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Safety Considerations

Product and Documentation Labels

WARNING  A WARNING denotes a hazard that can cause injury or death.

CAUTION  A CAUTION denotes a hazard that can damage equipment or cause data loss.

Do not proceed beyond a WARNING or CAUTION notice until you have understood the hazardous conditions and have taken appropriate steps.

Grounding

The power module (HP 0950-2546 AC/DC Adapter) is a safety class I product and has a protective earthing terminal. There must be an uninterruptible safety earth ground from the main power source to the product’s input wiring terminals, power cord, or power cord set. Whenever it is likely that the protection has been impaired, disconnect the power cord until the ground has been restored.

Servicing

There are no user-serviceable parts inside the HP E2050 LAN/HP-IB Gateway or its power module (AC/DC Adapter). Any servicing, adjustment, maintenance, or repair must be performed by service-trained personnel only.

The power module does not have a power switch; the power cord is intended to serve as the disconnect device. Make sure that the power module is installed near the wall outlet and is easily accessible.
How to Use This Guide

Use this guide to install and configure the HP E2050 LAN/HP-IB Gateway for use with supported, network-equipped computer systems. You can also use this guide to administer the Gateway on your network and to troubleshoot any problems you might encounter while installing or configuring the Gateway.

Network-equipped computer systems that are supported for use with the LAN/HP-IB Gateway are:

- HP 9000 Series 700 workstations running either HP-UX Version 9 or Version 10.01 or later
- 32-bit personal computers (PCs) running either Microsoft® Windows 95™ or Windows NT®

To use the LAN/HP-IB Gateway for I/O applications, you must also have one or more of the following software products installed and configured on your network-equipped computer system.

- HP I/O Libraries, including one or more of the following:
  - HP Standard Instrument Control Library (HP SICL) either on HP-UX, or on Microsoft Windows 95 or Windows NT (for WIN32 applications only)
  - HP Virtual Instrument Software Architecture (HP VISA) library or HP VISA Transition Library (HP VTL) either on HP-UX, or on Microsoft Windows 95 or Windows NT (for WIN32 applications only), as applicable
  - HP Visual Engineering Environment (HP VEE) either on HP-UX, or on Microsoft Windows 95 or Windows NT (for WIN32 applications only)
  - HP BASIC/UX 700 Version 7.1 or Version 8.x on HP-UX

Note

Once you have used this guide to install and configure the Gateway, please refer to the appropriate documentation for your software product(s). See Appendix C, “Related Software Documentation,” for the software manuals you should use.
Who Should Use This Guide

This guide assumes that you are a Network Administrator who installs, configures, and maintains a local area network (LAN), including network-related hardware like the HP E2050 LAN/HP-IB Gateway. If you will use a Series 700 HP-UX workstation with the Gateway, you must also have superuser (root) privileges on the HP-UX system. If you will use a Windows NT PC with the Gateway, you must also have system administrator privileges on the Windows NT PC.

What Is in This Guide

This guide contains the following chapters and appendices:

- **Chapter 1 - Overview** provides a brief overview of the HP E2050 LAN/HP-IB Gateway.
- **Chapter 2 - Installation** explains how to install the Gateway hardware on the LAN and HP-IB bus.
- **Chapter 3 - Configuration** explains how to configure the Gateway on your network.
- **Chapter 4 - Administration** explains how to maintain the Gateway on the network.
- **Chapter 5 - Troubleshooting** provides ways to fix problems you may encounter with the Gateway.
- **Appendix A - Explanation of LEDs** explains the status information provided by the light-emitting diodes (LEDs) on the front panel of the Gateway.
- **Appendix B - Technical Reference** provides specifications and conformity information for the Gateway.
- **Appendix C - Related Software Documentation** lists the software manuals you should reference to use the Gateway with your I/O application software.

This guide also contains a Glossary of technical terms used throughout this guide, as well as an Index of topics.
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Overview
Overview

This chapter provides a general overview of the HP E2050 LAN/HP-IB Gateway, including:

- An explanation of the contents of your HP E2050 product package.
- A brief overview of the HP E2050 LAN/HP-IB Gateway’s functionality.

Figure 1-1. Components of the HP E2050 Product
HP E2050 Package Contents

Your HP E2050 product package contains the following items:

- This Installation and Configuration Guide
- HP E2050 LAN/HP-IB Gateway

As shown in Figure 1-2, the front panel of the Gateway contains 8 light-emitting diodes (LEDs) that indicate the status of the Gateway. The meanings of the LEDs are explained in Appendix A, “Explanation of HP E2050 LEDs.”

![Figure 1-2. Front Panel of the HP E2050 LAN/HP-IB Gateway](image)

As shown in Figure 1-3, the back panel of the Gateway has the following (from left to right)

- HP-IB connector
- RJ-45 connector for 10 Base-T, unshielded twisted-pair cable (Ethertwist LAN)
- BNC connector for 10 Base2, thin coaxial cable (ThinLAN)
- **Config Preset** button for resetting the Gateway to its default configuration values (preset at the factory)
- RS-232 connector (Note that the RS-232 interface is not supported for I/O application use at this time.)
- Power input for the DC cable from the AC/DC Adapter (power module)

![Figure 1-3. Back Panel of the HP E2050 LAN/HP-IB Gateway](image)
Overview

HP E2050 Package Contents

**Note**

Converters are available that provide an AUI connection (10 Base-T to DB15 AUI port) for ThickLAN or fiber optic networks (for Ethernet/IEEE 802.3 protocol). Note that you will need to purchase both a converter and a MAU to use the HP E2050 LAN/HP-IB Gateway with ThickLAN or a fiber optic network. Contact your HP Sales Representative for information on these and other networking products.

**HP 0950-2546 AC/DC Adapter and Standard AC Power Cord.**

As shown in Figure 1-4, the power module (AC/DC Adapter) provides 5 Vdc power to the Gateway. The 4-foot, DC cable attached to the power module connects to the power input on the back panel of the Gateway. The universal AC outlets on the power module can automatically accept and adapt to 100-240 Vac power.

The separate AC power cord connects to the AC IN outlet on the power module and to a power outlet (wall outlet), thus providing power to the power module and Gateway. You should have received the AC power cord for your country.

![Figure 1-4. AC/DC Adapter and Standard AC Power Cord](image)
Overview

HP E2050 Package Contents

HP 8120-6302 Accessory AC Power Cord (Optional). As shown in Figure 1-5, this optionally purchased cord can be used to set up power connections so that you only need one power outlet for the power module and an HP-IB instrument. This power cord attaches to the AC OUT outlet on the power module and to the power input of an HP-IB instrument.

Figure 1-5. Accessory AC Power Cord (Optional)

HP E2051 Rack Mount Kit (Optional). As shown in Figure 1-6, this optionally purchased kit allows you to mount up to two LAN/HP-IB Gateways in a rack frame. A light-duty, fixed shelf is also required. It is recommended that you use an HP E3666 Plain Shelf with this rack mount kit.

Figure 1-6. Rack Mount Kit (Optional)
Product Overview

The HP E2050 LAN/HP-IB Gateway combines hardware and firmware in a small box that provides a network gateway between network-equipped computer systems and HP-IB based instruments. The Gateway enables users of I/O applications to obtain measurement data either locally or remotely from HP-IB instrumentation.

Figure 1-7. Using the HP E2050 LAN/HP-IB Gateway
The Gateway connects the local area network (LAN) from the computer system to the HP-IB bus. Network-equipped computer systems that are supported for use with the Gateway include Series 700 workstations and 32-bit PCs. Following the client/server model of computing, the computer system is the client, and the HP E2050 LAN/HP-IB Gateway acts as the server.

Thus, I/O applications running on the computer system can transparently interface to HP-IB based instruments over the LAN. Since several computer systems can access the LAN/HP-IB Gateway, groups of users can share access to the same HP-IB instruments via the Gateway. In addition, existing I/O applications that are supported with the LAN/HP-IB Gateway and are designed for HP-IB can use the Gateway without modification beyond a simple address change.

The Gateway and its attached HP-IB instruments can be placed anywhere on the network (rather than with a particular controller or server computer system). This includes networks which span different geographic locations, such as when networked computer systems are located at several different sites. Hence, HP-IB instruments can be located where they are most convenient for I/O application users.

In addition, you can have more than one LAN/HP-IB Gateway on a network, providing “clusters” of HP-IB instrumentation at different locations. This further aids users in accessing the instrumentation they need for their particular I/O applications.
Overview

Product Overview

Software/Firmware Architecture

The HP E2050 LAN/HP-IB Gateway is supported with the following I/O application software products.

- HP I/O Libraries, including:
  - HP Standard Instrument Control Library (HP SICL) either on HP-UX, or on Microsoft® Windows 95® or Windows NT® (for WIN32 applications only).
  - HP Virtual Instrument Software Architecture (HP VISA) library or HP VISA Transition Library (HP VTL) either on HP-UX, or on Microsoft Windows 95 or Windows NT (for WIN32 applications only), as applicable.
- HP Visual Engineering Environment (HP VEE) either on HP-UX, or on Microsoft Windows 95 or Windows NT (for WIN32 applications only).
- HP BASIC/UX 700 Version 7.1 or Version 8.x on HP-UX.

**Note**

The HP E2050 LAN/HP-IB Gateway supports all I/O application operations provided by these software products except for parallel polling, HP SICL commander sessions, and asynchronous aborting.

HP SICL contains the LAN client software needed to access the LAN/HP-IB Gateway. Thus, HP SICL is also provided with the HP VISA, HP VTL, HP VEE, and HP BASIC/UX 700 I/O application software products. To use any of these software products with the LAN/HP-IB Gateway, you must also install and configure HP SICL on the client computer system.

**Note**

Newer versions of several of these software products support two different LAN networking protocols: the current SICL LAN Protocol, and the newer TCP/IP Instrument Protocol. When configuring the software product, you may be offered the choice of which LAN networking protocol you wish to use. For a description of each of these protocols, refer to your software product’s documentation.

Version A.00.00 of the HP E2050 LAN/HP-IB Gateway supports only the SICL LAN Protocol; whereas Version A.01.00 or later of the LAN/HP-IB Gateway supports both the SICL LAN Protocol and the TCP/IP Instrument Protocol. To check which version of the Gateway you currently have (and, therefore, which protocol(s) you may use with the Gateway depending on which software product you have), see the section titled “Determining the Version of the Gateway’s Firmware” in Chapter 4 of this guide.
Hence, as shown in Figure 1-9, the client system contains the LAN client software provided with HP SICL, as well as the TCP/IP LAN software needed to access the Gateway. The Gateway contains LAN server and TCP/IP LAN firmware so that it acts as the LAN server.

The LAN client software provided with HP SICL uses the TCP/IP LAN protocol suite to pass messages between the client system and the server (the HP E2050 LAN/HP-IB Gateway). Therefore, the client sends I/O requests over the network to the server. The server then executes those I/O requests on the appropriate HP-IB based instrument(s) connected to the server.

**How I/O Application Software Works with the Gateway**

This subsection briefly summarizes how the software on a client computer system works with the HP E2050 LAN/HP-IB Gateway to complete I/O application operations on attached HP-IB instruments. For more detailed information on how to use your software with the Gateway, please refer to your software documentation as listed in Appendix C, “Related Software Documentation.”

Before trying to perform an I/O application operation on the Gateway’s HP-IB interface and the HP-IB bus, the LAN client software in the client computer system establishes a network connection to the LAN server (the Gateway). Once the client establishes a connection, the client can begin to send I/O requests to the Gateway.

The Gateway (LAN server) can have multiple clients connected and being serviced at any given time. The maximum number of concurrent client connections depends on memory usage in the Gateway, including the number of clients and the number of current sessions running on those clients. However, at least 8 and not more than 15 client connections can be
Overview

Product Overview

running concurrently. Thus, if the maximum number of client connections to the Gateway has not been exceeded, the connection is allowed to occur.

Although several instruments can be connected to the Gateway’s HP-IB bus, only one I/O application operation can occur on the HP-IB bus at any given time. Therefore, once a client’s request begins to execute on the HP-IB, all other client requests for operations on the HP-IB must wait until the current client request completes. Client requests are serviced in a first come, first served manner, unless they are prohibited by interface or device locks.

If a client has a sequence of I/O application operations to perform that should not be preempted, the client should obtain a lock on the Gateway’s HP-IB interface or device. Once the client’s sequence has completed, it should release its lock, allowing other clients access.

When a client closes a connection, the Gateway frees up the resources allocated to that client, including any locks, pending I/O requests, memory usage, and so forth. Abnormal termination (for example, the network and/or client goes down) is discussed in Chapter 5, “Troubleshooting.”
Where to Go Now

Now that you understand how the HP E2050 LAN/HP-IB Gateway works, you are ready to install and configure the Gateway. Please continue on to the next chapter, “HP E2050 Installation.”
Overview

Where to Go Now
Installation
This chapter explains how to install the HP E2050 LAN/HP-IB Gateway on the LAN and HP-IB bus for use with network-equipped computer systems.

To complete the installation, you will do the following:

1. Ensure that you have the hardware and software required.

2. Install the Gateway hardware by connecting it to the LAN, HP-IB bus, and power module.

The following sections explain how to complete these installation steps.
Prerequisites

This section lists the hardware and software you need to install the HP E2050 LAN/HP-IB Gateway.

Hardware Requirements

To install the Gateway, you must have the following hardware.

- One or more of the following, network-equipped computer systems to act as the LAN client system(s):
  - HP 9000 Series 700 workstation.
  - 32-bit personal computer (PC).
- A local area network (LAN) to which the client system(s) and the HP E2050 LAN/HP-IB Gateway can connect via the appropriate LAN cables.
- The HP E2050 LAN/HP-IB Gateway.
- The power module and standard power cord that will provide power to the Gateway.
- Optionally, a separately purchased accessory power cord.
- Optionally, a separately purchased rack mount kit in which you can mount the Gateway.
- HP-IB instrument(s), including the HP-IB cable(s) needed to connect the Gateway to the instrument(s).
Installation

Prerequisites

Software Requirements

Each client computer system that will access the Gateway must be running one of the following operating systems.

- HP-UX Version 9 or Version 10.01 or later (for Series 700 workstations)
- Microsoft Windows 95 or Windows NT (for 32-bit PCs)

You must also have one or more of the following I/O application products installed and configured on each client computer system that you wish to use with the Gateway.

- HP I/O Libraries, including one or more of the following:
  - HP SICL either on HP-UX, or on Microsoft Windows 95 or Windows NT (for WIN32 applications only).
  - HP VISA or HP VTL either on HP-UX, or on Microsoft Windows 95 or Windows NT (for WIN32 applications only), as applicable.
- HP VEE either on HP-UX, or on Microsoft Windows 95 or Windows NT (for WIN32 applications only).
- HP BASIC/UX 700 Version 7.1 or Version 8.x on HP-UX.

To learn how to install and configure these software products for use with the Gateway, please refer to Appendix C, “Related Software Documentation.”
Installing the Hardware

This section explains how to install the LAN/HP-IB Gateway hardware by connecting it to the LAN, HP-IB bus, and power module.

LAN Hardware Address

First, find the hardware address of the LAN interface in the HP E2050 LAN/HP-IB Gateway. Turn the Gateway over and look for the label on the underside of the Gateway.

The hardware address on the label will be similar to the following:

080009XXXXXX

Write down this address, as you may need it later to configure the Gateway on the network.
Hardware Installation

Now follow these steps to install the Gateway hardware:

1. If you purchased the optional rack mount kit, follow that kit’s documentation to assemble the rack and to install the Gateway in the rack’s frame.

2. Make sure the HP-IB instrumentation you will connect to the Gateway is working properly and is connected to the HP-IB bus.

3. Connect the Gateway to the network, as shown on the following pages.

Caution

Do not connect to both the RJ-45 and the BNC connectors on the Gateway. Only one connection to the LAN interface in the Gateway can be made at one time. Data loss may occur if you try to use both connectors simultaneously. The Gateway will automatically select the active port.

- For Ethertwist, connect the LAN cable to the RJ-45 connector on the back panel of the Gateway.

Figure 2-2. Connecting to an Ethertwist LAN Using an RJ-45 Connector
Note
If you want to connect the Gateway to a ThickLAN or fiber optic network, please follow the hardware documentation provided with your ThickLAN or fiber optic network to connect your LAN cable to the RJ-45 connector on the Gateway.

Note
To connect the Gateway directly to a client computer system, you will need a special twisted-pair cable. Contact your HP Sales Representative for more information.

■ For ThinLAN, connect the LAN cable to the BNC connector on the back panel of the Gateway using a BNC “T” connector. Make sure the ThinLAN segment is properly terminated. If the Gateway is the end node on the LAN, a 50-ohm BNC terminator must be attached to the “T” connector.

Figure 2-3. Connecting to a ThinLAN Using a BNC “T” Connector
4. Connect the HP-IB cable from the HP-IB instrument(s) to the HP-IB connector on the back panel of the Gateway.

5. If you have the optional accessory AC power cord, connect it to AC OUT on the power module and to the power input on the back panel of an HP-IB instrument. This allows you to use only one power outlet (wall outlet) for the power module and the HP-IB instrument.

6. Connect the DC power cord attached to the power module (AC/DC Adapter) to the power input on the back panel of the Gateway, as shown in Figure 2-5.
7. Connect the standard AC power cord to AC IN on the power module and to a power outlet (wall outlet), as shown in Figure 2-5.

![Figure 2-5. Connecting the Power Module](image)

**Note**

The power module and Gateway do not have power switches. Connecting the standard AC power cord to the power source (wall outlet) activates both units. The power module automatically adapts to the correct AC voltage range for your power source.

The Gateway now goes through its power-on, hardware self-test.

8. Verify that the hardware is working properly by looking at the LEDs on the front panel of the Gateway. The green Power LED should now be illuminated, and the red Fault LED should be off. (Note that one or more of the yellow LAN LEDs may also be flashing. Simply ignore the LAN LEDs at this time.)
Installation

Installing the Hardware

**Note**

If the red Fault LED is illuminated, this indicates a hardware fault was found during the power-on, hardware self-test of the Gateway. Please contact your HP Service and Support Center for instructions.

The Fault LED is illuminated *briefly* at power-on to verify its operation. Service is only required if the Fault LED remains illuminated.

9. Once you have verified that the hardware is working properly (the Gateway’s green Power LED is illuminated), disconnect the standard AC power cord from the power outlet (wall outlet).
Where to Go Now

You have now finished installing the Gateway hardware. Please continue on to the next chapter to configure the Gateway on your network.
Installation

Where to Go Now
Configuration
This chapter explains how to configure the HP E2050 LAN/HP-IB Gateway on your network. You can use this chapter if you are configuring the Gateway for the first time on your network, or if you need to change the Gateway’s configuration in the future.

Note

If your LAN/HP-IB Gateway is already configured and you wish to change the configuration, please read the section titled “Modifying the Gateway’s Configuration” in Chapter 4 first. Then use this chapter (Chapter 3) to reconfigure the LAN/HP-IB Gateway.

To configure the LAN/HP-IB Gateway on a network, you will need to do the following:

1. Gain an understanding of the configuration values that can be used for the Gateway, including what defaults, if any, are preset for each configuration value.

2. Decide which configuration values you need to change or set for the Gateway.

3. Either use one of three possible configuration methods on HP-UX, or use the Telnet configuration method on Windows 95 or Windows NT, to change or set the configuration values you want for the Gateway.

The following sections explain these configuration steps.
Configuration Values

This section provides a brief description of the configuration values that are used to configure the HP E2050 LAN/HP-IB Gateway on a network. Later sections describe the default configuration values that are set at the factory for the Gateway, as well as methods you can use to change or set the configuration values you want.

Note

The most important configuration value is the Internet Protocol (IP) address of the LAN/HP-IB Gateway. Without a proper IP address, the Gateway may appear “dead” or operate unexpectedly.

At a minimum, you must set the IP address for the LAN/HP-IB Gateway on your network. In fact, the IP address may be the only configuration value you will need to set. To determine what configuration values other than the IP address (if any) you will need for the Gateway, please read this section and the next section, “Default Configuration Settings” on page 39.

IP addresses for network devices are assigned by a designated Network Administrator in your workplace. If you are not the Network Administrator, you will need to contact the designated Network Administrator who can assign the Gateway’s IP address for you.

The following pages list the configuration values that are used to configure the LAN/HP-IB Gateway on a network. Note that many of these configuration values have defaults (preset at the factory), which are explained in the next section, “Default Configuration Settings.”
## Configuration

### Configuration Values

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOOTP ON/OFF</td>
<td>This value is used to enable (ON) or disable (OFF) a BOOTP or a BOOTP with TFTP configuration of the LAN/HP-IB Gateway. This value is only used with the Telnet configuration method. (The BOOTP, BOOTP with TFTP, and Telnet configuration methods are explained later in this chapter.)</td>
</tr>
<tr>
<td>Default Subnet</td>
<td>This value is the IP address of the default subnet gateway that allows the HP E2050 LAN/HP-IB Gateway to communicate with systems that are not on the local subnet. Thus, this is the default subnet gateway where packets are sent which are destined for a device not on the local subnet, as determined by the subnet mask setting. (See the explanation for the subnet mask configuration value.) Only one default subnet gateway can be configured. A value of 0.0.0.0 indicates that no subnetting is to be done.</td>
</tr>
<tr>
<td>Gateway Address</td>
<td>This value is the unique address of the LAN interface in the HP E2050 LAN/HP-IB Gateway. (Note that the LAN hardware address is also often called the link-level address, the Ethernet station address, or the LANIC ID.) The LAN hardware address is printed on a label on the underside of the LAN/HP-IB Gateway box. The hardware address value cannot be set or changed with Telnet configuration of the LAN/HP-IB Gateway. However, the hardware address value must be specified and set when using the BOOTP or the BOOTP with TFTP configuration method. (The BOOTP, BOOTP with TFTP, and Telnet configuration methods are explained later in this chapter.)</td>
</tr>
</tbody>
</table>
## Configuration Values

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hostname</strong></td>
<td>This value configures the Internet domain name for the LAN/HP-IB Gateway. This name is used in some error and status messages, but is not a required configuration setting. The maximum length of the hostname value is 35 characters.</td>
</tr>
<tr>
<td><strong>HP-IB Address</strong></td>
<td>This value configures the HP-IB bus address. This address is used when transfers are made on the HP-IB bus. Note that an HP SICL client application can change this value by using the HP SICL function, <code>IGPIBBUSADDR</code>. The HP-IB address value can be any number 0 through 30.</td>
</tr>
<tr>
<td><strong>HP-IB Interface Name</strong></td>
<td>This value is the symbolic name of the HP-IB interface in the LAN/HP-IB Gateway. It is used in an HP SICL client application’s <code>iopen</code> operation to symbolically reference the HP-IB interface in the Gateway. The maximum length of the HP-IB interface name is 15 characters.</td>
</tr>
<tr>
<td><strong>HP-IB Logical Unit</strong></td>
<td>This value is the interface logical unit number of the HP-IB interface in the LAN/HP-IB Gateway. It may be used in an HP SICL client application’s <code>iopen</code> statement to uniquely identify the HP-IB interface in the Gateway. The HP-IB logical unit value can be any number 1 through 255.</td>
</tr>
</tbody>
</table>
## Configuration

### Configuration Values

<table>
<thead>
<tr>
<th><strong>Value</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O Timeout</td>
<td>This value sets the server I/O timeout in seconds. This configures the Gateway to use an I/O timeout of the specified amount of seconds if the client requests a timeout of infinity. If 0 is specified for this value and the client requests infinity, then the Gateway will use a timeout of infinity as requested. This timeout value may be used to ensure that the Gateway does not wait indefinitely for an I/O operation. This also allows the Gateway to detect certain network events, such as when a client connection is dropped, which may otherwise go undetected. If the Gateway detects such a condition, it will release any resources, such as locks, associated with the client.</td>
</tr>
<tr>
<td>IP Address</td>
<td>This value is the Internet Protocol (IP) address of the LAN/HP-IB Gateway. The IP address is a required value and is used for all IP and TCP/IP communications with the LAN/HP-IB Gateway. The IP address is represented in dotted decimal notation (for example, 15.1.222.201). This number is not assigned by HP; rather, it is assigned by your designated Network Administrator. The LAN/HP-IB Gateway uses the default IP address of 192.0.0.192 as a temporary IP address until you configure a real IP address.</td>
</tr>
</tbody>
</table>
**Value**  | **Description**  
--- | ---
IP Allow List | The IP allow list defines a list of computer systems which are allowed to communicate with the LAN/HP-IB Gateway. When a computer system attempts to connect to the LAN/HP-IB Gateway, the Gateway checks the IP address of the computer system requesting the connection against the list of IP addresses that are allowed access to the LAN/HP-IB Gateway.

The IP address(es) of the computer system(s) are represented in dotted decimal notation, with each IP address separated by a blank space. The maximum length of the allow list is 125 characters. Not specifying an allow list or specifying an allow list value of * (the asterisk wild card character) allows connections from all computer systems on the network.

The following is an example IP allow list entry that lists the specific IP addresses of two computer systems which are allowed to communicate with the LAN/HP-IB Gateway:

```
allow: 15.1.34.2  192.54.24.5
```

You can also use the asterisk wild card character (*) to signify all IP addresses. For example, either of the following entries allow all computer systems with IP addresses starting with 15.1:

```
allow: 15.1.*.*
```

Or:

```
allow: 15.1.*
```

In addition, you can use a dash character (–) between numbers to signify a range of IP addresses. For example:

```
allow: 15.1.34–48.2  192.54.24–37.*
```
### Configuration Values

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LAN Timeout</strong></td>
<td>This value sets the LAN connect timeout in seconds. The Gateway may use the TCP keepalive timer of the TCP/IP protocol stack to determine if a client is still reachable. By specifying this configuration value, the Gateway turns on the keepalive timer when connecting to the client. If after the specified amount of time there has been no activity on the connection, the Gateway will send keepalive probes to the client to determine if it is still alive. After a system specified amount of time, the connection will be marked as down (“dropped”), and the Gateway will release any resources which were allocated to the associated client. A value of 0 means no timeout is set; thus, the Gateway will wait forever and no keepalive probes are sent. If this value is set, it is recommended that the largest value be used which still meets the application’s need for unreachable client detection. Smaller LAN timeout values will generate keepalive probes (network traffic) more often than larger values in an otherwise idle but healthy system, using more of the available network bandwidth.</td>
</tr>
<tr>
<td><strong>Subnet Mask</strong></td>
<td>This value is used to enable the LAN/HP-IB Gateway to determine if an IP address is on the same local subnet as the LAN/HP-IB Gateway itself. When an address is on a different subnet, all packets must be sent to a subnet gateway. The subnet mask is sometimes not needed with today’s smart subnet gateways, which automatically know when to forward packets between subnets. A value of 0.0.0.0 or 255.255.255.255 indicates no subnetting is to be done.</td>
</tr>
</tbody>
</table>
Configuration Values

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syslog Server Address</td>
<td>This value, which is only available on HP-UX (not on Windows 95 or Windows NT), is the IP address of the syslog server to which you want the LAN/HP-IB Gateway to send syslog messages. Syslog messages identify changes in the LAN/HP-IB Gateway’s status or error conditions that have occurred. A <strong>syslogd</strong> daemon on the syslog server reads and forwards messages to a log file. Typically, <strong>syslogd</strong> obtains its routing information from the <strong>/etc/syslog.conf</strong> configuration file, which you can edit to specify the log file to which you want syslog messages from the LAN/HP-IB Gateway routed. Refer to <a href="man">syslogd(1M)</a> for more information on the <strong>syslogd</strong> daemon and the <strong>syslog.conf</strong> file. The syslog server’s IP address is represented in dotted decimal notation. This is not a required configuration setting. However, setting up a syslog server and log file is recommended, as syslog messages are helpful in administering the LAN/HP-IB Gateway and troubleshooting problems with the Gateway.</td>
</tr>
</tbody>
</table>
## Configuration

### Configuration Values

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFTP File</td>
<td>This value is the path to an optional, TFTP configuration file. This value is only used with the BOOTP with TFTP configuration of the LAN/HP-IB Gateway. (The BOOTP with TFTP configuration method is explained later in this chapter.) The TFTP file contains additional configuration values, including LAN timeout, I/O timeout, IP allow list, HP-IB address, HP-IB interface name, and/or HP-IB logical unit. The maximum length of the path to the TFTP file is 33 characters. The TFTP file name is usually designated with a <code>.cfg</code> extension. Note that there are two modes for running TFTP: one which uses the TFTP home directory (the default mode); and one where a path is specified on the TFTP command line (the command line is normally set in the <code>/etc/inetd.conf</code> file on both HP-UX Versions 9 and 10.01). If no path is specified on the command line (the default mode), a relative path from the home directory must be used. In this case, the path to the TFTP configuration file is relative either from the <code>/usr/tftpdir</code> directory on HP-UX Version 9, or from the <code>/home/tftpdir</code> directory on HP-UX Version 10.01. However, if a path is specified on the command line, the full path to the TFTP configuration file must be used.</td>
</tr>
</tbody>
</table>
Default Configuration Settings

The HP E2050 LAN/HP-IB Gateway is shipped from the factory with default settings for the configuration values listed in Table 3-1. You can use the methods described in the next section to change or set any of the configuration values, as needed.

Table 3-1. Default Configuration Settings

<table>
<thead>
<tr>
<th>Configuration Value</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hostname</td>
<td>E2050</td>
</tr>
<tr>
<td>IP Address</td>
<td>192.0.0.192</td>
</tr>
<tr>
<td>Default Subnet Gateway Address</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>Syslog Server Address</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>BOOTP</td>
<td>ON</td>
</tr>
<tr>
<td>LAN Timeout</td>
<td>0</td>
</tr>
<tr>
<td>I/O Timeout</td>
<td>120</td>
</tr>
<tr>
<td>IP Allow List</td>
<td>* (All allowed)</td>
</tr>
<tr>
<td>HP-IB Address</td>
<td>21</td>
</tr>
<tr>
<td>HP-IB Interface Name</td>
<td>hpib</td>
</tr>
<tr>
<td>HP-IB Logical Unit</td>
<td>7</td>
</tr>
</tbody>
</table>

The HP E2050 LAN/HP-IB Gateway uses these default configuration values until you explicitly change any of these values and set any other configuration values. The Gateway also uses these values when you press the Gateway’s Config Preset button (located on the back panel of the Gateway). This is explained in the section titled “How the Configuration Values Are Used” on page 60.
Configuration Methods

This section explains the configuration methods you can use to set the configuration values for the LAN/HP-IB Gateway. Note that if you will configure the Gateway on your network from an:

- HP-UX client system -- you can use any one of the three configuration methods. You will need to choose the one method you wish to use, based either on your previous experience with one or more of these methods, or on what method seems the easiest for you to use to complete your particular configuration tasks.

- Windows 95 or Windows NT client system -- you must use the Telnet configuration method. Both the BOOTP and the BOOTP with TFTP configuration methods are not available on Windows 95 or Windows NT.

The following are descriptions of the three possible methods used to configure the LAN/HP-IB Gateway on a network.

**BOOTP**

BOOTP is a bootstrap protocol that allows critical configuration values such as the IP address and subnet mask to be set easily. With the BOOTP configuration method, you set the values for the Gateway in the `/etc/bootptab` file. This file is then used by the bootpd daemon running on the BOOTP server to configure the Gateway on the network.

You can use BOOTP from an HP-UX client system if you do not need to change the default values for the following configuration values:

- LAN timeout
- I/O timeout
- IP allow list
- HP-IB address
- HP-IB interface name
- HP-IB logical unit

**Note**

If you will use the BOOTP method, the BOOTP server system must be configured to run the `bootpd` daemon. See the *Administering ARP Services* manual for more information.
TFTP (Trivial File Transfer Protocol) is a protocol which can be used with BOOTP, where more configuration values for the Gateway are set in a separate, TFTP configuration file. The path to this TFTP configuration file, which usually has a .cfg extension, is set in the T144: BOOTP tag in the /etc/bootptab file. Both the /etc/bootptab file and the TFTP configuration file contents are used by the bootpd daemon running on the BOOTP server to configure the Gateway on the network.

You can use BOOTP with TFTP from an HP-UX client system to set or change any of the configuration values for the Gateway.

**Note**
If you will use the BOOTP with TFTP method, the BOOTP and TFTP server system must be configured to run the bootpd and tftpd daemons. See the *Administering ARPA Services* manual for more information.

Telnet is a networking protocol that connects to the Gateway and then provides a command line interface to assist you in configuring the Gateway on the network. If you prefer to use a command line interface (rather than having to edit files, as you would in the BOOTP and the BOOTP with TFTP methods), you may want to choose this method to configure the Gateway on the network.

You can use Telnet from either an HP-UX or a Windows 95 or Windows NT client system to set or change any of the configuration values for the Gateway.

**Note**
The Telnet utility used to configure the LAN/HP-IB Gateway is also used to administer the Gateway after it has been configured on the network. For example, you can use the Telnet utility in the future to monitor the status of client connections and so forth. Thus, you may want to use the Telnet configuration method simply because you will be using the same Telnet utility in the future for administration tasks.

Once you have determined the configuration method you wish to use, as well as the configuration values you want to change or set, go on to the appropriate subsection on the following pages for the configuration method you will use.
Configuration

Configuration Methods

Using the Telnet Configuration Method from HP-UX

To configure the LAN/HP-IB Gateway on your network using Telnet from an HP-UX client system, do the following:

1. Power-on the Gateway by plugging the AC power cord from the power module into a power outlet (wall outlet).

2. Once the Gateway is powered on, press the recessed Config Preset button on the back panel of the Gateway. This causes the Gateway to temporarily use its default IP address, 192.0.0.192. Note that the LAN Conn (LAN Connect) LED on the front panel of the Gateway will flash slowly, showing that the default IP address is now in use.

3. Log into a client computer system (the Series 700 HP-UX workstation) as root.

4. At the system prompt, type:
   
   \texttt{route add host 192.0.0.192 your\_system\_name \textbackslash{}Return}
   
   This sets up a route table entry on your client system for the Gateway at its default IP address.

5. At the system prompt, type:
   
   \texttt{telnet 192.0.0.192 \textbackslash{}Return}
   
   This connects you to the Gateway at its temporary, default IP address.

\textbf{Note}

If you are unable to make a Telnet connection using the default IP address (192.0.0.192), try pressing the Config Preset button again and then try the \texttt{telnet} command (step 5 above) again. If you are still unsuccessful, see Chapter 5, “Troubleshooting.”

When you are connected to the Gateway, you see the following message:

\texttt{Connected to 192.0.0.192}

This is followed by general information about the Telnet utility commands, as well as a listing of the current configuration settings for this Gateway.
Configuration

Configuration Methods

For example, if you have not changed any of the configuration settings previously, you will see the default configuration settings for the Gateway, as follows. However, note that in this example, the hardware-addr: value is merely an example. Your hardware-addr: value will be correct for your Gateway.

Welcome to the E2050 LAN/HP-IB Gateway configuration utility.

Commands

? Show additional commands
exit, quit Exit WITHOUT saving configuration changes
reboot Save configuration changes and restart
status Show the LAN/HP-IB Gateway connection status

Configuration Parameters

hostname: E2050 # Internet domain name
hardware-addr: 0800091A0E02 # Ethernet station address
ip: 0.0.0.0 # Internet Protocol address
default-gw: 0.0.0.0 # Default subnet gateway IP address
subnet-mask: 0.0.0.0 # Network subnet mask
syslog-svr: 0.0.0.0 # Syslog server IP address
bootp: ON # Obtain config via BOOTP/TFTP
lan-timeout: 120 # LAN connect timeout in seconds
io-timeout: 120 # Server I/O timeout in seconds
allow: * # IP allow list

hpib-address: 21 # HP-IB Address
hpib-name: hpb # HP-IB interface symbolic name
hpib-unit: 7 # HP-IB logical unit number

Note

On HP-UX 10.01, you may see the string Local flow control off at the bottom of the screen. This will not affect your use of the Telnet utility to configure the HP E2050.

6. At the Telnet prompt (>), enter the configuration values you want to change or set. (Note that you only need to specify the non-default values that you want.) The following information will help you set the values correctly.

First, Table 3-2 lists the configuration values you can set using Telnet. The information on the next page explains what syntax you should use, and provides reminders that will help you to change or set the configuration values correctly.
By using the Telnet configuration method, the LAN hardware address (\texttt{hardware-addr}) value is automatically set to the correct hardware address for this LAN/HP-IB Gateway. Do not change the hardware address value via Telnet. Its value in the Telnet configuration table is for information purposes only.

Table 3-2. Telnet Configuration Values

<table>
<thead>
<tr>
<th>Configuration Value</th>
<th>Telnet Command</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hostname</td>
<td>hostname:</td>
<td>E2050</td>
</tr>
<tr>
<td>IP Address</td>
<td>ip:</td>
<td>192.0.0.192</td>
</tr>
<tr>
<td>Default Subnet Gateway Address</td>
<td>gateway:</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>subnet-mask:</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>Syslog Server Address</td>
<td>syslog-svr:</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>BOOTP</td>
<td>bootp:</td>
<td>ON</td>
</tr>
<tr>
<td>LAN Timeout</td>
<td>lan-timeout:</td>
<td>0</td>
</tr>
<tr>
<td>I/O Timeout</td>
<td>io-timeout:</td>
<td>120</td>
</tr>
<tr>
<td>IP Allow List</td>
<td>allow:</td>
<td>* (All allowed)</td>
</tr>
<tr>
<td>HP-IB Address</td>
<td>hpib-address:</td>
<td>21</td>
</tr>
<tr>
<td>HP-IB Interface Name</td>
<td>hpib-name:</td>
<td>hpib</td>
</tr>
<tr>
<td>HP-IB Logical Unit</td>
<td>hpib-unit:</td>
<td>7</td>
</tr>
</tbody>
</table>

For each configuration value you need to change or set, use the syntax:

\textit{Telnet\_command: value} \textbf{Return}

For example, to set the IP address value of \texttt{15.1.222.201} for the Gateway, you would enter:

\texttt{ip: 15.1.222.201 Return}
REMINDERS:

- If you make a mistake, simply re-enter the correct configuration value you want. To do this, use the same syntax as before to re-enter the value (Telnet_command: value Return).

- If you want to exit *without* saving any of the configuration values you have changed or set, enter either `exit Return` or `quit Return`. You can then re-enter the Telnet configuration utility by starting with step 5 in this subsection.

- Any time during the Telnet session, you can enter `config Return` to view the current configuration settings.

- Any time during the Telnet session, you can enter `? Return` for a list of available commands you can use in the Telnet utility.

7. When you have changed or set all the configuration values you want for the Gateway, type `reboot Return`. Then type `y Return` to confirm your changes.

Rebooting activates the configuration values you have set for the Gateway.

---

**Caution**

If you are reconfiguring the Gateway, any client operations in progress and client connections will be terminated by the `reboot` command.

8. After you have rebooted the Gateway, test that the Gateway has been successfully configured by using the `ping` command. This command allows you to test general network connectivity between your client computer system and the LAN/HP-IB Gateway. At the client system, type in:

```
ping hostname (or) IP_address Return
```

For example, using a Gateway’s hostname:

```
ping E2050.hp.com Return
```

Or, using a Gateway’s IP address:

```
ping 15.1.4.249 Return
```
Configuration

Configuration Methods

You should get a response from the `ping` command that is similar to the following, where each line after the `PING` line is an example of a packet successfully reaching the Gateway from the client system.

```
PING E2050.hp.com: 64 byte packets
64 bytes from 128.10.0.3: icmp_seq=0. time=3. ms
64 bytes from 128.10.0.3: icmp_seq=1. time=3. ms
64 bytes from 128.10.0.3: icmp_seq=2. time=2. ms
```

If your `ping` response is similar to the previous one, your Gateway has been configured successfully. Please continue on to the section titled “How the Configuration Values Are Used” on page 60.

If after several seconds `ping` does not print any lines, use `Ctrl-C` to kill `ping`. The `ping` will then report on what it found. If the response is similar to the following, then this indicates that the client was unable to contact the Gateway, and there may be some problem with the Gateway’s configuration, or the network itself.

```
----E2050.hp.com PING Statistics----
4 packets transmitted, 0 packets received, 100% packet loss
```

**Note**

If you are having trouble configuring the Gateway, or if you wish to verify that the configuration is correct, see Chapter 5, “Troubleshooting.”
Using the Telnet Configuration Method from Windows 95 or Windows NT

To configure the LAN/HP-IB Gateway on your network using Telnet from a Windows 95 or Windows NT client system, do the following:

1. Power-on the Gateway by plugging the AC power cord from the power module into a power outlet (wall outlet).

2. Once the Gateway is powered on, press the recessed Config Preset button on the back panel of the Gateway. This causes the Gateway to temporarily use its default IP address, 192.0.0.192. Note that the LAN Conn (LAN Connect) LED on the front panel of the Gateway will flash slowly, showing that the default IP address is now in use.

3. If it is not already running, start up Windows 95 or Windows NT on the client computer system (the Windows 95 or Windows NT PC).

4. From the:
   - Windows 95 task bar at the bottom of the screen, select Start | Programs | MS-DOS Prompt. The MS-DOS window opens.
   - Windows NT Program Manager, select Main. Then select MS-DOS Prompt. The MS-DOS window opens.

5. At the > prompt in the MS-DOS window, type:

   `route add 192.0.0.192 your_system_name Enter`

   This sets up a route table entry on your client system for the Gateway at its default IP address.

6. At the > prompt in the MS-DOS window, type:

   `telnet 192.0.0.192 Enter`

   This connects you to the Gateway at its temporary, default IP address, and the Telnet window opens.

---

**Note**

If you are unable to make a Telnet connection using the default IP address (192.0.0.192), try pressing the Config Preset button again and then try the telnet command (step 6 above) again. If you are still unsuccessful, see Chapter 5, “Troubleshooting.”
Configuration

Configuration Methods

When you are connected to the Gateway, you see general information about the Telnet utility commands, as well as a listing of the current configuration settings for this Gateway.

For example, if you have not changed any of the configuration settings previously, you will see the default configuration settings for the Gateway, as shown below. However, note that in this example, the hardware-addr: value is merely an example. Your hardware-addr: value will be correct for your Gateway.

Welcome to the E2050 LAN/HP-IB Gateway configuration utility.

Commands
?
exit, quit Exit WITHOUT saving configuration changes
reboot Save configuration changes and restart
status Show the LAN/HP-IB Gateway connection status

Configuration Parameters

hostname: E2050 # Internet domain name
hardware-addr: 0800091A0E02 # Ethernet station address
ip: 0.0.0.0 # Internet Protocol address
default-gw: 0.0.0.0 # Default subnet gateway IP address
subnet-mask: 0.0.0.0 # Network subnet mask
syslog-svr: 0.0.0.0 # Syslog server IP address
bootp: ON # Obtain config via BOOTP/TFTP
lan-timeout: 0 # LAN connect timeout in seconds
io-timeout: 120 # Server I/O timeout in seconds
allow: * # IP allow list

hpib-address: 21 # HP-IB Address
hpib-name: hpib # HP-IB interface symbolic name
hpib-unit: 7 # HP-IB logical unit number

7. Now you must turn on Local Echo in the Terminal Preferences dialog box so that the Telnet utility will display your typed input. From the menu at the top of the Telnet window, select Terminal | Preferences.

The Terminal Preferences dialog box is displayed.

8. Click on the checkbox next to Local Echo to turn it on.

A checkmark is displayed in the checkbox. Local Echo is now set on.

9. Click on OK to close the Terminal Preferences dialog box.
10. At the Telnet prompt (>), enter the configuration values you want to change or set. (Note that you only need to specify the non-default values that you want.) The following information will help you set the values correctly.

First, Table 3-2 on page 44 lists the configuration values you can set using Telnet. The following information explains what syntax you should use, and provides reminders that will help you to change or set the configuration values correctly.

Note

By using the Telnet configuration method, the LAN hardware address (hardware-addr:) value is automatically set to the correct hardware address for this LAN/HP-IB Gateway. Do not change the hardware address value via Telnet. Its value in the Telnet configuration table is for information purposes only.

For each configuration value you need to change or set, use the syntax:

```
Telnet_command: value Enter
```

For example, to set the IP address value of 15.1.222.201 for the Gateway, you would enter:

```
ip: 15.1.222.201 Enter
```

REMINDERS:

- If you make a mistake, simply re-enter the correct configuration value you want. To do this, use the same syntax as before to re-enter the value (Telnet_command: value Enter).
- If you want to exit without saving any of the configuration values you have changed or set, enter either exit Enter or quit Enter. You can then re-enter the Telnet configuration utility by starting with step 6 in this section.
- Any time during the Telnet session, you can enter config Enter to view the current configuration settings.
- Any time during the Telnet session, you can enter ? Enter for a list of available commands you can use in the Telnet utility.

When you have changed or set all the configuration values you want for the Gateway, type reboot Enter. Then type y Enter to confirm your changes.

Rebooting activates the configuration values you have set for the Gateway.
Caution

If you are reconfiguring the Gateway, any client operations in progress and client connections will be terminated by the `reboot` command.

11. After you have rebooted the Gateway, test that the Gateway has been successfully configured by using the `ping` command. This command allows you to test general network connectivity between your client computer system and the LAN/HP-IB Gateway. At the client system, type in:

```
ping hostname (or) IP_address
```

For example, using a Gateway’s hostname:

```
ping E2050.hp.com
```

Or, using a Gateway’s IP address:

```
ping 15.1.4.249
```

You should get a response from the `ping` command that is similar to the following, where each line after the `PING` line is an example of a packet successfully reaching the Gateway from the client system.

```
Pinging E2050.hp.com[128.10.0.3] with 32 bytes of data:
Reply from 128.10.0.3: bytes=32 time=10ms TTL=255
Reply from 128.10.0.3: bytes=32 time=10ms TTL=255
Reply from 128.10.0.3: bytes=32 time=10ms TTL=255
```

If your `ping` response is similar to the previous one, your Gateway has been configured successfully. Please continue on to the section titled “How the Configuration Values Are Used” on page 60.

However, if `ping` is unable to reach the host, you will see a message similar to the following. This indicates that the client was unable to contact the Gateway, and there may be some problem with the Gateway’s configuration, or with the network itself.

```
Pinging E2050.hp.com[128.10.0.3] with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
```
Using the BOOTP Configuration Method

To configure the LAN/HP-IB Gateway on your network using BOOTP from an HP-UX client system, do the following:

1. Make sure that the Gateway is powered-off. The AC power cord from the power module must be disconnected from the power outlet (wall outlet).

2. Determine which computer system is the BOOTP server on your network. Then log into the BOOTP server system as root.

3. Edit the /etc/bootptab configuration file. Add an entry to the file for each LAN/HP-IB Gateway on your network. (Note that you only need to specify the non-default values that you want.) The following information will help you complete the entry correctly.

First, Table 3-3 lists the values that you can configure. Note that in the table, BOOTP Tag is the tag that the BOOTP daemon (bootpd) searches for in the /etc/bootptab file to service BOOTP requests. Also refer to the previous section titled Table 3-3. BOOTP Configuration Tag Values.

<table>
<thead>
<tr>
<th>Configuration Value</th>
<th>BOOTP Tag</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hostname</td>
<td>hn</td>
<td>E2050</td>
</tr>
<tr>
<td>Hardware Address</td>
<td>ha</td>
<td>None</td>
</tr>
<tr>
<td>IP Address</td>
<td>ip</td>
<td>192.0.0.192</td>
</tr>
<tr>
<td>Default Subnet Gateway Address</td>
<td>gw</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>sm</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>Syslog Server Address</td>
<td>lg</td>
<td>0.0.0.0</td>
</tr>
</tbody>
</table>

For more information on the BOOTP tags, use your system man command on bootpd. Also refer to the previous section titled Table 3-3. BOOTP Configuration Tag Values.
Configuration

Configuration Methods

“Configuration Values” beginning on page 31 for more information about each of the configuration values.

The following, simple example BOOTP entry configures a hostname (hn), a hardware address (ha), and an IP address (ip) for the LAN/HP-IB Gateway. All other configuration values are “set” to (will default to) the factory defaults.

E2050:\  Hostname for this Gateway
hn:\
ht=ether:\  Hardware type, which should be ether
vm=rfc1048:\  Vendor magic cookie selector, which should be rfc1048
ha=0800091A0E00:\  Hardware address for the Gateway’s LAN interface
ip=15.1.4.249  IP address for the Gateway

REMINDERS:

■ For each entry you make to the file, make sure that you:
  ■ Include a colon (“:”) and a backslash (“\”) after each field to continue the entry on the next line. (Do not put the :\ at the end of the last field in your entry.)
  ■ Begin the hostname with a letter. (Do not start a hostname with any other character, such as a number, underscore, etc.)
  ■ Use only letters, numbers, periods, or hyphens within a hostname. The underscore character (“_”) is not allowed.

Also remember that:

■ The LAN hardware address (ha) value is the address you wrote down earlier while installing the Gateway hardware in Chapter 2. The Gateway’s LAN hardware address is printed on a label on the underside of the Gateway box.

■ The IP address (ip) value is the address that your designated Network Administrator assigned for the Gateway. The address must be in dotted decimal notation.

4. Once you have added the configuration values you want for each of your Gateways, save and close the /etc/bootptab file.
5. Power on the Gateway by plugging-in the power cord to the power outlet (wall outlet).

As soon as it completes its hardware self-test, the Gateway will begin sending BOOTP requests to the BOOTP server. While the Gateway is sending BOOTP requests, the LAN Conn (LAN Connect) LED on the front panel of the Gateway will flash rapidly. The BOOTP server should respond with the BOOTP response to configure the Gateway. When the Gateway receives a valid response from the BOOTP server, the LAN Conn LED will stop flashing.

6. Test that the Gateway has received the BOOTP response and has configured itself by using the **ping** command. This command allows you to test general network connectivity between your client computer system and the LAN/HP-IB Gateway. At the client system, type in:

   **ping hostname (or) IP_address**

For example, using a Gateway’s hostname:

   **ping E2050.hp.com**

Or, using a Gateway’s IP address:

   **ping 15.1.4.249**

You should get a response from the **ping** command that is similar to the following, where each line after the **PING** line is an example of a packet successfully reaching the Gateway from the client system.

   **PING E2050.hp.com: 64 byte packets**
   **64 bytes from 128.10.0.3: icmp_seq=0. time=3. ms**
   **64 bytes from 128.10.0.3: icmp_seq=1. time=3. ms**
   **64 bytes from 128.10.0.3: icmp_seq=2. time=2. ms**

If your **ping** response is similar to the previous one, your Gateway has been configured successfully. Please continue on to the section titled “How the Configuration Values Are Used” on page 60.

If after several seconds **ping** does not print any lines, use **Ctrl-C** to kill **ping**. The **ping** will then report on what it found. If the response is similar to the following, then this indicates that the client was unable to
Configuration

Configuration Methods

Contact the Gateway, and there may be some problem with the Gateway’s configuration, or the network itself.

----E2050.hp.com PING Statistics----
4 packets transmitted, 0 packets received, 100% packet loss

Note

If you are having trouble configuring the Gateway, or if you wish to verify that the configuration is correct, see Chapter 5, “Troubleshooting.”

Using the BOOTP with TFTP Configuration Method

To configure the LAN/HP-IB Gateway on your network using BOOTP with TFTP from an HP-UX client system, do the following:

1. Make sure that the Gateway is powered-off. That is, the AC power cord from the power module must be disconnected from the power outlet (wall outlet).

2. Determine which computer system is the BOOTP server on your network. Then log into the BOOTP server system as root.

3. Edit the /etc/bootptab configuration file. Add an entry to the file for each LAN/HP-IB Gateway on your network. (Note that you only need to specify the non-default values that you want.) The following information will help you complete the entry correctly.

First, Table 3-4 lists the values that you can configure. Note that in the table, BOOTP Tag is the tag that the BOOTP daemon (bootpd) searches for in the /etc/bootptab file to service BOOTP requests. Also refer to the next page for an example BOOTP entry, as well as reminders to ensure that you complete your BOOTP entry correctly.
Configuration Methods

Table 3-4. TFTP Configuration Method BOOTP Tag Values

<table>
<thead>
<tr>
<th>Configuration Value</th>
<th>BOOTP Tag</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hostname</td>
<td>hn</td>
<td>E2050</td>
</tr>
<tr>
<td>Hardware Address</td>
<td>ha</td>
<td>None</td>
</tr>
<tr>
<td>IP Address</td>
<td>ip</td>
<td>192.0.0.192</td>
</tr>
<tr>
<td>Default Subnet Gateway Address</td>
<td>gw</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>sm</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>Syslog Server Address</td>
<td>lg</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>TFTP File</td>
<td>T144</td>
<td>None</td>
</tr>
</tbody>
</table>

For more information on the BOOTP tags, use your system `man` command on `bootpd`. Also refer to the previous section titled “Configuration Values” beginning on page 31 for more information about each of the configuration values.

The following, simple example BOOTP entry configures a hostname (hn), a hardware address (ha), an IP address (ip), and the path to the TFTP configuration file (T144). (Note that, in this example, the path to the TFTP configuration file is relative, with the assumption that the default TFTP mode is being used.) All other configuration values are “set” to (will default to) the factory defaults.

```
E2050:  Hostname for this Gateway
hn:     Hardware type, which should be ether
ht=ether:
vm=rfc1048:  Vendor magic cookie selector, which should be rfc1048
ha=0800091A0E00:  Hardware address for the Gateway’s LAN interface
ip=15.1.4.249:  IP address for the Gateway
T144=”E2050/gw1.cfg”  Path to the TFTP configuration file
```
REMINDERS:

For each entry you make to the file, make sure that you:

- Include a colon (“:”) and a backslash (“\”) after each field to continue
  the entry on the next line. (Do not put the : \ at the end of the last field in
  your entry.)

- Begin the hostname with a letter. (Do not start a hostname with any other
  character, such as a number, underscore, etc.)

- Use only letters, numbers, periods, or hyphens within a hostname. The
  underscore character (“_”) is not allowed.

Also remember that:

- The LAN hardware address (ha) value is the address you wrote down
  earlier while installing the Gateway hardware in Chapter 2. The
  Gateway’s LAN hardware address is printed on a label on the underside
  of the Gateway box.

- The IP address (ip) value is the address that your designated Network
  Administrator assigned for the Gateway. The address must be in dotted
  decimal notation.

- The TFTP configuration file (T144) value is the path to the TFTP file
  you will use. (You will create the TFTP file in the following steps.) The
  path must be enclosed in double quotation marks.

4. Once you have added the configuration values you want for each of your
   Gateways, save and close the /etc/bootptab file.

5. Create the appropriate directory structure and TFTP configuration file for
   each LAN/HP-IB Gateway, as noted in the T144 configuration value
   you set in the /etc/bootptab file. Make sure that you set
   permissions on these directories and on the TFTP configuration file to
   allow access by the bootpd daemon.

For example, the T144 value in the previous example /etc/
bootptab file was set to “E2050/gw1.cfg”. Let’s also assume that
the default TFTP mode is being used and that the client system is running
HP-UX Version 9. Thus, in this example, you would:

- cd to the /usr/tftpdir directory.
- Create an E2050 subdirectory under /usr/tftpdir.
- cd to the E2050 subdirectory
- Create the TFTP configuration file, gw1.cfg, with your editor.
6. Edit the TFTP configuration file, adding the configuration values you desire to set for the Gateway. (Note that you only need to specify the non-default values that you want.) The following information will help you complete this file correctly.

First, Table 3-5 lists the configuration values you can set in the TFTP file. Also refer to the example TFTP file that follows this table.

<table>
<thead>
<tr>
<th>Configuration Value</th>
<th>Telnet Command</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hostname</td>
<td>hostname</td>
<td>E2050</td>
</tr>
<tr>
<td>LAN Timeout</td>
<td>lan-timeout</td>
<td>0</td>
</tr>
<tr>
<td>I/O Timeout</td>
<td>io-timeout</td>
<td>120</td>
</tr>
<tr>
<td>IP Allow List</td>
<td>allow</td>
<td>* (All allowed)</td>
</tr>
<tr>
<td>HP-IB Address</td>
<td>hpi-address</td>
<td>21</td>
</tr>
<tr>
<td>HP-IB Interface Name</td>
<td>hpi-name</td>
<td>hpi</td>
</tr>
<tr>
<td>HP-IB Logical Unit</td>
<td>hpi-unit</td>
<td>7</td>
</tr>
</tbody>
</table>

The following is an example TFTP file:

```
# The E2050 gw1 Configuration File
hostname: E2050
# Timeouts
 lan-timeout: 7200
 io-timeout: 240
# IP allow list
 allow: 15.1.34.2  15.2.*
# HP-IB configuration
 hpiib-address: 17
 hpiib-name: hpiib1
 hpiib-unit: 8
```

Consult your system documentation for any other steps required to complete the TFTP configuration file.
Configuration

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7. Once you have added the configuration values you want, save and close the TFTP configuration file(s).

8. Power on the Gateway by plugging-in the power cord to the power outlet (wall outlet).
   As soon as it completes its hardware self-test, the Gateway will begin sending BOOTP requests to the BOOTP server. While the Gateway is sending BOOTP requests, the LAN Conn (LAN Connect) LED on the front panel of the Gateway will flash rapidly. The BOOTP server should respond with the BOOTP response to configure the Gateway. When the Gateway receives a valid response from the BOOTP server, the LAN Conn LED will stop flashing.

9. Test that the Gateway has received the BOOTP response and has configured itself by using the ping command. This command allows you to test general network connectivity between your client computer system and the LAN/HP-IB Gateway. At the client system, type in:

```
ping hostname (or) IP_address Return
```

For example, using a Gateway’s hostname:

```
ping E2050.hp.com Return
```

Or, using a Gateway’s IP address:

```
ping 15.1.4.249 Return
```

You should get a response from the ping command that is similar to the following, where each line after the PING line is an example of a packet successfully reaching the Gateway from the client system.

```
PING E2050.hp.com: 64 byte packets
64 bytes from 128.10.0.3: icmp_seq=0. time=3. ms
64 bytes from 128.10.0.3: icmp_seq=1. time=3. ms
64 bytes from 128.10.0.3: icmp_seq=2. time=2. ms
```

If your ping response is similar to the previous one, your Gateway has been configured successfully. Please continue on to the section titled “How the Configuration Values Are Used” on page 60.
Configuration

Configuration Methods

If after several seconds `ping` does not print any lines, use `Ctrl-C` to kill `ping`. The `ping` will then report on what it found. If the response is similar to the following, then this indicates that the client was unable to contact the Gateway, and there may be some problem with the Gateway’s configuration, or the network itself.

```
----E2050.hp.com PING Statistics----
4 packets transmitted, 0 packets received, 100% packet loss
```

Note If you are having trouble configuring the Gateway, or if you wish to verify that the configuration is correct, see Chapter 5, “Troubleshooting.”
How the Configuration Values Are Used

The HP E2050 LAN/HP-IB Gateway uses the default configuration values and/or the configuration values that you changed or set depending on certain situations, such as when the power is cycled on the Gateway, or when the Config Preset button on the back panel of the Gateway is pressed. Hence, this section summarizes how the configuration values are used in various situations. This information is important for you to understand so that, in the future, you can better maintain the Gateway and you can more easily troubleshoot any problems you might encounter with the Gateway.

This section describes how the Gateway uses the configuration values:

- During the Gateway’s power-on initialization sequence (that is, after power is cycled on the Gateway).
- When the Gateway’s Config Preset button is pressed.

During the Power-on Initialization Sequence

When power is applied to the Gateway and the hardware self-test has completed, the networking subsystem is initialized. What happens during this initialization sequence depends on what configuration method, if any, has been used to configure the Gateway.

If you have used the Telnet configuration method to set the IP address, the Gateway will not send BOOTP requests at power-on to configure itself. Instead, the Gateway will simply use the IP address and any other configuration values that were set through Telnet.

If you are applying power to the Gateway before it has been successfully configured with an actual IP address via BOOTP or BOOTP with TFTP, the Gateway will send BOOTP requests to the BOOTP server for up to five minutes. When the BOOTP server’s bootpd daemon receives the request, it will search the /etc/bootptab configuration file for an entry that matches the Gateway’s LAN hardware address. When a match is found, bootpd retrieves the configuration data associated with the entry and sends it to the Gateway as a BOOTP response. The Gateway then completes its initialization using the configuration data provided in the BOOTP response.
If you have applied power to the Gateway one or more times since configuration, the Gateway will have successfully completed BOOTP requests in the past. Thus, the Gateway will send BOOTP requests for only one minute before it stops and then uses the previous BOOTP response stored in the Gateway’s non-volatile memory.

### When the Config Preset Button is Pressed

The recessed **Config Preset** button on the back panel of the Gateway is used to reset the LAN/HP-IB Gateway to its default configuration values (preset at the factory). The **Config Preset** button has two modes of operation. If you press the **Config Preset** button:

- **At the same time** as you apply power to the Gateway, all previous configuration information is erased and all of the default configuration values are used. This is helpful if you wish to completely reconfigure the Gateway, but you first need to get it to a known state (that is, to a state where it is using all of its default configuration values).

- **After power is applied**, previous configuration information is not erased, but the Gateway *temporarily* uses its default IP address. (That is, only the IP address is reset to its default value temporarily. Once you reboot or cycle the power again, the Gateway will go back to its actual IP address that was previously set.) This is helpful if you wish to interrogate the Gateway at a known address in preparation for setting a new IP address for the Gateway. However, note that all network connections to the Gateway, if any, are also terminated without any cleansups.

**Note**

If you use the default IP address, you may need to explicitly tell your networking software how to talk to the Gateway. This is because the default IP address may appear to be on a different subnet. Use the `route` command, as follows.

- **On HP-UX client systems**, as root:
  
  ```
  route add host 192.0.0.192 your_system_name
  ```

- **On Windows 95 or Windows NT client systems**:
  
  ```
  route add 192.0.0.192 your_system_name
  ```
Configuration

Where to Go Now

You have now finished configuring the HP E2050 LAN/HP-IB Gateway. Please continue on to Appendix C, “Related Software Documentation.” Appendix C lists the manuals you should follow to use your I/O application software with the Gateway.

Note

Please keep this installation guide for your reference. In the future, if you need to perform an administration task (such as querying or modifying the Gateway’s configuration, or querying or terminating client connections), refer to Chapter 4, “Administration,” in this guide.

Likewise, if you ever encounter problems with the Gateway, please refer to Chapter 5, “Troubleshooting,” and to Appendix A, “Explanation of LEDs.”
Administration

This chapter explains how to administer the HP E2050 LAN/HP-IB Gateway on your network. To administer the Gateway, you will use the Telnet utility provided with the LAN/HP-IB Gateway. The Telnet utility provides a command line interface for accomplishing administration tasks, including Telnet configuration of the Gateway, querying the status of the Gateway and its client connections, and so forth.

The first section in this chapter, “Using the Telnet Utility,” explains how to access and exit the Telnet utility, and summarizes the various Telnet commands you can use to administer the Gateway. The subsequent sections then cover the Telnet commands in-depth, explaining how you can use the commands to accomplish the following administration tasks:

- Querying the Gateway’s Current Configuration
- Modifying the Gateway’s Configuration
- Querying the Status of the Gateway and Client Connections
- Terminating All Client Connections to the Gateway
- Viewing and Maintaining the Gateway’s syslog
- Determining the Version of the Gateway’s Firmware
Using the Telnet Utility

This first section explains how to access and exit the Telnet utility. It also summarizes the various Telnet commands you can use to administer the HP E2050 LAN/HP-IB Gateway.

Accessing the Telnet Utility

Any time you need to use the Telnet commands, follow this procedure first to access the Telnet utility:

1. If you are on an HP-UX or Windows NT client computer system, login. Also, if you are using a Windows 95 or a Windows NT client computer system, do the following:

   - From the Windows 95 task bar at the bottom of the screen, select Start | Programs | MS-DOS Prompt. The MS-DOS window opens.
   - From the Windows NT Program Manager, select Main. Then select MS-DOS Prompt. The MS-DOS window opens.

2. If you are using:

   - An HP-UX client system, at the HP-UX system prompt, type:
     
     \texttt{telnet IP\_address (or) hostname Return}

   - A Windows 95 or Windows NT client system, at the > prompt in the MS-DOS window, type:

     \texttt{telnet IP\_address (or) hostname Enter}

Where:

- \textit{IP\_address} is the IP address of the HP E2050 LAN/HP-IB Gateway. (The IP address is a required configuration value that was previously set for the Gateway via one of the configuration methods discussed in Chapter 3, “Configuration.”)

- \textit{hostname} is the hostname (Internet domain name) of the HP E2050 LAN/HP-IB Gateway. (The hostname is an optional configuration value that may have been previously set for the Gateway via one of the configuration methods discussed in Chapter 3, “Configuration.”)
Administration

Using the Telnet Utility

However, if you do not know the IP address or hostname of the Gateway, do the following:

1. After the Gateway has been powered-on, press the **Config Preset** button on the back panel of the LAN/HP-IB Gateway. This forces the Gateway to temporarily use the **192.0.0.192** default IP address without modifying any of the other configuration values.

2. If you are using:
   - An HP-UX client system, as root, type:
     
     ```
     route add host 192.0.0.192 your_system_name Return
     ```
   - A Windows 95 or Windows NT client system, at the > prompt in the MS-DOS window, type:
     
     ```
     route add 192.0.0.192 your_system_name Enter
     ```
   This sets up a route table entry on your client system for the Gateway at its default IP address.

3. If you are using:
   - An HP-UX client system, type:
     
     ```
     telnet 192.0.0.192 Return
     ```
   - A Windows 95 or Windows NT client system, type:
     
     ```
     telnet 192.0.0.192 Enter
     ```
   This connects you to the Gateway at its temporary, default IP address.

When you are connected to the Gateway’s Telnet utility, you see a listing of the main Telnet commands, as well as a listing of the current configuration values for this Gateway.
The following is an example screen for an HP E2050 LAN/HP-IB Gateway. Notice that each configuration value is briefly described in the commented (#) area to the right of each value. Also note that many of the configuration values in this example screen are not the default values, which means this example Gateway was previously configured. The configuration values you see for your Gateway will likely be different from those shown here.

Welcome to the E2050 LAN/HP-IB Gateway configuration utility.

Commands
? Show additional commands
exit, quit Exit WITHOUT saving configuration changes
reboot Save configuration changes and restart
status Show the LAN/HP-IB Gateway connection status

Configuration Parameters
hostname: E2050 # Internet domain name
hardware-addr: 0800091A0E02 # Ethernet station address
ip: 15.1.4.249 # Internet Protocol address
default-gw: 0.0.0.0 # Default subnet gateway IP address
subnet-mask: 0.0.0.0 # Network subnet mask
syslog-svr: 15.1.4.244 # Syslog server IP address
bootp: OFF # Obtain config via BOOTP/TFTP
lan-timeout: 7200 # LAN connect timeout in seconds
io-timeout: 120 # Server I/O timeout in seconds
allow: 15.1.4* # IP allow list

hpib-address: 21 # HP-IB Address
hpib-name: hpib1 # HP-IB interface symbolic name
hpib-unit: 7 # HP-IB logical unit number

If you are using a Windows 95 or Windows NT client system, you may also need to turn on Local Echo in the Terminal Preferences dialog box so that the Telnet utility will display your typed input. To do this:

1. From the menu at the top of the Telnet window, select Terminal | Preferences.

   The Terminal Preferences dialog box is displayed.

2. Click on the checkbox next to Local Echo to turn it on.

   A checkmark is displayed in the checkbox. Local Echo is now set on.

3. Click on OK to close the Terminal Preferences dialog box.
Exiting the Telnet Utility

To exit the Telnet utility, you have the choice of several Telnet commands. If you want to:

- Exit *without* saving any changes (if any) you have made to the configuration values, at the Telnet prompt (>) type in one of the following:
  
  **by**e (or)
  **exit** (or)
  **quit**

- Save the changes you have made to the configuration values via the Telnet utility, at the Telnet prompt (>) type in:
  
  **reboot**

**Caution**

Any client operations in progress and client connections will be terminated by the **reboot** command.

- Reset the Gateway to the default configuration values and reboot the Gateway, at the Telnet prompt (>) type in:
  
  **factory-reset**

**Caution**

Any client operations in progress and client connections will be terminated by the **factory-reset** command when it reboots the Gateway.

Summary of the Telnet Commands

Table 4-1 lists the Telnet commands you can use to administer the HP E2050 LAN/HP-IB Gateway, and provides a brief explanation of each command. Note that the last column in this table (*Refer to...*) points to the section in this chapter or in Chapter 3, “Configuration,” which you should refer to for specific procedural information on each of these Telnet commands.

Also note that many of the Telnet commands are for configuration purposes only. The Telnet configuration commands have a colon (“:”) and italicized value parameter after them (for example, **allow:** *IP_address(es)*). You should only use the Telnet configuration commands if you are using the Telnet configuration method to configure the Gateway. If, instead, you are
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using either the BOOTP or the BOOTP with TFTP configuration method, please follow the procedures provided in Chapter 3, “Configuration,” for the BOOTP or the BOOTP with TFTP method. Also refer to the section titled “Modifying the Gateway’s Configuration” beginning on page 73 for more information.

**Note**
You can see a summary of all the Telnet commands online by typing ? at any time within the Telnet utility.

**Caution**
Any client operations in progress and client connections will be terminated by the **reboot** command, or by the **factory-reset** command when it reboots the Gateway.

<table>
<thead>
<tr>
<th>Command</th>
<th>Explanation</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>allow: IP_address(es)</td>
<td>Set the IP allow list configuration value for the Gateway.</td>
<td>“Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>bootp: ON/OFF</td>
<td>Turn ON or OFF the use of BOOTP or BOOTP with TFTP configuration of the Gateway.</td>
<td>“Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>bye</td>
<td>Quit the Telnet utility without saving configuration changes.</td>
<td>“Exiting the Telnet Utility” earlier in this chapter.</td>
</tr>
<tr>
<td>config</td>
<td>Display the current configuration settings for the Gateway.</td>
<td>“Querying the Gateway’s Current Configuration” later in this chapter.</td>
</tr>
<tr>
<td>default-gw: IP_address</td>
<td>Set the default subnet gateway address configuration value for the Gateway.</td>
<td>“Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>exit</td>
<td>Exit the Telnet utility without saving configuration changes.</td>
<td>“Exiting the Telnet Utility” earlier in this chapter.</td>
</tr>
<tr>
<td>factory-reset</td>
<td>Reset the Gateway to its default configuration values and reboot the Gateway.</td>
<td>“Exiting the Telnet Utility” earlier in this chapter.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>hardware-addr</td>
<td>Display the Gateway’s LAN hardware address.</td>
<td>“Configuration Values” in Chapter 3.</td>
</tr>
</tbody>
</table>
## Table 4-1. Telnet Utility Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Explanation</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>help</td>
<td>Print help information on the main Telnet commands.</td>
<td></td>
</tr>
<tr>
<td>hostname: string</td>
<td>Set the Internet domain name configuration value for the Gateway.</td>
<td>• “Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>hpib-address: 0-30</td>
<td>Set the HP-IB address configuration value for the Gateway.</td>
<td>• “Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>hpib-name: string</td>
<td>Set the HP-IB interface symbolic name configuration value for the Gateway.</td>
<td>• “Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>hpib-unit: 1-255</td>
<td>Set the HP-IB logical unit number configuration value for the Gateway.</td>
<td>• “Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>io-timeout: seconds</td>
<td>Set the server I/O timeout configuration value for the Gateway.</td>
<td>• “Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>ip: IP_address</td>
<td>Set the IP address configuration value for the Gateway.</td>
<td>• “Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>lan-timeout: seconds</td>
<td>Set the LAN connect timeout configuration value for the Gateway.</td>
<td>• “Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>quit</td>
<td>Quit the Telnet utility without saving configuration changes.</td>
<td>“Exiting the Telnet Utility” earlier in this chapter.</td>
</tr>
<tr>
<td>reboot</td>
<td>Save configuration changes and restart the Gateway.</td>
<td>Exiting the Telnet Utility” earlier in this chapter.</td>
</tr>
<tr>
<td>status</td>
<td>Display the status of the Gateway and client connections.</td>
<td>“Querying the Status of the Gateway and Client Connections” later in this chapter.</td>
</tr>
<tr>
<td>subnet-mask: mask</td>
<td>Set the network subnet mask configuration value for the Gateway.</td>
<td>• “Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
</tbody>
</table>
### Table 4-1. Telnet Utility Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Explanation</th>
<th>Refer to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>syslog-clear</td>
<td>Clear the syslog file.</td>
<td>“Viewing and Maintaining the Gateway’s syslog” later in this chapter.</td>
</tr>
<tr>
<td>syslog-display</td>
<td>Display the syslog file’s contents.</td>
<td>“Viewing and Maintaining the Gateway’s syslog” later in this chapter.</td>
</tr>
<tr>
<td>syslog-svr: IP_address</td>
<td>Set the syslog server address configuration value for the Gateway.</td>
<td>• “Using the Telnet Configuration Method” in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “Modifying the Gateway’s Configuration” later in this chapter.</td>
</tr>
<tr>
<td>version</td>
<td>Display the version of the Gateway’s firmware.</td>
<td>“Determining the Version of the Gateway’s Firmware” later in this chapter.</td>
</tr>
</tbody>
</table>
Querying the Gateway’s Current Configuration

As soon as you access the Gateway’s Telnet utility, you see a screen full of information, including a listing of the Gateway’s current configuration settings. However, you can view the current configuration settings at any time while you are using the Telnet utility by typing in the following at the Telnet prompt (>):

```
config
```

If you wish to change any of the configuration values you see, refer to the next section, “Modifying the Gateway’s Configuration.”

If you wish to exit the Telnet utility with or without saving any configuration values you change, see “Exiting the Telnet Utility” beginning on page 68.
Modifying the Gateway’s Configuration

This section explains how to change the Gateway’s configuration, including how to:

- Determine what configuration method is currently being used for the Gateway.
- Change the configuration method being used for the Gateway. (For example, if the Gateway is currently using BOOTP configuration, but you want to change to the Telnet configuration method.)
- Reset the Gateway to the default configuration settings.

If you already know the configuration method that is currently being used for the Gateway, and you simply need to change one or more of the configuration values via that same configuration method, please follow the procedures for that configuration method in Chapter 3, “Configuration,” to reconfigure the Gateway.

Determining the Configuration Method

If you do not know what configuration method is currently being used for the Gateway, you can determine the method via the bootp: ON/OFF Telnet configuration value. To do this:

1. At the Telnet prompt (>) type in:
   
   `config`
   
   This displays the current configuration settings for the Gateway.

2. Look at the bootp: configuration setting. If it is set to:
   
   - **OFF**, the current configuration method being used is the Telnet configuration method.
   - **ON**, the current configuration method being used is either the BOOTP or the BOOTP with TFTP configuration method.

   If you wish to change the configuration method that is being used, see the next subsection, “Changing the Configuration Method.”

   If you wish to continue to use the current configuration method, but you wish to change one or more of the configuration values, follow the
Modifying the Gateway’s Configuration

procedures for the current configuration method in Chapter 3, “Configuration,” to reconfigure the Gateway.

Changing the Configuration Method

Note

Remember that on Windows 95 or Windows NT client systems, you must use the Telnet configuration method. Both the BOOTP and the BOOTP with TFTP configuration methods are not available on Windows 95 or Windows NT.

Also, before modifying the configuration method used for the Gateway, you may want to determine if the Gateway is currently in use via the status Telnet command. See the following section, “Querying the Status of the Gateway and Client Connections,” for information about the status command.

If the Gateway is currently in use, you may want to forewarn users that you will be reconfiguring and rebooting the Gateway. This is because any client operations in progress and client connections will be terminated by the reboot command. Users will then have to re-open sessions on the Gateway after the reboot occurs.

If you wish to change the configuration method used for the Gateway, you can either:

- Modify the bootp: ON/OFF Telnet configuration value, as follows:

  - To change to the Telnet configuration method, at the Telnet prompt (>) type in:

    bootp: OFF

  - To change to either the BOOTP or the BOOTP with TFTP configuration method, at the Telnet prompt (>) type in:

    bootp: ON

After you have modified the bootp: ON/OFF value, execute the reboot Telnet command to save the new configuration setting and reboot the Gateway.
Chapter 4

Modifying the Gateway’s Configuration

Caution

Any client operations in progress and client connections will be terminated by the reboot command.

- Execute a Telnet factory-reset command. This changes the configuration values back to the default values and reboots the Gateway. This will set the bootp: ON/OFF value to the default ON value. (That is, you may now use either the BOOTP or the BOOTP with TFTP configuration method.)

Caution

Any client operations in progress and client connections will be terminated by the factory-reset command when it reboots the Gateway.

- Press the Config Preset button on the back panel of the LAN/HP-IB Gateway at the same time as you power-on the Gateway. This changes all the configuration values back to the default values. This includes setting the bootp: ON/OFF value to the default ON value. (That is, you may now use either the BOOTP or the BOOTP with TFTP configuration method.)

Once you have changed the configuration method, follow the procedures in Chapter 3 to configure the Gateway via the new method.

Note

The bootp: ON/OFF configuration value in the Telnet utility is automatically set to OFF if the IP address is changed via the Telnet utility.

Resetting the Gateway to the Default Configuration Settings

If you wish to return the Gateway to all of its default configuration values, you can do either of the following:

- Press the Config Preset button on the back panel of the LAN/HP-IB Gateway at the same time that you power-on the Gateway.

- Execute the factory-reset Telnet command.

Caution

Any client operations in progress and client connections will be terminated by the factory-reset command when it reboots the Gateway.

Once it has been returned to the default configuration values, follow the configuration procedures in Chapter 3 to reconfigure the Gateway.

Chapter 4

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Querying the Status of the Gateway and Client Connections

This section explains how to query the status of the Gateway and its client connections (that is, the LAN client computer systems that are connected to the Gateway to perform I/O operations via the Gateway).

To query the status of the Gateway and client connections via the Telnet utility, at the Telnet prompt (>) type:

```
status
```

You now see the Telnet status screen, which lists all current clients that are connected to this Gateway. The following is an example status screen of clients connected to an HP E2050 LAN/HP-IB Gateway.

<table>
<thead>
<tr>
<th>Server ID</th>
<th>Client IP Addr</th>
<th>Client ID</th>
<th>Sess</th>
<th>Operation</th>
<th>Lock</th>
<th>Device/Intf</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x2008f624</td>
<td>15.1.4.247</td>
<td>4139</td>
<td>117</td>
<td>WRITE</td>
<td>DEV</td>
<td>hplb,1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DEV</td>
<td>hplb,21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>hplb</td>
</tr>
<tr>
<td>0x2008f40c</td>
<td>190.2.49.138</td>
<td>27598</td>
<td>21</td>
<td>LOCK</td>
<td>DEV</td>
<td>7,21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>DEV</td>
<td>7,9,1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14</td>
<td></td>
<td>DEV</td>
<td>7,9,2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>129</td>
<td></td>
<td></td>
<td>7,1</td>
</tr>
<tr>
<td>0x2008f1f4</td>
<td>15.1.4.249</td>
<td>739</td>
<td>36</td>
<td>READ</td>
<td></td>
<td>hplb,1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>hplb,9,2</td>
</tr>
</tbody>
</table>

The meaning of the various fields listed on the Telnet status screen are:

**Server ID** A unique process identification (ID) number for the client connection on this server (this HP E2050 LAN/HP-IB Gateway).

**Client IP Addr** The IP address of the client computer system that is connected to this server.

**Client ID** A unique identification (ID) number for the client computer system’s process. (Always 0 for a Windows 95 or Windows NT client.)

**Sess** The unique session number of a client’s communication channel with a device, which can be any number 1 through 256.
Operation: The client’s I/O operation that is currently being performed on the associated device or interface. A blank field indicates that no I/O operation is currently executing. The complete list of operations is provided later in this section.

Lock: Indicates if the client has a lock on the associated device (DEV) or interface (INTF). A blank field indicates no lock.

Device/Intf: The HP-IB device or interface on which the client is currently performing, or will perform, its I/O operation. Note that for SICL I/O operations, this relates to the device or interface specified in the iopen statement.

Also note the following:

- All the sessions for a particular connection are listed together and only the first session has the Server ID, Client IP Addr, and Client ID specified.
- For a given client, one session at most will have an operation pending or in progress at a given time.
- The Client IP Addr and Client ID are both needed to uniquely identify a client connection. In the previous example, clients 1 and 3 are separate processes on the same machine (that is, they have the same Client IP Addr).
- If an Operation is specified for a given session and the session does not have a Lock, then the operation for the session may be waiting for another client to complete an I/O operation or to unlock a device or the interface. In the previous example, client 2 is waiting to get a lock on device 21 after client 1 completes the WRITE operation and unlocks device 21. Also, client 3 is waiting for client 2 to unlock device 9,2 (primary,secondary) before it can perform the READ operation.
- If an Operation is specified for a given session and the session does have a Lock, the operation is likely to be in progress and not waiting on another client to complete an operation. For more information, consult the documentation for your I/O application software on how interface locks and device locks work in your software. (See Appendix C, “Related Software Documentation.”)
## Querying the Status of the Gateway and Client Connections

The following is a list of *Operation* field values and the SICL functions that correspond to them.

<table>
<thead>
<tr>
<th>Operation</th>
<th>SICL Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEAR</td>
<td>iclear</td>
</tr>
<tr>
<td>CLOSE</td>
<td>iclose</td>
</tr>
<tr>
<td>GETDEV</td>
<td>igetdevaddr</td>
</tr>
<tr>
<td>GETINTF</td>
<td>igetintftype</td>
</tr>
<tr>
<td>GETLU</td>
<td>igetlu</td>
</tr>
<tr>
<td>GETSESS</td>
<td>igetsesstype</td>
</tr>
<tr>
<td>HINT</td>
<td>ihint</td>
</tr>
<tr>
<td>LOCAL</td>
<td>ilocal</td>
</tr>
<tr>
<td>LOCK</td>
<td>ilock</td>
</tr>
<tr>
<td>ONINTR</td>
<td>ionintr</td>
</tr>
<tr>
<td>ONSRQ</td>
<td>ionsrq</td>
</tr>
<tr>
<td>OPEN</td>
<td>iopen</td>
</tr>
<tr>
<td>READ</td>
<td>iread</td>
</tr>
<tr>
<td>READSTB</td>
<td>ireadstb</td>
</tr>
<tr>
<td>REMOTE</td>
<td>iremote</td>
</tr>
<tr>
<td>SETINTR</td>
<td>isetintr</td>
</tr>
<tr>
<td>TRIGGER</td>
<td>itrigger, ixtrig</td>
</tr>
<tr>
<td>UNLOCK</td>
<td>iunlock</td>
</tr>
<tr>
<td>VERSION</td>
<td>iversion</td>
</tr>
<tr>
<td>WRITE</td>
<td>iwrite</td>
</tr>
<tr>
<td>ATNCTL</td>
<td>igpibantctl</td>
</tr>
<tr>
<td>BUSADDR</td>
<td>igpibibusaddr</td>
</tr>
<tr>
<td>BUSSTAT</td>
<td>igpibibusstatus</td>
</tr>
<tr>
<td>GETT1</td>
<td>igpibgett1delay</td>
</tr>
<tr>
<td>LLO</td>
<td>igpibullo</td>
</tr>
<tr>
<td>PASSCTL</td>
<td>igpibpassctl</td>
</tr>
<tr>
<td>RENCTL</td>
<td>igpibrenctl</td>
</tr>
<tr>
<td>SENDCMD</td>
<td>igpibsendcmd</td>
</tr>
<tr>
<td>SETT1</td>
<td>igpibsett1delay</td>
</tr>
</tbody>
</table>

If you wish to terminate the client connections, see the next section, “Terminating All Client Connections to the Gateway.”
Terminating All Client Connections to the Gateway

If after querying the status of the Gateway and client connections (as explained in the previous section), you determine that the Gateway or a client’s I/O operation is “hung,” or there is a deadlock situation between clients that are connected to the Gateway, you can reboot the Gateway to terminate all client connections. However, before rebooting the Gateway, you may want to forewarn users that any I/O operations they have in progress and their client connections to the Gateway will be terminated. The users will then need to re-open new sessions on the Gateway after the reboot has occurred.

To terminate all client connections to the Gateway, at the Telnet prompt (>) type the following:

reboot

**Caution**

Any client operations in progress and client connections will be terminated by the reboot command.

Once the reboot occurs, users who previously had open sessions on the Gateway will likely get either an I_ERR_TIMEOUT or I_ERR_NOCONN error message. Again, since the reboot terminates all client connections, those users will need to re-open new sessions on the Gateway after the reboot occurs.
Viewing and Maintaining the Gateway’s syslog

This section explains how to view and maintain a syslog for the LAN/HP-IB Gateway. The Gateway sends status information, configuration error messages, and run-time error messages to a syslog file. The syslog file is configured via the syslog server address configuration value. For more information, see “Configuration Values” on page 31.

Note: Windows 95 and Windows NT clients do not support a syslog server. However, you may still use the syslog-display Telnet command (explained below) on Windows 95 or Windows NT clients to view messages stored within the HP E2050.

Viewing syslog Messages

The messages logged to a syslog file can be viewed either:

- Via the syslog-display Telnet command. To do this, at the Telnet prompt (>) type in:

  `syslog-display`

- By looking in the syslog file itself on the computer system acting as the syslog server.

In general, the same messages can be viewed in either or both places. However, a few differences do exist:

- Messages viewed with the syslog-display Telnet command are shorter versions of the messages that are sent to the actual syslog file. In particular, syslog-display messages do not show the date or time when the message was logged.

  Also, all syslog-display messages are cleared out each time the Gateway powers on or reboots, or the syslog-clear Telnet command is executed. Finally, because of the limited memory area on the Gateway, only about 50 lines of syslog-display messages can be logged in the Gateway. After the limit has been reached, any new messages cannot be logged. For more information, see the next subsection, “Maintaining the syslog.”
Viewing and Maintaining the Gateway’s syslog

Messages sent to the syslog file on the syslog server will have the date, time, and hostname prepended to the message. For example:

Feb 16 13:51:06 hostname: ready for use

Depending on how your systems are administered, messages sent to the syslog file will probably have a longer history. Therefore, if you need to look at messages before a power-on or a reboot was performed, you should look at the syslog file itself.

Note

Any invalid BOOTP values are detected when the file /etc/bootptab is read by the bootpd daemon. Errors will be sent to the syslog server for the BOOTP server system that is running the bootpd daemon.

See Chapter 5, “Troubleshooting,” for a list of the common syslog messages that are generated by the HP E2050 LAN/HP-IB Gateway.

Maintaining the syslog

Messages written to the actual syslog file are constantly appended to the file (that is, the log file is not overwritten with new messages). Therefore, the syslog file may grow rather large over time, and will need to be truncated or removed occasionally to regain disk space.

On the Gateway, the syslog-display messages are kept in a fixed-size memory area. If the syslog message area fills up, the most recent messages generated will be discarded. The number of messages allowed in the syslog memory buffer will vary depending on the size of the individual messages. A good rule is to use the syslog-clear Telnet command to clear out the memory buffer before the buffer has around 50 lines or so in it.

To clear the syslog memory buffer on the Gateway, at the Telnet prompt (>) type in:

syslog-clear
Determining the Version of the Gateway’s Firmware

You may need to determine the version of the Gateway’s firmware if you contact HP for support information, or if you wish to update the firmware to a new version in the future.

To determine the current version of the Gateway’s firmware, at the Telnet prompt (>) type in:

```
version
```

You will see the version of the software and Bootrom for the Gateway, which will be similar to the following:

```
Software revision A.00.00
Bootrom revision A.00.00
```
Troubleshooting
This chapter explains how to troubleshoot problems you may encounter with the HP E2050 LAN/HP-IB Gateway. This chapter includes information for:

- HP SICL LAN Error Codes and Messages
- `syslog` Messages
- Hardware Failures
- Network Connection Problems
- Configuration Problems
- Client Connection Problems
- Client Run-time Errors

**Note**
Throughout the troubleshooting information in this chapter, reference is often made to Telnet commands you can use to troubleshoot problems. The Telnet utility commands for the HP E2050 LAN/HP-IB Gateway are fully explained in Chapter 4, “Administration.”

Also, reference is often made to various configuration values. See Chapter 3, “Configuration,” for descriptions of the configuration values used with the LAN/HP-IB Gateway, as well as the methods used to configure the Gateway.
## HP SICL LAN Error Codes and Messages

The following table lists the more common SICL LAN error codes and messages that a client application might encounter when using the HP E2050 LAN/HP-IB Gateway. The final column in the table (Troubleshooting Explanation) explains the error and suggests possible troubleshooting procedures to try.

### Table 5-1. Common SICL LAN Errors

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Message</th>
<th>Troubleshooting Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_ERR_BADADDR</td>
<td>Bad address</td>
<td>The device/interface address passed to iopen does not exist. Use the Telnet commands to verify that the hpib-address:, hpib-name:, and hpib-unit: configuration values are correct.</td>
</tr>
<tr>
<td>I_ERR_NOCONN</td>
<td>No connection</td>
<td>The communication session with the Gateway was never established, or the connection to a remote Gateway was dropped. Use the Telnet status command and any error messages logged to a syslog file to get more information.</td>
</tr>
<tr>
<td>I_ERR_NORSRC</td>
<td>Out of resources</td>
<td>No more resources are available. Use the Telnet status command and any error messages logged to a syslog file to get more information.</td>
</tr>
<tr>
<td>I_ERR_SYMNAME</td>
<td>Invalid symbolic name</td>
<td>The symbolic name passed to iopen was not recognized. Use the Telnet hpib-name: configuration value to verify the configuration.</td>
</tr>
<tr>
<td>I_ERR_TIMEOUT</td>
<td>Timeout occurred</td>
<td>A timeout occurred while performing an operation. The device may be busy, in a bad state, or a longer timeout value may be needed for the operation on the device. Verify the correct address was used in iopen. Use the Telnet status command and any error messages logged to a syslog file to get more information.</td>
</tr>
</tbody>
</table>
syslog Messages

The syslog error messages can be viewed via the Telnet syslog-display command, or by looking in the syslog file specified via the syslog server address configuration value.

Note

Any invalid BOOTP values are detected when the file /etc/bootptab is read by the bootpd daemon. Errors will be sent to the syslog server for the BOOTP server system that is running the bootpd daemon.

The following are the more common syslog messages that are generated by the HP E2050 LAN/HP-IB Gateway.

■ ready for use
   The Gateway has powered on and successfully completed its hardware self-test.

■ rebooting
   The Gateway is about to do a reboot or factory-reset command.

■ Access denied for IP_address
   A client specified by the IP_address has been denied access to the Gateway because it is not in the IP allow list. Check the current IP allow list configuration setting.

■ Max connections exceeded, client IP_address refused
   A client specified by the IP_address was not allowed to connect to the Gateway because the maximum number of concurrent client connections on the Gateway has been exceeded. (No more than 15 client connections can be running concurrently on the Gateway, and fewer may be allowed depending on memory usage for existing clients.) Use the Telnet status command to determine the status of the current client connections on the Gateway.
Troubleshooting

**syslog Messages**

- **Insufficient resources**
  An operation could not get sufficient resources on the Gateway to execute. This usually means the Gateway has too many sessions open, not allowing another session to be opened or an operation on an open session to be performed. Use the Telnet `status` command to determine the status of the current open sessions on the Gateway.

- **HP-IB Address n is not a valid HP-IB address.**
  The `hpib-addr:` value in the TFTP configuration file specifies an invalid HP-IB address, n.

- **HP-IB Logical Unit n is not valid.**
  The `hpib-unit:` value in the TFTP configuration file specifies an invalid HP-IB logical unit, n.

- **io-timeout must be >= 0**
  The `io-timeout:` value in the TFTP configuration file specifies an invalid, negative I/O timeout for the server.

- **lan-timeout must be >= 0**
  The `lan-timeout:` value in the TFTP configuration file specifies an invalid, negative “keepalive” LAN timeout for the server.

- **Address is not a valid IP address.**
  An invalid IP address for a configuration value was specified in the TFTP configuration file.
Troubleshooting

Hardware Failure (Fault LED is Illuminated)

Hardware Failure (Fault LED is Illuminated)

The red Fault LED is illuminated when a hardware fault is found during the power-on, hardware self-test of the HP E2050 LAN/HP-IB Gateway.

If the Fault LED is illuminated, please contact your HP Service and Support Center for instructions.

Note

The Fault LED is illuminated *briefly* at power-on to verify its operation. Service is only required if the Fault LED remains illuminated.
Network Connection Problems

Before attempting to communicate with the HP E2050 LAN/HP-IB Gateway, you may want to verify that the network connection and cabling are correct. Do the following:

- Verify proper connections and network terminations visually. (Refer to the installation instructions in Chapter 2.)
- Power on the LAN/HP-IB Gateway.
- Make sure network packets are being transmitted on the same local subnet that is connected to the Gateway. The packets do not need to be addressed to go to the Gateway. You could use the `ping` command to generate network traffic.
- If the LAN Rx LED is flashing, then the Gateway is reading packets being sent over the local subnet. This means that you have a network connection.

**Note**
The LAN Conn and Tx LEDs may be flashing even if you do not have a connection to the network.
Troubleshooting

Configuration Problems

This section covers possible problems you may encounter when configuring the IP address and other configuration values for the HP E2050 LAN/HP-IB Gateway.

**Note**
If you are not concerned about the current configuration of the Gateway and wish to return the Gateway to all of its default configuration values, you can do either of the following:

- Press the **Config Preset** button on the back panel of the LAN/HP-IB Gateway at the *same time* that you power-on the Gateway.

- If it is configured to a known IP address, Telnet to the Gateway and use the Telnet **factory-reset** command.

  **CAUTION:** Any client operations in progress and client connections will be terminated by the **factory-reset** command when it reboots the Gateway.

Once the Gateway has been returned to the default configuration values, follow the configuration procedures in Chapter 3 to reconfigure the Gateway.
Verifying the Configuration Method

If you are having a problem configuring the LAN/HP-IB Gateway, such as configuring the IP address, first verify which method of configuration the Gateway is using. Do one or more of the following actions to determine which configuration method is currently being used. Once you verify the configuration method, go on to the appropriate subsection on the following pages to troubleshoot the Gateway’s configuration.

- Look at how the LAN Conn LED is illuminated when the Gateway is powered on:
  - **Fast Flash** Attempting BOOTP or BOOTP with TFTP configuration.
  - **Slow Flash** Temporarily using the default IP address of 192.0.0.192.
  - **Off** Has a valid IP address and is configured. Could be from a valid BOOTP server response, or has been configured via Telnet.
  - **On** Has a valid IP address and a client is connected to it.

**Note**

When the Gateway is powered on, the LAN Conn LED works independent of whether the Gateway is physically connected to a network. Temporarily disconnecting the Gateway can be helpful to determine if it is being configured via Telnet or BOOTP. Consult your Network Administrator before disconnecting the Gateway from an active network.

- If the Gateway is powered on, configured, and has a known valid IP address, Telnet to the Gateway and look at the setting of the `bootp: ON/OFF` configuration value to determine which configuration method is being used.
- If the Gateway is powered on, configured, but you do not know the IP address, do the following:
  - Press the **Config Preset** button on the back panel of the LAN/HP-IB Gateway. This forces the Gateway to temporarily use the 192.0.0.192 default IP address without modifying any of the other configuration values.
  - Make sure the route table entry for the Gateway at its default IP address is setup via the `route` command on the client system.
Troubleshooting
Configuration Problems

- Telnet to 192.0.0.192 and look at the setting of the bootp: ON/OFF configuration value to determine which configuration method is being used.

**Note**
If you are unable to make a Telnet connection using the default IP address (192.0.0.192), try pressing the Config Preset button again and then try to Telnet to 192.0.0.192 again.

- Execute a Telnet reboot command. If no values were changed, the Gateway will use the same configuration method and have the same configuration values (IP address, etc.) as was previously set for it.

**Caution**
Any client operations in progress and client connections will be terminated by the reboot command.

Changing the Configuration Method

**Note**
Remember that on Windows 95 or Windows NT client systems, you must use the Telnet configuration method. Both the BOOTP and the BOOTP with TFTP configuration methods are not available on Windows 95 or Windows NT.

If you wish to change the configuration method used for the Gateway, you can either:
- Telnet to the Gateway, modify the bootp: ON/OFF value, then use the Telnet reboot command.

**Caution**
Any client operations in progress and client connections will be terminated by the reboot command.

- Telnet to the Gateway, then do a Telnet factory-reset command. This changes the configuration values back to the default values and reboots the Gateway. This will set the bootp: ON/OFF value to the default ON value. (That is, you may now use either the BOOTP or the BOOTP with TFTP configuration method.)

**Caution**
Any client operations in progress and client connections will be terminated
by the \texttt{factory-reset} command when it reboots the Gateway.

Press the \textbf{Config Preset} button on the back panel of the LAN/HP-IB Gateway \emph{at the same time} as you power-on the Gateway. This changes all the configuration values back to the default values. This includes setting the \texttt{bootp: ON/OFF} value to the default \texttt{ON} value. (That is, you may now use either the BOOTP or the BOOTP with TFTP configuration method.)

Once you have changed the configuration method, follow the procedures in Chapter 3 to configure the Gateway via the new method.

\section*{Troubleshooting Telnet Configuration}

If you are having trouble configuring the LAN/HP-IB Gateway using Telnet with the default IP address of 192.0.0.192, do the following:

1. Verify that the \texttt{route} command was performed properly. Use the following command to display the network routing tables:

\begin{verbatim}
netstat -r
\end{verbatim}

2. Verify that the Gateway is on the same local subnet as the client system from which you are Telneting. If not, consult your Network Administrator to determine if the default IP address will work from a separate subnet, or to find a client system on the same local subnet that you can use.

3. After the Gateway is powered on, press the Config Preset button on the back panel of the LAN/HP-IB Gateway. Then verify the LAN Conn LED is flashing slowly.

4. If the Telnet to the default 192.0.0.192 IP address does not work:

\begin{enumerate}
\item Try pressing the \textbf{Config Preset} button again. Depending on how your network is configured, sometimes the button needs to be pressed twice before the default IP address will be properly recognized and routed on the network.
\item One of the network values may be improperly configured on the Gateway, prohibiting a successful connection. See the next subsection for more troubleshooting information.
\end{enumerate}
Troubleshooting
Configuration Problems

Troubleshooting BOOTP Configuration

If you are having trouble configuring the LAN/HP-IB Gateway using the
BOOTP configuration method, do the following:

1. Verify that the Gateway’s configuration values are correct in the
   /etc/bootptab file for your BOOTP server.

2. Verify that the BOOTP server system is configured to run the bootpd
daemon. See the Administering ARPA Services manual for more
   information.

3. Look for bootpd daemon errors in the syslog file on the syslog server
   for the BOOTP server.

4. Verify the BOOTP server is on the same local subnet as the Gateway. If
   not, consult your Network Administrator to verify that your network
   configuration supports using a BOOTP server that is not on the same
   subnet.

5. When the Gateway is powered on, verify there is a fast flash on the LAN
   Conn LED. (See the previous information about the LAN Conn LED.)

Note

Your BOOTP server may support the bootpquery capability to verify
your BOOTP configuration. Consult your BOOTP server documentation for
how to use the bootpquery command.
Troubleshooting Configuration Problems

Troubleshooting BOOTP with TFTP Configuration

If you are having trouble configuring the LAN/HP-IB Gateway using the BOOTP with TFTP configuration method, do the following:

1. Follow the steps in the previous “Troubleshooting BOOTP Configuration” subsection.

2. Verify that the TFTP server system is configured to run the `tftpd` daemon. See the *Administering ARPA Services* manual for more information.

3. Consult your BOOTP server documentation to verify you have the correct permissions on the specified TFTP configuration file.

4. Verify that the Gateway's configuration values are correct in the TFTP file.

5. Look for errors specific to the TFTP values in the syslog file on the configured syslog server, or with the Telnet `syslog-display` command.
Troubleshooting

Configuration Problems

Troubleshooting Network Configuration

If some of the network configuration values for the HP E2050 LAN/HP-IB Gateway are improperly configured, one or more client systems may not be able to make a connection to the Gateway. The problem may be:

- Improper configuration value(s) for the default subnet gateway and/or the subnet mask. If this is the case, the Gateway may be receiving requests from the client, but routing the replies to the wrong place.

- Improper or incomplete configuration value(s) for the IP allow list. If the client IP address does not match the ones allowed in the configured IP allow list, the connection will be refused. To verify this, do the following:
  - See if you get a response from the Gateway with the `ping` command. If so, the connection is being refused because of the IP allow list configuration values.
  - If using a syslog server, look for `access denied` messages in the syslog file. See the previous section, “syslog Messages,” for more information.

For Telnet Configuration

To fix network configuration values when using the Telnet configuration method, do one of the following actions:

- If a client can successfully Telnet to the Gateway, use the Telnet configuration commands to fix the values. Then reboot using the Telnet `reboot` command.

Caution

Any client operations in progress and client connections will be terminated by the `reboot` command.

- Otherwise, reset the Gateway to the default configuration values by pressing the Config Preset button on the back panel of the LAN/HP-IB Gateway at the same time as you power-on the Gateway. Then follow the configuration steps in Chapter 3 to reconfigure the Gateway.
To fix network configuration values when using the BOOTP or the BOOTP with TFTP configuration method:

1. Fix the improper value in the `/etc/bootptab` file or the specified TFTP configuration file.

2. Cycle the power on the Gateway, or use the Telnet `reboot` command. This will force the Gateway to use the new configuration values.

**Caution**

Any client operations in progress and client connections will be terminated by the `reboot` command.

**Verifying the Configuration**

To verify that the HP E2050 LAN/HP-IB Gateway is properly configured, you can do the following:

- Telnet to the LAN/HP-IB Gateway and:
  - Use the Telnet `config` command to verify the current configuration settings.
  - Use the Telnet `syslog-display` command to see if any TFTP configuration errors were logged during the last power-on initialization of the Gateway.

- Examine the syslog file, looking for configuration errors generated by the `bootpd` daemon or by the Gateway.
Client Connection Problems

Once the HP E2050 LAN/HP-IB Gateway has been successfully configured and the configuration has been verified, individual clients might still have problems getting a connection to the Gateway.

The first step is to verify that the client system has network access to the Gateway:

1. Use the ping command, as follows.

   - On an HP-UX client system, type:
     \[ \text{ping \ hostname (or IP\_address)} \\]

     For example:

     \begin{verbatim}
     >ping E2050.hp.com
     PING E2050.hp.com: 64 byte packets
     64 bytes from 128.10.0.3: icmp_seq=0. time=8. ms
     64 bytes from 128.10.0.3: icmp_seq=1. time=3. ms
     64 bytes from 128.10.0.3: icmp_seq=2. time=3. ms
     64 bytes from 128.10.0.3: icmp_seq=3. time=3. ms
     \end{verbatim}

     Each line after the PING line is an example of a packet successfully reaching the Gateway. If after several seconds ping does not print any lines, use Ctrl-C to kill ping. The ping command will then report on what it found. For example:

     \begin{verbatim}
     -----E2050.hp.com PING Statistics-----
     7 packets transmitted, 0 packets received, 100% packet loss
     \end{verbatim}

     This indicates that the client was unable to contact the Gateway. It could be that the Gateway is on a different subnet than the client (see your Network Administrator), or the Gateway could have incorrect network configuration values (see the previous information on “Troubleshooting Network Configuration”).
Troubleshooting

Client Connection Problems

- On a Windows 95 or Windows NT client system, type:

  \texttt{ping hostname (or) IP\_address Enter}

For example:

  \texttt{> ping E2050.hp.com}
  Pinging E2050.hp.com[128.10.0.3] with 32 bytes of data:
  Reply from 128.10.0.3:bytes=32 time=10ms TTL=255
  Reply from 128.10.0.3:bytes=32 time=10ms TTL=255
  Reply from 128.10.0.3:bytes=32 time=10ms TTL=255
  Reply from 128.10.0.3:bytes=32 time=10ms TTL=225

Each line after the \texttt{Pinging} line is an example of a packet successfully reaching the Gateway from the client system. However, if \texttt{ping} is unable to reach the host, you will see a message similar to the following:

  Pinging E2050.hp.com[128.10.0.3] with 32 bytes of data:
  Request timed out.
  Request timed out.
  Request timed out.

This indicates that the client was unable to contact the Gateway. It could be that the Gateway is on a different subnet than the client (see your Network Administrator), or the Gateway could have incorrect network configuration values (see the previous information on “Troubleshooting Network Configuration”).

2. Once \texttt{ping} works, you can try one of the following \texttt{rpcinfo} commands from an HP-UX client system, using the Gateway IP address to verify that the client has access privileges to the Gateway (in the IP allow list configuration):

  \texttt{rpcinfo -p IP\_address Return}

This \texttt{rpcinfo} command gives the following response:

\begin{verbatim}
program  vers  proto  port
100000   2     tcp   111  portmapper
100000   2     udp   111  portmapper
395180   1     tcp   5055
\end{verbatim}

where the line for program \texttt{395180} is the LAN server in the Gateway.
You can also try the following:

\texttt{rpcinfo -t \textit{IP\_address 395180 Return}}

This \texttt{rpcinfo} command gives the following response:

\texttt{program 395180 version 1 ready and waiting}

If this is not working properly, see the previous section titled “Troubleshooting Network Configuration.”

3. The Telnet command can be used to verify if a client has network access to the Gateway as well. If the Telnet command returns the message:

\texttt{connection refused}

Then either the client may not have access (check the IP allow list configuration values), or the Gateway has run out of resources and cannot open the Telnet session.
Client Run-time Errors

The following are common run-time errors that may occur on a client that is using an HP E2050 LAN/HP-IB Gateway.

- **iopen** fails: Invalid address errors
  
  Use the Telnet commands to verify that the HP-IB address, HP-IB interface name, and/or HP-IB logical unit configuration values are correct.

- **iopen** fails: No connection
  
  The connection to the LAN/HP-IB Gateway failed for one of these reasons:
  
  - A TCP/IP network timeout occurred because the network connection is down or the Gateway is down.
  
  - The client was denied access to the Gateway because it is not in the IP allow list. Check the IP allow list configuration values and any error messages in a syslog file for more information.
  
  - The Gateway has reached its maximum concurrent client connections and this new connection was refused. Use the Telnet **status** command to determine the current Gateway client connection status and check the syslog file for error messages. You may need to have a client close its connection, or you may need to reboot the Gateway to close all client connections to allow a new connection to be made.

- **iopen** fails: Timeout
  
  The client has timed out. The Gateway has not responded within the appropriate timeout time because:
  
  - The network connection is down or the Gateway is down.
  
  - The server is busy performing an operation for a different client. Use the Telnet **status** command to verify the Gateway status. You may need to increase the Client Timeout Delta configuration value on the LAN client.
Troubleshooting

Client Run-time Errors

- **iopen** fails or I/O operation fails: Out of resources
  
The Gateway was unable to open another session or perform the operation because it is out of resources. Use the Telnet `status` command and look in the syslog file for any error messages to determine the current Gateway status. You may need to have a client terminate its connection, or you may need to reboot the Gateway to close all client connections to reclaim resources.

- I/O operation fails: No connection
  
The connection to the Gateway failed because:
  
  - The network connection is down or the Gateway is down and a TCP/IP network timeout occurred.
  - The Gateway was powered off and then powered on, or a Telnet `reboot` command was executed, either of which terminates any open client connections. Check the syslog file for reboot messages.

- I/O operation fails: Timeout
  
  There are several possible causes:
  
  - The client may be attempting a transaction to a non-existent or powered-off device. Check the address used, as well as the status of the device.
  - The network connection or Gateway has gone down since the previous I/O operation.
  - The I/O timeout specified is not long enough for the transaction to complete. You may need to verify that the Gateway I/O timeout configuration value is long enough if the client specified a timeout value of infinity.
  - The Gateway is busy performing an I/O operation for another client, or another client has the device/interface locked. Use the Telnet `status` command to determine if another client is currently executing an operation, or if the required device/interface is locked. See the following discussion, “Gateway appears to be hung,” for more information.
Troubleshooting

Client Run-time Errors

■ Gateway appears to be hung

There are several possible causes. Note that, for all of the following, use of client timeouts and/or Gateway timeouts (the I/O timeout and LAN timeout configuration values) can be used to ensure that the Gateway will not “hang” indefinitely.

■ The network connection has gone down or the Gateway has gone down.

■ The Gateway may be attempting a transaction to a non-existent or powered-off device. Check the address used, as well as the status of the device.

■ The Gateway is busy performing a very long transaction to a (slow) device, or it is waiting for input from a device.

■ A client may be waiting for access to a device/interface locked by another client. Use the Telnet status command to determine what clients have which devices or interface locked, and which clients are waiting for those locks to be freed before they can proceed. Check for possible deadlock situations and, if possible, make sure the clients owning locks and the connections to those clients are still up and functioning.

If you determine that the Gateway is truly hung, you may be able to free it by terminating a particular client connection at the client, thus freeing up the resources to allow the Gateway to proceed. Otherwise, you may have to use the Telnet reboot command.

Caution

Any client operations in progress and client connections will be terminated by the reboot command.
Troubleshooting

Client Run-time Errors
Explanation of LEDs
Explanation of LEDs

Table A-1 explains the status information provided by the 8 light-emitting diodes (LEDs) on the front panel of the HP E2050 LAN/HP-IB Gateway.

Table A-1. Status Information Provided by LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Meaning When Illuminated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>green</td>
<td>Indicates power is applied to the Gateway.</td>
</tr>
<tr>
<td>Fault</td>
<td>red</td>
<td>Indicates a diagnostic failure of the hardware. This LED will normally be off.</td>
</tr>
</tbody>
</table>
| LAN Connect | yellow | Indicates a TCP/IP port is open. This could be a Telnet or a LAN connection. This LED flashes at a:  
|          |       | • Fast rate when attempting a BOOTP or a BOOTP with TFTP configuration.                  |
|          |       | • Slow rate when the default IP address (192.0.0.192) is in use, after the Config Preset button is pressed. |
| LAN Tx   | yellow | Flashes at 10 Hz rate when transmitting packets on the LAN.                              |
| LAN Rx   | yellow | Flashes at 10 Hz rate when receiving packets from the LAN.                                |
| HP-IB Talk | yellow | Indicates that the Gateway is configured to TALK on the HP-IB bus.                       |
| HP-IB Listen | yellow | Indicates that the Gateway is configured to LISTEN on the HP-IB bus.                     |
| HP-IB SRQ | yellow | Indicates that the HP-IB SRQ line is asserted.                                           |

Note

The Power, Tx, and Rx LEDs are hardware driven. They are not controlled by the software you are using for I/O applications.

In addition, the Rx LED is illuminated when any packet on the LAN is received, even packets not addressed to the HP E2050 LAN/HP-IB Gateway.
Explanation of LEDs

As explained in Table A-1, if the red Fault LED is illuminated, a hardware fault was found during the Gateway’s power-on, hardware self-test. Please contact your HP Service and Support Center for instructions.
Explanation of LEDs
Technical Reference
Technical Reference

This appendix provides a technical reference of the following topics for the HP E2050 LAN/HP-IB Gateway:

- Specifications
- Radio and Television Interference
- Declaration of Conformity
Specifications

Power Requirements

The following are the power requirement specifications for the HP E2050 LAN/HP-IB Gateway and the AC/DC Adapter (power module).

Table A-1. HP E2050 Power Requirement Specifications

<table>
<thead>
<tr>
<th></th>
<th>HP E2050</th>
<th>AC/DC Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input Voltage</strong></td>
<td>5 Vdc</td>
<td>100-240 Vac</td>
</tr>
<tr>
<td><strong>Input Current</strong></td>
<td>~0.8A Typical</td>
<td>9.75A</td>
</tr>
<tr>
<td><strong>Frequency Range</strong></td>
<td>dc</td>
<td>50/60Hz</td>
</tr>
<tr>
<td><strong>Output Current</strong></td>
<td>—</td>
<td>2.0A Maximum</td>
</tr>
<tr>
<td><strong>Power Consumption</strong></td>
<td>4W (Typical)</td>
<td>10W (Maximum)</td>
</tr>
</tbody>
</table>

Environmental

<table>
<thead>
<tr>
<th></th>
<th>Operating</th>
<th>Non-Operating (Storage)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td>0°C to +40°C</td>
<td>-40°C to +70°C</td>
</tr>
<tr>
<td><strong>Relative Humidity</strong></td>
<td>15% to 80% at 40°C</td>
<td>90% R.H. at 60°C 24 hrs.</td>
</tr>
</tbody>
</table>
Technical Reference

Specifications

Electromagnetic

Emissions
- FCC part 15 Class A in U.S.A., Canada, and Latin America
- CISPR-22 Class A in Europe, Japan, and miscellaneous countries
- EN 55022 Class A in Europe
- VCCI Class 1 in Japan

Immunity
- ESD Immunity -- IEC 801-2 (1991) 3kV CD, 8kV AD
- Radiated Immunity -- IEC801-3 (1984), 3V/m

Safety
- UL 1950
- CSA950/234

HP-IB Characteristics

The HP-IB connection conforms to IEEE 488.1 - 1987 specifications. Per this specification, the following constraints exist:

- Total Bus length: Less than 2 meters x number of devices, and no more than 20 meters total length.
- Length between devices: Less than 2 meters between each device or equivalent standard load.
- Total number of devices: 15 devices or less (includes HP E2050 LAN/HP-IB Gateway).
- Address restrictions: Address 31 is a reserved IEEE 488 address. Address 21 is normally used by the HP E2050 LAN/HP-IB Gateway, unless changed in the configuration table.
- Drivers: The HP E2050 LAN/HP-IB Gateway uses 48mA three-state drivers (E2).
Radio and Television Interference

This device has been verified to comply with FCC Rules Part 15. Operation is subject to these two conditions:

1. this device may not cause radio interference, and
2. this device must accept any interference received (including interference that may cause undesired operation).

This equipment generates and uses radio frequency energy. If not installed and used in accordance with this manual, it can cause interference to radio and television communications. The rules with which it must comply afford reasonable protection against such interference when it is used in most locations. However, there can be no guarantee that such interference will not occur in a particular installation. If you think your device is causing interference, turn off the system. If the radio or television reception does not improve, your device is probably not causing the interference. If your device does cause interference to radio and television reception, you are encouraged to try to correct the interference by one or more of the following measures:

■ Relocate the radio or TV antenna.

■ Move the device away from the radio or television.

■ Plug the device into a different electrical outlet, so that the device and the radio or television are on separate electrical circuits.

■ Make sure you use only shielded cables to connect peripherals to your device.

■ Consult your dealer, Hewlett-Packard, or an experienced radio/television technician for other suggestions.

■ Order the FCC booklet How to Identify and Resolve Radio-TV Interference Problems from the U.S. Government Printing Office, Washington, D.C. 20402. The stock number of this booklet is 004-000-00345-4.
Declaration of Conformity

According to ISO/IEC Guide 22 and EN 45014

The Hewlett-Packard Company declares that the HP E2050 conforms to the following Product Specifications.

        CSA C22.2 #1010.1 (1992)
        UL 1244

EMC:    CISPR 11:1990/EN 55011 (1991): Group1 Class A
        IEC 801-2:1991/EN 50082-1 (1992): 4kVCD, 8kVAD
        IEC 801-3:1984/EN 50082-1 (1992): 3 V/m
        IEC 801-4:1988/EN 50082-1 (1992): 1kV Power Line,
             .5kV Signal Lines


Tested in a typical configuration with a Series 700, LAN, and HP-IB based instrument.

Q.A. Manager,
Hewlett-Packard Company
Related Software Documentation
Related Software Documentation

This appendix explains what software manuals you should follow to use the HP E2050 LAN/HP-IB Gateway with these I/O application software products:

- HP SICL
- HP VISA or HP VTL
- HP VEE
- HP BASIC/UX 700

**Note** The HP E2050 LAN/HP-IB Gateway supports all I/O application operations by these software products except for parallel polling, HP SICL commander sessions, and asynchronous aborting.
To use the LAN/HP-IB Gateway, you must configure the LAN client software provided with HP SICL. See the “Installing and Configuring the HP I/O Libraries” chapter of the *HP I/O Libraries Installation and Configuration Guide* for configuration procedures.

To develop and use HP SICL I/O applications for the Gateway, see the “Using HP SICL with LAN” chapter of the *HP SICL User's Guide*. HP SICL functions, including those that are LAN-specific, are fully defined in the *HP SICL Reference Manual*. 
Related Software Documentation
HP VISA or HP VTL Documentation

HP VISA or HP VTL Documentation

To use the LAN/HP-IB Gateway, you must configure the LAN client software provided with HP SICL and either HP VISA or HP VTL. See the “Installing and Configuring the HP I/O Libraries” chapter of the *HP I/O Libraries Installation and Configuration Guide* for configuration procedures.

To develop and use HP VISA or HP VTL I/O applications for the Gateway, see the “Programming over LAN” chapter of the *HP VISA User’s Guide*. 
HP VEE Documentation

To use the LAN/HP-IB Gateway, you must configure the HP SICL LAN client software provided with HP VEE. See the *Installing the HP I/O Libraries for HP VEE* manual for configuration procedures.

To develop and use HP VEE I/O applications for the Gateway, see the “Using Instruments” chapter of the *HP VEE Advanced Programming Techniques* manual.
HP BASIC/UX 700 Documentation

Version 8.x

To use the LAN/HP-IB Gateway, you must configure the HP SICL LAN client software provided with HP BASIC/UX 700 Version 8.x. See the “Installing and Configuring SICL for BASIC/UX 8.x” chapter of the Installing and Using HP BASIC/UX 8.x manual for configuration procedures.

To develop and use HP BASIC/UX 700 Version 8.x I/O applications for the Gateway, see “The HP SICL/LAN Interface” chapter of the HP BASIC Interface Reference manual.

Version 7.1

To use the LAN/HP-IB Gateway, you must configure the HP SICL LAN client software provided with HP BASIC/UX 700 Version 7.1. See the “Configuring HP SICL for Series 700” chapter of the Installing and Maintaining HP BASIC/UX manual for configuration procedures.

To develop and use HP BASIC/UX 700 Version 7.1 I/O applications for the Gateway, see the “HP SICL/LAN Interface” chapter of the HP BASIC Interface Reference manual.
Glossary

address
A string uniquely identifying a particular interface or a device on that interface which is interpreted at the HP E2050 LAN/HP-IB Gateway to identify the interface or device.

BOOTP requests
Broadcast messages sent at power-on from the HP E2050 LAN/HP-IB Gateway to the BOOTP server’s bootpd daemon to gain configuration information for the LAN/HP-IB Gateway. The BOOTP request contains the LAN/HP-IB Gateway’s LAN hardware address.

BOOTP response
The configuration information that the BOOTP server’s bootpd daemon sends to the HP E2050 LAN/HP-IB Gateway in response to the Gateway’s BOOTP requests. The Gateway then uses this information to complete its power-on initialization sequence.

BOOTP server
The server computer system running the bootpd daemon used in the configuration of devices on the local area network.

client
Part of the client/server model used in distributed computing. A client is a computer system that requests services from a server computer system, such as I/O application requests, networking requests, and so forth.

controller
A computer used to communicate with a remote device such as an instrument. In the communications between the controller and the device, the controller is in charge of and controls the flow of communication that is, it does the addressing and/or other bus management). The controller acts as the SICL/LAN client.
**device**
A unit that receives commands from a controller. Typically a device is an instrument but could also be a computer acting in a non-controller role, or another peripheral such as a printer or plotter.

**gateway**
Hardware that permits a network connection between the LAN that your computer understands, and the instrument specific interface that your device understands.

**instrument**
A device that accepts commands and performs a test or measurement function.

**interface**
A connection and communication media between devices and controllers, including mechanical, electrical, and protocol connections.

**LAN**
Local Area Network. The HP E2050 LAN/HP-IB Gateway can be used on either Ethertwist or ThinLAN networks. The Gateway can also be used on ThickLAN or fiber optic networks by purchasing the appropriate converter and MAU.

**lock**
A state that prohibits other users from accessing a resource, such as a device or interface.

**logical unit**
A logical unit is a number associated with an interface. In HP SICL, a logical unit uniquely identifies an interface. Each interface on the controller must have a unique logical unit.

**server**
Part of the client/server model used in distributed computing. The server is a computer system designated to act as a main servicer of requests from other client computer systems, such as I/O application requests, networking requests, and so forth.
SICL
The HP Standard Instrument Control Library, which is software used for I/O application programming.

SRQ
Service Request. An asynchronous request (an interrupt) from a remote device indicating that the device requires servicing.

symbolic name
A name corresponding to a single interface. This name uniquely identifies the interface on a controller or gateway. If there is more than one interface on the controller or gateway, each interface must have a unique symbolic name.

TFTP
The Trivial File Transfer Protocol, which is an extension to BOOTP.

VEE
The HP Visual Engineering Environment, which is software used for I/O application programming.

VISA
The HP Virtual Instrument Software Architecture library, which is software used for I/O application programming.

VTL
The HP VISA Transition Library, which is software used for I/O application programming.
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