Installation and User's Guide

ACEnic™ Adapter

For Novell NetWare™

Part Number: 050016, Revision B, May 1999

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Preface

This guide describes how to install and use your Alteon WebSystems ACEnic adapter in a Novell NetWare operating environment. The procedures in this manual assume that you are a system or network administrator experienced in installing similar hardware.

How This Book Is Organized

This book is organized as follows:

Chapter 1, "About the ACEnic Adapter," describes the features of the ACEnic adapter and lists the hardware and software requirements for its installation and use.

Chapter 2, "Installing the ACEnic Hardware," tells you how to physically install the adapter in your system.

Chapter 3, "The ACEnic Driver Software," explains how to install the Gigabit Ethernet adapter software under Novell Netware.

Chapter 4, "Troubleshooting," provides a list of items to check for basic installation and configuration problems.

Appendix A, "Specifications," provides adapter hardware specifications.

Operating System Commands

This document may not include all necessary hardware procedures or software commands. Instead, it may name specific tasks and refer you to operating system documentation or the hardware handbook that was shipped with your workstation.

You might need to use supplemental documentation for the following types of information:

- Shutting down the system
- Getting access to the system's PCI slots
- Booting the system
- Configuring devices
- Other basic software procedures

Typographic Conventions

The following table describes the typographic styles used in this book.

Table 1 Typographic Conventions

Typeface or Symbol	Meaning	Example
`AaBbCc123`	This type is used for names of commands, files, and directories used within the text.	View the `readme.txt` file.
	It also depicts on-screen computer output and prompts.	`>> Main#`
`AaBbCc123`	This bold type appears in command examples. It shows text that must be typed in exactly as shown.	`>> Main#` **`sys`**
AaBbCc123	This italicized type appears in command examples as a parameter placeholder. Replace the indicated text with the appropriate real name or value when using the command.	To establish a Telnet session, enter: `host#` **`telnet`** *IP-address*
	This also shows book titles, special terms, or words to be emphasized.	Read your *User's Guide* thoroughly.
[ ]	Command items shown inside brackets are optional and can be used or excluded as the situation demands. Do not type the brackets.	`host#` **`ls`** [**`-a`**]

Contacting Alteon WebSystems

Use the following information to access Alteon WebSystems support and sales.

- URL for Alteon WebSystems Online:

  `http://www.alteon.com`

  This website includes product information, software updates, release notes, and white papers. The website also includes access to Alteon WebSystems Customer Support for accounts under warranty or that are covered by a maintenance contract.

- E-mail access:

  `support@alteon.com`

  E-mail access to Alteon WebSystems Customer Support is available to accounts that are under warranty or covered by a maintenance contract.

- Telephone access to Alteon WebSystems Customer Support:

  1-888-Alteon0 (or 1-888-258-3660)
  1-408-360-5695

  Telephone access to Alteon WebSystems Customer Support is available to accounts that are under warranty or covered by a maintenance contract. Normal business hours are 8 a.m. to 6 p.m. Pacific Standard Time.

- Telephone access to Alteon WebSystems Sales:

  1-888-Alteon2 (or 1-888-258-3662), and press 2 for Sales
  1-408-360-5600, and press 2 for Sales

  Telephone access is available for information regarding product sales and upgrades.

CHAPTER 1

About the ACEnic Adapter

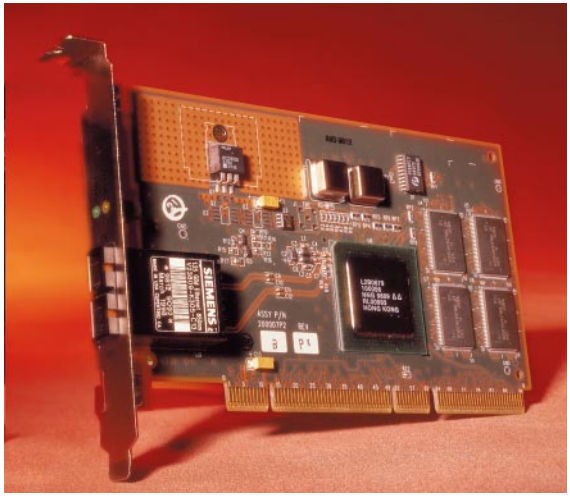


Figure 1 Alteon WebSystems ACEnic Gigibit Ethernet Adapter

The ACEnic adapter connects your PCI-compliant server or workstation to a Gigabit Ethernet network. The adapter incorporates a technology that transfers data at a rate of one gigabit per second—10 times the rate of a Fast Ethernet adapter.

The ACEnic adapter targets the increased congestion experienced at the backbone and server in today's networks, while providing a future upgrade path for high-end workstations that require more bandwidth than Fast Ethernet can provide.

Included with your adapter is the following:

- Anti-static bag (used for protecting the adapter when stored or shipped). Keep the adapter in its packaging until ready for installation.
- ACEnic Gigibit Ethernet Adapter CD-ROM with ACEnic adapter driver software and documentation

Inform your network supplier of any missing or damaged items. If you need to return the adapter, you must pack it in the original (or equivalent) packing material or the warranty will be voided.

Features

- Full-duplex Gigabit Ethernet interface (IEEE 802.3-1998)
- Duplex SC fiber-optic connector
- Interoperability with existing Ethernet and Fast Ethernet equipment
- Standard Ethernet frame size (up to 1,518 bytes)
- Adaptive interrupt frequency (maximizes network throughput; adapts to traffic load)
- Dual DMA channels
- 33/66 MHz, 32-bit or 64-bit PCI bus master with adaptive DMA
- PCI Local Bus Rev 2.1 compliant: 17.3 cm x 10.7 cm (6.8" x 4.2")
- ASIC with on-chip MAC and dual RISC processors
- Universal dual voltage signaling (3.3V and 5V)
- Status LEDs

Key Protocols and Interfaces

The ACEnic adapter is interoperable with existing Ethernet equipment assuming standard Ethernet minimum and maximum frame size (64 to 1518 bytes), frame format, and compliance with the following standards and protocols:

- Gigabit Ethernet (IEEE 802.3z)
- Logical Link Control (IEEE 802.2)
- Flow Control (IEEE 802.3x)

Adaptive Interrupt Frequency

The adapter driver intelligently adjusts host interrupt frequency based on traffic conditions, in order to increase overall application throughput. In light traffic, the adapter driver interrupts the host for each received packet, minimizing latency. When traffic is heavy, the adapter issues one host interrupt for multiple, back-to-back incoming packets, preserving host CPU cycles.

Dual DMA Channels

The PCI interface on the ACEnic adapter contains two independent DMA channels for simultaneous read and write operations.

32-bit or 64-bit PCI Bus Master

Compliant with PCI Local Bus Rev 2.1, the PCI interface on the ACEnic adapter is compatible with both 32-bit and 64-bit PCI buses. As a bus master, the adapter requests access to the PCI bus instead of waiting to be polled.

ASIC with Embedded RISC Processor

The core control for the ACEnic adapter resides in a tightly integrated, high-performance ASIC. The ASIC includes dual RISC processors. This provides the flexibility to add new features to the card and adapt it to future network requirements via software download. This also enables the adapter drivers to exploit the built-in host off-load functions on the adapter as host operating systems are enhanced to take advantage of these functions.

Physical Description

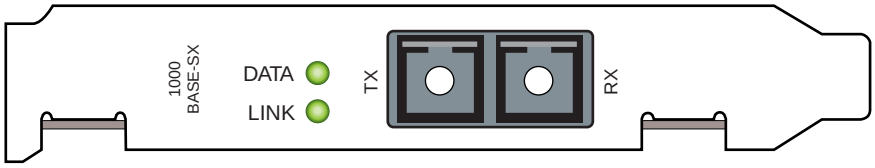


Figure 2 ACEnic adapter faceplate

The faceplate of the ACEnic adapter has one 1000Base-SX fiber-optic connector for connecting the adapter to a Gigabit Ethernet segment. There are also two LEDs: one to indicate link status and one for data transfer status.

Once the adapter hardware and its driver software have been properly installed on your system, the LEDs will signal the following adapter states:

Table 2 ACEnic Port LED Activity

LED	State	Description
Data	Blinking	Data detected on the port.
	On	Data detected on the port.
	Off	No data detected on the port.
Link	Blinking slowly	Port has been disabled by software.
	On	Good link.
	Off	No link; possible bad cable, bad connector, missing or improperly installed driver software, or configuration mismatch.

CHAPTER 2

Installing the ACEnic Hardware

The following instructions apply to installing the ACEnic adapter in most servers. Refer to the manuals that were supplied with your server for details about performing these tasks on your particular system.

System Requirements

Before installing the ACEnic adapter, make sure your system meets the requirements listed in the following table:

Table 3 Hardware and Software Requirements

Category	Requirements
Hardware	■ Pentium-based server that meets Novell NetWare 4.11 software requirements ■ One open 32-bit or 64-bit PCI slot ■ 64MB RAM (minimum)
Software	
Operating System	Novell NetWare 5.0, with the most recent NetWare 5 Support Pack Novell NetWare 4.11 with the most recent Support Pack, including the optional ODI v3.31 LAN drivers (`MISC/ODI331`). Novell NetWare 4.10 Patch Kit and the `ODI33F.EXE` patch You can get the appropriate updates from the Novell support website at `http://support.novell.com/misc/patlst.htm`
Adapter Software	ACEnic adapter driver software, version 1.10 (or higher) for Novell NetWare. See the CD-ROM for these files in both the `\netware\alpha` and `\netware\x86` directories: ■ `alt.lan` (network device driver file) ■ `alt.ldi` (information used by installation program)

Safety Precautions

CAUTION—The adapter is being installed in a server that operates with voltages that can be lethal. Before you remove the cover of your server, you must observe the following precautions to protect yourself and to prevent damage to the system components.

- Remove any metallic objects or jewelry from your hands and wrists.
- Make sure to use only insulated or nonconducting tools.
- Installation or removal of adapters must be performed in a static-free environment. The use of a properly grounded wrist strap or other personal anti-static devices and an anti-static mat is strongly recommended.
- Verify that the server is powered OFF before accessing internal components.

Pre-Installation Checklist

1. **Check that your server meets the hardware and software requirements listed in Table 3 on page 13.**
2. **Verify that your system is using the latest firmware or BIOS.**
3. **Review the information in the `readme` file on the ACEnic CD-ROM for important information not available at the time this manual was printed.**

NOTE – If you acquired the adapter software on a floppy disk or from the Alteon WebSystems support website, please check the appropriate source for the most recent information.

4. **If your system is active, shut it down.**

   If Novell NetWare is currently up and running, use the following commands to gracefully shut down the server functions and reach the DOS prompt:

```
server_name: down
server_name: exit
```

5. **When system shutdown is complete, power OFF your system.**
6. **Holding the adapter card by the edges, remove it from its shipping package it and place it on an anti-static surface.**
7. **Check the adapter for visible signs of damage, particularly on the card's edge connector. Never attempt to install any damaged adapter.**

If the adapter is damaged, report it to your Alteon WebSystems Customer Support Representative. For more information, see "Contacting Alteon WebSystems" on page 7.

PCI Adapter Installation

To install a PCI ACEnic adapter in your system, perform the following procedure.

1. **Observe all precautions and pre-installation instructions on page 14.**

   Before installing the adapter, ensure the system power is OFF, and proper electrical grounding procedures have been followed.

2. **Remove the server cover, and select any empty PCI slot.**

   If you do not know how to identify a PCI slot, refer to your server documentation.

3. **Remove the blank cover-plate from the slot that you selected. Retain the screw so that it can be replaced later.**

4. **Holding the PCI card by the edges, align the adapter's connector edge with the PCI connector dock in the server.**

NOTE – The connector dock in a 32-bit PCI slot is shorter than in a 64-bit PCI slot. Although the adapter is designed to fit in either slot type, when installed in a 32-bit PCI slot, part of the adapter's connector edge will remain undocked. This is perfectly normal.

---

5. **Applying even pressure at both corners of the card, push the adapter card until it is firmly seated in the PCI slot.**

CAUTION—Do not use excessive force when seating the card, as this may damage the server or the adapter. If the card resists seating, remove it from the system, realign it, and try again.

When properly seated, the adapter's port connectors will be aligned with the slot opening, and its faceplate will be flush against the server chassis.

6. **Use the screw removed above (in Step 3) to secure the adapter in the PCI card cage.**

7. **Replace the server cover and disconnect any personal anti-static devices.**

8. **Power the server on.**

Once the server returns to proper operation, the adapter hardware is fully installed. You must next connect the network cables (see page 16) and install the adapter driver software (see Chapter 3).

Connecting the Network Cables

The adapter has one SC-type connector used for attaching the server to a Gigabit Ethernet fiber-optic segment. The port is auto-negotiating and supports full-duplex operation.

1. **Prepare an appropriate cable.**

   The following table lists cable characteristics required for connecting to 1000Base-SX ports:

Table 4 1000BASE-SX Link Characteristics

Description	62.5 Micron	50 Micron
	Shortwave (850 nanometer multimode fiber)	
Operating Range	2 to 260 meters	2 to 550 meters (in compliance with IEEE 802.3z)

2. **As shown in the following diagram, connect one end of the cable to the ACEnic adapter.**

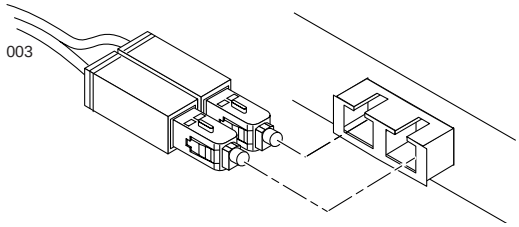


Figure 3 Connecting the network cable to the adapter

3. **Connect the other end of the cable to a Gigabit Ethernet network port.**

   Attach the cable connector so that the TX (transmit) port on the ACEnic adapter is connected to the RX (receive) port of the device at the other end of the cable.

NOTE – The adapter port LEDs are not functional until the adapter driver software is installed. See Table 2 on page 12 for a description of adapter port LED operation. See Chapter 3, "The ACEnic Driver Software," for driver installation and configuration instructions.

CHAPTER 3

The ACEnic Driver Software

A network device driver must be installed before the ACEnic adapter can be used with your Novell NetWare system. This chapter describes how to perform the following tasks:

- Install the driver software in the Novell NetWare environment
- Reconfigure the driver software after installation

Adding the Drivers to a NetWare Server

NOTE – The ACEnic adapter must be physically installed in your server prior to installing the driver software. See Chapter 2, "Installing the ACEnic Hardware," for details.

To install the adapter software for Novell NetWare, perform the following procedure:

1. **Make sure that your server meets the hardware and software requirements described in Table 3 on page 13.**
2. **Go to the Novell support website at `http://support.novell.com`. Click on the "Minimum Patch List" option in the navigation bar.**
3. **Scroll down the page and, using the table below as a guide, select and download the latest support pack or patch file(s) for the operating system running on your system.**

Table 5 NetWare Support Files

NetWare OS	File Name	File to be Installed
5	NetWare 5 Support Pack 2 (or the latest service pack)	NW5SP2.EXE (or the .exe. file associated with the latest service pack)
4.11	Support Pack 6	IWSP6.EXE MISC/ODI331 (part of support pack)
4.10	NetWare 4.10 Patch Kit LAN Drivers	410PT8B.EXE ODI33F.EXE

NOTE – The latest ODI LAN drivers are not automatically installed with the NetWare 4.11 Support Pack. Follow the support pack instructions for including the ODI LAN drivers during installation.

4. **Install the appropriate file(s) on your server, as indicated below:**

   - **NetWare 5 - Already Installed:** Install the latest support pack file(s) and proceed to the next step.
   - **NetWare 5 - Initial Installation:** If you are installing Novell NetWare 5.0 for the first time on your server, this version of the operating system software requires an adapter to already be (physically) installed in the server. You will install the driver software during the NetWare installation procedure.
     Install the latest support pack file(s) and proceed to the next step.
   - **NetWare 4.11:** The adapter driver software is written to the ODI HSM C Language Specification 1.11 from Novell Labs. Install the latest Support Pack, including the optional ODI v3.31 LAN drivers (`MISC/ODI331`), then proceed to the next step.
   - **NetWare 4.10:** Install the NetWare 4.10 Support Kit and the `ODI33F.EXE` patch file, then proceed to the next step.

5. **In the `startup.ncf` file, set the packet receive buffers parameters.**

   For maximum performance, the adapter driver requires 512 additional packet receive buffers for each adapter installed in your system. Make sure that your maximum and minimum packet receive buffer values are increased to take this into account, as shown in the example below.

   Example:

Values prior to adapter configuration	Add 512 for one adapter	Add 1024 for two adapters
maximum packet receive buffers = 2500	3012	3524
minimum packet receive buffers = 1000	1512	2024

NOTE – NetWare 5 Initial Installation: If you are installing NetWare 5 on a server for the first time in conjunction with installing the ACEnic adapter driver, there is no `startup.ncf` file to edit until the operating system is installed. Later in this procedure, you will set the `RecvBuffer` parameter to the minimum number of buffers. For now, proceed to the next step.

In the following sample `startup.ncf` file listing, the buffer values on the **bold** lines have been changed to support one adapter:

```
; The following lines were moved or added by the NetWare Support Pack
LOAD D:\NWSERVER\PK411.NLM
; End of modifications made by NetWare Support Pack installation

LOAD AIC7870.DSK SLOT=2
set maximum packet receive buffers = 3012
set minimum packet receive buffers = 1512

set maximum physical receive packet size = 1530
set cpu hog timeout amount = 0
```

6. **Reboot the Novell NetWare server.**

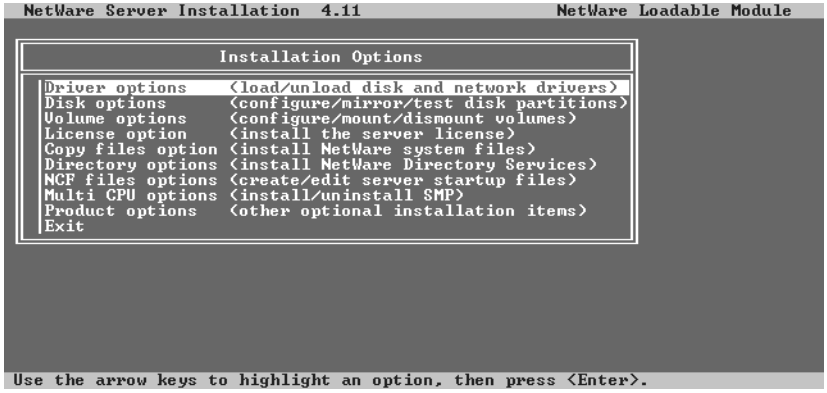
7. **Run the Novell NetWare installation program.**

   At the Novell NetWare server prompt, enter this command:

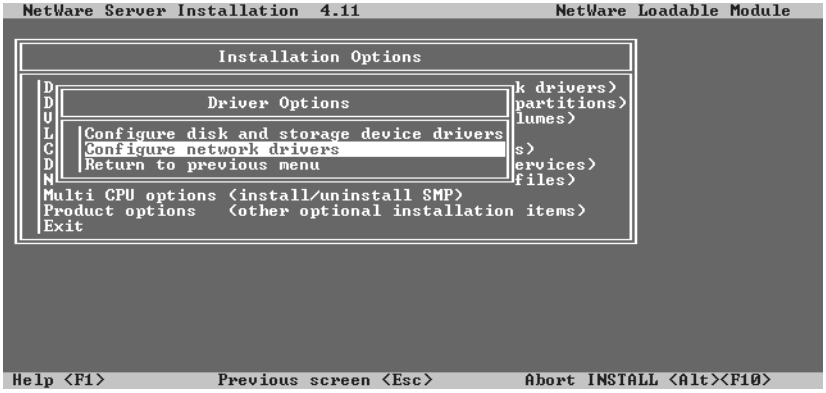
```
server_name: load install
```

NOTE – For Novell NetWare 5, the command is `load nwconfig`.

8. **When the Installation Options menu appears, select "`Driver options (load/unload disk and network drivers)`:"**

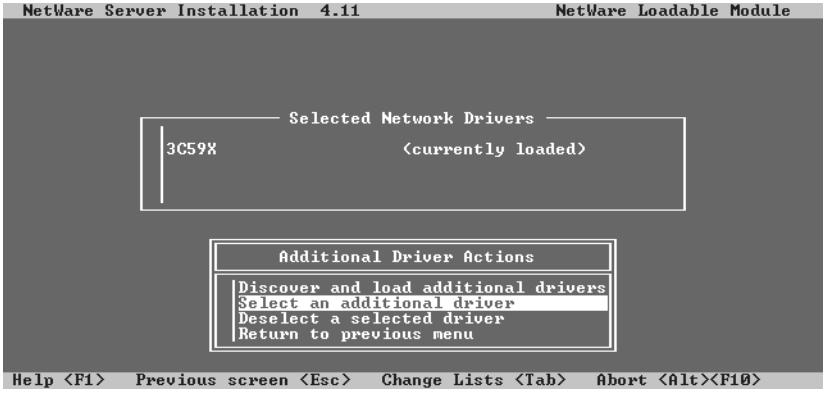


9. **From the Driver Options menu, select "`Configure network drivers`:"**

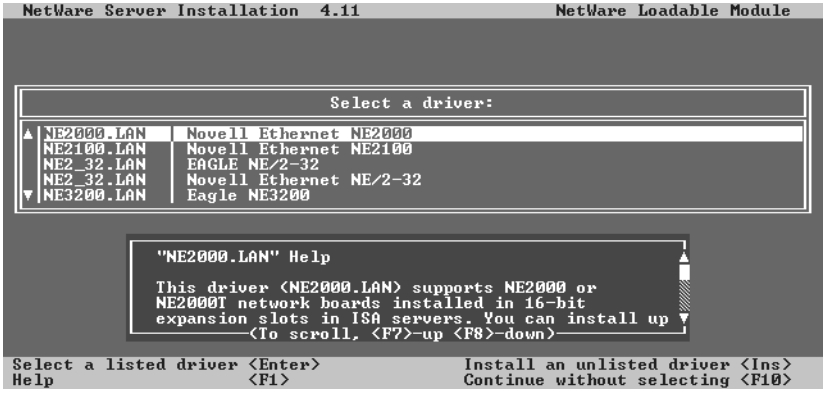


10. **Place the ACEnic CD-ROM into the appropriate CD-ROM drive and mount the CD-ROM on a local directory.**

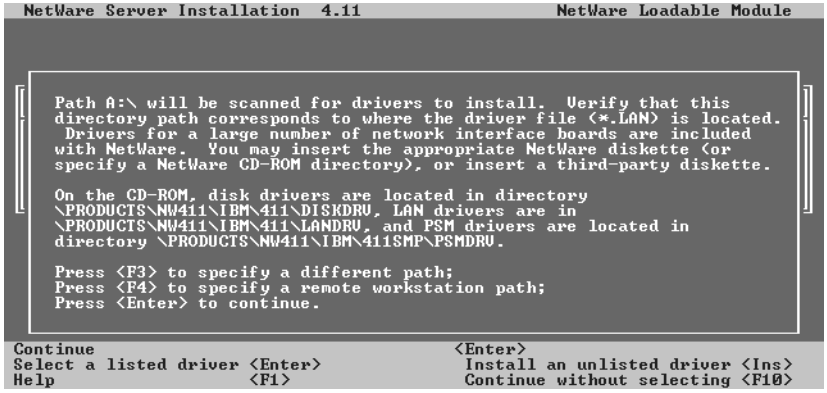
11. **At the Additional Driver Actions menu, choose "`Select an additional driver`:"**



12. **At the Select A Driver menu, press <Ins> (the Insert key) to install an unlisted driver.**



13. **You will be prompted to specify the path for the software drivers:**



The NetWare adapter drivers are located in the following ACEnic CD-ROM directory:

`ACENIC_REV_`*`x`*`:\netware\drivers`

where *x* is the current revision level as stamped on the CD-ROM label.

If the path shown on the installation screen is correct, press <Enter> to continue. Otherwise, press <F3> to specify the path to the ACEnic CD-ROM driver files on your server, or <F4> to specify the path to the driver files on a remote workstation.

NOTE – If you acquired the adapter software on a floppy disk or from the Alteon WebSystems support website, enter the path to where the adapter driver files reside on your system.

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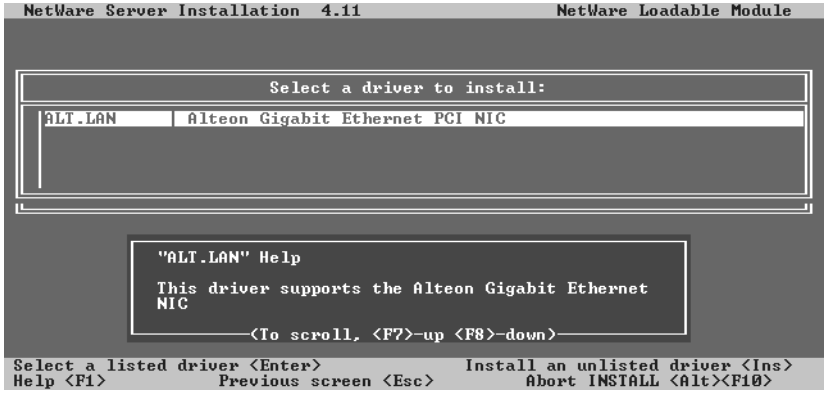
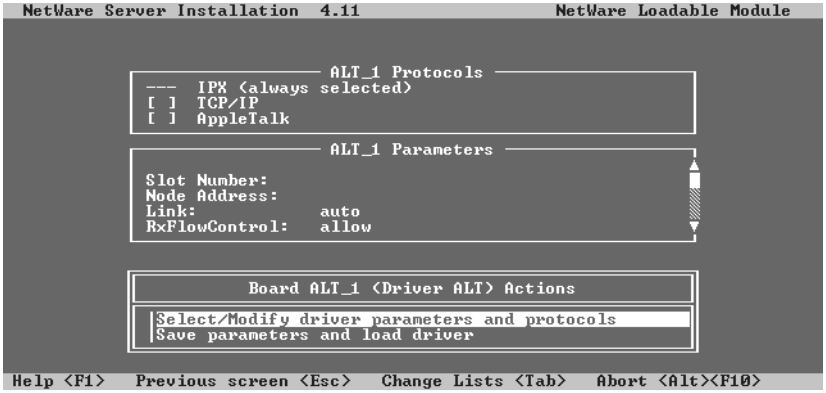
14. **Once the path is selected, the NetWare installation program will scan the CD-ROM for available drivers. When complete, the driver shown below should be displayed:**



15. **Select the `ALT.LAN` driver and press the <Enter> key.**

16. **When prompted whether you wish to copy the driver, select "`yes`." The driver files will then be copied to your hard-drive.**

17. **When the copying is complete, the driver configuration screen appears:**



18. **To configure parameters, choose "`Select/Modify driver parameters and protocols`."**

The configurable driver parameters are described below:

```
Slot Number:
Node Address:
Link:          auto
RxFlowControl: allow
TxFlowControl: off
FDRFiltering: off
RecvBuffers:
Jumbo Frames:  off
Other:
Driver Version:
```

- **`Slot Number`**

  This field is required for proper configuration. Enter the slot of the specific ACEnic adapter currently being configured.

CAUTION—If this parameter is not supplied and there is more than one card installed in a server running NetWare 4.10 or 4.11, a system crash may result.

- **`Node Address`**

  To override the default MAC address, specify a node address in this field.

- **`Link`**

  When you select this field and press <Enter>, you are prompted to choose between "`auto`" and "`off`" settings:

  - The "`auto`" setting activates the IEEE 802.3z compliant link negotiation.
  - When "`off`" is selected, only link signal detection is used.

- **`RxFlowControl`**

  When you select this field and press <Enter>, you are prompted to choose between "`allow`" and "`off`" settings:

  - When "`allow`" is selected, and link parameter is set to "`auto`," the adapter will negotiate 802.3x receive flow control with the device at the other end of the link. If 802.3x flow control is supported by the other device, it will be enabled.
  - When "`off`" is selected, or link parameter is "`off`," receive flow control is disabled.

- **`TxFlowControl`**

  When you select this field and press <Enter>, you are prompted to choose between "`allow`" and "`off`" settings.

  - When "`allow`" is selected, and link parameter is set to "`auto`," the adapter will negotiate 802.3x transmit flow control with the device at the other end of the link. If 802.3x flow control is supported by the other device, it will be enabled.
  - When "`off`" is selected, or link parameter is "`off`," transmit flow control is disabled.

- **`FDRFiltering`**

NOTE – `FDRFiltering` is ignored on Model 710011and 710012 ACEnic adapters. This parameter is included to maintain driver compatibility with earlier models.

  When you select this field and press <Enter>, you are prompted to choose between "`on`" and "`off`" settings:

  - Use "`on`" if the adapter is attached to a full-duplex repeater.
  - Use "`off`" or leave the field blank if the adapter is *not* connected to a full-duplex repeater.

- **`RecvBuffers`**

  To ensure optimum adapter performance, the adapter driver has a default value of 512 packet receive buffers for each ACEnic adapter installed on the network.

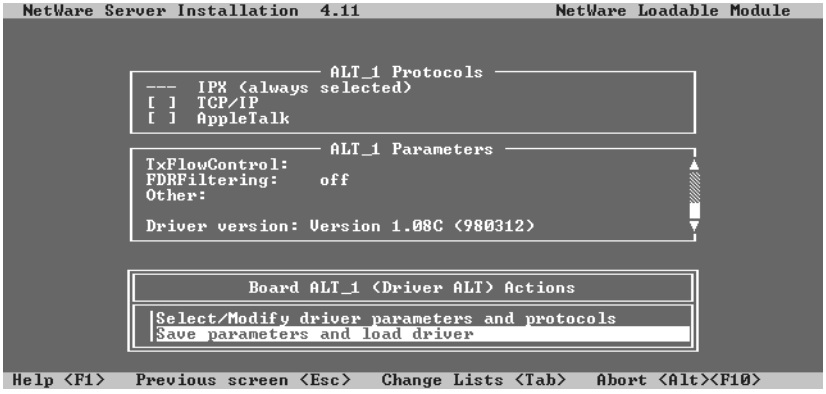
NOTE – NetWare 5 Initial Installation: If you are performing an initial installation of NetWare 5, the driver cannot allocate additional packet receive buffers before installation is complete. The `RecvBuffer` value should be set to 32, the minimum number of buffers the driver requires for each adapter. While this setting will dramatically effect adapter performance, it will allow installation of the operating system.

- **`Other:`** This parameter is reserved for future features or technical support use.
- **`Driver Version:`** This parameter shows the current version of the adapter driver software. It cannot be edited.

19. **If you are performing an initial installation of NetWare 5, set the `Recv Buffer` value to 32, the minimum number of buffers the driver requires for each adapter.**

    After NetWare 5 has been installed, you will need to edit the `startup.ncf` file, then reinstall the driver. To change the `RecvBuffers` parameter without reinstalling the driver, you can edit the `autoexec.ncf` file and, after exiting the NetWare installation program, reboot the server.

20. **After setting all the appropriate parameters, use the arrow keys to scroll downward and select "`Save parameters and load driver`:"**



21. **If this is the first Gigabit Ethernet driver loaded onto your server, you may be prompted to accept a randomly generated IPX number. Only accept or enter a new number for frame types used on your network. Press <Esc> to reject numbers you do not wish to use.**

22. **When prompted whether you wish to select another driver, select "`no`."**

23. **Exit the NetWare installation program.**

    You may have to press <Esc> (the Escape key) a few times in order to return to the main installation menu before you can exit to the NetWare prompt.

Verifying Configuration Parameters

The Novell monitor program and the `config` command are useful for verifying driver configuration.

NOTE – For more information on how to use monitor program or the `config` command, see the *Utilities Reference* in your Novell NetWare online documentation.

The install program adds `load` and `bind` statements to your `autoexec.ncf` file. You can verify the entries and, if necessary, edit them. Below is a sample listing of a valid `autoexec.ncf` file. One set of `load` and `bind` commands (**bolded**) is added for each frame type the adapter is configured to support:

```
set Time Zone = PST8PDT
set Daylight Savings Time Offset = 1:00:00
set Start Of Daylight Savings Time = (APRIL SUNDAY FIRST 2:00:00 AM)
set End Of Daylight Savings Time = (OCTOBER SUNDAY LAST 2:00:00 AM)
set Default Time Server Type = SINGLE

# Note: The Time zone information mentioned above
# should always precede the SERVER name.
set Bindery Context = O=ALTEON

file server name MARS
ipx internal net 34881EEE

load conlog maximum=100
; Network driver LOADs and BINDs are initiated via
; INITSYS.NCF. The actual LOAD and BIND commands
; are contained in INITSYS.NCF and NETINFO.CFG.
; These files are in SYS:ETC.
sys:etc\initsys.ncf

load alt slot=4 frame=Ethernet_802.2 name=alt_1_e82
bind ipx alt_1_e82 net=aaaa

mount all

set immediate purge of deleted files = on
set upgrade low priority threads = on
set display spurious interrupt alerts = on
set display lost interrupt alerts = on
```

The following table lists the parameters that may be defined in the `load` statements.

Table 6 Load Parameters

Parameter	Descriptions
`slot=`*n*	Identifies the slot number for the specific Alteon WebSystems ACEnic adapter currently being configured. This parameter is not necessary if only a single adapter is installed.
`frame=`*type*	Defines the frame type being used by this load instance. Valid types are: ■ `Ethernet_802.2` ■ `Ethernet_802.3` ■ `Ethernet_ii` ■ `Ethernet_snap`
`link=`*n*	A value of 1 activates the 802.3z compliant link negotiation. A value of 0 turns this feature off. The default value is 1.
`name=`*xxx*	The name assigned to this adapter (also specified in the `bind` statement).
`rxflow=`*n*	A value of 1 allows the adapter to negotiate 802.3x flow control with the device at the other end of the link. If 802.3x flow control is supported by the other device, receive pause packets will be respected. A value of 0 disables receive flow control. The default value is 1.
`txflow=`*n*	A value of 0 disables transmit flow control negotiation. The default value is 0. Present adapter hardware does not support any other setting.
`jumboframes=`*n*	A value of 1 enables Jumbo Frames support (frames up to 9,000 bytes long). Set this value to 0 if connecting to a device that supports only standard Ethernet frame sizes (up to 1,500 bytes).
`fdrfiltering=`*n*	This option is ignored by Model 710011and 710012 ACEnic adapters. For earlier models, set this value to 1 if the adapter is attached to a full-duplex repeater. Otherwise, set this value to 0 or leave it blank.
`recvbuffer=`*n*	This value is the number of packet receive buffers pre-allocated by the driver for the ACEnic adapter. The default value is 512.

CHAPTER 4

Troubleshooting

Hardware Diagnostic Utility

ALTDIAG, an MS-DOS based diagnostic utility, is included on the ACEnic CD-ROM. This utility is used for verifying that the adapter hardware is functional. It performs internal and external loopback tests and provides resulting pass/fail information. Perform the ALTDIAG tests any time you wish to rule out or identify possible adapter hardware problems.

To use the ALTDIAG utility, follow this procedure:

1. **Boot your system in clean MS-DOS mode, rather than Novell NetWare.**

   NOTE – To use ALTDIAG, boot your computer in clean MS-DOS mode, with no other plug-ins, add-ons, or resident programs installed.

2. **Disconnect the network cables on all adapters being tested.**

   The loopback tests will not perform properly if the adapter is left connected to other devices.

3. **Connect a loopback cable between the adapter's RX port and its TX port.**

   NOTE – The external loopback test requires a loopback cable connecting the adapter's RX port to its TX port. If a loopback cable is not used, the external loopback test will fail.

4. **Place the ACEnic CD-ROM into your system's CD-ROM drive.**

5. **From the MS-DOS prompt, enter the following commands to access the proper directory:**

```
>e:
>cd \diags
```

   Where "*e:*" is the designation of the CD-ROM drive on your system.

NOTE – If you acquired the diagnostic software on a floppy disk or from the Alteon WebSystems support website, specify the path to where the files reside on your system.

6. **From the MS-DOS prompt, enter the following command to run diagnostics:**

```
>dos4gw altdiag [-c card_number] [-l c:log_filename]
```

If more than one ACEnic adapter is installed in your system, the optional `-c` parameter can be used for specifying the adapter card to be tested. Cards are numbered starting with 0. By default, `ALTDIAG` tests only the first card (number 0) detected in the system.

The optional `-l` parameter is used for defining a file in which to log the test results. A text copy of the `ALTDIAG` test results will be placed in the specified file on the specified drive.

Example: To test the second card in a system and store the test results in `log.txt` in the current directory on the C: drive, the following command could be used:

```
>dos4gw altdiag -c 1 -l c:log.txt
```

7. **Review the test results.**

The test result from the previous example could look like this:

```
Log file created by Development and Diagnostic Test Program v1.02
on: Thu Aug 20 15:28:34 1998
-------------------------------------------
Development and Diagnostic Test Program (ALTDIAG) v1.02

PCI bios found. v0.16.
  HW Mech #1 supported
  Number of PCI buses: 1
Alteon #0 found in PCI bus 0.
Alteon #1 found in PCI bus 0.
2 Alteon card(s) detected
Current card set to bus 0 Alteon #1.
internal Loopback Test
pkts:0  secs:0pkts:48  secs:1pkts:144  secs:2pkts:240
secs:3pkts:320  secs:4pkts:416  secs:5pkts:512  secs:6pkts:592
secs:7pkts:688  secs:8pkts:784  secs:9pkts:864  secs:10pkts:960
secs:11  1000 packets transmitted sucessfully
  1000 packets received sucessfully
     0 errors detected
external Loopback Test
pkts:0  secs:0pkts:96  secs:1pkts:192  secs:2pkts:288
secs:3pkts:368  secs:4pkts:464  secs:5pkts:544  secs:6pkts:640
secs:7pkts:736  secs:8pkts:816  secs:9pkts:912  secs:10  1000 pack-
ets transmitted successfully
  1000 packets received successfully
     0 errors detected
>
```

Both the internal and external loopback example tests show 1000 packets successfully received with 0 errors detected, indicating that the adapter hardware is functioning properly.

If the adapter does not perform as expected, try reinstalling the adapter card or moving it to a different slot or to a different system, then run the `ALTDIAG` tests again. If the card still fails, contact Customer Support.

Checking the Port LEDs

Two port LEDs are located on the faceplate of the ACEnic adapter: one to indicate link status and one for data transfer status (see Figure 2 on page 12). Before the port LEDs can provide troubleshooting information, the adapter must be connected to the network (see Chapter 2), and the network drivers for your particular operating system must be installed (see Chapter 3).

1. **Verify that the adapter driver software has been installed and that the adapter is connected to a network.**

2. **Check to see that the adapter status LEDs operate as described in the following table:**

Table 7 Port LED Activity

LED	State	Description
Data	Blinking	Data detected on the port.
	On	Data detected on the port.
	Off	No data detected on the port.
Link	Blinking slowly	Port has been disabled by software.
	On	Good link.
	Off	No link; possible bad cable, bad connector, or configuration mismatch.

Troubleshooting Checklist

The following checklist provides recommended actions to take to resolve problems installing the ACEnic adapter or running it in your system.

CAUTION—Before opening the cabinet of your system for removing or inserting the adapter, please follow all safety precautions outlined under “Safety Precautions” on page 14.

- Inspect all cables and connections. Verify that the fiber-optic cable connections at the ACEnic adapter and Alteon WebSystems switch are attached properly. Check the length and rating of the cable. Make sure that the cable segment is compliant with the requirements listed in Table 4 on page 16.
- Connect the adapter to a different network port and run the tests again. If the test results reflect that the adapter is functioning properly, the original network port may be defective or improperly configured.

- Check the adapter installation by reviewing Chapter 2. Make sure that the adapter board is properly seated in a PCI slot. Check for specific hardware problems, such as broken traces or loose/broken solder connections.
- Check the configuration settings and change them if they are in conflict with another device.
- Make sure that your system is using the latest BIOS.
- Check the PCI BIOS parameters for proper configuration of the slot where the adapter is installed. The following table shows several possible PCI BIOS parameters (these may not all be available on every system):

Table 8 PCI BIOS Parameters

Parameter	Setting
Bus-Master	Enabled
Interrupt number	Set to any IRQ with does not conflict with another device
Interrupt type	Level
Latency timer	Recommended range is between 20 and 255. This is typically set to 64

- Try inserting the adapter in another slot. If the new position works, the original slot in your system may be defective.
- Replace the failed adapter with one that is known to work properly. If the second adapter works in the slot where the first one failed, the original adapter is probably defective.
- Install the adapter in another functioning system and run the tests again. If the adapter passed the tests in the new system, the original system may be defective.
- Remove all other adapters from the system and run the tests again. If the adapter passes the tests, the other adapters may be causing contention.

APPENDIX A

Specifications

1000BASE-SX Link Characteristics

Description	62.5 Micron	50 Micron
	Shortwave (850 nanometer multimode fiber)	
Operating Range	2 to 260 meters	2 to 550 meters (in compliance with IEEE 802.3-1998)

Performance Specifications

Feature	Specification
PCI clock	66 MHz max
PCI Data/Address	32-bit and 64-bit
PCI data burst transfer rate	132 MB/second (32-bit bus) 264 MB/second (64-bit bus) 528 MB/second (64-bit bus at 66 MHz)
PCI modes	Master/slave
1000Base-SX	1000 Mbps (full duplex)

Physical Characteristics

Dimension	Measurement
Length	17.3 cm (6.8 in.)
Width	10.7 cm (4.2 in.)

Power Requirements

Specification	Measurement
Operating voltage	+5 V ± 5%
Power consumption	7.5 Watts 1.5A @ +5VDC

Environmental Specifications

Condition	Operating Specification	Storage Specification
Temperature	0°C to 55°C (+32°F to +131°F)	-40°C to +85°C (-40°F to +185°F)
Relative humidity	5% to 85% (non-condensing) 40°C, 16 hour dwells at extremes	5% to 95% (non-condensing) 10°C/hour
Altitude	Up to 10,000 ft.	Up to 35,000 ft.
Shock	10g, 1/2 sine wave, 11 msec	60g, 1/2 sine wave, 11 msec
Vibration, peak to peak displacement	0.005 in. max (5 to 32 Hz)	0.1 in. max (5 to 17 Hz)
Vibration, peak acceleration	0.25g (5 to 500 Hz) (Sweep Rate = 1 octave/min.)	0.25g (5 to 500 Hz) (Sweep Rate = 1 octave/min.)