InterChangeVS™ 1000 Series

VS1000 and VS1100
Novell® NetWare®

Installation and Configuration Guide

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Introduction

Product Overview

The **Comtrol InterChangeVS 1000** is a rack-mountable or stackable "network appliance" that connects via Ethernet to a host server and supports from 16 to 64* RS-232 asynchronous serial ports per network address (MAC). All ports are supported at rates up to 230.4K bps.

*   *The base VS1000 has 16 ports. Additional ports can be added by plugging in VS1100 expansion units, to a maximum of three VS1100 expansion units per each VS1000 base unit.*

Operating System Requirements

The InterChangeVS 1000 requires at least one network server running one of the following operating systems:

*   Microsoft Windows® NT (3.51, 4.0, or higher)

    Note: *Windows NT 4.0 or higher is required to support Multilink PPP.*

    Note: *RAS or RRAS is required to support Remote Access Service.*

*   Citrix® WinFrame® (1.7 or later)

*   Novell® NetWare® (3.12, 4.11, or IntranetWare™)

    Note: *Contact Novell for information regarding Multilink PPP support for NetWare.*

Your choice of operating system determines the limits of the VS1000/VS1100 configuration. Novell NetWare supports a maximum of 128 ports per server, while Microsoft supports up to 256 RAS ports or 1,000 COM ports per server.

Connectivity Requirements

*   An Ethernet connection, either to an Ethernet hub or to a NIC card in the host server. (See the *Installing the Hardware* section.)

Installation Overview

The following outlines summarize the various VS1000/VS1100 installation scenarios. For more information about hardware issues, see the *Installing the Hardware* section. For more information about software issues, see the section for your network operating system.

Initial Installation

A. Hardware Installation

1. Install the VS1000.
2. Install one or more VS1100 units (optional).
3. Install RS-232 serial devices.
4. Connect the VS1000 to the network hub or server.
5. Power-up the new VS1000 and verify that it passes the power-on diagnostics.

B. Software Installation

1. Unzip the VS-Link distribution file.
2. Install the VS-Link software.
3. Configure VS-Link to support the VS1000/VS1100.
4. Configure serial ports to support the RS-232 devices.
5. Shut down and restart the server.

Installing VS-Link Software Updates

A. Hardware Installation (*no changes needed*)

B. Software Installation

1. Remove the existing VS-Link software.
2. Install the new version of the VS-Link software.
3. Configure VS-Link to support the VS1000/VS1100.
4. No port configuration changes are required.
5. Shut down and restart the server.

Adding a VS1000 to an Existing Installation

A. Hardware Installation

1. Install the VS1000.
2. Install any associated VS1100 expansion units.
3. Install RS-232 serial devices.
4. Connect the VS1000 to the network hub or server.
5. Power-up the new VS1000 and verify that it passes the power-on diagnostics.

B. Software Installation

1. Configure VS-Link to support the new VS1000/VS1100.
2. Configure serial ports to support the RS-232 devices.
3. Shut down and restart the server.

Adding a VS1100 to an Existing Installation

A. Hardware Installation

1. Install the VS1100.
2. Power down the VS1000 base unit to which you are attaching the VS1100 expansion unit.
3. Connect the VS1100 cable from the **VS1100** port on the VS1000 base unit to the **Input** port on the VS1100 expansion unit.
4. Install the terminator plug in the **Output** port on the last VS1100 in the chain.
5. Install RS-232 serial devices.
6. Power-up the VS1000 and verify that it passes the power-on diagnostics.

B. Software Installation

1. Change the VS-Link configuration for the VS1000 base unit to support the added serial ports.
2. Configure the serial ports to support the RS-232 devices.
3. Shut down and restart the server.

"Hot-Swapping" a VS1000

Replacing a VS1000 with an identical VS1000

A. Hardware Installation

1. Power-down the VS1000 to be removed from service.
2. Install the new VS1000.
3. Transfer *all* cabling from the old VS1000 to the new VS1000. This includes the VS1100 cable, if used.
4. *Do not* add or remove VS1100 expansion units. The new VS1000 must be connected to the same number of VS1100 units as the VS1000 that is being removed from service.
5. Connect the new VS1000 to the network hub or server.
6. Power-up the new VS1000 and verify that it passes the power-on diagnostics.

B. Software Installation

1. Change the VS1000 VS-Link configuration to reflect the network address (MAC) of new VS1000 base unit.
2. No port reconfiguration is needed.
3. *Do not* shut down and restart the server.

"Hot-Swapping" a VS1100

A. Hardware Installation

1. Power-down the VS1000 base unit.
2. Install the new VS1100 expansion unit.
3. Transfer *all* cabling from the old VS1100 to the new VS1100.
4. Power-up the VS1000 base unit and verify that it passes the power-on diagnostics.

B. Software Installation

1. No software changes required.
2. *Do not* shut down and restart the server.

Obtaining Software or Document Updates

For information that is not in this *Guide*, see the **README** and/or **Help** files on the installation media. In particular, the Windows NT version of VS-Link includes significant online help.

Comtrol manuals and other documents are available in electronic form on the Comtrol web site. Driver software updates can be downloaded at no charge from the Comtrol ftp site. Always check the web and ftp sites to make sure that you have the current driver and documentation.

The current released version of the software is stored in the **VS1000** directory. If a newer version has reached the beta testing stage, it can be found in the **BETA** directory. Beta software is made available on an **"as-is"** basis and users of beta software assume all risks and liabilities relating thereto.

Note: *Downloadable driver software files are stored in either zipped (*filename.**zip***) or self-extracting zip (*filename.**exe***) format. You must extract the zipped files before installing a downloaded file. For more information, see the appropriate section for your server operating system.*

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Technical Support

Comtrol has a staff of support technicians available to help you. U.S. telephone support is available from 8 AM to 6 PM Central time, Monday through Friday (holidays excluded), at the phone number(s) listed on the previous page. Before you call Comtrol technical support, please have the following information available.

Table 1. Support Call Information

Item	Information
Hardware Type	**VS1000 VS1100**
Hardware Serial Number*	
Network Address*	**00 C0 4E ____ ____ ____**
Operating system type and release	
SPACK revision number (Novell only)	
VS-Link version number	
Server computer make, model, and speed	
Serial devices connected to the VS1000/VS1100 ports	
Other serial port adapters installed in the server and their COM port numbers	
Other network adapter devices installed in the server and their network (MAC) addresses	

*   *The hardware serial number and network address can be found on printed tags on the back panel of the unit. VS1100 expansion units have serial numbers only.*

Comtrol supplies a self-adhesive label with each InterChangeVS unit, which you can use to record the serial number and network address. If the VS1000/VS1100 unit is not in a readily accessible location, check to see if this label has been filled out and posted elsewhere (for example, near the server console).

Novell NetWare

Overview

VS-Link for Novell (AIOVS1.NLM) is a NetWare Loadable Module™ (NLM™) that provides the software interface between AIO and the VS1000 virtual server. This includes:

- All enqueuing and dequeuing of serial data.
- Communicating as a protocol stack to an Ethernet II driver.
- Modem control signal functioning (excluding ring indicator).
- Hardware and software flow control.

VS-Link works with the following operating system releases:

Table 2. Novell Operating System Releases Supported

Operating System	Feature
NetWare 3.12	MPR 3.1A or higher and/or NetWare Connect 2.0.30 or higher
NetWare 4.1x	MPR 3.1A or higher and/or NetWare Connect 2.0.30 or higher
IntranetWare I	NIAS (Support Pack V1.0)

Note: *VS-Link also supports third-party products such as Computer Associates® FAXserve™ and Funk WanderLink®. If you use such a product you may not need NetWare Connect or MPR; for more information see your application documentation.*

VS-Link can support up to eight VS1000/VS1100 units networked to one Ethernet adapter in one NetWare server. (All communication is handled through a single Ethernet II driver, so all VS1000/VS1100 units must be connected to the same Ethernet adapter.) Each VS1000 can support three VS1100 expansion units: different combinations of VS1000 and VS1100 units can be controlled by a single NetWare server, provided the total number of units does not exceed **8** and the total number of serial ports does not exceed **128**.

Baud rates from 75 to 230.4 Kbps are supported on all ports. Actual usable rates may vary, depending on operating system limits.

Note: *You can obtain on-line help by entering* **load AIOVS1 ?**

Software Installation

The installation process varies depending on whether you are installing under NetWare Connect™, NIAS/MPR, or a third-party product. In any event, you must collect the following information and perform the following steps before beginning the install.

Note: *It is not necessary to down the server during installation. In fact, it is possible to switch VS1000 units in and out on the fly: for more information, see "Hot Swapping" in the Troubleshooting section.*

Before You Begin

1. Install the VS1000/VS1100 hardware, as described in the *Installing the Hardware* section.

2. Verify that the VS1000/VS1100 units pass the power-on diagnostics.

3. Install NetWare Connect, MPR, or third-party software, if needed.

   Note: *You must have NetWare Connect, MPR, or a third-party product installed before proceeding. If such a product is not already installed, do so before continuing. Instructions for installing NetWare Connect and/or MPR are found in the Novell system administrator's documentation.*

4. Use a text editor or **install.nlm** to determine the device name of the Ethernet network board (NIC) installed in your Novell server, and write it down:

Ethernet Board Name	

Extracting the Files

VS-Link for Novell is distributed as a zipped file (**6612.zip**). Before you can install the software, you must extract the files. Follow these steps:

1. Locate **6612.zip** on the installation media, or download it from the Comtrol ftp site.

2. **On a DOS or Windows client system**, use a utility such as PKUNZIP or WinZip to extract 6612.zip to a temporary directory.

3. Login to the Novell server, and copy all VS-Link files to the **system** directory. The **system** directory is found on the sys volume.

4. If you are installing under NetWare Connect, continue with the instructions that begin on the following page. If you are installing under MPR, jump to the instructions under *NIAS/MPR*, later in this section.

Creating an AIOVS1 Load Line

The following procedure describes the basic load line used to load and configure the VS1000 driver. For more information about load lines, see the Novell documentation.

1. At the server console, enter the command to load the driver manually. The syntax is as follows:

    load AIOVS1 mac={*MACADDR*} node={*NNN*} nports=PP {trace} name={*SSS*}

    The parameters for the load statement are:

Table 3. AIOVS1.NLM Parameters

Parameter	Description
mac=*MACADDR*	This specifies the Ethernet MAC (Network Address) of the VS1000. [*REQUIRED*]
node=*NNNN*	This optional parameter overrides the default node number for this particular unit. If a node number is not specified in the load statement, the node number defaults to the **device count** (0 through 7), which is incremented each time the load aiovs1 statement is executed.
nports=*PP*	This optional parameter lets you set the number of ports on the VS1000 and associated VS1100 expansion units. For example, if you are loading VS-Link for a single VS1000, set *nports=16*. If you are loading VS-Link for a VS1000 with one VS1100 expansion unit, set *nports=32*.
trace	This optional parameter causes VS-Link to load with all tracing options enabled. For more information, see the *Troubleshooting* discussion later in this section. **Note**: *Enabling trace on load causes all driver trace messages to be printed to the system console.*
name=*SSS*	This optional parameter sets the text name for the VS1000. If omitted, the text name is blank.

Note: *If the load statement is entered with no parameters except the MAC address, VS-Link assumes the protocol stack is being configured.*

2. Repeat Step 1 for each VS1000 attached to the server.

3. At the server console, enter the command to bind the protocol stack to a LAN card that is configured to support the Ethernet II Frame type. The syntax for this is as follows:

   bind AIOVS1 {*LAN board name*}

   For example, if the command to load the LAN card driver is:

   load ETHER frame=ETHERNET_II slot=10001 name=FRED

   Then the bind command would be:

   bind AIOVS1 FRED

   Since you are binding the *protocol stack* to the LAN card, enter this command only once, after all VS1000 load commands are entered.
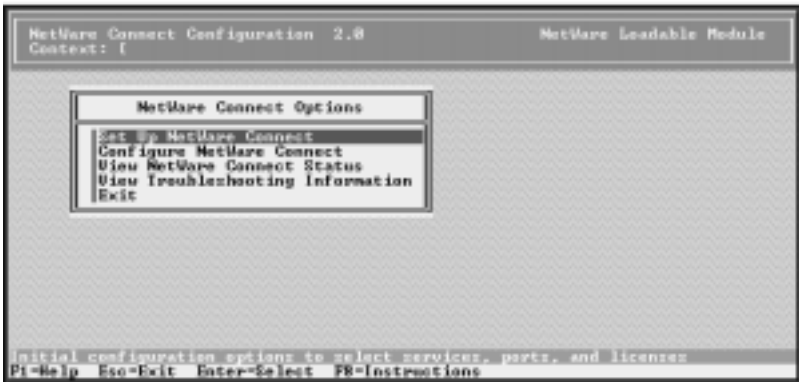
NetWare Connect Installation and Configuration

Follow these steps:

1. Enter the load line, as described under *Creating an AIOVS1 Load Line*.

2. Repeat Step 1 for each VS1000 attached to the server.

3. Bind the protocol stack to the LAN card, as described above.

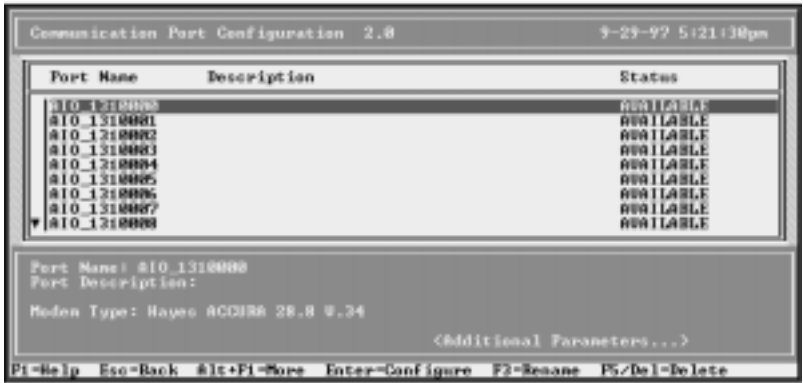4. At the server console, enter **load nwccon.**

   The *NetWare Connect Options* menu is displayed:

5. Select **Configure NetWare Connect.**

   The *Configuration Options* menu is displayed.

6. Select **Ports.**

The *Port Configuration* screen is displayed:

7. If necessary, use the cursor keys to scroll down the screen until the VS1000 ports are displayed.

The default VS1000/VS1100 port names follow this form:
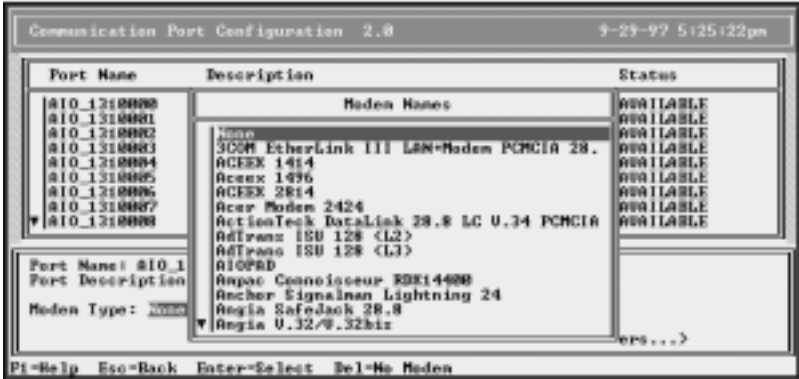**AIO_131***{node}{port}*

Table 4. Port Name Parameters

Parameter	Description
AIO	Indicates that this is an asynchronous I/O port.
131	The Novell hardware type, which for InterChangeVS 1000 is always **131.**
{node}	The node number, if specified in the load statement. Otherwise, this is the **device count** (0 through 7), which is incremented each time the load aiovs1 statement is executed. That is, if you have two *load aiovs1* statements for two VS1000s, the ports on the unit initialized by the first statement appear as **AIO_1310{port}** and the ports on the unit initialized by the second statement are **AIO_1311{port}.**
{port}	The port number. Ports are numbered from **000** to **015** (or 31, 47, or 63, depending on the number of VS1100 expansion units installed).

8. Select the port to be configured and press **Enter**.

The cursor moves to the lower window and you can edit the *Port Name*, *Port Description*, *Modem Type*, or *Additional Parameters*.
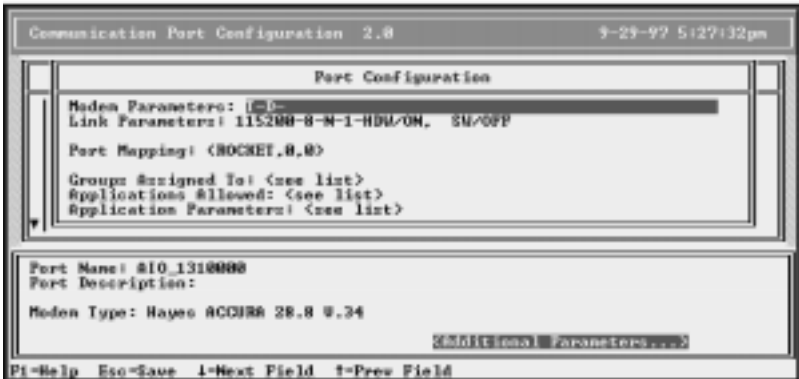
9. To enter or change the modem type, highlight *Modem Type* and press **Enter**. The list of valid modem types is displayed:

Scroll through and select from this list.

10. To enter other information, highlight *Additional Parameters* and press **Enter**.

    A secondary window displays additional setup parameters which you can change as needed:

11. Repeat Steps 8 through 10 for each port you want to configure.

12. When you are done, press **Esc** to exit the configuration screen. You are asked if you want to save your changes. Select **Yes** to save any changes you may have made, or **No** to discard them.

13. Press **Esc** to back out to the *NetWare Connect Options* menu.

14. Select **Set Up NetWare Connect** and press **Enter**.

The *System Setup Options* menu is displayed.

15. Select **Select NetWare Connect Ports**.
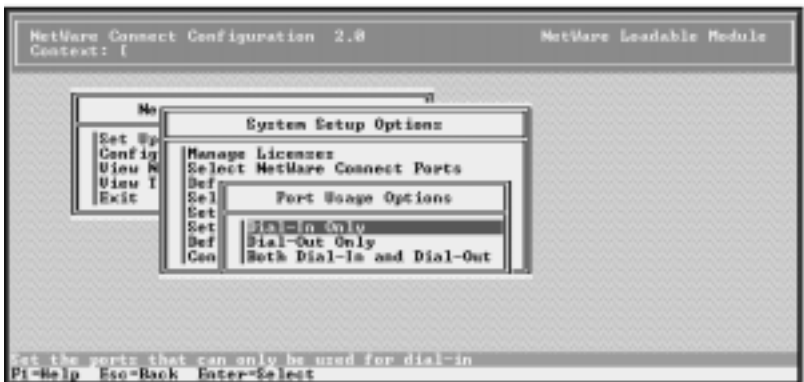
The list of valid NetWare Connect Ports is displayed:

If all ports you configured show up, the ports are set up correctly.

Note: *The list of ports is sorted alphabetically. If you have changed any Port Names, the ports may appear in different order here than they did on the Port Configuration screen.*
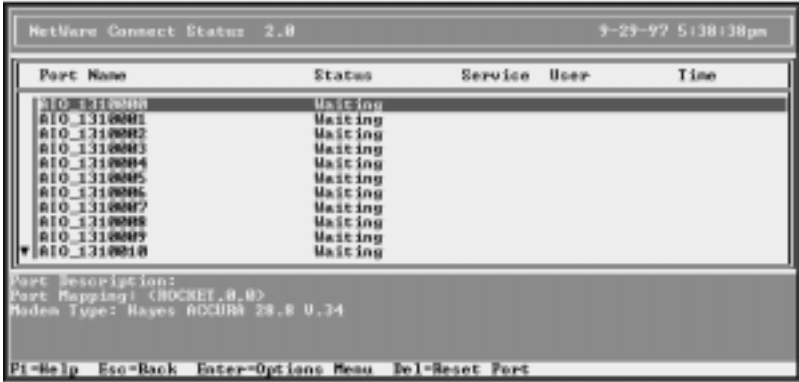
16. Press **Esc** to return to the *System Setup Options* menu.

17. Next, select **Define NetWare Connect Port Usage.**

The *Port Usage Options* menu is displayed:

18. Select port usage options as desired.

19. Press **Esc** twice to back out to the *NetWare Connect Options* menu.

---

20. Select **Configure NetWare Connect.**

21. Use the options on this menu to configure **Port Groups** and **Security** as needed. For more information, see the Novell documentation.

22. Press **Esc** to back out to the *NetWare Connect Options* menu.

23. Select **View NetWare Connect Status.**

    The *Status Options* menu is displayed.

24. Select **Display Port Status**. The Port Status window displays:

    If the status of all configured ports is "Waiting," you have correctly completed setup and configuration. At this point, the system is ready for users to dial in and access the server.

25. Press **Esc** to back out of the menu system and exit nwccon.

26. Using a text editor or **install.nlm**, edit the **autoexec.ncf** file. Add the following:

    • One **load aiovs1** command line for each VS1000 installed. Use the syntax described in Step 1 of this procedure.

    • After all *load aiovs1* commands, one **bind aiovs1** command line to bind the protocol stack to the LAN board. Use the syntax described in Step 3 of this procedure.

At this point, the VS1000/VS1100 units should be fully operational. The changes you have made to **autoexec.ncf** enable the server to automatically execute the load and bind commands the next time the server is downed and restarted.

Adding VS1000 Virtual Servers

To add VS1000 virtual servers to an existing and operating Novell NetWare Connect system, follow these steps:

1. Connect the VS1000 unit to the Ethernet hub.
2. Switch the VS1000 on, and verify that it passes power-up diagnostics.
3. At the system console, enter the **load aiovs1** command for this unit, using the syntax described in the *AIOVS1.NLM Parameters* table.
4. Use **nwccon** to configure ports as needed.
5. Edit the **autoexec.ncf** file to add the *load aiovs1* command for the new VS1000.

You are now ready to resume normal operations.

Adding VS1100 Expansion Units

To add VS1100 expansion units to an existing and operating NetWare Connect system, follow these steps:

1. Power off the VS1000 to which the VS1100 will be connected.
2. Connect the VS1100 to the VS1000, following the instructions in the *Installing the Hardware* section. Remember to put the terminator plug in the OUTPUT connection on the last VS1100 in the chain.
3. Switch the VS1000 back on.
4. Find the line in **autoexec.ncf** that initializes the host VS1000.
5. Change the **nports** command in the **load aiovs1** statement to reflect the added ports.
6. Down and restart the server so that your changes take effect.
7. Use **nwccon** to configure the ports on the new unit as needed.

You are now ready to resume normal operations.

NIAS/MPR Installation and Configuration

The following procedures describe how to configure NetWare Internet Access Server/MultiProtocol Router™ (NIAS/MPR) to work with the VS1000. This discussion presumes you have already completed the steps under "*Before You Begin*," earlier in this section.

Note: NetWare Connect installation requires that you manually load the driver and bind the protocol before beginning configuration. In contrast, when working with NIAS/MPR, the driver must <u>not</u> be loaded or bound before beginning. If necessary, down and restart the server to make sure that the driver is not loaded.

1. At the server console, enter **load inetcfg**

    The *Internetworking Configuration* menu is displayed:

2. Select **Boards**.

    The list of configured boards is displayed:

3. Press the **Ins** key.
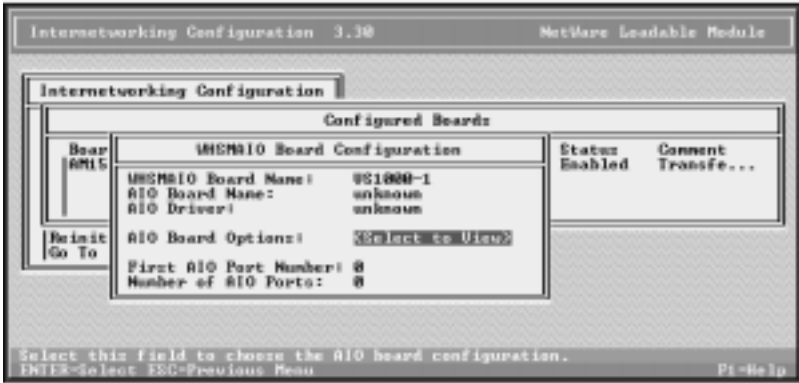
   The list of available drivers is displayed:

4. Scroll down the list, highlight **whsmaio**, and press **Enter**.

5. Enter a logical board name and press **Enter**.

   For example, if this is your first VS1000, you could type **VS1000-1** and press **Enter**.

   The *WHSMAIO Board Configuration* window is displayed.
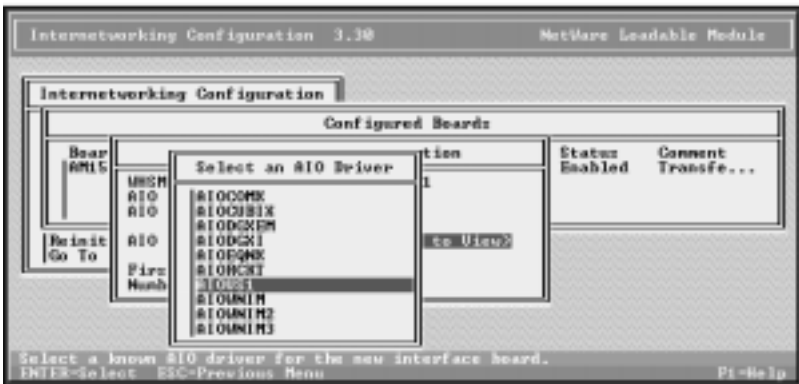
6.   Highlight **AIO Board Option** and press **Enter**:

   This prompt appears:

   Should INETCFG automatically load the AIO driver?

7.   Select **Yes** and press **Enter**.

   The list of AIO drivers is displayed:

8.   Scroll down the list, highlight **AIOVS1**, and press **Enter**.

The *AIO Board Configuration* window displays:

9. Highlight **MAC** and press **Enter**.

10. Enter the network address of the VS1000 unit and press **Enter**.

11. If there are VS1100 units attached to the VS1000, press **Enter** to display the list of valid values and select the correct number of ports.

Note: *The number of ports defaults to 16.*

12. Press the **Esc** key.

    The *WHSMAIO Board Configuration* window is displayed, this time including the board and driver names.

13. If the first AIO port number is not 1, enter the first port number.

14. Enter the number of AIO ports and press **Enter**.

15. Press the **Esc** key.

    You are asked if you want to save your changes.

16. Select **Yes** and press **Enter**.

You are returned to the *Configured Boards* window, and the VS1000 you just installed is displayed on the list of configured boards:

17. If you have more VS1000 units to configure, repeat steps 3 through 16 as needed.

18. When you are done, press **Esc** to return to the *Internetworking Configuration* menu.

At this point, the system has automatically added the necessary load commands to the system startup files. There is no need to edit the **autoexec** file manually.

Proceed with the following steps as needed.

Configuring Network Interfaces

Follow these steps to configure each port:

1. From the *Internetworking Configuration* menu, select **Network Interfaces**.

    The *Network Interfaces* status window displays:

    Each line is a port on your VS1000. At this point the status of each port should be "unconfigured."

2. Select the first port to configure and press **Enter**.

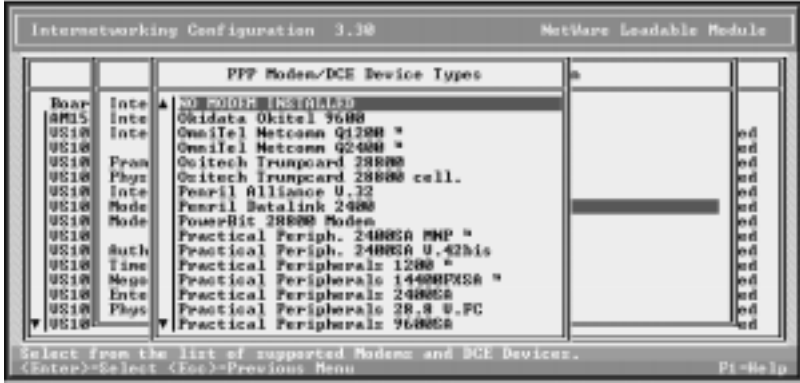   For example, if you named the board **VS1000-1**, the first port is **VS1000-1_01**.

    You are asked to select a medium.

3. Select **PPP** and press **Enter**.

    The *PPP Network Interface Configuration* window is displayed:

4. Move the cursor to **Modem/DCE Type** and press **Enter**.

   The list of available PPP Modem/DCE Device Types displays:

5. Select the modem type attached to the port and press **Enter**.

6. Move the cursor up to *Interface Speed* and press **Enter**.

   The list of interface speeds displays.

7. Select one and press **Enter**.

8. Press **Esc** to exit the *PPP Network Interface Configuration* screen. You are asked if you want to save your changes. Select **Yes** and press **Enter**.

   You are returned to the *Network Interfaces* window. The Media type should be **PPP** and the port Status should be **Enabled**.

9. Repeat this process as needed for all ports on the system. When you are done, press **Esc** to exit to the *Internetworking Configuration* menu.

Configuring WAN Call Destinations
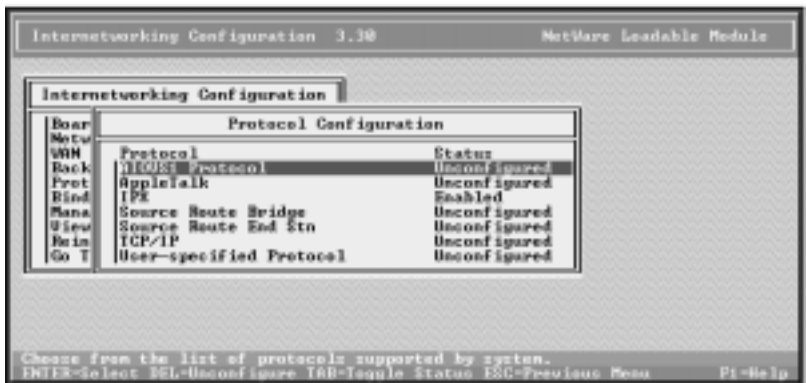
Follow these steps to create WAN Call Destinations:

1. From the *Internetworking Configuration* menu, select **WAN Call Directory**.

   The list of Configured WAN Call Destinations is displayed.

2. Press **Insert** to create an entry.

3. Enter the New Call Destination Name and press **Enter**.

4. Select one supported wide-area medium (for example, **PPP**) and press **Enter**.

   The *PPP Call Destination Configuration* screen is displayed.

5. Move the cursor to the *Interface Name* field and press **Enter**.

   The list of PPP Network Interfaces is displayed.

6. Select the desired port by name and press **Enter**.

7. Set other parameters on the *PPP Call Destination Configuration* screen as needed. When you are done, press **Esc** to exit. You are asked if you want to save your changes.

8. Select **Yes** and press **Enter**.

9. If authentication is enabled, you must enter a password in order to save your changes.

   The updated list of WAN Call Destinations is displayed.

10. Repeat steps 2—10 to add more destinations as needed, or press **Esc** to exit to the *Internetworking Configuration* menu.

Configuring Protocols

Follow these steps to configure the protocols:

1. From the *Internetworking Configuration* menu, select **Protocols**.

   The *Protocol Configuration* window is displayed.

2. Select **AIOVS1** and press **Enter**. The *Miscellaneous Protocol Load Commands* window is displayed.

3. Press the **Ins** key. The *Protocol Command Configuration* window is displayed.

4. Enter **AIOVS1** for the NLM Name, and press **Enter**.

5. Press **Esc** to close this window because no parameters are needed. You are asked if you want to save your changes.

6. Select **Yes** and press **Enter**.

The *Miscellaneous Protocol Load Commands* window is displayed. It should contain a line for **LOAD AIOVS1**.
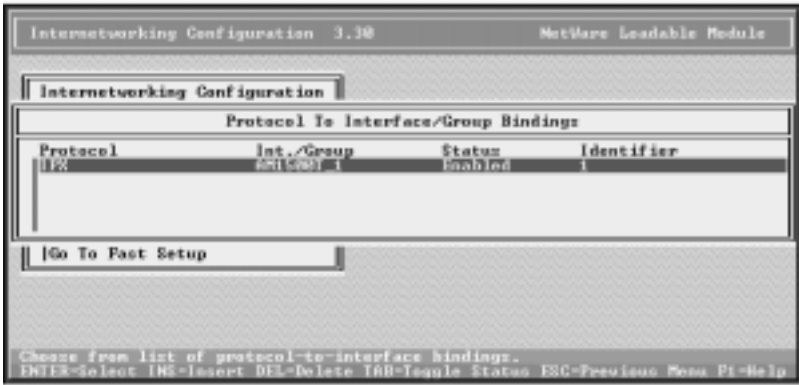
7. Press **Esc** to exit to the Protocol Configuration window.

8. Configure other protocols as needed. When you are done, press **Esc** to exit to the *Internetworking Configuration* window.
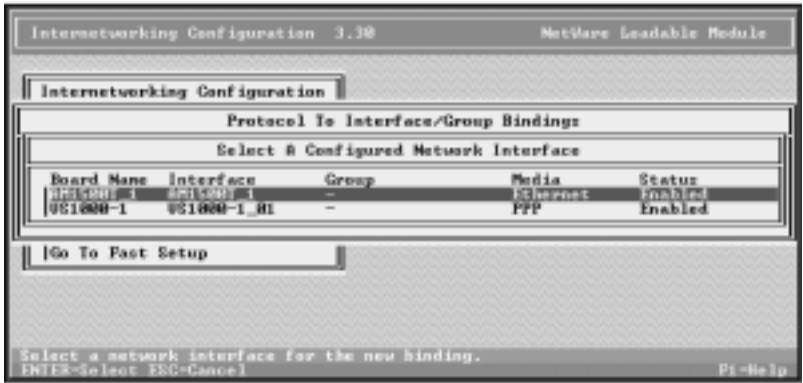
Configuring Bindings

Follow these steps to set the protocol to interface/group bindings:

1. From the *Internetworking Configuration* menu, select **Bindings**. The *Protocol to Interface/Group Bindings* window is displayed:

```
 Internetworking Configuration  3.30          NetWare Loadable Module

 | Internetworking Configuration |
 |                Protocol To Interface/Group Bindings                |
 | Protocol          Int./Group         Status      Identifier        |
 | IPX               AIO15VS1_1          Enabled     1                 |
 |                                                                     |
 |                                                                     |
 | |Go To Fast Setup |                                                 |

 Choose from list of protocol-to-interface bindings.
 ENTER=Select INS=Insert DEL=Delete TAB=Toggle Status ESC=Previous Menu F1=Help
```
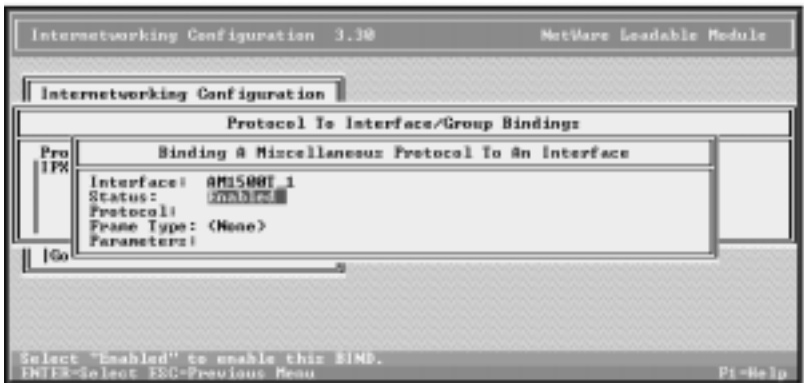
2. Press the **Insert** key to add a new binding. The list of configured protocols is displayed.

3. Select **AIOVS1 Protocol** and press **Enter**. You are asked which interface you want this protocol bound to.

4. Select **A Network Interface** and press **Enter**.

The list of configured boards is displayed:

5. Select the **Ethernet** board and press **Enter**. The *Binding A Miscellaneous Protocol to an Interface* window displays:

6. Move the highlight to *Protocol*, enter **AIOVS1**, and press **Enter**.

7. At *Frame Type*, press **Enter** to display the list of valid frame types. Select **Ethernet_II** and press **Enter**.

8. Press **Esc** to close this window. You are asked if you want to save your changes. Select **Yes** and press **Enter**.

9. Repeat these steps to configure other bindings as needed. When done, press **Esc** to return to the *Internetworking Configuration* menu.

Reinitializing the System

After you have finished configuring MPR for the VS1000, it is not necessary to edit the **autoexec.ncf** file or down and restart the server. Instead, select **Reinitialize System** from the *Internetworking Configuration* menu.

When the system has completed the reinitialization process, you are ready to begin normal operations.

Adding VS1000 Virtual Servers

To add VS1000 virtual servers to an existing and operating NIAS/MPR system, follow these steps:

1. Connect the VS1000 unit to the Ethernet hub.

2. Switch the VS1000 on, and verify that it passes power-up diagnostics.

3. Use the **Boards** option on the *Internetworking Configuration* menu to add the new unit.

4. Use the **Network Interfaces** option to configure the new ports.

5. Use the **Reinitialize System** option to put the new configuration into effect.

You are now ready to resume normal operations.

Adding VS1100 Expansion Units

To add VS1100 expansion units to an existing and operating NIAS/MPR system, follow these steps:

1. Power off the VS1000 to which the VS1100 will be connected.

2. Connect the VS1100 to the VS1000, following the instructions in the *Installing the Hardware* section.

3. Switch the VS1000 back on.

4. Use the **Boards** option on the *Internetworking Configuration* menu to change the number of AIO ports on the host VS1000.

5. Use the **Network Interfaces** option to configure the new ports.

6. Use the **Reinitialize System** option to put the new configuration into effect.

Note: *This causes* all *VS1000 units on the server to reload VS-Link.*

You are now ready to resume normal operations.

Troubleshooting

Problem Resolution Procedures

If you are having trouble with a VS1000, try the following:

1. Verify that you are using the correct types of cables in the correct places and that all cables are connected securely.

2. Verify that the Ethernet hub and any other network devices between the server and VS1000 are powered up and operating.

3. Verify that the VS1000 is powered up and has passed the power-on diagnostics. (See *Installing the Hardware*.)

4. If using the 10Base-T Ethernet connection, verify that the port polarity is correct. (See *Installing the Hardware*.)

5. Verify that the network address (MAC) used in the **load aiovs1** command matches the network address on the VS1000 unit. (See *Creating an AIOVS1 Load Line*.)

6. Use **VS1MAN.NLM** to examine and test the InterChangeVS 1000 Virtual Server. This utility also enables you to replace ("hot-swap") a configured VS1000 unit with another unit without either downing the server or changing port configuration.

7. Use **VS1TRACE.NLM** to trace and log the flow of data through the VS-Link software and VS1000 hardware.

8. If VS1MAN and VS1TRACE indicate no problems, try **AIOTERM**. This NLM, which can be downloaded from Novell, is used with a loopback plug to verify that the VS-Link software and VS1000 hardware are functioning properly. If **aioterm** can access ports on the VS1000, then the problem lies in the application.

9. If still unable to resolve the problem, see the *Introduction* for information on contacting Comtrol technical support. When you contact Comtrol, please have the following information available:

   • NetWare Connect or MPR revision number

   • SPACK (Support Pack) revision number

   • aiovs1.nlm version number

   To determine the aiovs1.nlm version number, enter this command on the server console: **modules aiovs1.nlm**. The version number is displayed.

   If you are using NetWare 4.11, enter this command at the server console: **load techwalk**. This generates a Configuration Report (techwalk.out) that is stored in the **/etc** directory, and which contains much useful and valuable information.

VS1MAN.NLM

VS1MAN.NLM is a utility that enables you to configure, examine, and test the InterChangeVS 1000 Virtual Server. It also enables you to replace ("hot-swap") an operating VS1000 unit with another, without either downing the server or changing port configuration.

To install the utility, copy the file **vs1man.nlm** into the SYSTEM directory on the SYS volume.

Operating VS1MAN

To use **vs1man**:

1. At the system console, type: **load vs1man**

   The command line is displayed:

   > st'A'te 'C'onfig 'H'otSwap 'S'tats aio'D'test 'F'lowCtl e'X'it):

2. Press the letter [A, C, H, S, D, F, X] of the command you want to execute.

3. When you are done using vs1man, press **X** to exit. Then press any key to close the screen and return to the console prompt.

Replacing Units in Service ("Hot-Swapping")

In the event that a VS1000 needs to be removed from service, it is possible to replace it with another VS1000 without taking down the server. To do so, following the instructions under "Hotswap" in the following table.

Note: *Do not use this procedure to add or remove VS1100 expansion units. The VS1000 being swapped in must have the same number of ports as the unit it is replacing.*

Provided the number of ports remains the same, VS1100 expansion units may be "hot-swapped" without further configuration changes or use of the **VS1MAN** utility. However, be sure to power down the VS1000 base unit before disconnecting or reconnecting VS1100 expansion units.

Commands and options are discussed in the following table.

Table 5. VS1MAN Commands

Command	Description
stAte	Check the state of the VS1000 or of one or more ports. After you select this, you are asked to press **V** to check VS1000 units or **P** to check ports. **VS1000** The list of installed VS1000 units is shown and you can select a specific VS1000 by board number or press **A** to check all VS1000 units. A state of INIT is the first level and means the VS1000 is configured but not loaded. A state of ACTIVE means the VS1000 is loaded and running. **Port** The range of port numbers is displayed. Select a specific port by port number or press **A** to check all ports. For each port, the AIO state and line signals (CD, DSR, CTS, etc.) are displayed.
Config	Display the configuration of AIOVS1, VS1000, or of one or all ports. After you select this, you are asked to select the configuration to display. **AIOVS1** The number of VS1000 devices, number of ports, **vs1trace.log** file descriptor, and looping and flow control values are displayed. **VS1000** The list of installed VS1000 units is displayed. You can select a specific VS1000 by board number or press **A** to display all. For each VS1000 selected, the MAC (network address) is displayed. **Port** The list of installed boards and ports is displayed. You can select a specific port by number, or press **A** to display all. For each port selected, the speed, data bits, stop bits, parity, flow control status, and device name is displayed.

Table 5. VS1MAN Commands

Command	Description
Hotswap	This lets you replace an existing and configured VS1000 with an identical unit, without downing the server or reconfiguring ports. *Before you begin*: Shut off the existing VS1000, connect all cables to the new VS1000, and power up the new VS1000. After you press **H**, the list of installed units is displayed. Select the unit to swap out by board number. The MAC address of the selected VS1000 is displayed. Confirm that this is the unit you want to replace, type in the MAC address of the new VS1000, and press **Enter**. The new VS1000 immediately replaces the old one. **Note**: *Do not add or remove VS1100 expansion units while swapping VS1000 units. The unit being swapped in must have the same number of ports as the unit it is replacing.*
Stats	Display statistics for AIOVS1, VS1000, or ports. After you select this, you can press **A** to show AIOVS1 statistics, **V** to display VS1000 statistics, or **P** to display port statistics**.** **AIOVS1** DO NOT USE. Reserved for development use only. **VS1000** For Technical Support use only. Use only when told to do so by Comtrol Technical Support. **Port** Select a port to examine by number or press **A** to view data for all ports. For each port chosen, the following is displayed: AIO receiveBytes=0, transmitBytes=0, txqPut=0, txqGet=0, txqSize=8192, txqCount=0, rxqPut=0, rxqGet=0, rxqSize=8192, rxqCount=0, parityErrors=0, framingErrors=0, overrunSoftware=0, overrunHardware=0 HDLC QOut.cnt=0, QOut.Size=2000, QIn.cnt=0, QIn.Size=2000
aioDtest	DO NOT USE. Reserved for development use only.
Flowctl	DO NOT USE. Reserved for development use only.
eXit	**Exit from** vs1man.

VS1TRACE.NLM

VS1TRACE.NLM is a NetWare Loadable Module (NLM) that controls tracing for the Comtrol InterChangeVS 1000/VS1100 units.

VS1TRACE requires that the VS-Link software (**aiovs1.nlm**) be resident in the system.

Tracing can be enabled or disabled at the AIOVS1, VS1000, or Port level. At the VS1000 or Port level, tracing can be enabled for all VS1000 units or Ports, or for one specific VS1000 or Port. At each level, different types of information are collected.

Tracing can also be enabled when **aiovs1.nlm** is loaded, using the "trace" parameter in the LOAD AIOVS1 command. In this case, tracing is enabled for AIOVS1, all VS1000 units, and all ports simultaneously.

A separate debug screen (*Comtrol VS Trace Display*) can be opened for displaying trace messages.

A log file (**vs1trace.log**) can be created in the SYS directory for recording trace messages. The log file is automatically closed when **vs1trace** is exited or when the log file is disabled manually.

Trace messages can be recorded to **vs1trace.log** and displayed on the debug screen simultaneously. The log file is opened as "shared" so that it can be viewed while trace messages are being recorded. If traces are enabled and neither the **vs1trace.log** nor the vs1trace screen are opened, trace messages are displayed on the System Console screen.

To install the utility, copy the file **vs1trace.nlm** into the SYSTEM directory on the SYS volume.

Operating VS1TRACE

There are two ways to enable tracing: as part of the LOAD AIOVS1 command, or as a standalone module. To enable tracing as part of the LOAD command, see *Creating an AIOVS1 Load Line*.

To run **vs1trace** standalone, follow these steps:

1. At the system console, type: **load vs1trace**

    The command line is displayed:

    > **'C'hange 'D'isplay 'S'creen 'L'ogfile e'X'it):**

2. Press the letter [C, D, S, L, X] of the command you want to execute.

3. When you are done using **vs1trace**, press X to exit. Then press any key to close the screen and return to the console prompt.

Commands and options are discussed in the following table.

Table 6. VS1TRACE Commands

Command	Description
Change	Enable/disable trace functions. After you select this, you can select AIOVS1, VS1000, or Port. **AIOVS1** The AIOVS1 trace functions are shown with their current states (enabled or disabled). Press **Y** to toggle the state or **N** to leave it as-is. **VS1000** The list of installed VS1000s is shown. Select a VS1000 by board number, or press **A** to select all. After you do so the VS1000 trace functions and their current states are listed. Press **Y** to toggle the state, or **N** to leave it as-is. If you selected "All," this repeats until all traces for all VS1000 units have been reviewed. **Port** The list of installed boards and ports is shown. Select a board number and port, or press **A** to select all. After you do, the port trace functions and their current states are listed. Press **Y** to toggle the state, or **N** to leave it as-is. If you selected "All," this repeats until all traces for all ports have been reviewed.
Display	Display trace results. After you select this, you can select AIOVS1, VS1000, or Port. As above, if you select VS1000 or Port, you can select specific VS1000 units/Ports or all VS1000 units/Ports. After you make you selections, the trace results are displayed.
Screen	Toggle the Debug Screen (Comtrol VS Trace Display) enabled/disabled.
Logfile	Toggle the log file (**vs1trace.log**) enabled/disabled.
eXit	**Exit from** vs1trace.

Notes on the Use of Trace Types

This table describes the trace types and their definitions:

Table 7. VS1TRACE Type Codes

Trace Type	Description
INIT	Traces the initialization of **aiovs1**.
ERR	Traces the error conditions. You should trace only devices that are experiencing problems. Turn this on any time you are diagnosing a problem.
LSL	Traces the LSL interface to the Ethernet Driver.
AIO	Traces the AIO interface. Use caution and make sure you are tracing only the port experiencing problems. Use the AIOVS1-level trace only if *nothing* is working.
PORT	Traces the port activities between the server and the InterChangeVS 1000, such as signal changes, modem status changes, and so on.
HDLC	Traces the exchange of packets between the server and the InterChangeVS 1000.
ADM	Traces the administrative activity between the server and the InterChangeVS 1000. This is mainly used to trace problems with loading a VS1000.
DATA	This is used to verify that data is being received/transmitted between AIO and the InterChangeVS 1000. Use sparingly as it can cause a lot of traffic.
QUE	Trace data being placed on and off the various queues.

Printer Configuration

All serial printer configuration is handled through NetWare. See the Novell documentation for troubleshooting procedures and more information.

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