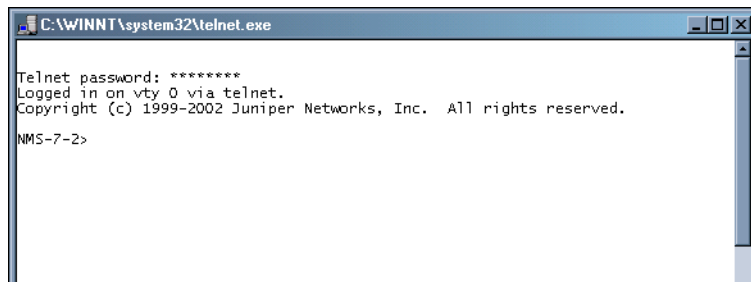
open 10.6.129.39



NOTE: Step 2 may be slightly different depending on the version of Windows you are running.

3. Press Enter.

You are prompted for your Telnet password.



4. Type your Telnet password, and press Enter.

You are logged into the system.

Using Ping

Ping can be used to test the connection status between two devices. You can ping using the basic default settings, or you can set advanced settings to provide more detailed information.

There are three ways to start the Ping utility:

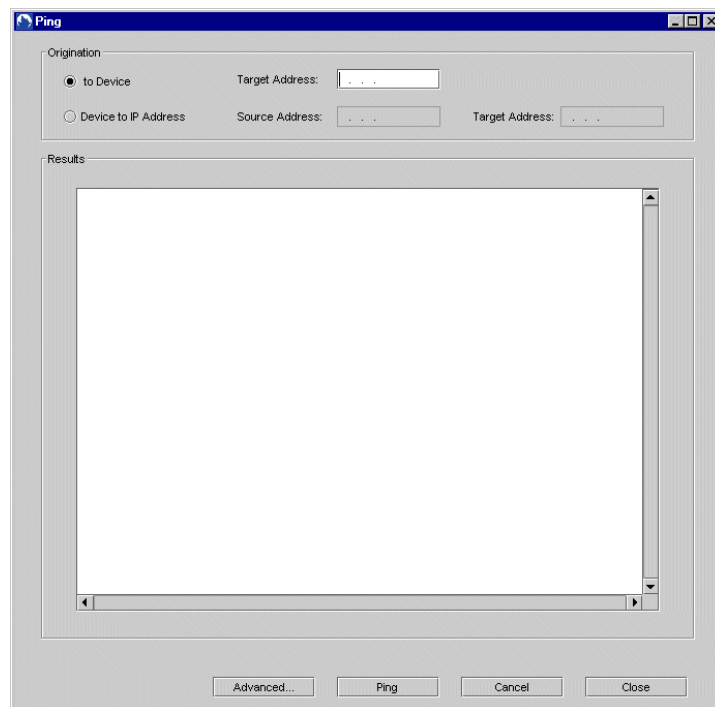
- From the Tools menu—Select Device Utilities, and click Ping. You must then manually enter the IP address.
- From the Network Workshop—Select the device, right-click, and click Ping. The IP address of the selected device is automatically entered in the Address field.
- From the Device Workshop—Select the System folder, right-click, and click Ping. The IP address of the selected device is automatically entered in the Address field.

Using Basic Ping Settings

To ping an IP address using basic settings:

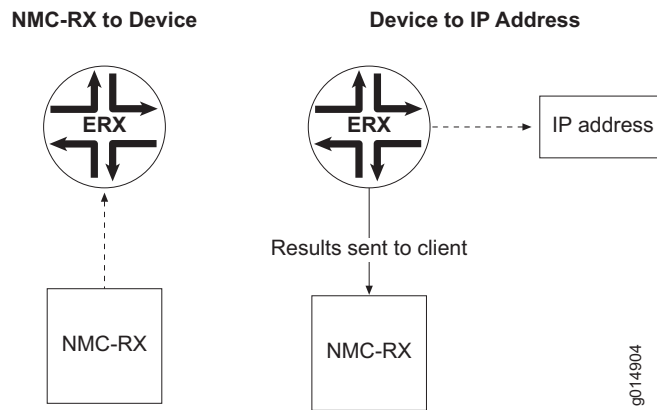
1. Start the Ping utility by using one of the methods described above.

The Ping dialog box appears.



2. Select the Origination point (Figure 12):
 - To Device—Initiates ping from the computer containing the NMC-RX software you are using to a device. Similar to using the ping command in a DOS window.
 - Device to IP Address—Initiates ping from an E-series router to another IP address.

Figure 12: Setting the Origination Point



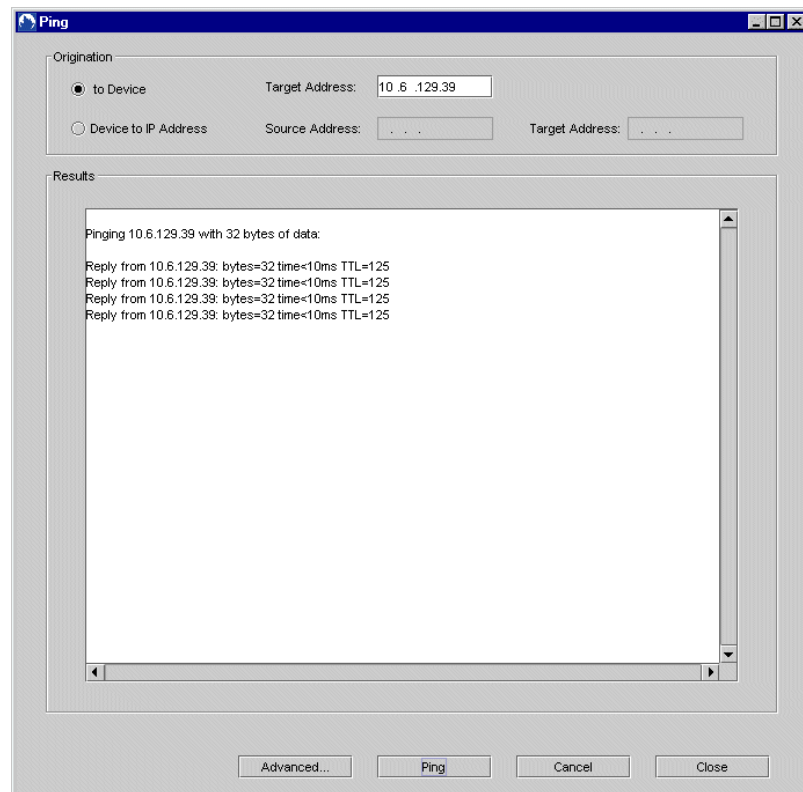
3. Enter the target address and source address (if applicable).
4. Click Ping.

The results appear in the dialog box.



NOTE: Depending on the origin selected, different results appear.

When you click Ping again, the previous results are cleared, the command is executed, and the new results are displayed.



Using Advanced Ping Settings

To ping an IP address using advanced settings:

1. Perform Steps 1–3 in *Using Basic Ping Settings* on page 209.
2. Click Advanced.

Depending on the Origination type selected, one of the following Advanced Ping Options dialog boxes appears.

Figure 13: NMC-RX to Device Advanced Ping Options (Windows)

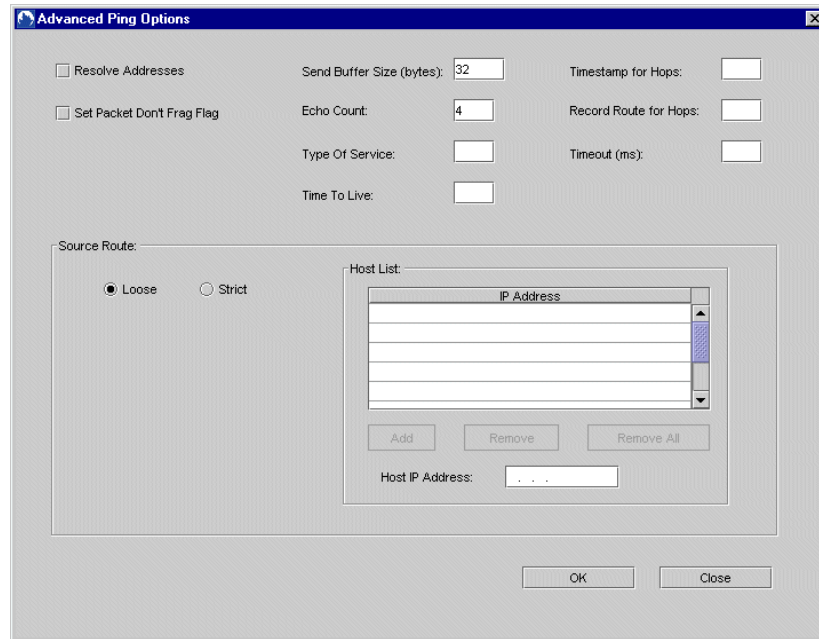
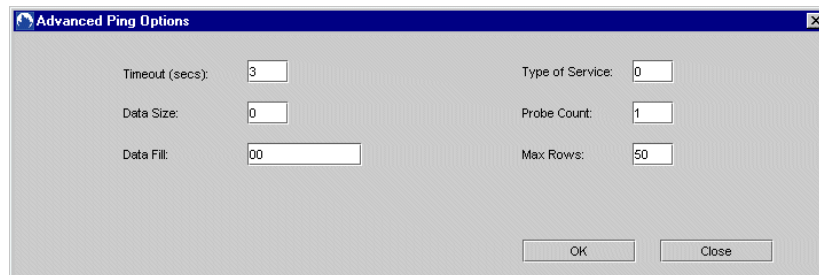


Figure 14: Device to IP Address Advanced Ping Options (Windows)



3. Set the Advanced Ping options (Table 64 or Table 65).

Table 64: NMC-RX to Device Advanced Ping Parameters

Parameter	Description
Resolve Addresses	Select to resolve addresses to host names.
Set Packet Don't Frag Flag	Select to send a Do Not Fragment flag in the packet. The packet will not be fragmented by gateways on the route. Use in conjunction with Send Buffer Size option.
Send Buffer Size (bytes)	Used to increase or decrease the size of the ICMP packets sent in the ping request <ul style="list-style-type: none"> ■ Minimum: 0 ■ Maximum: 65500

Table 64: NMC-RX to Device Advanced Ping Parameters (continued)

Parameter	Description
Echo Count	Sends Echo packets specified by count. For example, if the Echo Count is four, four pings will be sent. <ul style="list-style-type: none"> ■ Default: 4
Type of Service	Sets the ToS value in the ICMP packet for routers that are set up to treat packets with certain types of service differently than others. ToS is not used very often, and most routers ignore it.
Time to Live	Sets the number of hops (routers) that the ping request can traverse before it is discarded. The TTL field in the packet is decremented by one each time it passes through a router. When the number reaches zero, the router discards the packet and sends a TTL Expired ICMP message back.
Timestamp for Hops	Specifies the timestamp for the number of hops <ul style="list-style-type: none"> ■ Minimum: 1 ■ Maximum: 4
Record Route for Hops	Records the route of the outgoing packet and the returning packet in the record route field <ul style="list-style-type: none"> ■ Minimum: 1 ■ Maximum: 9
Timeout (ms)	Time ping waits for each reply. <ul style="list-style-type: none"> ■ NMC-RX to Device uses milliseconds (ms) ■ Device to IP Address uses seconds (sec)
Source Route <ul style="list-style-type: none"> ■ Loose 	<ul style="list-style-type: none"> ■ Identifies certain milestone routers that must be used in route to the destination address. However, any path can be used to get to these milestone routers. ■ When selected, routes packets through the hosts specified in the host list ■ Consecutive hosts can be separated by intermediate gateways (loose source routed). ■ Maximum allowed by IP is 9
Source Route <ul style="list-style-type: none"> ■ Strict 	<ul style="list-style-type: none"> ■ Describes a complete path that must be followed to a destination ■ When selected, routes packets through the hosts specified in the host list ■ Consecutive hosts cannot be separated by intermediate gateways (strict source routed). ■ Maximum allowed by IP is 9

Table 65: Device to IP Address Advanced Ping Parameters

Parameter	Description
Timeout (secs)	Time ping waits for each reply in seconds
Data Size	Specifies the size of the ICMP payload
Data Fill	Specifies the contents of the ICMP payload
Type of Service	Sets the ToS value in the ICMP packet for routers that are set up to treat packets with certain types of service differently than others. ToS is not used very often, and most routers ignore it.
Probe Count	Number of ICMP packets to send
Max Rows	Number of rows displayed

- (Optional) Enter a host IP address (NMC-RX to Device origination only), and click Add.

The address is added to the IP Address list.

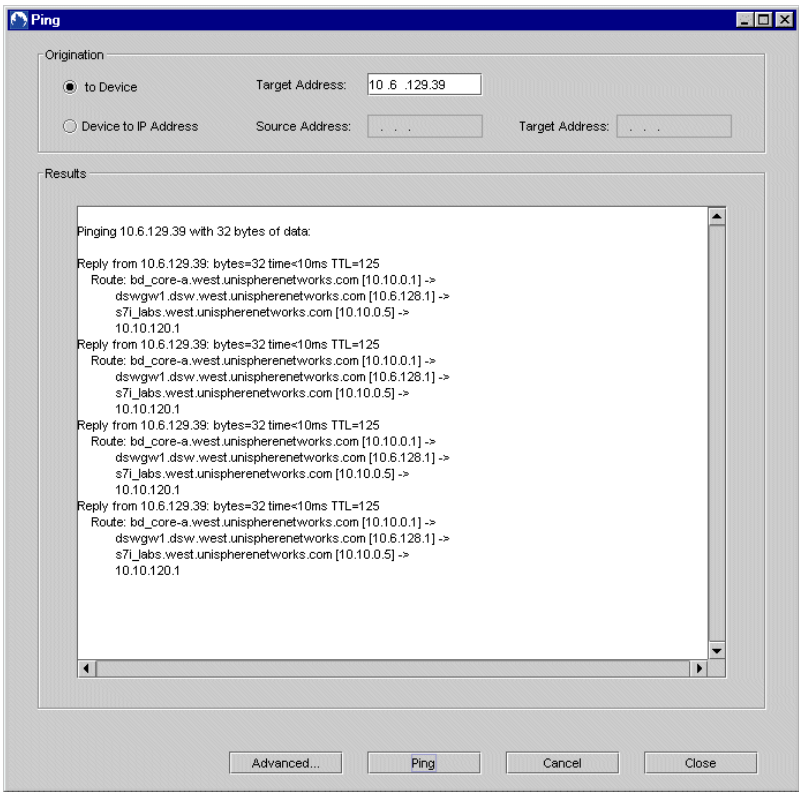
- Click OK to close the Advanced Ping dialog box.
- Click Ping.

The results appear in the dialog box.



NOTE: Depending on the origin selected, different results appear.

When you click Ping again, the previous results are cleared, the command is executed, and the new results are displayed.



Using Traceroute

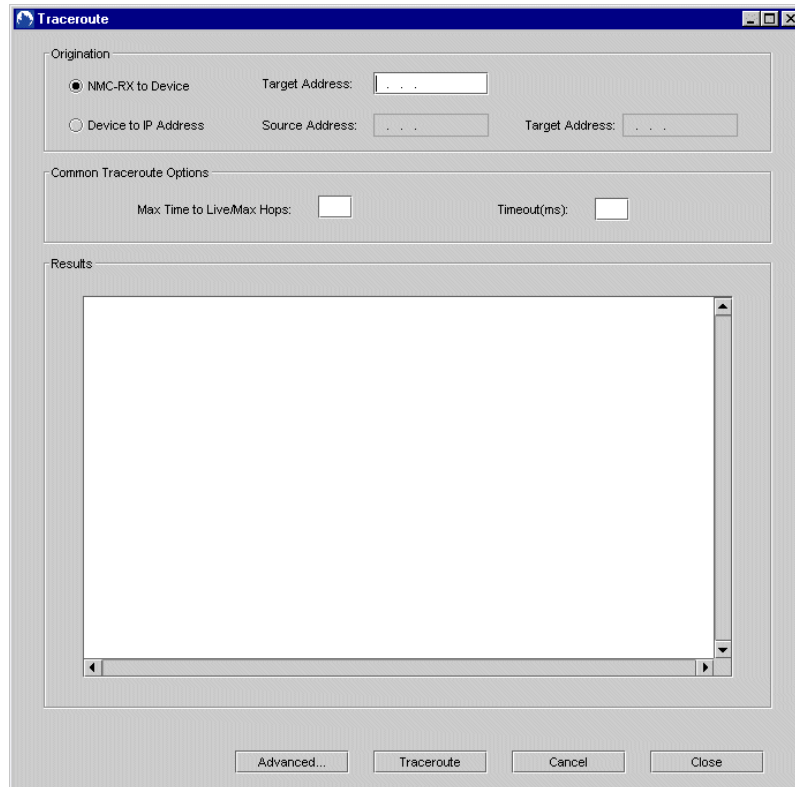
Traceroute can be used to discover the paths that router packets follow when traveling to their destinations. There are three ways to start the Traceroute utility:

- From the Tools menu—Select Device Utilities, and click Traceroute. You must then manually enter the IP address.
- From the Network Workshop—Select the device, right-click, and click Traceroute. The IP address of the selected device is automatically entered in the Address field.
- From the Device Workshop—Select the System folder, right-click, and click Traceroute. The IP address of the selected device is automatically entered in the Address field.

Using Basic Traceroute Settings

To check a device traceroute by using basic settings:

1. Start the Traceroute utility by using one of the methods described above. The Traceroute dialog box appears.



2. Select the Origination method (see descriptions in *Using Advanced Ping Settings* on page 211):
 - NMC-RX to Device
 - Device to IP Address
3. Enter the target address and source address (if applicable).
4. Enter Common Traceroute Options (Table 66).

Table 66: Traceroute Parameters

Parameter	Description
Max Time to Live/Max Hops	Maximum number of hops to search for target
Timeout	Time traceroute waits for each reply: <ul style="list-style-type: none"> ■ NMC-RX to Device uses milliseconds (ms) ■ Device to IP Address uses seconds (sec)

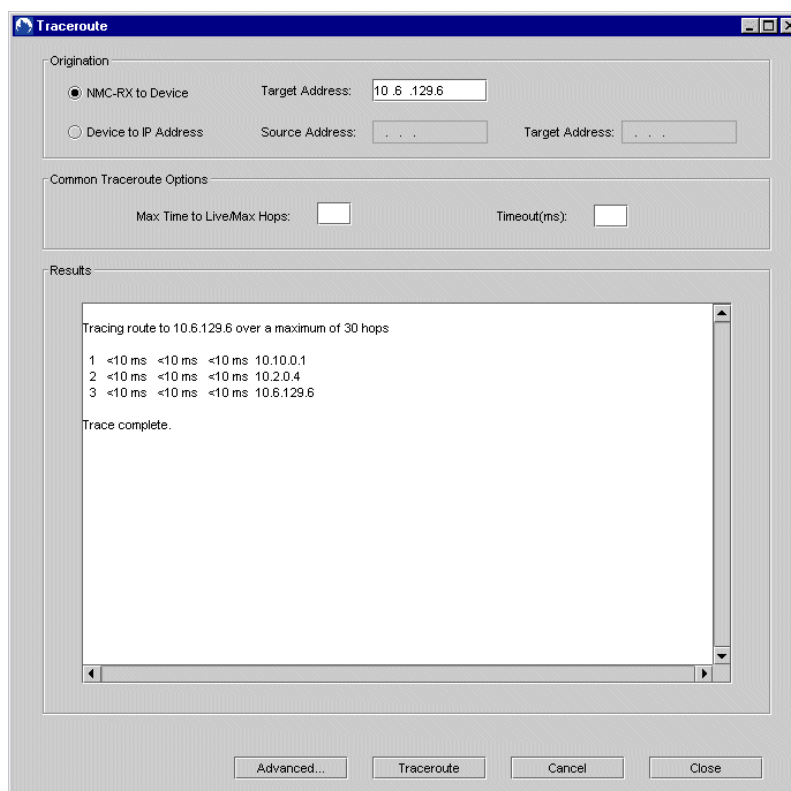
- Click Traceroute.

The results appear in the dialog box.



NOTE: Depending on the origin selected, different results appear.

When you click Ping again, the previous results are cleared, the command is executed, and the new results are displayed.



Using Advanced Traceroute Settings

To check a device traceroute using advanced settings:

- Perform Steps 1–4 in *Using Basic Traceroute Settings* on page 216.
- Click Advanced.

Depending on the Origination type selected, one of the following Advanced Traceroute Options dialog boxes appears.

Figure 15: NMC-RX to Device Advanced Traceroute Options (Windows)

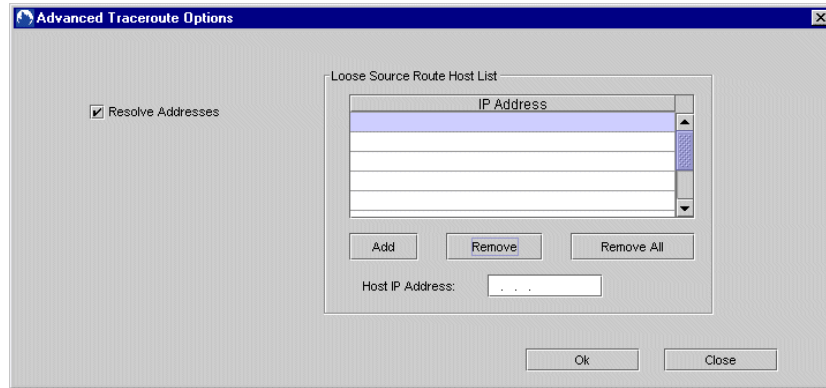
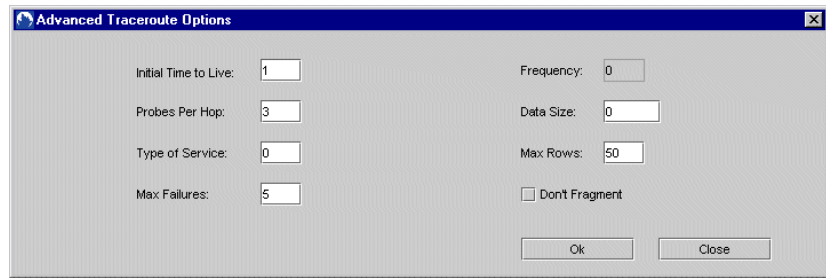


Figure 16: Device to IP Address Advanced Traceroute Options (Windows)



3. Set the Advanced Traceroute options (Table 67 or Table 68).

Table 67: NMC-RX to Device Advanced Traceroute Parameters

Parameter	Description
Resolve Addresses	Select to resolve addresses to host names.
Loose Source Route Host List	<ul style="list-style-type: none"> ■ Identifies certain milestone routers that must be used in route to the destination address. However, any path can be used to get to these milestone routers. ■ Routes packets through the hosts specified by the host list. ■ Consecutive hosts can be separated by intermediate gateways (loose source routed). ■ Maximum allowed by IP is 9.

Table 68: Device to IP Address Advanced Traceroute Parameters

Parameter	Description
Initial Time to Live	Sets the number of hops (routers) that the traceroute request can traverse before it is discarded. The TTL field in the packet is decremented by one each time it passes through a router. When the number reaches zero, the router discards the packet and sends a TTL Expired ICMP message back.
Probes Per Hop	Number of ICMP packets to send for each hop.
Type of Service	Sets the ToS value in the ICMP packet for routers that are set up to treat packets with certain types of service differently than others. ToS is not used very often, and most routers ignore it.
Max Failures	Maximum number of failures before the command is terminated.
Data Size	Specifies the size of the ICMP payload.
Max Row	Maximum number of rows displayed.
Don't Fragment	Sets the don't fragment (DF) bit. Routers that see these packets will not fragment them.

- (Optional) Enter a host IP address in Host IP Address, press Enter, and click Add.

The host IP address is added to the list.

- Click OK to close the Advanced Traceroute dialog box.
- Click Traceroute.

The results appear in the dialog box.



NOTE: Depending on the origin selected, different results appear.

When you click Ping again, the previous results are cleared, the command is executed, and the new results are displayed.

Using the Configuration Save and Restore Utilities

The Configuration Save utility saves the running configuration of a device to a staging area and then transfers it to a user-specified location by means of FTP. The Configuration Restore utility transfers saved configuration files by means of FTP back to the originating device.

The staging area is specified in the Config Sync Services tab (see *Configuring Config Sync Services* on page 146).

Saving a Configuration File

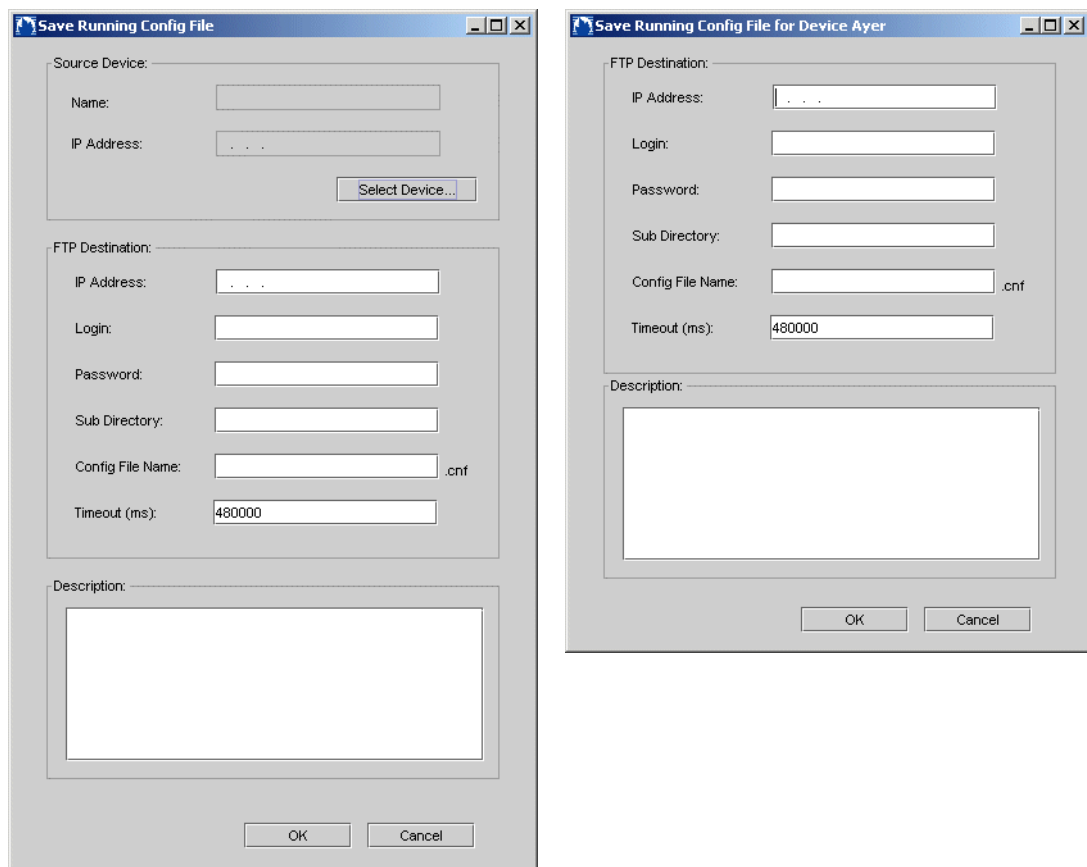
There are three ways to save a configuration file:

- From the Tools menu—Select Device Utilities, and click Save Running Config File. You then must select a device and enter FTP destination information.
- From the Network Workshop—Select the device, right-click, and click Save Running Config File. The name of the selected device is added to the dialog box title bar, and you only have to enter FTP destination information.
- From the Device Workshop—Select the System folder, right-click, and click Save Running Config File. The name of the device is added to the dialog box title bar, and you only have to enter FTP destination information.

To save a running configuration file:

1. Start the Configuration Save utility by using one of the methods described above.

One of two possible Save Running Config File dialog boxes appears.

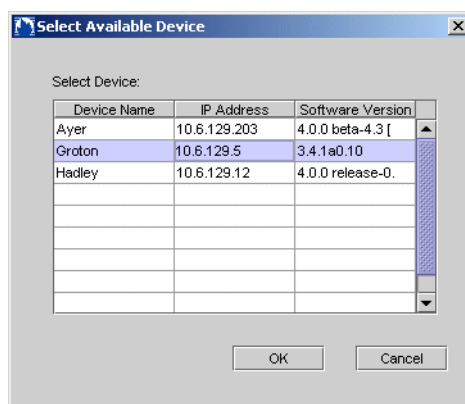




NOTE: If you started the utility from a pop-up menu (right-click), the Source Device group box does not appear in the dialog box (example on right). Instead, the device name is added to the dialog box title bar.

- Click the Select Device button, or, if you started the utility from a device, skip to Step 4.

The Select Available Device dialog box appears.



- Select the device that is running the configuration you want to save, and click OK.

The device information is added to the Source Device group box.

- Enter the FTP destination parameters (Table 69). (The FTP destination is where the config file is saved.)

Table 69: Save Running Configuration File Parameters

Parameter	Description
IP Address	IP Address of configuration file destination
Login	Login user name for the FTP site
Password	Login password for the FTP site; cannot be empty
Sub Directory	<ul style="list-style-type: none"> ■ Directory where the file is saved (from the point of the FTP root directory) ■ Cannot exceed 255 characters when combined with the filename ■ Cannot contain the following characters: * ? " < > % : ■ Cannot contain ASCII values: <ul style="list-style-type: none"> ■ Less than or equal to 31 ■ Greater than or equal to 127

Table 69: Save Running Configuration File Parameters (continued)

Parameter	Description
Config File Name	<ul style="list-style-type: none"> ■ Name of saved configuration file ■ .CNF is appended to the file name ■ 128 characters (except / and \); leading spaces are not allowed ■ Cannot exceed 255 characters when combined with Sub-Directory ■ Cannot contain the following characters: / : \ * ? " < > % ■ Cannot contain ASCII values: <ul style="list-style-type: none"> ■ Less than or equal to 31 ■ Greater than or equal to 127
Timeout (ms)	■ Number of milliseconds to wait for the FTP process to be completed; range 300–2147483647
Description	Additional information describing the configuration file

5. Click OK. The configuration file is saved to the designated directory.

Restoring a Configuration File

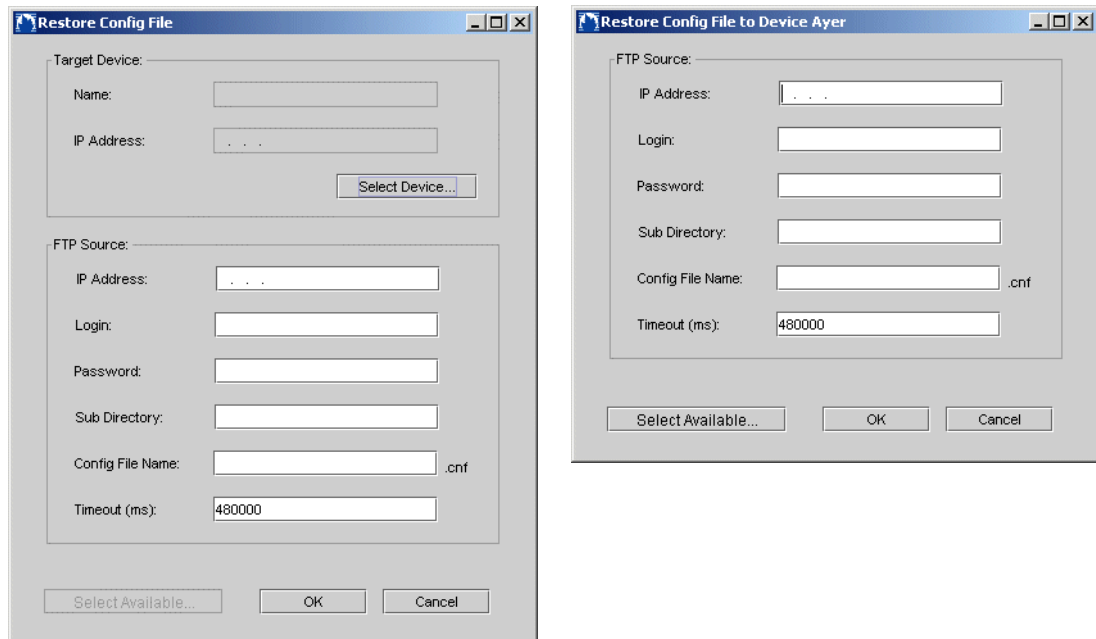
There are four ways to restore a configuration file:

- From the Tools menu—Select Device Utilities, and click Restore Config File. You then must select a device and enter FTP source information.
- From the Network Workshop—Select the device, right-click, and click Restore Config File. The name of the selected device is automatically listed in the window title bar, and you only have to enter FTP source information.
- From the Device Workshop—Select the System folder, right-click, and click Restore Config File. The name of the device is automatically listed in the window title bar, and you only have to enter FTP source information.
- From the Device-Wide Explorer—In the System folder, select Config Files, right-click, and click List All. Then select a configuration file in the list area, right-click, and click Restore.

To restore a configuration file:

1. Start the Configuration Restore utility by using one of the methods described above.

One of two possible Restore Config File dialog boxes appears.

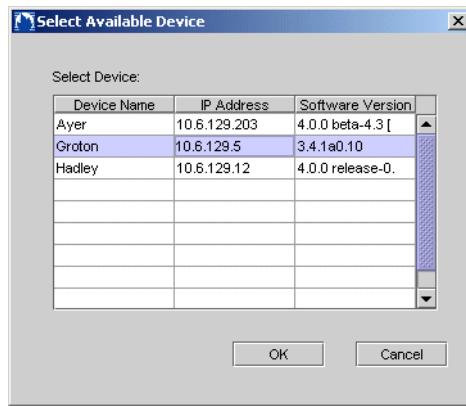


NOTE: If you started the utility from a pop-up menu (right-click), the Target Device group box does not appear in the dialog box (example on right). Instead, the device name is added to the dialog box title bar.

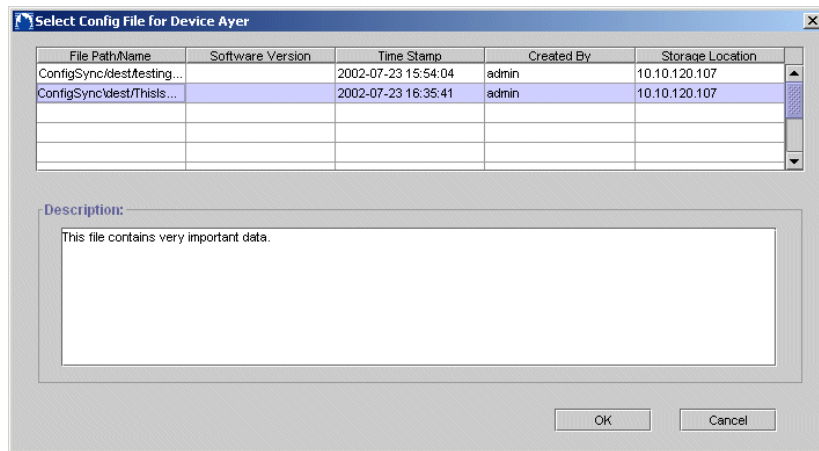
If you started the utility from the list area, the IP Address, Sub Directory, and Config File Name fields are automatically filled in, and the Select Available button does not appear.

2. Click the Select Device button, or:
 - If you started the utility from a device, skip to Step 4.
 - If you started the utility from the list area, skip to Step 6.

The Select Available Device dialog box appears.



3. Select the device to which the configuration file will be copied, and click OK.
The device information is added to the Target Device group box.
4. Click the Select Available button to choose the configuration file.
The Select Config File for Device dialog box appears.



5. Select a file, and click OK.
The FTP Source group box parameters are filled in (Table 70).

Table 70: Restore Configuration File Parameters

Parameter	Description
IP Address	IP address of the FTP source where the configuration file is located
Login	Login user name for the FTP site
Password	Login password for the FTP site; cannot be empty

Table 70: Restore Configuration File Parameters (continued)

Parameter	Description
Sub Directory	<ul style="list-style-type: none"> ■ Directory where file resides (from the point of the FTP root directory) ■ Cannot exceed 255 characters when combined with file name ■ Cannot contain the following characters: * ? " < > % : ■ Cannot contain ASCII values: <ul style="list-style-type: none"> ■ Less than or equal to 31 ■ Greater than or equal to 127
Config File Name	<ul style="list-style-type: none"> ■ Name of saved configuration file ■ .CNF is appended to the file name ■ 128 characters (except / and \); leading spaces are not allowed ■ Cannot exceed 255 characters when combined with Sub-Directory ■ Cannot contain the following characters: / : \ * ? " < > % : ■ Cannot contain ASCII values: <ul style="list-style-type: none"> ■ Less than or equal to 31 ■ Greater than or equal to 127
Timeout (ms)	<ul style="list-style-type: none"> ■ Number of milliseconds to wait for the FTP process to complete; range 300–2147483647

6. Enter a login and password, and then click OK.

The file is restored.



NOTE: The Config Restore utility does not configure the device with the restored file; it simply places a copy of the configuration on the system. You must use the CLI to reload (reboot) the device with the restored file.

Deleting a Configuration File

To delete a saved configuration file for a device:

1. From the Device-Wide Explorer, in the System folder, select Config Files, right-click, and click List All.

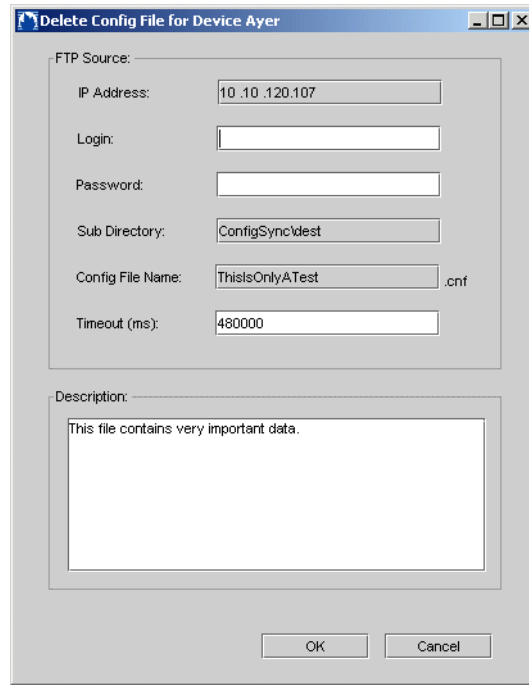
All saved configuration files for that device are displayed in the list area.

2. Select a configuration file, right-click, and click Restore.

A confirmation pop-up appears.

3. Click Yes.

The Delete Config File for Device dialog box appears.



4. Enter login and password information, and click OK.

The configuration file is deleted.