

Installation and User's Guide



ACEnic[™] Adapter For Novell NetWare

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50 Great Oaks Boulevard
San Jose, California 95119
408-360-5500 Main
408-360-5501 Fax
www.alteonwebsystems.com

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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, “Installing 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. It also depicts on-screen computer output and prompts. | View the <code>readme.txt</code> file. Main# |
| AaBbCc123 | This bold type appears in command examples. It shows text that must be typed in exactly as shown. | Main# sys |
| <i>AaBbCc123</i> | 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. This also shows book titles, special terms, or words to be emphasized. | To establish a Telnet session, enter: host# telnet <i>IP-address</i> Read your <i>User's Guide</i> 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.alteonwebsystems.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 The ACEnic 10/100/1000Base-T Gigabit 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 Gigabit 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)
- Supports 32 multicast addresses
- 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 2.2 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 802.3-1999)
- Logical Link Control (IEEE 802.2)
- Flow Control (IEEE 802.3x)

When multiple ACEnics are installed in the same server, they can be paired into *teams*. Up to two teams, each with two adapters, can be configured on the server.

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

1000Base-SX and 1000Base-LX

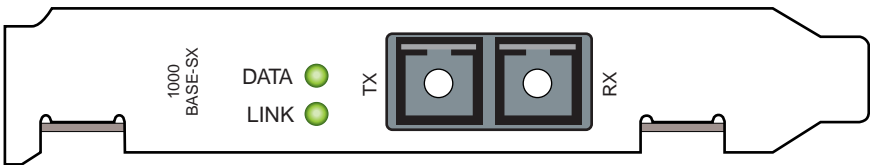


Figure 2 1000Base-SX and 1000Base-LX ACEnic adapter faceplate

Connectors

The faceplate of the ACEnic adapter has one 1000Base-SX/LX fiber-optic connector for connecting the adapter to a Gigabit Ethernet segment.

LEDs

There are two LEDs on the faceplate: 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 indicate the following adapter states:

Table 2 1000Base-SX and 1000Base-LX 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, or configuration mismatch. |

10/100/1000Base-T

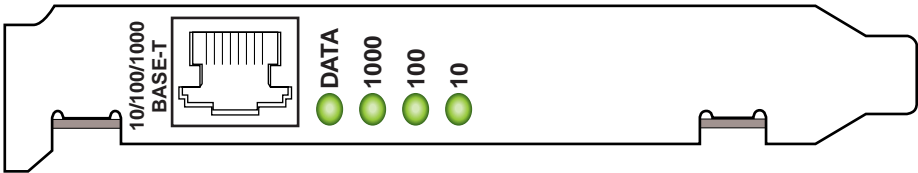


Figure 3 10/100/1000Base-T ACEnic adapter faceplate

Connectors

The faceplate on the 10/100/1000Base-T adapter provides an RJ-45 connector for connecting the adapter to another network device.

LEDs

The faceplate of the ACEnic 10/100/1000Base-T adapter has four LEDs: one for each port speed option (10Mbps, 100Mbps, and 1Gbps), to indicate which link is active, and one LED for data transfer status. Until the driver software is properly installed, all four LEDs will remain lit when the server is powered on.

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

Table 3 1000Base-T ACEnic Port LED Activity

| LED | State | Description |
|------|----------|--|
| Data | Blinking | Brief bursts of data detected on the port. |
| | On | Streams of data detected on the port. |
| | Off | No data detected on the port. |
| 1000 | On | Good 1000 Mbps (Gigabit) Ethernet link. |
| | Off | No 1000 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch. |
| 100 | On | Good 100 Mbps Fast Ethernet link. |
| | Off | No 100 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch. |
| 10 | On | Good 10 Mbps Ethernet link |
| | Off | No 10 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch. |

NOTE – If all four LEDs remain lit simultaneously, the adapter driver software is either missing or improperly installed.

CHAPTER 2

Installing the ACEnic Hardware

The following instructions apply to installing the ACEnic adapter in most systems. Refer to the manuals that were supplied with your system 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 4 Hardware and Software Requirements

| Category | Requirements |
|------------------|--|
| Hardware | <ul style="list-style-type: none">■ Pentium-based computer that meets Novell NetWare 4.2 and 5.0 software requirements■ One open 32-bit or 64-bit PCI slot■ 128MB RAM (minimum) |
| Software | |
| Operating System | Novell NetWare 5.0, with the most recent NetWare 5 Support Pack Novell NetWare 4.2 with the most recent patches and support available from Novell technical support (http://support.novell.com) |
| Adapter Software | ACEnic adapter driver software, version 2.3 (or higher) for Novell NetWare. See the CD-ROM for these files: <ul style="list-style-type: none">■ <code>alt.lan</code> (network device driver file)■ <code>alt.ldi</code> (information used by installation program) |

Safety Precautions



CAUTION—The adapter is being installed in a system that operates with voltages that can be lethal. Before you remove the cover of your system, 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.
 - Verify that the system is powered OFF and unplugged before accessing internal components.
 - 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.
-

Pre-Installation Checklist

1. Check that your system meets the hardware and software requirements listed in [Table 4 on page 15](#).
 2. Verify that your system is using the latest 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.
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](#).

ACEnic Adapter Installation

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

1. Observe all precautions and pre-installation instructions on [page 16](#).

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

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

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

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 system 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 system chassis.

6. Use the screw removed in [Step 3](#) to secure the adapter in the PCI card cage.

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

8. Power the system on.

Once the system returns to proper operation, the adapter hardware is fully installed. You must next connect the network cables (see [page 18](#)) and install the adapter driver software (see [Chapter 3](#)).

Connecting the Network Cables

This section provides information you'll find useful in attaching a network device to either the 1000Base-SX/LX or 10/100/1000Base-T version of the ACEnic adapter.

1000Base-SX/LX Adapter

The adapter has one SC-type connector used for attaching the system 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/LX ports:

Table 5 1000Base-SX/LX Link Characteristics

| | Medium Diameter | Frequency | Cable Type | Operating Range |
|----|-----------------|----------------------------|-------------------|---|
| SX | 62.5 Microns | Shortwave (850 nanometers) | Multimode fiber | 2 to 275 meters (6.5 to 902 feet) |
| | 50 Microns | Shortwave (850 nanometers) | Multimode fiber | 2 to 550 meters (6.5 to 1804 feet) (in compliance with IEEE 802.3-1999) |
| LX | 62.5 Microns | Longwave (1300 nanometers) | Multimode fiber | 2 to 440 meters (6.5 to 1443 feet) |
| | 50 Microns | Longwave (1300 nanometers) | Multimode fiber | 2 to 550 meters (6.5 to 1804 feet) |
| | 9 Microns | Longwave (1300 nanometers) | Single mode fiber | 2 to 5,000 meters (6.5 to 16,404 feet) |

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

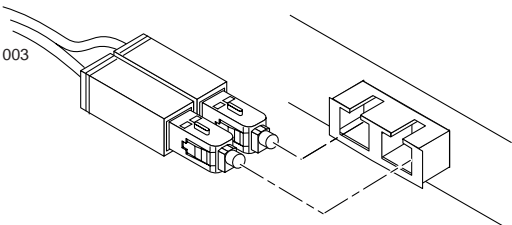


Figure 4 Connecting the network cable to the adapter

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 (they will not reflect port link or data status) until the adapter driver software is installed. See [Table 2 on page 12](#) for a description of adapter port LED operation. See [Chapter 3, “Installing the ACEnic Driver Software,”](#) for driver installation and configuration instructions.

10/100/1000Base-T Adapter

The adapter has one RJ-45 connector used for attaching the system to an Ethernet copper-wire segment. When link negotiation is disabled, the port supports 10Mbps, 100Mbps, or 1000Mbps signaling and either half-duplex or full-duplex operation.

1. **Prepare an appropriate cable.**

The following table lists the cable characteristics for connecting to 10/100/1000Base-T ports:

Table 6 10/100/1000Base-T Cable Specifications

| Port Type | Connector | Media | Maximum Distance |
|----------------|-----------|---------------------|-----------------------|
| 10Base-T | RJ-45 | Cat. 3, 4, or 5 UTP | 100 meters (325 feet) |
| 100/1000Base-T | RJ-45 | Cat. 5 UTP | 100 meters (325 feet) |

NOTE – 1000Base-T signaling requires four twisted pairs of Category 5 balanced cabling, as specified in ISO/IEC 11801:1995 and ANSI/EIA/TIA-568-A (1995) and tested using procedures defined in TIA/EIA TSB95.

2. **Connect one end of the cable to the ACEnic adapter.**

3. **Connect the other end of the cable to an RJ-45 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 (they will not reflect port link or data status) until the adapter driver software is installed. See [Table 3 on page 13](#) for a description of adapter port LED operation. See [Chapter 3](#) for driver installation and configuration instructions.



CHAPTER 3

Installing 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:

- Verify that the required OS support files are installed on the server and the NetWare pre-installation parameters are correctly set.
- Install the driver software in the Novell NetWare environment.
- Reconfigure the driver software after installation, if necessary.

Because network administrators can use more than one method to install device drivers on a NetWare server, this chapter does not attempt to provide detailed installation instructions for each method. Several commonly used methods to install a driver on a NetWare server are listed in [Table 8 on page 23](#), with brief descriptions of the advantages and drawbacks of using each method.

NOTE – If you are installing NetWare 5.0 for the first time on the server, NetWare uses the `nwconfig` program to install the adapter driver during the installation of the operating system.

Table 7 NetWare Device Installation Methods

| Method/ Program | OS Support | Advantage | Drawback |
|--|---------------------------|---|--|
| autoexec.ncf | NetWare 5, NetWare 4.2 | Quick, efficient | Text file interface requires you to accurately enter parameters, using correct syntax. Cannot be used for <i>initial</i> installation of NetWare 5.0 on a server. |
| inetcfg.nlm (Internetworking Configuration) | NetWare 5, NetWare 4.2 | Straightforward graphical user interface, simpler than either nwconfig or install . | Doesn't allow you to modify the parameters database manually. (See Note at the bottom of the table.) |
| nwconfig/ install | NetWare 5 NetWare 4.2 | Graphical user interface enables you to enter all adapter parameters. | Doesn't allow you to modify parameters. To do so requires you to remove the driver software and re-install it on the server. If you are installing Netware 5.0 for the first time on the server, Netware uses the nwconfig program to install the adapter driver during the installation of the operating system. |

NOTE – During the installation process, Novell's Internetworking Configuration (**inetcfg.nlm**) program requires you to bind a protocol to the driver.

Pre-Installation Requirements

Before you can use the Alteon ACEnic adapter in your Novell NetWare system, you must have a network device driver must be installed.

First, make sure that the Alteon ACEnic adapter card is physically installed on your system. Make sure that your server meets the hardware and operating system software requirements described in [Table 4 on page 15](#).

Install the latest support pack files to ensure the ACEnic adapter will function correctly. The support pack or patch file(s) needed for the operating system running on your server are indicated below:

Table 8 NetWare Support Files

| NetWare OS | File Name | File(s) to be Installed |
|------------|--|------------------------------|
| 5 | NetWare 5 Support Pack 4 (or the latest support pack) | NW5SP4.EXE (or latest file) |
| 4.2 | Support Pack 8 (or the latest support pack) | NW4SP8A.EXE (or latest file) |

NOTE – NetWare 5.0: If you are installing NetWare 5.0 for the first time on a server, you will install the Alteon ACEnic adapter driver during the OS installation procedure. You will then install the NetWare 5 support pack after you have successfully installed NetWare 5.0 on the server.

To get the latest support pack files, go to the Novell support website at <http://support.novell.com>. Using [Table 8](#) as a guide, select and download the latest support pack or patch file(s) for the operating system running on your server.

Installing the Adapter Driver

You will use one of two procedures for installing the adapter software, depending on whether NetWare is already running on the server or if you are performing an initial installation of the NetWare 5.0 operating system:

- If NetWare is already running on the server, you can edit the `autoexec.ncf` and `STARTUP.NCF` files to load files and configure the adapter driver. For the procedure, see [“Installing the Driver: NetWare Already Installed” on page 25](#).
- If you are installing the adapter software as part of an initial installation of NetWare 5.0, you can edit the `STARTUP.NCF` file and configure the adapter driver during the normal NetWare 5.0 installation process. This version of the operating system will not allow you to allocate the actual number of receive buffers required by the adapter until installation is complete. Install the driver software using the procedure described in [“Installing the Adapter: Initial Installation of NetWare 5.0” on page 29](#).

Installing the Driver: NetWare Already Installed

This section provides basic guidelines for installing the adapter driver on a server already running the NetWare operating system. This procedure works for NetWare 4.2 and 5.0.

1. **Place the ACEnic CD-ROM into the appropriate CD-ROM drive and mount the CD-ROM on the server.**
2. **Copy the `ALT.LAN` and the `ALT.LDI` files into the `\system` directory.**

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

ACENIC_23x:\NW

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

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.

3. **Edit the `STARTUP.NCF` file. Set the packet receive buffers parameters for the number of adapters installed in the system.**

To ensure optimum performance, add at least 1024 additional packet receive buffers for each adapter installed in your system.

NOTE – Depending on your system configuration, the number of clients being supported, and other requirements, more than 1024 packet receive buffers may be needed for each adapter.

For more information, see [“Editing the `STARTUP.NCF` File” on page 33](#).

4. **If the `listslot.nlm` program has been copied into the `\system` directory, enter the following at the system console/command line:**

LOAD LIST SLOT

The following message should be displayed:

card found in slot *slot-number*

Note the slot number of the ACEnic adapter you are installing; you will need this parameter when you are editing the `autoexec.ncf` file.

5. **Edit the `autoexec.ncf` file and modify adapter load parameters. The adapter parameters that can be defined in the `load` statements are described in [Table 9 on page 27](#).**

Example: A valid `autoexec.ncf` file is shown below. One set of `load` and `bind` commands (in **bold**) is added for each type of frame 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_2
bind ipx alt_1_e82_2 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
```

Table 9 Adapter Load Parameters

| Parameter | Descriptions |
|---------------------|--|
| slot= <i>n</i> | Identifies the slot number for the specific ACEnic adapter currently being configured. This parameter is not necessary if only a single adapter is installed. |
| frame= <i>type</i> | Defines the frame type being used by this load instance. Valid types are: <ul style="list-style-type: none">■ Ethernet_802.2■ Ethernet_802.3■ Ethernet_ii■ Ethernet_snap |
| link= <i>n</i> | Defines whether 802.3 compliant link negotiation is enabled/disabled. <ul style="list-style-type: none">■ A value of 1 (one) activates the IEEE 802.3 compliant link negotiation (default). All ACEnic adapters use link negotiation by default.■ A value of 0 (zero) enables link signal detection. Use this setting when connecting to Ethernet equipment that does not support link negotiation, or if there is a problem establishing a link between the adapter and the connecting device. Unless you specify otherwise, the default signaling speed for the 1000Base-SX/LX and 10/100/1000Base-T adapter is 1Gbps. When link negotiation is off, be sure that the connecting device uses the same duplex and speed settings |
| duplex= <i>n</i> | If link negotiation has been disabled, you can select either half-duplex or full-duplex operation. <ul style="list-style-type: none">■ A value of 1 (one) enables full-duplex signaling (default).■ A value of 0 (zero) enables half-duplex signaling. |
| name= <i>text</i> | The name assigned to this adapter (also specified in the bind statement). |
| speed= <i>value</i> | If link negotiation has been disabled, you can select port speed to be either 10 (Mbps), 100 (Mbps), or 1000 (Mbps). |
| rxflow= <i>n</i> | If link negotiation has been disabled, you can turn 802.3x receive flow control on or off. <ul style="list-style-type: none">■ A value of 1 (one), the default, allows the adapter to 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, receive pause packets will be respected.■ A value of 0 (zero) disables receive flow control. |

Table 9 Adapter Load Parameters (Continued)

| Parameter | Descriptions |
|------------------------------|--|
| txflow=<i>n</i> | <p>If link negotiation has been disabled, you can turn 802.3x transmit flow control on or off.</p> <ul style="list-style-type: none"> ■ A value of 1 (one), the default, allows the adapter to 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, transmit pause packets will be respected. ■ A value of 0 (zero) disables transmit flow control. |
| fdrfiltering=<i>n</i> | <p>This option is ignored by Model 710011 and 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.</p> |
| recvbuffers=<i>n</i> | <p>This value is the number of packet receive buffers pre-allocated by the driver for the ACEnic adapter. The default value is 512.</p> |

6. Save your revisions to the `autoexec.ncf` file and, if all adapter configuration has been completed, reboot the server.

Installing the Adapter: Initial Installation of NetWare 5.0

This section provides information you need to install the adapter driver while performing a fresh install of the NetWare 5.0 operating system.

1. **Use the MS-DOS batch file utility makenw.bat to copy the ALT.LAN, ALT.LDI, and LIST SLOT.NLM files from the CD-ROM to a floppy disk.**

The makenw.bat file and NetWare adapter drivers are located in the following CD-ROM directory:

```
ACENIC_23x:\
```

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

2. **Start the NetWare 5.0 installation and proceed as usual until you reach the Devices Detected screen.**
3. **When you are prompted for an unlisted driver, place the floppy disk into the appropriate drive. Press <Insert> and select the ALT.LAN driver.**
4. **When the driver configuration screen is displayed, choose “Select/Modify driver parameters and protocols.”**
5. **Configure driver parameters, referring to the parameter descriptions below and in [Table 10 on page 30](#).**

```
Slot Number:
Node Address:
Link: auto
Duplex: full
Speed: 1000
RxFlowControl: allow
TxFlowControl: off
FDRFiltering: off
RecvBuffers:
Other:
Driver Version:
```

Table 10 Adapter Configuration Parameters


| Parameter | Description |
|--------------|---|
| Slot Number | <p><i>This field is required for proper configuration.</i> Enter the slot of the specific ACEnic adapter currently being configured.</p> <div>  <p>CAUTION—If this parameter is not correctly supplied and there is more than one card installed in the server, the installation program may crash the system. Use the <code>listslot.nlm</code> program to identify the slot where an ACEnic adapter is installed.</p> </div> |
| Node Address | To override the default Media Access Control (MAC) address, specify a node address in this field. The expected range is 0060CF000000 through 0060CFFFFFFF |
| Link | <p>When you select this field and press <Enter>, you are prompted to choose between “auto” and “off” settings:</p> <ul style="list-style-type: none"> ■ The “auto” setting activates the IEEE 802.3 compliant link negotiation. All Alteon WebSystems Gigabit Ethernet adapters and switches use link negotiation by default. ■ When “off” is selected, only link signal detection is used. Use this setting when connecting to Ethernet equipment that does not support link negotiation, or if there is a problem establishing a link between the adapter and the connecting device. Unless you specify otherwise, the default signaling speed for the Base-SX/LX and 10/100/1000Base-T adapters is 1Gbps. <p>NOTE – When link negotiation is off, be sure that the connecting device uses the same duplex and speed settings.</p> |
| Duplex | <p>When you disable link negotiation while installing an ACEnic Base-SX/LX or 10/100/1000Base-T adapter, you can select either half-duplex or full-duplex operation. If you select this field and press <Enter>, you are prompted to choose between “full” and “half” settings:</p> <ul style="list-style-type: none"> ■ When “full” is selected, full-duplex signaling is enabled (default). ■ When “half” is selected, half-duplex signaling is used. |
| Speed | If link negotiation has been disabled, you can select port speed to be either 10Mbps, 100Mbps, or 1Gbps. |

Table 10 Adapter Configuration Parameters (Continued)

| Parameter | Description |
|----------------|---|
| RxFlowControl | <p>When you select this field and press <Enter>, you are prompted to choose between “allow” and “off” settings:</p> <ul style="list-style-type: none">■ 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 the other device supports 802.3x flow control, Rx flow control will be enabled.■ When “off” is selected, or link parameter is “off,” receive flow control is disabled. |
| TxFlowControl | <p>When you select this field and press <Enter>, you are prompted to choose between “allow” and “off” settings.</p> <ul style="list-style-type: none">■ 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 the other device supports 802.3x flow control, Tx flow control will be enabled.■ When “off” is selected, or link parameter is “off,” transmit flow control is disabled. |
| FDRFiltering | <p>When you select this field and press <Enter>, you are prompted to choose between “on” and “off” settings:</p> <ul style="list-style-type: none">■ 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. <p>NOTE – FDRFiltering is ignored on Model 710011 and 710012 ACEnic adapters. This parameter is included to maintain driver compatibility with earlier models.</p> |
| RecvBuffers | <p>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.</p> <p>NOTE – If performing an initial installation of NetWare 5, the install program will not let you allocate the actual number of packet receive buffers needed by the adapter. During installation, the RecvBuffers value should be set to 32, the minimum number of buffers the driver requires for each adapter. While this setting will dramatically affect adapter performance, it will allow installation of the operating system. Once installation is complete, you need to increase the number of buffers allocated to the system, as described in “Editing the STARTUP.NCF File” on page 33.</p> |
| Other | <p>This parameter is reserved for future features or technical support use.</p> |
| Driver Version | <p>This information field displays the version of the driver software. This field cannot be edited.</p> |

6. Ensure that you have set the `RecvBuffers` value to 32.
7. After NetWare 5.0 has been successfully installed, edit the `STARTUP.NCF` file: Set the packet receive buffers parameter to 1024 for each adapter in the system. For more information, see [“Editing the STARTUP.NCF File” on page 33](#).
8. In the `autoexec.ncf` file, delete the packet receive buffers parameter (`RecvBuffers=32`) in the load statement for this adapter.

Deleting the receive buffers phrase from the load statement will reset the receive buffers parameter to the default value of 512 for this adapter.

Editing the STARTUP.NCF File

To ensure optimum adapter performance, add at least 1024 packet receive buffers for each adapter in the system.

NOTE – Depending on your system configuration, the number of clients being supported, and other requirements, more than 1024 packet receive buffers may be needed for each adapter.

Example: The default maximum number of receive buffers for the system is 500; the minimum is 128.

Table 11 Example Receive Buffers

| Values prior to adapter configuration | Add 1024 for one adapter | Add 2048 for two adapters |
|---------------------------------------|--------------------------|---------------------------|
| maximum packet receive buffers = 500 | 500 + 1024=1524 | 500 + 2048 = 2548 |
| minimum packet receive buffers = 128 | 128 + 1024 =1152 | 128 + 2048 = 2176 |

In the STARTUP.NCF file listing shown below, the buffer values on the lines in **bold** have been changed to support one adapter:

```
LOAD AIC7870.DSK SLOT=2
set maximum packet receive buffers = 1524
set minimum packet receive buffers = 1152

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

Verifying or Modifying Adapter Parameters

When an adapter configuration is saved, the NetWare install program adds load and bind statements to the autoexec.ncf file. By accessing this file, you can verify the parameters configured for each adapter, modify them, or enter additional parameters.

NOTE – The Novell **monitor** program and the **config** command are also useful for verifying driver configuration. For information on how to use these programs, see the *Utilities Reference* in your Novell NetWare online documentation.

The parameters that can be defined in the load statements are described in [Table 9 “Adapter Load Parameters” on page 27](#). A valid `autoexec.ncf` file is shown below. One set of load and bind commands (in **bold**) 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_2
bind ipx alt_1_e82_2 net=aaaa

load alt slot=4 frame=Ethernet_802.2 name=alt_1_e82_3
bind ipx alt_1_e82_3 net=bbbb

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
```

NOTE – If you modify any adapter parameters, you must reboot the system before the changes will take effect. If you make changes and do not reboot, you may experience configuration problems. If no configuration changes have been made, you can click the “No” button to close the configuration session without restarting your system.



CHAPTER 4

Troubleshooting

This chapter describes techniques for troubleshooting your ACEnic adapter and correcting some types of problems. The following topics are covered:

- Instructions for performing detailed hardware diagnostics on the adapter
- Behavior of the adapter's status LEDs
- How to resolve some common networking problems
- How to reach Alteon customer service and support

Hardware Diagnostic Utility

ALTDIAG Internal/External Loopback Test (MS-DOS)

ALTDIAG, an MS-DOS based diagnostic utility, is included on the 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, you *must* 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 Cat. 5 UTP loopback cable to the adapter's RJ-45 jack.

A loopback cable can be constructed by connecting the following pins back to the single connector:

Category 5 Loopback Cable

Pin 1 ————— Pin 3

Pin 2 ————— Pin 6

Pin 4 ————— Pin 7

Pin 5 ————— Pin 8

4. Place the 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 \dosdiags
```

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 Web-Systems 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:

```
e:\ 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` (letter L for “log”) 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:

```
e:\ 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 v2.3.1
on: Thu Apr 6 10:20:46 2000
-----
Development and Diagnostic Test Program ( ) v2.3.1

PCI bios found. v0.16.
    HW Mech #1 supported
    Number of PCI buses: 1
ALTEON #0 found in PCI bus 0.
1 Alteon card(s) detected
Current card set to bus 0 Alteon #0.
internal Loopback Test
pkts:0 secs:0pkts:32 secs:1pkts:144 secs:2pkts:256
secs:3pkts:352 secs:4pkts:480 secs:5pkts:576 secs:6pkts:704
secs:7pkts:800 secs:8pkts:912 secs:9 1000 packets transmitted
sucessfully
    1000 packets received sucessfully
    0 errors detected
external Loopback Test
pkts:0 secs:0pkts:96 secs:1pkts:208 secs:2pkts:320
secs:3pkts:432 secs:4pkts:544 secs:5pkts:656 secs:6pkts:768
secs:7pkts:880 secs:8pkts:992 secs:9 1000 packets transmitted
sucessfully
    1000 packets received sucessfully
    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 Alteon WebSystems Customer Support.

Checking the Port LEDs

1000Base-SX and 1000Base-LX Adapters

Two port LEDs are located on the faceplate of the ACEnic 1000Base-SX 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. **Verify that the adapter status LEDs operate as described in the following table:**

Table 12 1000Base-SX/LX 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. |

10/100/1000Base-T adapter

The faceplate of the ACEnic 10/100/1000Base-T adapter has four LEDs: one for each port speed option (10Mbps, 100Mbps, and 1Gbps), to indicate which link is active, and one LED 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. **Verify that the adapter status LEDs operate as described in the following table:**

Table 13 10/100/1000Base-T ACEnic Port LED Activity

| LED | State | Description |
|------|----------|--|
| Data | Blinking | Brief bursts of data detected on the port. |
| | On | Streams of data detected on the port. |
| | Off | No data detected on the port. |
| 10 | On | Good 10 Mbps Ethernet link |
| | Off | No 10 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch. |
| 100 | On | Good 100 Mbps Fast Ethernet link. |
| | Off | No 100 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch. |
| 1000 | On | Good Gigabit Ethernet link. |
| | Off | No 1000 Mbps link; possible link at different speed, possible bad cable, bad connector, or configuration mismatch. |

NOTE – If all four LEDs remain lit simultaneously, the adapter driver software is either missing or improperly installed.

Troubleshooting Checklist



CAUTION—Before opening the cabinet of your system for removing or inserting the adapter, please review all precautions outlined under [“Safety Precautions” on page 16](#).

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

- Inspect all cables and connections. Verify that the cable connections at the ACEnic adapter and the switch are attached properly. Make sure that the cable length and rating are compliant with the requirements listed in [“Connecting the Network Cables” on page 18](#).
- 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 obvious damage to board components or the PCI edge connector.
- Check the configuration settings and change them if they conflict with another device.
- Make sure that your system is using the latest BIOS.
- 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.

Alteon WebSystems Support Information

For product support information, software updates, and release notes, see [“Contacting Alteon WebSystems” on page 7](#).

APPENDIX A

Specifications

1000Base-SX/LX Link Characteristics

| | Medium Diameter | Frequency | Cable Type | Operating Range |
|----|-----------------|----------------------------|-------------------|---|
| SX | 62.5 Microns | Shortwave (850 nanometers) | Multimode fiber | 2 to 275 meters (6.5 to 902 feet) |
| | 50 Microns | Shortwave (850 nanometers) | Multimode fiber | 2 to 550 meters (6.5 to 1804 feet) (in compliance with IEEE 802.3-1999) |
| LX | 62.5 Microns | Longwave (1300 nanometers) | Multimode fiber | 2 to 550 meters (6.5 to 1804 feet) |
| | 50 Microns | Longwave (1300 nanometers) | Multimode fiber | 2 to 550 meters (6.5 to 1804 feet) |
| | 9 Microns | Longwave (1300 nanometers) | Single mode fiber | 2 to 5,000 meters (6.5 to 16,404 feet) |

10/100/1000Base-T Cable Specifications

| Port Type | Connector | Media | Maximum Distance |
|----------------|-----------|---------------------|-----------------------|
| 10Base-T | RJ-45 | Cat. 3, 4, or 5 UTP | 100 meters (325 feet) |
| 100/1000Base-T | RJ-45 | Cat. 5 UTP | 100 meters (325 feet) |

NOTE – 1000Base-T signaling requires four twisted pairs of Category 5 balanced cabling, as specified in ISO/IEC 11801:1995 and ANSI/EIA/TIA-568-A (1995) and tested for additional performance using testing procedures defined in TIA/EIA TSB95.

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 |
| 10/100/1000Base-T | 10/100/1000 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 \pm 5% |
| Power consumption | 14 Watts 2.8A @ +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 (104°F), 16 hour dwells at extremes | 5% to 95% (non-condensing) 10°C/hour |
| Altitude | Up to 3,048 meters (10,000 ft.) | Up to 10670 meters (35,000 ft.) |
| Shock | 10g, 1/2 sine wave, 11 msec | 60g, 1/2 sine wave, 11 msec |
| Vibration, peak to peak displacement | 0.0127 cm. (0.005 in.) max (5 to 32 Hz) | 0.2540 cm. (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.) |

