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Workgroup CDDI/FDDI SBus Adapter Upgrade and Configuration

This publication provides instructions for upgrading SBus adapter cards to enable diskless boot operation over the network. Instructions are provided for both SunOS 4.1.x and Solaris 2.x operating systems. The upgrade instructions include steps for configuring the firmware and upgrading SBus adapter cards.

For complete descriptions of configuration options available for the CDDI/FDDI SBus adapter, refer to the *Workgroup CDDI/FDDI SBus Adapter User Guide*.

Sections in this publication include the following:

- Product Overview
- Required Equipment
- Preventing Electrostatic Discharge Damage
- Configuring the Firmware
- Replacing the PROM
- Installing the SunOS 4.1.x Diskless Boot Server Software
- Installing the Sun Solaris 2.x Diskless Boot Server Software
- Installing Solaris 2.x JumpStart
- Configuring the Diskless Boot Client
- Cisco Information Online

Product Overview

The diskless client is any system that does not have a hard disk and relies on an assigned server for all of its resources. The diskless boot client's file systems, disk storage, and swap space are stored on a server, and it requires access to a server to boot.

Before you can begin upgrading adapter cards, you will need the following:

- Your superuser login
- SBus adapter software loaded onto the server

Note For instructions on how to copy the software to the server, see the section "Copying the SunOS Driver Files" in the chapter "Installing the Workgroup SBus Adapter Software" in the *Workgroup CDDI/FDDI SBus Adapter User Guide*.

- Your host name, Internet Protocol (IP) address, Ethernet address, and client name for each server and client

Required Equipment

Make sure you have the following equipment before you begin the upgrading procedure:

- Diskless boot PROM
- New firmware version 2.7 for WA-C300, WA-C301M, or WA-C303 adapters
- New firmware version 4.4 for WA-C300T, WA-C301T, WA-C303T adapters
- New driver version 4.1 for SunOS 4.1.x, and version 3.1 for Solaris 2.x
- Static strap

Note Make sure the adapter card is plugged in to a Sun Workstation that is configured to bring up a Cisco FDDI card. Also make sure that the only adapter card in the machine is the card you want to upgrade.

Caution To prevent electrostatic discharge (ESD) wear an antistatic strap at all times when handling hardware.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when electronic boards or components are handled improperly, can result in complete or intermittent failures. Make sure to handle the PROMs by the metal frame or carrier only; avoid touching the board (particularly avoid touching any components, connector pins, or the metal *fingers* on the edge connector).

Following are guidelines for preventing ESD damage:

- Always use an ESD wrist strap or ankle strap and ensure that it makes good skin contact.
- When removing or installing interface processors, connect the equipment end of the ground strap to the chassis ground screw on the interface processor end of the chassis.
- Place removed PROMs board-side-up on an antistatic mat or in a static shielding bag.
- If you are returning a replaced part to the factory, immediately place it in a static shielding bag to avoid ESD damage to the board.
- Avoid contact between the board and clothing. The ESD strap only protects the board from ESD voltages on the body; ESD voltages on clothing can still cause damage.

Caution For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms.

Configuring the Firmware

Perform the following tasks to configure the firmware:

Step 1 The latest firmware must be installed in the same directory as the driver utilities. For SunOS 4.1.x, the firmware is usually in the /usr/cfddi directory, and for Solaris 2.x, it is usually in the /opt/SBUSfddi directory. The firmware is in tar format.

Step 2 Enter the following command, where sbusxx.rom is the name of the firmware (and xx is the most current version). For example, for version 4.4, enter **44**, and for version 2.7, enter **27**.

```
download_flash sbusxx.rom
```

Replacing the PROM

Following are the procedures for replacing the programmable read-only (PROM) devices on the SBus adapters. Make sure to follow the procedures with the numbers that correspond to the adapters you are replacing.

Replacing WA-C300T, WA-C301T, or WA-303T Adapters

Following are the steps for replacing the PROM for the WA-C300T, WA-C301T, or WA-303T adapters.

Caution To prevent ESD damage, handle adapter cards by the carrier edges only, and always use a grounding strap.

Step 1 Turn OFF power to the workstation.

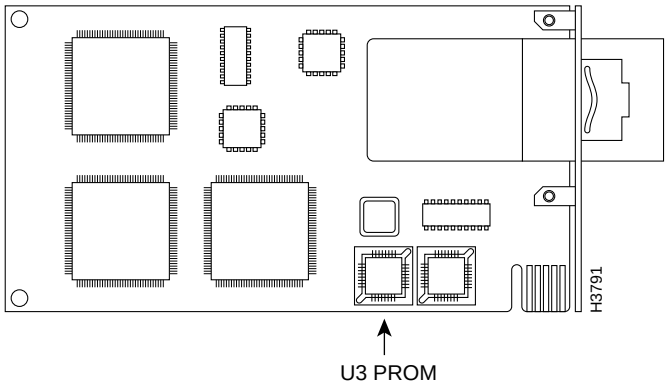
Step 2 Open the workstation using the appropriate documentation.

Step 3 Remove the SBus adapter card using the appropriate documentation.

Step 4 Place the removed SBus adapter card on an antistatic mat or foam.

Step 5 Locate the PROM in socket U3. Note the orientation of the notch on the existing PROM so that you can install the new PROM with the same orientation. (See Figure 1.)

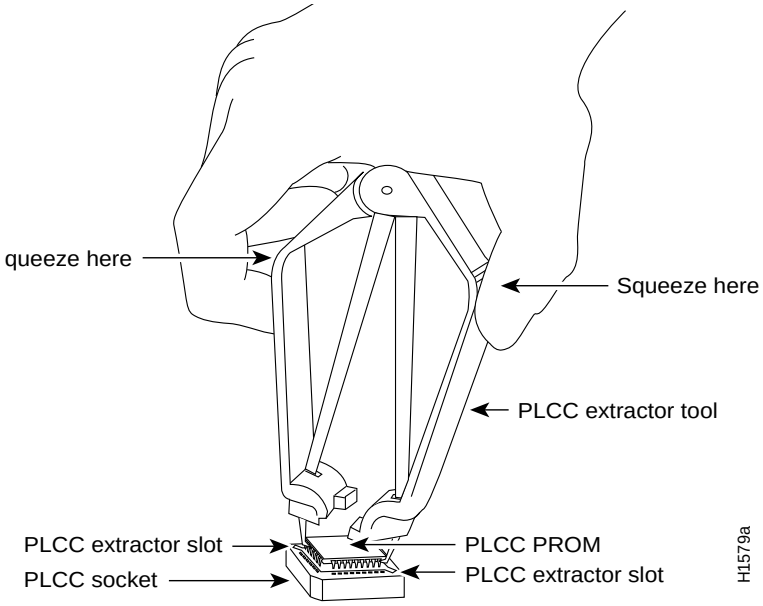
Figure 1 PROM Socket Designator for WA-C300T, WA-C301T, or WA-303T Adapters



Caution You must use a PLCC extractor to remove the PROM. (See Figure 2.) You cannot use a small flat-blade screwdriver to pry it out of the socket as with the older type of ICs. A PLCC IC does not have legs or pins that plug into the socket; instead, the contacts are on the sides of the IC and along the inner sides of the socket. When the IC is seated in the socket, the top of the IC is flush with the top of the socket. Forcing a small screwdriver or other tool between the IC and the sides of the socket to pry out the IC will damage the component or the socket or both, and you will have to replace them.

Step 6 Use a chip or PLCC-type extractor to remove the PROM labeled U3 from the PROM socket. Place the removed PROM on antistatic foam or into an antistatic bag. (See Figure 2)

Figure 2 Removing a PROM from a PLCC-Type Package



Step 7 Insert the new PROM in the same socket with the notched corner in the same orientation as the PROM you removed.

Caution Electrical damage may result if the PROM is positioned incorrectly. Always double-check the positioning of the PROM in the socket.

Step 8 After you have installed the PROM, replace the upgraded card into the workstation using the appropriate documentation.

Step 9 For the SunOS driver, extract the contents of the tar format driver diskette into a subdirectory (example: `/usr/local/diskless/cfddi`) on the diskless boot server, and proceed to the section “Installing the SunOS 4.1.x Diskless Boot Server Software” in this document.

For Solaris, follow the instructions in the section “Instructions for Installing the Sun Solaris 2.x Diskless Boot Server Software” in this document.

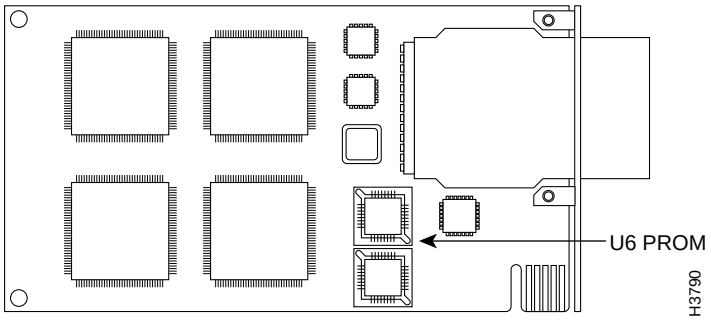
Step 10 Close the workstation using the appropriate documentation.

Step 11 Turn ON the system power.

Replacing WA-C300, WA-C301M, or WA-C303 Adapters

In general, you follow the preceding instructions to replace the PROM for the WA-C300, WA-C301M, or WA-C303 adapters. However, instead of replacing the PROM from the U3 socket, replace the PROM from the socket labeled U6. (See Figure 3.) If you are upgrading a CDDI card, you may need to remove the daughterboard to get direct access to the PROM.

Figure 3 PROM Socket Designator for WA-C300, WA-C301M, or WA-C303



Installing the SunOS 4.1.x Diskless Boot Server Software

This section describes how to install of diskless boot clients using the SunOS 4.1.x operating system using the **./install.fddi** command and how to add a client using the **add_client** command. Refer to the section "Administering Workstations" in the *Sun System and Network Configuration* manual for detailed installation instructions.

The installation requires the following steps:

- Adding a Client to the Server Databases
- Installing the Driver on the Server

Adding a Client to the Server Databases

Perform the following tasks to add the client to the server databases:

Step 1 Change directories to /usr/etc/install to use the **add_client** utility.

Step 2 At the server command line, enter the **./add_client -i** command. The **-i** option invokes full screen interactive mode, as shown in the following example:

```
Server # ./add_client -i

The following screen appears:
Interactive mode uses no command line arguments

CLIENT FORM      [?=help] [DEL= erase one char] [RET=end of input data]

------------------------------------------------------------------------
 Architecture type  : [sun4c.sunos.4.1.3] x [sun4m.sunos.4.1.3_u1]
 Client name        : cisco-fddi
 Choice             : x [create]  [delete]   [display]  [edit]









 Ok to use these values [y/n]
 [x/X=select choice] [space=next choice] [^B/^P=backward] [^F/^N=forward]
```

Step 3 From the preceding screen, select the following:

- Architecture type: select **sun 4c.sunos.4.1.3**
- Client name: enter **cisco-fddi,** as in this example
- Choice: select **create**

Information similar to the following is added to the screen:

```
CLIENT FORM      [?=help] [DEL= erase one char] [RET=end of input data]

-----------------------------------------------------------------
 Architecture type  : [sun4c.sunos.4.1] x [sun4m.sunos.4.1.3_u1]
 Client name        : cisco-fddi
 Choice             : x [create] [delete] [display] [edit]
 Root fs: /export/root (sd3h)     118805504     Hog:   3d3h 118805504
 Swap fs: /export/swap (sd3h)       118805504   Hog:   3d3h 118805504

 Client Information   :
      Internet Address           :  198.133.219.2511
      Ethernet Address           :  8:00:20:19:ef:4
      NIS Type                   :    X [none]  [client]

      Swap size (e.g. 8B, 8K)    :   16M
      Path to Root               :   /export/root/cisco-fddi
      Path to Swap               :   /export/swap/cisco-fddi
      Path to Executable         :   /usr
      Path to Kernel Executable  :   /usr/kvm
      Path to Home               :   /export/home/Boot-server-fddi
      Terminal type              :   sun

   Ok to use these values [y/n] y
    [x/X=select choice][space=next choice][^B/^P=backward][^F/^N=forward]
```

Note The Ethernet address displayed should be the address assigned to the workstation not the Ethernet address assigned to the FDDI/CDDI SBus adapter. Use the **ifconfig -a** command to determine the workstation Ethernet address. You must be a superuser to display the address.

Step 4 Verify that all displayed variables are correct. If all of the displayed variables are correct, enter **y**. The following confirmation screen appears:

```
CLIENT FORM     [?=Help]  [DEL= erase one char] [RET=end of input data]

-----------------------------------------------------------------------
 Architecture type  : [sun4c.sunos.4.1] x [sun4m.sunos.4.1.3_u1]
 Client name        : cisco-fddi
 Choice             : x [create] [delete] [display] [edit]

  sun4m.sunos.4.1.3_u1 Clients:

  cisco-fddi



  Are you finished with this form [y/n]  y
   [x/X=select choice][space=next choice][^B/^P=backward][^F/^N=forward]
```

Step 5 Enter **y**. The **add_client** utility adds the new client. The following message appears:

```
Updating the server's database
Setting up server file system to support client
Making client's swap file
Setting up client's files system
Copying /export/exec/proto.root.sun4m.sunos.4.1.3_u1 to /export/root/cisco-fddi
Copying binaries

Updating client's database
Setting up Client's ttytab

You must now ask the system administrator to update the NIS
master's /etc/hosts, /etc/bootparams and /etc/ethers files,
because of the change in the status of the client "cisco-fddi.'
```

Step 6 If the server where you ran the **add_client** utility contains the network information services (NIS) database, verify that the following files were updated:

- /etc/hosts
- /etc/bootparams
- /etc/ethers

If this server does not contain the NIS database, the system administrator must update the following files in the database:

- /etc/hosts—This file must contain the diskless station's IP address and name
- /etc/ether—This file must contain the diskless station's Ethernet addresses
- /etc/bootparams—This file should contain information for each diskless station as in the following example:

```
cisco-fddi root=Boot_server:    /export/root/cisco-fddi\
           swap=Boot_server:/export/swap/cisco-fddi
```

Note In the preceding example, when entering the server's host name, always enter the server's *fddi* host name, not the server's Ethernet host name.

Installing the Driver on the Server

Perform the following tasks to install the SunOS diskless boot driver on the server:

Step 1 At the server, change the directory to /usr/local/diskless/cfddi (same directory as in Step 9 in the section "Replacing the PROM" in this document.

Step 2 At the prompt, enter **./install.fddi** to run the install script:

```
Boot_server # ./install.fddi
    You have invoked the ./install.fddi script, which is used to install
    software for FDDI SBus Adapters.
    There are two steps to the installation:


        1) Install SNMP agent (optional).
        2) Install FDDI SBus driver.


    Is this install for a diskless station (y/n) [n] ? y
```

Step 3 At the prompt, enter the path to the diskless boot files, as shown in the preceding example. The following prompt appears:

```
/export/root
total 2
drwxr-xr-x  3 root          512 May 12  1994 SUNWxt
drwxr-sr-x 11 root          512 Mar  6 16:28 cisco-fddi

Input diskless base directory == /export/root/cisco-fddi
```

Step 4 At the prompt, enter the path to the diskless boot files. The following prompt appears:

```
   Do you wish to install the SNMP agent on diskless station (y/n) [y] ? y
```

Step 5 At the prompt, enter **y** to install the SNMP agent on the diskless station. The following information appears:

```
Copying snmpd.cfddi to /export/root/cisco-fddi/etc
    Updating /export/root/cisco-fddi/etc/rc.local to start SNMP agent at boot time.

    Installation of SNMP agent done.

    How many FDDI interfaces are being installed in this machine [1] 1?
```

Step 6 At the prompt, enter the number of FDDI interfaces installed in this workstation. The following prompt appears:

```
Enter hostname for FDDI interface fddi0 [Boot_server]: cisco-fddi
```

Step 7 The FDDI interface host name prompt appears. Enter the new host name of this workstation or use the default assigned (the existing name appended with -fddi). The following prompt appears:

```
You are using NIS, do you want to get ip address from NIS (y/n) [y] ? y
```

Step 8 Enter **y** to have the IP address retrieved from the host. The following prompt appears:

```
Retrieved ipaddr 172.20.25.146 for host cisco-fddi
Enter IP address for FDDI interface fddi0 [172.20.25.146]:
```

Step 9 Confirm the IP address retrieved and displayed in default brackets, is correct or manually add the correct IP address if needed. The following prompt appears:

```
Enter client architecture (sun4c or sun4m) [ sun4m ] ==> sun4m
```

Step 10 Enter the correct client architecture for this system. Enter either **sun4c** or **sun4m**. The following information and prompt appear:

```
/export/exec/kvm
total 3
drwxr-sr-x  7 root         1024 Sep 14 17:15 sun4c.sunos.4.1.3
lrwxrwxrwx  1 root           20 Sep 14 10:37 sun4m -> sun4m.sunos.4.1.3_U1
lrwxrwxrwx  1 root            8 Sep 14 10:37 sun4m.sunos.4.1.3_U1 -> /usr/kvm

Enter client architecture kernel build path ==>
   /export/exec/kvm/sun4m
```

Step 11 At the prompt, enter the path to the client architecture kernel. In this example, the path is **/export/exec/kvm/sun4m.** The following prompt appears:

```
Enter existing kernel configuration file [GENERIC]:
```

Step 12 At the prompt, enter the name of the existing kernel configuration file to be copied and modified in the next step. The following prompt appears:

```
Enter new kernel configuration file [FDDI]: FDDI_DLESS
```

Step 13 At the prompt, enter the name you want given to the new kernel configuration file. Information similar to the following appears:

```
Copying/updating files ...
        Copying fddi_conf.c to /usr/kvm/sys/sunif
        Copying if_fddi.o to /usr/kvm/sys/sun4m/OBJ
        Adding config.fddi to /usr/kvm/sys/sun4m/conf/ERIC
        Updating /usr/kvm/sys/sun4m/conf/files to include  FDDI files
        Updating /usr/kvm/sys/netinet/in_proto.c to increase tcp snd/rcv space
    Updating /usr/kvm/sys/sun4m/conf/ERIC for diskless station
    changing fddi_conf.c file to flag diskless booting
        Copying fddistat to /export/root/cisco-fddi/usr/etc


    Rebuilding diskless kernel ...


Doing a "make depend"

cc -sparc -c -O -Dsun4m -DGENERIC -DSUN4M_35 -DSUN4M_50 -DSUN4M_690 -
.
. data omitted
.
DSYSACCT -DPCFS -DTMPFS -DNFSCLIENT -DINET -DMULTIPROCESSOR -DKERNEL -I. -I..
-I../.. confvmunix.c
loading vmunix
rearranging symbols
text     data      bss     dec       hex
1368064  456104    208360  2032528   1f0390
        Changing fddi_conf.c back to non-diskless case


    Installing kernel ...
        Saving old /export/root/cisco-fddi/vmunix file in
/export/root/cisco-fddi/vmunix.save
        Copying vmunix to /export/root/cisco-fddi/vmunix


    A log of the installation is in ./install.fddi.log


Boot_server #
```

When the server console prompt reappears, the SunOS diskless boot driver installation is complete. Continue with the instructions in the section “Configuring the Diskless Boot Client” at each diskless boot client.

Installing the Sun Solaris 2.x Diskless Boot Server Software

This section describes to install diskless boot clients for the Sun Solaris 2.x operating system using the administration tool and how to add a client using the **pkg_add** command. Refer to the section "Introducing a Machine to a Network" in the *Solaris 2.3 System Configuration and Installation Guide* for detailed installation instructions.

This section includes the following:

- Adding a Client Using the Administration Tool
  - Using Host Manager
- Installing the Solaris Client Using the pkgadd Script

Adding a Client Using the Administration Tool

This section describes how to use the host manager to add a client using the administration tool.

Perform the following steps to modify the administration files to add a client using the host manager:

Step 1 Start the administration tool at the boot server by entering **/usr/bin/admintool** at the command line, as in the following example:

```
Boot_server# /usr/bin/admintool
```

The Administration Tool base screen appears.

Step 2 From the Administration Tool, screen select **Host Manager**. The Host Manager: Select Naming Service screen appears.

Step 3 Under Naming Service, select **none**.

Step 4 After selecting **none**, at the prompt Use /etc files on host:, enter the name of the server where the diskless workstation's /etc configuration files will reside.

Step 5 Select **apply**. The Host Manager base screen appears.

Step 6 From the Host Manager base screen, select **Edit**. The Host Manager: Add Host screen appears.

Step 7 Click on the **Client Type** menu button, and select **diskless**.

Step 8 In the host name field, enter a host name for the diskless client workstation.

Step 9 In the IP address field, enter the IP address for the diskless client workstation.

Step 10 In the Ethernet address field, enter the Ethernet address for the diskless client workstation.

Step 11 Select the correct variable for time zone and region, file server, and OS release.

Step 12 Enter the correct root and swap paths, swap size, system core path, and size.

Step 13 Select add to update the administration files.

Step 14 After adding all the clients to the server administration files, quit the administering tool.

Step 15 If the server where you ran the admin_tool utility contains the network information services (NIS) database, verify that the following files were updated:

- /etc/hosts
- /etc/bootparams
- /etc/ethers

If this server does not contain the NIS database, the system administrator must update the following files in the database:

- /etc/hosts—This file must contain the diskless station's IP and Ethernet addresses
- /etc/ether—This file must contain the diskless station's IP and Ethernet addresses
- /etc/bootparams—This file should contain information for each diskless station as in the following example:

```
cisco-fddi root=Boot_server:    /export/root/cisco-fddi\
           swap=Boot_server:/export/swap/cisco-fddi
```

Note In the preceding example, when entering the server's host name, always enter the server's *fddi* host name, not the server's Ethernet host name.

Continue with the following procedure in the section "Installing the Solaris Client Using the pkgadd Script" at each diskless boot client.

Installing the Solaris Client Using the pkgadd Script

At the server, use the pkgadd utility to add the SBus FDDI diskless boot adapter driver for the client workstation.

Perform the following steps:

Step 1 Put the drive diskette into the floppy drive.

Step 2 At the command line, enter the following command to start the pkgadd script:

pkgadd -R /export/root/*client name* **-d /floppy/floppy0**

as in the following example:

```
client # pkgadd -R /export/root/cisco-fddi -d /floppy/floppy0
```

The following information appears:

```
The following packages are available:
  1  CSCOmibs     Solaris 2.X Mibs
                  (sparc) 4.1
  2  SBUSfddi     Solaris 2.X FDDI Driver
                  (sparc) 3.1
  3  SBUSsnmp     Solaris 2.X FDDI SNMP Agent
                  (sparc) 4.1

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:2
```

Step 3 At the prompt, select package **2**. The following information appears:

```
Processing package instance <SBUSfddi> from </floppy/floppy0>



Solaris 2.X FDDI Driver
(sparc) 3.1
Copyright (c) 1991-1995 Cisco Systems, Inc.
Using </export/root/cisco-fddi> as the package base directory.


Is this installation for a diskless station [n] [y,n,?,q] y
```

Step 4 At the prompt, enter **y** to install a diskless workstation adapter driver. The following information appears:

```
Is the FDDI Adapter currently installed in the machine [y] [y,n,?,q] y
```

Step 5 At the prompt, enter **y** if the adapter is currently installed. The following information appears:

```
Will the ethernet interface continue to be used [y] [y,n,?,q] y
```

Step 6 At the prompt, enter **y** to continue to use the Ethernet interface. The following information appears:

```
How many FDDI interfaces are being installed in this machine [1] [1-4,?,q] 1
```

Step 7 At the prompt, enter the number of interfaces installed in this machine. The following information appears:

```
NIS is running, Do you want to get ip addresses from NIS [y] [y,n,?,q] y
```

Step 8 At the prompt, enter **y** if you want to get the IP address from NIS. The following information appears:

```
Enter hostname for FDDI interface fddi0 [Diskless-fddi] [?,q]
   cisco-fddi
```

Step 9 At the prompt, enter the new host name for this workstation. The following information appears:

```
Enter IP address for FDDI interface fddi0 [198.133.219.99] [?,q]
   198.133.219.99
```

Step 10 At the prompt, enter the IP address for the diskless workstation. The following information appears:

```
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.


This package contains scripts which will be executed with super-user
permission during the process of installing this package.


Do you want to continue with the installation of this package [y,n,?] y
```

Step 11 At the confirmation, enter **y** to continue with the installation. The following information appears:

```
Installing Solaris 2.X FDDI Driver as <SBUSfddi>


## Installing part 1 of 1.
/export/root/cisco-fddi/kernel/drv/fddi
[ verifying class <driver> ]
/export/root/cisco-fddi/opt/SBUSfddi/README
/export/root/cisco-fddi/opt/SBUSfddi/dflash.4.1.X
/export/root/cisco-fddi/opt/SBUSfddi/dflash.solaris
/export/root/cisco-fddi/opt/SBUSfddi/download_flash
/export/root/cisco-fddi/opt/SBUSfddi/download_flash.README
/export/root/cisco-fddi/opt/SBUSfddi/fddistat
/export/root/cisco-fddi/opt/SBUSfddi/network_download
/export/root/cisco-fddi/opt/SBUSfddi/ttcp
[ verifying class <tools> ]
## Executing postinstall script.
Running add_drv to add driver to system ...
Reboot client to install driver.
Note: major number maximum based on server, not client
Creating file /export/root/cisco-fddi/etc/hostname.fddi0 with host cisco-fddi
Hostname: cisco-fddi ip address: 198.133.219.99
Diskless station installed successfully

Installation of <SBUSfddi> was successful.


The following packages are available:
  1  CSCOmibs     Solaris 2.X Mibs
                  (sparc) 4.1
  2  SBUSfddi     Solaris 2.X FDDI Driver
                  (sparc) 3.1
  3  SBUSsnmp     Solaris 2.X FDDI SNMP Agent
                  (sparc) 4.1


Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]: q
```

Step 12 When the initial screen reappears, enter **q** to quit the pkgadd utility, and reboot the client workstation.

Step 13 If the server where you ran the pkgadd utility contains the network information services (NIS) database, verify that the following files were updated:

- /etc/hosts
- /etc/bootparams
- /etc/ethers

If this server does not contain the NIS database, the system administrator must update the following files in the database:

- /etc/hosts—This file should not contain the deleted diskless station's IP and Ethernet addresses
- /etc/ether—This file should not contain the deleted diskless station's IP and Ethernet addresses
- /etc/bootparams—This file should be modified to delete the following information for each diskless station deleted, as shown in the following example

```
cisco-fddi root=Boot_server:    /export/root/cisco-fddi\
           swap=Boot_server:/export/swap/cisco-fddi
```

Note In the preceding example, when entering the server's host name, always enter the server's *fddi* host name, not the server's Ethernet host name.

Installing Solaris 2.x JumpStart

This section describes how to configure the diskless workstation and server to use the Sun Microsystems custom JumpStart utility to automatically install the Solaris software over the FDDI network. Refer to the Sun Microsystems document *SPARC: Installing Solaris Software* for detailed installation instructions.

Follow the instructions in the Sun document to configure the local server as an install server and/or as a boot server.

Note Confirm that the server already supports the Cisco FDDI interface.

The following procedure will not affect the kernel running on the server, but it will make changes to JumpStart files to allow Solaris installation over the FDDI.

Follow these steps to prepare the install server to perform the jumpstart installation over FDDI.

Step 1 Access the file system on the diskette from the server using either a file manager or mount the Solaris FDDI/CDDI diskette.

Step 2 Copy the SBUSfddi directory and its contents from the diskette to the *install_dir_path*/Solaris_2.4 directory on the server.

```
# cp -r SBUSfddi install_dir_path/Solaris_2.4
```

This will create a directory with all FDDI files and scripts in *install_dir_path*/Solaris_2.4/SBUSfddi.

Note Do not copy the SBUSsnmp directory and CSCOmibs directory from the diskette to the server.

Step 3 Change directories to *install_dir_path*/Solaris_2.4/SBUSfddi/reloc.

Step 4 Change the permission of the neti file. Enter the following:

```
# chmod +x neti
```

Step 5 Enter **./neti** to run the neti script. The following information appears:

```
# ./neti

# Are you sure you want to continue with FDDI jumpstart network installation script
[n] y
```

Step 6 Enter **y** to continue with the FDDI jumpstart network installation script. The following information appears:

```
# Begin network installation
# Enter type of architecture for target installation machine [sun4m] sun4m
```

Step 7 At the prompt, enter the type of Sun architecture on the target workstation, either **sun4m, sun4c** or **sun 4d**. Information similar to the following appears:

```
Performing add_drv to jumpstart directory
../../../export/exec/kvm/sparc.sum.Solaris_2.4
removing request entry from pkgmap
changing .package toc
changing .order
Done

#
```

Step 8 Change directories to the *install_dir_path*, and issue the **add_an_install_client** command. Following is an example:

```
./add_install_client -i 188.122.139.45 -e 8:0:20:0d:92:23 -s install_srv:/
install_dir_path -c install_srv:/var/adm/jumpstart install_cli sun4m
```

Step 9 Refer to Chapter 4, “Preparing Custom Jumpstart Installations” in the *Sun SPARC: Installing Solaris Software* document for instructions on how to create the JumpStart directory and profile. Confirm that the SBUSfddi package is included in the profile. For example:

```
# Profile Keyworks     profile values
# ----------------     --------------

package                SBUSfddi add
```

Step 10 Create a rules file following the instructions in the *Sun SPARC: Installing Solaris Software* document.

The server is now configured to use custom JumpStart to automatically install the Solaris software over the FDDI.

Note The installed client FDDI adapter must support diskless boot.

Step 11 At the diskless station command line, enter the following:
boot *device_path* **-install,** where the *device_path* is your type of workstation. See Table 1 for the proper device path.

Table 1 Diskless Workstation Device Paths

Workstation Type	Device Path	Notes
Sun4c	/sbus/fddi	
Sun4d	/io-unit@f,e0200000/sbi/fddi	For Solaris only
Sun4m	/iommu/sbus/fddi	

Following is an example of the boot device path for a Sun4m workstation:

```
Diskless # boot /iommu/sbus/fddi -install
```

Step 12 Once the installation is complete, the following message is displayed:

```
ifconfig: SIOCGIFFLAGS: fddi0: no such interface
```

Step 13 Reboot to clear the problem or use the **ifconfig** command to initiate the interface.

```
ifconfig fddi# plumb
ifconfig fddi# diskless_name up
```

Note At this point you may also specify netmask and broadcast addresses, if applicable.

where:

fddi*#*—is the FDDI adapter number. Usually **fddi0**.

plumb—opens the device associated with the interface.

diskless_name—is the name of the diskless workstation.

Note Other stations may not recognize the client when you issue the **ifconfig** commands and you don't reboot the workstation. The ARP table of other stations on the FDDI network must be flushed by deleting the old entry for the client's MAC address using the following command: **arp -d** *diskless_name*

The Solaris custom JumpStart feature configuration is complete.

Configuring the Diskless Boot Client

Perform the following steps at each diskless boot client to boot from the remote server:

Step 1 At the diskless station command line, enter **boot** *device_path*, where *device_path* is your type of workstation. See Table 2 for the proper device path.

Table 2 Diskless Workstation Device Paths

Workstation Type	Device Path	Notes
Sun4c	/sbus/fddi	
Sun4d	/io-unit@f,e0200000/sbi/fddi	For Solaris only
Sun4m	/iommu/sbus/fddi	

Following is an example of the boot device path for a Sun4c workstation:

```
Diskless # boot /sbus/fddi
```

Note If multiple adapter cards are installed in the same workstation, you must use the absolute device path. To determine the absolute device path, enter **show-devs** at the diskless workstation command line to display the fddi absolute device path.

The following information appears, displaying the device path:

```
ok show-devs

/FM,MB86904
/virtual-memory@0,0
/memory@0,0
/obio
/iommu@0,10000000
/openprom
.
.
. (information omitted)
.
.
.
/iommu@0,10000000/sbus@0,10001000
/iommu@0,10000000/sbus@0,10001000/cgsix@3,0
/iommu@0,10000000/sbus@0,10001000/fddi@1,400000” 1
/iommu@0,10000000/sbus@0,10001000/fddi@1,400000” 2
.
.
. (information omitted)
.
.
.
ok
```

Step 2 At the ok prompt, enter **setenv boot-device** *device_path* to set the diskless workstation open boot PROM (OBP) environment path to use the FDDI adapter as the default boot device. See Table 2 for the proper device path or use the absolute device path, as shown in the preceding example.

Following is an example setting the environment path for a Sun4c workstation:

```
ok setenv boot-device /sbus/fddi
```

Step 3 Use the **printenv** command to show the OBP's current settings; the device path is displayed as in the following example:

```
ok printenv

Parameter                       Value                  Default Value

type-link-test                 true                   true
.
.
. (information omitted)
.
.
boot-device                    /sbus/fddi             disk net
.
.
. (information omitted)
.
.

ok
```

Step 4 At the next ok prompt, enter **boot** to boot the diskless workstation using the FDDI adapter as the boot device, as in the following example:

```
ok boot
```

Example:

```
abcoo hostname: cisco-fddi;
domainname: eng.com
root server: Boot_server
root directory: /export/home/root/cisco-fddi
SunOS Release 5.4 Version [UNIX(R) System V Release]
Copyright (c) 1983-1994, Sun Microsystems, Inc.
```

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This document is to be used in conjunction with the *Workgroup CDDI/FDDI SBus Adapter User Guide.*