

# Installation and User's Guide



## ACEnic™ Adapter v 4.0 For Windows NT

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The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The equipment generates, uses and can radiate radio-frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna, Increase the separation between the equipment and the receiver, Connect the equipment into an outlet on a circuit different from that to which the receiver is connected, Consult the dealer or an experienced radio/TV technician for assistance.

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# Preface

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This *Installation and User's Guide* describes how to install and use the ACEnic adapter with its drivers in a Microsoft Windows NT operating environment. The guide is intended for a system or network administrator experienced in installing similar hardware.

## How This Guide Is Organized

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This manual is organized as follows:

**Chapter 1, “About the ACEnic Adapter,”** describes the features of the ACEnic adapter. This chapter also describes the adapter faceplate and LED indicators.

**Chapter 2, “Installing the ACEnic Adapter,”** lists the hardware and software requirements for adapter installation and use and provides instructions to physically install the adapter in your system.

**Chapter 3, “Installing and Configuring the ACEnic Driver Software,”** explains how to install the ACEnic adapter software for Microsoft Windows NT.

**Chapter 4, “Configuring Adapter Teams,”** describes how to configure a team of ACEnic adapters for team configuration, server load balancing, EtherChannel, and 802.3ad support.

**Chapter 5, “Supporting VLANs,”** provides an overview of VLANs and explains how to configure the ACEnic adapter for use with VLANs.

**Chapter 6, “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 manual that was shipped with your system.

You may want to use supplemental documentation for the following types of information:

- n Shutting down the system
- n Accessing the system's PCI slots
- n Booting the system
- n Configuring devices
- n Following 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#
<b>AaBbCc123</b>	This bold type appears in command examples. It shows text that must be typed in exactly as shown.	Main# <b>sys</b>
<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# <b>telnet</b> <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# <b>ls</b> [-a]



## Contacting Alteon WebSystems

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

- n 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.

- n E-mail access:

[support@alteon.com](mailto: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.

- n 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.

- n Telephone access to Alteon WebSystems Sales:

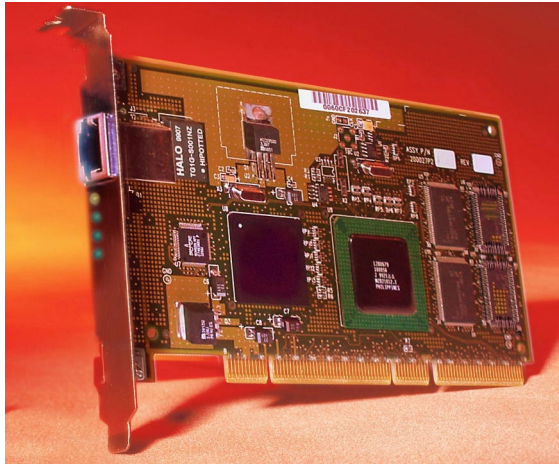
1-888-Alteon2 (or 1-888-258-3662), and press 2 for Sales  
1-408-360-5600, and press 2 for Sales

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 maximum 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 and allows for future upgrade path for high-end workstations when more bandwidth is required than fast ethernet is able to provide.

Included with your adapter is the following:

- n Anti-static bag (used for protecting the adapter when stored or shipped). Keep the adapter in its packaging until ready for installation.
- n 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.

## Feature Summary

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The ACEnic adapter version 4.0 supports the following features:

### System Specification

- n Full-duplex Gigabit Ethernet interface (IEEE 802.3-1999)
- n Interoperability with existing Ethernet and Fast Ethernet equipment
- n Duplex SC fiber-optic connector
- n Standard Ethernet frame size (up to 1518 bytes)
- n Dual DMA channels
- n 33/66 MHz, 32-bit or 64-bit PCI bus master with adaptive DMA
- n PCI-X Rev 1.0 compliant
- n PCI Local Bus Rev 2.2 compliant: 17.3 cm x 10.7 cm (6.8" x 3.75" for fiber and 6.6" x 3.75" for copper)
- n ASIC with on-chip MAC and dual RISC processors
- n Universal dual voltage signaling (3.3V and 5V)
- n Status LEDs

### Key Protocols and Interfaces

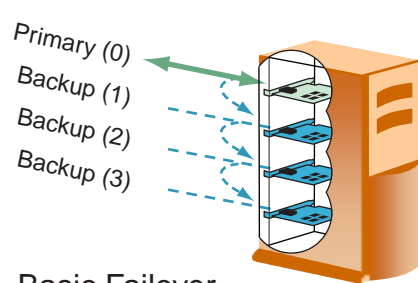
The ACEnic adapter is interoperable with existing Ethernet equipment assuming standard Ethernet minimum and maximum frame size (64 to 1518 bytes), frame format, and compliance with the following standards and protocols:

- n Gigabit Ethernet (IEEE 802.3-1999)
- n Logical Link Control (IEEE 802.2)
- n Flow Control (IEEE 802.3x)
- n Link Aggregation (IEEE 802.3ad)

### Teaming

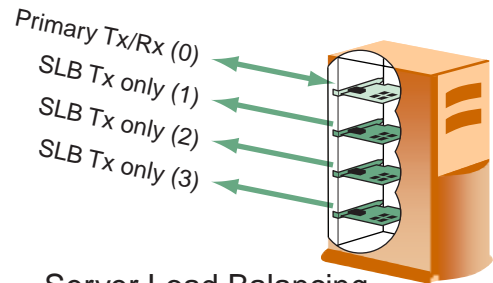
When multiple ACEnic adapters are installed in the same server, they can be paired into *teams*. *Teaming* provides redundant adapter operation in the event that a network connection fails. Multiple adapter teams, each with four adapters, can be configured on the server. The ACEnic adapter provides flexible, scalable bandwidth with resiliency and load sharing across links for

switches, router interfaces and servers. These adapter teams can be configured for basic failover, Server Load Balancing (SLB), EtherChannel, or 802.3ad as shown in the following figures.



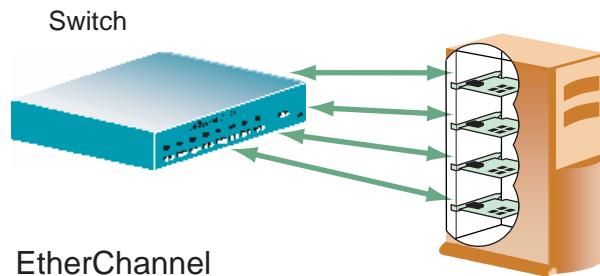
### Basic Failover

Traffic is received and transmitted on the primary adapter. If the link fails, the next adapter on the team takes over.



### Server Load Balancing

With load balancing, traffic is received on one adapter only, but data is transmitted from all the adapters on the team.



### EtherChannel

With EtherChannel support, all the adapters on the team receive and transmit data.

## Failover

If traffic is not seen on the primary adapter on a configured team because of failure of an adapter, cable, switch port, or switch (where the teamed adapters are attached to separate switches), the second adapter on the team becomes active, taking the MAC, IP, and IPX addresses originally assigned to the first adapter. Sessions are usually maintained, with no impact to the user. The ACEnic adapter also supports failover to a LAN On Motherboard (LOM).

## Server Load Balancing

Server load balancing a team of adapters allows all the ACEnic adapters in the team to transmit data while only one adapter receives data. This kind of trunking does not require support from a switch. Server load balancing provides automatic recovery for loss of a link by redistributing loads across remaining links.

The load balancing feature determines which adapter in your system is the least loaded and routes requests to that machine. Because ACEnic adapters intelligently assign requests, all of the adapters can operate at their full capacity—you won't have some adapters sitting idle while others are overloaded. Designed to be highly scalable, the ACEnic adapter will maintain the same high-speed performance even as more adapters are added to the system.

With ACEnic adapters, you can easily build highly available, fault-tolerant sites. When an ACEnic adapter detects that another adapter has failed, traffic is automatically redirected to the remaining adapters in the team.

## EtherChannel

EtherChannel support in the ACEnic adapter provides fault-tolerant, high-speed links between a team of adapters and a switch. EtherChannel support allows all the adapters in the team to transmit and receive data.

Both Fast and Gigabit EtherChannel bundles can be configured as trunk links. After a channel has been formed, configuring any port in the channel as a trunk applies the configuration to all ports in the channel. Port aggregation facilitates the automatic creation of EtherChannel links by exchanging packets between channel-capable ports.

If a link does fail, EtherChannel support will redirect traffic from the failed link to the remaining links in less than a second. Without EtherChannel support, connectivity options are limited to the specific line rates of the interface.

## IEEE 802.3ad

The ACEnic adapters support the standard link aggregation protocol 802.3ad, which is both interoperable and backward compatible with existing Ethernet devices. The primary goal of link aggregation is to increase effective connection capacity by combining several links into one logical trunk.

## PCI-X Support

PCI-X is a backward compatible, high-performance extension to the PCI Local Bus. PCI-X is anticipated first in servers and workstations that require higher bandwidth, with potential use in desktops and additional applications in embedded systems and data communications segments of the industry.

PCI-X is designed to bring the PCI Local Bus data throughput performance to over 1 Gbps (8 Gbps) running at frequencies of up to 133 MHz at either 32-bit or 64-bit widths. PCI-X brings more efficient bus operation allowing easier interface with memory controllers, bridges, and other advanced I/O solutions.

PCI-X also supports *split transactions*, which allows an initiator device to make only one data request and relinquish the bus, rather than continuously poll the bus for a response. The byte count support enables the initiator to specify the number of bytes requested, eliminating the inefficiency of speculative pre-fetches.

## Jumbo Frames Support

When sending Ethernet traffic at Gigabit speeds, considerable bandwidth is consumed by the overhead of handling a multitude of standard, 1518 byte packets. ACEnic adapters and ACE switches support Ethernet frames of up to 9014 bytes. Host CPU utilization is significantly reduced and network throughput is enhanced when enabling Jumbo Frames between servers with ACEnic PCI adapters.

For UDP traffic, an ACEnic adapter can support both standard Ethernet frames and Jumbo Frames. When attached to an Alteon WebSystems switch, Jumbo Frames are sent only between servers that have ACEnic adapters. When attached to a standard Ethernet device, a Jumbo Frames-enabled server may send UDP data in Jumbo Frames. When the data reaches the switch, however, the switch will automatically fragment the data into standard Ethernet frames before forwarding the data to all other standard Ethernet devices.

For non-UDP traffic, Alteon WebSystems recommends that both servers support Jumbo Frames.

## VLANs Support

Virtual Local Area Networks (VLANs) are commonly used to split groups of network users into manageable broadcast domains, to create logical segmentation of workgroups, and to enforce security policies among segments. VLAN support is implemented using IEEE 802.1Q-1998 tagging. You can have up to 64 VLANs per adapter, depending on the amount of memory available in your system.

With multiple VLANs on an adapter, a server with a single adapter can have a logical presence on multiple IP subnets. For details about planning networks with VLANs, refer to [“Overview” on page 50](#) and your Alteon WebSystems switch software manual.

## DMI 2.0 Support

Desktop Management Interface (DMI) 2.0 support on the ACEnic includes several standard DMTF-defined groups (Desktop Management Task Force), as well as IBM-defined groups that are used by IBM HotPlug/HotSwap Wizard for NT4.

## 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 Direct Memory Access (DMA) channels for simultaneous read and write operations.

## 32-bit or 64-bit PCI Bus Master

Compliant with PCI Local Bus Rev 2.2, 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.

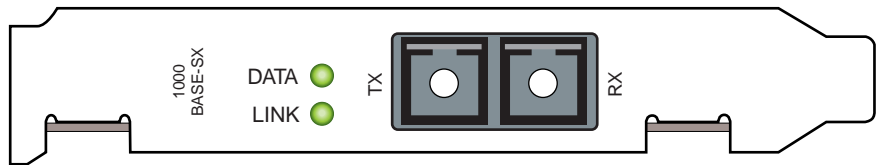
## ASIC with Embedded RISC Processor

The core control for the ACEnic adapter resides in a tightly integrated, high-performance Application Specific Integrated Circuit (ASIC). The ASIC includes dual RISC processors. RISC processors provide the flexibility to add new features to the card and adapt it to future network requirements via software download. They also enable 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 or 1000Base-LX Adapters



**Figure 2** 1000Base-SX or 1000Base-LX ACEnic Adapter Faceplate

### Connectors

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

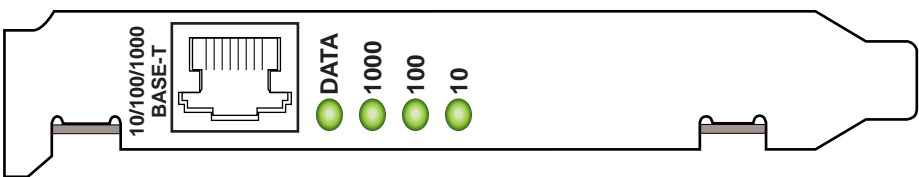
### LEDs

There are two LEDs on the faceplate—one for data transfer status and one to indicate link 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 or 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	On	Port has been disabled by software.
	On	Good link.
	Off	No link; possible bad cable, bad connector, or configuration mismatch.

## 10/100/1000Base-T Adapters



**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 LED for data transfer status and one for each port speed option (1000Mbps, 100Mbps, 10Mbps), to indicate which link is active. 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** 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.
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.

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

## CHAPTER 2

# Installing the ACEnic Adapter

The following instructions apply to installing the ACEnic adapter in most systems. Refer to the manuals that were supplied with your computer 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 Table 4:

**Table 4** System Requirements

Category	Requirements
<b>Hardware</b>	<ul style="list-style-type: none"><li>n Pentium-based computer that meets Windows NT 4.0 software requirements</li><li>n One open 32-bit or 64-bit PCI slot</li><li>n 128MB RAM (minimum)</li></ul>
<b>Software</b>	
Operating System	Microsoft Windows NT 4.0 (server or workstation) with Service Pack 4 or later
Adapter Software	ACEnic adapter driver software, version 4.0 or higher for Windows NT. Verify the following files in the CD-ROM: <ul style="list-style-type: none"><li>n \NT40\ACENDIS.SYS (network device driver file)</li><li>n \NT40\ACEVLAN.SYS (intermediate device driver file)</li><li>n \NT40\ACEDLG.DLL (information used by installation program)</li><li>n \NT40\ACEDLG.HELP and \NT40\ACEDLG.CNT (help files)</li><li>n PCIDUMPR.SYS (PCI scan driver)</li><li>n OEMSETUP.INF (information file)</li></ul>

## Safety Precautions

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**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.

- n Remove any metallic objects or jewelry from your hands and wrists.
  - n Make sure to use only insulated or nonconducting tools.
  - n Verify that the system is powered OFF and unplugged before accessing internal components.
  - n 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

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Follow these steps before installing an ACEnic adapter:

1. **Ensure that your server meets the hardware and software requirements listed on [Table 4 on page 19](#).**
2. **Verify that your system is using the latest BIOS.**
3. **Review the information in the `readme` file on the CD-ROM for important information not available at the time this guide was created.**

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**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.

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4. **If your system is active, shut it down.**  
If Windows NT is currently up and running, close all applications and select Start | Shut down | Shut down the computer.
5. **When system shutdown is complete, power OFF and unplug your system.**
6. **Hold the adapter card by its edges, and remove it from the shipping package 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 9](#).

# ACEnic Adapter Installation

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

1. **Observe all precautions and pre-installation instructions on [page 20](#).**

Before installing the adapter, ensure the system power is OFF and unplugged from the power outlet, and that 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 coverplate from the slot that you selected. Retain the screw so that it can be replaced later.**

4. **Hold the PCI card by its edges and 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.

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



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

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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 then connect the network cables (see [page 23](#)) and install the adapter driver software (see [Chapter 3](#)).

# Connecting the Network Cables

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This section provides information you will find useful in attaching a network device to the ACEnic 1000Base-SX/LX or 10/100/1000Base-T adapter.

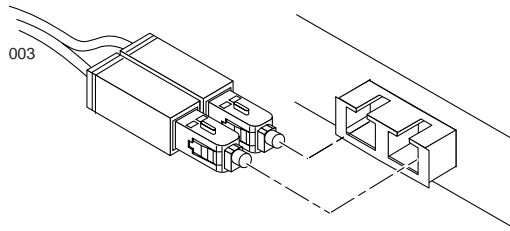
## 1000Base-SX or 1000Base-LX Adapters

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.**

For information on cable characteristics, see [“1000Base-SX and 1000Base-LX Link Characteristics” on page 73](#).

- 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.

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**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 17](#) for a description of adapter port LED operation. See [Chapter 3](#) for driver installation and configuration instructions.

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## 10/100/1000Base-T Adapter

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

- 1. Prepare an appropriate cable.**

For information on cable characteristics, see [“10/100/1000Base-T Cable Specifications” on page 74.](#)

- 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.**

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**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 18](#) for a description of adapter port LED operation. See [Chapter 3](#) for driver installation and configuration instructions.

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## CHAPTER 3

# Installing and Configuring the ACEnic Driver Software

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A network device driver must be installed before the ACEnic adapter can be used with your Windows NT system. This guide describes how to install the driver software.

- n [“Pre-installation Tasks” on page 25](#)
- n [“Installing the Driver Software” on page 26](#)
- n [“Modifying Configuration Parameters” on page 30](#)
- n [“Updating the Driver Software” on page 35](#)
- n [“Removing the Driver Software” on page 37](#)
- n [“Moving the Adapter to a Different Slot” on page 38](#)

## Pre-installation Tasks

---

- n Make sure the **ACEnic adapter** is physically installed in your server or workstation prior to installing the driver software. See [Chapter 2, “Installing the ACEnic Adapter”](#) for details.
- n Verify that Windows NT is upgraded with Service Pack 4 or later. If you attempt to install the adapter driver on a newly installed Windows NT system (without Service Pack 4 or later), the driver will not install. An error message will be displayed, indicating that you must exit the installation and first install Service Pack 4 or later. For Backup Domain Controller (BDC) installation, see the readme file on the CD-ROM for more information.
- n Remove old ACEnic drivers prior to version 2.3 before you start installing the drivers for the new ACEnic adapter. To remove the old ACEnic adapter drivers, refer to [“Removing the Driver Software” on page 37](#). To update ACEnic adapter version 2.3 or higher to the most recent release, follow the procedure under [“Updating the Driver Software” on page 35](#).
- n Upgrade the operating system BHNT . SYS file to the latest version available to prevent an abnormal end of task (ABEND) when using the Windows NT Network Monitor.

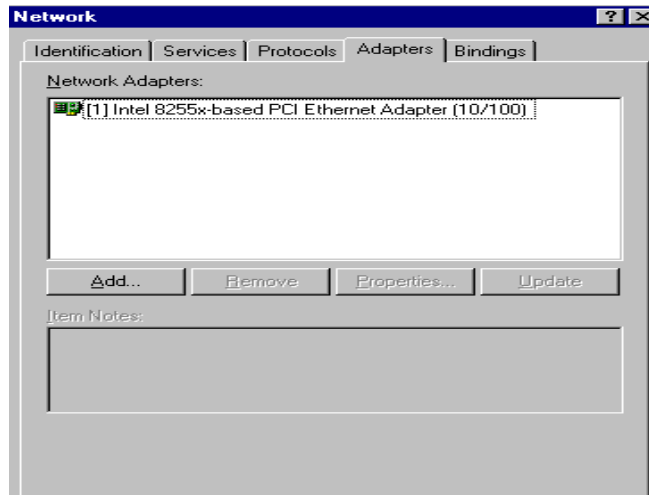
# Installing the Driver Software

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To install the ACEnic adapter software for Windows NT, perform the following procedure:

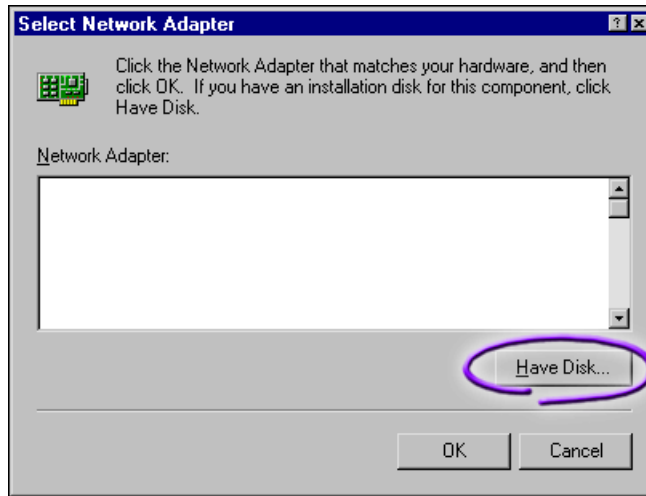
1. **Start your Windows NT system and log in with Administrator privileges.**
2. **Open the Control Panel and double-click the “Network” icon.**
3. **When the Network window opens, select the “Adapters” tab.**

Any previously installed drivers are listed under Network Adapters.



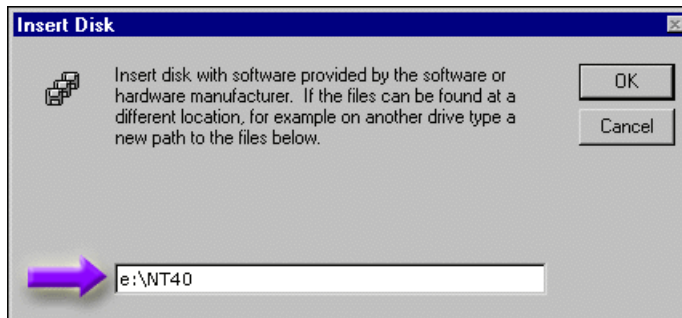
4. **Click the “Add” button to install the driver software for an ACEnic adapter.**

5. Click the “Have Disk...” button in the Select Network Adapter window.



6. Insert the CD-ROM that came with your ACEnic adapter into your system's CD-ROM drive and type the path to the driver and click “OK”.

For example, enter the following path where “e:” is the CD-ROM drive on your system.

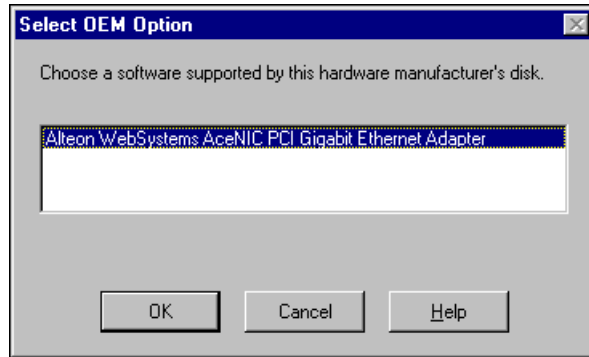



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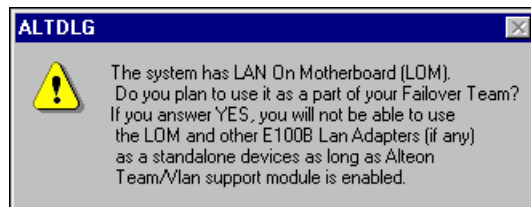
**NOTE** – If you acquired the ACEnic driver software on a floppy diskette or from the Alteon WebSystems support Website, enter the path to the location of the adapter driver files on your system.

---

7. In the Select OEM Option window, ACEnic Adapter Software Release will be highlighted. Click the “OK” button.

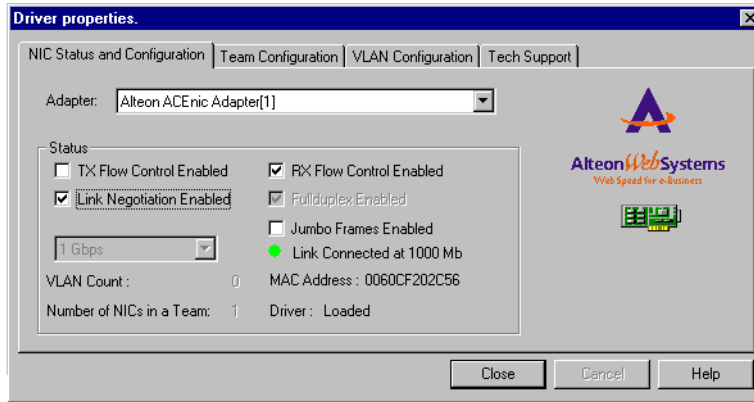


After the ACEnic driver software is copied to your system and if a dissimilar adapter, such as LAN On Motherboard (LOM), and its driver software are installed in your system, the following dialog box is displayed.



The system will allow only one intermediate driver to be loaded at a time. Advanced options—such as teaming, load balancing, EtherChannel support, and Virtual Local Area Networks (VLANs), can be configured for either ACEnic adapters or a stand-alone LOM, but not both. If you click “Yes” in the above dialog box, a LOM can be configured only as a member of an adapter team.

**8. The ACEnic Driver Properties window will open.**



After the Driver properties window opens, the NIC Status and Configuration tab is automatically selected. The options under this tab are used for configuring basic adapter properties. Refer to the [“Modifying Configuration Parameters” on page 30](#) to configure the driver properties.

- 9. When configuration is complete, click the “Close” button in the Driver Properties window.**
- 10. In the Network window, click the “Close” button.**

---

**NOTE –** If other adapters in your system use TCP/IP bindings, the TCP/IP Properties window will open.

---

**11. Configure TCP/IP addresses, if necessary, and click the “OK” button.**

For help in configuring TCP/IP protocol, refer to your Microsoft Windows NT 4.0 documentation.

**12. Click “Yes” when prompted to restart your computer.**

The system will restart, using the new configuration settings.

**13. When the system returns to proper operation, verify that the adapter port LEDs operate as described in [Table 3 on page 18](#).**

# Modifying Configuration Parameters

---

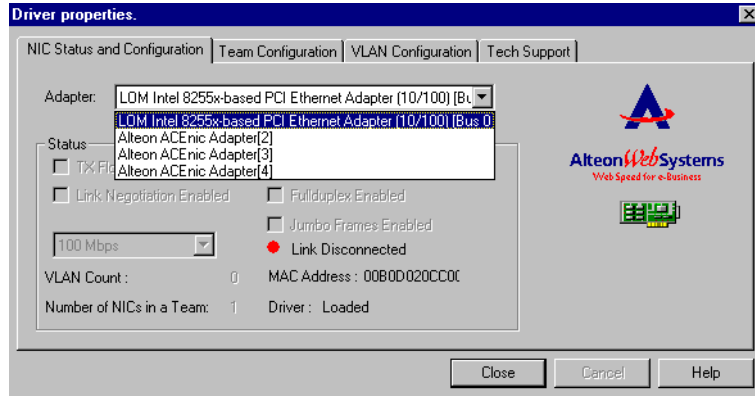
Once the adapter driver software has been installed, you can examine and change the configuration options at any time. The following adapter parameters are user-configurable:

- n Basic properties
  - ¥ Tx flow control
  - ¥ Rx flow control
  - ¥ Jumbo Frames
  - ¥ Link negotiation
  - ¥ Full-duplex/half-duplex operation
  - ¥ Port link speed
- n Optional properties
  - ¥ Adapter teams
  - ¥ Teaming
  - ¥ Load balancing
  - ¥ EtherChannel support
  - ¥ VLAN support

Use this procedure to access the Driver properties window.

1. **Open the Control Panel and double-click the “Network” icon.**
2. **When the Network window opens, select the “Adapters” tab.**
3. **Select an ACEnic adapter, LAN on motherboard (LOM), or adapter team entry and click the “Driver Properties” button.**

The Driver Properties window is displayed.



Each tab near the top of the Driver Properties window represents a different set of configurable options.

4. **Configure basic properties under the NIC Status and Configuration tab.**

Although the default values should be appropriate in most cases, you may change any of the available options to meet the requirements of your specific system.

The following options are displayed:

#### n Adapter

This field identifies which ACEnic adapter or team is being configured. In a system with multiple ACEnic adapters, select this field to access a pull-down list of the available adapters and teams. Each ACEnic adapter installed in the system is labeled with a unique instance number. Typically, the first adapter detected is instance 1, the second is instance 2, and so on.

Adapters that are paired into teams for automatic teaming, load balancing, EtherChannel, or 802.3ad support (see [Chapter 4, “Configuring Adapter Teams”](#)) are not listed individually. Instead, the defined team is listed. When a team is selected, the adapters within the

team are configured as a group, and the configuration parameters of the primary adapter are applied to the team. To configure an individual adapter in a manner different from the team, it must first be removed from the Team.

---

**NOTE** – Release 4.0 supports grouping adapters with an Intel LAN on motherboard (LOM) into teams.

---

#### n Link Negotiation

- ☒ When checked (default), IEEE 802.3-1999 compliant Gigabit Ethernet link negotiation is enabled. All ACEnic adapters use link negotiation by default.
- ☒ When unchecked, only link signal detection is enabled. Use this setting when connecting to Ethernet equipment that does not support link negotiation or when a problem arises in establishing a link between the adapter and the connecting device. Unless otherwise specified, the default signaling speed for the 1000Base SX/LX adapter and the 10/100/1000Base-T adapter is 1Gbps.  
  
When link negotiation is disabled, be sure that the connecting device uses the same duplex and speed settings.

---

**NOTE** – When link negotiation is on, the user-configured link speed and duplex settings are ignored in favor of automatically determined settings.

---

#### n Full Duplex Enabled

When link negotiation is unchecked, this parameter sets the duplex mode. You can select either half-duplex or full-duplex operation.

- ☒ When checked, full-duplex signaling is used (default).
- ☒ When unchecked, half-duplex operation is used.

#### n Tx Flow Control

- ☒ When Tx flow control is checked and link negotiation is enabled, 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, Tx flow control will be enabled.
- ☒ When Tx flow control is checked and link negotiation is disabled, you must check Full Duplex Enabled in order for Tx flow control to work properly. Tx flow control will not function under half-duplex operation.
- ☒ When Tx flow control is unchecked (default), or when Full Duplex Enabled is unchecked, transmit flow control is disabled.



## n Rx Flow Control

- ⌘ When Rx flow control is checked (default) and link negotiation is enabled, 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, Rx flow control will be enabled.
- ⌘ When Rx flow control is checked (default) and link negotiation is disabled, you must check Full Duplex Enabled in order for Rx flow control to work properly. Rx flow control will not function under half-duplex operation.
- ⌘ When unchecked, or when Full Duplex Enabled is unchecked, receive flow control is disabled.

## n Jumbo Frames

- ⌘ When checked, Jumbo Frames (up to 9014 bytes) will be supported by the ACEnic adapter. This setting can reduce host CPU overhead and increase bandwidth when sending to other devices that support Jumbo Frames. When attached to an Alteon WebSystems switch, Jumbo Frames will be sent only between end-stations that have ACEnic adapters. When sending to standard Ethernet devices, the switch will automatically fragment the Jumbo Frames traffic into standard Ethernet frames.
- ⌘ When unchecked (default), only standard-sized Ethernet frames will be sent. Use this setting when connecting to Gigabit Ethernet equipment that does not support Jumbo Frames.

## n Port Link Speed

When link negotiation is disabled, this parameter sets the port link speed. You can select link speed to be either 10Mbps, 100Mbps, or 1Gbps. When the port link is connected, the selected link speed is indicated to the right of this field.

## n VLAN Count

This field reflects the number of VLANs configured for the selected adapter. When there are no VLANs configured for the selected adapter, VLAN support is disabled. This is an information field and cannot be configured through this tab.

---

**NOTE** – ACEnic adapters that are members of a team can be configured to support VLANs. However, VLANs cannot be configured for a stand-alone LOM, or for a team that includes a LOM.

---

## n Number of NICs in a team

When a team is selected in the Adapter list, this field represents the total number of adapters configured for the selected team. This field does not apply when an individual (non-teamed) adapter is selected in the Adapter list. This is an information field and cannot be configured directly through this tab.

**5. Perform any optional configuration, if desired.**

Optional configuration can be performed now, or at any later time when the feature is required.

- n To configure adapter teams for teaming, load balancing, or EtherChannel support, refer to [“Configuring for Failover, Server Load Balancing, EtherChannel, or 802.3ad”](#) on page 45.
- n To configure for VLAN support, refer to [“Configuring for VLAN Support”](#) on page 52.

**6. When all desired configuration is complete, click the “Close” button to accept the settings.**

**7. In the Network window, click the “Close” button.**

**8. When prompted to restart your computer, click the “Yes” button. The system will restart, using the new configuration settings.**

---

**NOTE** – If you modify any configuration parameters, you must restart the system before the changes will take effect. If you make changes and do not restart, 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.

---

## Updating the Driver Software

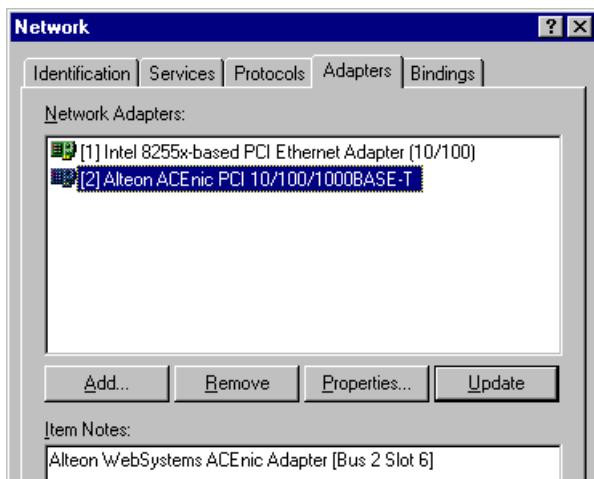
Use the following procedure to replace ACEnic adapter drivers version 2.3 or the most recent release.

---

**NOTE** – Do not use the update procedure to overwrite older ACEnic adapter drivers prior to version 2.1. If any older ACEnic drivers are on your system, they must be **removed** prior to installing the new drivers (version 2.3 or higher).

---

1. Start your Windows NT system and log in with Administrator privileges.
2. Open the Control Panel and double-click the “Network” icon.
3. When the Network window opens, select the “Adapters” tab.



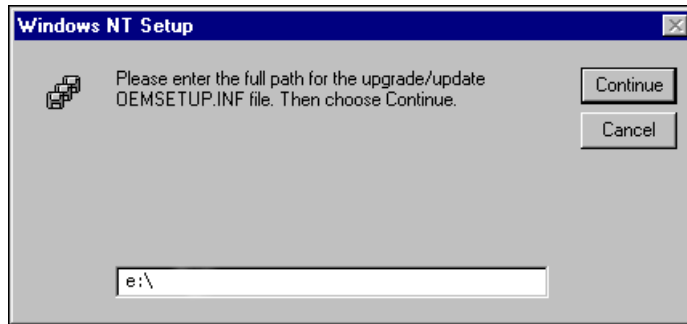
Any previously installed ACEnic driver software is listed under Network Adapters.

4. Select an Alteon ACEnic adapter and click the “Update” button.

5. When prompted, insert the CD-ROM into your system's CD-ROM drive, type the path to the driver that matches your system, and click the "Continue" button.

For example, enter the following path: **e:\** where "**e:**" is the CD-ROM drive on your system.

The system will then copy the appropriate adapter files from the CD-ROM.



---

**NOTE** – If you acquired the ACEnic adapter software on a floppy disk or from the support Website, enter the path to the location of the adapter driver files on your system.

---

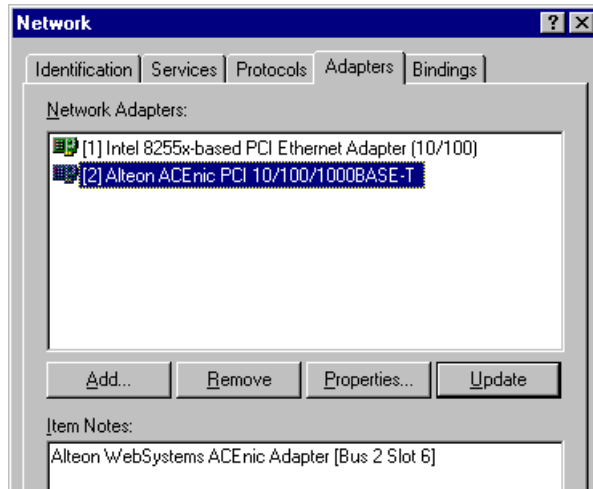
6. When the copying process is complete, click the "Close" button in the Network window.
7. When prompted to restart your computer, click the "Yes" button.

The system will restart, using the new configuration settings.

# Removing the Driver Software

Before physically removing an ACEnic adapter from your system, first remove the adapter driver software.

1. **Start your Windows NT system and log in with Administrator privileges.**
2. **Open the Control Panel and double-click the “Network” icon.**
3. **When the Network window opens, select the “Adapters” tab.**



Any previously installed ACEnic adapter will be listed under Network Adapters.

4. **If the adapter has been configured as part of an adapter team, you must first delete the team.**

If the adapter is not part of a team, you may skip this step. Otherwise, to delete the team, select the adapter you wish to remove and click the “Properties” button. When the Properties window opens, select the Adapter Team Configuration tab. This tab allows you to delete the team. For more information, see [“Deleting an Adapter Team” on page 47](#).

5. **Individually select each ACEnic adapter you wish to remove and click the “Remove” button.**
6. **Once the appropriate adapters have been removed, click the “Close” button.**
7. **When prompted to restart your computer, click the “Yes” button.**

## Moving the Adapter to a Different Slot

---

To move an ACEnic adapter to a different slot in the same system, you must do the following:

1. **Remove the adapter driver software** (see [“Removing the Driver Software” on page 37](#)).
2. **Shut down the system and remove the adapter card from the PCI slot.**
3. **Install the adapter card in its new PCI slot** (see [“ACEnic Adapter Installation” on page 22](#)).
4. **Install the adapter driver software.**
5. **When the system is powered on, reinstall the driver software** (see [“Installing the Driver Software” on page 26](#)).



## CHAPTER 4

# Configuring Adapter Teams

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This chapter provides instructions for configuring the ACEnic adapter teams for failover, Server Load Balancing (SLB), EtherChannel, or 802.3ad support. The following topics are covered:

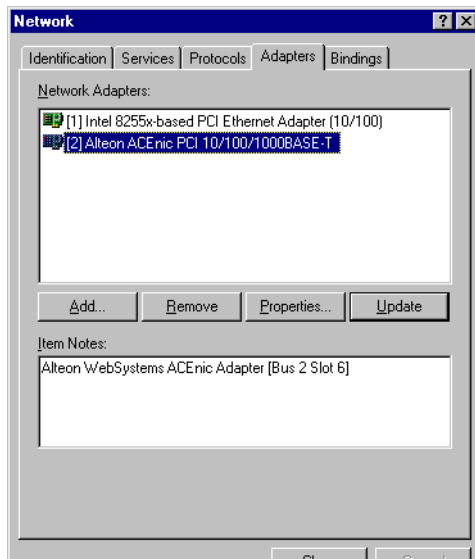
- n [“Creating Adapter Teams” on page 40](#)
- n [“Configuring for Failover, Server Load Balancing, EtherChannel, or 802.3ad” on page 45](#)
- n [“Removing Adapters from a Team” on page 46](#)
- n [“Deleting an Adapter Team” on page 47](#)

## Creating Adapter Teams

When multiple ACEnic adapters are installed in the same server, they can be paired into teams and configured for failover, load balancing, EtherChannel, or 802.3ad support. You can configure up to two teams, each with four adapters—a primary adapter and one or more backup adapters. Each adapter can belong to only one team.

Use this procedure to create an adapter team.

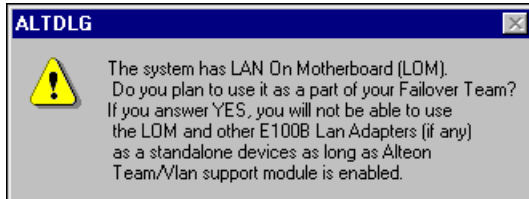
1. **Open the Control Panel and double-click the “Network” icon.**
2. **When the Network window opens, select the “Adapters” tab.**



3. **Select any ACEnic PCI Gigabit Ethernet Adapter or Team entry and click the “Properties...” button.**



If a dissimilar adapter such as a LAN On Motherboard (LOM) is installed in your system, the following dialog box is displayed.

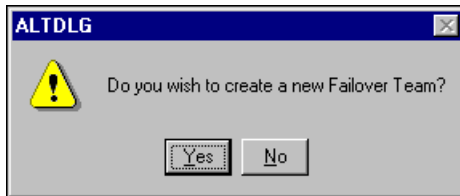


The system allows only one intermediate driver to be loaded at a time. A LOM can be configured for failover, but not for Load Balancing, EtherChannel, or 802.3ad support.

If you click "No" button, the LOM will not be used as part of a team.

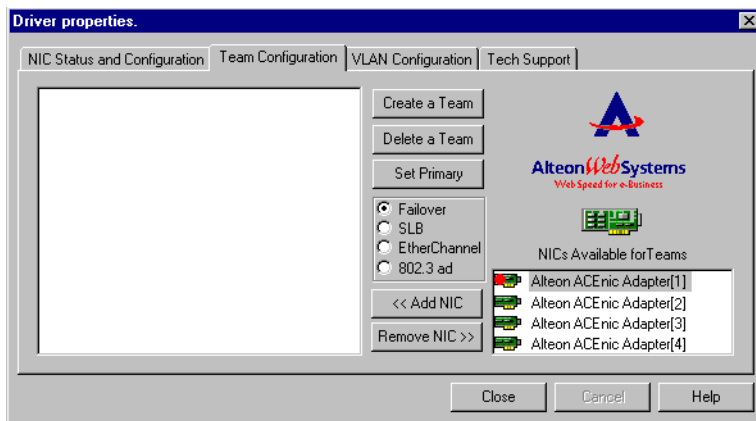
**4. In the ACEnic driver properties window, click the Team Configuration tab.**

If there are no failover teams or VLANs currently configured, the following dialog box is displayed.



**5. Click the "Yes" button to continue configuration.**

If you continue with configuration, the Team Configuration tab is displayed.



The NICs Available for Teams list (located at the lower right corner of your screen) displays all the ACEnic adapters and LOMs that are available to add to a team. A red circle, as shown on Adapter[1], indicates the adapter is physically installed but is not enabled.

**6. Select the Alteon ACEnic adapter you want to be the primary adapter for the team.**

The adapter will be highlighted when your selection is made. The selected adapter's basic configuration (Link Negotiation, Jumbo Frame, and Flow Control settings) is used as the starting point for the new team's configuration. Since each adapter can be added to one team only, the adapter is removed from this list once it has been assigned to a team.

By default, the first ACEnic adapter that is selected for a team is the primary adapter. After a team is created, you can change the primary adapter: select the desired ACEnic adapter and then click the "Primary" button.

---

**NOTE** – Release 4.0 supports grouping ACEnic adapters with a LOM into failover teams. However, this release does not support assigning a LOM as a primary adapter (the adapter for which you want to provide failover). It is not optimal to configure an 82559 Intel LOM in a team, because the Intel LOM runs 10/100 Mbps only.

---

**7. Click the "Create a Team" button.**

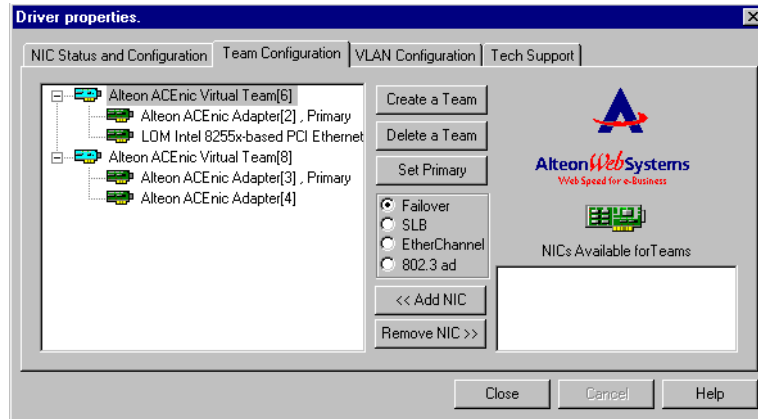
A new team instance will be created in the Team list. The selected adapter is automatically moved from the NICs Available list to the Team list under the newly created team. You can create up to two teams.

The newly created failover team inherits all the basic configuration properties (Jumbo Frame support, Flow Control setting, Link Negotiation, Port Speed, and VLANs, when assigned) from the primary adapter. Other adapters added to the team are automatically reconfigured to match the team's configuration. If you change the basic configuration properties for an adapter team using the NIC Status and Configuration tab (see ["Configure basic properties under the NIC Status and Configuration tab." on page 31](#)), all the adapters in the team will inherit the properties. However, once an adapter is removed from an adapter team, it will operate according to the parameters set for it *before* it became a member of an adapter team.

**8. Select another adapter for the team.**

Each team must contain at least two adapters. To add an adapter to a specific team, make sure that the team is highlighted in the Team list. If the desired team is not highlighted, select the team instance in the Team list.

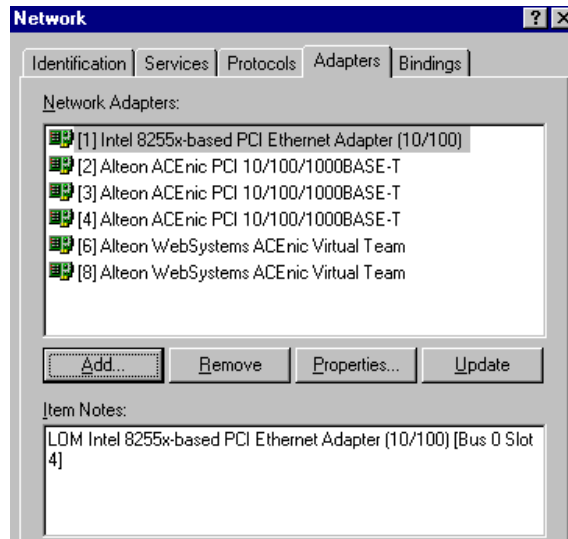
9. In the NICs Available for Team Configuration list, select the adapter to be added and click the “Add NIC” button. The highlighted adapter will be moved from the NICs Available list to the team list under the highlighted team as shown below:



In this sample configuration, the first adapter team contains an ACEnic adapter and the Intel LOM. The second adapter team contains two ACEnic adapters.

10. When you are finished configuring adapter teams, click the “Close” button to accept the changes.
- n If any team has fewer than two adapters assigned, you will be prompted to add another adapter or delete the team.
  - n If your computer is configured with a LOM and you have not added that LOM to any team, you will be prompted to add the LOM to one of the teams that you created. If you originally chose *not* to use the LOM as part of your failover team (see [Step 4 on page 41](#)), the dialog box will not appear.

- n When team configuration has been correctly performed, a Team adapter driver will be created for each configured team and will appear along with the other adapters in the Network window of the Network as shown below.



11. In the Network window, click the “Close” button.
12. Configure the IP address for the teams you created, if necessary.  
If other adapters in your system use TCP/IP bindings, the TCP/IP Properties window will open. Configure the IP address and any other necessary TCP/IP configuration for the team. Click the “OK” button when finished.
13. When prompted to restart your computer, click the “Yes” button.

The system will restart, using the new configuration settings.

---

**NOTE** – If you modify any optional configuration parameters (failover team or VLAN), you must restart the system before the changes will take effect. If you make changes and do not restart, 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.

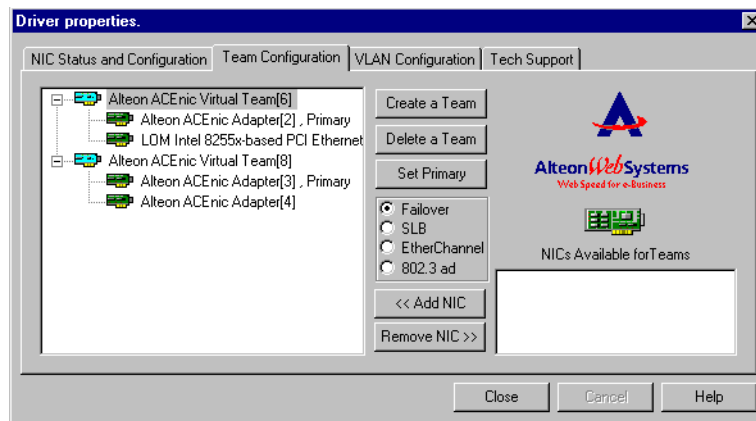
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## Configuring for Failover, Server Load Balancing, EtherChannel, or 802.3ad

To configure adapter teams for failover, Server Load Balancing (SLB), EtherChannel, or 802.3ad support, follow this procedure.

1. **Create an adapter team as described in “Creating Adapter Teams” on page 40.**
2. **In the Driver Properties window, select the Team Configuration tab.**

The following window screen appears.



3. **Click the button for Failover, SLB, EtherChannel, or 802.3ad support.**

The screen above shows the ACEnic Adapter Team[6] selected for failover.

## Removing Adapters from a Team

---

To remove an adapter from its assigned team, perform the following steps.

1. **Access the Team Configuration tab (see Step 1 to Step 5 on page 40).**
2. **Select the adapter in the Team list and click the “Remove NIC” button.**

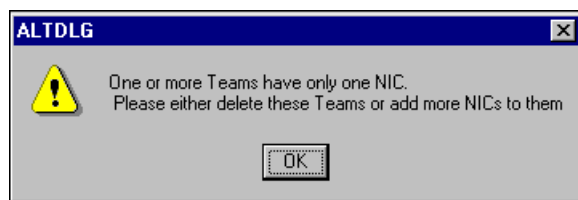
The adapter will be removed from the Team list and will reappear in the NICs Available list. When you remove an adapter from a team, it will operate according to the parameters set for it before it became a member of the team.

---

**NOTE –** If you remove a LOM from a failover team, you must also delete the team. If you don't either add the LOM back to the team or delete the team, the system will not allow you to complete adapter configuration successfully.

---

Each team needs to have at least two members; if you are removing one of two adapters assigned to a team, the system displays the following message:




---

**NOTE –** Because a failover team requires at least two adapters to provide failover protection, you will either need to add an adapter to any team with only one adapter, or delete the team before the system will allow you to successfully complete adapter configuration.

---

3. **If necessary, place another adapter into the team.**

Each team must comprise at least two adapters. To add an adapter to a specific team, make sure that the team is highlighted in the Team list. If the desired team is not highlighted, select the team instance in the Team list.

Next, in the NICs Available list, select the adapter to be added and click the “Add NIC” button. The highlighted adapter will be moved from the NICs Available list to the Team list under the highlighted team.

4. **When you are finished configuring failover teams, click the “Close” button to accept the changes.**

If any team has fewer than two adapters assigned, you will be prompted to add another adapter or delete the team.

5. **In the Network window, click the “Close” button to complete the configuration change.**
6. **When prompted to restart your computer, click the “Yes” button.**

The system will restart using the new configuration settings.

---

**NOTE –** If you modify any optional configuration parameters (Failover Team or VLAN), you must restart the system before the changes will take effect. If you make changes and do not restart, 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.

---

## Deleting an Adapter Team

---

To delete a configured adapter team and release its assigned adapters, perform the following steps:

1. **In the Team Configuration tab, select the team you want to delete from the Team list.**
2. **Click the “Delete a Team” button.**

The team and all its assigned adapters will be removed from the team list. The released adapters will reappear in the NICs Available list.

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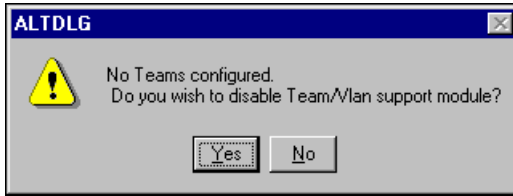
**NOTE –** Adapters that are part of a team inherit all the basic configuration properties of that team, including VLANs associated with that team. If you delete a failover team, any VLANs configured for the ACEnic adapters that are members of that team will also be deleted.

---

3. **When you have finished configuring the adapter, click the “Close” button to accept the changes.**

If any team has fewer than two adapters assigned, you will be prompted to add another adapter or delete the team. When team configuration has been correctly performed, a failover team will be created that will appear along with the other adapters in the Network window of the Control Panel.

If there are no failover teams or VLANs currently configured for the selected adapter, the following dialog box is displayed.



4. If the dialog box shown above is displayed, you must click the “Yes” or “No” button before the system will allow you to complete adapter configuration.
5. In the Network window, click the “Close” button.
6. When prompted to restart your computer, click the “Yes” button

The system will restart, using the new configuration settings.

---

**NOTE** – If you modify any optional configuration parameters (failover team or VLAN), you must restart the system before the changes will take effect. If you make changes and do not restart, 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.

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## CHAPTER 5

# Supporting VLANs

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Your ACEnic adapter can be configured to support Virtual Local Area Networks (VLANs). This chapter provides instructions for configuring optional VLANs for an adapter. The following topics are covered:

- n “Overview” on page 50
- n “Configuring for VLAN Support” on page 52
- n “Deleting a VLAN” on page 55
- n “Modifying VLAN Properties” on page 56

If you do not want to configure your network to include multiple VLANs, you need only configure the adapter to support the default configuration, as described in [Chapter 3, “Installing and Configuring the ACEnic Driver Software”](#).

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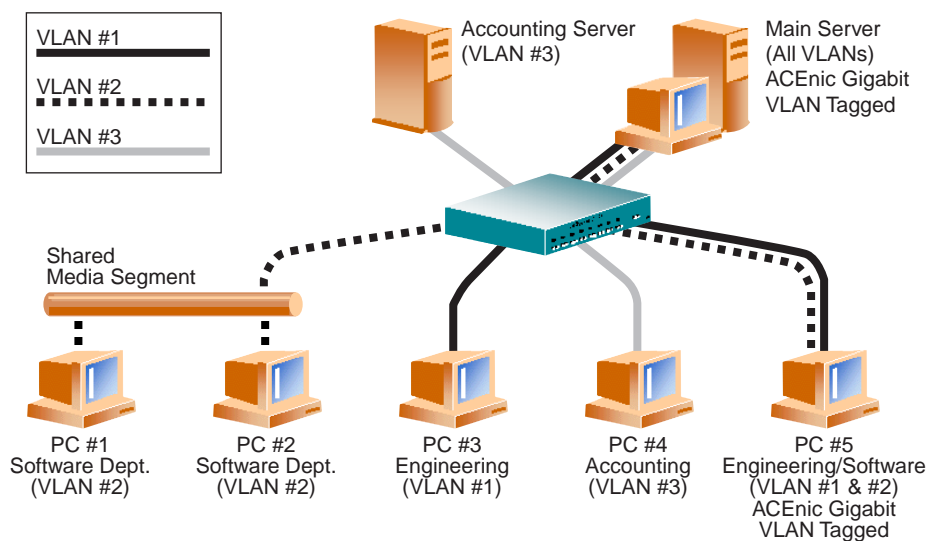
**NOTE** – Adapters that are members of an adapter team can also be configured to support VLANs. When configuring VLANs for adapters teams, any adapter or LAN On Motherboard (LOM) that is a member of a team inherits the configuration of the primary adapter. However, when an adapter or LOM is removed from the team, its original configuration parameters are used.

---

## Overview

VLANs allow you to split your physical LAN into logical subparts, to create logical segmentation of workgroups, and to enforce security policies among each logical segment. Each defined VLAN behaves as its own separate network, with its traffic and broadcasts isolated from the others, increasing bandwidth efficiency within each logical group. Up to 64 VLANs can be defined for each ACEnic adapter on your server, depending on the amount of memory available in your system.

Although VLANs are commonly used to create individual broadcast domains and/or separate IP subnets, it is sometimes useful for a server to have a presence on more than one VLAN simultaneously. Alteon WebSystems switches and ACEnic adapters use *VLAN tagging* to support multiple VLANs on a per-port or per-interface basis, allowing very flexible network configurations. VLAN tagging is a format used to identify packets according to membership in a particular VLAN. Figure 5 shows an example network that uses VLANs with tagging.



**Figure 5** Example of Servers Supporting Multiple VLANs with Tagging

In this example network, the physical LAN consists of a switch, two servers, and five clients. The LAN is logically organized into three different VLANs, each representing a different IP subnet. The features of this network are described in [Table 5](#).

**Table 5** Example of VLAN Network Topology

Component	Description
VLAN #1	An IP subnet consisting of the Main Server, PC #3, and PC #5. This subnet represents an engineering group.
VLAN #2	Includes the Main Server, PCs #1 and #2 via shared media segment, and PC #5. This VLAN is a software development group.
VLAN #3	Includes the Main Server, the Accounting Server and PC #4. This VLAN is an accounting group.
Main Server	A high-use server that needs to be accessed from all VLANs and IP subnets. The Main Server has an ACEnic adapter installed. All three IP subnets are accessed via the single physical adapter interface. The server is attached to one of the Alteon WebSystems switch Gigabit Ethernet ports, which is configured for VLANs #1, #2, and #3. Both the adapter and the connected switch port have tagging turned on. Because of the tagging VLAN capabilities of both devices, the server is able to communicate on all three IP subnets in this network but continues to maintain broadcast separation amongst all IP subnets.
Accounting Server	Available to VLAN #3 only. The Accounting Server is isolated from all traffic on VLANs #1 and #2. The switch port connected to the server has tagging turned off.
PCs #1 and #2	Attached to a shared media hub which is then connected to the switch. PCs #1 and #2 belong to VLAN #2 only and are logically in the same IP subnet as the Main Server and PC #5. The switch port connected to this segment has tagging turned off.
PC #3	A member of VLAN #1, PC #3 can communicate only with the Main Server and PC #5. Tagging is not enabled on PC #3's switch port.
PC #4	A member of VLAN #3, PC #4 can only communicate with the servers. Tagging is not enabled on PC #4's switch port.
PC #5	A member of both VLANs #1 and #2, PC #5 has an ACEnic adapter installed. It is connected to switch port #10. Both the adapter and the switch port are configured for VLANs #1 and #2 and have tagging enabled.

**NOTE –** VLAN tagging is only required to be enabled on switch ports that create trunk links to other Alteon WebSystems switches or on ports connected to tag-capable end-stations, such as servers or workstations with ACEnic adapters.

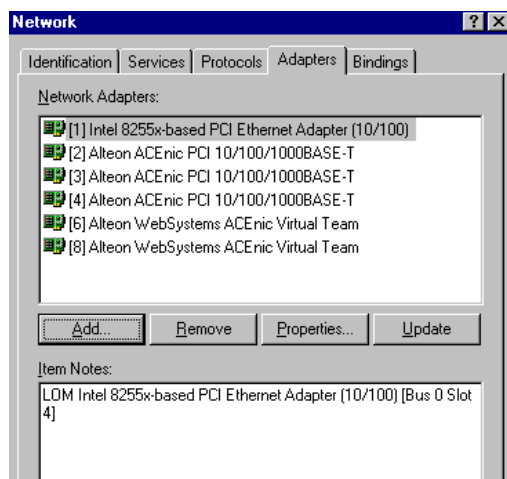
## Configuring for VLAN Support

Up to 64 VLANs can be defined for each ACEnic adapter on your server, depending on the amount of memory available in your system. By default, VLAN support is disabled on ACEnic adapters.

VLANs are not supported on non-ACEnic adapters, including a LAN On Motherboard (LOM). If a non-ACEnic adapter is a member of a failover team, VLANs will not be supported for that team.

Use this procedure to configure for VLAN support.

1. **Open your system Control Panel and double-click the “Network” icon.**
2. **When the Network window opens, select the “Adapters” tab:**



The bus and slot number of the highlighted adapter is listed in the lower part of the window.

3. **Select any ACEnic PCI Gigabit Ethernet Adapter or any adapter team and click the “Properties...” button.**

---

**NOTE –** VLANs are not supported for LOM. If a LOM is a member of an adapter team, VLANs will not be supported for that team.

---

If you have not configured an adapter team, select the Team Configuration tab and configure at least one adapter team. For more information, refer to [“Creating Adapter Teams” on page 40](#)”.

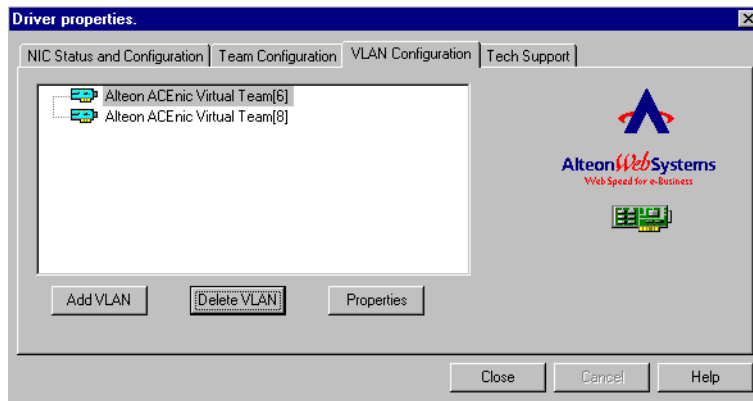
4. In the ACEnic driver properties window, click the “VLAN Configuration” tab.

If there are no VLANs or adapter teams currently configured, the following dialog box is displayed. Click “Yes” to continue configuration.



5. The VLAN Configuration tab is displayed.

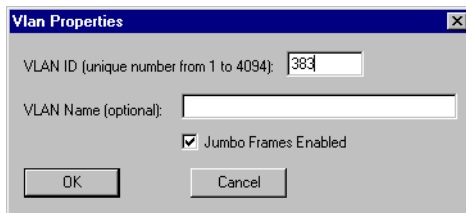
As shown in the figure below, the VLAN Configuration tab lists the configured adapter teams, if any.



6. Select the adapter team to which you wish to add a VLAN.
7. Click the “Add VLAN” button.

Use the three control buttons: “Add VLAN,” “Delete VLAN,” and “Properties” buttons to create, delete, or to modify the properties of VLANs already created.

8. In the VLAN Properties window, enter a unique number.



You must assign a unique identification number to each VLAN you create. Even though the maximum number of VLANs that can be configured on each adapter is 64, any particular VLAN can be assigned an identification number between 1 and 4094.

The VLAN tagging format follows the guidance provided in IEEE 802.1Q-1999. Ensure that there are no spaces, blank lines, or extra characters. The identifier can be entered in decimal (for example, 383), octal (for example, 0577), or hexadecimal (for example, 0x17F) format.

---

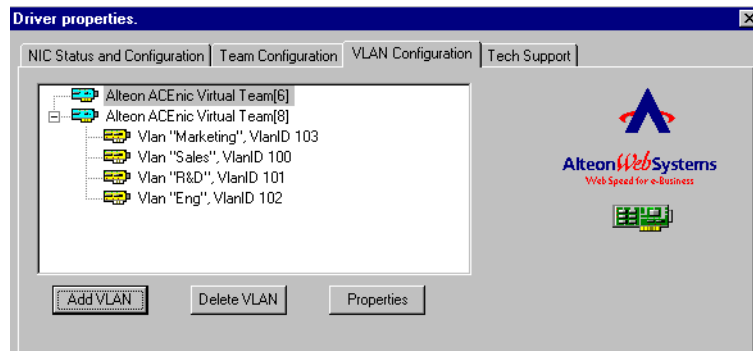
**NOTE –** When assigning a number for a VLAN, do not use the default VLAN identifier used by the adapter or the switch. Also, make sure the adapter VLAN configuration matches the configuration on the switch or server; that is, if you’ve already identified VLANs 383 and 777 on the switch or server, the VLAN IDs for the new adapter(s) should match.

---

**Example:** Consider a server with a single adapter. The server is a member of two VLANs, with VLAN identifiers 383 and 777. The unique identifier of the first VLAN added to the adapter would be 383. The ID of the second VLAN associated with the adapter would be 777.

9. Enter an (optional) name for the VLAN you’re creating.
10. If Jumbo Frames will be sent to or received by the adapter VLAN, click the “Jumbo Frames” box.
11. When you are finished adding VLANs to this adapter, click the “OK” button.

A new VLAN instance will be created in the previously selected adapter list as shown in the following window.



In the above sample configuration, you have four VLANs configured for ACEnic Virtual Team[8]. Virtual Team[6] is not configurable for VLAN because it contains a LOM.

---

**NOTE** – To maintain optimum adapter performance, your system should have 64MB of system memory for each eight VLANs created, per adapter.

---

12. When you are finished configuring VLANs, click the “Close” button in the ACEnic Driver Properties window to accept the changes.
13. In the Network window, click the “Close” button.
14. When prompted to restart your computer, click the “Yes” button.

The system will restart, using the new configuration settings.

---

**NOTE** – If you modify any optional configuration parameters (adapter team or VLAN), you must restart the system before the changes will take effect. If you make changes and do not restart, 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.

---

## Deleting a VLAN

---

To delete a configured VLAN, perform the following steps.

---

**NOTE** – Adapters that are part of a team inherit all the basic configuration properties of the team, including VLANs associated with the team. If you delete an adapter team, any VLANs configured for that team will also be deleted.

---

1. Access the VLAN Configuration tab, as described in the procedure on [page 52](#).
2. Select the adapter that has the VLAN you want to delete.
3. Select the VLAN you want to delete, and click the “Delete VLAN” button.

The selected VLAN will be deleted from the screen.

---

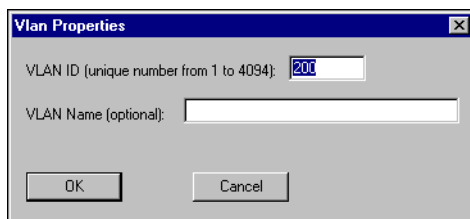
**NOTE** – If you modify any optional configuration parameters (Adapter teams, Failover, Server Load Balancing, EtherChannel, 802.3ad support, or VLAN), you must restart the system before the changes will take effect. If you make changes and do not restart, you may experience configuration problems. If no configuration changes have been made, you can click the “No” button to close the configuration session without restarting.

---

## Modifying VLAN Properties

To modify the properties of a configured VLAN, perform the following steps:

1. **Access the VLAN Configuration tab, as described in the procedure on [page 52](#).**
2. **In the NICs Available list, select the adapter that has the VLAN you want to modify.**  
The adapter will be highlighted when your selection is made.
3. **Click the “VLAN Properties” button. The following dialog box will appear.**



4. **In the VLAN Properties window, you can modify one of the following parameters:**

### n VLAN ID

You must assign a unique identification number to each VLAN you create. Even though the maximum number of VLANs that can be configured on each adapter is 64, any particular VLAN can be assigned an identification number between 1 and 4094.

The VLAN tagging format follows the guidance provided in IEEE 802.1Q-1998. Ensure that there are no spaces, blank lines, or extra characters. The identifier can be entered in decimal (for example, 383), octal (for example, 0577), or hexadecimal (for example, 0x17F) format.

### n VLAN Name

This optional identifier appears only in the ACEnic Driver Properties window.

5. **When you are finished modifying this VLAN, click the “OK” button.**
6. **When you are finished configuring VLANs, click the “Close” button in the ACEnic Driver Properties window to accept the changes.**
7. **In the Network window, click the “Close” button.**
8. **When prompted to restart your computer, click the “Yes” button.**

The system will restart, using the new configuration settings. If you make changes and do not restart the system, you may experience configuration problems.





## CHAPTER 6

# Troubleshooting

---

This chapter describes the techniques to troubleshoot your ACEnic adapter.

- n Using diagnostics utilities
- n Checking the port LEDs
- n Troubleshooting checklist
- n Contacting Alteon customer service and support

## Using Diagnostic Utilities

---

Alteon provides two diagnostic tests to verify the performance of your ACEnic adapter:

- n Internal loopback test
- n Internal/external loopback test

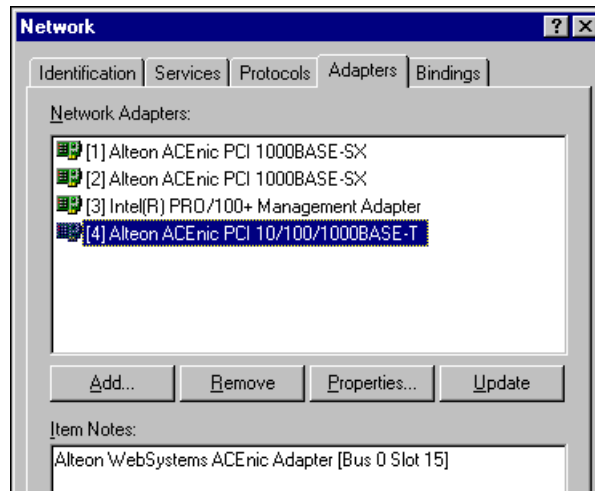
### Internal Loopback Test

Use the internal loopback test to verify that the adapter firmware is configured and operating correctly.

To perform the internal diagnostic test on an adapter, follow the steps in this procedure.

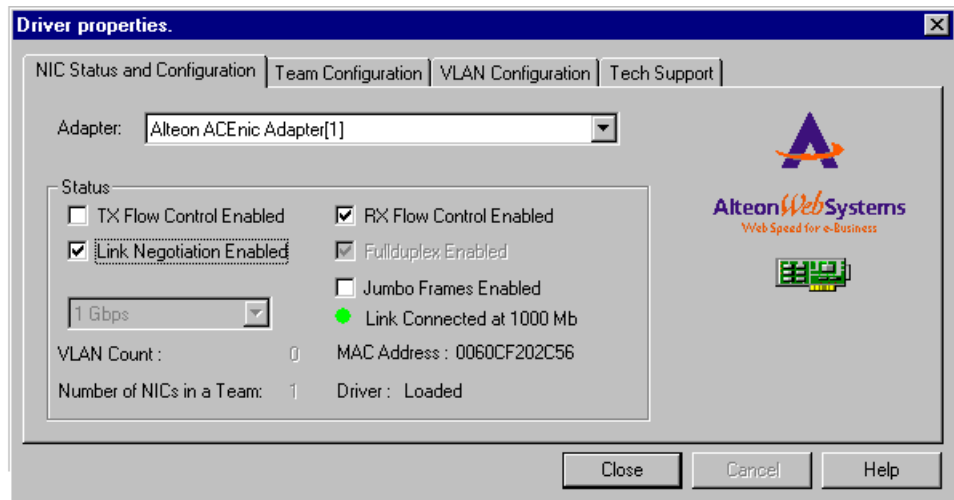
- 1. Open your system Control Panel and double-click the “Network” icon.**

2. When the Network window opens, select the “Adapters” tab.



3. Select any ACEnic adapter and click the “Properties...” button.

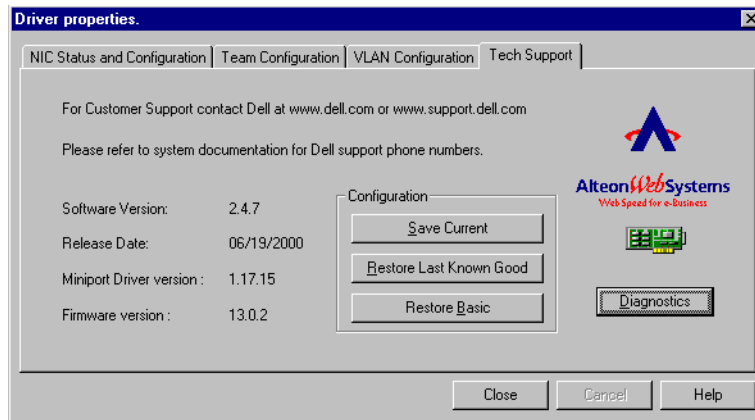
The ACEnic driver properties window is displayed.



4. If you want to run internal diagnostics on an adapter, select the NIC Status and Configuration tab and then select the ACEnic adapter to be tested.

**5. Click the Tech Support tab.**

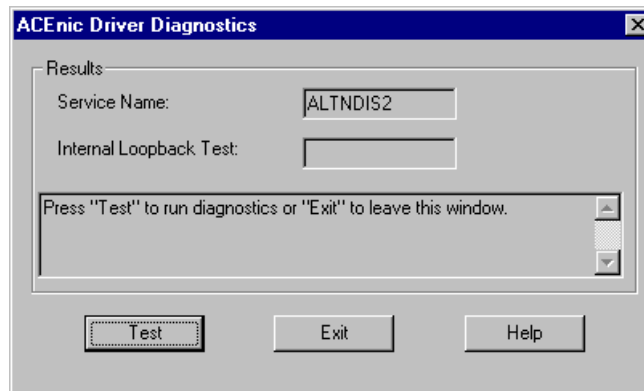
The Tech Support window is displayed.



This window provides contact information, access to the internal diagnostic test, and the option of saving the current configuration or reverting to either the previous or the factory-set configuration.

**6. To access the Diagnostics window, click the “Diagnostics” button.**

**7. When the ACEnic Driver Diagnostics window is displayed, click the “Test” button to run the internal loopback test for the adapter.**



If you have not yet restarted the system after installing the adapter driver, the following dialog box is displayed:



For best results, click the “OK” button to reboot the system prior to running diagnostics.

During this test, packet data is sent across the MAC (Media Access Control) chip to verify that traffic can be sent and received through the adapter. During the test, the Diagnostics window displays messages similar to those listed below:

- n Diagnostic firmware loaded “OK” (when running the test for the first time)
- n Running diagnostic test
- n Test completed “OK”
- n Normal adapter firmware loaded “OK”

When the test has been completed, the result (Passed/Failed) is shown in the Internal Loopback Test field.

# Hardware Diagnostic Utility

---

For hardware diagnostics, a software utility is provided.

## ALTDIAG Internal/External Loopback Test

The MS-DOS-based diagnostic utility, `ALTDIAG`, included on the CD-ROM is used to verify the functionality of the adapter. It can test the PCI, registers, SRAM, registers, processor, and perform internal and external loopback tests. For each test, resulting pass/fail information is provided. Perform the `ALTDIAG` tests any time you wish to rule out or identify possible adapter hardware problems.

To use the `ALTDIAG` utility, follow these procedures.

### Setup for MS-DOS Diagnostics

To set up the system for MS-DOS diagnostics, perform the following steps.

1. **Start your system in MS-DOS mode rather than Windows NT.**

---

**NOTE** – `ALTDIAG` **cannot** be used from the Windows NT “Start | Run” command or from “Start | Programs | MS-DOS Prompt.” To use `ALTDIAG`, you **must** start your computer in 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. **Insert 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 the location of the files on your system.

---

The main test menu appears which includes the list of tests.

```
Tigon 3 Test Program (ttp) v1.56 [menu mode]

PCI bios found. v0.16.
  HW Mech #1 supported
  Number of PIC buses: 2
Tigon #0 found in PCI bus 1.
  base addresss : fdff0000
  interrupt line: 10
  ASIC version : 3
1 Tigon card(s) detected
Current card set to bus 1 Tigon #0.
TMMEM = fdff000

[main menu]
go                - Perform ALL tests (except loop tests)
pci               - Basic PCI tests
register          - Register tests
sram              - SRAM integrity tests
processor         - Processor tests and utilities
loop             - Host Xmt/Rcv packet tests
```

Global commands are available.

**n** Enter **.** to view the current menu.

**n** Enter **..** to go to the main menu.

Test results can be logged.

---

**NOTE** – After executing a test, 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.

---

## Log File

To save the displayed test results in a file, enter the following command

```
> dos4gw ttp -l <file name>
```

## Go

The **go** command executes all diagnostics except loop.

### 1. To execute all diagnostics (except loop), enter go.

The results could be as follows:

```
Tigon 3 Test Program (ttp) v1.0 [menu mode]

PCI bios found. v0.16.
  HW Mech #1 supported
  Number of PIC buses: 2
Tigon #0 found in PCI bus 1.
  base addresss : fdff0000
  interrupt line: 10
  ASIC version  : 3
1 Tigon card(s) detected
Current card set to but 1 Tigon #0.
TMEM = fdff000
pci detect Tigon test : passed
configuration constants test : passed
*** WARNING - found suspicious base address for Tigon, fdff0004
configuration integrity test: passed
Tigon base address : fdff0000
Tigon base address test      : passed
pci byte/half-word test     : passed
register read/write test     : passed
Internal memory data line test :passed
Internal memory address line test : passed
SRAM data line test          : passed
SRAM address line test       : passed
download complete (552 lines)
CPU RX test finished ok, processor halted (PC = 0800088c)
download complete (552 lines)
CPU Tx test finished ok, processor halted (PC = 0800088c)
processor diagnostics test    : passed
```

## PCI

The pci diagnostics check that the pci bios and the ACEnic card are installed and available, and tests the pci registers.

### 1. To view the menu and access pci commands, enter **pci**.

```
[pci menu]
go           - Perform ALL tests (pci)
bus          - Test for PCI bus presence
card         - Test for Tigon presence
constants    - Verify Tigon and PCI constants
integrity    - Verify basic Tigon configuration
address      - Find Tigon base address
register      - Test access to Tigon registers
byte         - byte
```

To run a specific pci test, enter **bus** | **card** | **constants** | **integrity** | **access** | **register** | **byte** and then **go**. To run all PCI tests, enter **go** only. An example follows.

### 2. To execute all pci diagnostics, enter **go**.

```
pci> go
```

The test results could be as follows.

```
pci bios test           : passed
Tigon #0 found in PCI bus 1.
  base address          : fdff000
  interrupt line: 10
  ASIC version          : 3
serial eeprom revision 0
pci detect Tigon test   : passed
configuration constants test : passed
configuration integrity test : passed
Tigon base address : fdff0000
Tigon base address test : passed
pci byte/half-word test
```



## Register

The register diagnostics writes test patterns to the read/write registers, then checks them by reading the registers. PCI and CPU registers are not included in this test.

1. To view the menu and access register commands, enter **register**.

```
main> register
```

The register menu will be displayed.

```
[register menu]
go             - Perform all tests in order
rw            - Read/Write most registers
```

To run all register tests, enter **go**. An example follows.

2. To execute all register diagnostics, enter **go**.

```
register> go
```

The results could be as follows.

```
register read/write test      : passed
```

## SRAM

The sram diagnostic tests the data lines and address lines of external memory.

1. To view the sram menu and access the commands enter **sram**.

```
[sram menu]
go             - Perform all tests in order
data          - Test SRAM data lines
address       - Test SRAM address lines give SRAM size
```

To select only the data or address tests, enter **data|address** and then enter **go**. To run all sram tests, enter **go**.

2. To execute all sram diagnostics, enter **go**.

```
sram> go
```

The results could be as follows.

```
Internal memory data line test      : passed
Internal memory address line test  : passed
SRAM data line test                : passed
SRAM address line test             : passed
```

## Processor

The processor diagnostic tests the basic transmit and receive CPU commands.

1. **To view the menu and access processor commands, enter `processor`.**

```
main> processor
```

The processor menu is displayed.

```
[processor menu]
go           - Perform processor diagnostics
```

2. **To run the processor tests, enter `go`.**

```
processor> go
```

The results could be as follows.

```
download complete (552 lines)
CPU RX test finished ok, processor halted. (PC = 0800088c)
download complete (552 lines)
CPU Tx test finished ok, processor halted. (PC = 0800088c)
processor diagnostics test    : passed
```

## Loopback

There are many variables for loopback diagnostics which allow you to set up tests that apply to your system.

- n The loopback test can be set for internal connection (`int`), external connection (`ext`), or back to back (`b2b`) connection between two computers.
- n The number of send rings can be set as 1, 4, or 15. The default setting for `srings` is 1. This test uses the roundrobin method.
- n The number of receive rings can be set from 1 to 16. The default setting for `rrings` is 4. This test uses the roundrobin method.

- n When mcast is **on**, half of the test packet will be delivered multicast and the other half will be deliver non-multicast. Passing tests results would show that only half of the packets were received: multicast packets should be received, whereas non-multicast packets should not.
- n The frame can be set for jumbo, standard, mini, or extended. The default value is standard.
- n The delivery of packets can be set for a specific number of transmissions, or continuous transmission until the test is ended. If 0 or no value is entered, the transmission will be continuous. In this setup, press the **ESC** key to end the test.
- n Use **curstat** to view the current test setup .

An example of an internal loopback test follows.

**1. To view the loopback diagnostic menu enter loop.**

```
main> loop
```

The loop menu will be displayed.

```
[loop menu]
go           - <Int/Ext?B2b> for loopback/b2b test
curstat      - display current status
vlan         - <On/Off> mode
srings       - # of send rings to be used, 1, 4, or 16
rrings       - # of rcv rings to be used 1-16
mcast        - <On/Off> mode
frame        - <Jumbo/Std/Mini/Extend> frame
xmit         - transmit # of packets, 0 = never stop
rcv          - monitor receive packets
```

Running loopback test requires a minimum two commands: **go** and **int | ext | b2b**, and **xmit**.

**1. Enter the following command to set up the test for internal loopback.**

```
loop> go int
```

The system response shows test setup and pertinent information of current setup of ACEnic adapter.

```
internal loopback
speed at 1000BaseT and Full duplex
```

2. To run the test, enter **xmit**. This example uses 1000 transmissions for the test.

```
loop> xmit 1000
```

The test results could be as follows.

```
transmit 1000 of packets
pkts:64  secs:0pkts:160  secs:1pkts:256  secs:2pkts:352
secs:3pkts:448  secs:4pkts:544  secs:5pkts:640  secs:6pkts:704
secs:7pkts:800  secs:8pkts:896  secs:9pkts:992  secs:10pkts:1000
secs:11S
```

The results show the total number of transmitted and received frames. The test results or received frames are displayed in increments of one second. For example, `secs:10pkts:1000` shows that 1000 packets were received after 10 seconds.

An example of testing Jumbo frames with external loopback follows. This test requires three commands.

1. To set up the test for jumbo frames and external loopback, enter the following commands.

```
> frame jumbo
> go ext
```

The system could respond as follows:

```
external loopback in GMII mode 4
speed at 1000BaseT and Full duplex
```

2. To run the test continuously, enter **xmit**.

```
> xmit
```

If you want to transmit a specific number of packets, enter **xmit** *<number of packets>*.

The number of transmitted and received frames, and the number of errors are reported. The results could be as follows:

```
transmit 0 of packets
Tigon3 Link is up
  Tx Frames      Rx Frames      Err Frames
  -----      -
      375          375          0
      795          795          0
     1241         1241          0
```

The results show the number of transmitted and received frames, with 0 errors detected, indicating that the adapter hardware is functioning properly.

Send ring and receive ring can be set up for 4, 16, or 64 rings.

An example of testing send ring and receive ring for external loopback follows. This test requires three commands.

1. To set up the test for 4 send rings and 4 receive rings, enter the following commands.

```
> srings 4
> rrings 4
```

The system response could be as follows.

```
external loopback in GMII mode 4
speed at 1000BaseT and Full duplex
```

2. To run the test, enter the following command.

```
> xmit
```

The test results could be as follows.

```
transmit 0 of packets
Tigon3 Link is up
  Tx Frames      Rx Frames      Err Frames
  -----      -
      234          234          0
      654          654          0
     1100         1100          0
```

The results show the number of transmitted and received frames, with 0 errors detected, indicating that the adapter hardware is functioning properly.

An example of an internal loopback test follows.

1. **To check the current loopback test setup, enter `curstat`.**

```
loop> curstat
```

2. **The current test setup for loop diagnostics will be displayed. An example follows.**

```
NIC current status:
# of send ring: 1
# of recv ring: 4
frame size      : Standard
multicast more: Off
vlan            : Off
phy interface   : GMII
```

# Checking the Port LEDs

---

## 1000Base-SX and 1000Base-LX Adapters

Two port LEDs are located on the faceplate of the ACEnic 10F00Base-SX or 1000Base-LX adapter—one to indicate link status and one for data transfer status (see [Figure 2 on page 17](#)). 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 [Table 2 on page 17](#).**

## 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 1000Mbps), to indicate which link is active, and one LED for data transfer status (see [Figure 2 on page 17](#)).

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 [Table 3 on page 18](#).**

---

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

---

## Troubleshooting Checklist

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**CAUTION**—Before opening the cabinet of your system for removing or inserting the adapter, please review all precautions outlined under “[Safety Precautions](#)” on page 20.

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

- n 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 23.
- n 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.
- n 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.
- n Check the configuration settings and change them if they conflict with another device.
- n Make sure that your system is using the latest BIOS.
- n Try inserting the adapter in another slot. If the new position works, the original slot in your system may be defective.
- n 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.
- n 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.
- n Remove all other adapters from the system and run the tests again. If the adapter passes the tests, the other adapters may be causing problems.

## Contacting Alteon WebSystems Support

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For product support information, software updates, and release notes, see “[Contacting Alteon WebSystems](#)” on page 9.





# APPENDIX A

## Specifications

The following sections provide hardware and performance characteristics on link and cable specifications:

- n [1000Base-SX and 1000Base-LX Link Characteristics](#)
- n [10/100/1000Base-T Cable Specifications](#)
- n [Performance Specifications](#)
- n [Physical Characteristics](#)
- n [Power Requirements](#)
- n [Environmental Specifications](#)

### 1000Base-SX and 1000Base-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)

# 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

## Mean Time Between Failure

Feature	Measurement
10/100/1000Base-T	550,429 hours at 45°C
1000Base-SX/LX	767,538 hours at 45°C

## 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 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.)