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## 7. Installing the NDIS 3.x and 4.x Drivers

### 7.1. Installation of the NDIS 3.x Driver

The Network Driver Interface Specification (NDIS) 3.x is a driver specification developed by Microsoft to offer a standard driver interface for adapter cards. AMD's NDIS 3.x driver supports the following environments:

- Microsoft Windows NT 3.1, 3.5, 3.51
- Microsoft Windows for Workgroups 3.11 and Microsoft Windows 95

Installation of AMD's NDIS 3.x driver for the environments listed above is described below.

#### 7.1.1. Microsoft Windows NT

Support is provided for the Microsoft Windows NT (Versions 3.1, 3.5, and 3.51) environment.

**Notes:** 1) *The directory structure provided on the AMD NDIS 3.x driver diskette has been set up for automatic OEM installation. Also, more information can be found in the Microsoft Windows NT User's Guide.*

2) *Only x86-based Windows NT platforms are supported.*

Follow the steps listed below:

- \_\_1 Insert the AMD NDIS 3.x driver diskette into the floppy drive.
- \_\_2 From the Control Panel in the Windows NT Main window, double click on the Network icon to install the PCnet adapter card.
- \_\_3 In the Network Settings dialog box, choose Add Adapter.
- \_\_4 In the Add Network Adapter dialog box, pull down the adapter card list menu and select <Other> Requires disk from manufacturer from the list and continue.
- \_\_5 In the next window, enter:  
  
A:\WINNT350
- \_\_6 Then, select AMD PCnet Family Ethernet Adapter from the dialog box to

install the AMD PCnet adapter card.

- \_\_7 In the AMD PCnet Family Ethernet Adapter Card Setup dialog box, select bus type All (defaults to All if nothing is selected). If more than one network adapter card is used, select its bus type.

**Note:** Sometimes All will not work on PCI-based systems. In this case, try selecting PCI1 or PCI2 depending on the bus type.

- \_\_7.1 For a PCnet-ISA adapter card:

Enter the correct I/O port, IRQ, and DMA channel values to correspond with what is set on the card by jumpers. If no values are selected, the default values will be chosen by the AMD driver.

- \_\_7.2 For PCnet-ISA+, PCnet-ISA II, PCnet-32, and PCnet-PCI adapter cards:

IRQ and DMA channel values are auto-detected. However, the values must be specified for multiple network cards. The IRQ and DMA values are set by using the AMINSTAL Utility (see the Express Installation section for more details). Shutdown Windows NT and run the AMINSTAL Utility from DOS.

**Note:** If you are using a PCnet-PCI adapter card, you do not need to run the AMINSTAL Utility.

- \_\_8 Reboot your system to complete the driver installation process.

For additional information, refer to your Microsoft Windows NT OS documentation. In addition, the user may review the README.TXT file in the WINNT directory of the AMD NDIS 3.x driver diskette.

### **7.1.1.1. Keyword Example**

To set the TP keyword, go into the AMD PCnet Family Ethernet Adapter Card Setup dialog box (see instructions above on how to access this dialog box), activate the TP button to use the TP keyword as described in the *Software Keywords* section (Appendix B).

### 7.1.2. Microsoft Windows for Workgroups 3.11

Support is provided for the Microsoft Windows for Workgroups (Version 3.11) environment. Microsoft Windows for Workgroups 3.11 supports both NDIS 2.01 and NDIS 3.x drivers. AMD provides both of these NDIS drivers.

**Notes:** 1) *The format and procedure to install the NDIS drivers for Windows for Workgroups 3.11 is different from that of Windows for Workgroups 3.1.*

2) *The directory structure that is provided on the AMD NDIS 3.x driver diskette has been setup for automatic OEM installation. The OEM Installation section of this manual provides more details regarding OEM driver installation. Also, more information can be found in the Microsoft Windows for Workgroups 3.11 User's Guide.*

Follow the steps listed below:

- \_\_\_1 Insert the AMD NDIS 3.x driver diskette into the floppy drive.
- \_\_\_2 In the Windows for Workgroups 3.11 Program Manager, double click on the Windows Setup icon.
- \_\_\_3 From the Options Menu, select Change Network Settings.
- \_\_\_4 From the Network Setup dialog box, select the Drivers... button to install the PCnet NDIS 2.01 and NDIS 3.x drivers.
- \_\_\_5 In the Network Drivers dialog box, select the Add Adapter button to install the PCnet device drivers.
- \_\_\_6 In the Add Network Adapter window, choose the Unlisted or Updated Network Adapter from the menu and then select OK.

**Note:** *The Detect button, the Am2100/Am1500T, or the PCnet Family selections from the menu of standard drivers uses a previous release of the AMD driver software.*

- \_\_\_7 The Install Driver dialog box will appear. Enter the floppy drive containing the AMD NDIS 3.x driver diskette and specify the Windows for Workgroups 3.11 path to install the PCnet drivers. For example, enter:

```
A:\WFW311\ISA for ISA cards or  
A:\WFW311\PCI for PCI cards
```

Then select OK.

- \_\_\_8 The Advanced Micro Devices PCnet Family selection will appear under the Network Adapters list. Select OK to continue.
- \_\_\_9 Answer the series of questions for the correct base I/O port, IRQ channel, and DMA channel.

In the Network Drivers dialog box, select Setup.

In the AMD PCnet Family dialog box:

\_\_\_9.1 For a PCnet-ISA adapter card:

Specify the IRQ, base I/O port, and DMA channel to correspond to the jumper settings on the adapter card.

\_\_\_9.2 For PCnet-ISA+, PCnet-ISA II, PCnet-32, and PCnet-PCI adapter cards:

- a. Set interrupt (IRQ) to Auto\_scan and the base I/O port to 0.
- b. Select OK. In the Network Drivers dialog box, select Close. In the Network Setup dialog box, select OK. For the Microsoft-specific dialog boxes, select Skip. For the Install Driver dialog box, enter:

\WFW311

**Note:** If Auto\_scan is selected for PCnet-ISA+, PCnet-ISA II, PCnet-32, or PCnet-PCI, then no value need be specified; however, Windows for Workgroups 3.11 will issue a warning message regarding possible interrupt conflict. This is due to the temporary configuring of the interrupt to channel 0 until the real value is set according to the EEPROM configuration.

\_\_\_10 Select OK to exit. Windows for Workgroups 3.11 will ask the user to reboot the machine once the installation is completed.

The installation of the NDIS 3.x driver for Windows for Workgroups 3.11 is now complete.

### **7.1.2.1. Keyword Example**

To set the LED0 keyword value, follow the instructions given above to access the advanced settings for a PCnet adapter card. A dialog box will appear to set the LED keyword options. In the LED0 setting, enter the value desired from the list given in the *Software Keywords* section (Appendix B). See Table 4 for NDIS 3.x Driver Keywords.

### 7.1.3. Installation of the NDIS 3.x Win 95 Driver

This installation assumes that there is a PCnet controller and driver installed in the system and that this is an upgrade.

To install the driver from the distribution floppy, follow these instructions:

- \_\_\_1 Click on the Start button, choose Settings, and then choose Control Panel.
- \_\_\_2 Choose the Network icon from the menu. Then delete the already installed network card.
- \_\_\_3 From distribution diskette 7, copy the file `Netamd.inf` from `<drive>:\WIN95\MAC\NDIS3` to `c:\WINDOWS\INF`
- \_\_\_4 Then shut down the system.
- \_\_\_5 On reboot, Win95 detects the PCnet controller installed in the system and prompts the user for the path of the distribution floppy. For example, `a:\WIN95\MAC\NDIS3`  
*Note: In case, Win95 does not detect the controller on the system, then skip the following and try the next installation procedure.*
- \_\_\_6 The rest of the network files are copied from the Win95 Distribution disks.
- \_\_\_7 On completion of the installation, the user will be prompted to Shutdown the system. When the System comes up again, the network should be up and running.
- \_\_\_8 Highlight the AMD PCnet Adapter in the Network Control Panel and select the File Sharing Box. Choose the appropriate box here.
- \_\_\_9 The experienced user can choose the advanced button in the Network Control panel of Settings and set the appropriate parameters.

#### **7.1.4. Win 95 NDIS 3.x Driver Installation When Controller Is Not Detected On System Boot**

- \_\_\_1 Click on the Start button, choose Settings, and then choose Control Panel.
- \_\_\_2 Choose the Network icon and then click on Add.
- \_\_\_3 Select the AMD PCnet Family Adapters, from which the appropriate adapter type can be chosen.
- \_\_\_4 The user may be prompted to choose the I/O resources. Select resources without any conflicts.
- \_\_\_5 The experienced user can choose the advanced button in the Network Control panel of Settings and can set the appropriate parameters.
- \_\_\_6 Highlight the AMD PCnet Adapter in the Network Control Panel and select the File Sharing Box. Choose the appropriate box here.
- \_\_\_7 On completion, shutdown the system and then reboot. The NDIS 3.x driver should be up and running now.



### 7.1.5. Installation of the WINNT 3.51 NDIS 3.x Driver

This installation procedure is the same procedure as for the WINNT 3.1/3.5 driver. Refer to Section 7.1. The AMD WINNT 3.51 NDIS 3.x driver is in distribution diskette 6 under the WINNT 3.51 subdirectory. There is only one difference. The WINNT 3.51 will detect the PCnet-PCI controller if it is in the system and the PCI-only dialog box will appear. This means the user does not have to select the Bus To Scan for PCI controllers.

If there is a non-PCI controller in the system, then the AMD PCnet VL/ISA dialog box appears, and the appropriate parameters can be chosen as in the WINNT 3.1/3.5 driver case.

If there is a PCI and an ISA/VL controller in the same system, then the PCI controller is detected first, and the PCI dialog box appears. Then, when the user adds the next adapter, the AMD PCnet VL/ISA dialog box appears and the appropriate parameters can be chosen as in the WINNT 3.1/3.5 driver case.

**Note:** This driver will work on WINNT 3.51 onwards only and is not compatible with NT 3.1/3.5. The name of the driver has changed to AMDPCN.SYS.

#### 7.1.5.1. NDIS 3.x Driver Keywords

See Table 4 for the NDIS 3.x Driver Keywords.

**Table 1. NDIS 3.x Driver Keywords**

Keyword Description	Keyword Name	Additional Keyword Details	Range	Default
I/O Address	IOADDRESS	See Common Keywords.		
Interrupt	INTERRUPT	See Common Keywords.		
DMA	DMACHANNEL	See Common Keywords.		
Bus type designation	BUS_TO_SCAN	See AMD Driver Specific Keywords.		

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Net Address	NETADDRESS	This keyword allows the user to specify or overwrite the IEEE or Mfr. address. This must be edited in PROTOCOL.INI or NT registry.	Any valid IEEE address or Not Present	Not Present
Full Duplex	FDUP  * Supported on PCnet-ISA II only	FDUP keyword is used to enable or disable full duplex on the 10BaseT and AUI ports. See Common Keywords.	UTP AUI OFF	Not Present (What is on the EEPROM)

**Note:** All of the keywords available to the NDIS 3.x driver may be activated by selecting the options through a dialog box in the **appropriate operating system**.

### 7.2. Installation of the NDIS 4.x Driver

The Network Driver Interface Specification (NDIS 4.x) was developed by Microsoft to offer a standard driver interface for adapter cards. AMD's NDIS 4.x driver supports the following environments:

- Microsoft Windows NT 4.0
- Microsoft Windows 95 OSR2 and above (Memphis, etc.)

Installation details for AMD's NDIS 4.x driver are described below.

#### 7.2.1. Microsoft Windows NT

Support is provided for Microsoft Window NT (Version 4.0) environment.

- Notes:**
1. *The directory structure that is provided on the AMD NDIX 4.x driver diskette has been set up for automatic OEM installation. Also, more information can be found in the Microsoft Windows NT User's Guide.*
  2. *Only x86-based Windows NT platforms are supported.*

Follow the steps listed below:

- \_\_1 Insert the AMD NDIS 4.x driver diskette into the floppy drive.
- \_\_2 From the Control Panel in the Windows NT Main window, double click on the Network icon to install the PCnet adapter card.
- \_\_3 From the Network Settings dialog box, choose Adapter and click Add.
- \_\_4 From the Select Network Adapter dialog box, click Have Disk button.
- \_\_5 From the Insert Disk window, enter:  
  
A:\WINNT\MINIPORT\NDIS4
- \_\_6 On completion of the installation, the user will be prompted to shut down the system. When the system comes up again, the network should be up and running.
- \_\_7 Highlight the AMD PCnet adapter in the Network Control Panel and select the File Sharing box. Choose the appropriate box here.
- \_\_8 The experienced user can choose the Advanced button in the Network Control Panel settings and set the appropriate parameters.



## 8. Installing the SCO Unix LLI Driver (ODT 3.0 and below)

Support is provided for the SCO UNIX (Version 3.2.4) environment. The SCO UNIX LLI stream-based driver should be installed from the command line prompt.

**Notes:** 1) Support for Version 3.2.2 is no longer provided by AMD.

2) The directory structure that is provided on the AMD SCO Unix driver diskette has been set up for automatic OEM installation. The OEM Installation section of this manual provides more details regarding OEM driver installation. Also, more information can be found in the SCO UNIX User's Guide.

### 8.1. Driver Installation From The Command Line Prompt

If you currently have an older SCO UNIX driver installed in your system, you should remove it prior to installing a newer version. Use the netconfig and custom utilities to remove the older driver version. Refer to your SCO UNIX OS documentation as needed. After removing your existing driver, you may then proceed with installing a newer SCO UNIX driver.

**Note:** The custom and netconfig utilities are provided by SCO.

Follow the steps listed below:

- \_\_1 Login in as root.
- \_\_2 Insert the AMD SCO UNIX LLI driver diskette into floppy drive A. Make sure the floppy drive in which this diskette is inserted is fd0. This is the default floppy drive where the SCO UNIX custom utility will look for the driver and the corresponding installation script.

- \_\_3 Run the custom utility by typing:

custom

Then press <Enter>

**Note:** If you are using drive B, run the custom utility with the -m option to specify the correct drive where the AMD SCO UNIX LLI driver diskette is located.

- \_\_4 In the custom utility main menu, you will see four main options at the upper left hand corner of the screen (Install, Remove, List, Quit). Use the right/left arrow keys to select the Install option and then press <Enter>.
- \_\_5 Next, use the up/down arrow keys to select A new product and press <Enter>.
- \_\_6 Three options will be displayed (Entire Product, Packages, Files). Select Entire

Product and press <Enter>.

\_\_7 The following message will be displayed:

```
Insert the requested volume and press <Return> to continue the
installation
```

```
Insert:      Distribution
           Floppy Volume 1
```

```
Continue    Quit
```

Press <Enter> to continue.

\_\_8 The following message will be displayed:

```
Installing custom data files...
```

```
Insert the requested volume and press <Return> to continue the
installation
```

```
Insert:      AMD PCnet Family LLI Driver
           Floppy Volume 1
```

```
Continue    Quit
```

Press <Enter> to continue.

\_\_9 The following message will be displayed:

```
Extracting files...
```

```
Checking file permissions...
```

You will then be returned to the custom utility main screen.

\_\_10 Select Quit from the custom utility main options. Answer Yes you want to exit from the custom utility. You will then be returned to the Unix prompt.

\_\_11 Next, run the netconfig utility by typing:

```
netconfig
```

Then press <Enter>.

The netconfig utility is used to configure the SCO UNIX driver for different INT, DMA, and I/O address values. This utility is also used to add the driver to the protocol chain.

**Note:** The netconfig utility modifies the space.c file automatically and must be used in order to get proper support for PCI BIOS API calls.

\_\_12 The following will be displayed:

```
Available options:
 1. Add a chain
 2. Remove a chain
 3. Reconfigure an element in a chain
 q. Quit
Select Option:
```

Select option 1 (Add a chain) by typing:

1

Then press <Enter>.

\_\_13 The following will be displayed:

```
Select top level of chain to Add or q to quit:
```

Select the appropriate top level of chain for your system by entering the appropriate number (Num) value and pressing <Enter>.

\_\_14 Next, select the appropriate number (Num) value for the AMD PCnet Ethernet driver and press <Enter>.

\_\_15 Answer all of the questions asked by netconfig as appropriate for your system. Refer to your SCO UNIX OS documentation as needed. Also, see the *Software Keyword* section in this manual for more details on keyword settings.

**Note:** If you need to modify keyword values, you should edit the *space.c* file as needed. The path for this file is:

```
/etc/conf/pack.d/pnt0/space.c
```

\_\_16 Select Quit from the netconfig utility by typing `q` and then press <Enter>.

\_\_17 At this point, you should relink your kernel and reboot the system. Refer to your SCO UNIX OS documentation as needed.

The installation of the SCO UNIX LLI driver is now complete.

## 8.2. SCO Unix LLI Driver Keywords

Keywords can be added, deleted, and/or modified by manually editing the appropriate `#define` values in the `space.c` file. See Appendix B (*Software Keywords*) and your *SCO UNIX Manuals* for more details. A sample version of this file is listed below:

```

/*****
/*   Copyright (c) 1993 Advanced Micro devices, Inc.
/*
/*   File:          /etc/conf/pack.d/pnt0/space.c
/*   Version:       1.0
/*   Description:    SCO Unix System V/386 Config. file for PCnet family
/*   Author:        Leonid Grossman
/*   Created:       08/20/93
*****/
#include config.h

#if defined(PNT3_UNITS)
#define TOT_UNITS (PNT3_UNITS+PNT2_UNITS+PNT1_UNITS+PNT_UNITS)
#elif defined(PNT2_UNITS)
#define TOT_UNITS (PNT2_UNITS+PNT1_UNITS+PNT_UNITS)
#elif defined(PNT1_UNITS)
#define TOT_UNITS (PNT1_UNITS+PNT_UNITS)
#else
#define TOT_UNITS (PNT_UNITS)
#endif
#define MAX_MINORS 16 /* Please do not modify */
#define TX_BUFFERS_0 16 /* Must be power of 2 (1,2,4,8,...512) */
#define TX_BUFFERS_1 16
#define TX_BUFFERS_2 16
#define TX_BUFFERS_3 16
#define RX_BUFFERS_0 16
#define RX_BUFFERS_1 16
#define RX_BUFFERS_2 16
#define RX_BUFFERS_3 16
#define SCAN_TYPE_0 0 /* 0-all, 1-PCI, 2-PnP, 3-VESA, 4-ISA, 5-PCI1, 6-PCI2 */
#define SCAN_TYPE_1 0
#define SCAN_TYPE_2 0
#define SCAN_TYPE_3 0
#define LED0_0 0xffffffff /* 0xffffffff - defaults */
#define LED0_1 0xffffffff
#define LED0_2 0xffffffff
#define LED0_3 0xffffffff
#define LED1_0 0xffffffff
#define LED1_1 0xffffffff
#define LED1_2 0xffffffff
#define LED1_3 0xffffffff
#define LED2_0 0xffffffff
#define LED2_1 0xffffffff
#define LED2_2 0xffffffff
#define LED2_3 0xffffffff
#define LED3_0 0xffffffff
#define LED3_1 0xffffffff
#define LED3_2 0xffffffff
#define LED3_3 0xffffffff
#define dmarotate_0 0 /* 0 - normal priority, 1 - rotate priority */
#define dmarotate_1 0
#define dmarotate_2 0
#define dmarotate_3 0
#define tp_0 0 /* 0 - the autoselect mode, 1 - the UTP mode */
#define tp_1 0
#define tp_2 0
#define tp_3 0
#define fdup_0 0 /* 0 - default, 1 - AUI, 2 - 10BaseT, 3 - OFF */

```



## Installing The SCO UNIX LLI Driver

```

#define fdup_1 0
#define fdup_2 0
#define fdup_3 0
/* Please do not modify ACCESS_TYPE and LAST_BUS parameters */
/* unless you are sure that the values provided by 'netconfig' are wrong */
#define ACCESS_TYPE_0 0
#define ACCESS_TYPE_1 0
#define ACCESS_TYPE_2 0
#define ACCESS_TYPE_3 0
#define LAST_BUS_0 256
#define LAST_BUS_1 256
#define LAST_BUS_2 256
#define LAST_BUS_3 256

int pnt_MaxStreams = MAX_MINORS;
int pnt_TotalDevCount = TOT_UNITS;

/*
 * Structure used in space.c to pass configuration to driver. This information
 * is copied to the pnt_DeviceStruct structure.
 */

struct pnt_ConfigStruct {
    short index; /* board index */
    short minors; /* minor devices configured */
    short vec; /* interrupt vector # */
    short iobase; /* boards base memory address */
    short ioend; /* Ending base I/O address */
    short dma; /* DMA channel used by the board */
    short tx_buffers; /* Number of Transmit buffers */
    short rx_buffers; /* Number of Receive buffers */
    long bus_scan; /* Bus type to search for */
    long led0; /* LED value */
    long led1; /* LED value */
    long led2; /* LED value */
    long led3; /* LED value */
    long dmarotate;
    long tp;
    long fdup;
    long access_type;
    long last_bus;
};

struct pnt_ConfigStruct pnt_ConfigArray[TOT_UNITS] = {
#ifdef PNT_UNITS
    {0,
     MAX_MINORS,
     PNT_0_VECT,
     PNT_0_SIOA,
     PNT_0_EIOA,
     PNT_CHAN,
     TX_BUFFERS_0,
     RX_BUFFERS_0,
     SCAN_TYPE_0,
     LED0_0,
     LED1_0,
     LED2_0,
     LED3_0,
     dmarotate_0,
     tp_0,
     fdup_0,
     ACCESS_TYPE_0,
     LAST_BUS_0
    }

```

```
#endif
#if defined PNT1_UNITS
    ,{1,
      MAX_MINORS,
      PNT1_0_VECT,
      PNT1_0_SIOA,
      PNT1_0_EIOA,
      PNT1_CHAN,
      TX_BUFFERS_1,
      RX_BUFFERS_1,
      SCAN_TYPE_1,
      LED0_1,
      LED1_1,
      LED2_1,
      LED3_1,
      dmarotate_1,
      tp_1,
      fdup_1,
      ACCESS_TYPE_1,
      LAST_BUS_1
    }
#endif
#if defined PNT2_UNITS
    ,{2,
      MAX_MINORS,
      PNT2_0_VECT,
      PNT2_0_SIOA,
      PNT2_0_EIOA,
      PNT2_CHAN,
      TX_BUFFERS_2,
      RX_BUFFERS_2,
      SCAN_TYPE_2,
      LED0_2,
      LED1_2,
      LED2_2,
      LED3_2,
      dmarotate_2,
      tp_2,
      fdup_2,
      ACCESS_TYPE_2,
      LAST_BUS_2
    }
#endif
#if defined PNT3_UNITS
    ,{3,
      MAX_MINORS,
      PNT3_0_VECT,
      PNT3_0_SIOA,
      PNT3_0_EIOA,
      PNT3_CHAN,
      TX_BUFFERS_3,
      RX_BUFFERS_3,
      SCAN_TYPE_3,
      LED0_3,
      LED1_3,
      LED2_3,
      LED3_3,
      dmarotate_3,
      tp_3,
      fdup_3,
      ACCESS_TYPE_3,
      LAST_BUS_3
    }
#endif
};
```

## 9. Installing The SCO Unix MDI Driver (SCO OpenServer 5.0 and above)

**Note:** For PCnet Software Release 3.x only.

SCO OpenServer 5.0 has built-in support for the PCnet driver. See the SCO documentation for the network driver installation directions.

To upgrade the AMD PCnet driver to the 3.0 Version, follow the steps below:

- \_\_\_1 Copy the install file from the SCOUNIX.50 directory on diskette 6. The file is in DOS format. It can be copied with the `doscp` command or from the DOS MERGE session.
- \_\_\_2 Run `sh install` command to upgrade the PCnet MDI driver package.

### 9.1. SCO Unix MDI Driver Keywords

Keywords can be added, deleted, and/or modified by using the ADVANCED button for PCnet driver during netconfig installation. See Appendix B (*Software Keywords*) and your *SCO UNIX Manuals* for more details. The SCO MDI driver has an additional keyword, `pcnet2`. If set to a non-zero value, the `pcnet2` keyword enables advanced features for the PCnet-PCI2 chip.



## 10. Installing the SCO MDI Driver (Release 4.0)

SCO Open Server 5.0 or 5.0.4 have the AMD pnt driver in their installation CD-ROMs. After the operating system is installed, the updated pnt driver can be installed by following the steps below:

- \_\_1 Boot up the system after inserting the network card.
- \_\_2 Install the older driver that comes with the SCO 5.0 and 5.0.4 CD with `netconfig` and bind with TCPIP. Relink and reboot. To make sure that it works, follow these steps:
  - \_\_2.1 Start NETCONFIG.
  - \_\_2.2 Click and select the following options: Hardware, Add New LAN Adapter, AMD Adapter, and Add Protocol and the other Options.
- \_\_3 Copy the following four files from the updated driver files or from the software Release 4.0 files:

```
driver.o
space.c
space.h
pnt.h
```

- \_\_4 Link the kernel with the command: `/etc/conf/cf.d/link_unix` and then reboot. Make sure the following values are correct in the `/etc/conf/pack.d/space.h` file:

```
PNT_0_PCI_BUS      0
PNT_0_PCI_DEV      14
PNT_0_PCI_FUNC     0
```

The above values are for PCI; those for ISA will be different. Make sure they are not -1.

**Note:** A bug exists during driver removal when using the `netconfig` file. Manually remove the `pnt` directory under `/etc/conf/pack.d`, otherwise the next installation of the `pnt` driver will not work.

## 10.1. SCO MDI Software Release 4.0 Driver Keywords

The Software Release 4.0 pnt driver has additional keywords added to it for the user's convenience. The user may access the `space.c` file in the `/etc/conf/pack.d/pnt/` directory and edit the file to set the following keywords as per the requirement:

```
FULLDUP
Speed100
AUI
MII_EXT_PHY
10BaseT
```

Auto-Negotiation overrides when all the AUI, MII\_EXT\_PHY, and 10BaseT keywords are set to 0. Care should be taken that only one of the interface or none is enabled. If none is enabled, then Auto-Negotiation overrides. Also FULLDUP and Speed100 may be enabled or disabled by setting the values to 0 or 1, respectively.

**Note:** If Speed100 is set to 1 for controllers that support only 10 Mbps data transfer, it is ignored by the driver/controller and the 10 Mbps speed is effective.

### 10.1.1. LED Keywords

The `/etc/conf/pack.d/space.h` file may be edited to reflect the desired values for the LEDs of the controllers. If the user uses the default LEDs, the LEDs reflect the 4.0 specifications. If the user changes the values, the drivers reprogram the LEDs to reflect the desired value. These values may be edited and changed in the `space.h` file to reflect the user's desired values.

**Note:** After making any keyword changes the Unix kernel must be linked with the command `/etc/conf/cf.d/link_unix` and rebooted for the changes to be effective.

The `space.c` and `space.h` files are provided below for reference.

```

/*****
                                space.c
*****/

#include sys/types.h
#include sys/stream.h
#include sys/mdio.h
#include sys/pci.h
#include pnt.h
```

```

#include config.h
#include space.h

#define MAX_MINORS 16

int    pnt_MaxStreptnt = MAX_MINORS;
int    pnt_TotalDevCount = PNT_CNTLS;

/* kathyp */
int    Fulldup=0;
int    Speed100=0;
int    Aui=0;
int    TenBaseT=0;
int    MII_ExtPhy=1;

struct pnt_ConfigStruct pnt_ConfigArray[PNT_CNTLS] = {
#ifdef PNT_0
    {0,
     MAX_MINORS,
     PNT_0_VECT,
     PNT_0_SIOA,
     PNT_0_EIOA,
     PNT_0_DMA,
     PNT_0_TX_BUFFERS,
     PNT_0_RX_BUFFERS,
     PNT_0_LED0,
     PNT_0_LED1,
     PNT_0_LED2,
     PNT_0_LED3,
     PNT_0_DMAROTATE,
     PNT_0_TP,
     PNT_0_FDUP,
     PNT_0_PCNET2,
     PNT_0_PCI_BUS,
     PNT_0_PCI_DEV,
     PNT_0_PCI_FUNC
    }
#endif
#ifdef PNT_1
    ,{1,
     MAX_MINORS,
     PNT_1_VECT,
     PNT_1_SIOA,
     PNT_1_EIOA,
     PNT_1_DMA,
     PNT_1_TX_BUFFERS,
     PNT_1_RX_BUFFERS,
     PNT_1_LED0,
     PNT_1_LED1,
     PNT_1_LED2,
     PNT_1_LED3,
     PNT_1_DMAROTATE,
     PNT_1_TP,
     PNT_1_FDUP,
     PNT_1_PCNET2,
     PNT_1_PCI_BUS,
     PNT_1_PCI_DEV,
     PNT_1_PCI_FUNC
    }
#endif
#ifdef PNT_2
    ,{2,
     MAX_MINORS,
     PNT_2_VECT,
     PNT_2_SIOA,

```

```

        PNT_2_EIOA,
        PNT_2_DMA,
        PNT_2_TX_BUFFERS,
        PNT_2_RX_BUFFERS,
        PNT_2_LED0,
        PNT_2_LED1,
        PNT_2_LED2,
        PNT_2_LED3,
        PNT_2_DMAROTATE,
        PNT_2_TP,
        PNT_2_FDUP,
        PNT_2_PCNET2,
        PNT_2_PCI_BUS,
        PNT_2_PCI_DEV,
        PNT_2_PCI_FUNC
    }
#endif
#if defined PNT_3
    {3,
    MAX_MINORS,
    PNT_3_VECT,
    PNT_3_SIOA,
    PNT_3_EIOA,
    PNT_3_DMA,
    PNT_3_TX_BUFFERS,
    PNT_3_RX_BUFFERS,
    PNT_3_LED0,
    PNT_3_LED1,
    PNT_3_LED2,
    PNT_3_LED3,
    PNT_3_DMAROTATE,
    PNT_3_TP,
    PNT_3_FDUP,
    PNT_3_PCNET2,
    PNT_3_PCI_BUS,
    PNT_3_PCI_DEV,
    PNT_3_PCI_FUNC
    }
#endif
};
extern int pntopen(), pntclose(), pntuwput();
extern int nulldev();
struct module_info pnt_minfo = {
    0, pnt, 14, 1514, 16*1514, 12*1514
};
struct qinit pnturinit = {
    0, 0, pntopen, pntclose, nulldev, &pnt_minfo, 0
};
struct qinit pntuwinit = {
    pntuwput, 0, pntopen, pntclose, nulldev, &pnt_minfo, 0
};
struct streamtab pntinfo = {
    &pnturinit, &pntuwinit, 0, 0
};
};
/*****
    @(#) space.h 7.1 94/12/19 SCOINC
*****/

/* DMA channel - modified for jumpered ISA adapters */
#define PNT_0_DMA -1
#define PNT_1_DMA -1
#define PNT_2_DMA -1
#define PNT_3_DMA -1

/* Number of transmit buffers */
#define PNT_0_TX_BUFFERS 32
#define PNT_1_TX_BUFFERS 32

```



```

#define PNT_2_TX_BUFFERS 32
#define PNT_3_TX_BUFFERS 32

/* Number of receive buffers */
#define PNT_0_RX_BUFFERS 16
#define PNT_1_RX_BUFFERS 16
#define PNT_2_RX_BUFFERS 16
#define PNT_3_RX_BUFFERS 16

/* 10-BaseT enforced if non-zero */
#define PNT_0_TP 0
#define PNT_1_TP 0
#define PNT_2_TP 0
#define PNT_3_TP 0

/* LED0 value */
#define PNT_0_LED0 0xc0
#define PNT_1_LED0 0xc0
#define PNT_2_LED0 0xc0
#define PNT_3_LED0 0xc0

/* LED1 value */
#define PNT_0_LED1 0xb0
#define PNT_1_LED1 0xb0
#define PNT_2_LED1 0xb0
#define PNT_3_LED1 0xb0

/* LED2 value */
#define PNT_0_LED2 0x4088
#define PNT_1_LED2 0x4088
#define PNT_2_LED2 0x4088
#define PNT_3_LED2 0x4088

/* LED3 value */
#define PNT_0_LED3 0x81
#define PNT_1_LED3 0x81
#define PNT_2_LED3 0x81
#define PNT_3_LED3 0x81

/* FULL DUPLEX enabled */
#define PNT_0_FDUP 0
#define PNT_1_FDUP 0
#define PNT_2_FDUP 0
#define PNT_3_FDUP 0

/* DMA controller in rotate priority mode */
#define PNT_0_DMAROTATE 0
#define PNT_1_DMAROTATE 0
#define PNT_2_DMAROTATE 0
#define PNT_3_DMAROTATE 0

/* Advanced PCnet features */
#define PNT_0_PCNET2 0
#define PNT_1_PCNET2 0
#define PNT_2_PCNET2 0
#define PNT_3_PCNET2 0

/* PCI bus number */
#define PNT_0_PCI_BUS 0
#define PNT_1_PCI_BUS -1
#define PNT_2_PCI_BUS -1
#define PNT_3_PCI_BUS -1

/* PCI device number */
#define PNT_0_PCI_DEV 14
#define PNT_1_PCI_DEV -1
#define PNT_2_PCI_DEV -1

```

```
#define PNT_3_PCI_DEV -1

/* PCI adapter function number */
#define PNT_0_PCI_FUNC 0
#define PNT_1_PCI_FUNC -1
#define PNT_2_PCI_FUNC -1
#define PNT_3_PCI_FUNC -1
```

# 11. Installing The SCO Unixware 1.1 DLPI Driver

Support is provided for the SCO Unixware (Version 1.1) environment. AMD's Unixware driver is compliant with AT&T's Data Link Provider Interface (DLPI) specification. The Unixware driver can be installed using the Unixware Desktop Graphical User Interface (GUI) or from the Unixware command line prompt. Both methods are explained below.

## 11.1. Driver Installation Using The Desktop GUI

If you currently have an older Unixware driver installed in your system, you should remove it prior to installing a newer version. After removing your existing driver, you may then proceed with installing a newer Unixware driver. Follow the steps listed below:

\_\_1 In the Unixware Desktop window, double click on the System\_Setup icon.

\_\_2 In the System Setup window, double click on the Appl-n\_Setup icon. The following message will be displayed:

```
Cataloging applications on your system;  
Please wait
```

Wait for the system to catalog existing Applications/Sets currently installed.

\_\_3 Insert the AMD Unixware DLPI driver diskette into drive A.

\_\_4 From the Application Setup menu bar, select View.

\_\_5 From the View drop down menu, select Uninstalled Appl'ns.

\_\_6 From the Uninstalled Appl'ns drop down menu, select Disk\_A. The following message will be displayed:

```
Cataloging applications on Disk_A;  
Please wait
```

Wait for the system to catalog existing Applications/Sets currently on Disk A.

\_\_7 Select the pnt icon by clicking on it.

\_\_8 From the Application Setup menu bar, select Application.

\_\_9 From the Application drop down menu, select Install.

- \_\_10 A new window will then open entitled, Add Application: pnt. The following message will be displayed:

```
PROCESSING:
Package:      Advanced Micro Devices PCnet Family driver (pnt)
from <diskette1>.
```

Wait for the system to process the AMD Unixware driver.

- \_\_11 Next, within the Add Application: pnt window, you will see the Adapter Selection Menu with the following:

```
AMD PCnet (PNT): 0
```

Replace the 0 by typing:

```
1
```

The press <Enter>.

**Note:** At this time AMD's Unixware driver only supports one adapter.

The Apply box is then highlighted. Press <Enter> to continue.

- \_\_12 Next, within the Add Application: pnt window, you will see the PNT Parameter Selection menu with the following:

```
Interrupt vector: 0
I/O address: 0 0
DMA: 0
```

If you are using a PCnet-ISA adapter card, then go to step 14.1 below. If you are using a PCnet-ISA+, PCnet-ISA II, PCnet-32, or PCnet-PCI adapter card, then go to step 12.2 below.

\_\_12.1 For a PCnet-ISA adapter card:

- a. You must know what your card's IRQ (interrupt vector), I/O base address, and DMA values are.
- b. Use the right arrow key to select the appropriate IRQ value for your card and then the down arrow key to move to the next field.
- c. After filling in each field, press the down arrow key to highlight the Apply box and then press <Enter>.
- d. Go to step 13 below to continue.

\_\_12.2 For PCnet-ISA+, PCnet-ISA II, PCnet-32, PCnet-PCI adapter cards:

- a. Leave the I/O base address and DMA values set to 0.
- b. An auto scan will be performed to detect the proper I/O base address and DMA values automatically. However, note that the IRQ (interrupt vector) value will also be automatically detected, but cannot be installed dynamically.
- c. If you know the correct IRQ value, enter it in the interrupt vector field, press the down arrow key to highlight the Apply box, and then press <Enter>. Go to step 13 below to continue.
- d. If you do not know the correct IRQ value, enter a guess (e.g., 5 ), press the down arrow key to highlight the Apply box, and then press <Enter>.
- e. If you happen to guess the correct IRQ value, you will not get an IRQ mismatch message and the installation process will continue. Go to step 13 below to continue.
- f. Most likely, you will get an IRQ mismatch. In this case, you need to re-boot the system and restart the installation process.
- g. As the system comes up during the reboot you will get a WARNING message instructing you to run your setup again with a specified IRQ value. Write this IRQ value down and restart the installation process from step 1 above.
- h. When you reach step 12.2 again, use the IRQ value you wrote down and use it to fill in the interrupt vector field leaving the other two fields set to 0. Press the down arrow key to highlight the Apply box, and then press <Enter>.
- i. Go to step 13 below to continue.

\_\_13 The following message will be displayed:

```
## Installing part 1 of 1
```

Wait for the system to install the Unixware driver.

\_\_14 The following message will be displayed:

```
Click Exit to terminate pkgadd
```

Click on the Exit button.

- \_15 The following message will be displayed at the bottom of the Application Setup window:

```
Software installation of pnt succeeded
```

The installation of the Unixware DLPI driver is now complete.

**Note:** You should now attach the network to the driver by running:

```
/etc/confnet.d/configure -i
```

*Refer to your Unixware OS documentation as needed.*

## 11.2. Driver Installation From The Command Line Prompt

If you currently have an older Unixware driver installed in your system, you should remove it prior to installing a newer Version. After removing your existing driver, you may then proceed with installing a newer Unixware driver. Follow the steps listed below:

- \_\_1 At the Unixware prompt, type the following:

```
pkgadd -d diskette1
```

Then press <Enter>.

- \_\_2 The following message will be displayed:

```
Insert diskette into Floppy Drive 1.  
Type [go] when ready, (default: go)  
or [q] to quit:
```

Insert the AMD Unixware DLPI driver diskette into drive A. Then press <Enter> to accept the default value of go to start the installation process.

- \_\_3 The following message will be displayed:

```
Installation in progress. Do not remove the diskette.  
  
The following packages are available:  
1      pnt      Advanced Micro Devices PCnet Family driver  
          (i386) 1  
  
Select package(s) you wish to process (or 'all' to  
process all packages). (default: all) [?,??,q]
```

Type the following:

```
1
```

Then press <Enter> to select the pnt package.

\_\_4 The following message will be displayed:

```
PROCESSING:
Package:    Advanced Micro Devices PCnet Family driver (pnt) from
<diskette1>.
```

Wait for the system to process the pnt package.

\_\_5 Next, you will see the Adapter Selection Menu with the following:

```
AMD PCnet (PNT): 0
```

Type the following:

```
1
```

Then press <Enter>.

**Note:** At this time AMD's Unixware driver only supports one adapter.

The Apply box is then highlighted. Press <Enter> to continue.

\_\_6 Next, you will see the PNT Parameter Selection menu with the following:

```
Interrupt vector: 0
I/O address: 0 0
DMA: 0
```

If you are using a PCnet-ISA adapter card, then go to step 6.1 below. If you are using a PCnet-ISA+, PCnet-ISA II, PCnet-32, or PCnet-PCI adapter card, then go to step 6.2 below.

\_\_6.1 For a PCnet-ISA adapter card:

- a. You must know what your card's IRQ (interrupt vector), I/O base address, and DMA values are.
- b. Use the right arrow key to select the appropriate IRQ value for your card and then the down arrow key to move to the next field.
- c. After filling in each field, press the down arrow key to highlight the Apply box and then press <Enter>.
- d. Go to step 7 below to continue.

\_\_6.2 For PCnet-ISA+, PCnet-ISA II, PCnet-32, PCnet-PCI adapter cards:

- a. Leave the I/O base address and DMA values set to 0.

- b. An auto scan will be performed to detect the proper I/O base address and DMA values automatically. However, please note that the IRQ (interrupt vector) value will also be automatically detected, but cannot be installed dynamically.
- c. If you know the correct IRQ value, enter it in the interrupt vector field, press the down arrow key to highlight the Apply box, and then press <Enter>. Go to step 7 below to continue.
- d. If you do not know the correct IRQ value, enter a guess (e.g., 5), press the down arrow key to highlight the Apply box, and then press <Enter>.
- e. If you happen to guess the correct IRQ value, you will not get an IRQ mismatch message and the installation process will continue. Go to step 7 below to continue.
- f. Most likely, you will get an IRQ mismatch. In this case, you need to reboot the system and restart the installation process.
- g. As the system comes up during the reboot you will get a **WARNING** message instructing you to run your setup again with a specified IRQ value. Write this IRQ value down and restart the installation process from step 1 above.
- h. When you reach step 6.2 again, use the IRQ value you wrote down in the interrupt vector field leaving the other two fields set to 0. Press the down arrow key to highlight the Apply box, and then press <Enter>.
- i. Go to step 7 below to continue.

\_\_\_7 The following message will be displayed:

```
## Processing package information
## Processing system information
## Verifying package dependencies
```

Followed by:

```
## Installing part 1 of 1.
```

Followed by:

The following loadable modules will be configured now:

```
pnt
```

Module configuration is completed.



The Unix Operating System kernel will be rebuilt to include your configuration changes during the next system reboot.

Followed by:

Installation of Advanced Micro Devices PCnet Family driver (pnt) was successful.

\_\_8 The following message will be displayed:

```
Insert diskette into Floppy Drive 1.  
Type [go] when ready, (default: go)  
or [q] to quit:
```

Type `q` and then press <Enter> to quit the installation. You will then be returned to the Unix prompt.

The installation of the Unixware DLPI driver is now complete.

**Note:** You should now attach the network to the driver by running:

```
/etc/confnet.d/configure -i
```

*Refer to your Unixware OS documentation as needed.*

### 11.3. Unixware 1.1 DLPI Driver Keywords

Keywords can be added, deleted, and/or modified by manually editing the appropriate `#define` values in the `space.c` file. See Appendix B (*Software Keywords*) and your *SCO Unixware Manual* for more details. A sample version of this file is listed below:

```
#ident %W%
#ident $Header: $

#include <sys/types.h>
#include <sys/stream.h>
#include <sys/dlpi_ether.h>
#include <config.h>

#define NSAPS      8
#define MAXMULTI   8
#define INETSTATS  1
#define STREAMS_LOG 0
#define IFNAME      pnt

#define PNT_TX_BUF  16
#define PNT_RX_BUF  16

int pnt_TotalDevCount    = PNT_CNTLS;
int pnt_MaxStreams       = NSAPS;
int pntboards            = PNT_CNTLS;
int pntstrlog            = STREAMS_LOG;
char *pnt_ifname         = IFNAME;

DL_bdconfig_t pntconfig[ PNT_CNTLS ] = {
#ifdef PNT_0
{
    PNT_CMAJOR_0,
    PNT_0_SIOA,
    PNT_0_EIOA,
    PNT_0_SCMA,
    PNT_0_ECMA,
    PNT_0_VECT,
    NSAPS,
    0
}
#endif
}; struct pnt_ConfigStruct {
    short index;
    short minors;
    short vec;
    ushort iobase;
    ushort ioend;
    short dma;
    short tx_buffers;
    short rx_buffers;
    long bus_scan;
    long led0;
    long led1;
    long led2;
    long led3;
    long dmarotate;
    long tp;
    long fdup;
    long fast_isa;
};
```

```

struct pnt_ConfigStruct pnt_ConfigArray[PNT_CNTLS] = {
#ifdef PNT_0
{
    0,
    NSAPS,
    PNT_0_VECT,
    PNT_0_SIOA,
    PNT_0_EIOA,
    PNT_CHAN,
    PNT_TX_BUF,
    PNT_RX_BUF,
    0, /* bus to scan, MUST be set to 5 (PCI1) on PCI 1 machines */
    0, /* led 0 */
    0, /* led 1 */
    0, /* led 2 */
    0, /* led 3 */
    0, /* dmarotate */
    0, /* TP */
    0, /* full duplex */
    0 /* fast isa*/
}
#endif
};

```



## 12. Installing The SCO Unixware 2.X DLPI Driver

The SCO Unixware 2.x has built-in support for the PCnet driver.

- \_\_\_1 Use the Unixware `dcu` utility to install the built-in PCnet driver. For help, see the SCO Unixware manual.
- \_\_\_2 To upgrade to a new version of the driver, copy `Driver.o` and `space.c` from Disk 2 of the AMD drivers to `/etc/conf/pack.d/pnt` directory.  
*Note: These files are in DOS format in Unixware 2.0 directory on the AMD diskette and can be copied using the `doscp` command or from the DOS MERGES session.*
- \_\_\_3 Rebuild the kernel with `/etc/conf/bin/idbuild` command.

### 12.1. Unixware 2.x DLPI Driver Keywords

Keywords can be added, deleted, and/or modified by manually editing the appropriate `#define` values in the `space.c` file. See Appendix B (*Software Keywords*) and your *SCO Unixware Manuals* for more details. For the sample version of this file, see the *Unixware 1.1* section. The PCnet driver for Unixware 2.x has an additional keyword, `pcnet2`. If set to a non-zero value, this keyword enables advanced features for the PCnet-PCI2 chip.



## 13. Installing the VxWorks Driver

### 13.1. Introduction

The VxWorks Ethernet Device driver is compatible with the PCnet-PCI II and the PCnet-FAST network controllers. The source code of the driver is integrated and compiled in the VxWorks operating system, and the boot image of the standalone VxWorks (Vxworks.st) is loaded onto the floppy diskette. This diskette may be used as a boot diskette to load the VxWorks operating system.

### 13.2. Installation Procedure

To install, follow the steps listed below:

- \_\_1 Insert the floppy diskette into the floppy drive and boot up the system with the VxWorks operating system.
- \_\_2 Refer to the VxWorks 5.3.1 Programmer's Guide to mount the hard disk and also to attach the network interface card. The command to attach the network card is:

```
usrNetInit()
```

- \_\_3 The initial network address and the host address are obtained from the boot parameters. To change the network interface address, use the command:

```
ifAddrSet. Eg: ifAddrSet( InPci , 139.95.95.1 )
```

- \_\_4 In order to add other hosts to connect to the VxWorks system, user the command:

```
hostadd()
```

with the appropriate parameters.





## 14. Installing the SunSoft Solaris Driver

Support is provided for the SunSoft Solaris x86 (Version 2.1) environment. To install AMD's Solaris driver, follow the steps listed below:

\_\_1 Login as root.

\_\_2 At the prompt, type:

```
pkgadd -d <devname> pnt
```

Where <devname> is the floppy drive (/dev/fd0). That is, the above line should look like the following:

```
pkgadd -d /dev/fd0 pnt
```

For more information, see the man page for pkgadd (enter `man pkgadd` for help). Then press <Enter>.

\_\_3 Insert the AMD Solaris driver diskette into the floppy drive.

\_\_4 Enter the path to the package base directory (/kernel/drv).

\_\_5 Enter the path where you want the driver object installed (/kernel/drv).

\_\_6 The pkgadd application now installs:

```
/kernel/drv/pnt
/kernel/drv/pnt.conf
```

\_\_7 Wait for the process to complete.

\_\_8 Change into the directory where you installed the driver object (`cd /kernel/drv`).

\_\_9 Edit the pnt.conf file (`vi pnt.conf`). For more information, see the man page on driver.conf for help (`man driver.conf`). Make the following changes:

- a. Change `name` to indicate the driver name (`name = pnt`).
- b. Change `class` to indicate the system bus type (`class = sysbus`).
- c. Change `dmachan` to indicate the DMA channel (`dmachan = 5` for PCnet-ISA).
- d. Change `intr` to indicate the interrupt handle and line (`intr = 5,5` for PCnet-ISA).
- e. Delete additional entries in the table to reflect the number of PCnet cards in

the system.

Example (for PCnet-ISA):

```
name= pnt  class= sysbus  dmachan=5  intr=5,5  reg=0,0,0;
```

\_\_10 At the prompt, type the following:

```
add_drv pnt
```

Then press <Enter>. For more information, see the man page on add\_drv for help (man add\_drv).

\_\_11 Edit the hosts file (vi /etc/hosts). Make the following changes:

Add the IP address, hostname, and set entry as loghost.

**Note:** Remove default local host entries.

For example,

```
if IPaddress = 77.0.12.4
    hostname = Solaris-24-1

127.0.0.1    localhost        #loghost      #Solaris-24-1
77.0.12.4    loghost          Solaris-24-1
```

\_\_12 Edit the hostname.pcn0 file (vi /etc/hostname.pnt0). Enter the hostname in the file. For example,

```
if hostname = Solaris-24-1

Solaris-24-1
```

\_\_13 Edit the netmasks file (vi /etc/netmasks). Add the entry to conform to network requirements. For example,

```
if IPaddress = 77.0.12.4
```

and you wish to limit access to the local segment

```
77.0.12.4    255.255.255 0
```

This will permit the system to recognize stations with IP addresses between 77.0.12.0 and 77.0.12.255.

\_\_14 Reboot the system (shutdown -g0).

The following message is displayed during the reboot phase:

```
configuring network interfaces: pnt0
```

The installation of the SunSoft Solaris driver is now complete.

## 14.1. SunSoft Solaris Driver Keywords

See Table 5 for SunSoft Solaris Driver Keywords.

**Table 2. SunSoft Solaris Driver Keywords**

Keyword Description	Keyword Name	Additional Keyword Details	Range	Default
Driver name	name= pnt	This is required.	N/A	N/A
Driver class	class= sysbus	This indicates the system bus not the device type.	N/A	N/A
Interrupt	[intr=5,x]	See Common Keywords.		
I/O Address	[ioaddr= io_addr]	See Common Keywords.		
DMA	[dmachan= dma_no]	See Common Keywords. (ISA only)		
Full Duplex	FDUP	FDUP keyword is used to enable or disable full duplex on the 10BaseT and AUI ports. See Common Keywords.	UTP AUI OFF	Not Present (What is in the EEPROM)



## 15. Installing the Packet Driver

The AMD Packet driver for the PCnet architecture (backward compatible to the Am2100/Am1500T) is based on the packet driver from Clarkson University.

### 15.1. Driver Installation Using The AMINSTAL Utility

Follow the steps listed below:

- \_\_1 Run the AMINSTAL Utility to configure your PCnet adapter card's I/O base address, IRQ channel, and DMA channel.

*See the AMINSTAL Utility section for more information on configuring your PCnet adapter card.*

Once you have completed the configuration of your PCnet adapter card using AMINSTAL, go to step 2 below to continue.

- \_\_2 Select the Continue button in the Configuration dialog box. The Installation dialog box will appear.
- \_\_3 Select the desired PCnet adapter card by highlighting it in the top of the dialog box.
- \_\_4 Highlight the Packet driver to install the driver. Change the default path if necessary. The default directory is: C:\PKTDREV.
- \_\_5 Press the Continue button to complete the installation. AMINSTAL will copy the selected driver file into the specified directory and create a sample AUTOEXEC.NET file in the specified directory.

The AUTOEXEC.NET file contains the following:

```
PCNTPK INT=0x60 IOADDRESS=<ioaddress> IRQ=<irq> DMA=<dma>
```

**Note:** The Packet driver uses a software interrupt to provide a handle for a TCP driver to automatically scan. The software interrupt range is 0x60-66. The AMINSTAL utility uses a default value for INT of 0x60. If there is a conflict with other software settings, please change this setting by editing the AUTOEXEC.NET file.

- \_\_6 Exit AMINSTAL when the installation has been completed. The user may need to make modifications to the system files, using the AMD sample files as reference.

The installation of the Packet driver is now complete.

## 15.2. Driver Installation From The Command Line Prompt

Source and executable code for the DOS version of the packet driver is provided. A number of other utilities (including source) which run above the packet driver are also provided, as well as a number of documentation files.

It is recommended that you read all of the information available. The most important file to start reading is `install.doc`. Utilities are also described in this file.

Copy the AMD Packet driver (PCNTPK.COM) into a directory. The packet driver can be loaded from the DOS prompt or from the AUTOEXEC.BAT file.

The command line format for the packet driver is:

```
PCNTPK [-n] [-d] [-w] <INT=packet_int_no> [IRQ=int_no]
      [IOADDR=io_addr] [DMA=dma_no] [BUSTYPE=bus]
      [DMAROTATE] [TP] [LED0=xx] [LED1=xx] [LED2=xx]
      [LED3=xx] [FDUP=xx]
```

When using Windows, use either the -w option or the WINPKT Utility (see `install.doc`). If the [IRQ=int\_no], [IOADDR=io\_addr], and [DMA=dma\_no] are not specified for the PCnet-ISA adapter card, the default values are assumed by the packet driver.

**Note:** The following:

```
INT=packet_int_no
```

*is a handle for an upper layer interface (normally 0x60-66). This is not optional. An upper layer application such as TCP scans for the INT handle between 0x60-66.*

Additional common keywords may be specified. Please refer to the *Software Keywords* section (Appendix B) in this manual for more information.

## 15.3. Keyword Example

An example command line is as follows:

```
PCNTPK INT=0x60 IRQ=3 IOADDR=0x300 DMA=5
```

## 15.4. Packet Driver Keywords

See Table 6 for Packet Driver Keywords.

**Table 3. Packet Driver Keywords**

Keyword Description	Keyword Name	Additional Keyword Details	Range	Default
Packet converter	[-n]	The -n option converts Ethernet type 8137 and Novell PSO-like packets. This is required if you use a standard boot ROM from AMD and use the Packet driver and IPX included in the Packet Driver package as the drivers load from the boot image file.	N/A	Not Enabled
Initialization delay	[-d]	The -d option delays initialization. The -d option will keep the initialization code after loading. This is required for boot ROM support.	N/A	Not Enabled
Windows option	[-w]	The -w switch is used for Windows. Install the Packet Driver before running MS-Windows. This switch does not prevent Windows from swapping the network application out of memory, it simply detects when that has happened, and drops the packet. See the WINPKT Utility for enhanced mode applications.	N/A	Not Enabled
Software Interrupt	<INT= packet_int_no >	This is the software interrupt used to communicate with the packet driver. See Appendix A of the install.doc file for more details.	0x60-0x66	0x60

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Keyword Description	Keyword Name	Additional Keyword Details	Range	Default
I/O Address	[IOADDR= io_addr]	See Common Keywords		
DMA	[DMA= dma_no]	See Common Keywords.		
Full Duplex	FDUP  * Supported on PCnet-ISA II only	FDUP keyword is used to enable or disable full duplex on the 10BaseT and AUI ports. See Common Keywords.	UTP AUI OFF	Not Present (What is in the EEPROM)

**Note:** Keyword options for the Packet driver may be activated by loading the driver at the command line or loading the driver from a batch file like AUTOEXEC.BAT.



## 16. Installing the DMI Component Interface (CI)

### 16.1. Desktop Management Interface (DMI)

The DMI brings manageability and intelligence to computer systems such as desktop PCs and servers, allowing vendors to easily add manageability to their products. The DMI works synergistically with existing standards such as Plug 'n' Play and Simple Network Management Protocol (SNMP). Specifically, AMD's DMI support (MIF file and Instrumentation) extends to the following drivers:

- NDIS 2 DOS driver
- NDIS 2 OS/2 driver
- NDIS 3 Windows for Workgroups driver
- ODI DOS client driver
- ODI OS/2 client driver

The DMI is a local interface to be used within a single system. It provides a means by which component instrumentation developed by multiple vendors can interplay within a single system to uniformly provide management information. The Desktop Management Task Force's (DMTF) DMI interface consists of the following elements:

- The Service Layer (SL), a local program that collects information from components, manages that information through the MIF database, and passes the information to management applications as requested. It controls communication between itself and management applications by means of the Management Interface (MI), and between itself and manageable products by means of the Component Interface (CI). See the *DMI Specification* for detailed information.
- The MIF database, which contains the information about the products installed on or attached to the system. The Service Layer manages the information in the database. The information comes from MIF files provided with each manageable product. See the *DMI Specification* for detailed information.
- Management applications, remote or local programs for interrogating, changing, controlling, tracking, and listing the elements of a desktop system. A management application can be a graphical user interface program, a network management agent, an installer program, a diagnostics program, or a remote procedure call. See the *DMI Specification* for detailed information.
- Manageable products, also called *components*, are hardware, software, or peripherals that occupy or are attached to a desktop computer, such as hard disks, word processors, CD-ROMs, printers, motherboards, operating systems,

spreadsheets, graphics cards, sound cards, and modems. Each product provides information to the MIF database by means of a MIF file that contains the pertinent management information for that product. See the *DMI Specification* for detailed information.

The DMI structure is shown in Figure 9 below.

### 16.1.1. Service Layer

The Service Layer (SL) is the system-resident program that manages all DMI activities. It is a background task or process that is always ready for a request from a management application or managed components. There are specific implementations of the Service Layer for different operating systems and environments. Refer to the *DMI Specification* for installation procedures.

### 16.1.2. Component Interface (CI)

The CI, an integral part of the SL, handles communication between component instrumentation and the SL. It shields vendors from the complexity of management information encoding and minimizes the responsibilities of the instrumentation.

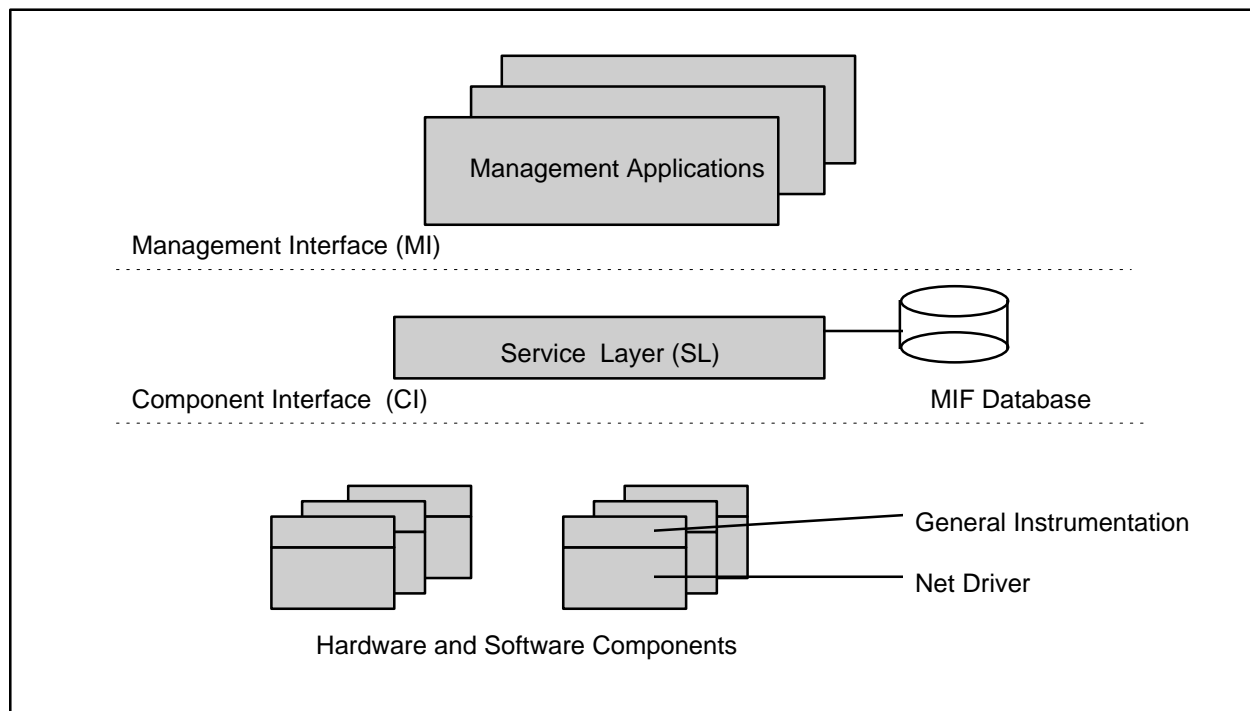


Figure 9. Desktop Management Interface Structure

## 16.2. DMI Installation Program (DMI Version 1.1)

The DMI Installation program edits the PCNET.MIF file and copies the DMI instrumentation files and the MIF file as follows:

PCNET.MIF	C:\DMI\DOS\MIFS\BACKUP
PCNET.OVL	C:\DMI\DOS\BIN
PCNET.EXE	C:\DMI\WIN16\BIN

The installation program performs the following edits to the PCNET.MIF file:

1. Chooses comment or uncomment the path string for the DOS overlay instrumentation, depending on whether the target driver (the driver that is going to be used in the system) is the Windows for Workgroups v3.11 NDIS 3 driver or one of the DOS drivers: NDIS 2 or ODI (comment for the former and uncomment for the latter).
2. Inserts the serial number in the 'Value' section of the 'Serial number' attribute field.
3. Inserts the installation date in the 'Value' section of the 'Installation' attribute field.
4. Inserts the connector type in the 'Value' section of the 'Connector type' attribute field.

These edits can be done manually if desired. A properly edited MIF file can be installed with any DMI management application that supports a MIF install feature such as the browser provided with the DMI SDK.

### 16.2.1. Invoking DMINSTL

To invoke the AMD DMI installation utility from the distribution diskettes, insert diskette 6 into the A: drive. Issue the following commands (assuming the diskette has the write-protect feature *disabled*):

```
A:>CD \DMI
A:\DMI>DMINSTL
```

The installation program can be copied to a directory on the target system and executed from there. The only limitation is that the files to be installed reside in the same directory as the installation program proper (this is true for installation from the floppy drive as well).

**Note:** When performing the DMI installation using the AMD DMI Installation Utility (DMINSTL), remove all TSRs that are not essential to the installation. For example, if installing on an MS-DOS V6.2 system, pressing the F5 key while the message, "Starting MS-DOS..." is displayed will bypass the system startup files and boot a clean system

startup. If using an earlier version of DOS (e.g., V3.3), booting from a floppy without the CONFIG.SYS and AUTOEXEC.BAT file will achieve the same result. Once the system has been started using this method, the DMI installation program can be used to install DMI support for the PCnet drivers.

#### **16.2.1.1. Directory Structure**

DMINSTL expects the following directory structure to exist in the target environment. If the directory structure does not exist, the installation program will create it. See Figure 10.

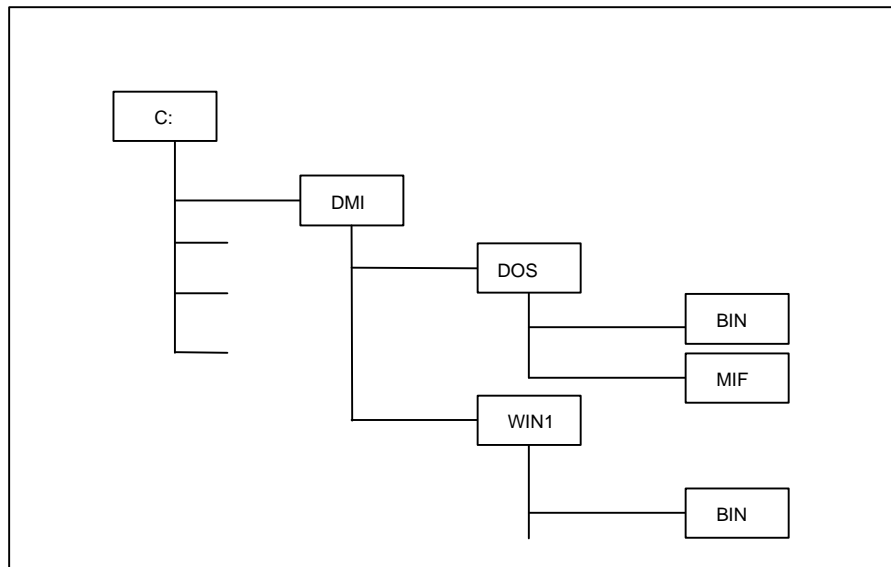


Figure 10. Directory Structure

#### **16.2.1.2. DMINSTL Interaction With SL**

DMINSTL interacts with the service layer in one of two ways. If the SL is loaded, the installation program invokes it as required to perform the installation. If the SL is not loaded, DMINSTL loads it before continuing. Once the installation completes, the SL is unloaded if DMINSTL loaded it. If the SL is not available on the target system, DMINSTL copies the PCNET.MIF file both to the C:\DMI\DOS\MIFS and C:\DMI\DOS\MIFS\BACKUP directories.

#### **16.2.1.3. Moving Between Fields**

Once the installation program has been invoked, it presents a forms based interface with two text input fields and two pull-down menu fields. To move between the fields, the TAB key is pressed repeatedly until the cursor enters the desired text input field, or until the desired pull down menu field is highlighted.

### 16.2.2. Editing Input

#### 16.2.2.1. Text Edit Fields

When the cursor enters a text input field, three actions can be effected on the field itself. The cursor can be advanced one character position for each press of the right-arrow key except at the rightmost position of the field where the cursor ceases to advance. By pressing the left-arrow key, the cursor can be moved to the left by one character position in the same manner as when moving it to the right. Finally, characters entered into the field are placed at the current cursor position and the cursor is advanced by one position to the right. Again, at the end of the field, the character is inserted but the cursor is not advanced.

#### 16.2.2.2. Pull Down List

When the cursor is placed in a pull down menu field, the field is highlighted. To display the pull down list, press the down-arrow key while holding down the ALT key. Once displayed, the items in the list can be highlighted by using the up and down arrow keys. Pressing the Enter key selects the highlighted item and hides the pull down list. To hide the pull down list without making a selection, press the ESC key.

### 16.2.3. Starting the Installation Program

The F10 key is used to instruct DMINSTL to begin the actual installation process. After filling all the fields as desired, press F10. See the subparagraphs below to get a description of the fields.

DMINSTL will display a progress dialog in the center of the screen. The dialog will alternately draw and erase a blue bar in the center of the screen to demonstrate that the installation is progressing. Once the installation completes, one of two actions will occur. If the installation succeeded, a dialog box appears indicating the success of the operation and the Component ID assigned to the driver. If the installation fails, a message box appears indicating the source of the failure. Again, a key must be pressed to clear the message.

#### 16.2.3.1. Serial Number

The Serial Number field is used to enter the serial number of the network adapter card package. The number can usually be found on the outside of the package or on the distribution media. The purpose of this field is to allow the serial number of the package to be readily retrieved in case it is required for any purpose such as technical assistance. The Serial Number field is a straight text field. This means that it will accept any text (letters or numbers) that is typed into it.

#### **16.2.3.2. Installation Date**

The Installation Date field is initialized to the system date and time. The field uses the following format.

mmm dd HH:MM:SS yyyy

The 'mmm' portion represents the month. The following values are accepted:

Jan	Apr	Jul	Oct
Feb	May	Aug	Nov
Mar	Jun	Sep	Dec

The 'dd' subfield represents the day of the month and can be any legal value between 1 and 31.

The HH:MM:SS subfield is used to denote the current time. The H, M, and S symbols represent the hours, minutes, and seconds, respectively.

Finally, the 'yyyy' field represents the year.

Any errors detected in the format of the time and date field will cause the value to be rejected and an error message displaying the required format to be displayed.

#### **16.2.3.3. Connector Type**

The Connector Type field identifies the three possible connectors that can be used with the network interface controller. The three connector types currently supported are as follows:

1. AUI
2. 10BaseT (RJ45)
3. 10Base2 (BNC)

The Connector Type field is a pull down menu field. To display the choices, press ALT-DownArrow.

#### **16.2.3.4. Target Driver**

The Target Driver field identifies the driver to be used with the DMI software. To select the desired driver, pull down (ALT-DownArrow) the menu and select either:

1. NDIS 3
2. NDIS 2/ODI

The first selection is for use with Windows for Workgroups Version 3.11. The second is for use with any network operating system that uses either the NDIS 2 or ODI drivers (e.g. LAN Server or Netware, respectively).

### 16.2.4. Exiting The Installation Program

The installation program can be terminated at any time prior to pressing F10 to begin the actual installation process. To exit the program, press the F4 key while holding down the ALT key. *Once the F10 key is pressed, the installation process must continue until complete.*

### 16.3. DMI Installation Procedure (DMI Version 2.0)

To install, follow the steps listed below:

- \_\_\_1 Copy the PCNET.MIF and PCNET.EXE files to a directory (for instance, PCNET).
- \_\_\_2 Install Intel's DMI SDK and DMI Explorer.
- \_\_\_3 Reboot the system. Make sure that the service layer (WIN32SL.EXE) program is running.
- \_\_\_4 Launch the DMI Explorer program. Click on the Add Component option under the File menu. Specify the path of the PCNET.MIF file and click on the OK button.
- \_\_\_5 From the Start menu, run the PCNET.EXE program.
- \_\_\_6 In the DMI Explorer window, double click on the My Computer icon. You will see the item, AMD PCnet Ethernet Controller Component. Expanding this item will show the 19 groups under it. You can examine the attributes and their corresponding values by expanding the group you are interested in.
- \_\_\_7 If you are running the PermaNet Server Software driver and you have configured two adapters as a pair, you will see a pop-up message each time the primary NIC fails or recovers. This can be demonstrated by causing a link failure on the primary NIC by pulling the Primary adapter's cable.





The Boot ROM is based on the IBM RPL protocol. To install the universal Boot ROM, follow the steps listed below:

- \_\_\_1 Obtain a Boot ROM from AMD or borrow a PROM with the netrom.hex file. This Hex file is in Intel MCS-86 hex format.

**Note:** *Currently, any EEPROM greater than or equal to 16K in size can be used. Also, this EEPROM should be 250 ns or faster*

- \_\_\_2 Insert the Boot ROM into the 28-pin socket.

- \_\_\_3 If you are using a PCnet-ISA adapter card, then go to step 3.1 below. Otherwise, go to step 3.2 below.

\_\_\_3.1 For a PCnet-ISA adapter card:

- a. Install the Boot ROM jumper to enable the Boot ROM. Next, set the jumpers for the I/O base address, IRQ channel, and DMA channel.
- b. For PCnet-ISA, you *must* use one of the four configurations listed below when setting the jumpers:

<u>Config Option</u>	<u>I/O Addr</u>	<u>IRQ</u>	<u>DMA</u>	<u>Boot ROM Addr</u>
1	300h	3	5	C8000h
2	320h	4	6	CC000h
3	340h	5	7	D0000h
4	360h	9	3	D4000h

**Note:** *Boot ROM Addresses listed above are not jumper settings.*

- c. Go to step 4 below to continue.

\_\_\_3.2 For PCnet PnP ISA adapter cards:

- a. Using AMINSTAL, configure the PCnet PnP ISA adapter cards with available Boot ROM address.

- b. Go to step 4 to continue.

**Notes:** 1) Refer to the *AMINSTAL* section to use the *AMINSTAL* utility.  
2) If a PCnet PnP ISA adapter card is configured as a Plug and Play mode, Boot ROM address will be selected automatically (which is the same as the PCnet VL device and the PCnet PCI devices).

- \_\_\_4 Follow the Boot ROM installation procedure outlined in the *Novell Installation Manual*, *Microsoft LAN Manager Server Manual*, or *IBM LAN Server Manual* to prepare the server to support RPL.
- \_\_\_5 If you are going to do a remote boot for an OS/2 workstation on Microsoft LAN Manager, follow the steps listed below prior to performing a remote boot from the server. Otherwise, go to step 6 below to continue.

- a. Edit the file `os213bb.cnf`. The path to this file is as follows:

```
C:\LANMAN\RPL\BBLOCK\NETBEUI\PCNTD
```

**Notes:** 1) The file `os213bb.cnf` is a remote boot configuration file for OS/2 Version 1.3. If you are running a different version of OS/2 on your workstation, the file name may be slightly different.

- 2) In the path for the `os213bb.cnf` file, *NETBEUI* may be different depending on which protocol you are using.

- b. Edit the following line in the `os213bb.cnf` file:

```
DRV BBLOCK\NDIS\pcntnd.DOS ~ ~ ~
```

**Note:** The DRV line shown above is the default. The tildes ( ~ ) represent parameter fields. By default a tilde means 0.

Change the second tilde to a value of 10.

- c. The DRV line should now look like:

```
DRV BBLOCK\NDIS\pcntnd.DOS ~ 10 ~
```

Save the `os213bb.cnf` file.

- d. Go to step 6 to continue.

- \_\_\_6 Next, perform a remote boot from the server. The diskless workstation will display some sign-on messages followed by:

```
To boot from Novell Server,                press 1
To boot from IBM LAN Server 2x and 3x,      press 2
To boot from IBM LAN Server 4x,            press 3
To boot from Microsoft LAN Manager,        press 4
To boot from the first available server,    press 5
If no selection within 30 seconds, will use choice 5
Please, make your choice now!
```

You may now make a selection by pressing the appropriate number. If nothing is selected within 30 seconds, the appropriate server will be selected by auto detect. This is also used to support workstations without a keyboard and monitor.

After the selection is made, the remote boot process is started.

**Note:** *This version of Boot ROM does not display the Boot from Network (Y/N) message. Make sure you do not have a bootable device in the system (i.e., no A or C drive). In a diskless system without a bootable device, this Boot ROM will take over the boot process.*

