

PCI 1000Base-T and HSC/PCI 1000Base-SX/9000 Quick Installation

These instructions apply to all HP 1000Base-T and SX cards for the HP 9000. The Base-T card supports 10-, 100- and 1000 Mbps operation. The Base-T card at 10- and 100- speeds operates in full and half-duplex modes. The Base-T card at 1000 Mbps and the Base-SX cards only support full-duplex mode. Ensure your switch is set to autonegotiation and the same duplex mode as this card. For detailed information about each of the steps below and for declarations of conformity, refer to the online guide *Using PCI 1000Base-T and HSC/PCI 1000Base-SX/9000* available in www.docs.hp.com or on the Instant Information CDROM. View online Release Notes either in `/opt/networkdocs` or the Instant Information CD.

Ensure that the HP 9000 is shut down completely and the power is off. Ensure that the system is grounded. If you are configuring the PCI card on a V-class server, skip to Step 3.

Step 1: Access the system card bay

- If the system is running, shut it down by executing the command: `shutdown -h`. Respond "y" to the continue to shutdown prompt.
- Wait for the system to shutdown completely, and then power off the system by pressing the system off button. Ensure that the system is grounded.
- Open the system to gain access to the HSC or PCI backplane, if applicable.
- Select an empty HSC or PCI slot and remove the slot cover.

For optimal performance on L- and N-class servers or new B-, C-, and J-class workstations, insert the PCI Gigabit Ethernet card into a twin-turbo or non-shared turbo PCI slot.

Step 2: Install the HSC or PCI card

- Observe the antistatic precautions.
- Record the card serial number from the card.
- Grasp the card by its edges or faceplate with both hands, insert the card into the slot, and press the card firmly into place.
- Secure the card and reassemble the system.

Step 3: Attach the system to the network

- Attach the network cable to the card. Fiber optic cabling can be either 62.5 micron or 50 micron multimode fiber optic cable. Refer to the table on the last page for the operating distances. Copper cabling must be Cat 5 UTP or better. The copper cable can be up to 100 meters long for PCI 1000Base-T operation.
- Attach the free end of the cable to any unused port on the switch. Connect power cable to system. Ensure that the 1000 Mbps port on the switch is set for autonegotiation.

If using Jumbo Ethernet frames, ensure that all switches in the data path support the jumbo frame size. Ensure the originating and destination nodes support the jumbo frame size as well.
- Power up the system. When the system is up, any error messages will appear on the terminal display or system console.

Step 4: Prepare to install 1000BaseSX/T software

- Log in as `root`.
- Check that the `/usr/bin`, `/usr/sbin` and `/sbin` directories are in your PATH using the command: `echo $PATH`.
- Check the HP-UX version by typing: `uname -a`. The version should be HP-UX 10.20 or 11.0.
- Install the appropriate patches for your system as described in the "Required Patches" section of the online Release Notes or the online

README. View the online files either in Instant Information or in `/opt/networkdocs`. Release notes are in `gether_relno.pdf`.

Step 5: Install the software (skip this step if you ordered product option 0D1--preinstallation)

- Load the software media (CDROM) into the appropriate drive.
- Run the `swinstall` program to install the software using the command: `swinstall`.
- Change the host name after "Source Host Name," if necessary.
- Click on the Source Depot Path to identify the registered depot for the appropriate source depot path and activate the **OK** button to return to the Software Selection Window.
- Highlight the 1000Base-SX/T software: **A492*A**.
- Choose Mark for Install from the "Actions" menu to choose the product to be installed.
- Choose Install from the "Actions" menu to begin product installation and open the Install Analysis Window.
- Activate the OK button in the Install Analysis Window when the Status field displays a "Ready" message.
- Activate the YES button at the Confirmation Window to confirm that you want to install the software. `swinstall` loads the fileset, runs the control scripts for the filesets, and builds the kernel. Estimated time for processing: 3 to 5 minutes. When the status field indicates "Ready," a Note Window opens. Activate the **OK** button on the Note Window to reboot the system.

Step 6: Configure the card using SAM

- Log in as `root` and verify that the card and its hardware path are displayed by executing the command: `ioscan`.
- Run the System Administration Manager: `sam`.
- Double click `Networking and Communications`.
- Double click `Network Interface Cards`.
- Highlight the Gigabit Ethernet card and choose `Configure` from the `Actions` menu.
- Fill in the form according to the instructions using the Network Card Configuration Worksheet.
- Activate the OK button to activate the card and then select exit from the "File" menu until you exit SAM.

Step 7: Verify the installation

- Verify that the connector's Link LED is steadily on (this means the card and driver are installed successfully). If *all* LEDs remain steadily on, either the driver is not yet installed or there is a failure. If the card and software are installed but the LAN cable is disconnected, the Link Status LED flashes.

NOTE: There is no Link LED on the 1000Base-T card. In its place are three LEDs which indicate what speed (10, 100, or 1000 Mbps) the "link" has been established at. If the card and driver have been

installed, but there is no LAN connection, all three will be OFF.

- ❑ Fill out the Network Card Configuration Worksheet on this guide for each card you are installing. **Refer to the last page of this card for the network configuration worksheet.**
- ❑ Obtain the NMID or PPA and the station address of each card by executing the command: `lanscan`.
- ❑ Verify that no errors occurred during installation by typing:
`linkloop -i PPA# remote_station_address` (for HP-UX 11.0 and above) or
`linkloop -i NMID remote_station_address` (for HP-UX 10.20).
- ❑ Verify connectivity with a remote system by executing the command: `ping Remote_IP_Address` and `netstat -in`.
- ❑ 1000Base-SX/T installation is complete when you have successfully run `linkloop` and `ping`. To configure remote systems, see the release notes. Do this step only if remote systems have not been previously configured.

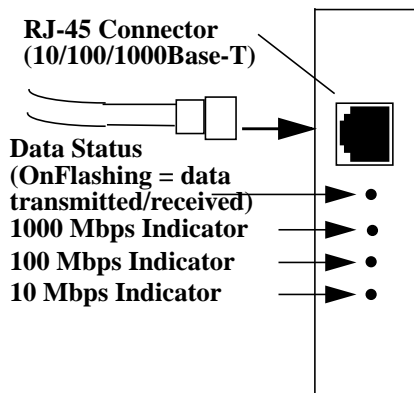
Optional Step: Configure Jumbo Frame Size

- ❑ Ensure that all switches in the data path support the jumbo frame size. Also, make sure that both ends of the connection are using jumbo frames.
- ❑ Obtain the PPA (HP-UX 11.0 and above) or NMID (for HP-UX 10.20) of the card by executing the command: `lanscan`.
- ❑ *HP-UX 10.20 only*: Execute the command:
`ifconfig lan# down`.
- ❑ Execute the command:
`lanadmin -M 9000 PPA#` (for HP-UX 11.0 and above) or
`lanadmin -M 9000 NMID#` (for HP-UX 10.20).
- ❑ *HP-UX 10.20 only*: Restart the network interface by entering:
`ifconfig interface inet IP_Address netmask netmask_value up`
- ❑ To check the current Ethernet frame size, execute the command:
`lanadmin -m PPA#` (for HP-UX 11.0 and above) or
`lanadmin -m NMID#` (for HP-UX 10.20).

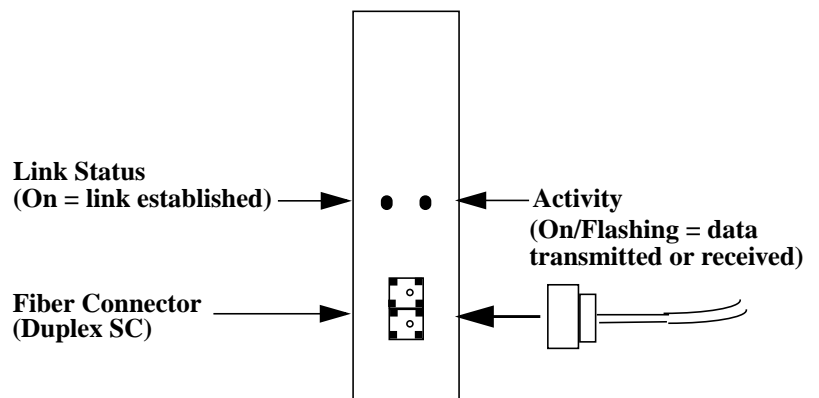
HP-UX 10.20 Example: `ifconfig lan1 inet 101.3.102.250 netmask 0xffffffff up`
- ❑ Verify that the MTU is correctly configured at the network layer, execute the command: `netstat -rn`.

An alternative way to configure the jumbo frame size on either HP-UX 10.20 or 11.0 is to edit the file `/etc/rc.config.d/hpgelanconf`. Set the parameter `HP_GELAN_MTU[0]=9000` and insert the proper `HP_GELAN_INTERFACE_NAME`. When the system reboots, the interface will be configured for jumbo frame operation. Accepted values for `HP_GELAN_MTU` are 1500 for standard frames and 9000 for jumbo frames.

PCI 1000Base-T/9000 LAN Card



HSC and PCI 1000Base-SX/9000 LAN Card



PCI 1000Base-T and HSC/PCI 1000Base-SX /9000 Quick Troubleshooting

Follow the steps below in sequence to quickly isolate PCI 1000Base-T/9000 or HSC/PCI 1000Base-SX problems on your system. The flowcharts referred to in these steps are in the online *HSC and PCI 1000Base-SX/T (Gigabit Ethernet) User's Guide*.

Check the HP-UX Directory Path

Prior to completing the steps below, check that the `/usr/bin`, `/usr/sbin`, and `/sbin` directories are in your PATH using the command: `echo $PATH`.

Step 1: Network Level Remote Test

- ❑ Check the IP network level connection with the remote host using the `ping(1M)` command. Example: `ping 196.6.20.2`.

Successful? If packets are being returned, your system has network level connectivity to the remote host. If not, refer to flowchart 1. Press `<Ctrl> C` to stop the `ping` output.

Step 2: Connections/LED Test

- ❑ Check that the network cable is connected to the Gigabit Ethernet card and to a Gigabit Ethernet card/switch. Ensure that the 1000 Mbps card/switch is set for autonegotiation and full-duplex. For Base-T, if manually configuring, ensure the speed, duplexity, and autonegotiation settings are the same on the card and switch.

- ❑ Check that the card's Link status LED (1000Base-SX) or speed LED (1000Base-T) LED is on.

Successful? Yes, if the Link status or speed LED is on. If not, refer to flowchart 2 for -SX, flowchart 3 for -T.

Step 3: Configuration Test

- ❑ Check that the 1000Base-SX/T interface is configured by displaying information about all 1000Base-SX/T cards that are successfully bound to the system using the command: `lanscan`.

Successful? Yes, if `lanscan` indicates the interface and hardware are 'up.' If not, refer to flowchart 4.

- ❑ Ensure that the 1000 Mbit/s switch is set to autonegotiate. If the switch cannot auto-negotiate, run `lanadmin` and ensure that the speed settings and duplex mode are the same as set at the switch (they can be 10, 100, 1000 and full-duplex or half-duplex mode).

- ❑ Check the log data (error and disaster messages) for the Gigabit Ethernet card using the `netfmt` command. Example: `netfmt -v -f /var/adm/netttl.LOG00 | more`.

Successful? Yes, if the problem stated in the log file is fixed. If not, refer to flowchart 5.

- ❑ Display IP information about the interface you want to test using the `ifconfig(1M)` command.

Example: `ifconfig lan1`.

Successful? Yes, if the output shows the correct Internet address and the flag: UP. If not, refer to flowchart 6.

Step 4: Network Level Loopback Test

- ❑ Check that a correct entry exists for the remote system in your system's ARP cache using the `arp(1M)` command.

Example: `arp 196.6.20.2`.

Successful? Yes, if there is an ARP cache entry for the remote host. If not, refer to flowchart 7.

Step 5: Link Level Test

- ❑ Check the link layer connectivity using the `linkloop(1M)` command with the PPA (or NMID) of your Gigabit Ethernet card and the station address of the remote host. Command syntax:

```
linkloop -i PPA# remote_station_address
(for HP-UX 11.0 and above) or
linkloop -i NMID# remote_station_address
(for HP-UX 10.20).
```

Use `lanscan` to obtain the PPA (or NMID) and station address of the remote system.

Successful? Yes, if an OK status is returned. If not, refer to flowchart 8.

Step 6: Subnet Test

- ❑ Check the host name, subnet number, and subnet mask of the interface using the `ifconfig(1M)` command.

Example: `ifconfig lan1`

Successful? Yes, if the host portion of the IP address and subnet number part of the IP address are not all 0s or all 1s and the subnet mask is what you expect. If not, use SAM to enter the mask or IP address.

- ❑ Check that all the hosts on the network are using the same subnet mask and that the mask has been set on all interfaces by executing the `ifconfig(1M)` command on each node in the network.

Example: `ifconfig lan1`

Successful? Yes, if the subnet masks are all the same. If not, use SAM to connect the mask or IP address. Refer to the online *HSC and PCI 1000Base-SX/T (Gigabit Ethernet) User's Guide* for additional information about subnet masks.

Step 7: Transport Level Loopback Test Using ARPA

- ❑ Check the transport level connection with the remote host using the `telnet(1)` command.

For example: `telnet abcde`.

Successful? Yes, if you have transport level connectivity to the remote host. If not, refer to flowchart 9.

- ❑ Check the route tables on the source and destination nodes using the command: `netstat -r`.

Successful? If the routing tables are not correct, refer to the `route` man page.

Refer to the on-line manual pages for more detailed information about the commands listed in the above steps.

For the Gateway Remote Loopback Test, refer to flowchart 10 in the online *HSC and PCI 1000Base-SX/T (Gigabit Ethernet) User's Guide*.

If you are still having problems connecting your system to the network, contact your HP support representative.

Step 8: Network Level Loopback Test for Jumbo Frames

This step is only for jumbo frames.

- Check the IP network level connection with the remote host with packet size larger than 1480 bytes using the `ping (1M)` command.

Example: `ping 196.6.20.2 2000`

This is successful if packets are being returned — your system has network level connectivity to the remote host. If not, refer to flowchart 10 in the online *Using PCI 1000Base-T and HSC/PCI 1000Base-SX/9000* guide. Press `<Ctrl> C` to stop the ping process.

Network Card Configuration Worksheet

Fill out one worksheet for each card you are installing

Data Type	Required/Optional	Default	Where to Configure	Example	Your System
Internet address	Required	0.0.0.0	SAM, ifconfig	196.6.20.2	
Subnet mask	Required if using subnetting	Subnet mask not used	SAM, ifconfig	255.255.248.0	
Station address	Built-in but can be optionally changed	As shown on card	lanadmin -X, SAM	0x0060b0c4012f	
Host name alias for this network interface (card)	Required if system is connected to more than 1 network	None	SAM	abcde	
Link configuration	Required	Autonegotiating	lanadmin -X or SAM	lanadmin -X auto_on PPA# (if already turned off)	
Link speed/duplex mode	Required	Autonegotiating	Hub or switch* and lanadmin -X or SAM	lanadmin -X auto_on PPA#/NMID#	
MTU (Maximum Transmission Unit): Jumbo Frames	Optional	1500 bytes	lanadmin -M or SAM	lanadmin -M 9000 PPA# (HP-UX 11.0 or above) or lanadmin -M 9000 NMID# (HP-UX 10.20) for Jumbo frames	
Receive flow control	Optional	On	lanadmin -X or SAM	On/Off	

*The speed configuration of the 1000Base-T card can be 10, 100, or 1000Mbps and is determined by the speed setting of the hub or switch port to which the card is connected. The card automatically senses this speed. The card only runs at one speed at a time. To verify the speed selection, run `lanadmin -x ppa#` or `lanadmin -x nmid#`

Operating Distance for 1000Base-T (Copper UTP)

Up to 100 meters — Cat 5 and Cat 5E

Operating Distances for Fiber Optic Cable Types

Fibre Description 1000Base-SX/9000 (850nm SWL)	Modal Bandwidth	Operating Distance
62.5 micron MMF	160 (MHz * km)	2 to 220 meters
	200 (MHz * km)	2 to 275 meters
50 micron MMF	400 (MHz * km)	2 to 500 meters
	500 (MHz * km)	2 to 550 meters