Cable Modem Termination System

BandwidthManager User Guide

Part No. 10030505
Version Number 1.0

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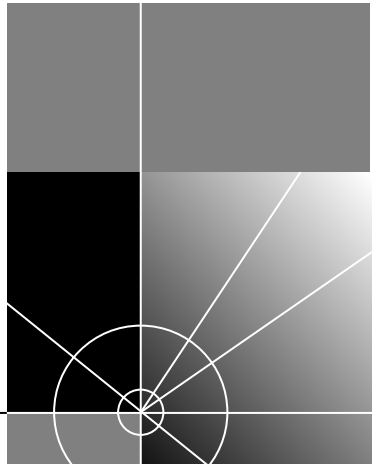
BandwidthManager
User Guide



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Part No. 10030505
Published June 2000

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About This Guide

About This Guide provides an overview of this guide, describes guide conventions, tells you where to look for specific information and lists other publications that may be useful.

This document describes how to install, configure, and use the *optional* 3Com® BandwidthManager (BWM) as part of the 3Com Cable Modem Termination System (CMTS). It provides a summary of system requirements, installation and setup.

This guide is intended for experienced network administrators and technicians who are responsible for installing, configuring, and maintaining the 3Com CMTS. It assumes a basic knowledge of Internet Protocol (IP) networking, and an advanced knowledge of Radio Frequency (RF) concepts and practices.

If the information in the Release Notes shipped with this product differs from the information in this guide, follow the instructions in the Release Notes.

Finding Specific Information in This Guide

This table shows the location of specific information in this guide.

Table 1 Finding Information in this Guide

If you are looking for	Turn to
A high-level description of how the BWM works	Chapter 1
Procedures for installing the hardware	Chapter 2
Procedures for installing the software	Chapter 3
Procedures for configuring the BWM Controller via the BWM GUI	Chapter 4
How to create bandwidth sets	Chapter 5
How to set schedules	Chapter 6
How to set traffic policies	Chapter 7
How to analyze bandwidth reports produced by BWM	Chapter 8
How to update EdgeServer Pro firmware	Appendix A

Conventions

The tables that follow list conventions that are used throughout this guide.

Table 2 Notice Icons

Icon	Notice Type	Description
	Information note	Important features or instructions
	Caution	Information to alert you to potential damage to a program, system, or device
	Warning	Information to alert you to potential personal injury

Related Documentation

The following 3Com documents provide information related to using 3Com data over cable products.

- *Cable Modem Termination System Release Notes*: Contains helpful information that was not available when the *CMTS User Guide* was printed.
- *Cable Modem Termination System Software Upgrade Instructions*: Provides detailed instructions for upgrading your CMTS software to the latest version.
- *Cable Access Router User Guide*: Contains product descriptions, installation, management, and troubleshooting information.
- *Cable Access Router Command Line Interface Reference Guide*: Contains descriptions and examples of all CAR CLI commands.
- *QAM Modulator Network Interface Card Getting Started Guide*: Provides information required to install and configure the Single Channel QAM Modulator NIC.
- *Upstream Receiver Card Network Application Card Getting Started Guide*: Provides information required to install and configure the Upstream Receiver Card to work with the Cable Access Router.
- *Cable Management System User Guide*: Provides information on how to use the optional Cable Maintenance System (CMS) Graphical User Interface (GUI) software to manage all aspects of the 3Com data over cable network.

Year 2000 Compliance

BandwidthManager is Year 2000 compliant.

For information on Year 2000 compliance and other 3Com products, visit the 3Com Year 2000 web page.

http://www.3Com.com/products/yr2000.html

Contacting 3Com Carrier Systems

Call the appropriate toll-free number listed below for technical support.

For European countries that do not have a toll free number listed, call +31 30 602 9900.

Table 3 3Com Carrier System Technical Support Contact Phone Numbers

Country	Toll Free Number	Country	Toll Free Number
Austria	06 607468	**Netherlands**	0800 0227788
Belgium	0800 71429	**Norway**	800 11376
Canada	18883263844	**Poland**	00800 3111206
Denmark	800 17309	**Portugal**	0800 831416
Finland	0800 113153	**South Africa**	0800 995014
France	0800 917959	**Spain**	900 983125
Germany	0800 1821502	**Sweden**	020 795482
Hungary	00800 12813	**Switzerland**	0800 553072
Ireland	1800 553117	**UK**	0800 966197
Israel	0800 9453794	**United States**	1888 3263844
Italy	1678 79489		

For information about Customer Service, including support, training, contracts, and documentation, visit our website at ***http://totalservice.3com.com****.*

1 PRODUCT OVERVIEW

This chapter describes the *optional* 3Com BandwidthManager (BWM) for use in conjunction with the 3Com Cable Modem Termination System (CMTS) Release 2.5.0 or greater. It explains how BWM fits into your data over cable network, and highlights usage considerations.

Introduction

BWM automates bandwidth allocation, prioritization, metering, and usage charting in the existing 3Com data over cable network architecture. The product is comprised of these components.

- BandwidthManager Controller (a 3Com EdgeServer Version Pro 1.0 that contains pre-installed BWM software)
- Server software
- Client software
- BWM GUI

The BWM client-server design allows for a distributed or centralized setup. The BWM is configured via the easy-to-use GUI.

Product Features

BWM provides these features.

- Easy new user setup.
- Ability to guarantee Committed Information Rate (CIR) minimum downstream and upstream service levels (assuming non-congested environments and appropriate network engineering by the Service Provider)
- Ability to offer Maximum Burst Rates (MBR) for both upstream and downstream to allow users to burst at higher rates when bandwidth is available
- Usage-based reporting and billing on a per user basis

- Usage reporting on a per channel basis to assist in bandwidth growth and network management
- Policy enforcement on a per cable modem basis
- GUI based specification of Service Level Agreements and policies

Dynamic Allocation and Management Allows you to dynamically allocate, manage, prioritize and control your bandwidth for up to 20,000 user groups based on IP addresses.

Bandwidth Usage Alerts Alerts you to unusual or sudden surges of bandwidth consumption to prevent usage abuse.

Easy-to-Use GUI Provides an easy-to-use administration GUI.

Real-time Charting Lets you use data collected by the BWM Controller for real-time charting.

SNMP Management Supports SNMP management functions.

Centralized Management Centralizes management of multiple distributed Controllers through server-based software.

Traffic Policies Lets you configure traffic policies from anywhere on the Internet.

Password-Protected Security Supports password-protected access at several points.

BWM and the Data Over Cable Network

BWM software ships pre-installed on the BWM Controller. Hardware setup simply involves installing the BWM card set in the CMTS. BWM client software is installed on a local and/or remote client workstation in the same network. Figure 1-1 shows how BWM typically fits in a network.

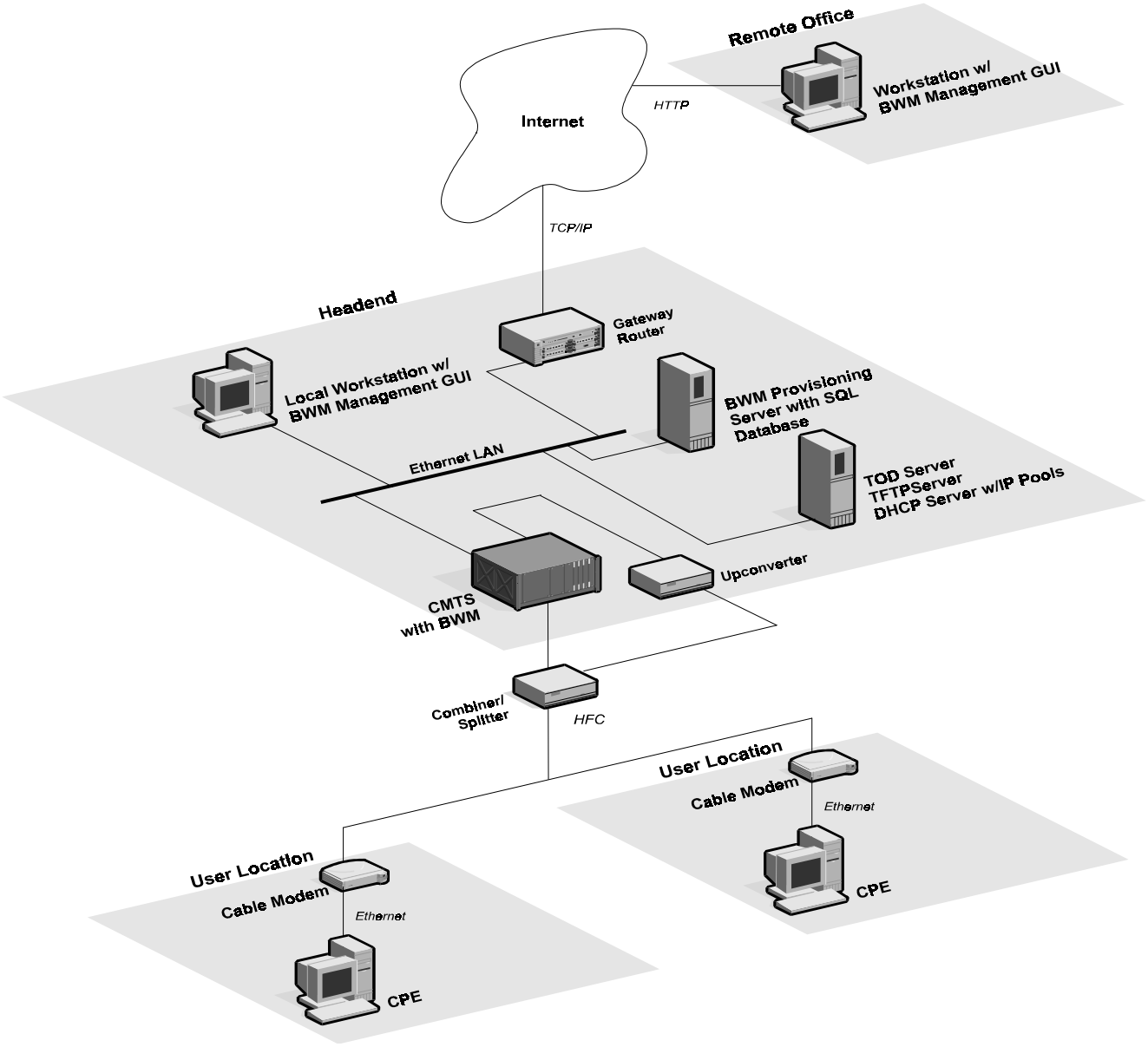


Figure 1-2 BandwidthManager and the Cable Data Network

Using BWM

Once you install the hardware and software, you can log into the BWM administration GUI and complete additional tasks as summarized in Figure 1-3.

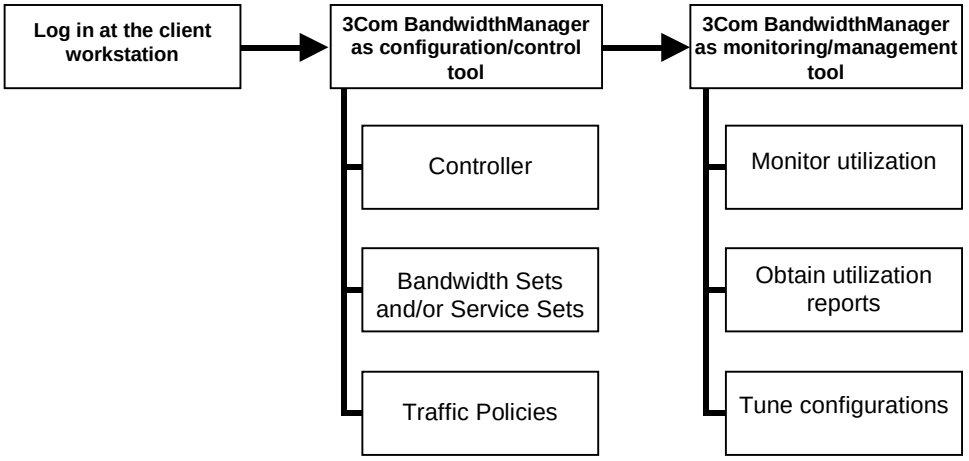


Figure 1-3 3Com BandwidthManager Task Overview

Log in via Client Workstation

You must download client software for BWM administration to your client workstation using 3Com's InstallShield. After you install the server and client software, you can log in at your client workstation as described in Chapter 3, *Accessing the BWM GUI*.

BWM Database

Bandwidth utilization information, configuration parameters, and account information are stored in the database. If you include your own corporate database in the same network as the BWM, the BWM database and your own corporate database can exchange information. This interaction enables you to populate the BWM database by batch input of account information from your corporate database into the BWM database.

You need to populate the BWM database by adding accounts, as described in Configuring Accounts in Chapter 7, *Setting Traffic Policies*.

The BWM database also supports real-time charting and trend analyses that you can obtain through the GUI.

BWM GUI as a Configuration Tool

Configuring the BWM consists of configuring the Controller, configuring a bandwidth set, then setting traffic policies. Use the BWM GUI to accomplish these tasks.

To configure the Controller properly, set the following parameters via the *Controllers* menu in the GUI.

- Controller name
- IP Addresses of the module
- Alert settings
- Detailed bandwidth allocation settings
- A bandwidth set
- The login ID and password created when the Controller was initialized

How BWM Works to Automate Bandwidth Allocation

A *bandwidth set* is a named collection of parameters that specify bandwidth rate and capacity information. You typically configure several bandwidth sets, any of which you then include in a traffic policy. The parameters in a bandwidth set include,

- Committed Information Rate (CIR) In and Out
- Maximum Burst Rate (MBR) In and Out
- Priority.

To understand what the CIR, MBR, and Priority do, think of the total bandwidth available to an account as a virtual pipe through which Internet traffic flows. The Controller treats the WAN link as a conduit which it divides into multiple virtual pipes. The CIR, MBR, and Priority allocate levels of bandwidth utilization within the virtual pipe.

The *Priority* specified for a bandwidth set determines how quickly a virtual pipe can ramp up to its MBR: a high Priority allows a rapid ramp-up; a low Priority allows a slow ramp-up. Allowing an account a quick ramp-up to its MBR means that a greater percentage of any excess bandwidth can be offered to accounts paying a higher fee.

When determining the detailed bandwidth allocation settings for a Controller, think of the WAN link (Port B) as a pipe. To allocate bandwidth within this pipe, you set a Margin In and Out and a Pipe Size In and Out, as shown in the following figure.

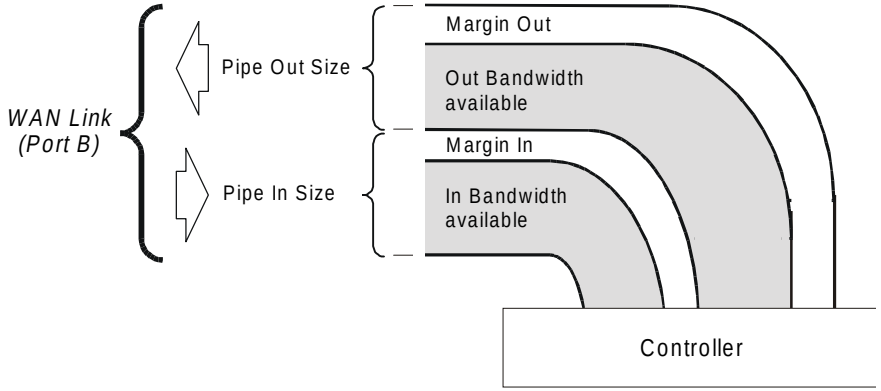


Figure 1-4 Determining Detailed Bandwidth Allocation Settings

Once a bandwidth set and the Controller are configured, you can set traffic policies that will govern bandwidth used by each account in the ODBC Database.

Before setting a traffic policy, you must:

- Configure accounts
- Configure user groups
- Configure a bandwidth set
- Establish a schedule.

All of the above is entered into the database.

The account name, user group name, bandwidth set name, and schedule name are then specified in the traffic policy, along with a direction, alerts, and active or inactive status.

Accounts and User Groups

An *Account* is a billable or charge-back entity using bandwidth managed by the Controller. This entity is typically the customer to whom you sold bandwidth. An account is divided into user groups. A *User Group* consists of IP addresses.

Next Step

Now that you have reviewed how BWM interoperates with the data cable network, go on to Chapter 2 for complete instructions on installing the BWM card set.

2 INSTALLING THE BWM CARD SET

This chapter lists the system requirements for the 3Com BWM, and outlines specific instructions for installing the hardware.

System Requirements

BWM setup requires you to supply the following hardware and software platforms.

- Local or Remote client workstation that includes the following:
  - Netscape Navigator 3. 0 or greater, or Microsoft Internet Explorer 4.0 with Service Pack 1 or greater
  - Windows NT 4.0 or greater.
- Windows NT 4.0 Server that includes the following:
  - SNMP Service enabled, SNMP Trap Service enabled
  - Windows NT RPC Configuration enabled
  - TCP/IP services running
  - Microsoft Internet Information Server (IIS) 4.0
  - Service Pack 3 or above for Oracle8 Database on Windows NT 4.0, or Service Pack 4 for SQL 7.0 on Windows NT 4.0
  - 300 MHz processor, minimum
  - 128 megabytes of RAM, minimum
  - A 10Base-T or 100Base-TX Ethernet NIC
  - An 8-gigabyte hard drive
- 10Base-T or 100Base-TX hub or switch with two open ports
- Gateway router.

IMPORTANT: *If you have questions related to BWM running in a multi-CAR CMTS configuration, please contact your 3Com Customer Support Organization (CSO) Program Manager.*

Checking Hardware

Before you continue, locate the necessary BWM components.

If you are a technician installing BWM for the first time, make sure that the BWM Controller card set is included in your BWM package. These two cards are the only hardware components that ship with the product, as follows.

- One BWM Peripheral Network Interface Card (NIC) that provides the required ports (PS2 keyboard port, PS2 mouse port, ultra-wide SCSI port, and a DB-15 video port) to support the hardware for configuring the BWM Controller.
- One BWM Network Application Card (NAC) where the actual BWM software resides.

IMPORTANT FOR INSTALL TECHNICIANS: *If you are a 3Com authorized technician, and need to transform an existing EdgeServer Pro card set to the BWM card set, please follow the instructions in Appendix A, Updating the EdgeServer Pro Card Set to BWM Functionality, before proceeding to the next section, Setting Up BWM Hardware.*

If the BWM product you are about to install shipped in the 3Com-specific BWM shipping carton, the firmware is preinstalled at the factory. Go onto the next section to complete the hardware install.

Setting Up BWM Hardware

Read these sections for complete instructions on installing the BWM card set.

Required Tools

To install the card set in the CMTS, you need a

- #2 Phillips, and
- Flat-head screwdriver.

Installing the BWM Peripheral NIC

Use these steps to install the BWM Peripheral NIC. You can install the NIC with or without chassis power turned on.

ESD: *To reduce the risk of electrostatic discharge (ESD), take proper grounding precautions before handling the NIC.*

1 Select a slot at the rear of the CMTS. For example, install this NIC in slot(s) 1 through 16.

Remember that slot 17 is reserved for the Network Management Card (NMC).

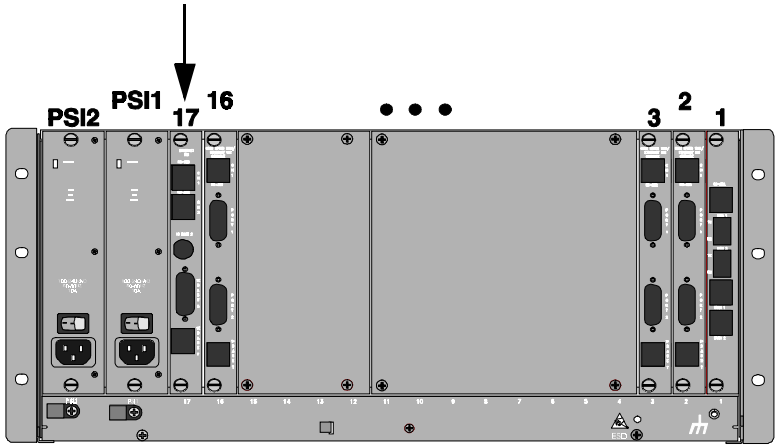


Figure 2-1 Rear View of CMTS

2 Use a #2 Phillips screwdriver to remove the safety panel covering this slot.

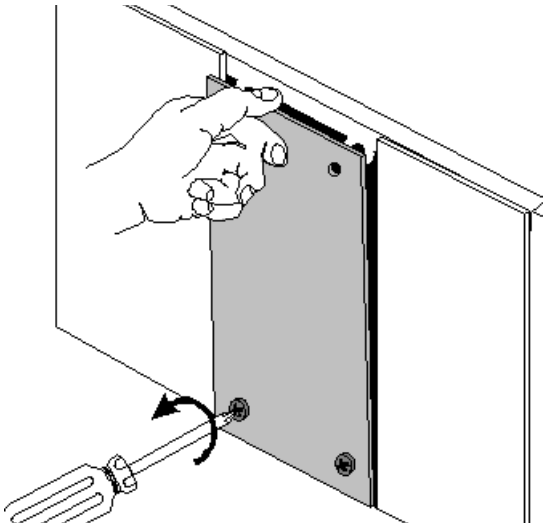


Figure 2-2 Removing the Slot to Install the BWM Peripheral NIC

3 Insert the NIC between the slot's upper and lower card guides.

4 Slide the NIC into the chassis, until the front of the NIC is flush with the chassis.

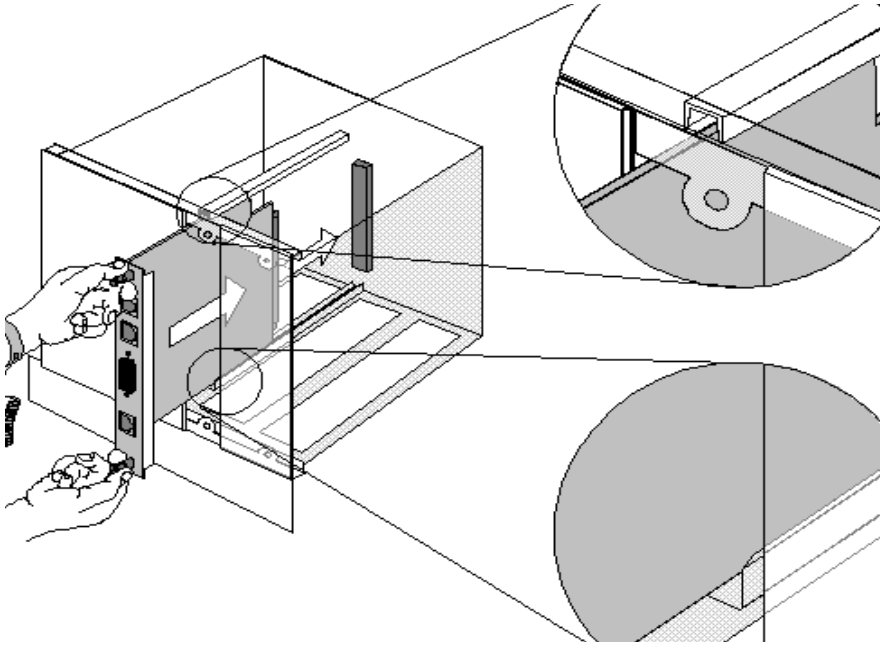


Figure 2-3 Aligning the NIC

5 Use a flat-head screwdriver to tighten the screws on the front panel.

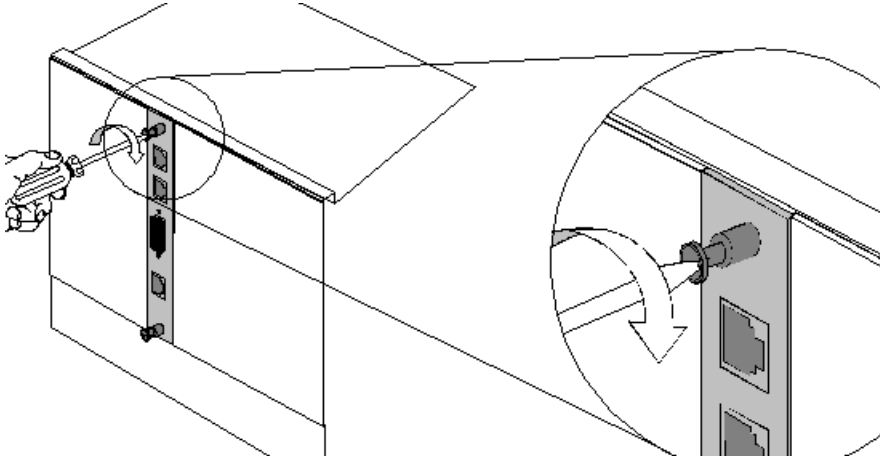


Figure 2-4 Securing the NIC in the Chassis

6 Next, install the BWM NAC. See the instructions listed next.

Installing the BWM NAC

Use these steps to install the BWM NAC. You can install the NAC with or without chassis power turned on.

ESD: *To reduce the risk of electrostatic discharge (ESD), take proper grounding precautions before handling the NIC.*

Before installing the BWM Controller, make sure that CMOS is set for plug and play.

1. First, make sure that you have already installed the BWM Peripheral NIC per the instructions listed in the previous section, *Installing the BWM Peripheral NIC*.
2. Select a slot at the front of the CMTS for installing the NAC. Make sure to install the NAC in slot(s) 1 through 16. Slot 17 is reserved.

Please note that the BWM NAC requires three chassis slots to install. For example, you can install the NAC in slots 3,4, and 5.

3. Use a #2 Phillips screwdriver to remove the safety panel covering the slot.
4. Insert the NAC between the slot's upper and lower card guides.

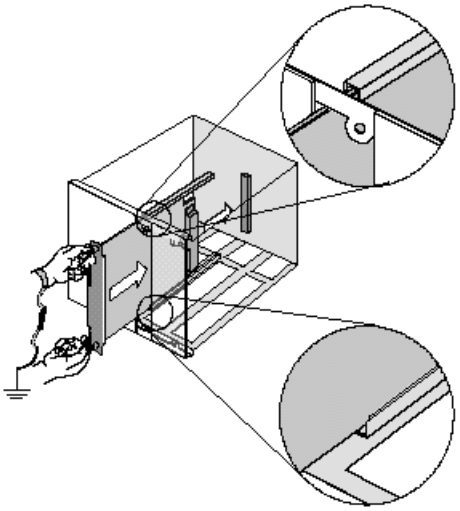


Figure 2-5 Aligning the NAC

5 Holding the tabs perpendicular to the NAC's front panel, slide the NAC into the chassis, until the front of the NAC is flush with the chassis.

6 Push the tabs toward each other to secure the NAC.

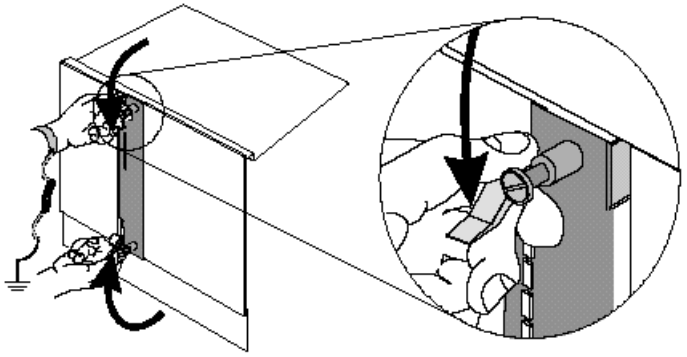
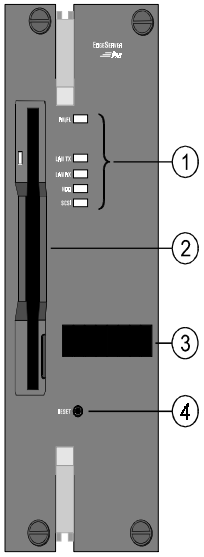


Figure 2-6 Securing the NAC

7 Use a flat-head screwdriver to tighten the screws on the front panel.

8 Turn on the chassis power.

9 After the NAC boots, verify that the RN/FL (run/fail) LED is green. See the following figure for a description of NAC LEDs.



Callout	Interface Description
1	**LEDs:** Hardware and network activity information. **RN/FL (Run/Fail):** Operating condition **Green:** Activity **No Color:** No Activity **LAN TX:** Network transmit activity **LAN RX:** Network receive activity **HDD:** Disk drive activity **SCSI:** SCSI device activity
2	**Diskette Drive:** Initial data input source. **LED**: Drive activity
3	**System Display:** System performance or user defined information can be displayed. *See the EdgeServer Pro Product Reference Guide for information about setting this feature.*
4	**Reset:** Press once to shut down the Windows NT operating system; press again to reset the unit.

Figure 2-7 BWM NAC LEDs

Installing the 10/100 Ethernet NIC

As shown in the System Requirements list at the beginning of this chapter, you need to supply a 10/100 Ethernet NIC. If you are installing the 3Com Dual 10/100 Ethernet NIC, you can use these instructions. Otherwise, refer to the documentation that came with your 10/100 Ethernet NIC.

ESD: *To reduce the risk of electrostatic discharge (ESD), take proper grounding precautions before handling the NIC.*

1 Configure the 3Com NIC via the jumper and switches. Put the jumper in the NAC position. Refer to Table 2-1 for specific jumper setting information.

*The 3Com Dual 10/100 Ethernet NIC **must** be configured with the jumper in the **NAC** position in order to function properly.*

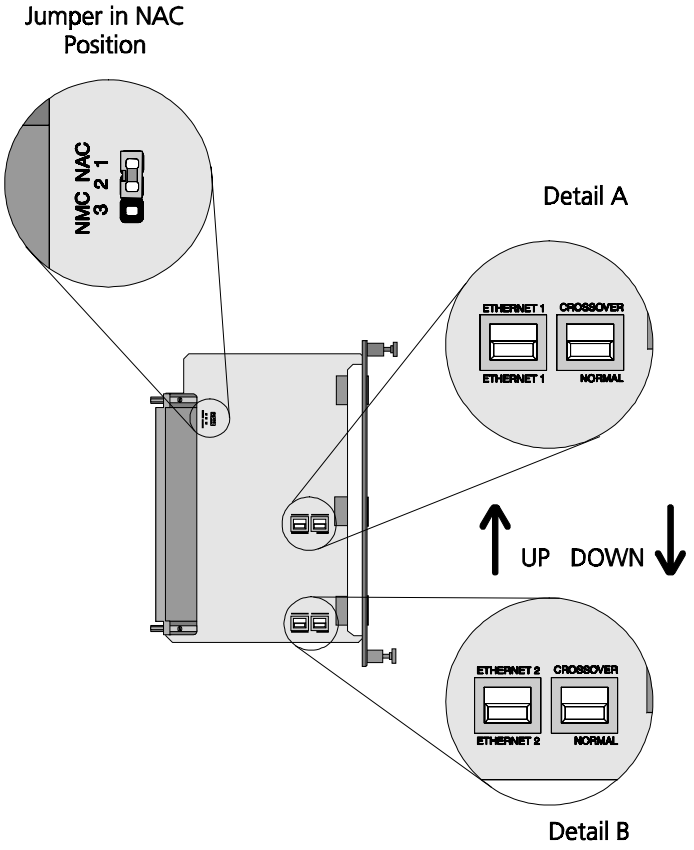


Figure 2-8 *Exploded View of 3Com Ethernet NIC*

Table 2-1 *3Com Dual 10/100 Ethernet NIC Jumper Settings*

To...	Do this...
Configure the Ethernet 1 port to connect directly to another NIC	Push both switches in *Detail A* in the *up* position
Configure the Ethernet 1 port to connect to a hub	Push switches in *Detail A* in the *down* position
Configure the Ethernet 2 port to connect directly to another NIC	Push both switches in *Detail B* in the *up* position
Configure the Ethernet 2 port to connect to a hub	Push both switches in *Detail B* in the *down* position

2 Select a slot at the rear of the CMTS for installing the NIC.

3 Use a #2 Phillips screwdriver to remove the safety panel covering this slot.

4 Insert the NIC between the slot's upper and lower card guides.

5 Holding the tabs perpendicular to the NIC's front panel, slide the NIC into the chassis, until the front of the NIC is flush with the chassis.

What to Do After Installing the BWM Card Set

After installing the BWM card set and 10/100 Ethernet NIC, go to Chapter 3, *Installing BandwidthManager Software*.

3 INSTALLING BWM SOFTWARE

This chapter lists the system requirements for the 3Com BWM, and outlines specific instructions for installing the software.

System Requirements

BWM setup requires you to supply the following hardware and software platforms.

- Local or Remote client workstation that includes the following:
  - Netscape Navigator 3. 0 or greater, or Microsoft Internet Explorer 4.0 with Service Pack 1 or greater
  - Windows NT 4.0 or greater.
- Windows NT 4.0 Server that includes the following:
  - SNMP Service enabled
  - SNMP Trap Service enabled
  - Windows NT RPC Configuration enabled
  - TCP/IP services running
  - Microsoft Internet Information Server (IIS) 4.0
  - Service Pack 3 or above for Oracle8 Database on Windows NT 4.0, or Service Pack 4 for SQL 7.0 on Windows NT 4.0
  - 300 MHz processor, minimum
  - 128 megabytes of RAM, minimum
  - A 10Base-T or 100Base-TX Ethernet NIC
  - An 8-gigabyte hard drive
- 10Base-T or 100Base-TX hub or switch with two open ports
- Gateway router.

Checking Package Contents

Before you continue, locate the necessary BWM components.

Checking Software

The BWM software package includes the following items sealed in the license envelope.

- Installation CD
- Release Notes
- *3Com BandwidthManager User Guide*

Software Installation

This section describes how to install the software required to run BWM. The five pieces that work together to make BWM work include,

- Any database software (for example, Microsoft SQL Server 7.0 or Oracle8 Database on Windows NT 4.0)
- ODBC database software
- Server Software (You must install BWM client and server software from the installation CD.)
- Client Software
- BWM GUI.

WARNING: *You must install the software in the sequence shown above. If you do not follow this order, BWM will not install properly. Error messages will appear indicating the correct order.*

Read the following sections for complete software install procedures.

Install the Database Software

Refer to the documentation that shipped with your database software to install the application onto your designated Windows NT server. BWM is compatible with most database software packages (for example, Microsoft SQL Server 7.0 or Oracle8 Database on Windows NT 4.0).

At some point, you may want to extract account information from the database application you selected to run with BWM. Refer to the database application's user guide for specific procedures.

Set up the ODBC Database

The second software piece you need to install is the ODBC Data Source Administrator. ODBC allows the SQL Server software and BWM to communicate.

WARNING: *You must install the ODBC database software after installing Microsoft SQL Server 7.0 software. If you do not follow this order, BWM will not install properly.*

1. Start Windows.
2. Log onto the NT server as an administrator.
3. Click **Start** | **Programs** | **Administrative Tasks**.
4. Click **ODBC Data Sources**.
5. Click the **System DSN** tab.
6. Click **Add**.
7. The *Create New Data Source* window displays. Select **SQL Server**. Click **Finish**.
8. The *Create a New Data Source to SQL Server* window displays. Type **amp** in the *Name* field.
9. Skip the *Description* field. For the *Server* entry, select **local**. Click **Finish**.
10. When the *ODBC Data Source Administrator* window appears, select the newly created database, AMP.
11. Click **Configure**.

Verify that the ***Connect to SQL Server to obtain default settings for the additional configuration options*** *item is NOT selected.*

Click **Next** to continue.

12. When the *Create a New Data Source to SQL Server* window reappears, click a checkmark in the *Change the default database to:* checkbox. Then type **amp** as the default database.
13. Click checkmarks in the following two checkboxes only.
    - Use ANSI quoted identifiers.
    - Use ANSI nulls, paddings and warnings.

    Click **Next**.

14 Next, set the SQL Server language. The default language is English. To choose a different language, select it from the drop-down list. Click a checkmark in the *Perform translation for character data* checkbox.

15 Click **Finish**.

16 The *ODBC Microsoft SQL Server Setup* window appears, summarizing the new ODBC data source you just created. Click the **OK** button.

*Do NOT click the **Test Data Source** button. Clicking this button causes a failed test result.*

This completes the ODBC database setup. Go onto the Server software installation procedures, listed next.

Install Server Software

The third software piece you need to install is the Server software, as follows.

1 Log into the server as the administrator.

2 Insert the BWM Installation CD into the designated server's CD drive.

3 Open Windows Explorer and click on the drive containing the installation CD.

4 Double-click the **BWM** folder.

5 To start the InstallShield, double-click the **setup.exe** file in the iSRs folder.

6 Click **Next** at the *Welcome* window.

7 Click **Yes** to accept the License Agreement.

8 The *User Information* window appears. Confirm that the names are correct, or type the correct names.

9 Locate the BWM software serial number. You will find it in the following locations,

- on the BWM software shipping carton, also
- on the CD jacket.

Type the serial number, then click **Next**.

10 Click **Next** to accept the default install directory INETPUB/www. To select a different destination directory, click **Browse** and choose the desired directory. Click **Next**.

11 When the *Server Setup Parameters* window appears, type the entries described in Table 3-1.

When typing entries, remember to use the default values as listed on-screen.

Table 3-1 Required Server Setup Entries

Parameter	Entry
Database Server Name	Enter the name of the host used by the database.
Database Server Port	Press **Enter** to accept the default port.
Database Name	Enter the name of the database.
Database User name	Enter the login name to be used for logging into the database. For this install, type **amplify**.
Database Password	A default password is already entered. Do not change.
Application Server Port	Press **Enter** to accept the default port.
Web Server Doc. Root Dir.	Type the location where you installed the Web Server Document Directory. Type **DIR wwwROOT**.
Write Bandwidth Manager User ID Here:	Specify a user name that must be entered later at the client workstation to access the BWM. This user name must range from 6-16 alphanumeric characters that are case-sensitive. Write the User ID in the left column of this table so that it is accessible when you start the BWM GUI (see the BWM GUI section).
Write Bandwidth Manager Password Here:	Specify a password that must be entered later at the client workstation to access the BWM. This password is case-sensitive, and must range from 6 to 16 alphanumeric characters. Write the Password in the left column of this table so that it is accessible when you start the BWM GUI (see the BWM GUI section).

12 When the *Setup Complete* window appears, remove the installation CD from the CD drive. Click **Yes** to restart the host computer.

13 Click **Finish**.

Continue with the Install Client Software procedures, listed next.

Install Client Software

The fourth software piece you need to install is the BWM Client software, as follows.

Make sure that you have installed the Server software first, before installing the client software.

1. Log in as the administrator at the client workstation (or other PC that will be the BWM administration console).
2. Set the color palette of the client workstation monitor to at least 65536 colors as follows.
   - select the Control Panel settings
   - select **Display**
   - select the **Settings** tab
   - select **65536 Colors**—or a larger number of colors—from the Color Palette.
3. Insert the BWM installation CD in the CD drive for the client workstation.
4. Open the Windows Explorer and click on the drive containing the installation CD.
5. Double-click the **BWM** folder.
6. To start the InstallShield, double-click the **jre12-rc2-win32.exe** file in the iSRc folder.
7. When the Java Plug-in Setup screen appears with a license agreement, click **Yes** to accept the license agreement. The *Choose Destination Location* screen appears.
8. To accept the default location, just click **Next**. To specify your own location for installing the Plug-in, click **Browser** then select the desired directory.
9. When setup is completed, the program returns to Windows Explorer.

Install BWM GUI

The fifth, and last piece of software that you need to install is the BWM GUI. Follow these steps to install the application.

At this time, write down the IP address of the computer where you're installing the BWM GUI. You will need this information when you start the GUI as outlined in the next section, "Accessing the BWM GUI."

1. Insert the BWM CD into the computer's CD ROM drive.
2. Click **Start** | **Run**.
3. Browse to the appropriate drive. Click **OK** to run Setup.exe.

Now that you have installed the software that runs BWM, read the next section, Accessing the BWM GUI.

Accessing the BWM GUI

Use these steps to run the BWM GUI. You will need to know the following before you begin.

- IP address of the computer where you installed the BWM GUI application
- user id you typed during the server software install, (see Table 2-1, listed previously in this chapter)
- the password you typed during the server software install, (see Table 2-1, listed previously in this chapter)

After you log in, the client workstation functions as a BWM administration console.

1. Launch your Internet browser (either *Netscape Navigator* 3.0 or later, or *Microsoft Internet Explorer 4.0* with Service Pack 1 or later).
2. Type this URL.

   `http://<ip address>/3Com_BandwidthManager/index.htm`

   Where <host:ip address> is the title of your Web server host and port. Once the connection is made, the BWM home page appears. See Figure 3-1.

3 To log in, click on the blue banner labelled BandwidthManager.

Figure 3-1 3Com BWM Home Page

The *login* screen appears, shown next.

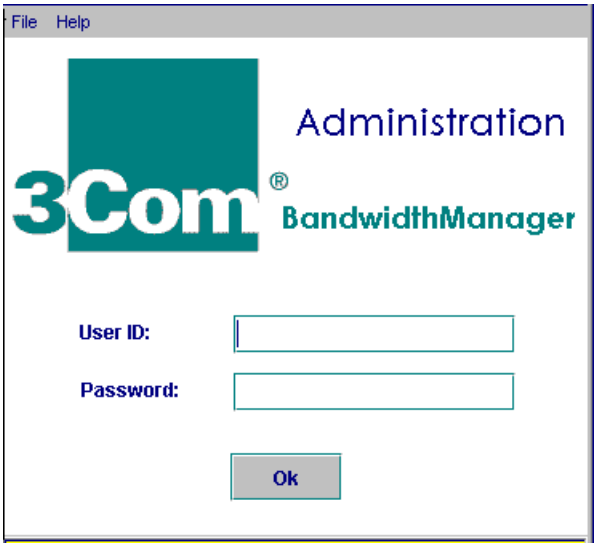


Figure 3-2 BWM Login Screen

4 Type the same user id that you used for the server installation procedures listed previously in this chapter, specifically in the *Install Server Software* section.

5 Type the same password that you used for the server installation procedures listed previously in this chapter, specifically in the *Install Server Software* section.

6 Click **OK**. The BWM main menu appears.

The next step is to set up BWM Controller parameters using the *Controllers* feature in the GUI application, see Chapter 4, *Configuring the BWM Controller to Work with the GUI*.

Once you set up Controller parameters, the BWM is ready to start automating user bandwidth!

BWM GUI Basics

Read the following sections for instructions on day-to-day GUI operations.

Logging Out of the BWM GUI

You can log out of BWM from one of two levels.

When a *detail* or *edit* screen is displayed.

1. Click **OK** or **Cancel**.
2. When the associated function screen displays, click **Close**. Make sure you update the Controllers if necessary.

When the *login screen* or *main menu* screen displays.

1. Select **File**.
2. Select **Exit**.
3. Click **Yes**.

Uninstalling Existing BWM Software

Use these steps to uninstall BWM software.

1. At the server PC, select **Start** | **Settings** | **Control Panel**.
2. Double-click **Add/Remove Programs**.
3. When the *Properties* dialog box appears, select **3Com BandwidthManager**, then click **Add/Remove**.
4. When the dialog box confirming the uninstall appears, click **OK**.
5. When prompted, restart the server PC.
6. Remove the "Amplifynet" install directory. The default install directory is:

   c:\Program Files\Amplifynet\
7. If it exists, remove the BWM web root directory. The default install directory is:

   c:\InetPub\wwroot\3Com_BandwidthManager\

8. Remove the SQL AMP database an amplify user as follows.
   - Select **Start** | **Programs** | **Microsoft SQL Server 7.0** | **Enterprise Manager**
   - expand SQL Server Group
   - expand <db_name> (Windows NT)
   - expand databases
   - select amp and click **Delete**
9. Next, expand Security.
10. Click **Logins**.
11. Select **Amplify** from the right pane. Click **Delete**.
12. Select **Console**, and exit to Exit Manager.

Using an SNMP-Based Network Manager

If you want to use an SNMP-based network manager instead of the browser-based BWM GUI, you must install two proprietary MIB files on the client. These MIB files are included on the 3Com BWM installation CD.

If you use an SNMP-based network manager instead of the BWM, you can only monitor bandwidth usage by account and the active/inactive status of the BWM Controller.

Use these steps to install the proprietary MIB files on the SNMP Manager client.

1. Double-clicking the **setup.exe** file in the iSRc folder.
2. Start another InstallShield by double-clicking on the **setup.exe** file in the iSRc folder.
3. When the *Welcome* screen appears, click **Next**, then click **Yes** on *License Agreement*.
4. When the *User Information* screen appears, confirm that the names are correct or enter the correct names.
5. Type the serial number assigned to your BWM software—located on the BWM shipping carton, and also on the CD jacket. Click **Next**.
6. InstallShield displays a directory. To accept the default directory, just click **Next**. To select a different destination directory, click **Browse** and choose the desired directory. Click **Next**.

7 When the *Setup Complete* screen appears, click **Finish**.

8 Access your SNMP-compliant network manager (HP OpenView, for example).

9 Load the two MIB files that were placed in your client workstation during the installation of client software that occurred in the preceding steps. If you accepted the default directory when you were placing the proprietary MIB files, the path name for the MIB files is, for example:

```
c:\Program Files\Amplifynet\3Com_BandwidthManager\mib
```

Configure events (alerts) in the network manager (in HP OpenView, for example).

When MIB file loading is completed, you can configure the BWM, then use an SNMP-based network manager, subject to the limitation described in the note at the beginning of this procedure.

4 CONFIGURING THE BWM CONTROLLER

Task Overview

To configure the BWM Controller residing on the BWM NAC, you must define Controller attributes via the BWM GUI. Complete the following procedures described in this chapter to configure the BWM controller.

- Configure address parameters (Controller name, associated default bandwidth set, module IP addresses, login name, and password)
- Configure alerts
- Configure bandwidth controls

Adding the BWM Controller to the Controller Table

To configure the Controller, you must first add BWM Controller to the Controller Table, as follows.

1. Start the BWM GUI. For complete steps, see *Accessing the BWM GUI* in Chapter 1.
2. From the Main Menu, select **Administration**.

3 From the *Administration* Menu, select **Controllers**. The *Controller Table* appears.

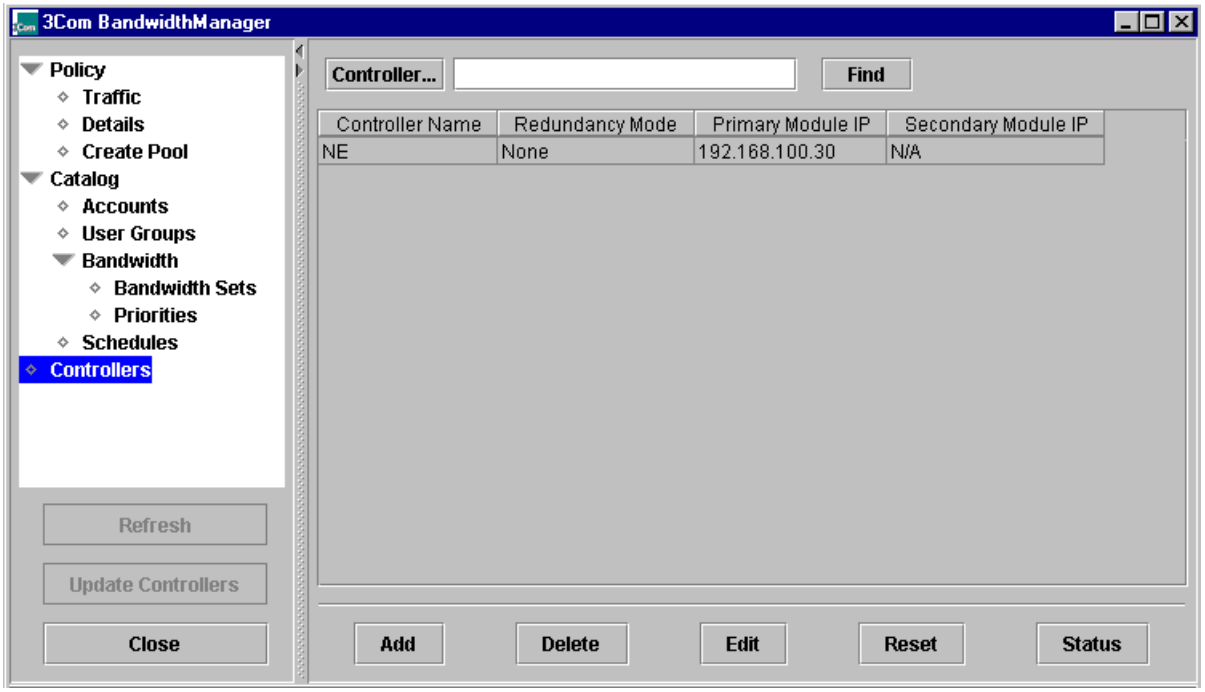


Figure 4-1 Accessing the Controller Table

During initial configuration, the table will be empty; otherwise, this table lists the BWM Controller installed and configured in the system.

4 Click **Add**. The *Controller Edit* window appears, as follows.

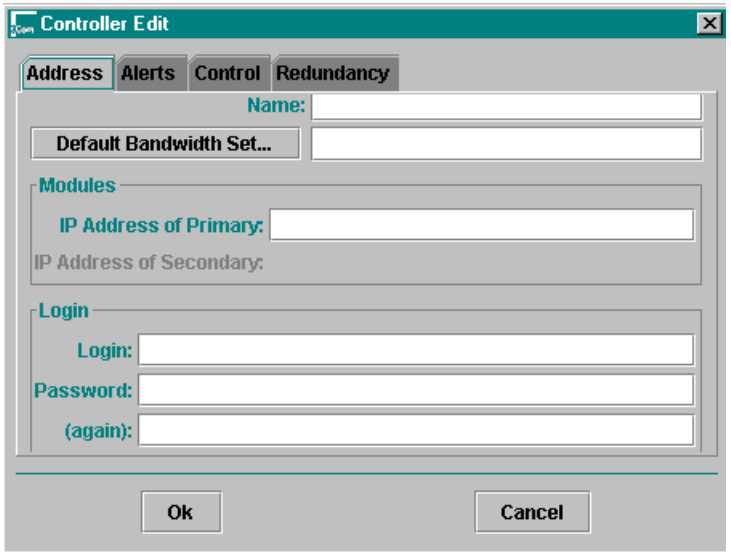


Figure 4-2 Configuring Address Parameters

5 Select the **Address** tab.

6 Type the entries as described in Table 4-1.

Table 4-1 Controller Edit: Address Dialog Box Field Descriptions

Field	Entry
Name	Enter a descriptive name for the Controller. Limited to 30 alphanumeric characters. BWM uses this name to associate a traffic policy with this Controller. If you are editing an existing configuration, this field is replaced by the name entered when the Controller was originally defined. It cannot be changed.
Default Bandwidth Set	From the scroll list, choose the desired *supplied bandwidth set* name or the *default bandwidth set* name. BWM uses the selected bandwidth set to control IP addresses not specified in any user group.
BWM Controller IP Address	Type the IP address of the BWM Controller, originally entered at the local console when the Controller was initialized. See *Setting the BWM Controller IP Address* section, in Chapter 2.

Table 4-1 Controller Edit: Address Dialog Box Field Descriptions

Field	Entry
Login	Type **isr** (lowercase). **Note:** Internal communication between the 3Com BWM and Controller can occur only after you enter the login ID (and password) here. For example, if you configure the Controller or any other 3Com BWM function per the GUI, click the **Update Controller** button. The Controller will be updated only if the login ID (and password) has been supplied here.
Password	Enter the login password specified at the Controller site when the Controller was initialized. If a new login password was not specified during Controller initialization, type **isr** (lowercase). Re-type the password to ensure that you have typed it correctly.

Editing BWM Controller Settings

Refer to Table 4-2 for information on how to use the buttons at the bottom of the *Controllers* screen.

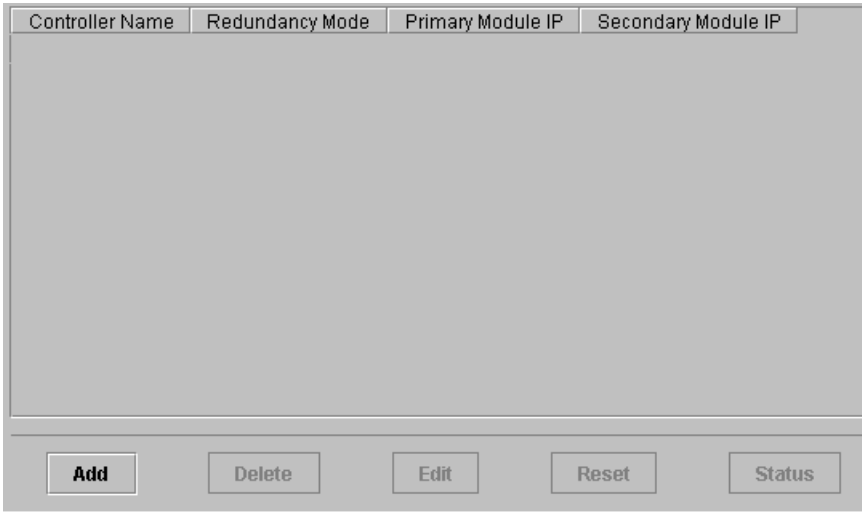


Figure 4-3 Controller Table Buttons

Controller Button Descriptions

The following lists Controller button descriptions.

- **Add** — Click to create a new BWM Controller configuration.
- **Edit** — To change existing controller configuration settings, select the Controller's row, then click **Edit**.

- **Delete** — To delete an existing BWM Controller configuration, select the Controller's row, then click **Delete**.
- **Update Controllers**—To enter any BWM Controller configuration changes you made to the current configuration, click **Update Controllers**.
- **Reset**—Click to power cycle the BWM Controller, without affecting the current configuration settings.

Updating BWM Controller Settings

When you set or change configuration settings per the BWM GUI, the ODBC Database is updated by the settings as soon as you click OK in the respective GUI screen. The BWM Controller is not updated, however. To make the settings you entered take effect in the Controller, you need to update it. You only need to do this Controller update once per session regardless of how many settings you entered. All configuration screens have an *Update Controllers* button that is either available or unavailable, for example.

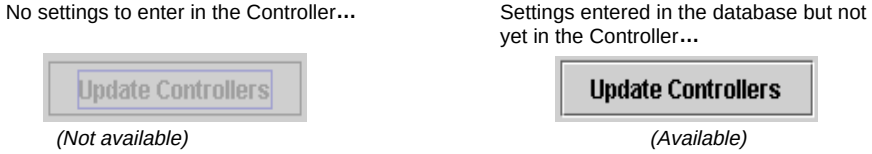


Figure 4-4 Update Controller Buttons

Configuring Alerts

Use these steps to configure alert SNMP traps, or messages for BWM.

1. From the *BWM Main Menu*, select **Administration**.
2. From the *Administration* menu, select **Controllers**.
3. Select the **Alerts** tab.

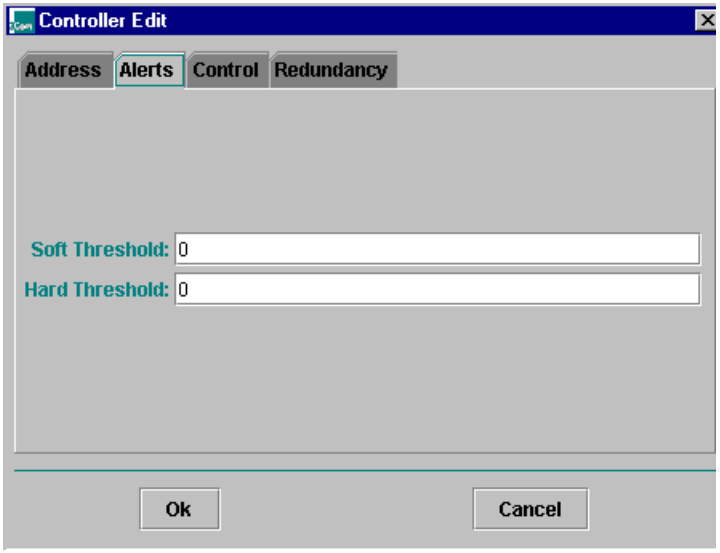


Figure 4-5 Alerts Tab

Table 4-2 Controller Edit: Alerts Dialog Box

Field	Entry
Soft Threshold	Enter the percentage of the CIR that, if exceeded, causes an SNMP trap to be sent. Default is 0, signifying no alerts. **Note:** This is usually a lower percentage, 100% for example, and merely indicates an undesirable situation rather than a severe abuse. An alert is only configured in this screen; to enable it, you must specify it in the Traffic Policy screen (see the *Setting a Traffic Policy* chapter).
Hard Threshold	Enter the percentage of the CIR that, when exceeded, causes an SNMP trap to be sent. Default is 0. **Note:** This is usually a higher percentage, 300% for example, and indicates a severe abuse. An alert is only configured in this screen; to enable it, you must specify it in the Traffic Policy screen (see the *Setting a Traffic Policy* chapter).

4 When you finish making your entries, click **OK**. To exit the dialog box without sending your settings, click **Cancel**.

Configuring Bandwidth Controls

Use these steps to configure bandwidth controls.

1 From the *BWM Main* menu, select **Administration**.

2 From the *Administration* menu, select **Controllers**.

3 Select the **Control** tab.

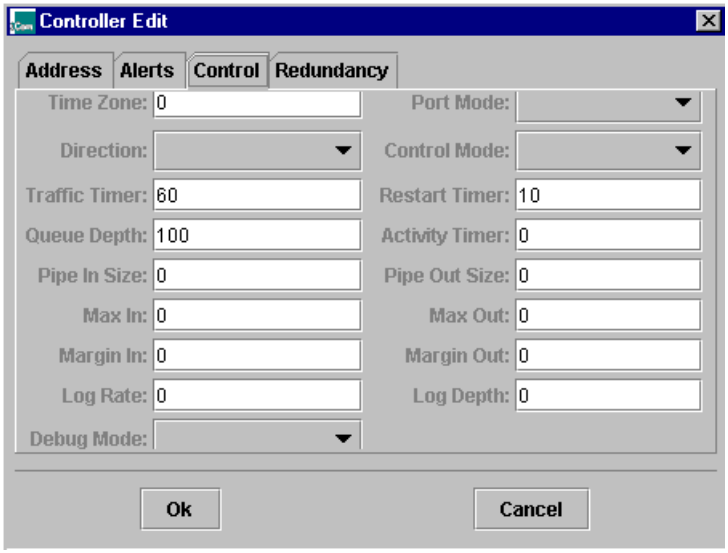


Figure 4-6 Control Tab

4 Type the entries as described in Table 4-4.

Table 4-3 Controller Edit: Control Dialog Box Entries

Field	Entry
Time Zone	Enter the Greenwich Mean Time (GMT) of the location of the Controller, from 00-24 preceded by a + (plus) or – (minus). For example, the time zone for a Controller located in San Salvador is –7. To determine your time zone, find the city in the following table closest to the location of the Controller, then enter the time zone for that city. Refer to the entries below for help in choosing your Time Zone.
Direction	Currently not used.
Traffic Timer	Currently not used.
Queue Depths	Currently not used.
Pipe In Size	Enter the maximum bandwidth available, in kilobits per second, for all traffic through the Controller from the WAN side. This should equal the *WAN link bandwidth*.
Max In	Enter the maximum bandwidth, in kilobits per second, that each user is allowed to burst no matter what the policy setting is. The default is 0.
Margin In	Enter the amount of reserved bandwidth, in kilobits per second, that you want available to satisfy the demand of new users to meet their CIRs. This entry also defines a level of total traffic below which every user is allowed to burst towards its maximum burst rate. Exceeding this defined Margin In value causes every user to return to its CIR. The default is 0.
Log Rate	Currently not used.
Debug Mode	Currently not used.

Beijing	+7	Mexico City	-6
Berlin	+1	Montreal	-6
Bombay	+4	Moscow	+3
Buenos Aires	-4	New York	-6
Cairo	+1	Panama City	-6
Caracas	-4	Paris	+1
Chicago	-7	Perth	+7
San Jose, Costa Rica	-7	Rio de Janeiro	-4
Denver	-8	Rome	+1
San Salvador	-7	San Francisco	-9
Hong Kong	+7	Santiago	-7
Honolulu	-11	Sidney	+9
Jakarta	+6	Tokyo	+9
Juneau	-10	Vancouver	-9
London/Greenwich	0		

Table 4-3 Controller Edit: Control Dialog Box Entries

Field	Entry
Port Mode	Currently not used.
Control Mode	Currently not used.
Restart Timer	Currently not used.
Activity Timer	Enter the number of seconds that can elapse without any traffic through the Controller before bandwidth is reset to the CIR. For example, an activity timer set to 120 causes the bandwidth to be reset every 2 minutes if there is no traffic during that 2-minute period. The minimum is 60 seconds. The default is 0 seconds.
Pipe Out Size	The maximum bandwidth available, in kilobits per second, for all traffic through the Controller from the LAN side. This should be the same as the LAN link bandwidth. The default is 0.
Max Out	The maximum bandwidth, in kilobits per second, that each user is allowed to burst no matter what the policy setting is. The default is 0 megabits.
Margin Out	Same as Margin In except it applies to the out traffic. The default is 0.
Log Depth	Reserved for future use.

5 When you have finished making your entries, click **OK**. To exit the dialog box without sending your settings, click **Cancel**.

Redundancy Setting for this BWM Release

This release (BWM Version 1.0) does not support redundancy. Therefore, use these steps to turn off redundancy mode as follows.

1 From the BWM Main Menu, select **Administration**.

2 From the Administration menu, select **Controllers**.

3 Select the **Redundancy** tab. The *Redundancy Dialog Box* appears.

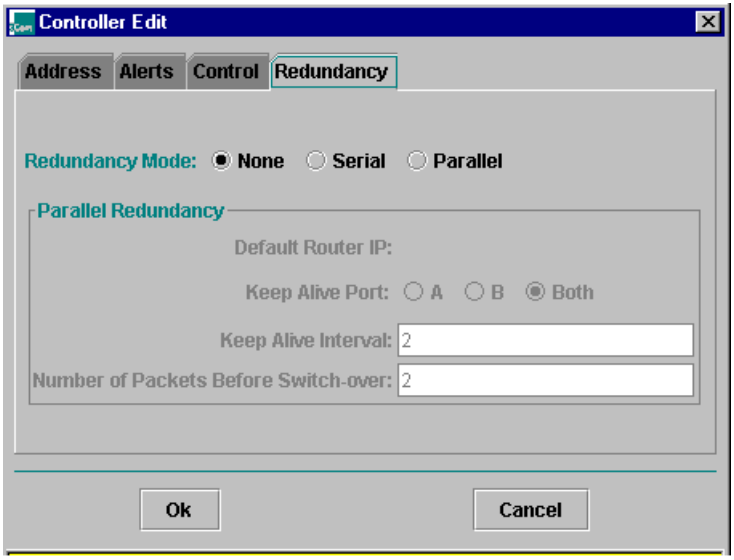


Figure 4-7 Redundancy Tab

4 Select **None**.

5 Click **OK**. To exit the dialog box without sending your settings, click **Cancel**.

What's Next?

Once you have set all pertinent parameters via the Address, Alerts, Control, and Redundancy tabs, the BWM Controller configuration is complete. Read the next section, *Viewing Traffic Status* to monitor current user activity.

Viewing Traffic Status

Use these steps to view traffic status.

1 From the BWM Main Menu, select **Administration**.

2 From the *Administration* menu, select **Controllers**.

3 Click **Status**. A screen similar to the following one displays.

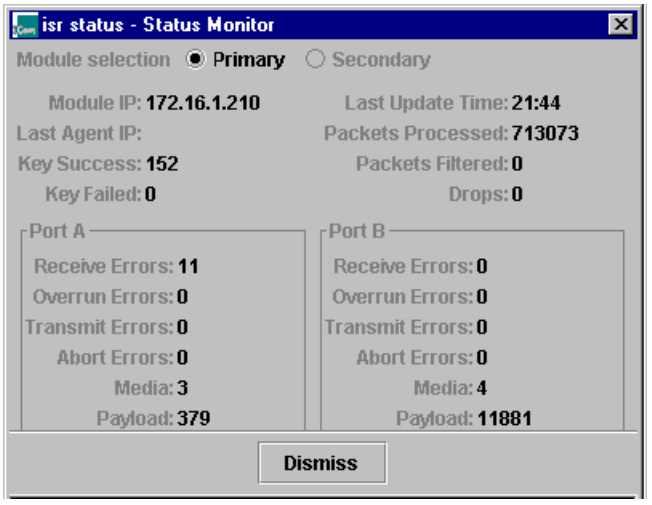


Figure 4-8 Sample Traffic Status Report

Table 4-5 describes the status information shown in Figure 4-7.

Table 4-4 List Status: Status Monitor Field Descriptions

Field	Description
Module Selection	For this version of BWM, only the Primary module is available.
Module IP	The IP address of the BWM Controller module.
Last Agent IP	Currently not used.
Key Success	The number of Controller configuration updates that were successful.
Key Failed	The number of unsuccessful attempts to update the Controller configuration. A large number of unsuccessful attempts could indicate hacker activity or tampering with the BWM Controller configuration.
Last Update Time	Shows last update time.
Packets Processed	The number of good packets processed in both directions.
Packets Filtered	The number of packets dropped because they did not conform to a traffic policy or because the direction mask was enforced. A high number could indicate that a hacker is launching a ping attack against a server.
Drops	The number of packets dropped in either direction because an internal buffer was full.

Table 4-4 List Status: Status Monitor Field Descriptions

Field	Description
Receive Errors	■ For port A: The number of packets coming from the LAN side that had cyclic redundancy check (CRC) errors or that were fragmented. If this is a high number, there might be a loose connector or a cabling problem on the LAN side of the network. ■ For port B: Same as for port A but applies to the WAN side of the network.
Overrun Errors	The number of times this port has lost all or part of a packet because the buffer for this port was full.
Transmit Errors	■ For port A: The number of packets going to the LAN side that had cyclic redundancy check (CRC) errors or that were fragmented. If this is a high number, there might be a loose connector or a cabling problem on the LAN side of the network. ■ For port B: Same as for port A but applies to the WAN side of the network.
Abort Errors	The number of times the Controller detected an error in a packet at the designated port. For example, if a packet header claims the packet is 60 bytes long but the Controller detects the packet is really more than 60 bytes long, the Controller reports an abort error.
Media	The speed of transmissions through the designated port, reported as 10 half-duplex or 10 full duplex or 100 half-duplex or 100 full-duplex.
Payload	■ For port A: The number of bytes minus the header information in all packets transmitted from port A to port B during the last 30 seconds. ■ For port B: The number of bytes minus the header information in all packets transmitted from port B to port A during the last 30 seconds.

4 Click **Dismiss** to exit the *Status Monitor* window.

5 CONFIGURING BANDWIDTH SETS

This chapter describes how to use BWM to configure bandwidth sets.

- Introduction
- Setting Priorities
- Configuring a Bandwidth Set

Bandwidth Set Overview

A *bandwidth set* is a named collection of bandwidth configuration parameters. Once a bandwidth set has been configured, you can access it simply by selecting its name via the GUI.

Bandwidth sets streamline traffic policy configuration. A bandwidth set saves you from entering each traffic policy parameter over and over each time a new traffic policy is created. Bandwidth sets also give you a quick way of changing an existing traffic policy for many accounts by simply changing the bandwidth set.

Once you configure a bandwidth set, you must then include it in a traffic policy.

The general steps for configuring a bandwidth set are:

- Setting Priorities
- Name the Bandwidth Set
- Specify CIRs and MBRs
- Assign Priority to Bandwidth Set.

Setting Priorities

Setting priorities is a prerequisite to configuring a bandwidth set.

Setting a Priority for a bandwidth set lets you fine-tune bandwidth allocations among user groups to achieve optimum distribution of bandwidth allocations.

A Priority consists of an *Attack Rate* and a *Retreat Rate*. To streamline the configuring of a bandwidth set, the BMW supplies seven Attack-Rate/Retreat-Rate pairs, each assigned to a Priority. You can specify any of these seven priorities as supplied or change them. Then you can assign the Priority representing the desired Attack-Rate/Retreat-Rate pair to the bandwidth set.

Use these steps to set priorities.

1 From the BMW *Main Menu*, select **Administration**.

2 From the *Administration* menu, select **Priorities**. The *Priorities* screen appears.

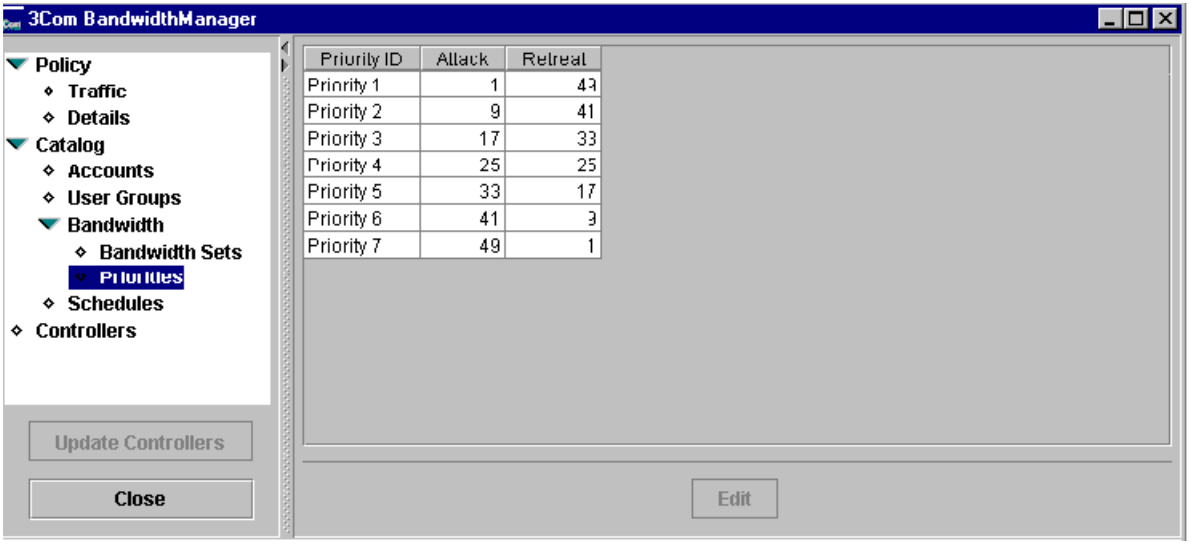


Figure 5-1 Priorities Menu

During initial BWM configuration, the Priorities screen displays the seven supplied Attack-Rate/Retreat-Rate pairs.

3 To change a Priority, select it from the list, then click **Edit**. The *Priorities Edit* dialog box appears.

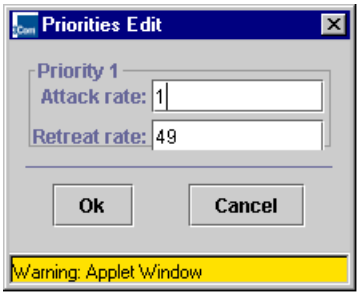


Figure 5-2 Priorities Edit Dialog Box

4 Type the entries described in Table 5-1.

Table 5-1 Priorities Edit Dialog Box Entries

Field	Entry
Priority 1	The supplied name (Priority ID) that identifies an Attack-Rate-Retreat-Rate pair. Use this ID to include the desired Attack-Rate-Retreat-Rate pair in a bandwidth set configuration. The Priority ID cannot be changed. Priority values range from 1 to 7, 7 signifies the highest Priority.
Attack Rate	Enter the number of kilobits per second that bandwidth will increase every 10 seconds to accommodate the initially high bandwidth needed when the account accesses a Web site (bursting). This value must be greater than 0 and should be much larger than the *Retreat Rate* described below. **Note:** The Attack Rate controls how quickly traffic ramps up from the CIR to the MBR. The higher the rate, the quicker bandwidth ramps up from the CIR. For example, if the account accesses a graphically rich Web site, the initial download requires more bandwidth than the remainder of the session at the Web site. To accommodate this initial burst, you should enter a high value. An attack rate of 15, for example, means the bandwidth will be increased by 15 kilobits every 10 seconds.
Retreat Rate	Enter the number of kilobits per second that bandwidth will decrease every 10 seconds to the CIR after bursting. This value must be no greater than the MBR minus the CIR. **Note:** The Retreat Rate controls how quickly traffic ramps down from the MBR to the CIR. In most cases, this value should be much smaller than the Attack Rate. The lower the rate, the slower bandwidth ramps down to the CIR. The Attack-and-Retreat function works best when the Attack Rate is high and the Retreat Rate is 0.

5 After you make your changes, click **OK**. The *Administration* menu displays.

6 To update the BWM Controller with your changes, click **Update Controllers**.

7 Click **Yes** to confirm that you want to update the Controller now.

Supplied Bandwidth Sets

BWM comes with three types of bandwidth sets,

- Gold
- Silver
- Biz.

You can edit any of the supplied bandwidth sets. These supplied bandwidth sets provide bandwidth allocations and Priorities graduated from low to high, numbered 1-7. Seven signifies the highest Priority.

Configuring a Bandwidth Set

Use these steps to create, edit, or delete a bandwidth set.

1 From the *BWM Main Menu*, select **Administration**.

2 From the *Administration* menu, select **Bandwidth Sets**. The *Bandwidth Set* screen appears.

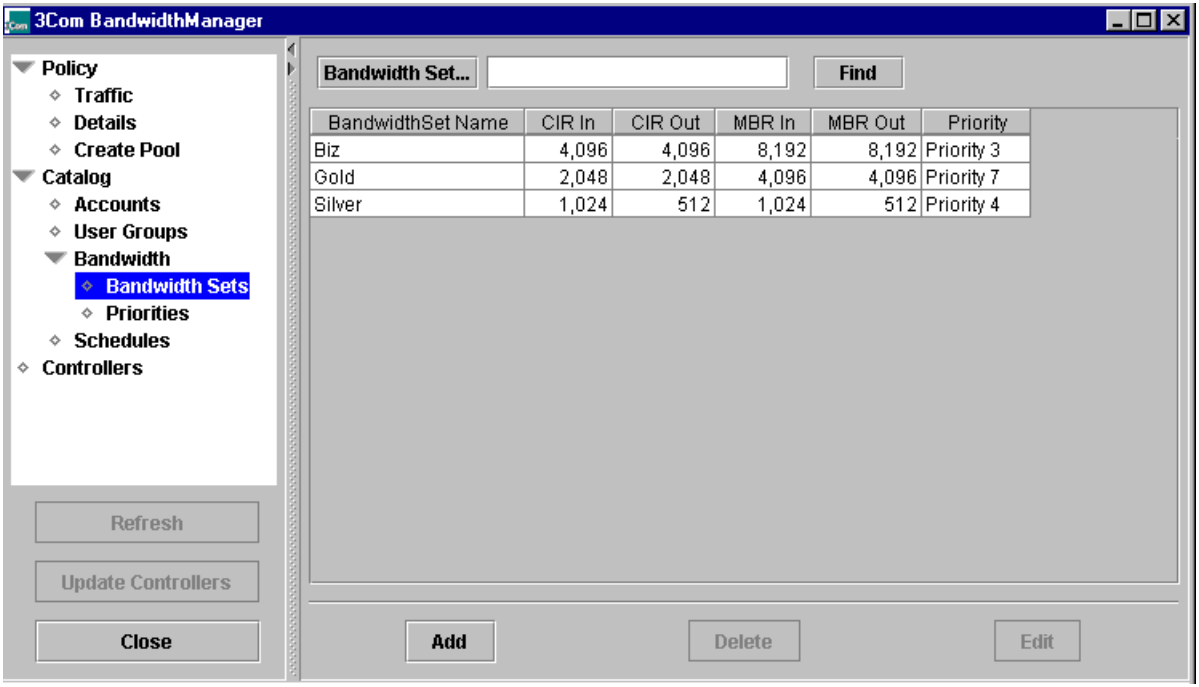


Figure 5-3 Bandwidth Set Screen

During initial BWM configuration, this screen contains the three supplied bandwidth sets (Gold, Silver, Biz as shown in figure 5-3).

3 Depending on how you want to proceed, use the appropriate command buttons as follows:

- To create a new bandwidth set, click **Add**.
- To change a bandwidth set, select its row, then click **Edit**.
- To delete a bandwidth set other than the Default bandwidth set, select its row, then click **Delete**.

The *Bandwidth Set Edit* dialog box appears.

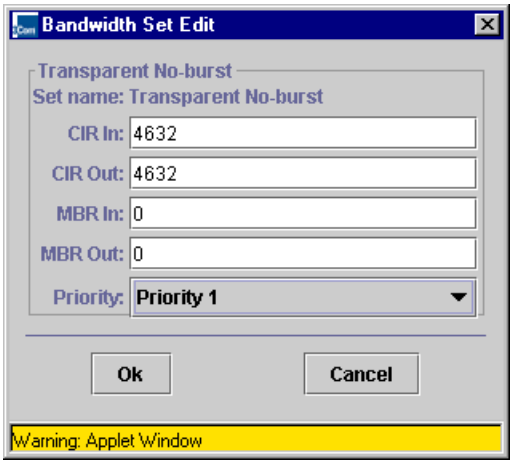


Figure 5-4 Creating a New Bandwidth Set

*If you are changing an existing bandwidth set, the **Set Name** box will be replaced by the existing name; the name cannot be changed. Also, the other boxes will contain the existing settings, and the Priority of the existing bandwidth set will appear in the Priority box.*

4 Make the entries described in Table 5-2.

Table 5-2 Bandwidth Set Edit Dialog Box Entries

Entry	Description
Set Name	Type a descriptive name for this Bandwidth Set. Limited to 30 alphanumeric characters. The Set Name is used to associate a bandwidth set with a traffic policy.
CIR In	Type the amount of bandwidth for traffic from the WAN side, in kilobits per second, that you guarantee as a minimum for each account associated with this bandwidth set. Valid entries are from 0 to 100000000 kilobits per second. **Note:** This rate you enter will be the maximum bandwidth available if you do not specify an *MBR In* below.
CIR Out	Type the amount of bandwidth for traffic from the LAN side, in kilobits per second, that you guarantee as a minimum for each account associated with this bandwidth set. The range is 0-100 megabits per second.

Table 5-2 Bandwidth Set Edit Dialog Box Entries

Entry	Description
MBR In	Type a bandwidth utilization limit, in kilobits per second, that you set for each message received from the WAN side and destined for an account. The range is 0-100 megabits per second. **Note:** The *MBR In* allows utilization of bandwidth above the CIR as long as more bandwidth is available for incoming traffic. If the *CIR In* defined above equals the maximum bandwidth available, you cannot specify an *MBR In*.
MBR Out	Type a bandwidth utilization limit, in kilobits per second, that you set for each message received from the LAN side. The range is 0-100 megabits per second. This value must be equal to or greater than the *CIR Out* defined above. **Note:** *MBR Out* operates the same as *MBR In* except that it applies to outgoing traffic. If the *CIR Out* equals the maximum bandwidth available, you cannot specify an *MBR Out*.
Priority	From the drop-down list, choose the priority that you want to assign to this bandwidth set (1 through 7). This Priority will apply to traffic to and from each user group governed by this bandwidth set.

5 When you are finished configuring your bandwidth set, click **OK**.

6 ESTABLISHING SCHEDULES

This chapter explains the role of Schedules in BWM, including

- Coverage
- Supplied Schedules
- Using the GUI to set up Schedules.

Schedule Coverage

Schedules are a part of a traffic policy. Using a Schedule allows you to establish a time when the traffic policy will be applied. Establishing a Schedule for applying a traffic policy lets you refine bandwidth management to accommodate the high and low volume usage patterns that typically vary among user groups.

You should establish a Schedule that gives 7-day, 24-hour coverage to each user group. BWM includes a Default Schedule and two other supplied Schedules. If your Schedules in a traffic policy governing a user group leave any uncovered time slots, BWM applies a Default Schedule to govern those time slots.

Supplied Schedules

BWM comes with three supplied Schedules.

- 24x7
- Workdays
- Default

You can edit or delete the *24x7* and *Workdays* Schedules.

You cannot edit or delete the Default Schedule. The Default Schedule is designed to automatically fill in any uncovered periods. For example, if user group A is not covered on weekends and user group B is not covered

from 6 p.m. to 7 a.m., the Default Schedule will automatically cover weekends for user group A and the 6 p.m-7 a.m. period for user group B.

Establishing a Schedule

Use these steps to establish a Schedule.

1 From the *BWM Main* menu, select **Administration**.

2 From the *Administration* menu, select **Schedules**. The *Schedules* screen appears.

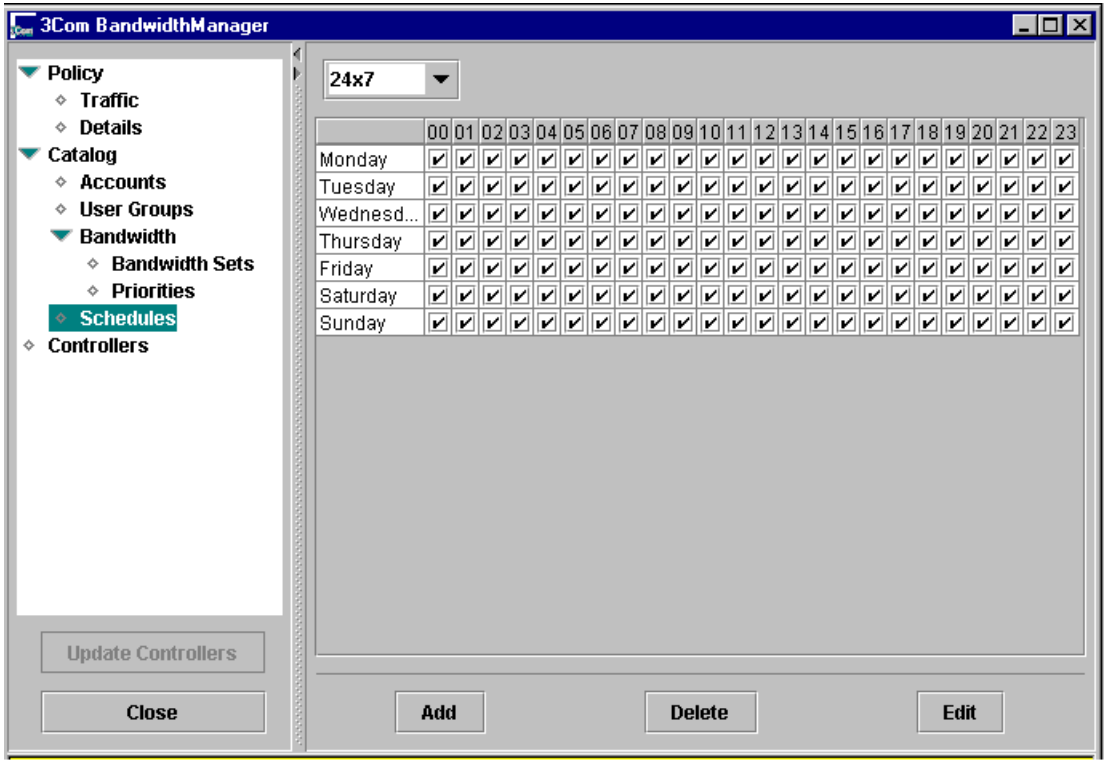


Figure 6-1 Schedules Screen

During initial BWM configuration, this screen lists the supplied 24x7 Schedule and the Workdays Schedules discussed earlier.

3 To see any Schedule, select its name from the Schedule list. The table below the Schedule list displays the days and times that comprise the selected Schedule.

4 Use the appropriate procedure below, depending on how you want to proceed.

- To change an existing Schedule, select its name from the drop-down list then click **Edit**.
- To delete an existing Schedule (other than the Default), click **Delete**.
- To establish a new Schedule, click **Add**.

*If you clicked Edit or Add, the Schedule Edit dialog box appears. If you are changing an existing Schedule, the **Name** box will be replaced by the name and the applicable boxes will contain a check mark.*

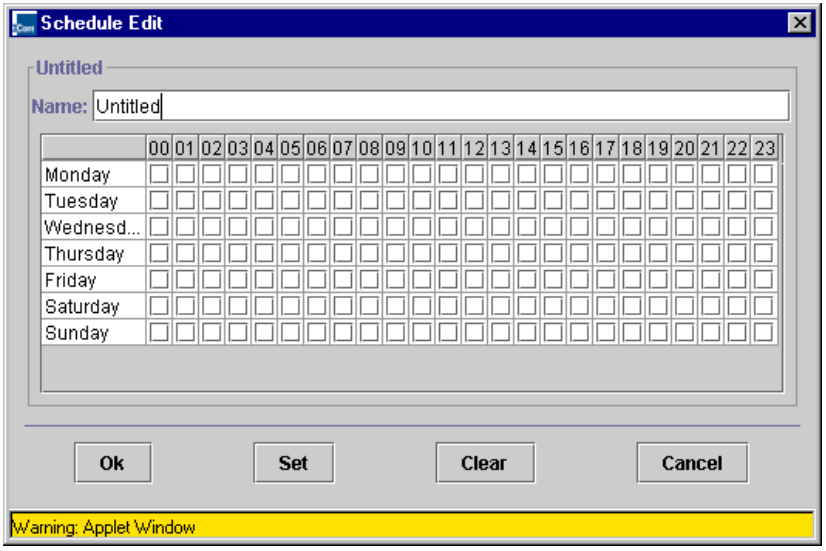


Figure 6-2 Schedule Edit Dialog Box

5 Type the entries described in Table 6-1.

Table 6-1 Schedule Edit Dialog Box Entry Descriptions

Entry	Description
Name	Enter a descriptive name for this Schedule. Limited to 10 alphanumeric characters.
00,01, etc.	Select the check box in the desired hour column and day row when you want the traffic policy associated with this Schedule to apply. ■ To select an hour, click on its box then click **Set**. A check mark appears in the box. ■ To select a series of hours, click on the first box in the series then drag the mouse over all the desired boxes in the series. Click **Set** to put a check mark in the boxes. ■ To deselect any checked boxes, drag the cursor over them then click **Clear**. **Note:** Individual Schedules can overlap. However, you cannot associate traffic policies that result in overlapping Schedules with the same user group.

6 When you have finished typing your entries, click **OK**.

7 SETTING TRAFFIC POLICIES

This chapter explains the role of BWM traffic policies and describes how to set them. This chapter also provides

- An account overview
- Configuring accounts procedures
- Configuring User Group procedures
- Defining traffic policy procedures
- Viewing traffic policy procedures.

Accounts

An account is a billable or charge-back entity using bandwidth managed by the BWM Controller. An account is divided into User Groups. Once you configure an account, you apply a traffic policy to any of its User Groups.

Default Account

BWM supplies a Default account. Bandwidth used by any IP address not identified in the BWM will be logged as the Default account. You can bill that IP address accordingly.

Setting Up Accounts

Use these steps to configure an account.

1 From the *BWM Main* menu, select **Administration**.

2 From the *Administration* menu, select **Accounts**. The Accounts screen appears.

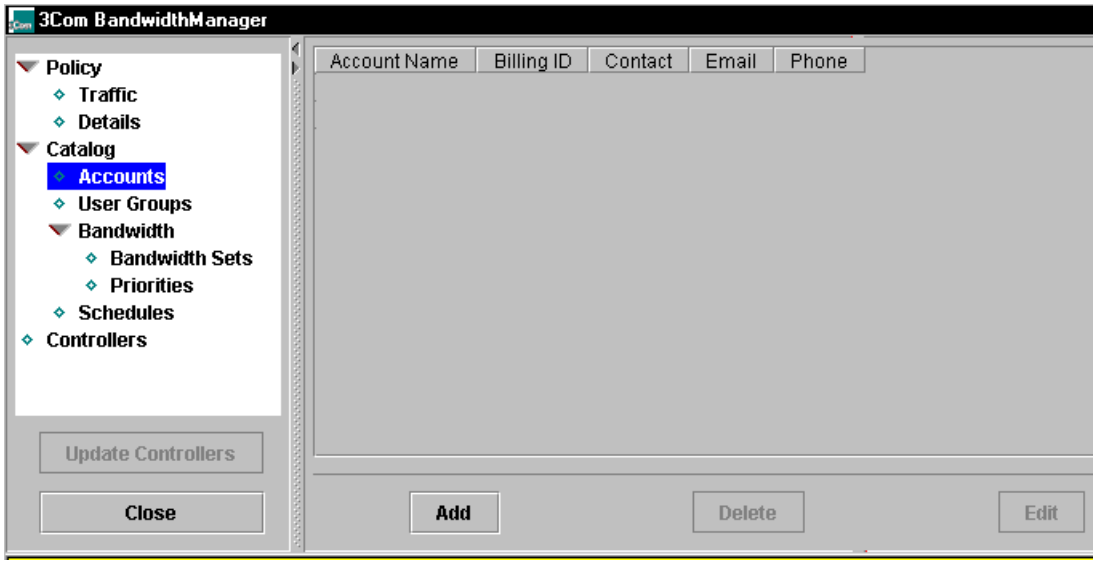


Figure 7-1 Accessing the Accounts Menu

3 Use the appropriate procedure below, depending on how you want to proceed.

- To create a new account, click **Add**.
- To change an existing account, select its row, then click **Edit**.
- To delete an existing account, select its row in the table then click **Delete**.

*When you click **Add**, the Account Edit dialog box appears. If you are changing an existing Schedule, the Name box will be replaced by the name and the applicable boxes will contain information.*

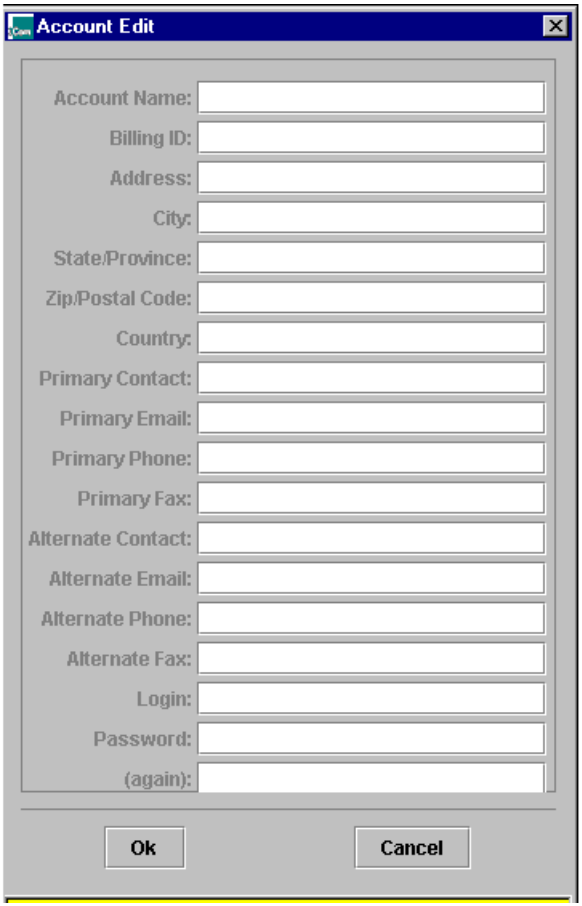


Figure 7-2 Account Edit Dialog Box

4 Type the entries described in Table 7-1.

Table 7-1 Account Edit Dialog Box Entries

Entry	Description
Account Name	A descriptive name, up to 72 alphanumeric characters, that uniquely identifies the account. When you set a traffic policy, you associate it with this account name.
Billing ID	(Not implemented in this version of the BWM.) A code, up to 36 alphanumeric characters, that the BWM uses for logging and for assigning to a record.
Address	The number and street that is the mailing address of this account, up to 64 alphanumeric characters.
City, State/Province, Zip/Postal Code, Country	The remainder of the mailing address of this account. Each field can be up to 64 alphanumeric characters.
Primary Contact	The name of a person, to contact in case of an emergency. Type up to 72 alphanumeric characters.
Primary Email	The e-mail address of the primary contact.
Primary Phone	The phone number, up to 16 alphanumeric characters, of the primary contact, including the area code.
Primary Fax	The fax number, up to 16 alphanumeric characters, of the primary contact, including the area code.
Alternate Contact	The name of a person or other entity who should be contacted if the primary contact is unavailable. Up to 72 alphanumeric characters are allowed.
Alternate Email	The e-mail address of the alternate contact.
Alternate Phone	The phone number, up to 16 alphanumeric characters, of the alternate contact, including the area code.
Alternate Fax	The fax number, up to 16 alphanumeric characters, of the alternate contact, including the area code.
Login	Currently not used.
Password	Currently not used.

5 When you have finished making your entries, click **OK**.

User Groups

An account is divided into User Groups (an account can consist of only one User Group, if desired). Each User Group is governed by a traffic policy. A User Group represents one or more IP addresses or one or more MAC addresses.

Setting Up a User Group

Use these steps to configure a User Group.

1. From the *BWM Main* menu, select **Administration**.
2. From the *Administration* menu, select **User Groups**. The *User Groups* window appears.

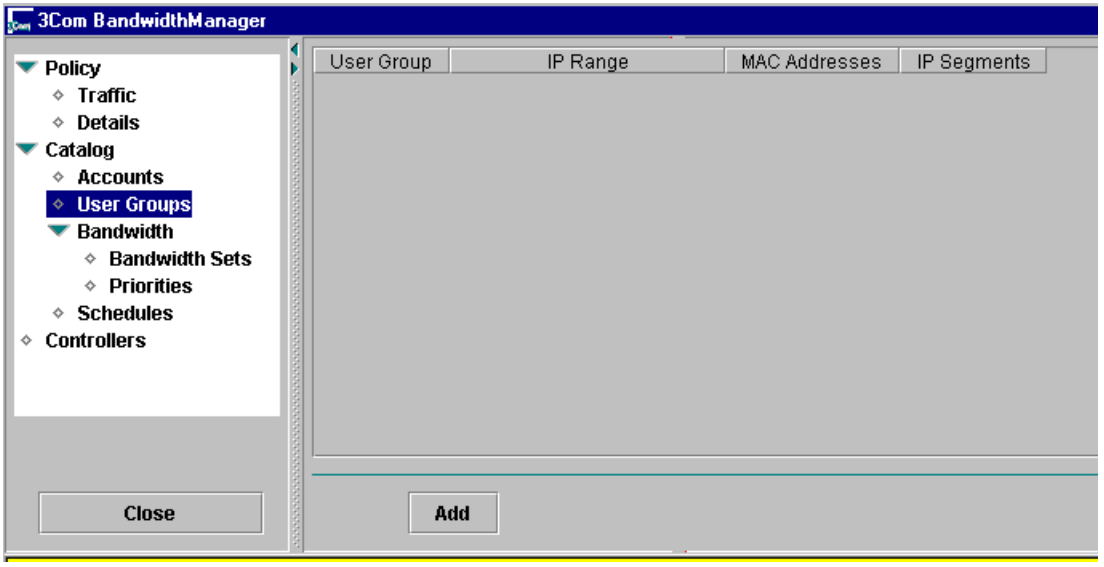


Figure 7-3 Accessing the User Groups Menu

3. To create a new User Group, click **Add**.

   When you click **Add**, the *User Group Edit* dialog box appears. If you are changing an existing User Group, the **User Group Name** box will be replaced by the existing name and the IP Range List will be displayed.

You do not have to fill in every field in the User Group Menu. For example, if you type the IP address, you do not need to type the MAC address.

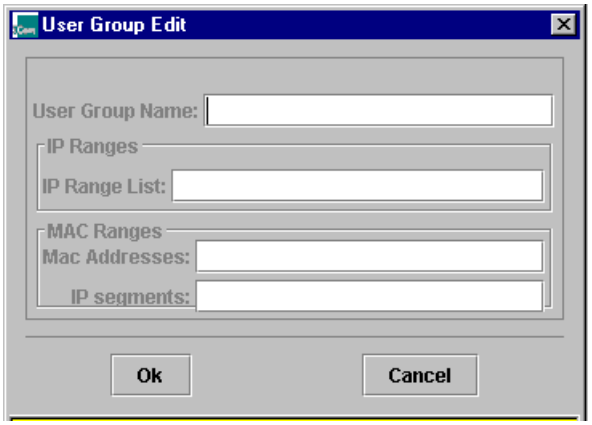


Figure 7-4 User Group Edit Dialog Box

4 Type the entries described in Table 7-2.

Table 7-2 User Group Edit Dialog Box Entries

Entry	Description
User Group Name	Type a descriptive name for this User Group within the defined account. Limited to 30 alphanumeric characters. For example, if the account name is "Megacorp," the User Group name could be "Megacorp Acct. Div."
IP Range List	Type the IP address range that comprises this User Group. Limited to up to 256 alphanumeric characters. Indicate a range of IP addresses in the format "nnn.nnn.nnn.nn-nn." For example, 192.83.240.3-63 indicates a range of IP addresses from 192.83.240.3 through 192.83.240.63. A series and a range can be combined; for example "192.22.237.18,192.83.240.3-63,192.55.40.74." The range for each of the four segments in an IP address is from 1-254. **Note:** The same IP address cannot appear in more than one User Group, nor can IP addresses be mixed with MAC addresses in the same User GroupUser Group. You can, however, combine User Groups of IP addresses with User Groups of MAC addresses. Indicate a series of IP addresses in the format "address,address,address."

Table 7-2 User Group Edit Dialog Box Entries

Entry	Description
MAC Addresses	Type the MAC addresses that comprise the User Group. Limited to a maximum of 256 alphanumeric characters. Type a MAC address in the hexadecimal format "xx:xx:xx:xx:xx." Indicate a series of MAC addresses in the format "address,address,address." MAC address ranges are not allowed. **Note:** Creating User Groups from MAC addresses is preferable in those cases where your customers might change their own IP addresses. The same MAC address cannot appear in more than one User Group, nor can you mix MAC addresses and IP addresses in the same User Group. You can, however, combine User Groups of MAC addresses with User Groups of IP addresses.
IP Segments	Type the complete address of the segment to which the host represented by the MAC addresses belongs, in the *nn.nn.nn.0* format. **Note:** This address must always end in 0. For example, if the IP addresses associated with the specified MAC addresses were 192.22.237.3-19, the IP segment would be 192.22.237.0.

5 When you have finished making your entries, click **OK**. To exit the dialog box without making any changes, click **Cancel**.

Traffic Policies

A traffic policy consists of a bandwidth set, direction, alerts, a Schedule, and active/inactive status. Before defining a traffic policy you need to configure accounts, User Groups, a bandwidth set, and a Schedule.

You can also use the Create Pool function to specify the same Traffic Policy for multiple Accounts and User Groups.

Defining a Traffic Policy

Use these steps to set a traffic policy for only one or two accounts at a time. However, if you want to set specific levels of access, or "classes of service" for many accounts, use the Create Pool function. See *Using Create Pool*, listed later in this chapter.

Use these steps to add, change, or delete a traffic policy:

1 From the *BWM Main* menu, select **Administration**.

2 From the *Administration* menu, select **Traffic**. The *Traffic* screen appears.

During initial configuration, the Traffic screen displays an empty table.

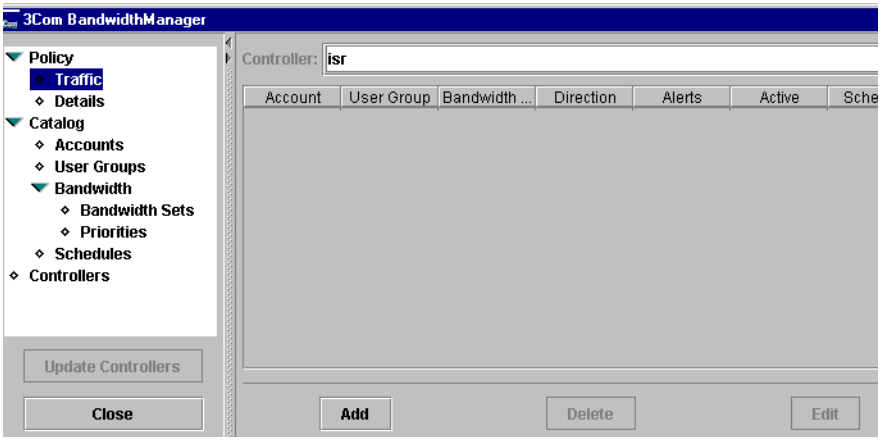


Figure 7-5 Accessing the Traffic Menu

3 From the Controller scroll list, select the *Controller* in the scroll list to be associated with the traffic policy you want to define.

Once you set traffic policies, the traffic policy associated with the BWM Controller displays in this screen. Until you configure a Controller, the Controller scroll list is empty.

4 Use the appropriate procedure below, depending on how you want to proceed.

- To create a new traffic policy, click **Add**.
- To change an existing policy, select its row then click **Edit**.
- To delete an existing traffic policy, select its row then click **Delete**. The policy's record is removed from the table.

If you click **Add** or **Edit**, the *Policy Edit* dialog box appears.

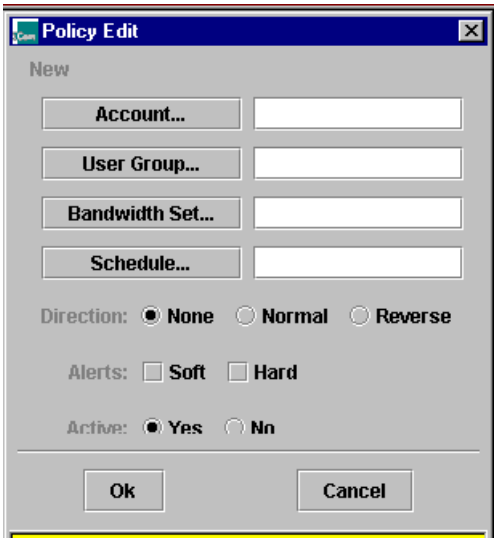


Figure 7-6 Policy Edit

5 Type the entries described in Table 7-3

Table 7-3 Policy Edit Dialog Box Entries

Entry	Description
Account	When you click **Account...**, an entry field and list of existing accounts appears. Either type the account name in the entry field or choose the account name from the list.
User Group	When you click **User Group...**, an entry field and list of existing User Groups appears. Either type the User Group name in the entry field or choose the User Group name from the list, to specify the User Group that you want this policy to govern.
Bandwidth Set	Either type the bandwidth set name in the entry field or choose a bandwidth set name from the list to specify the bandwidth set that will be a part of this policy.
Schedule	Either type the Schedule name in the entry field or select the desired Schedule from the list. **Note:** For instructions on creating a Schedule, see the *Establishing Schedules* chapter in this document.

Table 7-3 Policy Edit Dialog Box Entries

Entry	Description
Direction	To specify blocking or non-blocking of traffic to and from the designated User Group, click on the applicable button as follows. ■ **None**: Allow traffic through both port A (LAN side) and port B (WAN side) ■ **Normal**: Block traffic originated from WAN side, i.e. block traffic received on B, which has source address outside of defined User Group ■ **Reverse**: Block traffic originated from LAN side to keep it from going out, i.e. block traffic received on A, which has source address in the defined User Group The default, and recommended, setting is **None**.
Alerts	If a *soft alert* (soft threshold) is configured, click **Soft**. If a *hard alert* (hard threshold) is configured, click **Hard**. **Note:** Choosing an alert type in the Traffic Policy screen enables Alerts if they were configured for this Controller. For alert descriptions and configuration directions, see "Configuring Alerts" in Chapter 4.
Active	■ If this policy is in the database and you want it to govern the specified User Group whenever the Controller is operating, click **Yes**. ■ If you do not want this policy to govern the specified User Group now but you want to keep it for later use, click **No**. The default is *No*.

6 When you have finished making your entries, click **OK**. To exit the dialog box without making any changes, click **Cancel**.

Traffic Policies Menu The following table describes the *Traffic Policies* menu.

Table 7-4 Traffic Policy Details Information Fields

Field	Description
Controller	From the drop-down list, select the BWM Controller.
Account	The name of the Account containing the User Group governed by the displayed Traffic Policy.
User Group	The name of the User Group governed by the displayed Traffic Policy.
CIR In	The Committed Information Rate In for this User Group, as specified in the Bandwidth Set that is a part of the Traffic Policy.
CIR Out	The Committed Information Rate Out for this User Group, as specified in the Bandwidth Set that is a part of the Traffic Policy.

Table 7-4 Traffic Policy Details Information Fields

Field	Description
MBR In	The Maximum Burst Rate In for this User Group, as specified in the Bandwidth Set that is a part of the Traffic Policy.
MBR Out	The Maximum Burst Rate Out for this User Group, as specified in the Bandwidth Set that is a part of the Traffic Policy.
Priority ID	The Priority for this User Group, as specified in the Bandwidth Set that is a part of the Traffic Policy.
Direction Mask	The Direction specified for the Traffic Policy when it was defined.
Alerts	The Alerts specified for the Traffic Policy when it was defined and that are enabled.
Active	The current status specified for the Traffic Policy. **Yes** means this policy is in the database and will govern the specified User Group whenever the Controller is operating. **No** means this Traffic Policy will not be in effect.
Schedule	The name of the Schedule that determines when this Traffic Policy applies. This Schedule is a part of the Traffic Policy.

How to View Traffic Policies

Use these steps to view the existing parameters that comprise a traffic policy.

1 From the *BWM Main Menu*, select **Administration**.

2 From the *Administration* menu, select **Details**. The *Traffic Policy Details* screen appears.

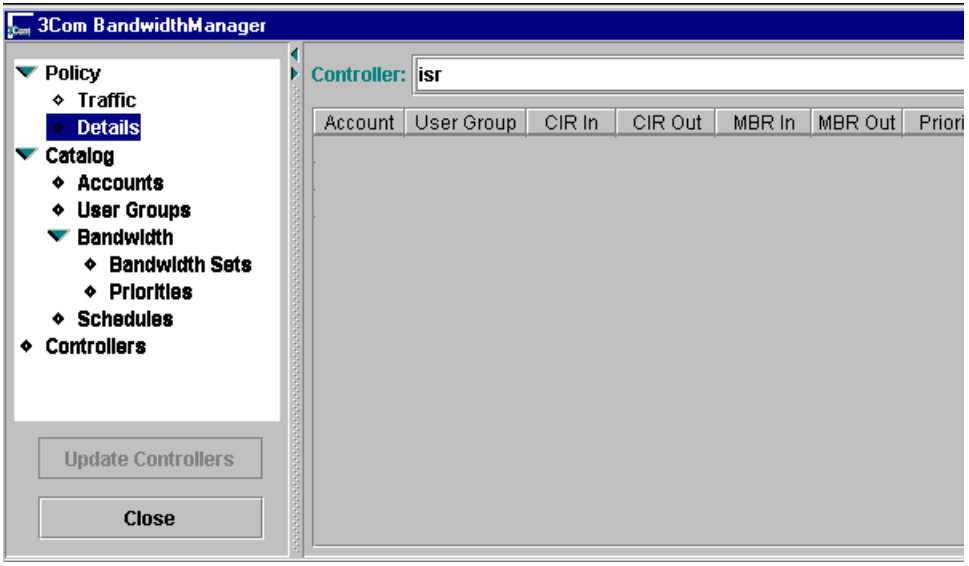


Figure 7-7 Accessing the Traffic Policies Menu

3 Click **Close** to exit the *Traffic Policy Details* area.

Using Create Pool to Apply a Single Traffic Policy to Multiple Accounts

If you are using a DHCP server, it is essential to apply different classes of service to different types of customers. In a single operation, the Create Pool function lets you build pools for each class of service, which then generate the accounts and User Groups. To use the Create Pool feature you need to know,

- Controller Name (i.e. BandwidthManager)
- A singular account name to represent all the generated accounts and User Groups in the Pools.
- IP addresses of the User Groups to be generated
- A class of service for the generated accounts and User Groups.

Use these steps to create a Pool.

1. From the *BWM Main* menu, select **Administration**.
2. From the *Administration* menu, select **Create Pool**.
3. Click **Controller**. The *Controller* dialog box displays.
4. Select **BandwidthManager** from the Controller list.
5. Click **OK**. The Controller name, BandwidthManager, appears in the *Controller* field.
6. Type the Account Base Name. The Account Base Name is a name you provide to identify the accounts and User Groups generated via the Create Pool feature.

   Create Pool applies the following format to the Account Base Name that you provide,

   ACC<base name><number>

   For example, if you type **Star** in the Account Base Name field, and four accounts will generate Create pool assigns the following name,

   ACCStar0, ACCStar1, ACCStar2, ACCStar3
7. Type the IP address range that comprises this User Group. Type one or more IP address ranges, or individual IP addresses.

   To continue the Create User Pool procedure, follow the *Building a Class of Service for User Group Pools* procedure, listed next.

Building a Class of Service for User Group Pools

Use these steps to create a Class of Service for User Group Pools.

1. Click **Add** in the Class of Service section of the screen to access the *Class of Service Edit* dialog box, as follows.
2. Click **Bandwidth Set**. Select a Bandwidth Set from the list.
3. Click **Schedule**. Select a Schedule from the list.
4. Select one of the following traffic directions for this bandwidth set.
   - None — Traffic travels through both port A (LAN side) and port B (WAN side).
   - Normal — Blocks traffic from the WAN side (traffic received on Controller Port B) which has its source address in a defined User Group.

- Reverse — Blocks traffic from the LAN side (traffic received on Controller Port A) which has a source address in the defined User Group, to keep it from going out.

5 Select the *Alerts* configured previously. If you configured a soft alert (soft threshold) for the BWM Controller click **Soft**. If you configured a hard alert (hard threshold) for the BWM Controller click **Hard**.

See the *Configuring Alerts* section in Chapter 4, *Configuring the BWM Controller*, to help determine the preset Alert type.

6 Click **OK**. The bandwidth set Schedule is added to the Pool in the Class of Service table, and becomes part of the Class of Service.

Repeat these steps for each bandwidth set that will become part of the Class of Service.

Checking Coverage

Use these steps to check Schedule coverage in a Class of Service.

1 Click **Coverage** in the Class of Service section of the screen.

2 The *s* screen appears. Verify whether or not the Schedule coverage is sufficient.

8 ANALYZING BANDWIDTH

This chapter describes the two bandwidth analysis tools available in BWM,

- Real-Time Bandwidth Charting, and
- Bandwidth utilization reports.

You can use the information supplied by these tools for capacity planning, usage forecasting, as a basis for billing, and for balancing loads among your accounts.

Real-Time Bandwidth Charting

At any time during a BWM administration session at the client workstation, you can view a line chart that shows real-time bandwidth utilization by an account or by an IP address over the past 24 hours. The BWM updates this chart every 10 minutes.

Displaying a Real-Time Bandwidth Chart

Use these steps to display a real-time bandwidth utilization chart.

1. From the 3Com *BWM Main* menu, select **Reports**.
2. From the *Reports* menu, select ***Daily***. A setup screen for a real-time chart appears.
3. In the *Account* drop-down list, select the name of the account.

All currently-configured accounts will appear in the drop-down list beginning with the first time you access the Real-time Bandwidth Chart function.

4 Click **Display**. The *Bandwidth Utilization* chart displays.

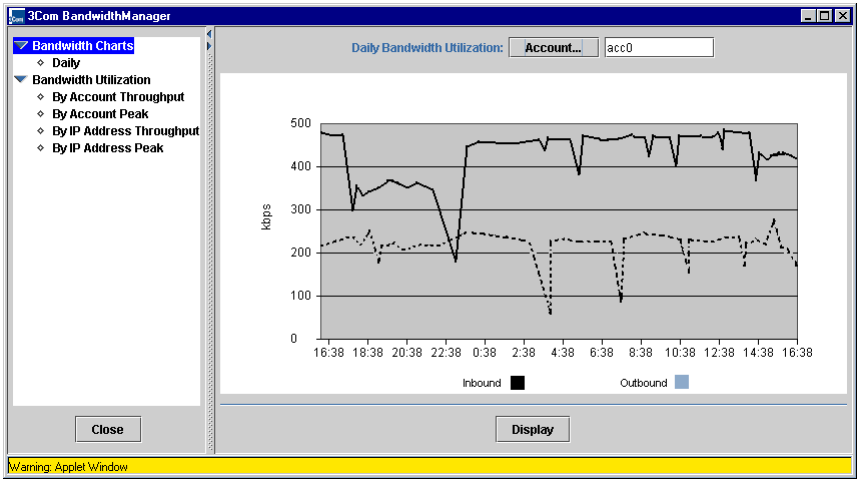


Figure 8-1 Real-Time Bandwidth Chart

The outbound line and inbound line each plot the average number of bytes per second used by the account at the stated time. The client scales itself to handle differing ranges of throughput.

5 To view a chart for another account or IP address, repeat steps 3 - 4. To exit, click **Close**.

Bandwidth Utilization Reports

In addition to the real-time bandwidth charting capability, the Reports feature provides four types of reports for analyzing the utilization of bandwidth, as follows.

- Accounts ranked by throughput
- Accounts ranked by peak
- IP addresses ranked by throughput
- IP addresses ranked by peak

The BWM Controller begins collecting account data as soon as the account is added. However, it is important to note that a new account will not be reflected in reports until midnight of that day.

Displaying an Accounts Bandwidth Utilization Report

Reports of this type show Accounts ranked by total megabytes of data transferred in a given period (throughput) *or* by highest kilobit-per-second usage in a given period (peak).

By Throughput

Use these steps to access bandwidth utilization reports for Accounts ranked by throughput.

1. From the *BWM Main* menu, select **Reports**.
2. From the *Reports* menu, select **By Account Throughput**.

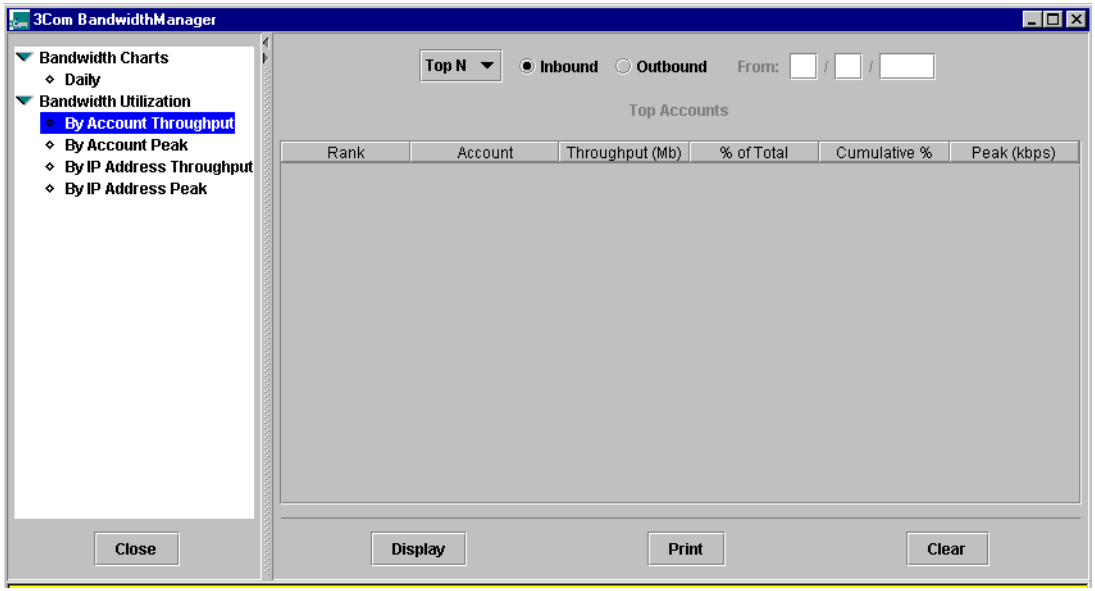


Figure 8-2 Accessing Account Throughput

By Peak

Use these steps to display a bandwidth utilization report for Accounts ranked by peak.

1 From the *BWM Main* menu, select **Reports**.

2 From the *Reports* menu, select **By Account Peak**.

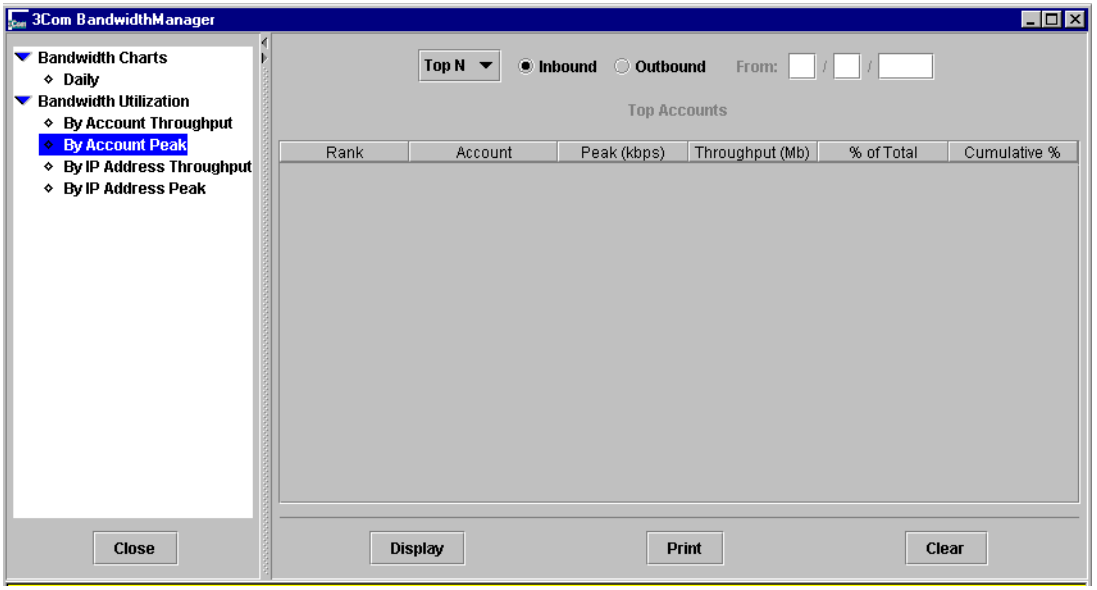


Figure 8-3 Accessing Account Peak Reports

Select the options that best suit the information you want to display. Refer to Table 8-1 for a description of available options.

Table 8-1 By Account Peak Information Screen Options

Option	Description
Top N or Top%	■ To obtain a report on a specific number of top accounts, leave **Top N** displayed and then enter the number desired in the first box, for example *2*. The accounts will be ranked according to highest usage. If the report lists fewer accounts than you specified, it means you specified more top accounts than there are total accounts. ■ To obtain a report on the top *n* percent of all accounts, choose **Top %** from the drop-down list, then enter the percentage, from 1-100, in the first box.
Inbound	To show data for traffic coming *to* the account, select *Inbound*.

Table 8-1 By Account Peak Information Screen Options

Option	Description
Outbound	To show data for traffic *from* the account, select this *Outbound*.
From...To	Enter the beginning date and ending date to indicate the period the profile will cover. The date is in the format mm/dd/(yy)yy; for example *2/1/1999* or *02/01/1999*.
Close	Closes the Bandwidth Utilization reports window.
Display	Displays the requested report.
Print	Prints the selected report.
Clear	Clears entries and data from the active window.

All reports for accounts give the same type of information, the only differences being how the accounts are ranked and the order of columns in the report.

The following sample is a report for the top two accounts ranked by throughput (that is, the two accounts that used the most megabytes of outbound bandwidth) over a seven-day period.

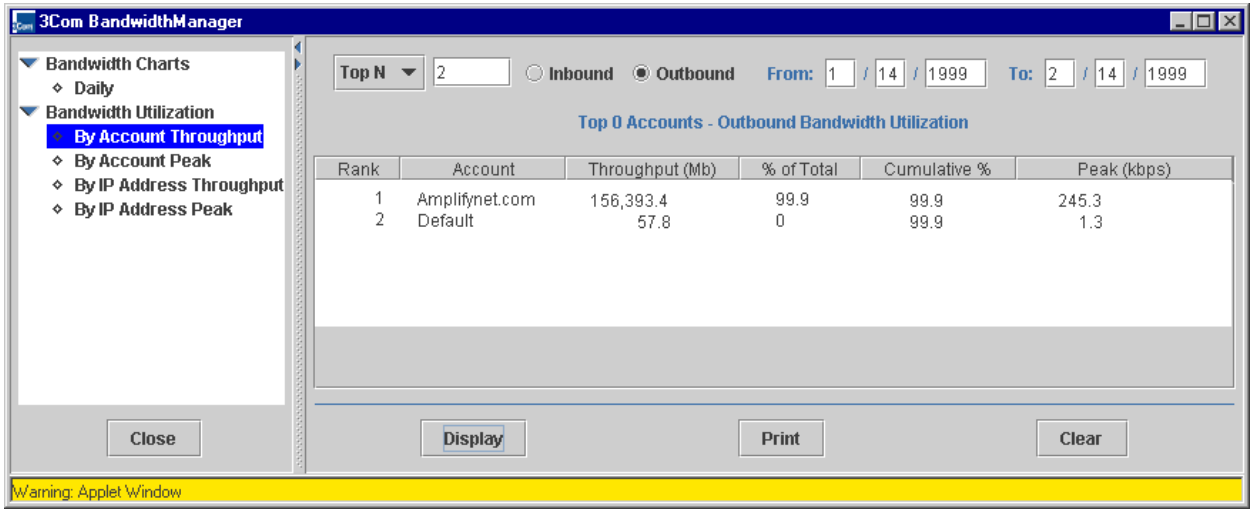


Figure 8-4 Viewing Account Throughput Information

Table 8-2 describes the information displayed.

Table 8-2 Account Throughput Screen Details

Field	Description
Rank	The numerical ranking of the top accounts. The report lists either the top number of all accounts or the top percentage of all accounts ordered by megabytes transferred or by highest peak usage.
Account	The name of the account specified when the traffic policy was configured.
Throughput (Mb)	If you specified outbound, the amount of bandwidth in megabytes, consumed by traffic coming *from* this account. If you specified Inbound, this is the amount of bandwidth in megabytes, consumed by traffic coming *to* this account.
% of Total	The percentage of all accounts ranked by throughput or peak.
Cumulative %	A running total of the individual percentages to this point in the report.
Peak (kbps)	The largest burst of traffic experienced by this account, measured in kilobytes.

For IP Addresses Reports of this type show IP addresses ranked by total megabytes processed in a given period (throughput) or by highest usage in a given period (peak). To obtain either type of ranking, follow one of the sequences below from the Main menu.

Use these steps to obtain a report ranked by IP address throughput.

1. In the BWM main menu, select *Reports*.
2. In the *Reports* menu, select *By IP Address Throughput*.

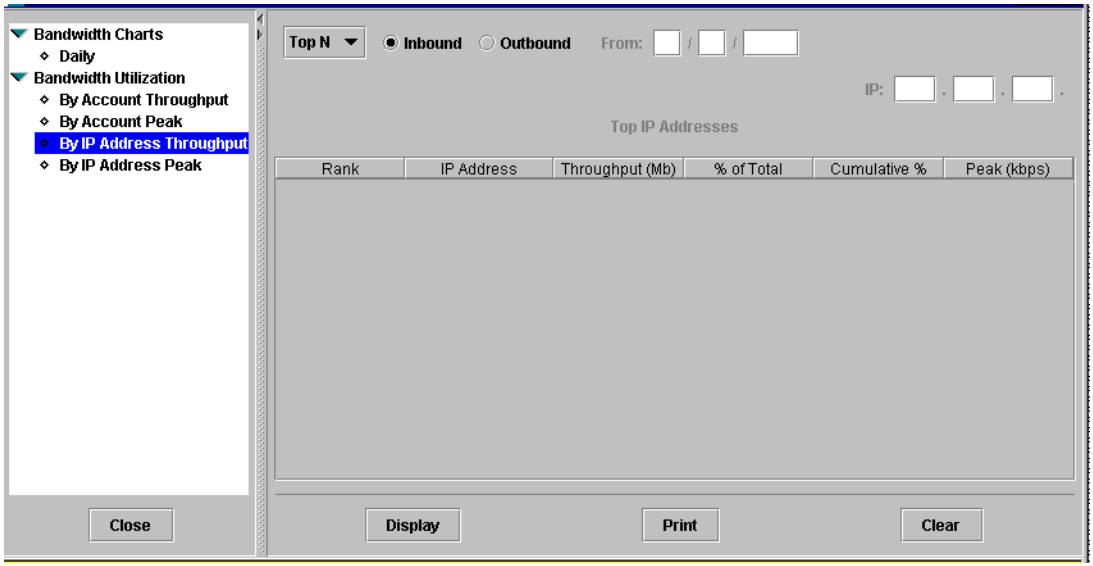


Figure 8-5 Viewing Throughput Reports by IP Address

3. Select **Close** to exit.

Use these steps to obtain a report ranked by IP address peak.

1 In the BWM *Main* menu, select *Reports*.

2 In the *Reports* menu, select *By IP address Peak*.

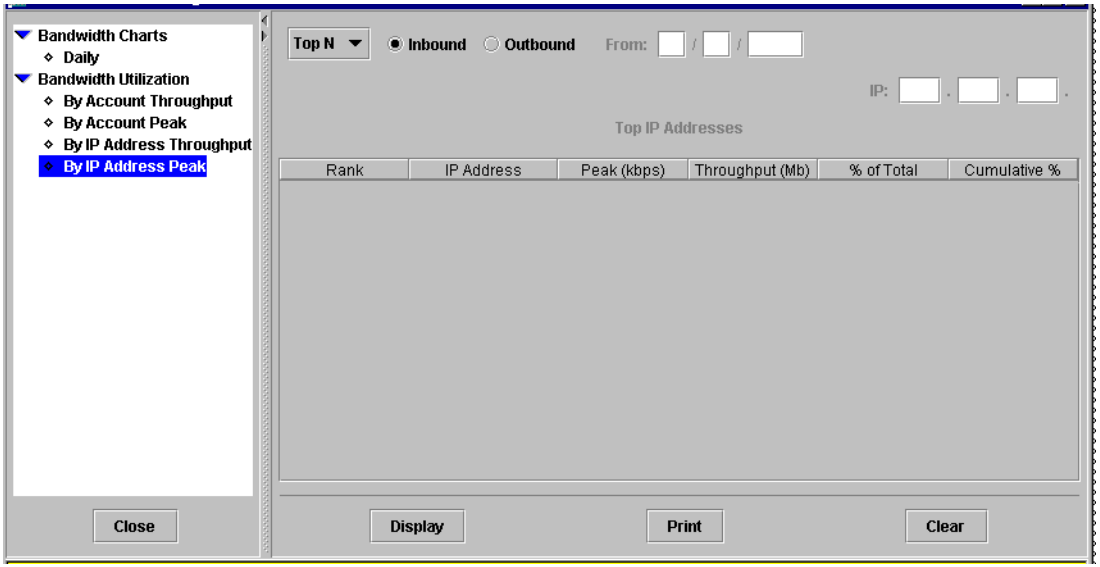


Figure 8-6 Viewing Bandwidth Utilization by IP Address Peak

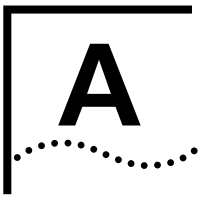
Parameters and buttons in these setup screens are the same as described in the *For Accounts* section, with the following exceptions listed in Table 8-3.

Table 8-3 Bandwidth Utilization by IP Address Peak Screen Details

Field	Description
Rank	The numerical ranking of the top accounts. The report lists either the top number of all accounts or the top percentage of all accounts ordered by megabytes transferred or by highest peak usage.
IP	Enter the beginning and ending IP addresses in the desired range. You can obtain a finer ranking within a reported account, for example, by obtaining a report of the top IP addresses in a user group associated with the top account. To do this, go to the User Groups option of the *Administration* menu to determine which IP addresses to enter.
Account	The name of the account specified when the traffic policy was configured.

Table 8-3 Bandwidth Utilization by IP Address Peak Screen Details

Field	Description
Throughput (Mb)	If you specified outbound, the amount of bandwidth in megabytes, consumed by traffic coming *from* this account. If you specified Inbound, this is the amount of bandwidth in megabytes, consumed by traffic coming *to* this account.
% of Total	The percentage of all accounts ranked by throughput or peak.
Cumulative %	A running total of the individual percentages to this point in the report.
Peak (kbps)	The largest burst of traffic experienced by this account, measured in kilobytes.



UPDATING THE EDGESERVER PRO CARD SET TO BWM FUNCTIONALITY

IMPORTANT FOR INSTALL TECHNICIANS: *If the BWM product you are about to install shipped in the 3Com-specific BWM shipping carton, the firmware is preinstalled at the factory.* ***You do not need to complete the updating procedure as outlined in this Appendix.*** *Refer to Chapter 2 for complete instructions on installing the BWM Card Set.*

In order to transform a 3Com EdgeServer Pro Version 1.0 to a 3Com BWM Controller Version 1.0, you will need to follow the sequence outlined in this chapter, as follows.

- First, install the 3Com EdgeServer NIC, 3Com EdgeServer Pro NAC, and 3Com Dual Ethernet NIC in the CMTS chassis.
- Second, copy the BWM software (from the BWM Boot diskette) to the EdgeServer Pro.
- Third, reboot the EdgeServer Pro, (after the power cycle completes, the hardware becomes the BWM Controller)
- Fourth, initialize and set the IP address for the BWM Controller.

Follow the complete instructions, listed next.

Install the Card Set

Read these sections for instructions on installing the card set. The cards that make up the EdgeServer Pro (and ultimately the BWM Controller) include,

- One Peripheral Network Interface Card (NIC) that provides the required ports (PS2 keyboard port, PS2 mouse port, ultra-wide SCSI port, and a DB-15 video port) to support the hardware for configuring the BWM Controller,
- One EdgeServer Pro Network Application Card (NAC) where you will copy the BWM software, and

- One 3Com (recommended, but any brand will work) 10/100 Ethernet NIC, supplied by you.

Install the BWM Peripheral NIC first.

Required Tools

To install the NIC in the Cable Modem Termination System (CMTS), you need a #2 Phillips and flat-head screwdriver.

Installing the BWM Peripheral NIC

Use these steps to install the BWM Peripheral NIC. You can install the NIC with or without chassis power turned on.

ESD: *To reduce the risk of electrostatic discharge (ESD), take proper grounding precautions before handling the NIC.*

1 Select a slot at the rear of the CMTS. For example, install this NIC in slot(s) 1–16.

Remember that slot 17 is reserved for the Network Management Card (NMC).

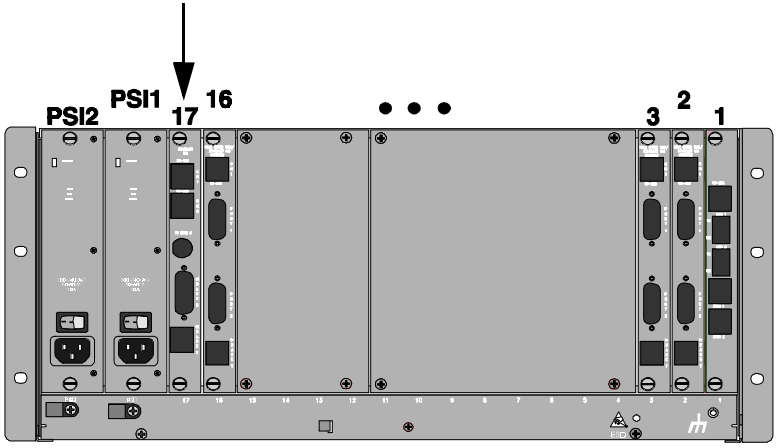


Figure A-1 Rear View of CMTS

2 Use a #2 Phillips screwdriver to remove the safety panel covering this slot.

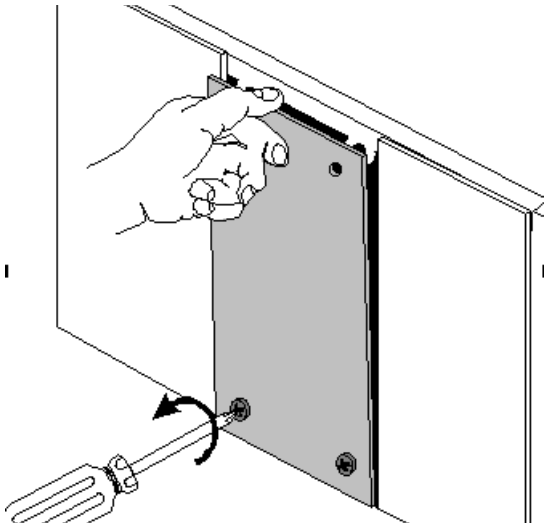


Figure A-2 Removing the Slot to Install the BWM Peripheral NIC

3 Insert the NIC between the slot's upper and lower card guides.

4 Slide the NIC into the chassis, until the front of the NIC is flush with the chassis.

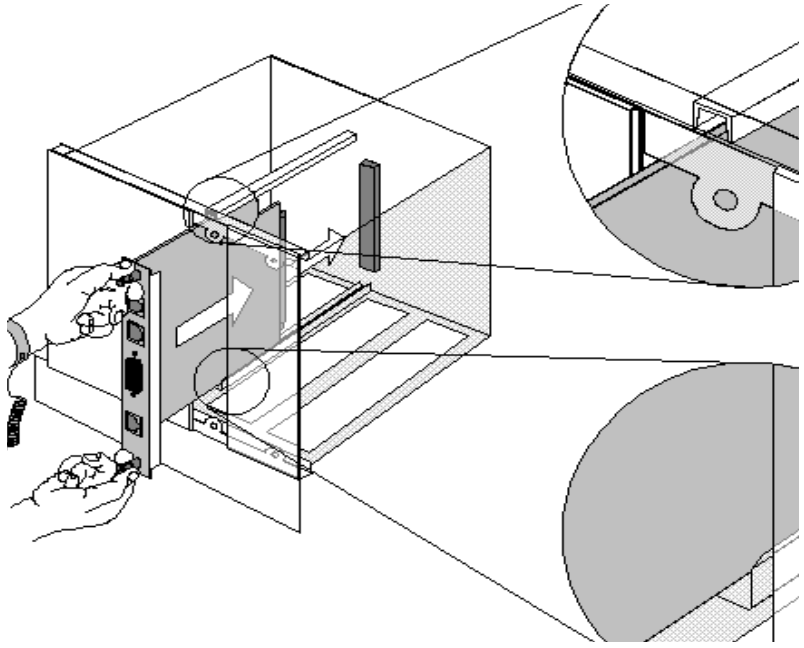


Figure A-3 Aligning the NIC

5 Use a flat-head screwdriver to tighten the screws on the front panel.

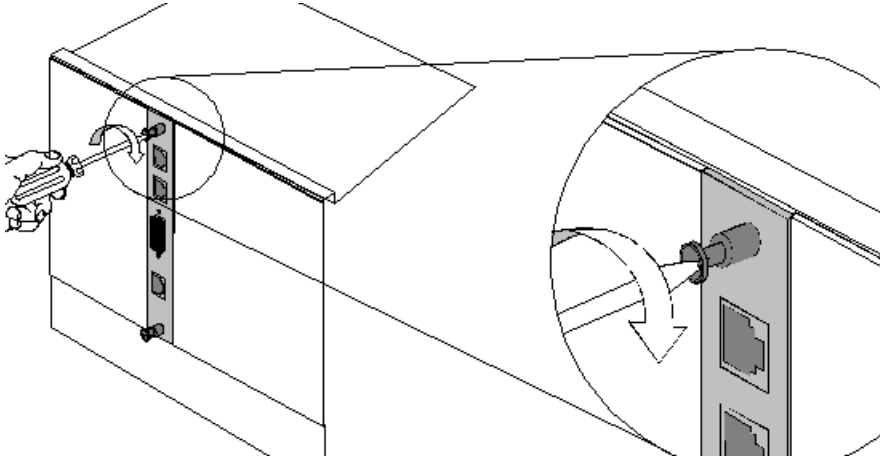


Figure A-4 Securing the NIC in the Chassis

6 Cover any unused chassis slots with safety panels.

7 Next, install the BWM NAC. See the instructions listed next.

Installing the BWM NAC

Use these steps to install the BWM NAC. You can install the NAC with or without chassis power turned on.

ESD: *To reduce the risk of electrostatic discharge (ESD), take proper grounding precautions before handling the NIC.*

Before installing the BWM Controller, make sure that CMOS is set for plug and play.

1. First, make sure that you have already installed the BWM Peripheral NIC per the instructions listed in the previous section, *Installing the BWM Peripheral NIC*.
2. Select a slot at the front of the CMTS for installing the NAC. Make sure to install the NAC in slot(s) 1 through 16. Slot 17 is reserved.

Please note that the BWM NAC requires three chassis slots to install. For example, you can install the NAC in slots 3,4, and 5.

3. Use a #2 Phillips screwdriver to remove the safety panel covering the slot.
4. Insert the NAC between the slot's upper and lower card guides.
5. Holding the tabs perpendicular to the NAC's front panel, slide the NAC into the chassis, until the front of the NAC is flush with the chassis

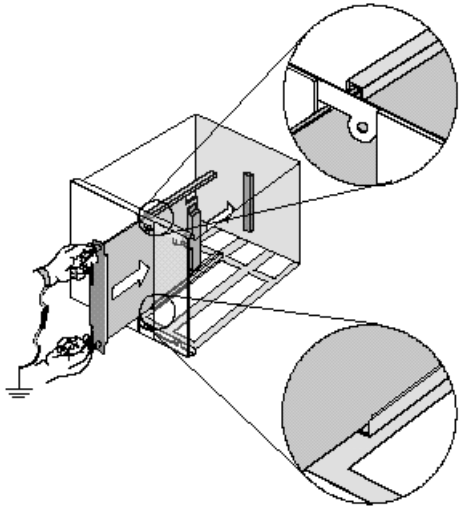


Figure A-5 Aligning the NAC

6 Push the tabs toward each other to secure the NAC.

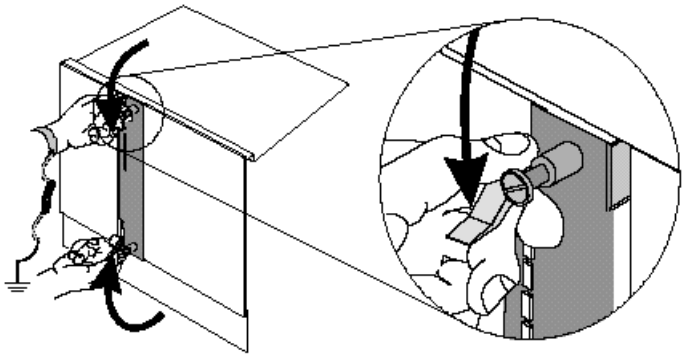


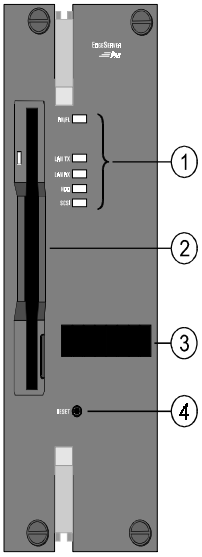
Figure A-6 Securing the NAC

7 Use a flat-head screwdriver to tighten the screws on the front panel.

8 Cover any unused chassis slots with safety panels.

9 Turn on the chassis power.

10 After the NAC boots, verify that the RN/FL (run/fail) LED is green. See the following figure for a description of NAC LEDs.



Callout	Interface Description
1	**LEDs:** Hardware and network activity information. **RN/FL (Run/Fail):** Operating condition **Green:** Activity **No Color:** No Activity **LAN TX:** Network transmit activity **LAN RX:** Network receive activity **HDD:** Disk drive activity **SCSI:** SCSI device activity
2	**Diskette Drive:** Initial data input source. **LED**: Drive activity
3	**System Display:** System performance or user defined information can be displayed. *See the EdgeServer Pro Product Reference Guide for information about setting this feature.*
4	**Reset:** Press once to shut down the Windows NT operating system; press again to reset the unit.

Figure A-7 BWM NAC LEDs

Resetting the BWM NAC

To shut down Windows NT, press the RESET button on the front of the BWM NAC (previously EdgeServer Pro). A prompt displays..."it is now safe to turn off your computer."

At this point, either remove the card from the chassis or press the RESET button again to force a system restart.

Installing the 10/100 Ethernet NIC

As shown in the System Requirements list at the beginning of this Chapter 2, you need to supply a 10/100 Ethernet NIC. If you are installing the *3Com Dual 10/100 Ethernet NIC*, you can use these instructions.

Otherwise, refer to the documentation that came with your 10/100 Ethernet NIC.

Use these steps to install the Dual 10/100 Ethernet NIC. You can install the NIC with or without chassis power turned on.

ESD: *To reduce the risk of electrostatic discharge (ESD), take proper grounding precautions before handling the NIC.*

Install the NIC with or without power applied to the chassis.

1 Configure the NIC via the jumper and switches. Put the jumper in the NAC position. Refer to the following graphic for more information.

*This NIC **must** be configured with the jumper in the **NAC** position in order to function properly.*

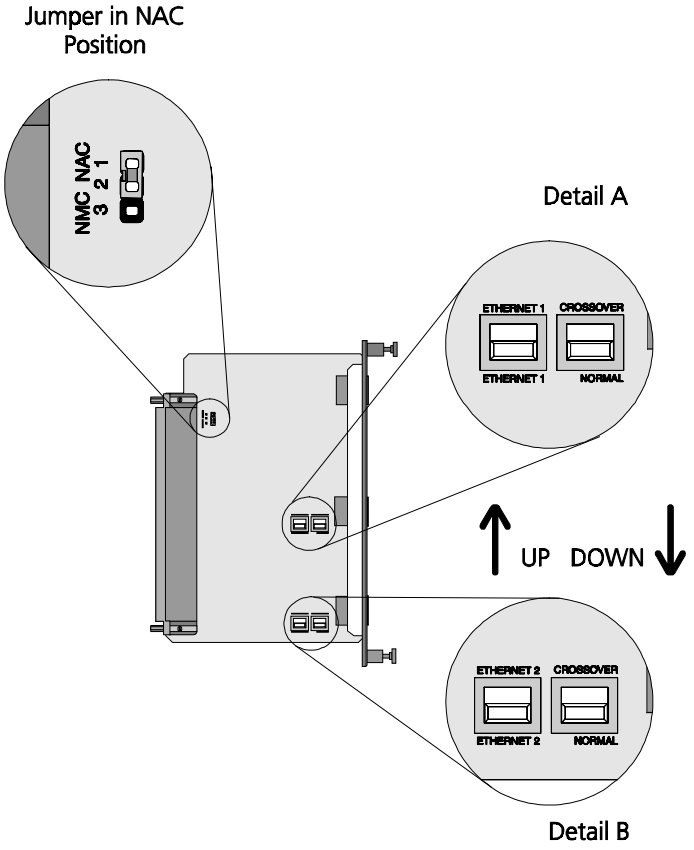


Figure A-8 3Com Ethernet NIC Exploded View

2 Select a slot at the rear of the CMTS for installing the NIC.

To...	Do this...
Configure the Ethernet 1 port to connect directly to another NIC	Push both switches in *Detail A* in the *up* position
Configure the Ethernet 1 port to connect to a hub	Push switches in *Detail A* in the *down* position
Configure the Ethernet 2 port to connect directly to another NIC	Push both switches in *Detail B* in the *up* position
Configure the Ethernet 2 port to connect to a hub	Push both switches in *Detail B* in the *down* position

3 Use a #2 Phillips screwdriver to remove the safety panel covering this slot.

4 Insert the NIC between the slot's upper and lower card guides.

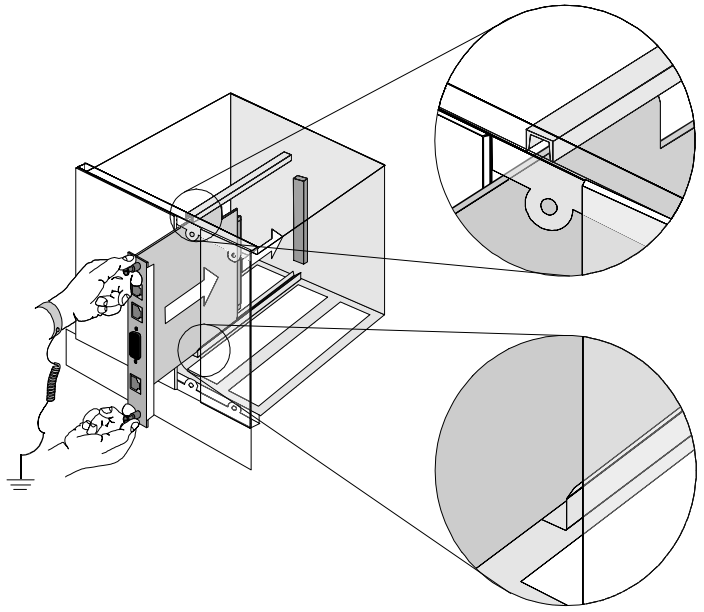


Figure A-9 Inserting the NIC

5 Slide the NIC into the chassis, until the front of the NIC is flush with the chassis.

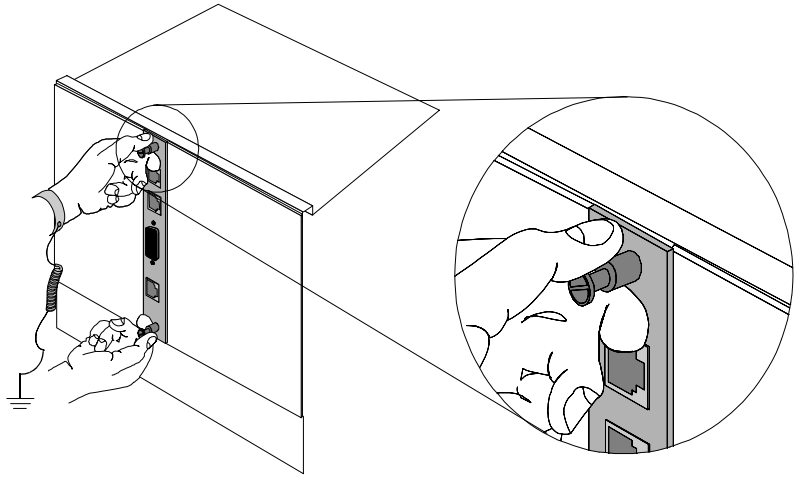


Figure A-10 Securing the NIC

6 Use a flat-head screwdriver to tighten the screws on the front panel.

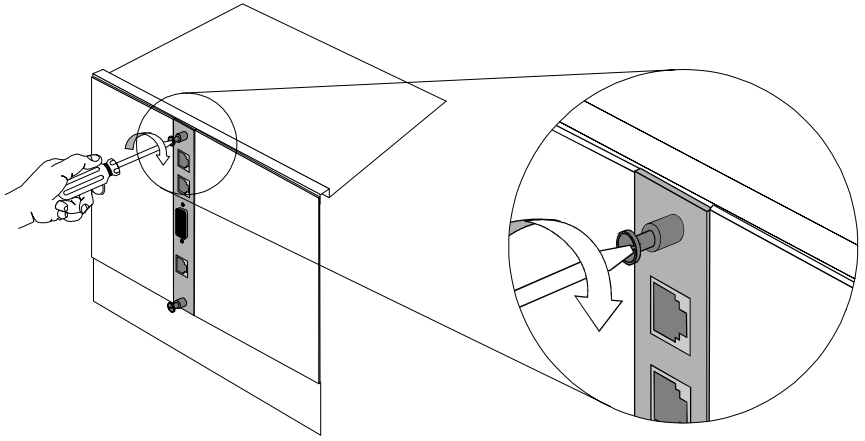


Figure A-11 Tightening NIC Screws

7 Cover any unused chassis slots with safety panels.

8 Install the Network Application Card (NAC) corresponding to this NIC. Refer to the NAC's *Getting Started Guide* for more information.

How to Load BWM Software on the 3Com EdgeServer Pro

Use these steps to load the BWM firmware onto the 3Com EdgeServer card set.

Setting Up the BWM Controller for the First Time

After properly installing the card set in the CMTS, read this section for setup information. To change from EdgeServer functionality to BWM functionality, you must,

- Connect to a local console
- Copy the BWM Boot Disk Contents to the EdgeSever Pro Hard Drive
- Reboot the EdgeServer Pro
- Initialize the BWM Controller
- Set the IP address
- Check BWM Controller BIOS Settings
- Create a backup diskette.

Each step is summarized in the following sections.

Connect to a Local Console

Use these steps to connect to a local console.

1. Connect one end of the null modem cable to the RS-232 port on the 10/100 Ethernet NIC.
2. Connect the other end of the null modem cable to the RS-232 connector on the computer you've designated as the local console.
3. Attach the monitor, keyboard, and mouse cables to the EdgeServer Pro that will become the BWM Controller.
4. Insert the BWM boot disk into the EdgeServer Pro diskette drive.
5. During the boot process, you will see the prompt, "Hit DEL if you want to run setup." Press the **DEL** key to run CMOS Setup.
6. Enter CMOS setup, and set the following.
   - Select the *Standard CMOS Setup* option to set time and date.
   - Select the *Advanced CMOS Setup* option to boot from the diskette drive first, IDE0 second.
   - Select the *PCI/Plug&Play Setup* option, to change all IRQs [2-15] as PCI/PNP. (By default, IRQ9 and 10 are set up as ISA/EISA.
7. Save the settings, and exit CMOS setup.

Next, see the following sections for instructions on copying the BWM Boot Disk data to the hard drive.

Copy the BWM Boot Disk to the Hard Drive Via Hyperterminal

Use these steps to begin transforming the EdgeServer Pro to a BWM Controller.

To complete these steps, you will need access to a system with the Hyperterminal application installed.

1. Move the monitor, keyboard and mouse to the computer with Hyperterminal installed.
2. Verify the terminal communication settings, as follows.
   - 38400 bps
   - 8 bit
   - No parity
   - 1 stop bit
3. At the login prompt, type the temporary login name **3Com**, and press **Enter**.
4. Next, type the temporary password **3Com**, and press **Enter**.
5. Now that you have logged in, it is a good idea to select your own personal login name, and password. To do this, type **password** and press **Enter**.
6. At the appropriate prompts, type your login name and an original password.

Choose from 3 to 14 alphanumeric characters for your login name and password. Remember that passwords are case-sensitive.

7. Type **y** to update your login name and password.
8. Press **Enter** a few times, until you see the A> prompt.
9. Format the EdgeServer Pro C drive, as follows.

You must format the drive with a 32 MB partition size. If you use a larger partition size, the format will fail.

   At the A> prompt, type **format c: /q /s**, press **Enter**.

10. After the format is complete, copy the BWM boot diskette data to the hard drive. At the A> prompt, type **copy a:*.*c:**.
11. Type **CD C:** to change to the C:\ drive.

12 At the C prompt, type **copy isp autoexec.bat** and press **Enter**.

13 Remove the BWM Boot diskette from the diskette drive. Reboot the EdgeServer Pro.

Reboot the EdgeServer Pro

Use these steps to reboot the EdgeServer Pro. After you reboot, the EdgeServer Pro module is becomes the BWM module.

1 Locate the **RESET** pin hole on the EdgeServer Pro.

2 Insert a very thin object, (like a pen) into the pin hole.

3 Remove the pen. The EdgeServer Pro reboots.

Set the BWM Controller IP Address

Use these steps to set the IP address for the BWM Controller. This IP address allows the BWM management software on the control console to communicate with the BWM Controller.

1 At the C:\> prompt type,

chgip <address> press **Enter**.

Type the IP address using the a.b.c d format.

At this time, write down the IP address, and keep it in a safe place. You will use this IP address again when you want to access the BWM management GUI.

2 To verify that you entered the correct IP address, type,

type conf, and press **Enter**.

The console displays the IP address.

Check BIOS Settings

Use these steps to check BIOS settings.

1 Connect the monitor and keyboard cables to the BWM Controller.

2 During the boot messages, press **F5** to view the *BIOS Configuration* screen. Locate the *Plug and Play Settings* screen.

3 Verify that the BIOS settings listed on the *Plug and Play Settings* screen match the settings shown.

4 Remove the diskette and reboot the BWM Controller.

Create a Backup Diskette

Use these steps to create a backup diskette.

1. To create a backup copy of the BWM software, insert a diskette into the appropriate diskette drive and type **backup**, press **Enter**.
2. Remove the diskette and store in a safe place.

Reinstalling BWM Software

Use these steps to reinstall the BWM software.

1. Locate the BWM Boot diskette that shipped with the software.
2. Connect the monitor and keyboard to the BWM Peripheral NIC.
3. Power on the board, and follow the onscreen prompts until the C:> prompt appears.
4. Type **setOS**, and press **Enter**.
5. Type the IP address in n.n.n.n format, that you would like to assign to the BWM Controller. Press **Enter**.
6. Type **setIP**, and press **Enter**.
7. Type **showcfg**, and press **Enter**. Verify that the settings are correct.

When you finish setting management software parameters, create a backup diskette.

B

BWM Card Set Technical Specifications

Overview

This Appendix lists technical specifications for the BWM card set. The BWM card set consists of a 3COM EdgeServer Pro NAC and NIC Version 1.0, preinstalled with BWM software.

BWM NAC

Read the following section for BWM NAC specifications.

Certification

Complies with FCC Part 15 Class A, FCC Part 68, UL-listed, CSA-approved, and DOC-certified

Processor

80486DX4 at 100 MHz

Operational Memory, Dynamic Random Access Memory (DRAM)

64 Mbytes

Data Retention Method

Clock, CMOS and chassis configuration values retained

Type: Supercap 5.5V .47 Farad

Retention:3 days

Operating System

Microsoft Windows NT Server 4.0

Input Devices

Mouse

PS2 compatible

Keyboard

PS2 compatible

Video

SVGA compatible, 800´600, 16 color

Midplane Connector

180-pin DIN connector

NAC Management Bus

512 kHz (Data Clock)

ISA Bus

8 MHz

NAC Physical Dimensions (x2)

Length:12.95"32.89 cm

Width:.79" 2.0 cm

Height:6.9" 17.53 cm

Environment — Shipping and Storage

Temperature

0 ° - 65 ° Celsius, 32 ° - 149 ° Fahrenheit

Relative Humidity

5 - 95% (non-condensing)

Operating Temperature

5 ° - 40 ° Celsius, 41 ° - 104 ° Fahrenheit

Relative Humidity

8 - 90% (non-condensing)

Fan trays are recommended for all EdgeServer and BWM modules.

NAC Power Requirements

Power	Typical	Maximum
+5VDC	2.8 A	3.5 A
-5VDC	8 mA	20 mA
+12VDC	29 mA	50 mA
-12VDC	-16 mA	50 mA

BWM NIC Read the following section for BWM NIC specifications.

Certification

Complies with FCC Part 15 Class A, FCC Part 68, UL-listed, CSA-approved, and DOC-certified

Environment — Shipping and Storage

Temperature

-25° - 75° Celsius, -13° - 167° Fahrenheit

Relative Humidity

- 100% non-condensing

Operating

Temperature

0° - 40° Celsius, 32° - 104° Fahrenheit

Relative Humidity

0 - 95% non-condensing

NIC Physical Dimensions

Length:5.3"13.46 cm

Width:.79"2.0 cm

Height:6.90"17.53 cm

NIC Power Requirements

Power	Typical	Maximum
+5VDC	1.2 A	1.5 A
+12VDC	3 mA	50 mA
-12VDC	11 mA	50 mA

Midplane Connector

90-pin DIN connector

Serial Port (CH1)

Standard EIA-232 (formerly RS-232) DTE port.

Electrical Specification

EIA-232 (formerly RS-232), 8-position modular jack

Connectors

modular jackStewart 88-360808 or equivalent DB-25Amp 748677-1 or equivalent

Configuration

DTE

Transmission Method

Unbalanced EIA-232 (formerly RS-232)

Transmission Rate

57.6 Kbps maximum

INDEX

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