

**Intel EtherExpress™ Flash32
LAN Adapter for Indigo²™
Installation Guide**

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Installing the Flash32 Adapter

This guide tells you how to install the Intel EtherExpress Flash32 LAN adapter in an Indigo². Please use this booklet in replacement of the *Intel EtherExpress™ Flash32 Adapters Complete Guide* that came with the Flash32 adapter.

Install the Flash32 adapter after you have done the following:

- set up your Indigo² as a single-Ethernet station
- installed and configured the Flash32 adapter software

If your Indigo² is not yet up and running, follow the instructions in the *Indigo² Owner's Guide* to bring the workstation to a functioning state as an Ethernet node. Doing this first verifies that everything works properly before you install the Flash32 adapter.

If you have not installed and configured the Flash32 adapter software, follow the instructions in the *EISA E++ Release Notes* before installing the board.

The Flash32 Adapter Package

The Flash32 adapter product is an optional package shipped separately from your Indigo². You can install a Flash32 adapter in any of the four slots, depending on the number of slots available (graphics and option cards may occupy other slots).

Caution: The components on the Flash32 adapter and Indigo² CPU boards are sensitive to static electricity. Handle all Indigo² boards carefully, and use the wrist strap (shipped with your Indigo²) to avoid any flow of static electricity.

Your EISA E++ software package should contain all of the items listed below. If anything is missing, contact your sales representative.

- a CD-ROM disk (or tape if specially ordered) containing the software
- this manual (*Intel EtherExpress Flash32 LAN Adapter for Indigo² Installation Guide*)
- the *EISA E++ Release Notes*

In addition, your site should have a copy of the *Advanced Site and Server Administration Guide* (an on-line document).

Carefully follow all the steps in the following sections to install the Flash32 adapter.

Installing the Board

The instructions for installing your Flash32 product (board and software) are divided into three documents, as summarized in Table 1.

Table 1 Where to Find Instructions

Document	Installation Steps Covered
<i>EISA E++ Release Notes</i>	Installing and configuring the Flash32 software. This must be done first.
This guide	Installing the Flash32 adapter. Connecting the Indigo ² to the site's Ethernet network. Verifying the board's basic functionality.
<i>IRIX Advanced Site and Server Administration Guide, Networking Volume</i>	General information about configuring network connections. Verifying operation of the Ethernet connection. Explaining terminology and operation.

Getting Ready

To prepare for the installation, follow these steps:

1. Verify that the following two statements are both true:
 - Flash32 software has been installed, following the instructions in the *EISA E++ Release Notes*.
 - Flash32 has been configured, following the instructions in the *EISA E++ Release Notes* or in the Administrator's Manual set.

If both statements are true, proceed to the next step. If one or both are not true, follow the instructions in the appropriate document to make sure both statements are true before proceeding.

2. Prepare a flat, cleared, non-carpeted, antistatic surface next to your Indigo². This will be your work area.

Note: Materials that can be used to create an antistatic surface include the following: rubber mat, corkboard, slate chalkboard, wood, antistatic bag. †

3. Have the following items nearby:
 - wrist strap
 - Phillips screwdriver
 - Flash32 adapter, still in its antistatic bag.

Shutting Down and Powering Off the System

To shut down and power off the system, follow these steps:

1. Open the front cover.
2. Press and release the power switch on the front of the system to shut down the software and power off the system.

The system powers off automatically.
3. Disconnect the power cable from the back of the system.

Removing the Cover

To remove the cover, follow these steps:

1. Remove the front bezel.
 - Press down on the tabs on each side of the bezel, as shown in Figure 1.
 - Pull the bezel down and away from the chassis.

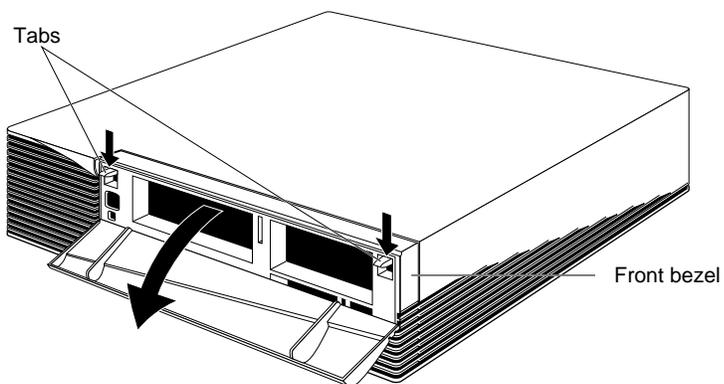


Figure 1 Removing the Front Bezel from the Indigo² Chassis

2. Remove the top cover.
 - Press up on the tabs on each side of the drive openings and pull up on the cover.
 - Rotate the cover back and away from the chassis, as shown in Figure 2.

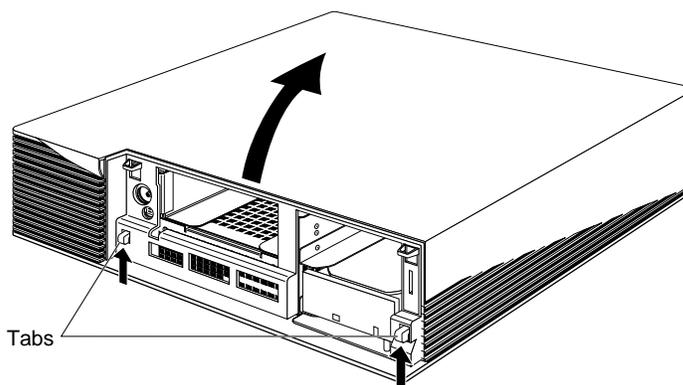


Figure 2 Removing the Top Cover From the Indigo² Chassis

Installing the Flash32 Adapter

To install the Flash32 adapter, follow these steps:

1. Ground yourself to a metal part of the Indigo² chassis.
 - Caution:** The Flash32 adapter is sensitive to static electricity; you should wear the wrist strap while installing it. The wrist strap prevents the flow of static electricity, which could damage the board.
 - Put the wrist strap over your wrist, making sure it is tight against your arm.
 - Attach its alligator clip to a metal part of the Indigo² chassis.

2. Open the metal panel located in front of the EISA slots by pulling up on the door and lowering it, as shown in Figure 3.

The EISA slots are located on the left side of the system, behind the internal fan.

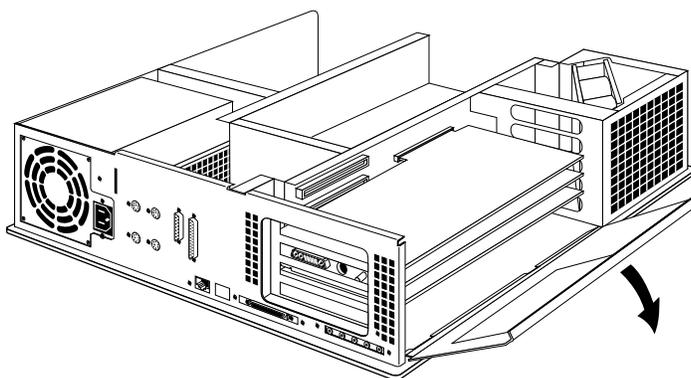


Figure 3 Opening the Metal Panel in Front of the EISA Slots

3. Remove the small cover that covers the slot in the back of the system in which you are installing the Flash32 adapter.
 - Remove the screw that attaches the cover to the system. The screw is located inside the system on the outer end of the cover.

4. Install the board.
 - Align the connector on the left side of the board with the connector opening on the left.
 - Push the board into the slot until the board is securely connected to the port on the EISA backplane, as shown in Figure 4. If the gold leads on the connector on the board are still visible, push the board further into the port until you can no longer see the gold leads. This ensures the board is secure in the slot.
5. Insert and tighten the screw that holds the board to the chassis.

The screw opening is located on the metal bracket on the upper left side of the board.

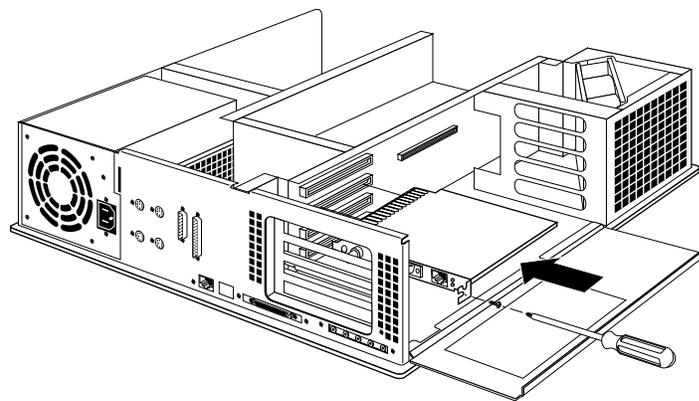


Figure 4 Installing the Flash32 Adapter

6. Tip the metal panel up until it snaps into place, as shown in Figure 5.

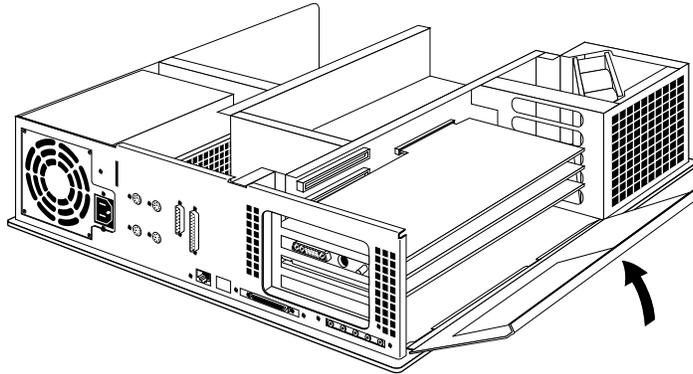


Figure 5 Closing the Metal Panel in Front of the EISA Slots

Replacing the Cover

To replace the cover, follow these steps:

1. Place the prongs on the underside of the cover into the slots under the top ridge of the backplane of the chassis, as shown in Figure 6.
2. Lower the cover down onto the chassis until it snaps into place.

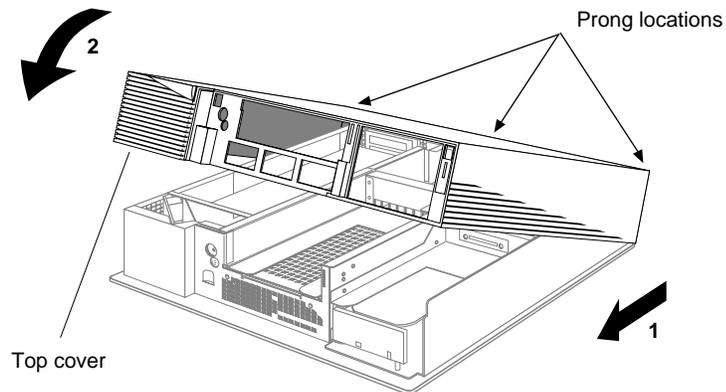


Figure 6 Replacing the Top Cover of the Indigo² Chassis

3. Replace the front bezel.
 - Place the tabs on the bottom of the bezel in the grooves in the front of the chassis, as shown in Figure 7.
 - Tilt the bezel up until it snaps into place.

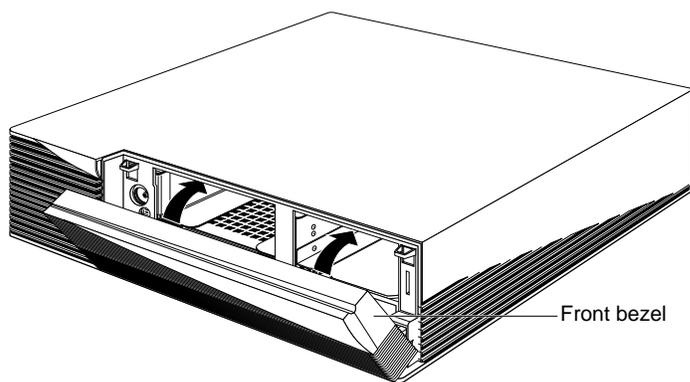


Figure 7 Replacing the Front Bezel on the Indigo² Chassis

4. Reconnect the power cable to the connector on the back of the system.

You are finished installing the Flash32 adapter and are ready to start up the system.

Connecting the Indigo² to the Site's Ethernet Network

The Flash32 adapter supports three different interfaces, as shown in Figure 8:

- Twisted pair RJ45
- AUI 15-pin connector
- 10Base-2 BNC connector

Caution: Connect to only one of these interfaces. Port selection is random if more than one interface is connected.

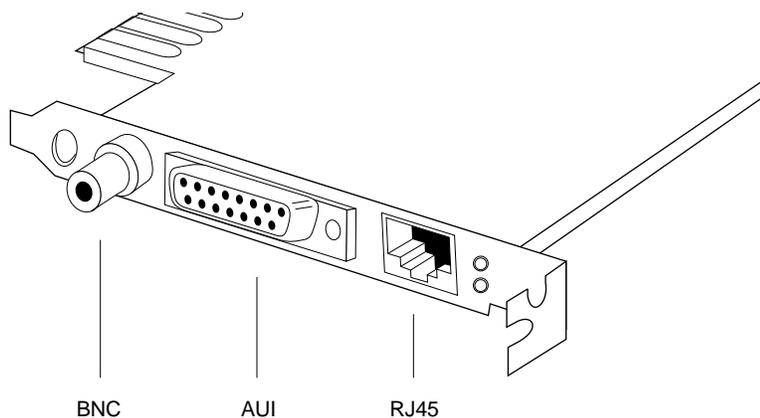


Figure 8 Ethernet Connectors on the Flash32 Adapter I/O panel

To connect to the network, follow these steps:

1. Locate an Ethernet cable for each Flash32 adapter installed in your Indigo². Cables are part of your site's equipment, not part of the Flash32 product.
2. If you are connecting to the AUI connector, locate a transceiver to your site's Ethernet network for each Flash32 adapter installed. Transceivers are part of your site's current equipment.
3. Attach the end of the Ethernet cable to the Flash32 adapter I/O panel.
4. If you are connecting to AUI, attach the other end of the cable to the transceiver.

Finishing the Installation

To finish the installation, restart the system, rebuild the operating system, and reboot, as described below.

1. Turn on the power switch on the front of the Indigo².
2. Restart the system.
 - If the system displays the message `Press any key to restart, do so.`
 - If the System Maintenance Menu is displayed, select "Start System."

3. The following appears on your screen:

`Automatically reconfiguring the operating system.`

If you do not see this message, the system does not know about the new network interface. Verify that you have installed the Flash32 software. If you have, the board may not be firmly seated into its slot connector. Go to the beginning of this guide and reinstall the board.♦

4. When the login display appears, log in.
5. Choose "Unix Shell" from the Desktop toolchest to open a shell window if you are running Indigo Magic, or "Shell" from the Tools menu if you're running WorkSpace, and become root by typing:

```
% su
```

```
Password: thepassword
```

Verifying the Network Connections

To verify that the new network connections are functional, follow the instructions in this section.

Verifying the Board

To verify that the board has been installed properly, look at the two LEDs to the right of the Flash32 adapter connectors on the back of the Indigo² after booting up the system.

- The top LED glows yellow when power is on and connection to the network is active. If the light is off, the cable or the connector may be bad, there may be a problem with the network, or the board may be installed incorrectly.

Note: If you installed 10Base-2 or AUI, the top LED will be off even when power is on.

- The bottom LED blinks yellow while transmitting or receiving data. If the light is off for an extended period of time, there may be a problem with the network.

If you want to further verify the connection, follow the steps below:

1. Type the command below to verify that all the Flash32 adapter boards have been recognized by the software.

```
% /bin/hinv
```

You see a display similar to the one shown in Figure 9.

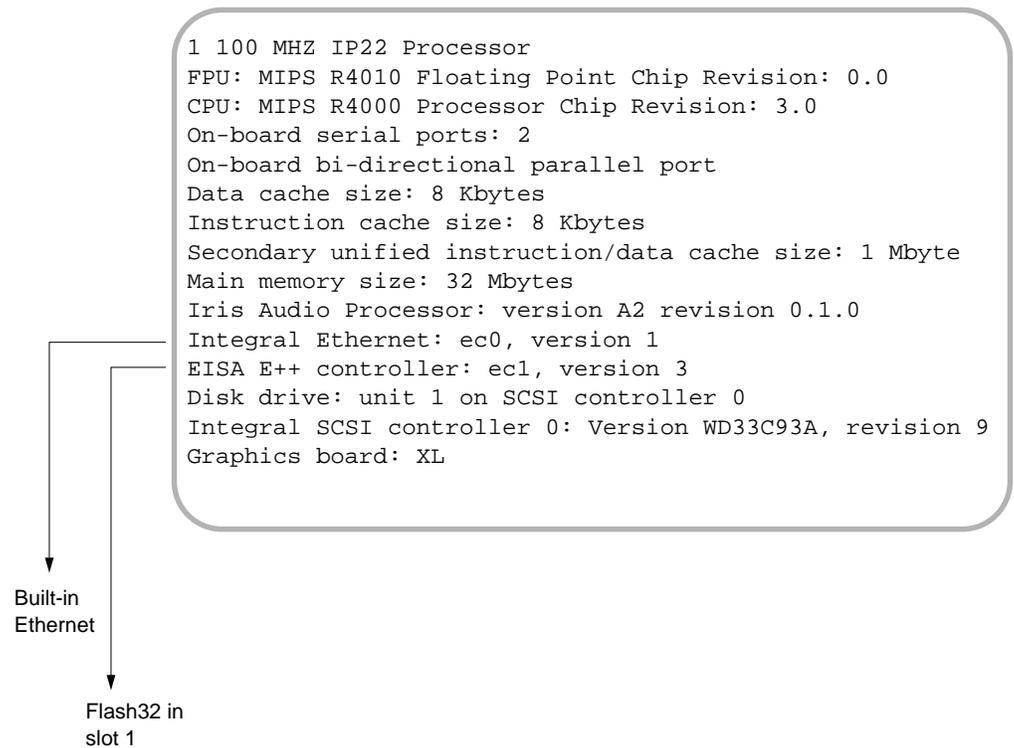


Figure 9 Example of the *hinvt* Display for a System with Two Flash32 Adapters

2. If an expected board/network interface is not listed, the operating system did not recognize the board during the last reboot. If this occurs, check the following:
 - Did you install the Flash32 adapter software? If you did, proceed. If not, follow the instructions in the *EISA E++ Release Notes* to install the software.
 - Did you rebuild the operating system and reboot? If you did, proceed. If not, follow the instructions in the section “Finishing the Installation.”
 - Verify that your network configuration (*/etc/hosts* file and */etc/config/netif.options* file) has been set up correctly. For example, the */etc/hosts* file must contain one line for each Ethernet connection.

- If the configuration information is correct, it is possible that a Flash32 adapter is not seated firmly into its slot connector. Go to the beginning of this guide and reinstall the board(s). Take extra care to ensure that the adapter card is fully seated into its connector.
 - If you have done all of the above, and the missing Flash32 adapter still does not appear, it is possible that the board is defective. Contact Intel's LAN Technical Support Group (see the Intel documentation that came with the adapter for information).
3. Type the command below to list the configured network interfaces:

```
%/usr/etc/netstat -in
```

4. The display should look similar to Figure 10.

The listing should include a line for *ec0* (the built-in Ethernet connection) and a line for *ecx*, where *x* represents the slot number.

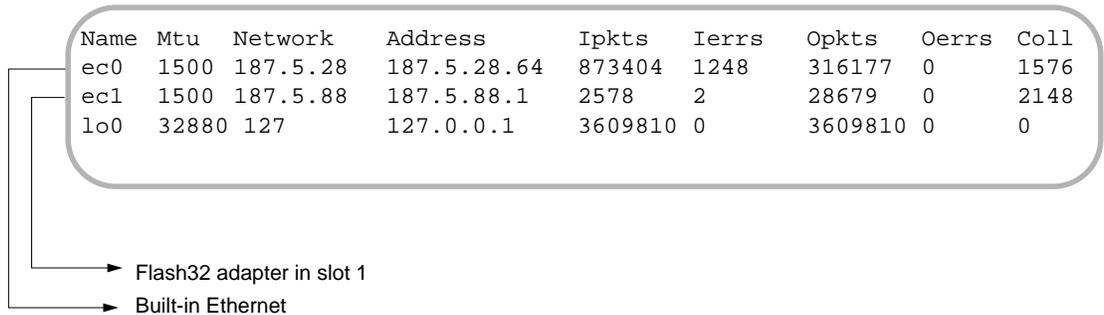


Figure 10 Example of a *netstat -in* Display

Verifying the Network Connection

To verify that the network connection is functional, follow the instructions in this section. To accomplish this verification, you use *ping -r* (lower case -r, not -R) to verify that this station can communicate with one other station on the local area network attached to each of the network interfaces listed in the *netstat* display (except the loopback, *lo0*).

1. Obtain the name of at least one station on each local area network to which this station is connected.

Two methods for obtaining station names are described below. The *ec#_networkaddress* variables used are the values in the *Network* column of the *netstat* display (illustrated in Figure 10).

- For sites with NIS, create a file with the names and addresses of stations located on the local area network for each network connection:

```
%ypcat hosts | grep ec0_networkaddress > ec0.s
%ypcat hosts | grep ec1_networkaddress > ec1.s
<if other connections exist, do a line for each
connection>
%ypcat hosts | grep ec2_networkaddress > ec2.s
```

- For distributed (non-NIS) sites, create a file with the names and addresses of stations located on the local area network for each network connection:

```
%grep ec0_networkaddress /etc/hosts > ec0.s
%grep ec1_networkaddress /etc/hosts > ec1.s
<if other connections exist, do a line for each
connection>
%grep ec2_networkaddress /etc/hosts > ec2.s
```

2. Communicate with one station on the LAN attached to the *ec0* connection. For the variable *ec0_station*, you can use any of the names or IP addresses from the *ec0.s* file, except the station's own.

```
%ping -r ec0_station
PING stationname (IPaddress): 56 data bytes
64 bytes from . . . time=x ms
. . .
<Ctrl><c>
----stationname PING Statistics----
# packets trans,# pckts rcvd, y% packet loss
```

3. If *netstat* lists an *ec1* interface, communicate with one station on the LAN attached to the *ec1* connection. For the variable *ec1_station*, you can use any of the names from the *ec1.s* file, except the station's own.

```
%ping -r ec1_station
PING stationname (IPaddress): 56 data bytes
64 bytes from . . . time=x ms
. . .
<Ctrl><c>
----stationname PING Statistics----
# packets trans, # pckts rcvd, y% packet loss
```

4. If *netstat* lists an *ec2* interface, communicate with one station on the LAN attached to the *ec2* connection. For the variable *ec2_station*, you can use any of the names from the *ec2.s* file, except the station's own.

```
%ping -r ec2_station
PING stationname (IPaddress): 56 data bytes
64 bytes from . . . time=x ms
. . .
<Ctrl><c>
----stationname PING Statistics----
# packets trans, # pckts received, y% packet loss
```

5. If one *ping* on each network succeeded, you have completed the verification procedure. All the network connections are functioning. Use the commands below to remove the files with the lists of stations:

```
%rm ec0.s  
%rm ec1.s  
%rm ec2.s
```

If the *ping* on a network fails, follow the instructions in the section “Troubleshooting.”

Troubleshooting

If the *ping* verification tests return 100% packet loss for all the network connections, your system probably has been configured incorrectly. Contact your network administrator and have him/her verify that the station’s network interface configuration (as displayed by *netstat -ina*) matches the physical connections and that the operating system software supports networking with TCP/IP.

1. Select two different stations on the network interface for which *ping* failed. Try to *ping -r* the new stations using the numerical addresses (instead of the names). If either *ping* works, the network connection is functional. If both of these *pings* fail, proceed to the next step.
2. Check that the Ethernet cables to the interface’s I/O panel and to the site’s transceiver (if connected to AUI) are tightly connected.
3. Try step 1 (above) for that network interface again. If both *pings* still fail, proceed to the next step.
4. Verify that the network portion (leftmost digits) of the addresses you are attempting to *ping* match the network address displayed by the */usr/etc/netstat -in* command. (See Figure 10 for an example of the *netstat* display.)

If the network addresses match, continue to the next step. If the network addresses do not match, repeat the steps in the section “Verifying the Network Connections” to obtain and test a new selection of stations. Take extra precautions to ensure that you use the correct network addresses.

If the verification procedure continues to fail, continue to the next step.

5. Replace the Ethernet cable.
6. Try step 1 (above) for that network interface again. If the *pings* still fail, proceed to the next step.
7. Replace the transceiver if connected to AUI.
8. Try step 1 for that network interface again. If the *pings* still fail, contact your network administrator to verify that the LAN is functioning properly. (The *IRIX Advanced Site and Server Administration Guide* and the *NetVisualyzer User's Guide* provide information on verifying network functionality.)
9. If the LAN is functioning properly, contact Intel's LAN Technical Support Group about your Flash32 adapter (see the Intel documentation that came with the adapter for information).

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