

HP Jetdirect pn1050 Network Projector Manager Administrator's Guide



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Table of Contents

1. Introducing the HP Jetdirect Network Projector Manager	
Introduction	5
Security Protocols	5
Supplied Manuals	7
HP Support	7
Product Registration	8
2. HP Web Jetadmin	
Introduction	9
3. TCP/IP Configuration	
Introduction	12
Default IP Address	13
Using BOOTP/TFTP	17
Using DHCP	32
Using RARP	40
Using the arp and ping Commands	42
Using the Embedded Web Server	44
Moving to Another Network	44
4. Using the Embedded Web Server	
Introduction	45
Requirements	47
Viewing the Embedded Web Server	48
HP Jetdirect Home Tab	50
Networking Tab	52
Projector Tab	77
Other Links	79
5. Security Features	
Introduction	80
Using Security Features	83
6. Troubleshooting the HP Jetdirect Projector Server	
Introduction	84
Resetting to Factory Defaults	85
General Troubleshooting	86

A. TCP/IP Overview

Introduction	90
IP Address	91
Configuring IP Parameters	93
Subnets	94
Gateways	95
Syslog Server	95

B. OpenSSL Statements

Index

Introducing the HP Jetdirect Network Projector Manager

Introduction

The HP Jetdirect network projector manager is a server that connects a projector directly to a network, so that you can manage it from anywhere on the network.

Throughout this manual, this product is called a *projector server*.

Security Protocols

SNMP

SNMP (Simple Network Management Protocol) is used by network management applications for device management. HP Jetdirect projector servers support SNMP and standard MIB-II (Management Information Base) objects on IP networks.

HP Jetdirect projector servers support an SNMP v1/v2c agent, and an SNMP v3 agent for enhanced security.

HTTPS

HP Jetdirect projector servers support HTTPS (Secure Hyper Text Transfer Protocol) for secure, encrypted management communications between their embedded Web servers and your Web browser.

Authentication

EAP/802.1X Server-Based Authentication

As a network client, the HP Jetdirect projector server support network access using the Extensible Authentication Protocol (EAP) on an IEEE 802.1X network. The IEEE 802.1X standard provides a port-based authentication protocol where a port can allow or block access depending on client authentication results.

When using an 802.1X connection, the projector server supports Extensible Authentication Protocol (EAP) with an authentication server, such as a RADIUS (Remote Authentication Dial In User Service, RFC 2138) server.

Projector servers support the following EAP/802.1X method:

- **PEAP** (Protected Extensible Authentication Protocol). PEAP is a mutual authentication protocol that uses digital certificates for network server authentication and passwords for client authentication. For additional security, the authentication exchanges are encapsulated within TLS (Transport Layer Security). Dynamic encryption keys are used for secure communications.

The network infrastructure device that connects the projector server to the network (such as an HP Procurve switch) must also support the EAP/802.1X method used. In conjunction with the authentication server, the infrastructure device can control the degree of network access and services available to the server client.

To configure the server for EAP/802.1X authentication, you must access the embedded Web server through your Web browser. For more information, see [Chapter 4](#).

Supplied Manuals

The manuals listed below are supplied with your projector server on the Documentation CD.

- This *Administrator's Guide*.
- The *Setup Guide*.

HP Support

HP Online Support

Click your way to a quick solution! The HP Web site:

<http://www.hp.com/support>

is a great place to start for answers to questions about your HP Jetdirect projector server — 24 hours a day, 7 days a week.

Firmware Upgrades

Hewlett-Packard offers downloadable firmware upgrades for HP Jetdirect projector servers that contain upgradeable memory. The upgrades are available from the World Wide Web at:

http://www.hp.com/go/proj_firmware

Firmware Installation Tools

Firmware upgrades for supported HP Jetdirect projector servers may be installed over a network using one of the following firmware installation tools:

- HP Jetdirect Download Manager (Windows). HP Jetdirect Download Manager can be downloaded from HP online support at:

http://www.hp.com/go/dlm_sw

- HP Web Jetadmin may be used on supported systems. For more information on HP Web Jetadmin, visit:

<http://www.hp.com/go/webjetadmin/>

- The embedded Web server resident on the projector server provides a firmware upgrade feature using your Web browser. For more information see [Chapter 4](#).
- FTP (File Transfer Protocol) may be used to transfer a firmware upgrade image file to the projector server. To start an FTP session, use the device IP address or host name. If a password is set, it must be entered to log into the device. After user login, typical FTP commands to upgrade the device are illustrated below:

```
ftp> bin
ftp> hash
ftp> cd /download
ftp> put <firmware image filename; specify full pathname>
ftp>##### <Wait for FTP to complete the download>
ftp> bye
```

HP Support By Phone

Highly trained technicians are ready to take your call. For the most recent HP support telephone numbers and available services worldwide, visit:

<http://www.hp.com/support>

Note For toll-free support in the USA and Canada, call 1-800-HPINVENT or 1-800-474-6836.

Note Telephone fees are the responsibility of the caller. Rates may vary. Contact your local telephone company for current rates.

Product Registration

To register your HP Jetdirect projector server, use the following HP Web page:

<http://www.register.hp.com>

HP Web Jetadmin

Introduction

HP Web Jetadmin is an enterprise management tool that allows you to remotely install, configure, and manage a wide variety of HP and non-HP network printers and HP projectors simply through a standard Web browser. HP Web Jetadmin can be used to proactively manage both individual or groups of devices.

To use HP Web Jetadmin, see the online help and documentation supplied with the software.

System Requirements

HP Web Jetadmin software runs on Microsoft Windows 2000, Windows XP Professional, and Windows Server 2003 systems. For information on supported operating systems, clients, and compatible browser versions, visit HP online support at <http://www.hp.com/go/webjetadmin>.

To manage digital projectors, HP Web Jetadmin version 7.8 or greater and the HP Web Jetadmin plug-in for digital projectors are required. We recommend using the latest version, which may provide enhanced functionality.

Note When installed on a supported host server, HP Web Jetadmin can be accessed from any client through a compatible Web browser by browsing to the HP Web Jetadmin host.

Installing HP Web Jetadmin

Before installing the HP Web Jetadmin software, you must have administrator or root privileges on the local system:

1. Download the installation files from HP online support at <http://www.hp.com/go/webjetadmin>.
2. Follow the instructions on the screen to install the HP Web Jetadmin software.

Note

Installation instructions are also contained in the HP Web Jetadmin install file.

Verifying Installation and Providing Access

- Verify that the HP Web Jetadmin software is correctly installed by navigating to it with your browser as shown in the following example:

```
http://systemname.domain:port/
```

where `systemname.domain` is the host name of your Web server and `port` is the port number assigned during installation. By default, the port number is 8000.

- Provide users access to HP Web Jetadmin software by adding a link to your Web server's home page that is addressed to HP Web Jetadmin's URL. For example:

```
http://systemname.domain:port/
```

Configuring and Modifying a Device

Using your browser, navigate to HP Web Jetadmin's URL. For example:

```
http://systemname.domain:port/
```

Note. In place of `systemname.domain`, the IP address of the host computer on which HP Web Jetadmin is installed can be used.

Follow the instructions on the appropriate home page to find and manage your printers and projectors.

Removing HP Web Jetadmin Software

To remove HP Web Jetadmin software from your Web server, use the uninstall program provided with the software package.

TCP/IP Configuration

Introduction

To operate properly on a TCP/IP network, the HP Jetdirect projector server must be configured with valid TCP/IP network configuration parameters, such as an IP address that is valid for your network. For general information on TCP/IP networks, see [Appendix A](#).

Server-Based and Manual TCP/IP Configuration

When in a factory-default state and powered on, the HP Jetdirect projector server will try to obtain its TCP/IP configuration using a server-based method, such as BOOTP/TFTP, DHCP/TFTP, or RARP. These server-based methods are described later in this chapter. Depending on the server model, up to two minutes may be used for these methods. If configuration is not successful, a default IP address will be assigned.

The server may also be configured manually. Manual-based tools include a Web browser, arp and ping commands (when the default IP address is 192.0.0.192), or SNMP-based management software. TCP/IP configuration values assigned manually will be retained when powered off/on.

The server can be reconfigured to use either server-based or manual configuration of TCP/IP settings at any time.

To identify the IP address that is configured on the projector server at any time, see the IP address displayed in the projector's on-screen Help menu.

Default IP Address

When in a factory-default state (for example, when shipped from the factory or after a cold-reset), the HP Jetdirect projector server has no IP address. A default IP address may or may not be assigned depending on the network environment.

Default IP Address Will Not Be Assigned

A default IP address will not be assigned if a server-based method (such as BOOTP or DHCP) is successful. And if the server is powered off/on, the same method will again be used to retrieve IP configuration settings. If this method now fails to retrieve the IP configuration settings (for example, the BOOTP or DHCP server is no longer available), a default IP address will not be assigned. Instead, the server will continue to send IP configuration requests indefinitely. You must cold-reset the server to change this behavior.

In addition, a default IP address will not be assigned if a network cable is not attached.

Default IP Address Will Be Assigned

A default IP address will be assigned if the factory-default methods fail, or if the server has just been reconfigured by an administrator to use a server-based method (such as BOOTP or DHCP) that fails.

If a default IP address is assigned, the address will depend on the network to which the server is connected. The server senses broadcast packets on the network to determine the appropriate default IP settings:

- On small private networks that adhere to automated, standards-based IP address assignments, the server uses a link-local addressing technique to assign a unique IP address. Link-local addressing is limited to a local IP subnet (not routed) and may be referenced as *Auto IP*. The IP address assigned will be in the range of 169.254.1.0 to 169.254.254.255 (commonly referenced as 169.254/16). However, it can be further modified for your network using supported TCP/IP configuration tools if necessary.

With link-local addresses, subnetting is not used. The subnet mask will be 255.255.0.0, and cannot be changed.

Link-local addresses will not route off the local link, and access to or from the Internet will not be available. The default gateway address will be the same as the link-local address.

If a duplicate address is sensed, the HP Jetdirect server will automatically reassign its address, if necessary, in accordance with standard link-local addressing methods.

- On large or enterprise IP networks, a temporary address of 192.0.0.192 will be assigned until it is reconfigured with a valid address through supported TCP/IP configuration tools. We refer to this address as *Legacy Default IP*.
- On mixed-environment networks, the self-assigned default IP address may be either 169.254/16 or 192.0.0.192. In this case, you should verify through the projector's on-screen Help menu that the assigned default IP address is as expected.

The IP address configured on your projector server can be found on the projector's on-screen Help menu.

Default IP Address Configuration Options

Default IP Parameter

A Default IP configuration parameter on the projector server controls how the default IP address is assigned. Whenever the server is unable to obtain an IP address during a forced TCP/IP reconfiguration (for example, when manually configured to use BOOTP or DHCP), this parameter will determine the default IP address to use.

When the server is in a factory-default state, this parameter is undefined.

If the server is initially configured with a default IP address (either a link-local IP address or the legacy default 192.0.0.192 IP address), the Default IP parameter will be set to either **Auto IP** or **Legacy Default IP** to match.

The Default IP parameter can be changed through a supported configuration tool, such as a Web browser and SNMP management applications.

DHCP Requests Enable/Disable

When a default IP address is assigned, you can configure the projector server to send, or not send, periodic DHCP requests. DHCP requests are used to retrieve IP configuration settings from a DHCP server on the network. By default, this parameter is enabled, allowing DHCP requests to be transmitted. However, this parameter may be disabled through supported configuration tools such as a Web browser, and SNMP management applications.

TCP/IP Configuration Tools

When a network connection has been established, an HP Jetdirect projector server can be configured with valid TCP/IP parameters for your network in the following ways:

- **Using Software.** You can use installation, setup, and management software running on supported systems. For more information see [Chapter 2, “HP Web Jetadmin”](#).
- **BOOTP/TFTP.** You can download the data from a network-based server using BOOTP (Bootstrap Protocol) and TFTP (Trivial File Transfer Protocol) each time the projector is turned on. For more information, see “[Using BOOTP/TFTP](#)”.

The BOOTP daemon, `bootpd`, must be running on a BOOTP server that is accessible by the projector.

- **DHCP/TFTP.** You can use Dynamic Host Configuration Protocol (DHCP) and TFTP (Trivial File Transfer Protocol) each time the projector is turned on. These protocols are supported on HP-UX, Solaris, Linux, Windows NT/2000/Server 2003, NetWare and Mac OS systems. (Refer to your network operating system manuals to verify that your server operating system supports DHCP.) For more information, see “[Using DHCP](#)”.

Note

Linux and UNIX systems: For more information, see the bootpd “man” page.

On HP-UX systems, a sample DHCP configuration file (dhcptab) may be located in the `/etc` directory.

Since HP-UX presently does not provide Dynamic Domain Name Services (DDNS) for its DHCP implementations, HP recommends that you set all projector server lease durations to *infinite*. This ensures that server IP addresses remain static until such time as Dynamic Domain Name Services are provided.

- **RARP.** A network-based server can use RARP (Reverse Address Resolution Protocol) to answer the projector server’s RARP request and supplying the server with the IP address. The RARP method only allows you to configure the IP address. For more information, see “[Using RARP.](#)”
- **arp and ping commands.** (For projector servers configure with Legacy default IP address 192.0.0.192 only) You can use the `arp` and `ping` commands from your system. For more information, see “[Using the arp and ping Commands.](#)”
- **Embedded Web server.** You can browse to the embedded Web server on the HP Jetdirect projector server to set configuration parameters. For more information, see [Chapter 4](#).

Using BOOTP/TFTP

BOOTP (Bootstrap Protocol) and TFTP (Trivial File Transfer Protocol) provide a convenient way to automatically configure the HP Jetdirect projector server for TCP/IP network operation. When powered on, the Jetdirect server sends a BOOTP request message onto the network. A properly configured BOOTP server on the network will respond with a message that contains basic network configuration data for the Jetdirect server. The BOOTP server's response may also identify a file that contains extended configuration data for the server. The Jetdirect server downloads this file using TFTP. This TFTP configuration file may be located on the BOOTP server, or a separate TFTP server.

BOOTP/TFTP servers are typically UNIX or Linux systems. Windows NT/2000/Server 2003 and NetWare servers can respond to BOOTP requests. Windows NT/2000/Server 2003 servers are configured through Microsoft DHCP services (see "[Using DHCP](#)"). However, Windows NT/2000/Server 2003 systems may require third-party software for TFTP support. For setup of NetWare BOOTP servers, refer to your NetWare documentation.

Note If the Jetdirect projector server and BOOTP/DHCP server are located on different subnets, IP configuration may fail unless the routing device supports "BOOTP Relay" (allows the transfer of BOOTP requests between subnets).

Why Use BOOTP/TFTP?

Using BOOTP/TFTP to download configuration data has the following benefits:

- Enhanced configuration control of the HP Jetdirect projector server. Configuration by other methods are limited to select parameters.
- Ease of configuration management. Network configuration parameters for the entire network can be in one location.
- Ease of HP Jetdirect projector server configuration. Complete network configuration can be automatically downloaded each time the server is powered on.

Note

BOOTP operation is similar to DHCP, but the resulting IP parameters will be the same when powered off/on. In DHCP, IP configuration parameters are leased and may change over time.

When in its factory-default state and powered on, the HP Jetdirect projector server will attempt to automatically configure itself using several dynamic methods, one of which is BOOTP.

BOOTP/TFTP on UNIX

This section describes how to configure the projector server using BOOTP (Bootstrap Protocol) and TFTP (Trivial File Transfer Protocol) services on UNIX servers. BOOTP and TFTP are used to download network configuration data from a server to the HP Jetdirect projector server over the network.

Systems That Use Network Information Service (NIS)

If your system uses NIS, you may need to rebuild the NIS map with the BOOTP service before performing the BOOTP configuration steps. Refer to your system documentation.

Configuring the BOOTP Server

For the HP Jetdirect projector server to obtain its configuration data over the network, the BOOTP/TFTP servers must be set up with the appropriate configuration files. BOOTP is used by the projector server to obtain entries in the `/etc/bootptab` file on a BOOTP server, while TFTP is used to obtain additional configuration information from a configuration file on a TFTP server.

When the HP Jetdirect projector server is powered on, it broadcasts a BOOTP request that contains its MAC (hardware) address. A BOOTP server daemon searches the `/etc/bootptab` file for a matching MAC address, and if successful, sends the corresponding configuration data to the Jetdirect projector server as a BOOTP reply. The configuration data in the `/etc/bootptab` file must be properly entered. For a description of entries, see “[Bootptab File Entries](#).”

The BOOTP reply may contain the name of a configuration file containing enhanced configuration parameters. If the HP Jetdirect projector server finds such a file, it will use TFTP to download the file and configure itself with these parameters. For a description of entries, see “[TFTP Configuration File Entries](#).” Configuration parameters retrieved through TFTP are optional.

Note HP recommends that the BOOTP server be located on the same subnet as the projectors it serves. **BOOTP broadcast packets may not be forwarded by routers unless the routers are properly configured.**

Bootptab File Entries

An example of a `/etc/bootptab` file entry for an HP Jetdirect projector server is provided below:

```
picasso:\
:hn:\
:ht=ether:\
:vm=rfc1048:\
:ha=0001E6123456:\
:ip=192.168.40.39:\
:sm=255.255.255.0:\
:gw=192.168.40.1:\
:lg=192.168.40.3:\
:T144="hnp/picasso.cfg":
```

Note that the configuration data contains “tags” to identify the various HP Jetdirect parameters and their settings. Entries and tags supported by the HP Jetdirect projector server are listed in [Table 3.1](#).

Table 3.1 Tags Supported in a BOOTP/DHCP Boot file (1 of 3)

Item	RFC 2132 Option	Description
<i>nodename</i>	--	The name of the peripheral. This name identifies an entry point to a list of parameters for a specific peripheral. <i>nodename</i> must be the first field in an entry. (In the example above, <i>nodename</i> is “picasso”.)
ht	--	The hardware type tag. For the HP Jetdirect projector server, set this to ether (for Ethernet). This tag must precede the ha tag.
vm	--	The BOOTP report format tag (required). Set this parameter to rfc1048 .
ha	--	The hardware address tag. The hardware (MAC) address is the link-level, or station address of the HP Jetdirect projector server. It is printed on a label attached to the server, and displayed by the embedded web server.
ip	--	The IP address tag (required). This address will be the HP Jetdirect projector server’s IP address.
sm	1	The subnet mask tag. The subnet mask will be used by the HP Jetdirect projector server to identify the portions of an IP address that specify the network/subnetwork number and the host address.
gw	3	The gateway IP address tag. This address identifies the IP address of the default gateway (router) that the HP Jetdirect projector server will use for communications with other subnets.
ds	6	DNS (Domain Name System) server’s IP address tag. Only a single name server can be specified.
lg	7	The syslog server’s IP address tag. It specifies the server that the HP Jetdirect projector server sends syslog messages to. For more information, see Appendix A .

Table 3.1 Tags Supported in a BOOTP/DHCP Boot file (2 of 3)

Item	RFC 2132 Option	Description
hn	12	The host name tag. This tag does not take a value but causes the BOOTP daemon to download the host name to the HP Jetdirect projector server. The host name will be returned on an SNMP sysName request by a network application.
dn	15	Domain name tag. Specifies the domain name for the HP Jetdirect projector server (for example, support.hp.com). It does not include the host name; it is not the Fully Qualified Domain Name (such as projector1.support.hp.com).
ef	18	Extensions file tag that specifies the relative path name of the TFTP configuration file. Note: This tag is similar to the vendor-specific tag T144, described below.
na	44	Tag for IP addresses of the NetBIOS-over-TCP/IP Name Server (NBNS). A primary and secondary server may be specified in order of preference.
lease-time	51	DHCP IP address lease duration time (seconds).
tr	58	DHCP T1 timeout, specifying the DHCP lease renewal time (seconds).
tv	59	DHCP T2 timeout, specifying the DHCP lease rebind time (seconds).
T144	--	An HP-proprietary tag that specifies the relative path name of the TFTP configuration file. Long path names may be truncated. The path name must be in double quotes (for example, "pathname"). For file format information, refer to " TFTP Configuration File Entries ." Note: Standard BOOTP option 18 (extensions file path) also allows a standard tag (ef) to specify the relative path name of the TFTP configuration file.
T145	--	Idle Timeout option. An HP-proprietary tag to set the idle timeout (seconds), which is the amount of time that a data connection may remain idle before being closed. The range is 1 - 3600 seconds.

Table 3.1 Tags Supported in a BOOTP/DHCP Boot file (3 of 3)

Item	RFC 2132 Option	Description
T146	--	<p>Buffer Packing option. An HP-proprietary tag to set buffer packing for TCP/IP packets.</p> <p>0 (default): Normal data buffers are packed before sending to the projector.</p> <p>1: Disable buffer packing. Data is sent to the projector when received.</p>
T147	--	<p>Write Mode option. An HP-proprietary tag that controls the TCP PSH flag setting for device-to-client data transfers.</p> <p>0 (default): disables this option, flag not set.</p> <p>1: all-push option. The push bit is set in all data packets.</p>
T148	--	<p>IP Gateway Disable option. An HP-proprietary tag to prevent configuration of a Gateway IP address.</p> <p>0 (default): allows an IP address.</p> <p>1: prevents a Gateway IP address to be configured.</p>
T149	--	<p>Interlock Mode option. An HP-proprietary tag that specifies whether an acknowledgement (ACK) on all TCP packets is required before the projector is allowed to close a Port 9100 connection. A Port Number and Option value are specified, in the form:</p> <p><i><Port Number> <Option></i></p> <p><i><Port Number></i>: For supported HP Jetdirect projector servers, the Port Number is 1 (default).</p> <p><i><Option></i>: Option value 0 (default) disables interlock, 1 enables.</p> <p>Example: 1 1 specifies <Port 1>, <interlock enabled></p>
T150	--	<p>TFTP server's IP address option. An HP-proprietary tag to specify the TFTP server's IP address where the TFTP configuration file is located.</p>
T151	--	<p>Network Configuration option. An HP-proprietary tag to specify either "BOOTP-ONLY" or "DHCP-ONLY" requests be sent.</p>

A colon (:) indicates the end of a field, and a backslash (\) indicates that the entry is continued on the next line. Spaces are not allowed between the characters on a line. Names, such as host names, must begin with a letter and can contain only letters, numbers, periods (for domain names only), or hyphens. The underline character (_) is not allowed. Refer to your system documentation or online help for more information.

TFTP Configuration File Entries

To provide additional configuration parameters for your HP Jetdirect projector server, such as SNMP (Simple Network Management Protocol) or non-default settings, an additional configuration file can be downloaded using TFTP. This TFTP configuration file's relative path name is specified in the BOOTP reply using the `/etc/bootptab` file's T144 vendor-specific tag (or the "ef" standard BOOTP tag) entry. An example of a TFTP configuration file is provided below (the symbol '#' denotes a remark and is not included in the file).

```
# Example of an HP Jetdirect TFTP Configuration File
#
# Allow only Subnet 192.168.10 access to peripheral.
# Up to 10 'allow' entries can be written through TFTP.
# Up to 10 'allow' entries can be written through
# embedded Web server.
#
# 'allow' may include single IP addresses.
allow: 192.168.10.0 255.255.255.0
#
# Enable the embedded Web server
ews-config: 1
#
# Detect SNMP unauthorized usage
auth-trap: on
#
# Send Traps to 192.168.10.1
trap-dest: 192.168.10.1
#
# Specify the Set Community Name
set-cmnty-name: lhome2
#
# End of file
```

[Table 3.2](#) lists supported TFTP commands.

[Table 3.3](#) describes the TFTP parameters.

Table 3.2 List of Supported TFTP Commands

General	
● passwd:	● ssl-state:
● sys-location:	● security-reset:
● sys-contact:	● tftp-parameter-attribute:
TCP/IP Main	
● host-name:	● sec-dns-svr:
● domain-name:	● pri-wins-svr:
● pri-dns-svr:	● sec-wins-svr:
TCP/IP Access Control	
● allow: netnum [mask]	
TCP/IP Other Settings	
● syslog-config:	● user-timeout:
● syslog-svr:	● ews-config:
● syslog-max:	● tcp-mss:
● syslog-priority:	● tcp-msl:
● syslog-facility:	● default-ip:
● slp-config:	● default-ip-dhcp:
● slp-keep-alive:	● dhcp-arbitration:
● ttl-slp:	● phone-home-config:
● ipv4-multicast:	● web-refresh:
● idle-timeout:	
SNMP	
● snmp-config:	● auth-trap:
● get-cmnty-name:	● trap-dest:
● set-cmnty-name:	
Other Settings	
● link-type:	● upgrade:
Support	
● support-name:	● support-url:
● support-number:	● tech-support-url:

Table 3.3 TFTP Configuration File Parameters (1 of 7)

General
<p>passwd: (passwd-admin:)</p> <p>A password (up to 16 alphanumeric characters) that allows administrators to control changes of HP Jetdirect projector server configuration parameters through HP Web Jetadmin or embedded Web server. The password may be cleared by a cold reset.</p>
<p>sys-location: (host-location:, location:)</p> <p>Identifies the physical location of the projector (SNMP sysLocation object). Only printable ASCII characters are allowed. The maximum length is 64 characters. The default location is undefined. (Example: 1st floor, south wall)</p>
<p>sys-contact: (host-contact:, contact:)</p> <p>ASCII character string (up to 64 characters) that identifies the person who administers or services the projector (SNMP sysContact object). This may include how to contact this person. The default contact is undefined.</p>
<p>ssl-state:</p> <p>Sets the projector server's security level for Web communications:</p> <ul style="list-style-type: none">1 (default): Forced redirection to the HTTPS port. Only HTTPS (secure HTTP) communications can be used.2: Disable forced redirection to HTTPS. Both HTTP and HTTPS communications can be used.
<p>security-reset:</p> <p>Reset security settings on the projector server to factory default values. 0 (default) does not reset, 1 resets the security settings.</p>
<p>tftp-parameter-attribute:</p> <p>Specifies whether TFTP parameters can be manually overwritten on the projector server after it has been configured by TFTP.</p> <ul style="list-style-type: none">tftp-ro (default): Do not allow TFTP parameters to be manually changed, and always overwrite manual configurations.tftp-rw: Allow TFTP parameters to be manually changed, and always overwrite manual configurations.manual-ro: Do not allow TFTP parameters to overwrite manually configured parameters.

Table 3.3 TFTP Configuration File Parameters (2 of 7)

TCP/IP Main
host-name: (sys-name:, name:) Specifies the node name. Default is NPIxxxxxx, where xxxxxx is the last six digits of the LAN hardware address.
domain-name: The domain name for the device (for example, support.hp.com). It does not include the host name; it is not the Fully Qualified Domain Name (such as projector1.support.hp.com).
pri-dns-svr: (dns-srv) The IP address of the DNS (Domain Name System) server.
sec-dns-svr: The IP address of a secondary DNS server to use if the primary DNS server is unavailable.
pri-wins-svr: (pri-wins-srv:) The IP address of the primary Windows Internet Naming Service (WINS) server.
sec-wins-svr: (sec-wins-srv:) The IP address of the secondary Windows Internet Naming Service (WINS) server.
TCP/IP Access Control
allow: netnum [mask] Makes an entry into the host access list stored on the HP Jetdirect projector server. Each entry specifies a host or network of hosts that are allowed to connect to the projector. The format is "allow: netnum [mask]" where netnum is a network number or host IP address, and mask is an address mask of bits applied to the network number and host address to verify access. Up to 10 access list entries are allowed. If there are no entries, all hosts are permitted access. For example, allow: 192.0.0.0 255.0.0.0 allows hosts on network 192. allow: 192.168.1.2 allows a single host. In this case, the default mask 255.255.255.255 is assumed and is not required. allow: 0 This entry clears the host access list. For additional information, see Chapter 5 .

Table 3.3 TFTP Configuration File Parameters (3 of 7)

TCP/IP Other Settings
<p>syslog-config:</p> <p>Enables or disables syslog server operation on the projector server: 0 disables, 1 (default) enables.</p>
<p>syslog-svr: (syslog-srv:)</p> <p>The syslog server's IP address. It specifies the server that the HP Jetdirect projector server sends syslog messages to. For more information, see Appendix A.</p>
<p>syslog-max:</p> <p>Specifies the maximum number of syslog messages that can be sent by the HP Jetdirect projector server on a per-minute basis. This setting allows administrators to control the log file size. The default is 10 per minute. If set to zero, the number of syslog messages is not restricted.</p>
<p>syslog-priority:</p> <p>Controls the filtering of syslog messages sent to the syslog server. The filter range is 0 to 8, with 0 being the most specific and 8 the most general. Only messages that are lower than the filter level specified (or higher in priority) are reported. The default is 8, messages of all priorities are sent. If 0, all syslog messages are disabled.</p>
<p>syslog-facility:</p> <p>A code used to identify the source facility of a message (for example, to identify the source of selected messages during troubleshooting). By default, the HP Jetdirect projector server uses local user values of local0 through local7 to isolate individual or groups of projector servers. The default is local0.</p>
<p>slp-config:</p> <p>Enables or disables the Service Location Protocol (SLP) operation on the projector server: 0 disables, 1 (default) enables.</p>
<p>slp-keep-alive:</p> <p>Specifies a time period for the projector server to send multicast packets on the network to prevent being deleted from network device tables. Some infrastructure devices, such as switches, may delete active devices from their device tables due to inactivity on the network. To enable this feature, set a value from 1 to 1440 minutes. Set 0 to disable this feature.</p>
<p>ttl-slp:</p> <p>Specifies the IP multicast "Time To Live" (TTL) setting for Service Location Protocol (SLP) packets. The default value is 4 hops (the number of routers from the local network). The range is 1-15. When set to a -1, multicast capability is disabled.</p>
<p>ipv4-multicast:</p> <p>Enables or disables the receipt and transmission of IP version 4 multicast packets by the projector server. 0 disables, 1 (default) enables.</p>

Table 3.3 TFTP Configuration File Parameters (4 of 7)

<p>idle-timeout:</p> <p>The number of seconds that an idle data connection is allowed to remain open. The acceptable values range from 0 to 3600 (1 hour). If "0" is typed, the timeout mechanism is disabled. The default is 270 seconds.</p>
<p>user-timeout:</p> <p>An integer (1..3600) that specifies the number of seconds that your FTP session can be idle before it will be automatically disconnected. The default is 900 seconds. 0 disables the timeout.</p>
<p>ews-config: (web:)</p> <p>Enables or disables the projector server's embedded Web server to change configuration values: 0 disables, 1 (default) enables.</p>
<p>tcp-mss: (subnets-local:)</p> <p>Specifies the maximum segment size (MSS) that the HP Jetdirect projector server will advertise for use when communicating with local subnets (Ethernet MSS=1460 bytes or more) or remote subnets (MSS=536 bytes):</p> <p>0 (default): All networks are assumed to be local (Ethernet MSS=1460 bytes or more).</p> <p>1: Use MSS=1460 bytes (or more) for subnets, and MSS=536 bytes for remote networks.</p> <p>2: All networks are assumed to be remote (MSS=536 bytes), except the local subnet.</p> <p>MSS affects performance by helping to prevent IP fragmentation that may result in data retransmission.</p>
<p>tcp-msl:</p> <p>Specifies the maximum segment life (MSL) in seconds. The range is 5 - 120 seconds. The default is 15 seconds.</p>

Table 3.3 TFTP Configuration File Parameters (5 of 7)

<p>default-ip:</p> <p>Specifies the IP address to use when the projector server is unable to obtain an IP address from the network during a forced TCP/IP reconfiguration (for example, when powered off/on or manually configured to use BOOTP/DHCP).</p> <p>DEFAULT_IP: sets the legacy default IP address 192.0.0.192.</p> <p>AUTO_IP: sets a link-local IP address 169.254.x.x.</p> <p>The initial setting is determined by the IP address obtained when first powered on.</p>
<p>default-ip-dhcp:</p> <p>Specifies whether DHCP requests will be periodically transmitted when a legacy default IP address 192.0.0.192 or link-local IP address 169.254.x.x has been automatically assigned.</p> <p>0: Disables DHCP requests.</p> <p>1 (default): Enables DHCP requests.</p>
<p>dhcp-arbitration:</p> <p>Specifies the amount of time, in seconds, that the projector server will wait for DHCP configuration offers. A value from 1 to 10 may be set. The default is 5 seconds.</p>
<p>phone-home-config:</p> <p>Specifies privacy settings on the projector server during embedded Web server access. This command controls whether statistical data on product use may be sent to HP. For HP to collect data, Internet access is required.</p> <p>2: Prompt the user to allow sending data on initial access to the Networking tab of the embedded Web server. This is the factory-default and cold-reset value. Once changed, this value cannot be re-selected.</p> <p>1: Allows the sending of data to HP without prompting the user.</p> <p>0: Disables sending data to HP without prompting the user.</p>
<p>web-refresh:</p> <p>Specifies the time interval (1 – 99999 seconds) for embedded Web server diagnostic page updates. If set to 0, the refresh rate is disabled.</p>

Table 3.3 TFTP Configuration File Parameters (6 of 7)

SNMP
<p>snmp-config:</p> <p>Enables or disables SNMP operation on the projector server. 0 disables, 1 (default) enables SNMP.</p> <p>CAUTION: Disabling SNMP will disable all SNMP agents (SNMP v1, v2, v3) as well as communications with HP Web Jetadmin. In addition, firmware upgrades through current HP downloading utilities will be disabled.</p>
<p>get-cmnty-name: (get-community-name:)</p> <p>Specifies a password that determines which SNMP GetRequests the HP Jetdirect projector server will respond to. This is optional. If a user-specified get community name is set, the server will respond to either a user-specified community name or the factory-default. The community name must be ASCII characters. The maximum length is 255 characters.</p>
<p>set-cmnty-name: (set-community-name:)</p> <p>Specifies a password that determines which SNMP SetRequests (control functions) the HP Jetdirect projector server will respond to. The community name of an incoming SNMP SetRequest must match the server's "set community name" for the server to respond. (For additional security, you may limit configuration access through the server's host access list). Community names must be ASCII characters. The maximum length is 255 characters.</p>
<p>auth-trap: (authentication-trap:)</p> <p>Configures the projector server to send (on) or not send (off) SNMP authentication traps. Authentication traps indicate that an SNMP request was received, but the community name check failed. The default is "on."</p>
<p>trap-dest: (trap-destination:)</p> <p>Enters a host's IP address into the HP Jetdirect projector server's SNMP trap destination list. The command format is:</p> <p style="padding-left: 40px;">trap-dest: <i>ip-address</i> [community name] [port number]</p> <p>The default community name is "public"; the default SNMP port number is "162". The port number cannot be specified without a community name.</p> <p>If a "trap-community-name" command is followed by "trap-dest" commands, the trap community name will be assigned to those entries unless a different community name is specified in each "trap-dest" command.</p> <p>To delete the table, use "trap-dest: 0".</p> <p>If the list is empty, the server does not send SNMP traps. The list may contain up to three entries. The default SNMP Trap Destination List is empty. To receive SNMP traps, the systems listed on the SNMP trap destination list must have a trap daemon to listen to those traps.</p>

Table 3.3 TFTP Configuration File Parameters (7 of 7)

Other Settings
<p>link-type:</p> <p>(10/100 Fast Ethernet) Sets the projector server's link speed (10 or 100 Mbps) and communication mode (Full- or Half-Duplex). Selections are AUTO, 100FULL, 100HALF, 10FULL, 10HALF.</p> <p>For AUTO (default), the server uses autonegotiation to determine the link speed and mode. If autonegotiation fails, then 100HALF is set.</p>
<p>upgrade:</p> <p>To configure one or more Jetdirect projector servers with the name and location of a firmware upgrade file.</p> <p>CAUTION: Ensure that command parameters are properly entered and that the upgrade file is a higher version than the currently installed version. The server will attempt to upgrade when the upgrade file contains a higher version than the installed version.</p> <p>The command format is:</p> <p>upgrade: <TFTP server IP> <Version> <Product Number> <Filename></p> <p>where,</p> <p>TFTP Server IP is the IP address of the TFTP server,</p> <p>Version specifies the firmware version of the upgrade file,</p> <p>Product Number specifies and must match the product number of the server,</p> <p>Filename is the path and filename of the firmware upgrade file.</p>
Support
<p>support-name: (support-contact:)</p> <p>Typically used to identify the name of a person to contact for support of this device.</p>
<p>support-number:</p> <p>Typically used to specify a phone number or extension to call for support of this device.</p>
<p>support-url:</p> <p>A Web URL for product information on this device over the Internet or an intranet.</p>
<p>tech-support-url:</p> <p>A Web URL for technical support over the Internet or an intranet.</p>

Using DHCP

Dynamic Host Configuration Protocol (DHCP, RFC 2131/2132) is one of several auto configuration mechanisms that the HP Jetdirect projector server uses. If you have a DHCP server on your network, the HP Jetdirect projector server automatically obtains its IP address from that server and registers its name with any RFC 1001 and 1002-compliant dynamic name services as long as a WINS (Windows Internet Naming Service) server IP address has been specified.

A TFTP (Trivial File Transfer Protocol) configuration file may also be used with DHCP to configure extended parameters. For more information on TFTP parameters, see “[Using BOOTP/TFTP.](#)”

Note DHCP services must be available on the server. Refer to your system documentation or online help to install or enable DHCP services.

Note If the Jetdirect projector server and BOOTP/DHCP server are located on different subnets, IP configuration may fail unless the routing device allows the transfer of DHCP requests between subnets.

UNIX Systems

For more information on setting up DHCP on UNIX systems, see the `bootpd` man page.

On HP-UX systems, a sample DHCP configuration file (`dhcptab`) may be located in the `/etc` directory.

Since HP-UX presently does not provide Dynamic Domain Name Services (DDNS) for its DHCP implementations, HP recommends that you set all projector server lease durations to “infinite”. This ensures that server IP addresses remain static until dynamic domain name services are provided.

Windows Systems

HP Jetdirect projector servers support IP configuration from a supported Windows DHCP server. This section describes how to set up a pool, or “scope,” of IP addresses that the Windows server can assign or lease to any requester. When configured for BOOTP or DHCP operation and powered on, the HP Jetdirect projector server automatically sends a BOOTP or DHCP request for its IP configuration. If properly set up, a Windows DHCP server will respond with the projector server’s IP configuration data.

Note This information is provided as an overview. For specific information or for additional support, see the information supplied with your DHCP server software.

Note To avoid problems resulting from IP addresses that change, HP recommends that all projectors be assigned IP addresses with infinite leases or reserved IP addresses.

Windows NT 4.0 Server

To set up a DHCP scope on a Windows NT 4.0 server, perform the following steps:

1. At the Windows NT server, open the *Program Manager* window and double-click the *Network Administrator* icon.
2. Double-click the **DHCP Manager** icon to open this window.
3. Select **Server** and select **Server Add**.
4. Type the server IP address, then click **OK** to return to the *DHCP Manager* window.
5. In the list of DHCP servers, click on the server you have just added, then select **Scope** and select **Create**.
6. Select **Set up the IP Address Pool**. In the *IP Address Pool* section, set up the IP address range by typing the beginning IP address in the *Start Address* box and the ending IP address in the *End Address* box. Also type the subnet mask for the subnet to which the IP address pool applies.

The starting and ending IP addresses define the end points of the address pool assigned to this scope.

Note If desired, you can exclude ranges of IP addresses within a scope.

7. In the *Lease Duration* section, select **Unlimited**, then select **OK**.

HP recommends that all projectors be assigned infinite leases to avoid problems resulting from IP addresses that change. Be aware, however, that selecting an unlimited lease duration for the scope causes all clients in that scope to have infinite leases.

If you want clients on your network to have finite leases, you can set the duration to a finite time, but you should configure all projectors as reserved clients for the scope.

8. Skip this step if you have assigned unlimited leases in the previous step. Otherwise, select **Scope** and select **Add Reservations** to set up your projectors as reserved clients. For each projector, perform the following steps in the *Add Reserved Clients* window to set up a reservation for that projector:
 - a. Type the selected IP address.
 - b. Obtain the MAC address or hardware address from the label on the server, embedded web server, or on-screen Help menu, and type this address in the *Unique Identifier* box.
 - c. Type the client name (any name is acceptable).
 - d. Select **Add** to add the reserved client. To delete a reservation, in the *DHCP Manager* window, select **Scope** and select **Active Leases**. In the *Active Leases* window, click on the reservation you want to delete and select **Delete**.
9. Select **Close** to return to the *DHCP Manager* window.
10. Skip this step if you are not planning to use WINS (Windows Internet Naming Service). Otherwise perform the following steps when configuring your DHCP server:
 - a. From the *DHCP Manager* window, select **DHCP Options** and select one of the following:
 - Scope** — if you want Name Services only for the selected scope.
 - Global** — if you want Name Services for all scopes.
 - b. Add the server to the *Active Options* list. From the *DHCP Options* window, select **WINS/NBNS Servers (044)** from the *Unused Options* list. Select **Add**, then select **OK**.

A warning may appear requesting that you set the node type. You do this in step 10d.

- c. You must now provide the IP address of the WINS server by doing the following:
 - Select **Value**, then **Edit Array**.
 - From the IP Address Array Editor, select **Remove** to delete any undesired addresses previously set. Then type in the IP address of the WINS server and select **Add**.
 - Once the address appears in the list of IP addresses, select **OK**. This returns you to the **DHCP Options** window. If the address you have just added appears in the list of IP addresses (near the bottom of the window) return to step 10d. Otherwise, repeat step 10c.
 - d. In the **DHCP Options** window, select **WINS/NBT Node Type (046)** from the **Unused Options** list. Select **Add** to add the node type to the **Active Options** list. In the **Byte** box, type 0x4 to indicate a mixed node, and select **OK**.
11. Click **Close** to exit to **Program Manager**.

Windows 2000 Server/Server 2003

To set up a DHCP scope on a Windows 2000 server or Server 2003 system, perform the following steps:

1. Run the Windows DHCP manager utility.
 - Windows 2000: Click **Start**, then select **Settings** and **Control Panel**. Open the **Administrative Tools** folder and run the **DHCP** utility.
 - Server 2003: Click **Start**, then select **Control Panel**. Open the **Administrative Tools** folder and run the **DHCP** utility.
2. In the **DHCP** window, locate and select your Windows server in the DHCP tree.

If your server is not listed in the tree, select **DHCP** and click the **Action** menu to add the server.
3. After selecting your server in the DHCP tree, click the **Action** menu and select **New Scope**. This runs the **Add New Scope** Wizard.
4. In the **Add New Scope** Wizard, click **Next**.
5. Enter a Name and Description for this scope, then click **Next**.

6. Enter the range of IP addresses for this scope (beginning IP address and ending IP address). Also, enter the subnet mask. then click **Next**.

Note

If subnetting is used, the subnet mask defines which portion of an IP address specifies the subnet and which portion specifies the client device. For more information, see [Appendix A](#).

7. If applicable, enter the range of IP addresses within the scope to be excluded by the server. Then click **Next**.
8. Set the IP address lease duration for your DHCP clients. Then click **Next**.
HP recommends that all projectors be assigned reserved IP addresses. This can be accomplished after you set up the scope (see step [11](#)).
9. Select **No** to configure DHCP options for this scope later. Then click **Next**.
To configure DHCP options now, select **Yes** and click **Next**.
 - a. If desired, specify the IP address of the router (or default gateway) to be used by clients. Then click **Next**.
 - b. If desired, specify the Domain Name and DNS (Domain Name System) servers for clients. Click **Next**.
 - c. If desired, specify WINS server names and IP addresses. Click **Next**.
 - d. Select **Yes** to activate the DHCP options now, and click **Next**.
10. You have successfully set up the DHCP scope on this server. Click **Finish** to close the wizard.

11. Configure your projector with a reserved IP address within the DHCP scope:
 - a. In the DHCP tree, open the folder for your scope and select **Reservations**.
 - b. Click the **Action** menu and select **New Reservation**.
 - c. Enter the appropriate information in each field, including the reserved IP address for your projector. (Note: the MAC address for your HP Jetdirect-connected projector is available on the label on the server, embedded web server, or on-screen Help menu.)
 - d. Under “Supported types”, select **DHCP only**, then click **Add**. (Note: Selecting **Both** or **BOOTP only** will result in a configuration through BOOTP due to the sequence in which HP Jetdirect projector servers initiate configuration protocol requests.)
 - e. Specify another reserved client, or click **Close**. The reserved clients added will be displayed in the Reservations folder for this scope.
12. Close the DHCP manager utility.

To Discontinue DHCP Configuration

CAUTION Changes to an IP address on your HP Jetdirect projector server may require updates to device or system configurations for clients or servers.

If you do not want your HP Jetdirect projector server configured through DHCP, you must reconfigure the server to use a different configuration method.

- You can manually modify the TCP/IP parameters through a supported Web browser using the Jetdirect embedded Web server or HP Web Jetadmin.

If you change to BOOTP configuration, the DHCP-configured parameters are released and the TCP/IP protocol is initialized.

If you change to Manual configuration, the DHCP-configured IP address is released and the user-specified IP parameters are used. **Therefore, if you manually provide the IP address, you should also manually set all of the configuration parameters, such as subnet mask, default gateway, and idle timeout.**

Note

If you choose to re-enable a DHCP configuration, the projector server will acquire its configuration information from a DHCP server. This means that when you choose DHCP and complete your configuration session, the TCP/IP protocol for the projector server is re-initialized and all current configuration information is deleted. The projector server then attempts to acquire new configuration information by sending DHCP requests on the network to a DHCP server.

Using RARP

This section describes how to configure the projector server using the Reverse Address Resolution Protocol (RARP) on UNIX and Linux systems.

This setup procedure enables the RARP daemon running on your system to respond to a RARP request from the HP Jetdirect projector server and to supply the IP address to the server.

1. Turn the projector off.
2. Log onto your UNIX or Linux system as a superuser.
3. Make sure the RARP daemon is running on your system by typing the following command at the system prompt:

```
ps -ef | grep rarpd (Unix)
```

```
ps ax | grep rarpd (BSD or Linux)
```

4. The system response should be similar to the following:

```
861 0.00.2 24 72 5 14:03 0:00 rarpd -a
```

```
860 0.00.5 36 140 5 14:03 0:00 rarpd -a
```

5. If the system does not display a process number for the RARP daemon, see the *rarpd* man page for instructions on starting the RARP daemon.
6. Edit the `/etc/hosts` file to add your designated IP address and node name for the HP Jetdirect projector server. For example:

```
192.168.45.39 projector1
```

7. Edit the `/etc/ethers` file (`/etc/rarpd.conf` file in HP-UX 10.20) to add the LAN hardware address/station address (from the label on the server, embedded web server, or on-screen Help menu) and the node name for the HP Jetdirect projector server. For example:

```
00:01:E6:a8:b0:00 projector1
```

Note

If your system uses Network Information Service (NIS), you need to incorporate changes to the NIS host and ethers databases.

8. Turn the projector on.
9. To verify that the card is configured with the correct IP address, use the ping utility. At the prompt, type:

```
ping <IP address>
```

where <IP address> is the assigned address from RARP.
10. If ping does not respond, see [Chapter 6](#).

Using the arp and ping Commands

You can configure an HP Jetdirect projector server with an IP address using an ARP (Address Resolution Protocol) command from a supported system. The protocol is not routable, that is, the workstation from which the configuration is made must be located on the same network segment as the HP Jetdirect projector server.

Using the arp and ping commands with HP Jetdirect projector servers requires the following:

- Windows NT/2000/XP/Server 2003 or UNIX system configured for TCP/IP operation
- A legacy default IP address 192.0.0.192 has been set on the projector server
- The LAN hardware (MAC) address of the HP Jetdirect projector server (specified on the label on the server, embedded web server, or on-screen Help menu)

Note On some systems, superuser rights may be required for the arp command.

After an IP address is assigned through arp and ping commands, use other tools (such as embedded Web server or HP Web Jetadmin software) to configure other IP parameters.

To configure a Jetdirect projector server, use the following commands:

```
arp -s <IP address> <LAN hardware address>
```

```
ping <IP address>
```

where <IP address> is the desired IP address to be assigned to the projector server. The arp command writes the entries to the arp cache on the workstation, and the ping command configures the IP address on the server.

Depending on the system, the LAN hardware address may require a specific format.

For example:

- For Windows NT 4.0, 2000, XP, Server 2003

```
arp -s 192.168.45.39 00-01-E6-a2-31-98  
ping 192.168.45.39
```

- For UNIX

```
arp -s 192.168.45.39 00:01:E6:a2:31:98  
ping 192.168.45.39
```

Note

Once the IP address has been set on the projector server, additional `arp` and `ping` commands will be ignored. Once the IP address is configured, `arp` and `ping` cannot be used unless the server is reset to factory values (see [Chapter 6](#)).

On UNIX systems, the `arp -s` command may vary between different systems.

Some BSD-based systems expect the IP address (or host name) in reverse order. Other systems may require additional parameters. See your system documentation for specific command formats.

Using the Embedded Web Server

You can set IP parameters on HP Jetdirect projector servers that support the embedded Web server. For more information, refer to [Chapter 4](#).

Moving to Another Network

When moving an HP Jetdirect projector server that is configured with an IP address to a new network, make sure that the IP address does not conflict with addresses on the new network. You may change the IP address of the server to one that can be used on the new network, or erase the current IP address and configure another address after it is installed on the new network. See [Chapter 6](#), “[Troubleshooting the HP Jetdirect Projector Server](#),” for instructions to reset the server to factory default settings.

If the current BOOTP server is not reachable, you may need to locate a different BOOTP server and configure the projector to this server.

If the server was configured using BOOTP, DHCP or RARP, edit the appropriate system files with updated settings. If the IP address was manually set, reconfigure IP parameters as described in this chapter.

Using the Embedded Web Server

Introduction

HP Jetdirect projector servers contain an embedded Web server that can be accessed from a compatible Web browser over an intranet. The embedded Web server provides access to configuration and management pages for the HP Jetdirect projector server and the attached projector.

Tabs across the upper portion of your browser window provide access to device and networking pages.

Typical **Home**, **Networking**, and **Projector** tabs served by the HP Jetdirect projector server are illustrated in [Figure 4.1](#), [Figure 4.2](#), and [Figure 4.3](#), respectively. For more information, see “[HP Jetdirect Home Tab](#),” “[Networking Tab](#),” and “[Projector Tab](#).”

[HP Jetdirect Home Tab](#)

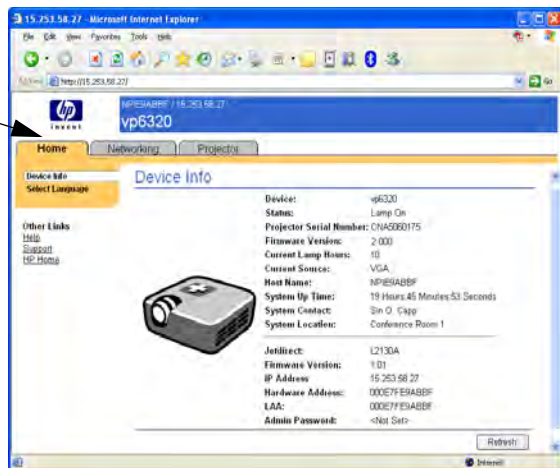


Figure 4.1 Typical HP Jetdirect Home Tab

[Networking Tab](#)

Menu items in left margin

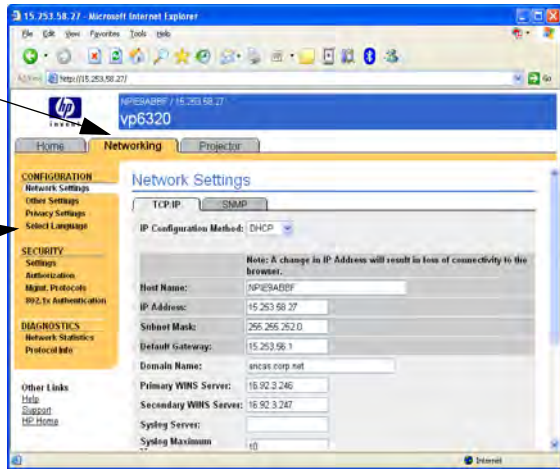


Figure 4.2 HP Jetdirect Networking Tab

For network parameter descriptions, see “[Networking Tab](#)”.

[Projector Tab](#)

Menu items in left margin

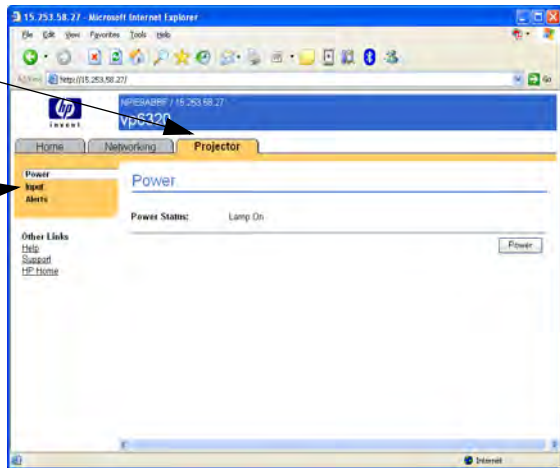


Figure 4.3 Typical HP Jetdirect Projector Tab

Requirements

Compatible Web Browsers

To access the embedded Web server, you must use a compatible Web browser. In general, the embedded Web server can be used with Web browsers that support HTML 4.01 and cascading style sheets.

Hewlett-Packard tests a number of current and older browsers using a variety of systems. In general, we recommend using the following browsers:

- Microsoft Internet Explorer 5.0 or greater
- Netscape Navigator 6.0 or greater

Browser Exceptions

Due to known problems experienced during testing, we recommend that you do not use the following browsers:

- Netscape Navigator 6.2.x with SSL

Supported HP Web Jetadmin Version

HP Web Jetadmin is a browser-based, enterprise management tool for network devices. It is available from HP online support at the following URL:

<http://www.hp.com/go/webjetadmin>

To manage digital projectors, HP Web Jetadmin version 7.8 or greater and the HP Web Jetadmin plug-in for digital projectors are required. We recommend using the latest version, which may provide enhanced functionality.

A link to HP Web Jetadmin will be displayed on the embedded Web server if HP Web Jetadmin has discovered this device through an Integration URL.

Currently, browser support between HP Web Jetadmin and the embedded Web server may differ. For supported browsers with HP Web Jetadmin, visit <http://www.hp.com/go/webjetadmin>.

Viewing the Embedded Web Server

Before you can use the embedded Web server, the HP Jetdirect projector server must be configured with an IP address. For a description of an IP address and an overview of TCP/IP networking, see [Appendix A](#).

There are many ways to configure an IP address on the server. For example, you can automatically configure IP parameters over the network using BOOTP (Bootstrap Protocol) or DHCP (Dynamic Host Configuration Protocol) each time the server is turned on. Or, you can manually configure IP parameters using the “arp” and “ping” commands, HP Web Jetadmin, or other management software. For more information on TCP/IP configuration options, see [Chapter 3](#).

When powered on, an HP Jetdirect server that is unable to retrieve a valid IP address from the network will automatically assign itself either a legacy default IP address 192.0.0.192 or a link-local address in the range 169.254.1.0 to 169.254.254.255. The IP address configured on your server can be determined by inspecting the IP address shown in the projector’s on-screen menus. See [Chapter 3](#) for more information.

If the legacy default IP address 192.0.0.192 has been assigned, you must temporarily set up your computer with the same IP network number or establish a route to the server before you can gain access to the embedded Web server.

To access the embedded Web server, perform the following steps:

1. Run a supported Web browser.
2. Enter the IP address of the projector server as the URL.



Figure 4.4 Entering the IP Address

3. If prompted with security alerts, click **Yes** to proceed.

For initial access, the embedded Web server uses standard HTTP. However, it can be configured to appear as a secure site, using an X.509-compliant certificate installed on the projector server for identification. When properly configured, encrypted browser communications through HTTPS (secure HTTP) may be used for secure access.

Although not recommended, you can use your **Internet Options** menu to configure your browser to ignore security warnings if the projector server is configured to operate through HTTPS. See “[Mgmt. Protocols.](#)”

4. An embedded Web server page will be displayed.

Operating Notes

- If you enter or change a configuration parameter value, click **Apply** to enable your change, or click **Cancel** to erase your change.
- Changes to the IP address will close the connection to the embedded Web server. To re-establish a connection, use the new IP address.

HP Jetdirect Home Tab

The HP Jetdirect projector server's product model, firmware version, and network addresses are displayed along with any device information that can be retrieved. [Table 4.1](#) provides a summary of the items displayed on the HP Jetdirect home page.

Table 4.1 HP Jetdirect Home Page Items (1 of 2)

Item	Description
Home tab	Provides access to server/projector information and language selection for the embedded web server.
Networking tab	Provides access to network configuration, security, and diagnostic parameters. For more information, see Networking Tab .
Projector tab	Provides control of projector power, selection of the input source, and setup of alerts for specific conditions.
Device Info	Displays information about the projector and the Jetdirect server.
Select Language	Appears if the HP Jetdirect Web pages support multiple languages. Supported languages may also be selected through language preference settings in your browser. To display supported non-English languages, the use of cookies must be enabled in your browser settings.
Device	Displays the projector model or series.
Status	Displays the projector's power status.
Projector Serial Number	Displays the projector's serial number.
Firmware Version	The version of the operating instructions installed on the HP projector.
Current Lamp Hours	Displays the cumulative number of hours that the lamp has been on.
Current Input Source	Displays the input port currently selected on the projector. The signal on this port is projected on the screen.
Host Name	Specifies the IP host name assigned to the device and stored on the HP Jetdirect projector server. See TCP/IP on the Networking Tab .

Table 4.1 HP Jetdirect Home Page Items (2 of 2)

Item	Description
System Up Time	The length of time since either the HP Jetdirect projector server or the network device was last powered off/on.
System Contact	A text string (stored on the HP Jetdirect projector server) for the name of a person to contact for this device. See TCP/IP on the Networking Tab .
System Location	A text string (stored on the HP Jetdirect projector server) that identifies the physical location of this device. See the Networking TCP/IP configuration pages.
HP Jetdirect	The product number of the HP Jetdirect projector server (for example HP L2130A).
Firmware Version	The versions of the operating instructions installed on the HP Jetdirect projector server.
IP Address	The Internet Protocol address configured on the HP Jetdirect projector server. For general information on IP addresses, see Appendix A .
Hardware Address	The LAN hardware (or MAC, Media Access Control) address of the HP Jetdirect projector server. This unique address is assigned by Hewlett-Packard, but can be locally administered.
LAA	A Locally Administered Address (LAA) that replaces the LAN Hardware (MAC) address. The LAA may be configured under local control by a network administrator. By default, the LAA is the factory-assigned LAN Hardware address.
Admin Password	Specifies whether or not an administrator password has been set. This password may also be configured from HP Web Jetadmin. Use the Admin Password page to set or clear administrator passwords. If an administrator password has been set, you will be prompted for a User Name and Password to access network parameters. For more information, see " Admin Account ."

Networking Tab

The **Networking** tab provides access to HP Jetdirect network configuration parameters and status. The menu items in the left margin provide access to configuration and status pages.

Table 4.2 Networking Menu Items

CONFIGURATION section	
<ul style="list-style-type: none">● Network Settings● Other Settings	<ul style="list-style-type: none">● Privacy Settings● Select Language
SECURITY section	
<ul style="list-style-type: none">● Settings● Authorization	<ul style="list-style-type: none">● Mgmt. Protocols● 802.1x Authentication
DIAGNOSTICS section	
<ul style="list-style-type: none">● Network Statistics	<ul style="list-style-type: none">● Protocol Info

Sending Product Information to HP

The first time that you access the **Networking** tab in the embedded Web server, you will be prompted to allow the sending of product information to HP using the Internet. Product identification and usage data collected by HP will be used to improve product features and services. Personal data is not collected in accordance with HP privacy policies. See the [Hewlett-Packard Online Privacy Statement](#).

If you choose to decline by pressing **No**, a log entry to record this choice may be sent to HP. To prevent HP from making a log entry that data collection was refused, do one of the following:

- Disable access to the Internet before pressing **No**.
You can disable Internet access on your browser, for example, by disabling the Web Proxy server. After pressing **No**, simply re-enable Internet access.
- Use an SNMP management utility or an SNMP command line utility to disable this functionality before pressing **No**. The object identifier (OID) is .1.3.6.1.4.1.11.2.4.3.7.31.0 and needs to be set to zero (0).

You can choose to enable or disable this feature at any time using the **Privacy Settings** page under the **Networking** tab.

Network Settings

The **Network Settings** pages allow you to set or change configuration parameters for [TCP/IP](#) and [SNMP](#) protocols. To assign a parameter setting, enter the desired value and click **Apply**.

TCP/IP

The **TCP/IP** page provides configuration parameters summarized in [Table 4.3](#).

Table 4.3 TCP/IP Settings (1 of 3)

Item	Description
IP Configuration Method	<p>Selects the method that the HP Jetdirect projector server will use for its IP configuration parameters: BOOTP (default), DHCP, Manual, or Auto IP.</p> <p>For BOOTP or DHCP, the IP parameters will be automatically configured by a BOOTP or DHCP server each time the projector server is powered on.</p> <p>If you select Manual, then basic IP parameters can be manually entered using this Web page, or using other available tools.</p> <p>If you select Auto IP, then a unique link-local address 169.254.x.x will be assigned.</p> <p>For more information, see Chapter 3.</p>
Host Name	<p>Specifies a readable IP name (the SNMP SysName object) for the network device. The name must start with a letter and can end in a letter or number, up to 32 ASCII characters. The default name is NPIxxxxxx, where xxxxxx is the last six digits of the LAN hardware (MAC) address.</p>
IP Address	<p>Use this field to manually assign the Internet Protocol address on the HP Jetdirect projector server. The IP address is a four byte (32-bit) address in the form "n.n.n.n", where 'n' is a number from 0 to 255.</p> <p>An IP address uniquely identifies a node on a TCP/IP network. Duplicate IP addresses on a TCP/IP network are not allowed. For more information on IP addresses, see Appendix A.</p>
Subnet Mask	<p>If subnetting is used, use this field to manually assign a subnet mask. A subnet mask is a 32-bit number that, when applied to an IP address, determines which bits specify the network and subnet, and which bits uniquely specify the node.</p> <p>For more information on subnet masks, see Appendix A.</p>

Table 4.3 TCP/IP Settings (2 of 3)

Item	Description
Default Gateway	Identifies the IP address of a router or computer that is used to connect to other networks or subnetworks.
Domain Name	Specifies the name of the Domain Name System (DNS) domain that the HP Jetdirect projector server resides in (for example, support.hp.com). It does not include the host name; it is not the Fully Qualified Domain Name (such as projector1.support.hp.com).
Primary WINS Server	Specifies the IP address of the primary Windows Internet Naming Service (WINS) server. The WINS server provides IP address and name resolution services for network computers and devices.
Secondary WINS Server	Specifies the IP Address to be used for WINS if the primary WINS Server is unavailable.
Syslog Server	Specifies the IP address of a host computer that is configured to receive syslog messages from the HP Jetdirect projector server. If a Syslog Server is not specified, syslog messages are disabled. For more information, see Appendix A .
Syslog Maximum Messages	Specifies the maximum number of syslog messages that can be sent by the HP Jetdirect projector server on a per-minute basis. This setting allows administrators to control the log file size. The default is 10 per minute. If set to zero, no maximum number is defined.
Syslog Priority	Controls the filtering of syslog messages that are sent to the syslog server. The filter range is 0 to 8, with 0 being the most specific and 8 being the most general. Only messages that are lower than the filter level specified (that is, higher in priority) are reported. The default value is 8 which reports all syslog messages. A value of zero effectively disables syslog reporting.
Idle Timeout	Specifies the number of seconds that an idle connection is allowed to remain open. Up to 3600 seconds can be set. 270 is the default value. If set to 0, the timeout is disabled and TCP/IP connections will remain open until closed by the device at the other end of the network (for example, a workstation).

Table 4.3 TCP/IP Settings (3 of 3)

Item	Description
TTL/SLP	<p>Specifies the IP multicast Time To Live (TTL) discovery setting for Service Location Protocol (SLP) packets. The default value is 4 hops (the number of routers from the local network). The range is 1-15. If set to -1, multicast capability is disabled.</p> <p>For projector servers configured for Auto IP (link-local) addresses, this field will be ignored. TTL on outbound packets will always be set to 255 and limited to the link-local network.</p>
System Contact	<p>Identifies a person who is assigned to administer or service this device. This field may include a phone number or similar information.</p> <p>When configured, this parameter will be displayed on the HP Jetdirect home page.</p>
System Location	<p>Specifies the physical location of the device or related information. Only printable ASCII characters are allowed, up to 64 characters.</p> <p>When configured, this parameter will be displayed on the HP Jetdirect home page.</p>
Default IP	<p>Specifies the IP address to use when the projector server is unable to obtain an IP address from the network during a forced TCP/IP reconfiguration (for example, when manually configured to use BOOTP/DHCP).</p> <p>LEGACY_DEFAULT_IP: sets the legacy default IP address 192.0.0.192.</p> <p>AUTO_IP: sets a link-local IP address 169.254.x.x.</p> <p>The initial setting is determined by the IP address obtained when first powered on.</p>
Send DHCP requests	<p>A checkbox is used to specify whether DHCP requests will be periodically transmitted when a legacy default IP address 192.0.0.192 or link-local IP address 169.254.x.x has been automatically assigned.</p> <p>Clear the checkbox to disable DHCP requests.</p> <p>Check the checkbox (default) to enable DHCP requests.</p>

SNMP

You can specify or change the SNMP (Simple Network Management Protocol) parameters provided. See [Table 4.4](#).

CAUTION

If you use HP Web Jetadmin to manage your devices, you should use HP Web Jetadmin to seamlessly configure SNMP v3 and other security settings on the projector server.

Using the embedded Web server to create the SNMP v3 account will erase any existing SNMP v3 accounts. In addition, the SNMP v3 account information will need to be implemented on the SNMP management application. For more information, see [“SNMP v3.”](#)

Table 4.4 SNMP Settings (1 of 2)

Item	Description
Enable SNMPv1/v2 read-write access	<p>This option enables the SNMP v1/v2c agents on the projector server. Custom community names can be configured to control management access to the server.</p> <p>An SNMP Set Community Name is a password to be able to configure (or “write”) SNMP information on the HP Jetdirect projector server.</p> <p>An SNMP Get Community Name is a password to retrieve (or “read”) SNMP information on the HP Jetdirect projector server.</p> <p>An incoming SNMP SetRequest or GetRequest command must contain the appropriate Set or Get community name before the server will respond.</p> <p>A community name must be ASCII characters and can be up to 255 characters long.</p> <p>The default Get community name is “public”, which can be disabled to restrict access by checking the checkbox provided.</p> <p>Note: If “public” is disabled, some discovery utilities may not operate properly.</p>
Enable SNMPv1/v2 read-only access	<p>This option enables the SNMP v1/v2c agents on the projector server, but limits access to read-only. Write-access is disabled. The default Get community name “public” is automatically enabled.</p>

Table 4.4 SNMP Settings (2 of 2)

Item	Description
Disable SNMPv1/v2	This option disables the SNMP v1/v2c agents on the projector server, which is recommended for secure environments. If SNMP v1/v2c is disabled, some discovery utilities may not operate properly.
Enable SNMPv3	This option enables (check) or disables (clear) the SNMP v3 agent on the projector server. When enabled, an SNMP v3 account must be created on the server, and the account information must be implemented on the SNMP v3 management application. You may create an account by providing the following information: User Name: the SNMP v3 account user name. Authentication Key: a 16-byte hexadecimal value for authenticating the SNMP packet contents using the Message Digest Algorithm 5 (MD5, RFC 1321). Privacy Key: a 16-byte hexadecimal value for encrypting the data portion of the SNMP packet using the Data Encryption Standard (DES) algorithm. Context Name: the view context in which this user can access SNMP objects. It is always "Jetdirect".

Other Settings

This item provides access to a variety of management and configuration options. The following tabs are provided:

- [Misc. Settings](#): for enabling miscellaneous advanced protocols and functions
- [Firmware Upgrade](#): to update your HP Jetdirect projector server with new features and enhancements
- [Support Info](#): to set up the **Support** link located under **Other Links** in the left margin
- [Refresh Rate](#): to set the time interval (in seconds) for embedded Web diagnostic page updates

Misc. Settings

The Miscellaneous Settings parameters allow you to set a variety of advanced protocols and features, as described below. See [Table 4.5](#).

Table 4.5 Miscellaneous Settings (1 of 2)

Item	Description
SLP Config	Enable or disable SLP (Service Location Protocol), used by selected client application software to automatically discover and identify the HP Jetdirect projector server.
Multicast IPv4	Enable or disable the receipt and transmission of IP version 4 multicast packets by the projector server. NOTE: If this parameter is disabled, other protocols that use multicast protocols, such as SLP, may also be disabled without notification.
Link settings	(For wired 10/100TX networks only) Set the network link speed(10 or 100 Mbps) and communication mode (full- or half-duplex) for HP Jetdirect projector servers. The available settings are listed below. CAUTION: If you change the link setting, network communications with the server and network device may be lost. <ul style="list-style-type: none">● AUTO: (Default) The server uses autonegotiation to match the network's link speed and communication mode. If autonegotiation fails, 100TXHALF is set.● 10TXFULL: 10 Mbps, full-duplex operation● 10TXHALF: 10 Mbps, half-duplex operation● 100TXFULL: 100 Mbps, full-duplex operation● 100TXHALF: 100 Mbps, half-duplex operation
Primary DNS Server	Specify the IP address of the primary DNS (Domain Name System) server.
Secondary DNS Server	Specify the IP address of a secondary DNS server to use if the primary DNS server is unavailable.
Locally Administered Address	Specifies a locally administered address (LAA) that replaces the factory-assigned LAN Hardware (MAC) address. If LAA is used, a user-specified string of exactly 12 hexadecimal digits must be entered. The LAA address must start with hexadecimal X2, X6, XA, or XE, where X is any hexadecimal digit 0 through F. The default address is the factory assigned address.

Table 4.5 Miscellaneous Settings (2 of 2)

Item	Description
Syslog Facility	Specify the encoded source facility of a message (for example, to identify the source of selected messages during troubleshooting). By default, the HP Jetdirect projector server uses local user values of local0 through local7 to isolate individual or groups of projector servers.

Firmware Upgrade

This page allows you to upgrade the projector server with new features.

The firmware upgrade file for the server must be available on your system.

To identify and retrieve the appropriate upgrade file, visit HP online support at:

http://www.hp.com/go/proj_firmware

On that page, do the following:

1. Locate the projector server model and the upgrade file.
2. Check the upgrade file version and verify that it is more recent than the server's installed version. If it is, then download the file. If not, then you do not need to upgrade.

To upgrade the projector server using the embedded Web server:

1. Enter the path to the upgrade file or click **Browse** to locate it.
2. Then click **Upgrade Firmware**.

Support Info

Use this page to configure links for Support assistance. You can designate a Support person and phone number of an administrator for this device, as well as URL addresses for Web-based product and technical support.

Refresh Rate

The refresh rate is the time period (in seconds) that the diagnostic pages will be automatically updated. The value '0' disables the refresh rate.

Privacy Settings

On the **Privacy Settings** page, you can allow the embedded Web server to collect product identification and use information and then send the information to HP (Internet access is required). Product use information assists HP in improving product features and services. The default setting for this page will depend on the user's selection on initial access to the Networking tab.

To enable this feature, check the checkbox and click **Apply**.

To disable this feature, clear the checkbox and click **Apply**.

Select Language

This link appears if the HP Jetdirect Web pages support multiple languages. Supported languages may also be selected through language preference settings in your browser (see your browser's Help).

To display supported non-English languages, the use of cookies must be enabled in your browser settings.

Settings

In the **SECURITY** section, the **Settings** menu provides access to the following tabs: **Status** (default), **Wizard**, **Restore Defaults**.

Status

The **Status** page displays the current security configuration settings of the server.

Wizard

Note If you use HP Web Jetadmin to manage your devices, you should not use this wizard. Instead, use HP Web Jetadmin to configure your network security settings to ensure they are properly set for your network.

The **Wizard** page allows you to run the *HP Jetdirect Security Configuration Wizard*. This wizard will guide you through the projector server's security configuration needed for your network. Click **Start Wizard** to run the wizard. This opens the **Security Level** page.

The optional configuration parameters presented by the wizard will depend on your choice of security level. For an overview, see [Table 4.6](#).

Note If you improperly exit the wizard (for example, by failing to use the Cancel button), an *Operation Failed* screen may appear. If so, wait approximately two minutes before entering the wizard again.

Restore Defaults

This page is used to restore security configuration settings to factory defaults. The default settings displayed depend on the features supported by the projector server.

Only the security settings listed are restored to factory defaults, other configuration settings are not affected.

Table 4.6 Wizard Security Levels (1 of 2)

Security Level	Description
Basic Security	<p>This option requires that you configure an administrator password for configuration management. The administrator password is shared with other management tools, such as SNMP applications. However, some management tools use plain-text communications and are not secure.</p> <p>The Administrator Account page is used to enter the administrator password. The Administrator Password will also be used as the SNMP v1/v2 Set Community Name for SNMP management applications.</p> <p>The Configuration Review page displays all the current settings that may affect security. Click Finish to set your basic security selections.</p>
Enhanced Security (Recommended)	<p>This option adds to Basic Security by automatically disabling management protocols that do not use secure, encrypted communications (such as FTP firmware updates, RCFG, SNMP v1/v2c). To change individual protocol settings, see "Mgmt. Protocols."</p> <p>The Administrator Account page is used to enter the administrator password.</p> <p>SNMP Configuration pages are used to configure specific SNMP settings:</p> <ul style="list-style-type: none"> ● Enable SNMPv3: Enable SNMP v3 and create an SNMP v3 account. Creating an SNMP v3 account is not recommended if you manage devices using HP Web Jetadmin. See "SNMP." ● Enable SNMPv1/v2 read-only access: Enable this option to allow support of current tools that rely on SNMP v1/v2 for device discovery and status. <p>The Configuration Review page displays all the current settings that may affect security. Click Finish to set your basic security selections.</p>

Table 4.6 Wizard Security Levels (2 of 2)

Security Level	Description
Custom Security	<p>This option proceeds through all available security settings supported by your projector server. For more information on specific parameters and selections, see the tabs on the 802.1x Authentication, Mgmt. Protocols, and Authorization menu pages under SECURITY.</p> <p>The Administrator Account page is used to enter the administrator password.</p> <p>The Web Mgmt. page is used for HTTPS (secure HTTP) configuration, including certificates and encryption levels.</p> <p>The Management Tools page allows configuration of management protocols that are not secure (such as FTP firmware updates).</p> <p>SNMP Configuration pages are used to configure specific SNMP settings:</p> <ul style="list-style-type: none"> ● Enable SNMPv1/v2: Enable this option to allow management software that use SNMP v1/v2. If selected the SNMPv1/v2 Configuration page is displayed to configure SNMP community names. ● Enable SNMPv3: Enable this option to create an SNMP v3 account. Creating an SNMP v3 account is not recommended if you manage devices using HP Web Jetadmin. See SNMP. <p>The Access Control page is used to set up an Access Control List, if desired to control host access to the device.</p> <p>The Protocols and Services page is used to enable or disable network services, and device discovery protocols that may affect security.</p> <p>The 802.1x Authentication page configures the server as required for client authentication on your network.</p> <p>The Configuration Review page displays all the current settings that may affect security. Click Finish to set your basic security selections.</p>

Authorization

The **Authorization** page provides tabs that allow you to control access to the device, as well as to device configuration and management features. In addition, you may configure certificates for client and server authentication.

Admin. Account

Use this page to set an administrator password for controlled access to Jetdirect configuration and status information. The administrator password is shared by Jetdirect configuration tools, such as the embedded Web server and HP Web Jetadmin.

If a password is set and you attempt to access Jetdirect projector server settings, you will be prompted for a user name and *this password* before you are allowed access.

Note The administrator password may be cleared by a cold reset of the projector server, which resets the server to factory default settings.

A checkbox allows you to synchronize HP Web Jetadmin and the SNMP v1/v2c Set Community Name. If you enable this feature (the checkbox is checked), the administrator password will also be used as the SNMP Set Community Name for SNMP v1/v2c management applications.

Note If you subsequently change the SNMP Set Community Name (for example, using the SNMP tab on the **Network Settings** page or from Web Jetadmin), the two settings will no longer be synchronized.

Certificates

This tab provides access to installation, configuration and management services for X.509 digital certificates. A digital certificate is an electronic message typically containing, among other things, a key (a short string used for encryption and decryption) and a digital signature. Certificates may be issued and signed by a trusted third party (commonly called a Certificate Authority, or CA), which may exist internal or external to the organization. Or certificates may be “self-signed”, which is similar to validating your own identity.

Note While self-signed certificates are permitted and allow data encryption, they do not ensure valid authentication.

The **Certificates** page provides the status of the certificates installed on the HP Jetdirect projector server:

- **Jetdirect certificate.** The Jetdirect certificate is used to validate the identity of the Jetdirect device to clients and to network authentication servers.

By factory default, a self-signed Jetdirect certificate is preinstalled. This allows the embedded Web server to use HTTPS and appear as a secure site when accessed by a Web browser.

Click **View** to view the contents of an installed Jetdirect certificate, or click **Configure** to update or install a new one. See “[Configuring Certificates.](#)”

When installed, a Jetdirect certificate will be saved across a cold-reset, which is used to restore the projector server to factory-default values.

- **CA Certificate.** A certificate from a trusted third party, or Certificate Authority (CA), is used to validate the identity of a network authentication server during 802.1X authentication methods that use EAP (Extensible Authentication Protocol). The authentication server’s identity is validated when information on the CA certificate matches the information on a certificate received from the authentication server.

A CA certificate for the projector server is a certificate that was used to sign the authentication server’s certificate. Therefore, the Certificate Authority for the authentication server’s certificate must also be used for the CA certificate.

Click **View** to view the contents of an installed Jetdirect certificate, or click **Configure** to update or install a new one. See “[Configuring Certificates](#).”

A CA certificate is not saved when the projector server is reset to factory-default values.

The maximum certificate size that can be installed on the HP Jetdirect projector server is 3072 bytes.

Configuring Certificates

When you click **Configure**, a certificate management wizard will help you update or install a certificate. The screens displayed will depend on the type of certificate (Jetdirect or CA) and your selections. [Table 4.7](#) provides a description of the screens and configuration parameters that may appear.

Note If you improperly exit Certificates configuration (for example, by failing to use the **Cancel** button), an *Operation Failed* screen may appear. If so, wait approximately two minutes before entering the wizard again.

Table 4.7 Certificate Configuration Screens (1 of 4)

Certificate Options
Choose from the options listed.
<p>Update Pre-Installed Certificate. Use this option to update the preinstalled, self-signed certificate. When updated, the preinstalled certificate is overwritten. You may update the following item:</p> <ul style="list-style-type: none">● Certificate Validity Period <p>With self-signed certificates, the browser will identify the certificate as self-signed for each new Web session and may cause a security alert message. This message can be bypassed if the user adds it to their browser’s certificate store or disables browser alerts (not recommended).</p> <p>Self-signed certificates are not necessarily secure because the certificate owner is merely confirming his own identity instead of verification by a trusted third party. Certificates from a trusted third party are considered more secure.</p>

Table 4.7 Certificate Configuration Screens (2 of 4)

<p>Create Certificate Request. Using this option, you are prompted for specific device and organizational information in the following screen:</p> <ul style="list-style-type: none">● Certificate Information <p>This option may be used, for example, when an authentication protocol requires that a Jetdirect certificate issued by a trusted third party or Certificate Authority be installed.</p>
<p>Install Certificate. This option is displayed only if there is a Jetdirect certificate request (to a trusted third party) pending. When received, the certificate is installed using this option. Once installed, this certificate overwrites the preinstalled certificate.</p> <p>Using this option, you are prompted for information in the following screen:</p> <ul style="list-style-type: none">● Install Certificate <p>The certificate to be installed must be associated with a previous certificate request generated by the embedded Web server.</p>
<p>Install CA Certificate. This option is provided when you click Configure for a CA certificate, which must be installed for selected authentication protocols. Using this option, you are prompted for information in the following screen:</p> <ul style="list-style-type: none">● Install Certificate
<p>Import Certificate and Private Key. This option allows you to import a previously acquired and known certificate as the Jetdirect certificate. If you import a certificate, the currently installed certificate will be overwritten. Using this option, you are prompted by the following screen:</p> <ul style="list-style-type: none">● Import Certificate and Private Key
<p>Export Certificate and Private Key. This option allows you to export the Jetdirect certificate currently installed on the projector server for use on other projector servers. Using this option, you are prompted by the following screen:</p> <ul style="list-style-type: none">● Export the Jetdirect certificate and private key
<p>Delete CA Certificate. This option is used to remove the CA certificate installed on the Jetdirect projector server. This option appears when a CA certificate for EAP authentication has been installed.</p> <p>CAUTION: If the CA Certificate is deleted, EAP authentication will be disabled and network access will be denied.</p> <p>The CA Certificate will also be removed on a cold-reset of the server, where factory-default settings are restored.</p>

Table 4.7 Certificate Configuration Screens (3 of 4)

<p>Certificate Validity Use this screen to specify how long the Jetdirect self-signed certificate will be valid.</p> <p>This screen appears only when a self-signed certificate is preinstalled and you click Edit Settings to update the validity period. It specifies the current Coordinated Universal Time (UTC). UTC is a time scale maintained by the International Bureau of Weights and Measures. It adjusts for differences between Greenwich Mean Time and atomic time. It is set at 0 degrees longitude on the prime meridian.</p> <p>The Validity Start Date is calculated from the PC's clock settings.</p> <p>The Validity Period specifies the number of days (1 to 3650) that the certificate is valid, starting from the Validity Start Date. A valid entry (1 to 3650) is required. The default is 5 years.</p>
<p>Certificate Information Use this page to enter information for requesting a certificate from a Certificate Authority.</p> <p>Common Name. (Required) For HP Jetdirect projector servers, specify the fully qualified domain name or a valid IP address for the device.</p> <p>Examples:</p> <ul style="list-style-type: none">● Domain Name: <i>myprojector.mydepartment.mycompany.com</i>● IP address: <i>192.168.2.116</i> <p>The Common Name will be used to uniquely identify the device. For HP Jetdirect projector servers using EAP authentication, some authentication servers may need to be configured with the Common Name as specified on the certificate.</p> <p>If the default IP address 192.0.0.192 is configured on the Jetdirect projector server, it will not likely be valid for your network. You should not use this default address to identify your device.</p>
<p>Organization. (Required) Specify the full legal name for your company.</p>
<p>Organizational Unit. (Optional) Specify your department, division, or other subgroup of your organization.</p>
<p>City/Locality. (Required) Enter the city or locality in which your organization is located.</p>
<p>State/Province. (Required for all countries/regions) Must contain at least three characters. (required)</p>
<p>Country/Region. Two-character ISO 3166 country/region code. For example, use "gb" Great Britain or "us" for USA (required).</p>

Table 4.7 Certificate Configuration Screens (4 of 4)

Install Certificate, or Install CA Certificate

Use the **Install Certificate** screen to install a Jetdirect certificate.

Use the **Install CA Certificate** screen to install a trusted Certificate Authority (CA) certificate for use during EAP authentication.

Install a PEM/Base64 (Privacy Enhanced Mail) encoded certificate.

To install a certificate, specify the name and path of the file that contains the certificate. Or, click **Browse** to browse your system for the file.

Click **Finish** to complete the installation.

To install a certificate, it must be associated with a pending certificate request by the embedded Web server. The Install Certificate option will not be presented if there is no pending request.

A Jetdirect or CA certificate size is limited to 3 KBytes.

Import Certificate and Private Key

Use this screen to import a Jetdirect certificate and private key.

Import a Jetdirect certificate and private key. When imported, the existing certificate and private key will be overwritten.

The file format must be PKCS#12 encoded (.pfx) and cannot exceed 4 KBytes.

To import a certificate and private key, specify the name and path of the file that contains the certificate and private key. Or, click **Browse** to browse your system for the file. Then enter the password that was used to encrypt the private key.

Click **Finish** to complete the installation.

Export the Jetdirect certificate and private key

Use this screen to export the installed Jetdirect certificate and private key to a file.

To export a certificate and private key, enter a password that will be used to encrypt the private key. You must enter the password again to confirm it. Then click **Save As** to save the certificate and private key in a file on your system. The file format will be PKCS#12 encoded (.pfx).

Access Control

Use this tab to display the Access Control List (ACL) on the HP Jetdirect projector server. An access control list (or host access list) specifies individual host systems, or networks of host systems, that will be allowed to access the server and the attached network device. Up to 10 entries can be included on the list. If the list is empty (no hosts are listed), any supported system can access the server.

CAUTION

Use caution when using this feature. You may lose your ability to communicate with the HP Jetdirect projector server if your system is not properly specified in the list, or access through HTTP is disabled.

For use of the host access list as a security feature, see [Chapter 5](#).

Note

By default, hosts with HTTP connections (for example, through the embedded Web server) are allowed access to the projector server regardless of access control list entries.

To disable access by HTTP hosts, clear the **Allow Web Server (HTTP) access** checkbox at the bottom of the list.

Host systems are specified by their IP addresses or network number. If the network contains subnets, an address mask may be used to identify whether the IP address designates an individual host system or a group of host systems.

Examples. See the table of sample entries below:

IP Address	Mask	Description
192.0.0.0	255.0.0.0	Allow all hosts with network number 192.
192.1.0.0	255.1.0.0	Allow all hosts on network 192, subnet 1.
192.168.1.2		Allow the host with IP address 192.168.1.2. The mask 255.255.255.255 is assumed and is not required.

To add an entry into the access control list, use the **IP Address** and **Mask** fields to specify a host, and click (check) the **Save** checkbox for that entry. Then click **Apply**.

To delete an entry from the list, clear the **Save** checkbox for that entry. Then click **Apply**.

To clear the entire access control list, clear all **Save** checkboxes, and click **Apply**.

Mgmt. Protocols

This link provides access to management communications and other protocols that affect security.

Web Mgmt.

Use this tab to manage communications with the embedded Web server from Web browsers.

Secure, encrypted Web-based communication is provided through the Secure HTTP (HTTPS) protocol. If configured to require HTTPS, the embedded Web server routes HTTPS communications through port 443, the well-known port for HTTPS traffic. Other non-secure communications (HTTP) are redirected to HTTPS. Redirection of your browser to use HTTPS may be transparent depending on your browser's capabilities.

By factory default, the projector server is configured to allow HTTPS or HTTP.

Although not recommended, you may choose to accept both HTTPS and HTTP communications that are not secure by disabling (clearing) the **Encrypt All Web Communication** checkbox.

To support the use of HTTPS communications, a Jetdirect certificate must be installed. A factory-default, self-signed certificate is preinstalled for initial use. Click the **Configure** button to update the preinstalled certificate, or to install a new one. For more information, see "[Configuring Certificates.](#)"

The minimum encryption strength that will be allowed must be specified when using a Jetdirect certificate. You may select **Low** (default), **Medium**, or **High** encryption strength. For example, selecting **Low** will allow medium or high encryption levels to be used whereas selecting **High** will only allow high encryption levels.

For each encryption strength, ciphers are specified to identify the weakest cipher allowed. Early browsers may only support 40-bit (Low) encryption levels.

Note

Cipher suites support different levels of encryption strength. The cipher suites currently supported for encryption and decryption are DES (Data Encryption Standard, 56-bit), RC4 (40-bit or 128-bit), and 3DES (168-bit).

SNMP

Use this tab to enable or disable SNMP v1, v2c and v3 agents on the server. For a description of SNMP selections, see [Table 4.4](#).

SNMP v3. HP Jetdirect projector servers include an SNMP v3 (Simple Network Management Protocol, version 3) agent, for enhanced SNMP security. The SNMP v3 agent employs a User-based Security Model for SNMP v3 (RFC 2574), which features user-authentication and data privacy through encryption.

The SNMP v3 agent is enabled when an initial SNMP v3 account on the server is created. Once the account is created, any SNMP management application, if properly configured, can access or disable the account.

CAUTION

If you use HP Web Jetadmin to manage your devices, you should use HP Web Jetadmin to seamlessly configure SNMP v3 and other security settings on the projector server.

Using the embedded Web server to create the SNMP v3 account will erase any existing SNMP v3 accounts. In addition, the SNMP v3 account information will need to be implemented on the SNMP management application.

You may create the initial account by specifying the HMAC-MD5 authentication and CBC-DES data privacy encryption keys used by your SNMP v3 management application.

CAUTION

You should ensure secure embedded Web communications through HTTPS is enabled before creating the initial SNMP v3 account. This will help to prevent access or interception of account information over a connection that is not secure.

SNMP v1 and v2c agents can coexist with the SNMP v3 agent. However, to fully secure SNMP access, you should disable SNMP v1 and v2c.

Other

Use this tab to enable or disable various protocols supported by the projector server for services and management. See [Table 4.8](#).

Table 4.8 Other Protocols

Item	Description
Enable Device Discovery	Enable or disable device discovery protocols supported by the projector server: SLP (Service Location Protocol). If enabled (checked), the server sends SLP packets, which are used by system applications for automated discovery and installation. If disabled (cleared), SLP packets are not sent. Multicast IPv4. If enabled (checked), the server will send and receive IP version 4 multicast packets.
Enable Management Protocols	Enable or disable the use of FTP to upgrade firmware on the server. FTP is not a secure protocol, and device passwords may be intercepted. Disabling FTP firmware upgrades is recommended.

802.1x Authentication

This page allows you to configure 802.1X authentication settings on the Jetdirect projector server as required for client authentication on your network. In addition, you can reset the 802.1X authentication settings to factory-default values.

CAUTION Use caution when changing the 802.1X authentication settings; you may lose your connection. If communication with the projector is lost, you may need to reset the projector server to a factory-default state and then reinstall the device.

For most 802.1X networks, the infrastructure components (such as LAN switches) must use 802.1X protocols to control a port's access to the network. If these ports do not allow partial or guest access, the projector server may need to be configured with your 802.1X parameters prior to connection.

To configure initial 802.1X settings before connecting to your network, you can use an isolated LAN, or a direct computer connection using a cross-over cable.

The supported 802.1X authentication protocols and associated configuration depend on the server model and firmware version. Available configuration settings are listed in [Table 4.9](#).

Table 4.9 802.1X Configuration Settings (1 of 2)

Item	Description
Enable Protocols	Enable (check) the supported protocols used for 802.1X authentication on your network. <ul style="list-style-type: none">● PEAP: (Protected Extensible Authentication Protocol). PEAP uses digital certificates for network server authentication and passwords for client authentication. PEAP requires an EAP User Name, EAP Password, and CA Certificate. Dynamic encryption keys are also used.
User Name	Specify an EAP/802.1X user name (up to 128 characters maximum) for this device. The default user name is the default host name of the projector server, NP1xxxxxx, where xxxxxx are the last six digits of the LAN hardware (MAC) address.
Password, Confirm Password	Specify an EAP/802.1X password (up to 128 characters maximum) for this device. Enter the password again in the Confirm Password field to ensure it was properly entered.
Server ID	Specify the Server ID validation string that identifies and validates the authentication server. The Server ID string is specified on the digital certificate issued by a trusted Certificate Authority (CA) for the authentication server. The entry may be a partial string unless the Require Exact Match checkbox is enabled.
Encryption Strength	Specify the minimum encryption strength that can be used during communications with the authentication server. You may select Low , Medium , or High encryption strength. For each encryption strength, ciphers are specified to identify the weakest cipher allowed. Early browsers may only support 40-bit (Low) encryption levels.
CA Certificate	To validate the authentication server's identity, a CA (or "Root") certificate must be installed on the projector server. This CA certificate must be issued by the Certificate Authority who signed the authentication server's certificate. To configure or install a CA certificate, click Configure .

Table 4.9 802.1X Configuration Settings (2 of 2)

Item	Description
Authentication Behavior: Reauthenticate on Apply	<p>Enable (check) or disable (clear) this checkbox to control authentication when you click Apply on this page, assuming valid configuration entries have been made.</p> <p>Note: This parameter does not apply to security or other configuration wizards. Changes to parameters through a wizard will always cause the server to reauthenticate.</p> <p>If disabled (default), the server will not attempt reauthentication unless configuration changes cause the server to disconnect and reconnect to the network.</p> <p>If enabled, the server will always try to reauthenticate using the configuration values set.</p>

Network Statistics

This page is used to display counter values and other status information currently stored on the HP Jetdirect projector server. This information is often useful to diagnose performance and operational problems associated with the network or network device.

Protocol Info

This page provides a list of various network configuration settings on the HP Jetdirect projector server for each protocol. Use these lists to validate your desired settings.

Projector Tab

The **Projector** tab provides control of projector power, selection of the input source, and setup of alerts for specific conditions. The menu items in the left margin provide access to configuration pages.

Power

On the **Power** page, **Power Status** displays the projector's current power state. To turn the projector on or off, click the **Power** button.

Input

The **Input** page displays the current input source and provides controls for selecting a new input source and changing certain input settings.

Table 4.10 Input Page Items

Item	Description
Current Source	Displays the input port currently selected on the projector. The signal on this port is projected on the screen.
Requested Source	Selects an input port to be scanned for a valid input signal (which if found is projected on the screen). To activate a source, select the source and click Apply .
Source Auto-Search	Enables (or disables) the projector to automatically search for the next input port with a valid signal, then display that signal. Searching starts whenever the projector is not displaying a valid signal.
Auto Sync	(VGA sources only) Forces the projector to resynchronize with the signal from the VGA source. Mark this option and click Apply to resynchronize. This option automatically clears after each use.

Alerts

The **Alerts** page specifies certain projector conditions that cause an email notification to be sent. These notifications allow recipients to take appropriate action to prevent or fix a projector problem.

Table 4.11 Alerts Page Items

Item	Description
Enable	Enables (or disables) e-mail notifications set up on this menu. This provides a quick way to turn alerts on and off.
Events	Selects the events that trigger e-mail notifications. When a selected event occurs, the Jetdirect server sends an e-mail message to each recipient.
Send Email Alert To	Specifies each alert recipient's Internet e-mail address with the @ symbol. Separate multiple addresses with commas.
Email (SMTP) Server	Specifies the IP address of the Simple Mail Transfer Protocol server that relays outgoing e-mail from the Jetdirect server.
Send Test Email	Sends a message to recipients to test the e-mail setup.

Other Links

Help

The **Help** page in the **Networking** tab provides a quick summary of the HP Jetdirect embedded Web server features. This *Administrator's Guide* contains detailed information about all features.

Support

The information displayed on the **Support** page depends on the values configured in the [Support Info](#) tab in the [Other Settings](#) menu. Support information may include the name and telephone number of a Support person, or Web links to Product and Technical Support pages. The default Web links include HP online support and HP product information Web pages (Internet access is required).

HP Home

HP Home provides a link to Hewlett-Packard's home page on the HP Web site (Internet access is required). This link may also be accessed by clicking on the HP logo.

HP Web Jetadmin

HP Web Jetadmin is HP's premier network peripheral management software tool.

A link to HP Web Jetadmin will be displayed only if HP Web Jetadmin has discovered this device through an "Integration URL." You can then use HP Web Jetadmin to provide enhanced management capabilities for this and other HP Jetdirect-connected devices on your network.

Security Features

Introduction

Security features are provided that can help to minimize unauthorized access to network configuration parameters and other data stored on HP Jetdirect projector servers. The features may differ depending on the version of firmware resident on the server.

CAUTION

Although these features can help to minimize unauthorized access to stored data and configuration parameters on HP Jetdirect projector servers, the prevention of unauthorized access cannot be guaranteed.

For advanced security needs, contact HP Consulting services.

[Table 5.1](#) summarizes the basic security features provided with HP Jetdirect projector servers.

Table 5.1 Summary of HP Jetdirect Security Features (1 of 2)

Secure Embedded Web Server Management
<ul style="list-style-type: none">● A preinstalled, self-signed digital certificate provides HTTPS (secure HTTP) access to the embedded Web server from your Web browser. HTTPS (secure HTTP) provides secure, encrypted communications with your browser.● Digital certificates issued by a trusted third party can be installed on the projector server, allowing it to be configured as a trusted site.● Using HTTPS, the embedded Web server provides configuration and management of network parameters and protocols through a secure channel.● An HP Jetdirect Security Configuration Wizard provides an easy-to-use interface to configure security settings.● Projector servers can be configured with EAP/802.1X server-based authentication.
Network Protocol Control
<ul style="list-style-type: none">● Device discovery and management protocols on the HP Jetdirect projector server can be enabled or disabled. By disabling unused or unnecessary protocols, unauthorized access through applications that use these protocols can be prevented.● Protocols may be enabled or disabled through the embedded Web server and HP Web Jetadmin.
IP Administrator Password
<ul style="list-style-type: none">● Used by HP Web Jetadmin and the embedded Web server to control access to HP Jetdirect configuration parameters.● Up to 16 alphanumeric characters may be used.● Configured on the HP Jetdirect projector server using TFTP (Chapter 3), the embedded Web server (Chapter 4) services, or HP Web Jetadmin. Up to 16 alphanumeric characters are allowed.● If configured through the embedded Web server, may be synchronized as the SNMP Set Community Name used in HP Web Jetadmin SNMP v1/v2c Set commands.● Cleared by cold reset of the projector server to factory default settings.
IP Access Control List
<ul style="list-style-type: none">● Specifies up to 10 host systems, or networks of host systems, that are allowed access to the HP Jetdirect projector server and the attached network device.● Access is generally limited to host systems specified in the list.● By factory default, host systems that use HTTP (for example, using the embedded Web server) are not checked against entries in the Access List and are allowed access. However, HTTP host access can be disabled through the embedded Web server.● If the list is empty, then all hosts are allowed access.● Configured on the HP Jetdirect projector server using TFTP (Chapter 3), embedded Web server (Chapter 4), or management software.

Table 5.1 Summary of HP Jetdirect Security Features (2 of 2)

Authentication and Encryption
<ul style="list-style-type: none">● Certificate management for X.509 digital certificates is provided through the embedded Web server, for both client-based and server-based authentication. (Installed certificates are limited to 3KB. A single Certificate Authority (CA) certificate may be installed.)
SNMP v1/v2c Set Community Name
<p>(SNMP v1/v2c only)</p> <ul style="list-style-type: none">● A password on the HP Jetdirect projector server that allows incoming SNMP Set commands (for example, from management software) to write (or set) HP Jetdirect configuration parameters.● For a user-assigned Set Community Name, SNMP Set commands must contain the user-assigned name, which is authenticated by the server before the command is performed.● On IP networks, authentication of SNMP Set commands may be further restricted to systems identified on the access control list.● Configured on the HP Jetdirect projector server using TFTP (Chapter 3), the embedded Web server (Chapter 4), or Management application services.● SNMP v1/v2c uses plain text and can be disabled.
SNMP v3
<ul style="list-style-type: none">● An SNMP v3 agent on the HP Jetdirect projector server provides secure, encrypted communications with an SNMP v3 management application, such as HP Web Jetadmin.● The projector server supports creation of an SNMP v3 account when it is enabled through the embedded Web server. The account information can be integrated on SNMP v3 management applications.● The projector server supports seamless SNMP v3 account creation and management from HP Web Jetadmin.
HP Web Jetadmin Password and Profiles
<ul style="list-style-type: none">● Access control to Jetdirect configuration parameters through the Jetdirect IP Administrator password, which may be configured from HP Web Jetadmin or embedded Web server. For instructions, refer to the HP Web Jetadmin online help.● HP Web Jetadmin provides access control through User Profiles. User Profiles allow password protection for individual profiles and controlled access to HP Jetdirect and projector features. For more information, refer to the HP Web Jetadmin online help.● HP Web Jetadmin can seamlessly enable the SNMP v3 agent on the projector server, and create an SNMP v3 account for secure, encrypted management.

Using Security Features

Access to HP Jetdirect configuration parameters can be controlled through combined use of the available security features. [Table 5.2](#) provides examples of various settings and the associated level of access control.

Table 5.2 Settings for Access Control

Settings	Level of Access Control
<ul style="list-style-type: none"> ● Accessible through HTTP (embedded Web server) or SNMP v1/v2c applications ● Administrator password not set ● Default SNMP v1/v2c community names used ● No authentication or encryption ● Access control list empty 	<p>Low</p> <p>Best suited for trusted environments.</p> <p>Any system can access the HP Jetdirect configuration parameters through the embedded Web server or SNMP management software. Passwords are not required.</p>
<ul style="list-style-type: none"> ● Administrator password set ● User-specified SNMP v1/v2 Set Community Name set ● The Access Control List contains host entries and checks HTTP connections ● Non-secure protocols disabled. 	<p>Medium</p> <p>Limited security for non-trusted environment. If the Administrator password and SNMP v1/v2c Set Community Name are known, access is limited to:</p> <ul style="list-style-type: none"> ● systems listed in the Access Control List, and ● SNMP v1/v2c management applications
<ul style="list-style-type: none"> ● Unused protocols disabled ● HTTPS access enabled using certificates issued by trusted sources ● Configured for EAP/802.1x server-based authentication and encryption ● SNMP v3 enabled, SNMP v1/v2c disabled ● Passwords set ● The Access Control List contains specified entries and HTTP connections are checked 	<p>High</p> <p>High security for non-trusted, professionally managed environments.</p> <p>Access is limited to authenticated hosts that are specified in the Access Control List. Encryption provides data privacy; network communication in plain-text is not used.</p> <p>CAUTION: Power-on settings (for example, configurations from a BootP/TFTP or DHCP/TFTP server) may change the server's settings when it is power-cycled. Be sure to confirm your intended power-on settings.</p>

Troubleshooting the HP Jetdirect Projector Server

Introduction

This chapter describes how to diagnose and correct problems associated with the HP Jetdirect projector server.

A flowchart guides you to the correct procedures for troubleshooting the following:

- HP Jetdirect hardware installation and connection problems
- Network-related problems

To troubleshoot your HP Jetdirect projector server, you may need the following items:

- Documentation that came with your HP projector
- Documentation that came with your HP Jetdirect projector server
- The diagnostics tools and utilities provided with your network software (for example, TCP/IP utilities, or network device management applications such as HP Web Jetadmin)

Resetting to Factory Defaults

Parameters on the HP Jetdirect projector server (for example, the IP address) can be reset to factory default values using the following procedures:

- Reset the HP Jetdirect external projector server by holding down the **Reset** button on the server while connecting the power cord.

After a cold reset, your network systems may lose their connection to the projector.

General Troubleshooting

Troubleshooting Chart - Assessing the Problem

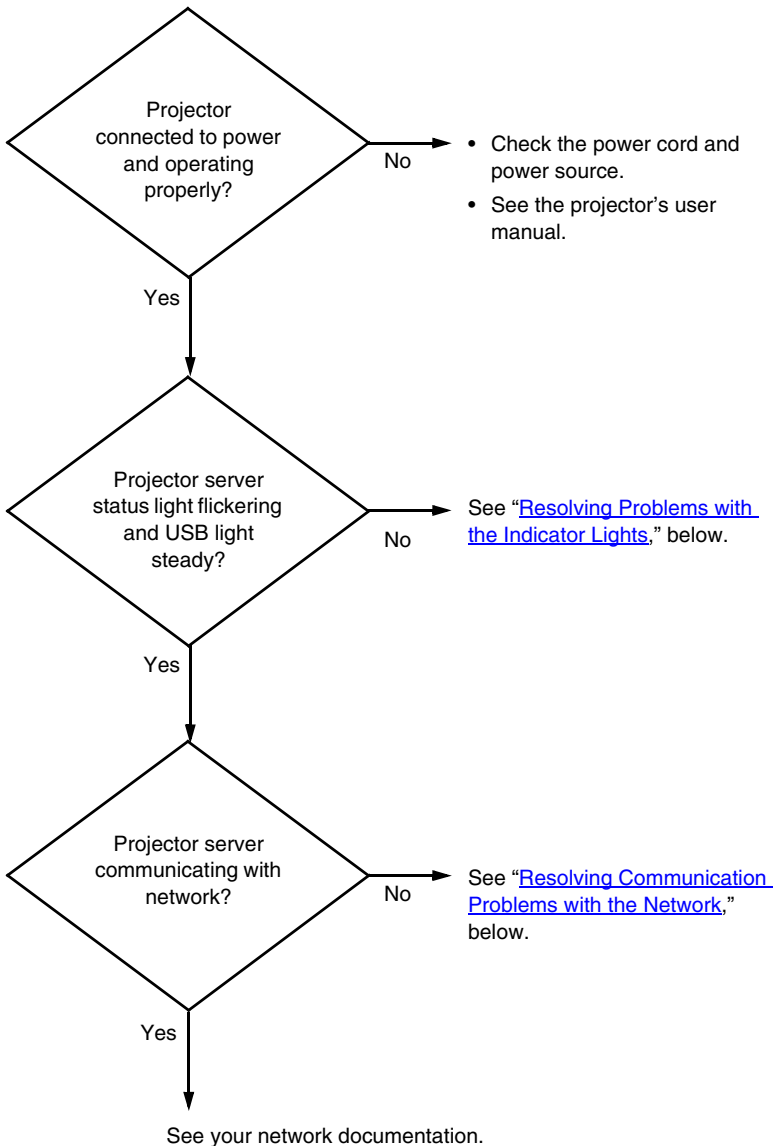


Figure 6.1 Assessing the Problem

Resolving Problems with the Indicator Lights

Check the following items to see whether the projector server is operating properly.

1. Power/status light:

- ◆ If the light is flickering green, network activity is normal. No problem indicated.
- ◆ If the light is off, power is not connected. Check the power module and power source.
- ◆ If the light is on steady, there is no network activity. Go to “[Resolving Communication Problems with the Network](#),” below.
- ◆ If the light slowly blinks green more than 15 seconds after startup, no network is detected. Go to “[Resolving Communication Problems with the Network](#),” below.
- ◆ If the light blinks orange, disconnect and reconnect power at the Jetdirect server. If the condition persists, the server is faulty.

2. USB/projector light:

- ◆ If the light is on steady, the USB connection is good. No problem indicated.
- ◆ If the light is off more than 15 seconds after startup, no USB connection is detected. This is normal if no projector is connected. Disconnect and reconnect power at the Jetdirect server. Make sure a USB cable connects to a projector and the projector is connected to power. Try a different USB cable. If the condition persists, the server or projector is faulty. If possible, repeat with a different server or projector.
- ◆ If the light blinks green, the projector is not compatible with the Jetdirect server. Check for Jetdirect compatibility in the specifications for the projector model and firmware version — or go to www.hp.com/support and look up the model number of your Jetdirect server.
- ◆ If the light blinks orange, a hardware problem exists. Disconnect and reconnect power at the Jetdirect server. If the condition persists, disconnect and reconnect power in each of the following conditions:
 - No USB cable (blinking orange indicates the server is faulty), then —
 - USB cable plugged into only the server (blinking orange indicates the cable is faulty), then —
 - USB cable plugged into the server and projector (blinking orange indicates the projector is faulty).

3. LAN 10/100 lights:

- ◆ If one light is on, a network connection is established at 10 Mbps or 100 Mbps. No problem indicated.
- ◆ If both lights are off, no network is detected. See [“Resolving Communication Problems with the Network,”](#) below.

Resolving Communication Problems with the Network

Check the following items to verify that the projector server is communicating with the network.

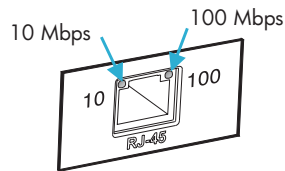
1. Are there any physical connection problems between the workstation or file server and the HP Jetdirect projector server?
 - ◆ Verify network cabling, connections, and router configurations.
 - ◆ Verify that network cable lengths meet network specifications.
 - ◆ Verify that network settings have been properly configured.
2. Are your network cables connected properly?

Make sure that the projector is attached to the network using the appropriate HP Jetdirect projector server port and cable. Check each cable connection to make sure it is secure and in the right place. If the problem continues, try a different cable or network port on the hub or switch.

3. Is autonegotiation properly configured?

The speed and communication mode on the projector server must match the network for proper operation.

The server’s RJ-45 network connector has indicator lights to identify the connection speed. Verify that either the 10 Mbps or 100 Mbps light is on.



4. Is the projector server connected to an 802.1X network and properly configured for EAP/802.1X operation?

The network must support the Extensible Authentication Protocol (EAP) method configured for use on the server.

Verify the configuration of the network’s 802.1X port. If it does not allow guest or temporary access, you may need to preconfigure the Jetdirect projector server for 802.1X operation before connection to your network. This is done using an isolated LAN, or through a direct computer-to-Jetdirect server connection using a cross-over cable.

5. Are other users able to access the projector embedded Web server?

The problem may be workstation-specific. Check the workstation network drivers.

6. If other users can access the projector's embedded Web server, are they using the same network operating system?

Check your system for proper network operating system setup.

7. Is your protocol enabled on the HP Jetdirect projector server?

Check the status of the network protocols on the Jetdirect server. Use the embedded Web server to check status of network protocols. See [Chapter 4.](#))

8. Does the projector appear in HP Web Jetadmin or other management application?

- ◆ Verify the projector's IP address in the projector's on-screen Help menu.
- ◆ See the troubleshooting section in the online help included with the HP Web Jetadmin software.

TCP/IP Overview

Introduction

This appendix is intended to provide information to help you gain a basic understanding of TCP/IP.

Similar to a common language that people use to communicate with each other, TCP/IP (Transmission Control Protocol/Internet Protocol) is a suite of protocols designed to define the way computers and other devices communicate with each other over a network.

TCP/IP is rapidly becoming the most used set of protocols. The main reason this is happening is the fact that the Internet is based on TCP/IP. If you have a network that you wish to connect to the internet, you must be using TCP/IP to communicate.

Internet Protocol (IP)

When information is sent across the network, the data is broken down into small packets. Each packet is sent independently of one another. Each packet is encoded with IP information, such as the IP address of the sender and receiver. IP packets can be routed over routers and gateways, devices that connect a network with other networks.

IP communications is connectionless. When IP packets are sent, there is no guarantee that they arrive at their destination in the proper sequence. That task can be performed by higher level protocols and applications thereby allowing IP communications to be efficient.

Each node or device that will communicate directly onto the network requires an IP address, including HP Jetdirect-connected devices.

Transmission Control Protocol (TCP)

TCP handles breaking the data into packets and recombining the packets on the receiving end by providing a connection-oriented, reliable, and guaranteed delivery service to another node on the network. When data packets are received at their destination, TCP calculates a checksum for each packet to verify the data is not corrupt. If the data in the packet has been corrupted during transmission, TCP discards the packet and requests that the packet be resent.

User Datagram Protocol (UDP)

UDP provides similar services to TCP. However, UDP does not acknowledge data receipt and supports request/reply transactions with no added reliability or guarantee of delivery. UDP is used when acknowledgment and reliability are not required, such as during a “discovery broadcast.”

IP Address

Every host (workstation or node) on an IP network requires a unique IP address for each network interface. This address is a software address that is used to identify both the network and specific hosts located on that network. Each IP address can be divided into two separate parts: the network portion and the host portion. It is possible for a host to query a server for a dynamic IP address each time the device boots-up (for example, using DHCP and BootP).

Note

When assigning IP addresses, always consult the IP address administrator. Setting the wrong address can disable other equipment operating on the network or interfere with communications.

IP Address: (Network Portion)

Network addresses are managed by an organization in Norfolk, Virginia recognized as InterNIC. InterNIC has been contracted by the National Science Foundation to manage the Internet addresses and domains. Network addresses are distributed to organizations that are in turn responsible for making sure all attached devices or hosts on the network are properly numbered. For more information on the network portion of an IP address, see “[IP Address Structure and Class](#)” and “[Subnets](#)” later in this appendix.

IP Address: (Host Portion)

Host addresses numerically identify specific network interfaces on an IP network. Usually a host has only one network interface; thus, only one IP address. Because no two devices can share the same number at the same time, administrators typically maintain address tables to assure correct assignment of addresses in the host network.

IP Address Structure and Class

An IP address is comprised of 32 bits of information and divided into 4 sections containing 1 byte each section or 4 bytes total: xxx . xxx . xxx . xxx

For efficiency in routing, networks were broken down into three classes, so routing can begin simply by identifying the leading byte of information in the IP address. The three IP addresses that InterNIC assigns are class A, B, and C. The network class determines what each of the four IP address sections identify as shown in [Table A.1](#):

Table A.1 IP Address Class Format

Class	First Address Byte xxx.	Second Address Byte xxx.	Third Address Byte xxx.	Fourth Address Byte xxx
A	Network.	Host.	Host.	Host
B	Network.	Network.	Host.	Host
C	Network.	Network.	Network.	Host

As illustrated in [Table A.2](#), each network class differs by the leading bit identifier, the address range, the number of each type available, and the maximum number of hosts each class allows.

Table A.2 Network Class Characteristics

Class	Leading Bit Identifier	Address Range	Maximum Number of Networks in the Class	Maximum Hosts in the Network
A	0	0.0.0.0 to 127.255.255.255	126	Over 16 Million
B	10	128.0.0.0 to 191.255.255.255	16,382	65,534
C	110	192.0.0.0 to 223.255.255.255	Over 2 Million	254

Configuring IP Parameters

TCP/IP configuration parameters (such as IP address, subnet mask, default gateway) can be configured on the HP Jetdirect projector server in a variety of ways. These values can be configured manually (for example, through the embedded Web server, the arp and ping commands, and HP management software), or they can be automatically downloaded using DHCP or BOOTP each time the server is turned on. For configuration methods, see [Chapter 3](#).

When powered on, a new HP Jetdirect projector server that is unable to retrieve a valid IP address from the network will automatically assign itself a default IP address. The default IP address will depend on the type of network to which the server is connected. On a small private network, a technique called link-local addressing is used to assign a unique IP address in the range of 169.254.1.0 to 169.254.254.255, which should be valid. On a large or enterprise network, a temporary address of 192.0.0.192 will be assigned until it is properly configured for your network. The IP address configured on your projector server may be determined by inspecting the projector's on-screen Help menu.

Dynamic Host Configuration Protocol (DHCP)

DHCP allows a group of devices to use a set of IP addresses that are maintained by a DHCP server. The device or host sends a request to the server, and if an IP address is available, the server assigns it to that device.

BOOTP

BOOTP is a bootstrap protocol used to download configuration parameters and host information from a network server. BOOTP uses UDP for its transport. In order for devices to boot and load configuration information into RAM, they must communicate through the bootstrap protocol BOOTP as a client with their server.

To configure the device, the client broadcasts a boot request packet containing at least the hardware address of the device (HP Jetdirect projector server hardware address). The server answers with a boot reply packet containing the information the device needs to configure.

Subnets

When an IP network address for a particular network class is assigned to an organization, no provision is made for more than one network being present at that location. Local network administrators use subnets to partition a network into several different subnetworks. Splitting a network into subnets can result in better performance and improved use of limited network address space.

Subnet Mask

The subnet mask is a mechanism used to divide a single IP network into several different subnetworks. For a given network class, a portion of an IP address that would normally be used to identify a node is used, instead, to identify a subnetwork. A subnet mask is applied to each IP address to specify the portion used for subnetworks, and the portion used to identify the node. For example, see [Table A.3](#).

Table A.3 Example: Subnet Mask 255.255.0.0 Applied to Class A Network

Class A Network Address	15	xxx	xxx	xxx
Subnet Mask	255	255	0	0
IP Address fields with Subnet Mask applied	Network	Subnet	Host	Host
Example of a node's IP Address on Subnet 1	15	1	25	7
Example of a node's IP Address on Subnet 254	15	254	64	2

As illustrated in [Table A.3](#), the Class A IP network address “15” has been assigned to company ABC. To allow additional networks at company ABC’s site, the subnet mask of 255.255.0.0 is used. This subnet mask specifies that the second byte of the IP address will be used to identify up to 254 subnets. Using this designation, each device is uniquely identified on its own subnet, but company ABC can incorporate up to 254 subnetworks without violating their assigned address space.

Gateways

Gateways (routers) are used to connect networks together. Gateways are devices that act as translators between systems that do not use the same communication protocols, data formatting, structures, languages, or architectures. Gateways repackage the data packets and change the syntax to match that of the destination system. When networks are divided into subnets, gateways are required to connect one subnet to another.

Default Gateway

The Default Gateway is the gateway or router that, if not specified, will be used to move packets between networks. It is specified by an IP address.

If multiple gateways or routers exist, then the default gateway is typically the address of the first, or nearest, gateway or router. If no gateways or routers exist, then the default gateway will typically assume the IP address of the network node (such as the workstation or HP Jetdirect projector server).

Syslog Server

A syslog server is a system on the network (typically a UNIX system) that can receive and log syslog messages from other devices on the network. Syslog messages allow administrators to monitor status or troubleshoot network devices.

A syslog server requires software that provides syslog capabilities running on the server. UNIX systems provide a daemon, `syslogd`, that monitors User Datagram Protocol (UDP) port 514 for incoming messages. The messages are processed depending on their priority and on how `syslogd` is set up to operate.

You can configure the HP Jetdirect projector server with the syslog server's IP address. When a syslog server is configured, both the HP Jetdirect projector server and attached device can send syslog messages using UDP.

The syslog server may not receive all syslog events from the HP Jetdirect projector server:

- UDP does not guarantee delivery of messages.
- The HP Jetdirect projector server attempts to eliminate duplicate messages (to minimize unnecessary network traffic).
- The volume of messages sent by the HP Jetdirect projector server is configurable.

Methods to configure HP Jetdirect syslog parameters include BOOTP, DHCP, the embedded Web server, and management software. The syslog configuration command or parameter entries may vary depending on the method used. For more information, see the applicable sections in this guide.

Selected syslog parameters on the HP Jetdirect projector server are listed in [Table A.4](#).

Table A.4 HP Jetdirect Syslog Parameters

Item	Description
Syslog Server IP address	IP address of a syslog server for sending syslog messages. If zero (0.0.0.0) or not specified, syslog messages are disabled.
Syslog Maximum Messages	The number of syslog messages that can be sent by the HP Jetdirect projector server on a per-minute basis, from 0 to 1000. This parameter helps to control the syslog file size. The default is 10 messages per minute. If 0, the number of syslog messages is not restricted.
Syslog Priority	A method for filtering syslog messages that are sent to the syslog server. The range is 0 through 8, with 0 the most specific and 8 the most general. Only messages that are lower than the specified filter level (or higher in priority) are reported. The default is 8, messages of all priorities are sent. If 0, all syslog messages are disabled.
Syslog Facility	A code used to identify the source facility of a message (for example, to identify the source of selected messages during troubleshooting). By default, the HP Jetdirect projector server uses local user values of local0 through local7 to isolate individual or groups of projector servers.

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Index

A

- Access List
 - embedded Web server 70
 - security features 81
 - TFTP configuration file 26
- Administrator Password
 - embedded Web server 51, 64
 - Security features 81
 - TFTP configuration file 25
- arp command 42
- Authentication 74
 - 802.1X 6, 74
- Auto IP 13, 14
 - See also, Default IP address
 - embedded Web server 53

B

- BOOTP
 - embedded Web server 53
 - overview 93
 - using 17
- BOOTP Server 18
 - configuration 18
- browsers
 - embedded web server 47
 - HP Web Jetadmin 9

C

- CA certificate 65
 - embedded Web server 75
- Certificate Authority, See CA certificate
- Certificates 65
 - validity period 68
- cold-reset 85
- Community name
 - embedded Web server 56
 - security features 82
 - TFTP configuration 30
- configuration
 - HP Web Jetadmin 11
 - TCP/IP networks 13
 - TFTP parameters 25

D

- Default IP address 13
- defaults, See factory defaults
- DHCP
 - enabling or disabling 38
 - IP addresses 93
 - UNIX systems 33
 - using 32
 - Windows servers 33
- DNS server 33
 - Boot file tag 20
 - embedded Web server 58
 - TFTP configuration 26
- Domain name
 - Boot file tag 21
 - embedded Web server 54
 - TFTP configuration 26

E

- EAP
 - CA certificates 65
- embedded Web server
 - HP Web Jetadmin 47
 - HTTPS security 71, 81
 - TFTP configuration file 28
 - upgrading firmware 59
 - using 45
 - viewing 48
 - web browsers 47
- Encryption
 - SNMP v3 72
 - supported ciphers 72

F

- factory defaults, resetting 85
 - cold-reset 85
 - security parameters 25, 61
- firmware upgrades 7
 - embedded Web server 59
 - obtaining 7
 - TFTP configuration 31

G

gateway

- bootptab file 20
- description 95
- embedded Web server 54

H

hardware address

- arp command 42
- Bootptab file 20
- embedded Web server 51
- in default user name 75
- RARP 40

Host Access List, See Access List

HOST NAME

- BOOTP tag 21
- embedded Web server 53
- TFTP file 26

HP Jetdirect

- cold-reset 85

HP Support, Online 7

HP Web Jetadmin 9

- installing 10
- removing 11

HTTPS

- embedded Web server 49, 71
- redirection from TFTP 25

I

idle timeout

- embedded Web server 54
- TFTP configuration file 28

IEEE 802.1X 6

- Configuration 74

installing

- HP Web Jetadmin software 10

IP address

- Bootptab file 20
- configuring 93
- default 13
- embedded Web server 48, 53
- resetting 85
- TCP/IP overview 91

IP, See TCP/IP

ipv4-multicast

- embedded Web server 58, 73
- TFTP configuration file 27

J

Jetdirect certificate 65

L

link configuration

- embedded Web server 58
- TFTP 31

locally administered address (LAA) 58

M

MAC address, See hardware address

N

network

- TCP/IP overview 90

NIS (Network Information Service) 18

P

PEAP 6

PEM (Privacy Enhanced Mail) 69

ping command 42

privacy settings

- embedded Web server 52

Protected Extensible Authentication

Protocol, See PEAP

protocols

- embedded Web server 57, 71

R

RARP, using 40

refresh rate

- embedded Web server 59
- web-refresh 29

requirements

- embedded web server 47

reset security
 embedded Web server 61
 TFTP 25
resetting to factory defaults 85

S

Secure Web
 embedded Web server 71
 TFTP configuration 25
security features 80
Service Location Protocol (SLP)
 embedded Web server 73
 TFTP configuration 27
SNMP 5
 embedded Web server 72
 TFTP configuration 24, 30
 version 3 72
SNMP get community name
 See also, Community name
 embedded Web server 56
 TFTP configuration 30
SNMP set community name
 See also, Community name
 embedded Web server 56
 security features 82
 TFTP configuration 30
SNMP v3 82
 embedded Web server 57
software installation
 HP Web Jetadmin 10
subnet mask
 bootptab file parameter 20
 overview 94
 TFTP host access list 26
 Windows configuration 37
subnets 94
syslog parameters 96
 embedded Web server 54
 TFTP configuration 27
syslog server
 Bootptab file parameter 20

T

TCP/IP 12
 configuration methods 12
 embedded Web server 53
 overview 90
 TFTP configuration 26
TFTP
 BOOTP 17
 configuration file 23
 controlling configuration 25
 DHCP 32
 Server 18
TFTP (Trivial File Transfer Protocol),
 See TFTP
traps, TFTP configuration 30
troubleshooting 84
 flow chart 86

U

UDP, See User Datagram Protocol
upgrades (software, driver, and flash
 image) 7
upgrades, firmware
 TFTP parameter 31
User Datagram Protocol (UDP) 91

V

Validity Period
 certificates 68

W

Web Jetadmin URL
 See also, HP Web Jetadmin
 embedded Web server link 79
WINS server
 DHCP and 32