

Nways AIS/MAS/MRS/MSS



Configuration Program User's Guide for Nways Multiprotocol and Access Services Products

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Note

Before using this information and the product it supports, be sure to read the general information under "Notices" on page iii.

Eighth Edition (October 1999)

This edition applies to Version 3.4 of IBM Nways Access Integration Services, IBM Nways Multiprotocol Access Services, and IBM Nways Multiprotocol Routing Services, and Version 2.2 of IBM Nways Multiprotocol Switched Services and MSS Family Clients, and subsequent releases until replaced.

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About This Manual

This manual explains how to install and use the Configuration Program on various platforms to configure an Nways device for your network.

This manual assumes a knowledge of networking concepts.

Who Should Read This Manual

The intended user of this book is the person who will configure an Nways device using the configuration program.

How This Manual Is Organized

This manual is divided into the following chapters:

- “Chapter 1. Obtaining and Installing the Configuration Program” on page 1, which describes the installation requirements for the IBM Nways Access Integration Services, Multiprotocol Access Services, Multiprotocol Routing Services, Multiprotocol Switched Services, and Multiprotocol Switched Services Clients Configuration Program and how to install the configuration program.
- “Chapter 2. Starting the Configuration Program” on page 7, which describes how to start the configuration program and some operational considerations.
- “Chapter 3. Using the Configuration Program” on page 13, which describes how to use the configuration program, some of its navigational features, and an overview of the configuration process.

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Features of the Configuration Program

The Configuration Program provides a point-and click-interface for creating configurations for the various models of devices. Doing the following tasks with this interface is easier than using the command line interface:

- Saving a configuration for later completion.
- Retrieving an existing configuration from a device and either updating it or using it as a template for configuring another device.
- Using an existing configuration as a template for a different device.
- Configuring multiple protocols. (You may do them in any order unless there are inter-protocol dependencies.)
- Upgrading previously-created configurations to the current format. For example, you can upgrade a configuration that was created with a previous version of the configuration program to the current configuration program release.
- Verifying the completeness of a configuration before loading that configuration to a device.
- Using guided configuration, which displays dynamic help information for configuration tasks.
- Using context-sensitive helps for panels and parameters to get more information as needed.
- Saving configurations as backups or storing multiple versions for the same router.
- Using the command line facility to automate many tasks including reading, writing, sending, and retrieving configurations.
- Creating, editing, and reading ASCII-formatted configuration files.

Library Ordering Information

Obtaining Softcopy Information

Softcopy BookManager READ library information is available for many of the IBM 2210, IBM 2212, IBM 2216, and IBM 8210 publications in the *IBM Networking Systems Softcopy Collection Kit*. To place a single order for the CD-ROM, use form number SK2T-6012. To place a single order for the 3480 cartridge, use form number SK2T-6013.

Yearly subscriptions to the *IBM Networking Systems Softcopy Collection Kit*, product number 5636-PUB, are available through your branch office representative. Order feature code 2003 and media code 5003 for CD-ROM format. Order feature code 2004 and media code 5004 for 3480 cartridge format.

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To order the CD-ROM that contains the 2216- and Network Utility-related publications, use form number SK2T-0405.

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The IBM 2210 publications are available via the System Library Subscription Service (SLSS). Use machine type 2210 and program number 5801-ARR to receive 2210 publications.

The IBM 2212 publications are available via the System Library Subscription Service (SLSS). Use machine type 2212 and program number 5639-F73 to receive 2212 publications.

The IBM 2216 publications are available via the System Library Subscription Service (SLSS). Use machine type 2216 and program number 5765-D47 to receive 2216 publications.

The Network Utility documentation is included in the IBM 2216 publications.

The IBM 8210 publications are available via the System Library Subscription Service (SLSS). Use machine type 8210 and program number 5765-368 to receive 8210 publications.

Summary of Changes to This Edition

Changes to This Manual

- Minor technical changes and editorial changes have been made.

Technical changes and additions are indicated by a vertical line (|) to the left of the change.

Changes to the Configuration Program Since the Previous Edition

The following changes were made to the configuration program since the previous edition of this manual:

- Minor technical changes not affecting the user interface.

Chapter 1. Obtaining and Installing the Configuration Program

This chapter describes the minimum requirements to run the IBM Nways Access Integration Services, Multiprotocol Access Services, Multiprotocol Routing Services, Multiprotocol Switched Services, and Multiprotocol Switched Services Clients configuration program and the procedure for getting and installing it. It consists of the following sections:

- “Obtaining the Configuration Program Electronically” on page 2
- “Product Installation and Starting Information Tables” on page 2
- “Installing the Configuration Program” on page 4

Important: Before proceeding, see the README file for the latest information about requirements and any changes to installation procedures.

Hardware and Software Requirements for the Configuration Program

Table 1 lists the minimum configuration program requirements.

Table 1. Configuration Program Requirements for Supported Operating Systems

Requirement	IBM AIX	IBM Operating System/2	Microsoft Windows 95 or Windows NT
Workstation	RS/6000 Model 250/410 or higher with minimum 80-Mhz CPU	IBM-compatible PC with Intel Pentium 166-MHz or higher processor (see Note 2 on page 2)	IBM-compatible PC with Intel Pentium 166-MHz or higher processor (see Note 2 on page 2)
RAM (minimum)	64 MB	48 MB	48 MB
CD-ROM	yes	yes	yes
Free Disk Space	40 MB Additionally, you need 1 to 3 MB for each configuration file.	33 MB Additionally, you need 1 to 3 MB for each configuration file.	37 MB Additionally, you need 1 to 3 MB for each configuration file.
Swapper Size	N/A	10 MB	N/A
Display (minimum)	Graphics (1024 x 768 x 256 colors)	SVGA (1024 x 768 x 256 colors)	SVGA (1024 x 768 x 256 colors)
Mouse	3-button	2-button (see Note 3 on page 2)	2-button (see Note 3 on page 2)
Software	AIX for RS/6000 V4.1.5 or higher AIXWindows Environment/6000	OS/2 3.0 or higher IBM TCP/IP 1.2.1 for OS/2 or higher	Microsoft Windows 95 or Windows NT

Notes:

1. For AIX, the AIX Common Desktop environment (X11.dt) is required to access Help.

2. More memory and faster processors improve the program's performance.
3. Functionally equivalent to a 3-button mouse.
4. You must make sure that TCP/IP is *installed* and *running* before using the "Single Send or Retrieve" or "Multiple Send or Retrieve" functions. On MS Windows platforms, the configuration program will hang if TCP/IP is not installed and running.

The AIX version of the conversion program requires special fonts. For this program to run correctly, you must have `/usr/lib/X11/fonts/75dpi/` in your list of directories. If you do not have this directory in your Xstation Font Path, at your Xstation, enter:

```
xset fp+ /usr/lib/X11/fonts/75dpi/
```

This command adds the conversion program font directory to your Xstation Font Path. Place the above line in your `.profile` for future use.

Note: The 2212 Access Utility does not use the conversion program.

Obtaining the Configuration Program Electronically

You can obtain the configuration program from the IBM Networking Technical Support Home Page. Follow this procedure to download the configuration program:

1. Access the IBM Networking page at:
`http://www.networking.ibm.com`
2. Select **Support** from the **Fast-Path Site-Links** menu to access the Technical Support page.
3. Select the product from the **Downloads** menu.
4. Select the desired code level for the configuration program that you want to download. On the next panel, in the **Files in this Package** box at the bottom of the panel, download the file you want into a temporary directory. (Consult the README file to determine which version of the configuration program and which file you need, and ensure that you have enough space on the hard drive.)
5. To install the configuration program, continue at "Installing the Configuration Program" on page 4.

Product Installation and Starting Information Tables

The configuration program supports multiple software products on multiple platforms, each with their unique program names, executable file names, version and release numbers, and so forth. The following tables list the product-specific information that you will need when you install or start the configuration program.

For example, if you want to use the Multiprotocol Routing Services version of the program on the AIX platform, download the file shown in the *aixname* column of Table 2 (*mrsaix.lpp*) from the IBM Networking page and follow the instructions at "Installing on AIX" on page 4.

When you are ready to start the program, you need to change to the directory shown in the *aixpath* column of the same table and follow the instructions at "Starting the Configuration Program on AIX" on page 7.

Table 2. AIX Product Information

Product Name	aixpath	aixname
Access Integration Services Version 3.4	/usr/lpp/aisv34	aisaix.lpp

Table 2. AIX Product Information (continued)

Product Name	aixpath	aixname
Multiprotocol Access Services Version 3.4	/usr/lpp/masv34	masaix.lpp
Multiprotocol Routing Services Version 3.4	/usr/lpp/mrsv34	mrsaix.lpp
Multiprotocol Switched Services Version 1 Release 2.2	/usr/lpp/mssv1r22	mssv1r22
MSS Family Clients Version 1 Release 2.2	/usr/lpp/mssv1r22	mssc1r22

Table 3 lists Windows-specific information. Use it if you want to use the program on the Windows platform.

Table 3. Windows Product Information

Product Name	winfolder	winprogram	winname
Access Integration Services Version 3.4	AISV3.4	AISV3.4	aiswin.exe
Multiprotocol Access Services Version 3.4	MASV3.4	MASV3.4	maswin.exe
Multiprotocol Routing Services Version 3.4	MRSV3.4	MRSV3.4	mrswin.exe
Multiprotocol Switched Services Version 1 Release 2.2	Mssv1r2.2	MSSV1R2.2	MSSV1R22.exe
MSS Family Clients Version 1 Release 2.2	Mssc1r2.2	MSSCV1R2.2	MSSCV1R22.exe

Table 4 lists OS/2-specific information. Use it if you want to use the program on the OS/2 platform.

Table 4. OS/2 Product Information

Product Name	os2folder	os2program	os2name
Access Integration Services Version 3.4	AIS V3.4 Config Programs	AIS V3.4 Config Program	aisos2.cmd
Multiprotocol Routing Services Version 3.4	MAS V3.4 Config Programs	MAS V3.4 Config Program	masos2.cmd
Multiprotocol Access Services Version 3.4	MRS V3.4 Config Programs	MRS V3.4 Config Program	mrsos2.cmd
Multiprotocol Switched Services Version 1 Release 2.2	MSS V1 R2.2 Config Programs	MSS V1 R2.2 Config Program	os2inst.cmd
MSS Family Clients Version 1 Release 2.2	MSSC V1 R2.2 Config Programs	MSSC V1 R2.2 Config Program	os2inst.cmd

Installing the Configuration Program

Once you have either obtained the appropriate CD-ROM or downloaded the appropriate file from the IBM Networking home page, the procedure for installing the configuration program depends on the operating system under which the program will run. “Installing on AIX”, “Installing on Windows” on page 5, and “Installing on OS/2” on page 5 describe the steps you take to install the configuration program based on your operating system.

Before installing the configuration program, make sure that you have write access to the directory in which you are installing it. The installation process writes program files to the directory during installation and the configuration program writes information to the directory while it is running. See the appropriate README file for more detailed information.

Installing on AIX

1. Ensure that you are logged on as the “root” user. (The **whoami** command will show root at the command prompt.) If not, enter **su root**.
2. If you are installing from the CD-ROM, create directory **/cdrom** if it does not exist, insert the appropriate configuration program CD-ROM into the CD-ROM drive, and mount the CD-ROM:

```
mount -v cdrfs -r ' ' /dev/cd0 /cdrom
```

3. Change to the directory where the INSTALLP file (*aixname*—see Table 2 on page 2 for the specific name) is located. On the CD-ROM it will be in the **/cdrom/config/aix** directory. If you downloaded the *aixname* file from the IBM Networking home page, change to the directory where the file exists.
4. Run SMIT and do either the AIX 4.1.5 or the AIX 4.2 procedure as follows:

AIX 4.1.5 Procedure:

- a. Select **Software Installation and Maintenance**.
- b. Select **Install and Update Software**.
- c. Select **Install/Update Selectable Software (Custom Install)**.
- d. Select **Install Software Products at Latest Level**.
- e. Select **Install New Software Products at Latest Level**.

AIX 4.2 Procedure:

- a. Select **Software Installation and Maintenance**.
 - b. Select **Install and Update Software**.
 - c. Select **Install and Update from Latest Available Software**.
 - d. Select **Input device/directory for software..**
- a. Enter the fully qualified file name of the INSTALLP file (*aixname*—see Table 2 on page 2 for the specific name) from the CD-ROM **/cdrom/config/aix** directory.
 - b. Press **PF4** to list the software and select the installation program.
 - c. Select **OK**.
 - d. Select **OK**.
 - e. Select **Done**.
 - f. Select **Cancel**.
5. If installing from the CD-ROM, unmount the CD-ROM:

```
umount /cdrom
```
 6. Enter **exit** to end the root user session.

Installing on Windows

1. If installing from the CD-ROM, insert the appropriate CD-ROM into the CD-ROM drive. If autoread is on, the installation program starts and displays an installation dialog. Otherwise, change to the **/config/win** directory and run setup on the CD-ROM.
2. If installing after downloading the Windows installation file from the IBM Networking page, change to the directory into which the file was downloaded and run the *winname* program (see Table 3 on page 3 for the specific name) to install the product.

Installing on OS/2

1. Open an OS/2 command window.
2. If installing from the CD-ROM, change to the **/config** directory on the CD-ROM.
3. If installing after downloading the OS/2 installation command from the IBM Networking page, change to the directory into which the file was downloaded.
4. Enter **os2name** (see Table 3 on page 3 for the specific name) and follow the prompts that display on the panel to complete the installation.

The program creates a folder that contains the Configuration Program icon. There will also be an icon for the README files in the folder.

Chapter 2. Starting the Configuration Program

This chapter describes the procedures for starting the configuration program and how to upgrade configuration files created by earlier versions of the program. It consists of the following sections:

- “Starting the Configuration Program on AIX”
- “Starting the Configuration Program with AIX NetView/6000”
- “Starting the Configuration Program on Windows” on page 8
- “Starting the Configuration Program on OS/2” on page 8
- “After the Configuration Program Starts” on page 8
- “Upgrading/Migrating Previous-Level Configuration Files” on page 8

Starting the Configuration Program on AIX

Before starting the configuration program, X-Windows and the common desktop environment must be running on the workstation.

To start the configuration program:

1. Change directories to the directory that contains the configuration program, for example:
`cd /usr/lpp/aixpath` (see Table 2 on page 2 for the specific path)
2. Enter **config &** to start the program in the background.

Starting the Configuration Program with AIX NetView/6000

If you have NetView/6000 you can start the configuration program directly from the menu bar. If the network contains routers of different types (for example, 2210 and 6611) or configuration programs of different versions and releases, you can start any configuration program installed on the machine directly from the menu bar.

To use multiple configuration programs, make sure that each configuration program is in a separate subdirectory from the other configuration programs and NetView/6000.

For each configuration program that you want to start from the menu bar:

1. Create a file in the `/usr/OV/registration/C` subdirectory that contains the code for the menu bar selection item.
2. Change the command statement in the file to point to the path of the desired configuration program.
3. Save the file with a name that indicates the type, version, and release of the configuration program you are starting.

Figure 1 on page 8 is an example of the code contained in a file named `MRSV34` that points to the configuration program in directory `/usr/lpp/mrsv34`. The `_C` in the line under MenuBar "Tools" represent the accelerator character for the menu item—the underscored character in the Navigation Window menu bar's `C`onfigure option. This character must be in the character string directly to the left of the action, and cannot be duplicated in another menu item.

```

/*
** Global Tools
*/
Application "2210 MRS Configuration V3.4"
  Description {
    "2210 MRS Configuration V3.4"
  }
/*
** Tools
*/
MenuBar "Tools"
{
  "2210 MRS Config Tool V3.4" _C f.action "cfgtool";
}
Action "cfgtool"
{
  Command "/usr/lpp/mrsv34/config";
}
}

```

Figure 1. Netview/6000 Menu File MRSV34

For more information, such as how to create a sub-menu that contains all of the configuration program menu items, refer to the *IBM AIX SystemView NetView/6000 V2R1 Programmer's Guide*, SC31-7022.

Starting the Configuration Program on Windows

To start the configuration program under Windows, select:

Start | **Programs** | *winfolder* | *winprogram*

(See Table 3 on page 3 for the specific folder name and program name.)

Starting the Configuration Program on OS/2

To start the configuration program under OS/2:

1. Locate and open the configuration program *os2folder* folder (see Table 4 on page 3 for the specific name).
2. Double-click the configuration program *os2program* icon (see Table 4 on page 3 for the specific name) to start the program. The title window for the configuration program displays.

After the Configuration Program Starts

When the program starts, it uses the options defined in the **cfg.ini** file. If the file does not exist in the configuration program's directory, the configuration program uses default options and creates a new **cfg.ini** file. To change the options, select **Options** from the configuration program menu bar. See "Changing the Configuration Program Options" on page 15 for the options that you can change.

Upgrading/Migrating Previous-Level Configuration Files

This version of the configuration program cannot use configuration database files with **.cdb** file extensions (created by earlier versions of the configuration program). You must upgrade to the new version format (**.csf** file extension). If the only copy of the existing configuration is in the router or is in a binary format (**.cfg**) file, before starting the migration process you must use the version of the configuration

program that created the existing configuration to create configuration database (.cdb) files, as described at “Creating a Configuration Database File or a Configuration Storage File”, and then convert the files to .csf format as described at “Converting Configuration Database Files to Configuration Storage Format Files”.

If your configuration database files were created by an earlier version of the configuration program, but already have .csf file extensions, go to “Converting a CSF-Format Configuration File to the Latest Release” on page 11

Creating a Configuration Database File or a Configuration Storage File

To create a configuration database file using a previous version of the configuration program:

1. Start the previous version of the configuration program.
2. Select **Configure | Read router configuration** to read the existing configuration into the configuration program.
Another way to read an existing configuration into the program is to select **Configure | Communications | Single | Retrieve**.
3. Select either **Configure | Save configuration** or **Save configuration as**.
4. Save the configuration into a file with a .cdb file extension (older format) or with a .csf file extension (newer format).
5. Continue at “Converting Configuration Database Files to Configuration Storage Format Files” to convert the configuration contained in the .cdb file into a .csf file.

Converting Configuration Database Files to Configuration Storage Format Files

All configuration database files (.cdb) from prior versions of the configuration program must be converted to the configuration storage format (.csf). You can use the configuration program to do this. It provides a dialog in which you specify which configuration database files you want to convert. Follow these steps to use the conversion program:

1. Start the Conversion Program.

AIX

- a. Change to the directory that contains the configuration program (*/usr/lpp/aixpath*) - see Table 2 on page 2 for the specific pathname).
- b. Enter **converter**.

Note: See “Hardware and Software Requirements for the Configuration Program” on page 1 for AIX font requirements for the conversion program.

Windows 95 or Windows NT

Select:

Start | Programs | winfolder | Conversion tool

(See Table 3 on page 3 for the specific folder name.)

OS/2

- a. Locate and open the configuration program folder (*os2folder* - see Table 4 on page 3 for the specific folder name).

- b. Double-click the conversion program icon (**Converter Program**) to start the conversion program.
2. Enter the directory that contains the database file into the *Directory containing CDB/TLV* field.
3. Use the radio buttons to specify whether you want to convert all configurations in the configuration database or only selected configurations. If you are converting only selected configurations, continue with step 4, otherwise go to step 5.
4. Select the configurations you want to convert from the *Convert Configs* list.
5. Specify the directory that will contain the new configuration files (.csf format).
6. Select **Convert!**. The program then converts the specified configurations into separate configuration files in the Configuration Storage Directory (CSD).
7. Follow the procedure at “Converting a CSF-Format Configuration File to the Latest Release” on page 11 to upgrade these new .csf files for compatibility with the latest release of the configuration program.

Converting the ELAN Type Link Value File to MSS V1 R2.2 from an Earlier Release

The ELAN Type Link Value Definition File (cfg.tlv) contains any user changes to the standard TLV definitions. This file only needs to be migrated if the standard definitions were changed in an earlier release. You can use the conversion program to do this. It provides a dialog in which you specify the ELAN Type Link Value Definition (cfg.tlv) that you want to convert. Do the following steps to use the conversion program:

1. Locate the ELAN Type Link Value Definition File (cfg.tlv) for the release from which you are migrating. This file is in the program installation directory.
2. Start the conversion program.

AIX

- a. Change to the directory that contains the configuration program (/usr/lpp/aixpath) - see Table 2 on page 2 for the specific pathname).
- b. Enter **converter**.

Note: See “Hardware and Software Requirements for the Configuration Program” on page 1 for AIX font requirements for the conversion program.

Windows 95 or Windows NT

Select:

Start | Programs | winfolder | Conversion tool

(See Table 3 on page 3 for the specific folder name.)

OS/2

- a. Locate and open the configuration program folder (*os2folder* - see Table 4 on page 3 for the specific folder name).
 - b. Double-click the conversion program icon (**Converter Program**) to start the conversion program.
3. Enter the directory that contains the TLV file into the *Directory containing CDB/TLV* field.
4. Select the TLV file that you want to convert using the *Convert Configs* list.
5. Specify the directory that will contain the new TLV file. This directory must be the current release program installation directory.
6. Select **Convert!**. The program then converts the specified TLV file.

7. Follow the procedure at “Converting a CSF-Format Configuration File to the Latest Release” to upgrade these new **.csf** files for compatibility with the latest release of the configuration program.

Converting a CSF-Format Configuration File to the Latest Release

To convert a configuration file that is already in **.csf** format for use by the current configuration program:

1. Start the latest version of the configuration program.
2. Select **Configure | Open configuration**. Select the configuration from the *Available Configurations* list.
3. Select **Open**. The configuration program asks if you want to upgrade the configuration to the current version.
4. Select **Configure | Save configuration as** to save the configuration to a new file with a new name. Saving the configuration with a new name allows you to keep a copy of the existing configuration file for possible future use.

Chapter 3. Using the Configuration Program

This chapter describes the configuration program's navigation features, explains how to use the configuration program, and helps you to diagnose problems. It consists of the following sections:

- "Before Using the Configuration Program"
- "Understanding the Navigation and Configuration Windows"
- "Navigating Through the Configuration Program" on page 17
- "Using the Configure Menu" on page 20
- "Establishing Communications Between the Configuration Program and a Router" on page 21
- "Using the Command Line Facility" on page 24
- "Creating and Using ASCII Files" on page 32
- "Diagnosing Configuration Program Problems" on page 41
- "Removing the Configuration Program" on page 42

Before Using the Configuration Program

Before using the configuration program to create configurations for your router, please read the README file that is contained in the directory in which the configuration program is installed or on the CD-ROM. The README file contains the most current directions for using the configuration program.

Important: The configuration program that you use must match the software that resides on the Nways device that you are configuring. Ensure that you have the latest software level by comparing the software you received with the files available at the web sites named in "Obtaining the Configuration Program Electronically" on page 2.

Understanding the Navigation and Configuration Windows

When you first start the configuration program, it displays three windows:

- The Copyright Notice window
- The Navigation window
- The Configuration window

Select **OK** in the copyright notice window to close the window. The program displays two windows similar to those shown in Figure 2 on page 14 and Figure 4 on page 17.

The window on the left is the *Navigation Window* and the window on the right is the *Configuration Window*.

Configure the router by selecting items in the Navigation Window and then providing the details for each selected item in the related Configuration Window. When you have finished entering the details for an item, select a new item to configure from the Navigation Window. "Setting Up the Router" on page 21 shows the typical steps to configure a new router or to change an existing configuration. "Setting Up the Configuration Program" on page 22 shows the typical steps for setting up the configuration program to communicate with a router.

Using the Navigation Window

The Navigation Window is shown in Figure 2. It contains:

- A title bar
- A menu bar
- A configuration description area
- A scrollable list of folders (indicated by folder icons), which contain features and protocols that you can configure. The folders and their contents are arranged logically so that you perform configuration activities by starting at the top of the window and working toward the bottom.

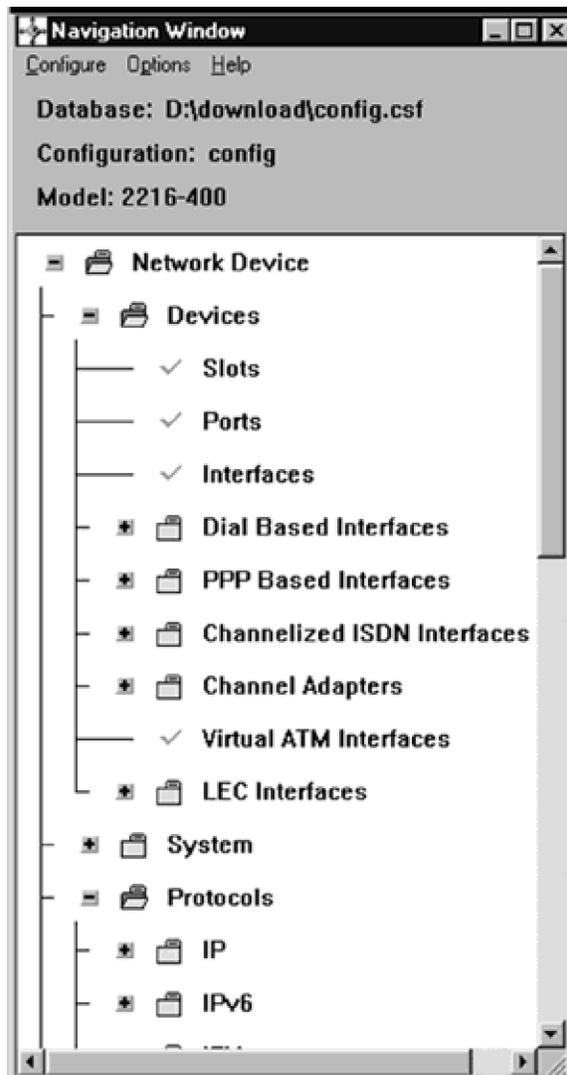


Figure 2. The Initial Navigation Window

If you select any item in the Navigation Window and Guided Configuration is active (the default setting), the program displays appropriate configuration assistance information as you select new items. See "Using Guided Configuration" on page 16 for further information.

If an error occurs or you have not supplied required information in the current configuration, a question mark (?) appears next to the related item. If the

configuration information is correct, a check mark (✓) appears next to the item. For an example of these indicators, see Figure 3 on page 16.

The Navigation Window's menu bar contains the following options:

- Configure
- Options
- Help

The area below the menu bar is the configuration description area. It displays the following information:

- The path and name that contains the configuration. The default path is the directory in which you installed the configuration program, and the default filename is **config.csf**.
- The filename of the current configuration (the default is **config**)
- The router model and, if applicable, adapter type you are configuring (the default is set in the Options menu)

In the Navigation Window, you may display a folder's contents either by clicking the plus (+) icon next to the folder or by double-clicking the folder itself. You may also choose an action to perform by selecting a folder and then pressing mouse button 2 (middle mouse button, right mouse button on a 2-button mouse) on the folder. This displays a pop-up menu that allows you to:

- Fully expand the items in the Navigation Window.
- Expand the items in a folder.
- Display a history menu of configuration items you have selected. From the history menu you can access any of the previously selected configuration items. For OS/2, Windows NT, and AIX, press and hold mouse button 2 (middle mouse button, right mouse button on a 2-button mouse) until you select the item from the submenu displayed by the history menu item. (You do not have to hold mouse button 2 for Windows 95.) You can invoke the history menu from any item just as you would the pop-up menu.
- Validate a selection item in error. The Navigation Window indicates erroneous items by displaying a large yellow question mark next to the item. The validate function displays messages for any configuration errors or required fields that do not have correct values based on the item selected. Using the validate function on a folder displays validation messages for all of the items within that folder.
If you correct an error or fill in a required field and then leave the panel that contained the error, the program removes the question mark.

Changing the Configuration Program Options

Use the Options menu to change:

- Guided configuration
- Colors
- Default model
- Default adapter
- Message prompting
- ATM address format

Notes:

1. The Multiprotocol Access Services, Multiprotocol Switched Services, and Multiprotocol Switched Services Clients versions of the configuration program do not contain the Default Adapter option.
2. The Access Integration Services version of the configuration program does not contain the ATM Address Format or Default Adapter options.

Using Guided Configuration

The configuration program contains a guided configuration facility to help you configure a device's features and protocols. Guided configuration consists of elementary procedures that step you through the configuration activity for a feature or protocol. Continuous guided configuration assistance is active by default. To toggle it off or on, display the Navigation window and select Guided configuration from the Options menu. If it is turned off and you want to view guided configuration text in a help window without making it active continuously, press **F1**.

Notes:

1. There may be multiple ways to configure a feature or protocol. Guided configuration is the recommended procedure.
2. Guided configuration does not keep track of where you are in a procedure. If you follow a link to other help information from within a procedure, then when you return to the procedure the help window displays information for the beginning of that procedure.

Using the Configuration Window

To display the Configuration Window, select an item in the Navigation Window (shown in Figure 3).

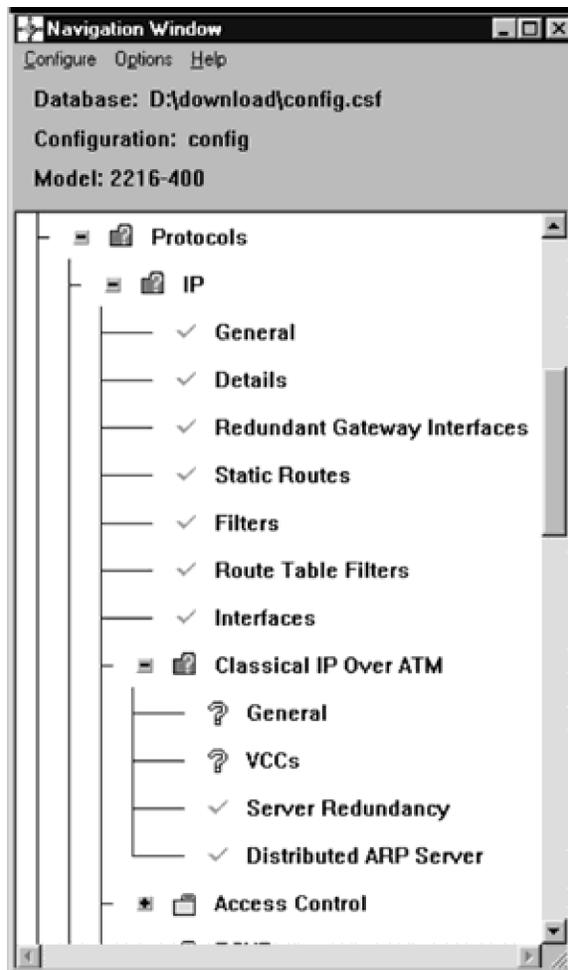


Figure 3. Typical Navigation Window

The program displays related configuration information in the Configuration Window (shown in Figure 4) with the name of the selected item on its title bar. It can have the appearance of a single page of configurable items or of a notebook with several pages of configurable items. The contents and format of the Configuration Window depend upon the item selected in the Navigation Window.

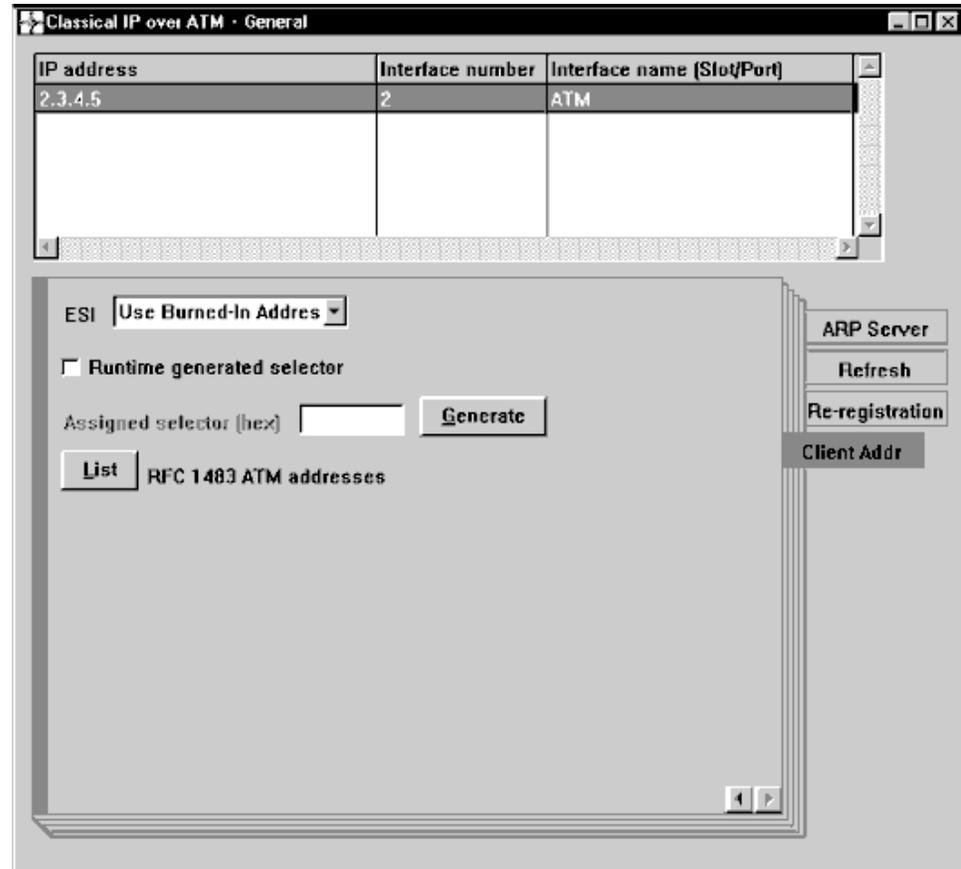


Figure 4. The Configuration Window

To validate information that you have entered on a notebook page, right-click the page. The program examines the fields and if it detects an error, it issues an error message. If, at any time, the program detects a problem with a required field, it highlights that page's tab in color (as indicated by the *Client Addr* tab in Figure 4). Additionally, you can validate a configuration at any time by right-clicking in the Navigation Window and then selecting the *Validate* option from the pop-up menu. The program displays a list of any errors that exist, which you can correct through the normal process of selecting items in the Navigation Window and entering new information in the Configuration Window.

Navigating Through the Configuration Program

The configuration program features a point-and-click interface. You select items from the Navigation Window and then fill in fields in the related pages in the Configuration Window. The items in the Navigation Window are arranged generally in logical top-to-bottom order so that you move down the list as you progress through the configuration tasks, and in left-to-right order as you specify detailed information. The configuration program provides *key combinations* to minimize the

number of keystrokes needed to do tasks. To display field-specific help information for panels in the Configuration Window, select the field and then press **F1**.

Using the Mouse

The mouse is the primary means for moving through the various windows in the configuration program.

The configuration program supports the following buttons on a 3-button mouse. (The left and middle buttons on a 3-button mouse are mapped to the left and right mouse buttons on a 2-button mouse.)

- Left (button 1) - to select an item in a panel
 - Middle (button 2) - to perform the following actions:
 - In the Navigation Window
 - Display a pop-up menu for a selected item in the scrollable display.
 - Move through and select items in a menu.
 - Validate a selection item in error. The Navigation Window indicates erroneous items with a yellow question mark next to the item. The validate function displays a message for each required field that does not have a valid value and for any configuration errors.
 - In the Configuration Window
 - Drag-and-drop items. The program indicates that drag-and-drop is active by changing the cursor into a hand icon. Use this function to reorder filters, dump entries, and other configuration lists. For example, you can drag and drop items in a list of IP addresses to reorder them and establish a new default gateway.
 - Right (button 3) is not used currently
- Note:** Some lists do not allow you to reorder items in them.
- Validate the data you have entered on a page.

Using the Keyboard

Some keys and key-combinations have specific functions. Table 5 on page 19 shows the key assignments.

Table 5. Keyboard Functions

Keys	Function	How to Use
F1 (Help)	Request help (see note).	<p>To obtain help for configuring a feature or protocol:</p> <p>See “Using Guided Configuration” on page 16.</p> <p>To get help on a panel:</p> <ol style="list-style-type: none"> 1. Select an item in the Navigation Window, then press F1. <p>To get help for a parameter, a button, or a drop-down list:</p> <ol style="list-style-type: none"> 1. Select the parameter field or button by tabbing to the field, button, or list, then press F1. <p>Note: If you tab to a field or button, a colored box highlights the item and you can then request help. Clicking a button causes the program to do the task indicated by the button or list.</p> <p>In the help text, additional information is hypertext-linked to the information on a particular panel. By default, this link is highlighted in blue.</p> <p>If you press F1 on a panel or a parameter without closing a previously opened help window, the new help text overlays the currently displayed text.</p>
Up/Down Arrow Keys	Move vertically.	Use these keys to move through lists on any panel, including the Navigation Window or items in any of its menu bar selection menus. To select an item, press the Space bar.
Left/Right Arrow Keys	Move Horizontally	Use these keys to move through both menu items (after you have selected one) and their drop-down lists in the Navigation Window. Also use them to move through parameter fields in the Configuration Window without affecting the existing values. To select an item, press the Space bar.
Tab and Back-tab	Next or previous entry field.	These keys work only in the Configuration Window. The keys move you to the various entry items in the Configuration Windows. If there are items in a scrollable list, such as in the Device Interfaces panel, you will move to items that are below the scrolling window.
Alt+C	Configure menu	Displays the Configure menu so you can select items from it.
Alt+P	Options menu	Displays the Options menu so you can select items from it.
Alt+H	Help menu	Displays the Help menu so you can select items from it.
Esc	Escape	Clears the menus.

Selecting Multiple Items in a List

If the configuration program displays a selection list, you can pick multiple items from those lists. The method for selecting items depends on whether you want to start at one point and end at another point or just choose items at random from the list.

To select multiple individual items:

Press and hold the **Ctrl** key, point to each item, and then press mouse button 1.

To select a range of items:

Select the first item in the range. Press and hold the **Shift** key. Select the last item in the range and then press mouse button 1.

To deselect items:

Press and hold the **Ctrl** key, point to the item you want to deselect and press mouse button 1. If you do not hold the **Ctrl** key, you will deselect all previously selected items except the item just selected.

Using the Configure Menu

The Navigation Window's Configure menu enables you to access the configuration program's features. The following list describes the menu choices and their usage. The underscored character and the text in parentheses indicate the key combination (shortcut) for the choice.

New configuration

Reset the working configuration to the default configuration for a specific model. The program resets the Navigation Window with a list appropriate for the selected model.

Change Model

Resets the configuration program to support the software for a different router model.

Note: This menu item is supported only for Multiprotocol Routing Services.

Change to High Perf Sys Card

Change the configuration of Access Integration Services models 1xx-1U and 4xx-2U to use the Release 2 High Performance System card.

Note: If you change to the Release 2 High Performance System card, you **must** select the *change to high performance card* option from the Configure menu and save the resulting configuration or your configuration will be unusable.

Open configuration (Alt+O)

Update an existing configuration or use an existing configuration as a basis for a new configuration.

Save configuration (Alt+S)

Save the current configuration into a configuration storage file (.csf). The physical file name under which the configuration is to be saved is an 8.3 version of the configuration name with any invalid file name characters replaced with underscores, and the file extension .csf.

Save configuration as

Save the current configuration (with a different configuration name) into a configuration storage file (.csf). The physical file name under which the configuration is to be saved is an 8.3 version of the new configuration name with any invalid file name characters replaced with underscores, and the file extension .csf.

Delete configuration

Remove a configuration. **Note:** The configuration name may not correspond to the .csf file name. It is recommended that you use the configuration program to delete configurations.

Create router configuration

Create a binary configuration file (.cfg) that you load into your router.

Read router configuration

Read a binary configuration file created by the “Create router configuration” option or obtained from the router using TFTP.

Communications

- Send or retrieve a configuration to or from a single router, restart a single router, or query a single router’s information.
- Send or retrieve configurations to or from multiple routers or restart multiple routers.

Note: Before using the communication features, you must establish communications between the configuration program and the router. See “Establishing Communications Between the Configuration Program and a Router” for details.

ASCII file

Create an ASCII version of a configuration. You can use this file as documentation of a device’s configuration.

You can also read in an existing ASCII configuration file to load into a device.

Exit (Alt+X)

Leave the configuration program.

Establishing Communications Between the Configuration Program and a Router

You must set up both the configuration program and the router before they can communicate with one another.

If you already have a configuration loaded into the router, you need perform only the steps described in “Setting Up the Configuration Program” on page 22; otherwise you must perform the steps in both “Setting Up the Router” and “Setting Up the Configuration Program” on page 22.

Setting Up the Router

This procedure describes how to set up the router to communicate with the configuration program. Any of the following conditions may result in the router not having a configuration loaded:

- You have a new router with no configuration
- You cleared the router’s configuration
- The router encountered a problem that cleared the configuration

If any of these conditions exist, you must do the following steps to set up the router and then do the steps at “Setting Up the Configuration Program” before you can send an existing configuration to it.

1. Establish access to the router. You can do this either locally through an ASCII terminal or remotely using Telnet, as described in your device’s setup guide. To use Telnet, you must at least configure the IP address for the device by doing the following steps.
2. Access quick configuration. For the 2210, if the router is in EZSTART mode, enter **stop** to access QCONFIG. For other devices, if the device is in Config Only> mode, enter the **qc** command to access quick configuration. See the device’s setup guide for more information about quick configuration.
3. Establish the IP address and IP mask for the primary interface for the router, using the following procedure.

Note: Steps 3a and 3b apply only to the 2210.

- a. Reply **yes** to the Configure Interfaces question.
 - b. Supply the interface information that is required for the LAN interface that will communicate with the configuration program.
 - c. Reply **no** to the Configure Bridging question.
 - d. Reply **yes** to the Configure Protocols question.
 - e. Reply **yes** to the Configure IP question.
 - f. Reply **yes** to the Configure IP on this interface question for the LAN interface that will communicate with the configuration program.
 - g. Enter the IP address at the IP Address prompt.
 - h. Enter the IP mask at the Address Mask prompt.
 - i. Reply **no** to the Configure IP on this interface question for the other router interfaces.
 - j. Reply **no** to the Enable Dynamic Routing question.
 - k. Reply **yes** to the Define community with Read_Write_Trap Access question. Enter the SNMP community name that will have Read_Write_Trap access.
 - l. Reply **yes** to the Save this configuration question.
4. Restart or reload the router.

When the router completes the restart sequence, it will be able to communicate with the configuration program.

Setting Up the Configuration Program

Note: This procedure assumes that you have already configured the IP address and the SNMP community and loaded them in the router, according to the steps at “Setting Up the Router” on page 21. If that is true, you can use the retrieve function under Communications, Single, to retrieve the information from the router.

This procedure describes how to set up the configuration program to communicate with the router. To do that:

1. Select the appropriate model from the New Configuration menu.
2. Select **Interfaces** in the IP folder.
3. In the Configuration Window:
 - a. Select **IP Addresses** next to the LAN interface with which the configuration program will communicate.

- b. Enter the *IP address* and *Subnet Mask* for this interface.

Note: These addresses must match the addresses that are configured on the router's interface.

- c. Select **Add**
4. Select **Communities** under the SNMP folder in the Navigation Window.
5. In the Configuration Window:
 - a. Enter the name of the SNMP community in the Name field on the General page. Use the SNMP community defined in step 3k on page 22 at "Setting Up the Router" on page 21.
 - b. Select **Read-write trap** in the drop-down list under Access type.
 - c. Select **Add**

Note: The name and the access type must match the name and access type that is configured on the router with which the configuration program will communicate.

The configuration program can now communicate with the router and perform functions such as *Send configuration*, *Retrieve configuration*, or *Query router information*.

Note: Unless the version of the configuration program and the software loaded on the router are the same, the retrieve function may fail. Use the procedure described in "Upgrading/Migrating Previous-Level Configuration Files" on page 8 to migrate the configuration from the previous version.

Configuring a New Router

To configure a router using the configuration program:

1. Select **Configure** from the Navigation Window.
2. Select the model you wish to configure from the **New configuration** submenu.
3. Select **Adapter Interfaces** from the Devices folder and configure any adapters for the router in their appropriate slots.

Notes:

- a. A Ports panel exists in the AIS, MAS, and MRS versions of the configuration program. This panel does not exist for the MSS or MSSC versions.
- b. The MRS version of the configuration program displays the physical ports first followed by the virtual ports.
In the AIS, MAS, MRS, MSS, and MSSC versions, the virtual ports can be intermingled with the physical ports.
- c. The Interfaces panel displays the interfaces sorted by slot and then port.
4. Select **Interfaces** from the Devices folder and configure the interfaces for the router.
5. Expand the General folder under the Devices folder, if it is not already expanded.
6. Select the items in the General folder and configure the parameters in each of those items.
7. Select the items in the System folder and configure the parameters in each of those items.
8. Select and configure the remaining folders as necessary.

Changing an Existing Configuration

Note: While using the configuration program to change an existing configuration, make sure that no one is updating the configuration with the router command line interface. Any configuration data entered from the command line is lost if you send the configuration to the router from the configuration program.

To change an existing configuration:

1. Open the configuration.
2. Use the configuration program to change the parameters you need to change.
3. Save the configuration.
4. Send the configuration to the router using the **Communications** menu.

Using the Command Line Facility

The Command Line facility enables you to automate configuration program operations. You can use the **config** command to enter a complete set of commands into an argument file named `cfgargs`, which the configuration program uses to direct its operation, or you can use it to enter commands on the command line. (See Figure 5 for an example of a `cfgargs` file.) To use only the **config** command, without displaying the GUI interface, the last command in the file or on the command line must be **-exit**. If you do not meet this requirement, the program displays the GUI interface's Navigation and Configuration windows. In AIX you can use the **headless** command, which processes commands without invoking the GUI tool. This enables you to use the command line facility on machines without a graphical display.

Note: You can use the **config** command only in a windowed operating system. You can use the **headless** command in an AIX environment with or without a windowed operating system

CFGARGS File Example

If you enter the **config** command, the program looks for a file named `cfgargs`. Figure 5 shows the contents of a `cfgargs` file that:

- Opens a modified ASCII configuration file.
- Sends the open configuration to a router.
- Causes the current configuration to become the active configuration by rebooting the router immediately.
- Saves the current configuration into a configuration storage file.

```
-displayMessages off 1
-storeMessages on cfgMessages.log 2
-asciiRead routerOne.acf withoutLogging 3
  -send 1.1.1.1 private 4
  -reboot 1.1.1.1 private 5
  -save * routerTwo 6
-exit
```

Figure 5. Example of CFGARGS File Contents

1. Turns off message display. If any message offers a choice, takes the default choice.
2. Logs all messages to the specified log file.
3. Opens the specified ASCII file.

4. Sends the configuration to a router.
5. Causes the configuration to become the active configuration by rebooting the router immediately.
6. Stores the configuration into the directory that was specified by the previous **save** command, using the specified configuration name, `routerTwo`.

Specifying the Config and Headless Commands

You may enter the **config** or the **headless** (AIX only) command with or without additional commands and their arguments.

config | headless

Causes the program to search for a `cfgargs` file in the configuration program directory and, if the file exists, performs the commands in it. When the program finishes processing the commands, it ends *and deletes the file*. If a `cfgargs` file does not exist, the program waits for additional commands on the command line.

Note: To facilitate making future configuration changes, you may want to prevent automatic deletion of the `cfgargs` file. You can do this by using a text editor to open the `cfgargs` file and keeping it open while the configuration program processes the commands in it. As an alternative, you may want to save a copy of the file under a different name.

config -command [args] [...]

If you specify additional commands and arguments on the command line, the program processes them. Each command must start with a minus sign (-) and be followed by as many additional arguments as needed.

headless -command [args] [...]

If you specify additional commands and arguments on the command line, the program processes them. Each command must start with a minus sign (-) and be followed by as many additional arguments as needed (AIX only).

If an argument, *args*, contains embedded blanks, you must enclose the argument in double quotes (" ").

Note: If you plan to enter commands on the command line, you must ensure that a `cfgargs` file does not already exist in the configuration program directory. This is necessary because if one does exist, the program processes only the commands in it and ignores the commands you enter on the command line.

The following list describes the **config** and **headless** command-related commands and arguments.

Notes:

1. Commands and arguments must be separated from each other by either spaces, tabs, or new lines.
2. You can enter the commands in any case.
3. Any *filename* argument that does not contain the path before the physical file name uses the current directory as the path.

-asciiRead *filename* [**withoutLogging**]

filename Required argument. Specifies the name of an ASCII configuration file and reads it into the configuration program as the current configuration in memory. Note: For AIX, if the *filename* contains embedded blanks, you must enclose it in double quotes (" ").

withoutLogging

Optional argument. Specifies that validation errors should not be logged.

Notes:

1. The ASCII file comments are provided for information only and they are ignored when present in an ASCII file specified by an **-asciiRead** command.
2. By default, the configuration program writes validation errors to an ASCII file, which has the same name as the file you read, but with a **.vlg** extension.

-asciiWrite *filename* [**withComments**]

filename Required argument. Specifies the name of the ASCII configuration file and creates the file from the configuration program's current configuration in memory.

withComments

Optional argument. Indicates whether the output file should contain extra commentary describing the ASCII configuration file.

Note: The ASCII file comments written by this command are provided for information only and are ignored if they are present in an ASCII file specified by an **-asciiRead** command.

-commandsFrom *filename*

filename Required argument. Specifies the name of a file containing additional commands, and reads and processes those commands. The **-commandsFrom** command may be nested in a maximum of 10 files.

-createConfiguration *filename*

filename Required argument. Specifies the name of the file being created (in the binary format recognized by the router) from the program's current configuration in memory.

-displayMessages on | off

on	Enables the displaying of messages. Allows you to control the displaying of messages.
off	Disables the displaying of messages. If a message would have offered you a choice of actions, the program takes the default action.

Notes:

1. The **-displayMessages** command can appear anywhere on the command line, in a cfgargs file, or in any of the **-commandsFrom** files.
2. You may provide multiple **-displayMessages** commands, but the configuration program only honors the last one.

-exit Closes the configuration program's GUI windows and ends the program. If you specify multiple commands, **-exit** must always be the last one.

-exitOnError If an error occurs while processing the command line, ends the program without starting the GUI. The errors.log file or the file specified in the **-storeMessages** command identifies the source of the error.

-noLogo Suppresses displaying the configuration program's logo window during startup. Because the logo window requires you to select the OK button, specify this command to run the configuration program in non interactive mode. This command is not necessary when executing the **headless** command in AIX.

-open *directory config*

directory Required argument. Specifies the name of the directory containing the configuration you want to open.

config Required argument. Specifies the name of the configuration you want to open. The command stores the contents as the program's current configuration in memory. If the configuration name contains embedded blanks, you must enclose the name in double quotes (" ").

-queryinfo *host name | ip address community [timeout]*

host name | ip address

Required argument. Specifies either the name of the router, which the program can resolve into an IP

address, or the router's actual IP address. The command retrieves a configuration summary from the router. The program displays and logs the summary based on the setting of the **-displayMessages** and **-storeMessages** commands, respectively.

community Required argument. Specifies an SNMP community that is defined on the router with read access.

timeout Optional argument. Specifies the time (in seconds) before the SNMP request expires. The default value is 10.

-read

filename

filename Required argument. Specifies the name of the router configuration file to be read, and reads it into the program's current configuration. The file must be in the binary format recognized by the router, and the release level of the configuration must match the release level of the configuration program.

-reboot

host name | ip address community [timeout] [date] [time]

host name | ip address

Required argument. Specifies either the name of the router, which the program can resolve into an IP address, or the router's actual IP address. The command sends a restart request to the router at the specified date and time, based on the date and time of the workstation on which the program is running. The program calculates the number of seconds between the date and time the program processes the command and the date and time specified in the command arguments.

community Required argument. Specifies an SNMP community that is defined on the router with read access.

timeout Optional argument unless the date or time arguments are specified, in which case it is required. Specifies the length of time (in seconds) before the SNMP request expires. The default value is 10.

date Optional argument unless the time argument is specified, in which case it is required. Specifies the date on which the router is to reboot. The default is the current date. The format is *dd/mm/yyyy* where *dd* is the 2-digit day of the month, *mm* is the 2-digit

month of the year, and yyyy is the 4-digit year. You may enter the year as either two or four digits.

time Optional argument. Specifies the time at which the router will reboot. The default is the current time. The format for the time is HH:MM:SS (am or pm), or a time in 24-hour format, for example, 1800 (without the colons). The SS value, seconds, and am or pm fields are optional.

-retrieve *host name | ip address community [timeout]*

host name | ip address

Required argument. Specifies either the name of the router, which the program can resolve into an IP address, or the router's actual IP address. The command retrieves the configuration from the router into the program's current configuration in memory.

community Required argument. Specifies an SNMP community that is defined on the router with read access.

timeout Optional argument. Specifies the length of time (in seconds) before the SNMP request expires. The default value is 10.

-save *directory config*

directory Required argument. Specifies the name of the directory into which you want to save the current configuration in the program's memory. If you specify an * instead of a name, the program uses the most recently named configuration directory.

Note: In AIX you can only specify an * instead of a name if you provide the **-save** command in a `cfgargs` or `-commandsFrom` file. It is not supported on the command line.

config Optional argument. Specifies the name of the configuration under which you want to save the current configuration. The default is the current configuration name. The physical file name under which the configuration is to be saved is an 8.3 version of the configuration name, with any invalid file name characters replaced with underscores and the file extension **.csf**.

-send *host name | ip address community [timeout]*

host name | ip address

Specifies either the name of the router, which the program can resolve into an IP address, or the router's actual IP address. The command sends the program's current configuration in memory to the router.

Note: If this command is issued before a valid configuration is read using either the **-asciiRead** or **-open** commands then the default configuration will be sent to the router. This default configuration will not contain an IP address for the router so if this configuration is activated then you will no longer be able to communicate with the router using IP.

community

Required argument. Specifies an SNMP community that is defined on the router with read access.

timeout

Optional argument. Specifies the length of time (in seconds) before the SNMP request expires. The default value is 10.

-sendMultiple *send list*

send list

Required argument. The send list contains the list of configurations and router addresses. You generate this list using the configuration program menu bar to select **Options** → **Communications** → **Send Multiple**, and completing the fields in the Send Multiple window. This command sends multiple router configurations to multiple routers.

-storeMessages

on [*filename*] **off**

on Enables the logging of messages. If a log file exists, the system appends messages to it. If a log file does not exist, the program creates one.

filename Optional argument. Specifies the name of the file in which to put logged messages. The default is **cfg.log**.

off Disables the logging of messages.

Notes:

1. The **-storeMessages** command can appear anywhere on the command line, cfgargs file, or in any of the **-commandsFrom** files.
2. You can provide multiple **-storeMessages** commands, but the configuration program only honors the last one.

3. If you disable **-displayMessages** and enable **-storeMessages**, the program writes all messages to the log file.

-timedConfig *host name* | *ip address* *community* [*timeout*] [*date*] [*time*]

host name | *ip address*

Required argument. Specifies either the name of the router, which the program can resolve into an IP address, or the router's actual IP address. The command sends a configuration file to the router with a request for reload at the specified date and time, based on the date and time of the workstation on which the program is running.

Notes:

1. This command is similar to the **-send** command except that a timer is set, based on the values provided in the date and time arguments. The timer is not affected by reloads or power outages. When the timer value expires, the router loads the configuration.
2. If the date and time arguments specify something earlier than the current date and time, the configuration is sent to the router's IBD (FLASH), but the timer is not set and the configuration will never be loaded.
3. The MSS and MSSC versions of the configuration program do not support this command.

community Required argument. Specifies an SNMP community that is defined on the router with read access.

timeout Optional argument unless the date or time arguments are specified, in which case it is required. Specifies the length of time (in seconds) before the SNMP request expires. The default value is 10.

date Optional argument unless the time argument is specified, in which case it is required. Specifies the date on which the router will reload. The default is the current date. The format is *dd/mm/yyyy* where *dd* is the 2-digit day of the month, *mm* is the 2-digit month of the year, and *yyyy* is the 4-digit year. You may enter the year as either two or four digits.

time Optional argument. Specifies the time at which the router will reload. The default is the current time. The format for the time is HH:MM:SS (am or pm), or a time in 24-hour format, for example, 1800 (without the colons). The SS value, seconds, and am or pm fields are optional.

Creating and Using ASCII Files

By default, the configuration program saves configuration files in binary format. You can use the configuration program to create and read configuration files in ASCII format. You can also convert configuration files from one format to the other.

An ASCII configuration file may be useful if you need to alter many configurations at one time without having to load configurations into the graphical user interface.

Note: The ASCII configuration facility is not intended to be used to create new configurations or to make major modifications to existing configurations.

For example, if you need to update many IP addresses throughout a network, it may be faster to save the affected configuration files in ASCII format and then manually (or automatically with a program) update the addresses. A configuration file saved in ASCII format is also useful when you want to scan the configuration online or print the configuration for review.

After updating an ASCII configuration, you can read it into the configuration program and save the configuration in binary. You can load a configuration into a multiprotocol device only in the binary format.

Understanding the ASCII Functions

The ASCII functions are contained in the Configure menu under the ASCII file item. If you select **ASCII file** you see the following menu items:

- **Create single file...** creates a single ASCII configuration file.
- **Read single file...** reads a single ASCII configuration file into the configuration program's memory.

If you select **Create single file...**, the program displays a dialog in which you specify the path and file name to which the program writes an ASCII file. You can also print comments in the ASCII File from this dialog, if desired.

If you select **Read single file...**, the program displays a dialog in which you specify the path and file name from which the program reads an ASCII file. You can also prevent the configuration program from writing validation errors to a validation file in this dialog. By default, the validation file has a **.vlg** file extension.

Note: For the **Read single file...** function to read an ASCII file successfully, you must either:

- Create the file with the **Create single file...** function, or
- Create an ASCII file with the same parameter structure that the **Create single file...** creates.

"Processing ASCII Files Using the Command Line Facility" on page 38 explains how to use the configuration command line facility to process ASCII files.

Creating an ASCII File

The configuration program uses the current configuration to create an ASCII file. Therefore, if you want to create an ASCII file for a particular device:

1. Configure the device. If you require an ASCII file for a device that is already configured, use the **Retrieve configuration** function to obtain the configuration and load it into the program's memory.
2. Select **Configure** from the Navigation Window menu.

3. Select **ASCII file** from the menu, but do not release the mouse button at this time.
4. Move to the right and select **Create single file....** The program displays a file dialog.
5. Enter the path and file name to which the program is to write the ASCII file. If you want to replace an ASCII file, you can select an existing file from the file dialog.
6. Select **OK**.

The configuration program uses the current configuration in memory to CREATE the ASCII file. This file will contain the configuration parameters and their current values.

Creating an ASCII file is effectively the same as converting a configuration from its binary form to ASCII. “Interpreting an ASCII File” on page 34 explains the contents of a sample of an ASCII file.

Adding Comments to an ASCII File

You can add comments to an ASCII file. These comments will help you to use the ASCII file as a template for other configurations. The comments include:

- A brief description of the parameter
- The type of value
- The valid values or value ranges, if applicable

The comments are a guide to help you update the ASCII configuration file. “Using an ASCII File as a Configuration Template” on page 40 explains using ASCII files as configuration templates.

Reading an ASCII File

Important

Because configuration parameters change between releases and between PTFs, the configuration program will read only ASCII files created by the same level configuration program. Altering the version number of an older ASCII file or changing the version number in a valid configuration file will cause the read function to fail. See “Understanding How the Configuration Program Validates ASCII Files” on page 41 for an explanation of how the configuration program validates an ASCII configuration.

You cannot upgrade an ASCII file from one version of the configuration program to another version. You can only migrate binary configuration files (**.csf**) between releases. For the procedure to migrate older configuration files, see “Upgrading/Migrating Previous-Level Configuration Files” on page 8.

When you read an ASCII file, the configuration program reads the file into memory and replaces the current configuration. If you need the configuration currently in memory, use the **Save configuration** or **Save configuration as** functions before reading in the ASCII file. See “Understanding the ASCII Functions” on page 32 for read function restrictions.

See “Interpreting an ASCII File” on page 34 for a description of the ASCII file that can help you create your own ASCII file.

To read an ASCII file:

1. Select **Configure** from the Navigation Window menu.
2. Select **ASCII file** from the menu, but do not release the mouse button at this time.
3. Move to the right and select **Read single file....** The program displays a file dialog.
4. Enter the path and file name or select a file in the dialog from which the program should read the ASCII file.
5. If you want the configuration program to create an ASCII record of errors in the configuration, select **Log validation errors**, which is the default. Because the configuration program always validates configurations and shows errors, you do not need to log validation error, but the feature is useful:
 - To check the configuration and correct any problems before transmitting the binary file to the device.
 - When reading ASCII files from multiple routers so that you can determine any validation errors when the read process completes.

Note: If you make changes in the configuration program, you can use **Create single file...** to replace the erroneous ASCII file.

6. Select **OK**.

By default, the validation file has a file extension of **.vlg**.

After reading in the configuration, you can:

- Send the configuration file to a device using **Send configuration to router**.
- Save the configuration using **Save configuration** or **Save configuration as**.

Converting from ASCII to Binary

Multiprotocol devices require that the configurations be in binary. Using the configuration program, you can convert an ASCII file to binary by:

1. Reading in the ASCII file as described in “Reading an ASCII File” on page 33 and sending the configuration to the device using the **Send** function.
2. Reading in the ASCII file as described in “Reading an ASCII File” on page 33 and creating a new configuration file using the **Create configuration** function.
3. Reading in the ASCII file as described in “Reading an ASCII File” on page 33 and saving the configuration using the **Save configuration** or **Save configuration as** functions.

Converting from Binary to ASCII

If you have a binary configuration file, you can convert it by:

1. Reading the file, which by default has a **.csf** extension, into the configuration file using **Open configuration** and creating the ASCII file using **Create single file....**
2. Retrieving a configuration from a device and creating the ASCII file using **Create single file....**

Interpreting an ASCII File

Figure 6 on page 36 contains a sample of a portion of an ASCII file with comments. When interpreting the ASCII file, note that:

- Header information begins with an exclamation mark (!).

- Comments begin with an asterisk (*) in column 1. The comments contain descriptions of the parameters and the valid values and ranges. When necessary, the comments indicate the type of the parameters. The types are:

Multiple Segments	Used for data composed of well-defined parts. For example, a four-segment numeric address that is used to define IP addresses and IP address masks.
Numeric	Typically used for data that may have mathematical calculations performed on it. Data value ranges are enforced on all numeric data types.
String	Each string must be within a certain length and can be composed only of a specific set of characters.
Enumerated	Used for multiple-choice values. When an ASCII file is saved with comments, the comments explain the possible values. For example: Enable/Disable 1 = enable, 2 = disable. Used mainly for enabling/disabling adapter ports and protocols.

- Configuration groups and parameters begin with a pound sign (#).
- A group of items is contained within { and }.
- Elements in a list of items are contained within { and }.
- The word "nil" signifies that the parameter currently has no value.
- All parameters appear in the file even if you did not configure them. When you did not explicitly specify the value, the program uses the default value. If a default value for the parameter does not exist, the program uses "nil".
- Encrypted values are preceded by an "E." To specify a new value to be encrypted by the configuration program, change the "E" to a "U" and overwrite the old value with the new value. When the configuration program reads in the ASCII file, it will encrypt the new value.

```

2210 Configuration
November 18, 1996 at 3:08:56 pm
! 'Configuration:' = 'config'
! 'Model:' = 'model 121/T'
! 'Adapter:' = 'emptySlot'
! 'Version:' = '13011'

#'appletalk' = {

*   at2General = {
*     at2Enable : Enable Appletalk 2
*       value : enable or disable
*     at2Checksum : Checksum
*       value : enable or disable
*     at2Translation : Translate
*       value : enable or disable
*     at2FastPath : Fast path cash size
*       value : range from 100 to 10000 }
*   #'at2General' = {
*     #'at2Enable' = 'disable'
*     #'at2Checksum' = 'disable'
*     #'at2Translation' = 'disable'
*     #'at2FastPath' = '500'
*   }
*   at2Interfaces = { list of at2Interface }
*   at2Interface = {
*     at2InterfaceGeneral = {
*       at2FirstNetworkRange : Lowest number of network range
*         value : range from 1 to 65279
*       at2LastNetworkRange : Highest number of network range
*         value : range from 1 to 65279
*       at2NodeNumber : Node number
*         value : range from 0 to 254
*       at2DefaultZoneName : Default zone name
*         value : a string no more than 34 character(s) in length
*           with any ASCII character
*       at2InNFilter : Input NFilter
*         value : 1 of the following strings: None Inclusive Exclusive
*       at2OutNFilter : Output NFilter
*         value : 1 of the following strings: None Inclusive Exclusive
*       at2InZFilter : Input ZFilter
*         value : 1 of the following strings: None Inclusive Exclusive
*       at2OutZFilter : Output ZFilter
*         value : 1 of the following strings: None Inclusive Exclusive
*       at2EnableInterface : Enable interface
*         value : enable or disable

```

Figure 6. Sample ASCII Configuration with Comments (Part 1 of 3)

```

*       at2InputNetworkFilter : Input NFilter
*       value : 1 of the following strings: None Inclusive Exclusive
*       at2OutputNetworkFilter : Output NFilter
*       value : 1 of the following strings: None Inclusive Exclusive
*       at2InputZoneFilter : Input ZFilter
*       value : 1 of the following strings: None Inclusive Exclusive
*       at2OutputZoneFilter : Output ZFilter
*       value : 1 of the following strings: None Inclusive Exclusive
*       at2SplitHorizon : Split horizon
*       value : enable or disable  }
*
* at2ZoneNames = { list of at2ZoneName }
* at2ZoneName = {
*       at2ZName : Zone name
*       value : a string
*               no less than 1 character(s) in length
*               and no more than 32 character(s) in length
*               with any ASCII character }*
* at2NFilter = {
*       at2FirstFilterNetworkRange : First network range number
*       value : range from 1 to 65279
*       at2LastFilterNetworkRange : Last network range number
*       value : range from 1 to 65279
*       at2NetworkFilterType : Filter type
*       value : 1 of the following strings: In Out  }
* at2ZFilters = { list of at2ZFilter }
* at2ZFilter = {
*       at2FilterZoneName : Zone name
*       value : a string
*               no less than 1 character(s) in length
*               and no more than 30 character(s) in length
*               with any ASCII character
*       at2ZoneFilterType : Filter type
*       value : 1 of the following strings: In Out  }  }
*
* #'at2Interfaces' = {
*   #'at2Interface' = {
*     #'at2InterfaceGeneral' = {
*       #'at2FirstNetworkRange' = nil
*       #'at2LastNetworkRange' = nil
*       #'at2NodeNumber' = '0'
*       #'at2DefaultZoneName' = nil
*       #'at2InNFilter' = 'None'
*       #'at2OutNFilter' = 'None'
*       #'at2InZFilter' = 'None'
*       #'at2OutZFilter' = 'None'
*       #'at2EnableInterface' = 'disable'
*       #'at2InputNetworkFilter' = 'None'
*       #'at2OutputNetworkFilter' = 'None'
*       #'at2InputZoneFilter' = 'None'
*       #'at2OutputZoneFilter' = 'None'
*       #'at2SplitHorizon' = 'enable'
*     }
*     #'at2ZoneNames' = {  }
*     #'at2NFilters' = {  }
*     #'at2ZFilters' = {  }
*   }
*   #'at2Interface' = {
*     #'at2InterfaceGeneral' = {
*       #'at2FirstNetworkRange' = nil
*       #'at2LastNetworkRange' = nil

```

Figure 6. Sample ASCII Configuration with Comments (Part 2 of 3)

Creating an ASCII File

Use the **asciiWrite** command to create an ASCII file. If you want to create an ASCII file for a specific device, retrieve the configuration from the device before the write command in the `cfgargs` file. The following example creates an ASCII file of the configuration for device CON656A with comments and then exits the configuration program:

```
-displayMessages off
-storeMessages on cfgCmds.log
  -retrieve CON656A myread
  -asciiWrite d:\asccfgs\con656a.acf withComments
-exit
```

Reading an ASCII File

Use the **asciiRead** command to read an ASCII file into the configuration program's memory. The following example reads the ASCII file named `rtr656b.acf` in directory `asccfgs`:

```
-displayMessages off
-storeMessages on cfgCmds.log
  -asciiRead d:\asccfgs\rtr656b.acf
-exit
```

Note: Validation errors are logged to file `rtr656b.vlg`.

Converting from ASCII to Binary

Use the **createConfiguration** command to convert an ASCII file to a binary file that you can use as backup for a device's configuration. The following example reads in an ASCII file, transmits it to a device, and then creates a binary configuration file for backup.

```
-displayMessages off
-storeMessages on cfgCmds.log
  -asciiRead d:\asccfgs\mss656c.acf
  -send mss656c mywrite
  -createConfiguration d:\bincfgs\mss656c.cfg
-exit
```

Converting a Retrieved File to ASCII

There may be times when you need to review the current configuration, for example, debugging or planning for an upgrade. The next example retrieves the configuration from device RTR656D and converts the configuration to ASCII for later use.

```
-displayMessages off
-storeMessages on cfgCmds.log
  -retrieve rtr656d readit
  -asciiWrite d:\asccfgs\rtr656d.acf
-exit
```

Using the ASCII File Functions with Multiple Devices

There may be times when you need to either create ASCII versions of configurations from multiple routers or convert multiple ASCII files to binary to transmit to various devices. The following sections outline a method to achieve those goals using the command line facility.

Creating Multiple ASCII Files: This following example assumes that you have just received five devices that were pre-configured. It illustrates a way to create documentation of the configuration for those devices.

```
-displayMessages off
-storeMessages on cfgCmds.log
  -retrieve rtr656a reada
  -asciiWrite d:\asccfgs\rtr656a.acf
  -retrieve rtr656b readb
```

```

-asciiWrite d:\asccfgs\rtr656b.acf
-retrieve rtr656c readc
-asciiWrite d:\asccfgs\rtr656c.acf
-retrieve rtr656d readit
-asciiWrite d:\asccfgs\rtr656d.acf
-retrieve rtr656e readit
-asciiWrite d:\asccfgs\rtr656e.acf
-exit

```

Reading Multiple ASCII Files: The following example assumes that you need to reload five devices with configurations and you have valid ASCII files. You have already set up the devices to communicate with the configuration program on each of the devices. Each device has a unique configuration and you do not need the binary configuration saved.

```

-displayMessages off
-storeMessages on cfgCmds.log
-asciiRead d:\asccfgs\rtr656f.acf
-send mss656f mywritef
-asciiRead d:\asccfgs\rtr656g.acf
-send mss656g mywriteg
-asciiRead d:\asccfgs\rtr656h.acf
-send mss656h mywriteh
-asciiRead d:\asccfgs\rtr656i.acf
-send mss656i mywritei
-asciiRead d:\asccfgs\rtr656j.acf
-send mss656j mywritej
-exit

```

Using an ASCII File as a Configuration Template

The ability to create and read ASCII files can assist you in automating the process of creating or updating a large number of device configurations. The following procedure outlines a method that you can use to perform a mass update.

1. Create a file that contains the new information for the devices you are configuring. You can use a full or partial template. Make sure that any interfaces or adapters specified match the models and adapters specified in the header.
2. Create a program to read the device file and a configuration template file.
3. Create a copy of the template file, update the new copy with the device information, and save the file with a name that would help you to identify the device for later transmittal.
4. Locate a device in your network that contains a configuration that closely matches the target devices. Ideally, the only things you should need to change are items like IP addresses, MAC addresses, dial circuit numbers, or other such items. The devices should support and use the same filters and protocols and have the same interfaces.
5. From the device you located in step 4, retrieve the device configuration using **Retrieve configuration**. You can retrieve the configuration with the command line facility of the configuration program.
6. Create an ASCII file of the configuration.
7. Create the new configurations using the ASCII file you created in step 6, the file you created in step 1, and the program you created in step 2.

After you create the new configurations, you can use the configuration program to read the resulting ASCII files, save them as binary files, if needed, and then send the files to the appropriate devices. "Reading Multiple ASCII Files" contains more information about how the command line facility can help you automate this task.

Understanding How the Configuration Program Validates ASCII Files

The configuration program performs the following actions while reading the ASCII files:

- If there is an adapter specified in the header, the program compares that value with the adapter type in the Devices group of the configuration file.
- If there is a model specified in the header, the program:
 1. Checks to see that the defined interfaces match the model capabilities. For example, a 2210 Model 12T cannot have an Ethernet interface. In this case, the program discontinues reading the configuration and logs an error.
 2. Verifies that the number of interfaces is correct for the device configuration identified in the header.

If there are too many interfaces defined, the program discontinues reading the configuration because it cannot determine which definitions are correct and logs an error.

If there are too few interfaces, the program fills in defaults for the undefined interfaces. For example, if the device has two WAN ports and you supply values for one, the program uses defaults for the missing interface after the configured interface.

Note: Undefined interfaces must be the last interfaces in the interface list. For example, if you define interfaces 0, 2, and 3, the configuration program will not use defaults for the missing interface. In this case, you must define the consecutive interfaces 0, 1, 2, and 3 for the program to provide defaults for the missing interface. For interface 1, you *must* provide a default interface.

- Compares the number of device interfaces to the number of elements in the interface protocol list.

If there are fewer elements in the interface protocol list than the number of device interfaces, the program fills the list with default protocols for the remaining interfaces.

If there are more elements in the interface protocol list, than the number of device interfaces, the program discontinues reading the configuration and logs an error.

Diagnosing Configuration Program Problems

If you experience problems with the configuration program, locate the symptom in Table 6 that most closely describes the problem and perform the actions described in the Recommended Actions column.

Table 6. Problem Symptoms

Symptom	Recommended Actions
Exit with error 34 message when attempting to start the configuration program in AIX	This message indicates that there is not enough space in the <i>/tmp</i> directory for the program to start. To avoid this problem, either delete unnecessary files in the directory or use SMIT to allocate more space to it.
Cannot read or make selections from a panel	Revert to the original initialization files by reinstalling the program.
The configuration program is running slowly or is hung	Stop other applications to see if that enables the program to operate normally. If it does not, revert to the original initialization files by reinstalling the program.

Table 6. Problem Symptoms (continued)

Symptom	Recommended Actions
Internal Execution Error or Run Time Error (indicated by an error message in a pop-up window)	Do the following: <ol style="list-style-type: none">1. Record the version of the configuration program that you are using and any problem-related error messages.2. Copy the following files in the configuration program's directory to a safe place:<ul style="list-style-type: none">• The walkback.log file• The binary router configuration file (.cfg) that you were creating• The configuration storage file (.csf) that you were creating3. Contact IBM Customer Service and provide the saved files.

Removing the Configuration Program

Before removing the configuration program, you must save all of the configuration files with a **.csf** extension into the configuration program's directory, if the configurations are still required for your network. Use either the **Save configuration** or **Save configuration as** choices from the Configuration menu (described in "Using the Configure Menu" on page 20).

To remove the configuration program:

1. Copy the configurations to another directory if necessary.
2. For Windows, use the Add/Remove Programs option from the Control Panel to uninstall the program. For OS/2, use either the **del** or **erase** command to delete the files in the configuration program's directory, then delete the folder. For AIX, use SMIT to uninstall the program.

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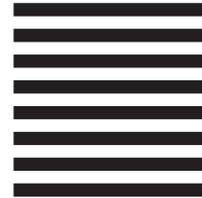
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Fold and Tape



Part Number: 35L3094



Printed in the United States of America
on recycled paper containing 10%
recovered post-consumer fiber.

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