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Quick Start Guide for Nortel Networks 5399 and 8000 Access Switches

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Preface

If you are responsible for installing, configuring, or managing a Nortel Networks 5399 Access Switch or 8000 Access Switch (formerly known as Model 5399 and Model 8000 Remote Access Concentrator (RAC)), you need to read this guide.

Note: The Access Switch product name appears *only* on the title page. Whenever the term Remote Access Concentrator (RAC) appears in this document, it refers to the Nortel Networks 5399 or 8000 Access Switch.

This guide provides instructions for installing Nortel Networks Remote Access Concentrator (RAC) hardware and software.

Before You Begin

Before using this guide, you must order line provisioning through your telco. For more information, refer to *Provisioning WAN Lines for Nortel Networks 5399 and 8000 Access Switches.*

Text Conventions

This guide uses the following text conventions:

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: If the command syntax is: **ping** <*ip_address*>, you enter: **ping 192.32.10.12**
bold text	Indicates command names and options and text that you need to enter. Example: Enter **show ip** {**alerts** | **routes**}. Example: Use the **dinfo** command.
braces ({})	Indicate required elements in syntax descriptions where there is more than one option. You must choose only one of the options. Do not type the braces when entering the command. Example: If the command syntax is: **show ip** {**alerts** | **routes**}, you must enter either: **show ip alerts** or **show ip routes**, but not both.
brackets ([ ])	Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command. Example: If the command syntax is: **show ip interfaces** [**-alerts**], you can enter either: **show ip interfaces** or **show ip interfaces -alerts**.
ellipsis points (. . .)	Indicate that you repeat the last element of the command as needed. Example: If the command syntax is: **ethernet/2/1** [<*parameter*> <*value*>] **. . .** , you enter **ethernet/2/1** and as many parameter-value pairs as needed.

italic text	Indicates file and directory names, new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore. Example: If the command syntax is: **show at** <*valid_route*> *valid_route* is one variable and you substitute one value for it.
`screen text`	Indicates system output, for example, prompts and system messages. Example: `Set Trap Monitor Filters`

Acronyms

This guide uses the following acronyms:

ANI	Automatic Number Identification
CAS	Channel Associated Signaling
DNIS	Dialed Number Information Service
FDL	Facilities Data Link
ISDN	Integrated Services Digital Network
PRI	Primary Rate ISDN
RAC	Remote Access Concentrator
WAN	Wide Area Network

Related Publications

For more information about using the Model 5399 and Model 8000 Remote Access Concentrators, refer to the following publications:

- *Nortel Networks 5399 Access Switch Hardware Installation Guide* (Nortel Networks part number 308679-A)
- *Installing the Nortel Networks 8000 Access Switch* (Nortel Networks part number 308680-A)
- *Nortel Networks 5399 and 8000 Access Switch SNMP MIB Reference* (Nortel Networks part number 300861-C)
- *Nortel Networks 5399 and 8000 Access Switch Software Reference* (Nortel Networks part number 300860-C)
- *Installing and Configuring Access Switch Software for UNIX* (Nortel Networks part number 300856-C)
- *Installing and Administering the Config Utility* (Nortel Networks part number 301697-C)
- *Installing and Configuring Nortel Networks 5399 and 8000 Access Switch Software for Windows and Windows NT* (Nortel Networks part number 300857-C)
- *Provisioning WAN Lines for Nortel Networks 5399 and 8000 Access Switches* (Nortel Networks part number 300854-C)

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- The “CD ROMs” section lists available CDs.
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How to Get Help

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If you purchased a Nortel Networks service program, contact one of the following Nortel Networks Technical Solutions Centers:

Technical Solutions Center	Telephone Number
Billerica, MA	800-2LANWAN (800-252-6926)
Santa Clara, CA	800-2LANWAN (800-252-6926)
Valbonne, France	33-4-92-96-69-68
Sydney, Australia	61-2-9927-8800
Tokyo, Japan	81-3-5402-7041

Quick-Start Guide

This Quick-Start guide describes how to install and configure Remote Access Concentrator (RAC) hardware and software using factory defaults. After installing the RAC, you can customize it for your specific requirements.

This guide is written for system administrators who install and maintain RACs and have knowledge of networking and networking protocols. You can choose either the quick-start procedure or the roadmap.

The information is presented as follows:

- Quick-Start -- Provides summarized instructions for installing the software images, tools, and the RAC.
- Roadmap -- Lists tasks and related documentation for each task.
- Related Documentation -- Lists all documents supporting Remote Access Concentrators.

Quick-Start Tasks

The quick-start tasks are designed to provide the information necessary to install and configure the RACs using factory defaults. Table 1 summarizes the quick-start tasks.

Table 1. Quick-Start Tasks

Task	What is Performed	What is Required
1	Order line provisioning from the telco	Switch type and switch parameters that are supported by the RAC
	Determine IP addresses	RAC IP address Subnet mask Broadcast address Preferred Load Host address Preferred Dump Host address Load/Dump Gateway address
	Determine boot sequence	**self** or **net**
	Determine software image location	**oper.64.enet** (on RAC) or TFTP Load Directory and Dump path/filename
2	Install RAC software	PC running Microsoft Windows NT Server or UNIX or a UNIX workstation
3	Install the Model 5399 or Model 8000	The Model 5399 requires an available slot in a System 5000 MSX chassis. The Model 8000 requires a remote monitor and an Ethernet connection.
4	RAC configuration	Configure the RAC's IP addresses, boot sequence, and operating image (information gathered in Task 1)
5	Boot the RAC	Boot the RAC from the ROM monitor
6	Configure the switch type	Information from Task 1 and using **admin**, the **na** utility, or the Config Utility
7	Set switch parameters	
8	Configure security	Configure security regime and PPP security
9	Reboot the RAC	Issue **boot** command
10	Customize the RAC	The **na** utility or the Config Utility

Task 1: Site Preparation

Before installing and configuring a Remote Access Concentrator you need to have the following information:

- Line provisioning
- IP addresses
- Boot sequence
- Software image location

Order Line Provisioning

The lines are ordered through the telco before the RAC is installed. Typically this is done after the sales order is placed. The supported switch types and switch parameters are described in *Provisioning WAN Lines for Nortel Networks 5399 and 8000 Access Switches*. You should have the switch type and parameter values before continuing with the installation.

IP Addresses

You must be prepared to enter the following addresses during the configuration procedure:

- Internet address
- Subnet mask
- Broadcast address
- Preferred load host
- Preferred dump host
- Load/Dump gateway address

Note: Load/Dump gateway is used as a low priority default route after the RAC boots.

Boot Sequence

You must decide which boot sequence you want to use (default is self). You can choose a network boot (**net**), self boot (**self**), or both. Typically, you select both (**net** and **self**).

Software Image

Determine the software image location (RAC or load host). The software image is shipped with the RAC and is stored in flash memory. Typically you would select to load from flash memory, but you can also load from a TFTP load directory from a load host.

Task 2: Install RAC Software

Follow the software install procedures for the operating system you are using. For detailed installation procedures, refer to *Installing and Configuring Nortel Networks 5399 and 8000 Access Switch Software for Windows and Windows NT* or *Installing and Configuring Nortel Networks Access Switch Software for UNIX*.

Task 3: Install the RAC

Install the Model 5399 or Model 8000 RAC. The Model 5399 is installed in a System 5000 MSX chassis and receives signal and power from the backplane connectors. The model 8000 RAC is a standalone chassis that requires the following cables:

- Ethernet
- Console
- Synchronous (if used)
- Power

Note: Configure the RAC before connecting the WAN cables.

The Model 8000 console terminal is configured as follows:

- 9600 baud
- 8 data bits
- No parity
- 1 stop bit
- XON/XOFF flow control

Detailed installation instructions are in the *Nortel Networks 5399 Access Switch Hardware Installation Guide* and *Installing the Nortel Networks 8000 Access Switch*.

Task 4: RAC Configuration

To configure the RAC, it must be in ROM monitor mode. Press and hold the Reset button on the Model 8000. After the green stat light flashes, release the Reset button. After all the lights flash again, press the Reset button again. The orange light should illuminate indicating the self-test sequence. The self-test completes when the alternating green %Utilization light illuminates. Lastly, the orange attn light should illuminate. This indicates that the Annex is in ROM monitor mode, and the monitor:: prompt should display on the terminal connected to the console port.

The Model 5399 is accessible through the Slot Selection Menu on the System 5000 MSX console. To enter monitor mode on a Model 5399 RAC:

1. **Enter r <***slot number***> to reset the 5399.**

   ```
   Do you want to reset the 5399 y/n [y]:y
   ```

2. **Enter c on the slot selection menu to connect and enter the 5399's** *slot number***.**
3. **Press the space bar to enter monitor mode.**

After the RAC is in ROM monitor mode, perform the following tasks:

- Set the network addresses
- Set the operating image
- Configure the interface sequence
- Enable the **allow_snmp_sets** parameter

Set the Network Addresses

This section uses the IP addresses established in Task 1. To set the network addresses:

1. **At the ROM monitor prompt, enter addr and respond to the prompts as shown in the example. To accept the default shown in brackets, press the Return key.**

Note: For illustration purposes, this example shows a RAC on an Ethernet network with the IP address 192.9.200.62. The host system address is 192.9.200.55. The router gateway address would be 192.9.200.1 for this subnet to access other subnets.

```
monitor:: addr
Enter Internet address::192.9.200.62
Enter Subnet mask [255.255.255.0]::
Enter Broadcast address::192.9.200.255
Enter preferred Load Host address::192.9.200.55
Enter Preferred Dump Host [0.0.0.0]::192.9.200.55
Enter Load/Dump Gateway address::192.9.200.1
Select type of IP packet encapsulation (ieee802/ethernet)
[<ethernet>]::
Load Broadcast y/n [y]::
```

2. **After you enter the address path names, enter ad -d to verify the IP address.**
3. **After you verify the IP address, set the operating image.**

Set the Operating Image

The default operating image is shipped with the RAC and is stored in flash memory. Verify or set the operating image as follows:

1. **At the ROM monitor prompt, enter image and respond to the prompts as shown in the example. To accept the default shown in brackets, press the Return key.**

```
monitor:: image
Enter Image name [(ip) “oper.64.enet”, “OPER_64_ENET.SYS”]::
Enter TFTP Load Directory[“”]::
Enter TFTP Dump path/filename::192.9.200.62.dump
```

2. **After you enter the image name, enter im -d to verify the operating image.**
3. **After you verify the operating image, set the interface sequence.**

Configure the Interface Sequence

The interface sequence determines the order or method in which the RAC boots. You can configure the RAC for network, self-boot, or both. To set the sequence:

1. **At the ROM monitor prompt, enter seq. The system responds:**

```
Enter a list of 1 to 4 interfaces to attempt to use for
downloading code or upline dumping. Enter them in the order they
should be tried, separated by commas or spaces. Possible
interfaces are:

Ethernet: net

SELF: self

Enter interface sequence [net]::
```

Note: If the RAC is configured for self-boot, copy the configuration (**config.annex**) file from the server to the RAC using FTP. Do this after you boot the RAC.

2. **After you enter the sequence, enter seq -d to verify the interface sequence.**

Enable the allow_snmp_sets Parameter

If you plan to use the Config Utility to configure and manage the RAC, you must enable the **allow_snmp_sets** parameter. To enable this parameter:

Note: If you do not plan to use the Config Utility, go to Step 3.

1. **At the ROM monitor prompt, enter allow_snmp_sets**.
2. **Enter Y when you are asked if you want to enable this parameter.**
3. **Save the changes you made to the RAC:**
   a. **For the 5399 RAC, exit the ROM monitor by pressing Ctrl T. This returns you to the System 5000 Slot Selection Menu.**
   b. **Enter s to select the supervisory Module main menu.**
   c. **Enter m to select the Module Information Menu.**
   d. **At the** `Enter slot # (1-14):` **prompt enter the** *slot number* **and press Return. Then enter d to set all the changes you made as the default.**

Task 5: Boot the RAC

Issue the **boot** command to boot the RAC. After the RAC boots, choose which tool you want to use to complete the remaining configuration tasks. The remaining tasks in this book use **admin** commands from the console monitor, but you can also use the **na** utility or the Config Utility.

Note: If you are using net boot and want to save the image on the RAC issue the **boot -l** command.

Task 6: Configure the Switch Type

You must configure the switch type using the information collected in Task 1 before connecting the network cables to the WAN ports. To configure the switch type:

1. **After the RAC boots, enter cli at the console monitor prompt. (If you are configuring a 5399, connect to the slot the 5399 is installed in using the Slot Selection menu before entering the cli command.)**

2. **Enter admin as follows:**

```
annex: su

Password:
```

Note: The default password is the RAC's IP address.

```
Annex# admin
```

3. **Using the set wan command, enter the switch type. The example below shows how you set the switch for AT9. Enter the switch type from the telco information. (For more information about switch types, refer to *Provisioning WAN Lines for Nortel Networks 5399 and 8000 Access Switches*.)**

```
admin: set wan=1 switch_type AT9
       You may need to reset the appropriate port,
       Annex subsystem or reboot the Annex for changes
       to take effect.

This sets the switch type for interface 1 to AT9. To specify WAN
2, enter wan=2; for both WANs, enter wan=all
```

Task 7: Set Switch Parameters

Using the switch parameters gathered from Task1, configure the switch.

View the existing WAN parameters by entering **sho wan=all all**. Set the WAN parameters to be compatible with those provided by the telco. For information on setting WAN parameters, refer to *Managing Nortel Networks 5399 and 8000 Access Switches Using Command Line Interfaces.*

Note: Make sure the WAN parameters are compatible with those provided by the telco. The telco may temporarily disable lines connected to improperly configured devices. For more information on WAN parameters, refer to *Nortel Networks 5399 and 8000 Access Switch Software Reference.*

Task 8: Configure Security

This section describes how to configure both ACP and RADIUS security regimes and PPP setup. When configuring RAC security, you configure the security regime before configuring PPP.

Note: If you are using another third party security regime, refer to the *Managing Nortel Networks 5399 and 8000 Access Switches Using Command Line Interfaces* and *Installing and Administering the Config Utility.*

ACP Security

This section tells the user how to configure ACP security on a server and how to setup the RAC to authenticate users. After setting up security on a Microsoft NT server or a UNIX server, you must setup the RAC for authentication on the server.

Note: To configure ACP security, you must have selected ACP as the default security regime during the software installation.

ACP Security on a Microsoft NT Server

To setup ACP security on a Windows NT Server, you can use native NT user accounts. Each user must have local logon access rights and belong to a group that has global authentication. The NT server must also have access to the domain's Primary Domain Controller (PDC).

ACP Security on a UNIX Server

To setup ACP security on a UNIX server, perform the following:

1. **Log on to the UNIX server as superuser.**
2. **Create the password file /usr/annex/acp_passwd. The format for acp_passwd is the same as /etc/passwd.**
3. **To add a user's password enter username:: and then run ch_passwd.**

Authentication Setup

Set up RAC to authenticate on the security server:

1. **Log on to the RAC as superuser and run admin. Enable security on the RAC by typing:**

   `admin:` **set annex enable_security y**

2. **Set the RAC's ACP host.**

   `admin:` **set annex pref_secure1_host** *<ip addr of ACP host>*

3. **Leave cli security off so you can access the RAC from the console.**

   `admin:` **set port cli_security n**

4. **Set vcli security.**

   `admin:` **set annex vcli_security y**

5. **Reset the RAC for the configuration changes to take effect.**

   `admin:` **reset annex all**

6. **After the RAC is reset, try to log on to the RAC through a telnet session. If security is working you may go ahead and set cli security using the following admin command:**

   `admin:` **set port cli_security y**

RADIUS Security

With the RADIUS server up and running, find out the service ports that the RADIUS server is using. The service ports will usually be 1645/udp for authentication and 1646/udp for accounting. To set up RADIUS security:

1. **Log on to the RAC as superuser and run admin. Enable security on the RAC by entering:**

   `admin:` **set annex enable_security y**

2. **Configure the RADIUS host.**

   a. **Set the RAC's RADIUS host.**

      `admin:` **set annex pref_secure1_host** *<ip addr of radius host>*

   b. **Set the RAC's service port for authentication on the RADIUS host.**

      `admin:` **set annex radius_auth1_port** *<1645 or 1812>*

   c. **Set the RAC's accounting host.**

      `admin:` **set annex radius_acct1_host** *<ip addr of radius acct1 host>*

   d. **Set the RAC's service port for accounting on the RADIUS acct1 host.**

      `admin:` **set annex radius_acct1_port** *<1646 or 1813>*

   e. **Set the authentication protocol on the RAC.**

      `admin:` **set annex auth_protocol radius**

3. **Enable the RADIUS client on the RAC.**

   `admin:` **set annex enable_radius_acct y**

Note: The secret entries made in Steps 6 and 7 must be made in the clients file on the RADIUS server for the RAC with the same *<secret>*.

---

4. **Set the secret authentication password that is shared between the RADIUS host and the RAC.**

   `admin:` **set annex radius_auth1_secret** *<secret>*

5. **Set the secret accounting password that is shared between the RADIUS host and the RAC.**

6. `admin:` **set annex radius_acct1_secret** *<secret>*

7. **Leave cli security off so you can access the RAC from the console.**

   `admin:` **set port cli_security n**

8. **Set vcli security.**

   `admin:` **set annex vcli_security y**

9. **Reboot the RAC for the configuration changes to take effect.**

   `admin:` **quit**

   `annex#` **boot**

10. **After the RAC is rebooted, try to log on to the RAC through a telnet session. If security is working you may go ahead and set cli security using the following admin command:**

    `admin:` **set port cli_security y**

PPP Setup

To set up PPP security, perform the following:

1. **Log on to the RAC as superuser and run admin.**
2. **Set PPP security.**

   `admin:` **set port slip_ppp_security y**

3. **Set PPP security protocol.**

   `admin:` **set port ppp_security_protocol** <*security protocol*> (**pap** or **chap**)

4. **Enable security for terminal dial-in users.**

   `admin:` **set port cli_security y**

5. **Set the RAC for PPP callers only.**

   `admin:` **set port mode ppp**

   `admin:` **reset port**

6. **Set up the RAC so that addresses are on the DS0s.**

   `admin:` **wan 1**

   `admin:` **set wan=1 ds0=all remote_address** *<starting ip address>* **1**

   `admin:` **reset wan**

Note: IP addresses are incremented from the *starting IP address* using an increment of 1. Addresses will be applied on all DS0s and will be used at random as the DS0s are used at random. Addresses are assigned to users once they dial in.

Task 9: Reboot the RAC

After making all the configuration changes, you must reboot the RAC for the changes to take effect. After you reboot the RAC:

1. **Connect the cables to the WAN interface ports on the front (Model 5399) or back (Model 8000) of the RAC.**
2. **Test the RAC by dialing into it.**

Task 10: Customizing the RAC

After installing and booting the RAC, you can customize RAC parameters (for example security or port parameters) using one of the following tools:

- CLI interface (see *Managing Nortel Networks 5399 and 8000 Access Switches Using Command Line Interfaces*)
- Config Utility (see *Installing and Administering the Config Utility* and the Config Utility online Help system)

Roadmap

The roadmap provides a series of tasks that you must perform in sequential order to install, configure, and boot a RAC. Refer to the specified documentation for detailed instructions. The roadmap can be divided into two distinct sections: installation and configuration, and customization.

Installing and Configuring the RAC

This portion of the roadmap lists the tasks you must perform to install and configure the RAC and the documentation needed to perform these tasks.

Task	Documentation
Prepare to install the Model 5399 or Model 8000 RAC: - Confirm that all WAN provisioning requirements are met: - IP address - Boot type (**net**, **self**, or **BFS**) - Image location (TFTP or local) - Confirm required platforms: - PC running Windows NT or UNIX - Workstation running UNIX	See the provisioning information provided by your telco. For Mircosoft Windows or Windows NT, see *Installing and Configuring Nortel Networks 5399 and 8000 Access Switch Software for Windows and Windows NT*. For UNIX, see *Installing and Configuring Nortel Networks 5399 and 8000 Access Switch Software for UNIX*. *Installing and Administering the Config Utility*
Install RAC software on the server: -UNIX - Install RAC Software - Install Config Utility -Windows - Install na - Install server tools - Install Config Utility	

Task	**Tools and Documentation**

Install the Model 5399 or Model 8000:
- Model 5399
  - Configure jumpers
  - Install module in hub
  - Verify installation
- Model 8000
  - Install chassis
  - Connect Ethernet cables
  - Connect console terminal
  - Verify installation
	Nortel Networks 5399 Access Switch Hardware Installation Guide
	
	Installing the Nortel Networks 8000 Access Switch

Initialize the Model 5399 and Model 8000 RAC:
- Manual initialization
  - Set IP address (**addr**)
  - Set boot image (**image**)
  - Set boot sequence (**seq**)
-Auto initialization
  -BOOTP
  -RARP	

Configure the RAC boot type: - Boot using BFS - Boot using TFTP - Self-boot (default) - Boot from a Windows NT host - Boot from another RAC	
Configure WANs: - Set switch type - Set WAN parameters - Connect WAN interface	Tools - Config Utility - na utility *Managing Nortel Networks 5399 and 8000 Access Switches Using Command Line Interfaces* *Installing and Administering the Config Utility* Config Utility online Help

Customizing the RAC

This portion of the roadmap describes how to customize the RAC for your specific needs and services. You set parameters and services using the tools available on the Microsoft Windows, Windows NT, or UNIX platform.

Task	**Tools and Documentation**
Configure basic security: - ACP - RADIUS - Filters	Tools - Config Utility - na utility *Managing Nortel Networks 5399 and 8000 Access Switches Using Command Line Interfaces* *Nortel Networks 5399 and 8000 Access Switch Software Reference* *Installing and Administering the Config Utility* Config Utility online Help *Installing and Configuring Nortel Networks 5399 and 8000 Access Switch Software for Windows and Windows NT.*
Change RAC configuration settings: - Automated Firmware Download (AFD) - Setting/changing parameters	
Configure hosts and servers: - Specify load and dump hosts - Configure the RAC - Event logging - File servers - Name servers - Customize the RAC - Using **erpcd**	
Configure calls and global ports: - Defining call types - Setting call default values	
Configure digital modems: - Busying out modems and channels - Modem definitions	

RAC Reference Documentation

In addition to this guide, the following documentation supports the Model 5399 and Model 8000 RAC:

Nortel Networks 5399 Access Switch Hardware Installation Guide (308679-A Rev. 00) -- Describes how to install the Model 5399 RAC, set the IP address, and make the RAC operational using factory defaults.

Installing the Nortel Networks 8000 Access Switch (308680-A Rev. 00) -- Describes how to install the Model 8000 RAC, set the IP address, and make the RAC operational using factory defaults.

Provisioning WAN Lines for Nortel Networks 5399 and 8000 Access Switch (300854-C Rev. 00) -- Describes the information you need to provision WAN lines for Remote Access Concentrators. The guide provides several switch types and switch parameters which must be negotiated through the telco before installing the RAC.

Installing and Configuring Nortel Networks Access Switch Software for UNIX (300856-C Rev. 00) -- Describes how to install Remote Access Concentrator software on a UNIX server. This book provides examples of the installation script as well as information about installing a particular security regime.

Installing and Configuring Nortel Networks 5399 and 8000 Access Switch Software for Windows and Windows NT (300857-C Rev. 00) -- Describes the procedures for installing Server Tools and the Network Administrator (**na**) utility, on a host server running Windows software.

Managing Nortel Networks 5399 and 8000 Access Switches Using Command Line Interfaces (300858-C Rev. 00) -- Describes how to configure and maintain the RAC using UNIX command-line interfaces for both UNIX and Windows environments.

Installing and Administering the Config Utility (301697-C Rev. 00) -- Describes how to install and configure the Config Utility web-based application software on a UNIX or Windows NT server.

Nortel Networks 5399 and 8000 Access Switch Software Reference (300860-C Rev. 00) -- Provides reference descriptions of all CLI commands and all **na** and **admin** parameters.

Nortel Networks 5399 and 8000 Access Switch SNMP MIB Reference (300861-C Rev. 00) -- Describes RAC MIB trees, standard MIB compliance information, and RAC extensions to standard MIBs. This guide references MIB listings on the Bay Networks web site and provides procedures for common tasks using a MIB browser.