

1. Installing Novell NetWare ODI Drivers

Open Datalink Interface (ODI) is a driver specification developed by Novell to offer a standard driver interface for Novell NetWare.

AMD provides 32 bit ODI driver (C-Language driver, Release 4.51) support for the following environments:

- Novell NetWare 3.2 Server
- Novell NetWare 4.11 Server (with Service Pack 6)
- Novell NetWare 4.2 Server
- Novell NetWare 5.0 Server (with Service Pack 1)
- Client 32 for DOS and Window 3.11

The following legacy drivers are also included in the release:

- 16 bit ODI driver for NetWare DOS ODI Client
- 16 bit ODI driver for NetWare OS/2 ODI Client

Installation procedures for each of the above drivers are described in the following sections.

This driver provides NetWare Server 4.11/4.2 or 5.0 follow PermaNet Server functions for AMD PCnet-PCI, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III Adapter Cards:

- Link Fault Tolerance (LFT)
- Dynamic Load Balancing (DLB) and Port Aggregation Technology (PAg)
- Fast EtherChannel (FEC)

1.1. Novell NetWare Server 3.2

For a NetWare 3.2 server configuration, AMD provides 32 bit ODI driver on the AMD NetWare driver diskette. Use the LOAD and BIND commands to load the 32 bit ODI driver as described below. (For NetWare Server 3.11, 3.12 users, Novell recommends to upgrade to NW3.2). For more information on these commands, refer to Novell's *NetWare 3.2 LAN Driver Installation* documentation.

There are two methods for loading the NetWare Server 3.2 driver:

- (1) Use the server command line prompt (:) or
- (2) Edit the AUTOEXEC.NCF file.

Note: *If you use the server command line, you will need to load the driver each time the system is booted. If you edit the AUTOEXEC.NCF file, it will automatically load the driver each time your system is booted.*

Follow the steps listed below:

- ___1 Install the Novell NetWare Server 3.2 on your system, and upgrade CMSM.NLM, ETHERTSM.NLM and NBI.NLM from NW4.11 Service Pack 6.
- ___2 Copy all the files from the 3.2 server directory of the AMD NetWare driver diskette to the hard disk directory where the NetWare 3.2 system files are located. The following path should be used to access the files from the AMD NetWare driver diskette:

A:\NOVELL\SERVER\3.2\CPCNTNW.LAN

- ___3 Boot NetWare by executing SERVER.EXE. Refer to the appropriate *Novell NetWare* documentation on loading disk drivers and mounting volumes for more information.
- ___4 To load the driver manually, follow *either* step 4.1 (for a PCnet-ISA Adapter Card) or step 4.2 (for PCnet-ISA+, PCnet-ISA II, PCnet-32, PCnet-PCI, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III Adapter Cards). If you want to load the driver using the AUTOEXEC.NCF file, go to step 5.

Note: *You will need to specify the DOS path if the driver is located in a DOS partition.*

___4.1 To manually load the driver for a PCnet-ISA adapter card:

- a. Type the following command at the file server console (which also changes the default settings for PCnet-ISA adapter cards):

```
LOAD LSLENH.NLM
LOAD MSM31X.NLM
```

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```
LOAD ETHERTSM.NLM
LOAD CPCNTNW ISA PORT=320 INT=5 DMA=7
```

- Notes:** 1) All of the files listed above are needed. You must use the versions of these files included on the AMD driver diskettes.
2) Make sure the LSLENH, MSM31X, PATCHMAN, and ETHERTSM files are present in the same directory as the PCNTNW.LAN file. These files should be copied from the AMD NetWare support files driver diskette from the 3.11 subdirectory under the Novell directory. You must use the latest versions of these files provided in the AMD diskette.

- b. Then press <Enter>. The PORT, INT, and DMA values used above must correspond to the PCnet-ISA adapter card's jumper settings.

Note: IOP, IRQ, and DRQ are older keywords previously used in place of PORT, INT, and DMA, respectively. However, they are still supported in order to maintain backward compatibility.

- c. Next, bind the driver to the IPX protocol stack by typing:

```
BIND IPX CPCNTNW NET=xxxx
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

- d. Then press <Enter>.

The installation of the NetWare Server 3. driver for a PCnet-ISA adapter card is now complete.

4.2 To manually load a driver for PCnet-ISA+, PCnet-ISA II, PCnet-32, PCnet-PCI, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III adapter cards:

- a. Type the following commands at the file server console:

```
LOAD LSLENH.NLM
LOAD MSM31X.NLM
LOAD ETHERTSM.NLM
LOAD CPCNTNW
```

Note: All of the files listed above are needed. You must use the versions of these files included on the AMD driver diskettes.

- b. Then press <Enter>.

The CPCNTNW driver automatically determines the adapter card configuration information.

- c. Next, bind the driver to the IPX protocol stack by typing:

```
BIND IPX CPCNTNW NET=xxxx
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

d. Then press <Enter>.

The installation of the NetWare Server 3.2 driver PCnet-ISA+, PCnet-ISA II, PCnet-32, PCnet-PCI, PCnet-FAST, PCnet-FAST+ and PCnet-FAST III adapter cards is now complete.

- __5. To load the driver using the AUTOEXEC.NCF file, you must first edit the AUTOEXEC.NCF file.

Note: You will need to specify the DOS path if the driver is located in a DOS partition.

- a. Type `LOAD INSTALL` at the server prompt (:) to access the Install Utility.
- b. Open the SYSTEM OPTIONS menu to access EDIT AUTOEXEC. NCF.
- c. Then add the following command lines to the AUTOEXEC.NCF file.

For PCnet-ISA adapter card:

```
LOAD PCNTNW ISA DMA=5 INT=3 PORT=320 FRAME=Ethernet_802.2
```

```
BIND IPX CPCNTNW NET=xxxx
```

(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)

Note: IOP, IRQ, and DRQ are older keywords previously used in place of PORT, INT, and DMA, respectively. However, they are not supported starting from Release 4.0.

Exit and save the file, then restart server.

The installation of the NetWare Server 3.2 driver for PCnet-ISA adapter card is now complete.

1.1.1. Keyword Examples

See *Keyword Examples* under *Section 5.5, Novell NetWare Server 4.2 or NW 5.0*, to use keywords for NetWare Server 3.2.

1.2. Novell NetWare Server 4.11/4.2 or 5.0

For an NetWare 4.11/4.2 or NetWare 5.0 server configuration, AMD provides a NetWare 32 ODI driver which is included on the AMD NetWare driver diskette. (For NetWare Server 4.01, 4.10 and IntranetWare 4.11 users, Novell recommends to upgrade to NetWare 4.2).

Note: *The directory structure provided on the AMD NetWare driver diskette has been set up for automatic OEM installation. Also, more information can be found in the Novell NetWare 4.x documentation.*

Use the LOAD and BIND commands to load the NetWare ODI server driver as described below. For more information on these commands, refer to the *Novell NetWare 4.x LAN Driver Installation* documentation.

1.2.1. Loading Driver

Before loading the driver, follow the steps listed below:

- ___1 Install Novell NetWare Server 4.11 and upgrade with Novell Support Pack 6, or NetWare 4.2, or Novell NetWare Server 5.00 and upgrade with Novell Support Pack 1 on your system.
- ___2 Copy the AMD 32bit ODI driver (CPCNTNW.LAN) from the AMD NetWare driver diskette to the hard disk directory where the NetWare Server system files are located. The following path should be used to access the files from the AMD NetWare driver diskette:

A:\NOVELL\SERVER\CPCNTNW.LAN
- ___3 Boot NetWare Server by executing SERVER.EXE. Refer to the appropriate *Novell NetWare* documentation on loading disk drivers and mounting volumes for more information.

Notes:

- 1) *You will need to specify the DOS path if the driver is located in a DOS partition.*
- 2) *Make sure the MSM.NLM and ETHEXTSM.NLM files are present in the same directory as the CPCNTNW.LAN file. These files should be copied from the AMD NetWare support files driver diskette from the NW4.11/4.2 or NW5.00 subdirectory under the Novell directory. You must use the latest versions of these files provided in the AMD diskette.*
- 3) *It is recommended that the LDB/Pag or FEC 4 cards configurations be tried out on systems with at least 64 MB of RAM memory. Also the following NetWare parameters should be set to the values given below*

MAXIMUM PACKET RECEIVE BUFFERS 300 or higher
MINIMUM PACKET RECEIVE BUFFERS 100 or higher

These parameters may be accessed by choosing the SERVER PARAMETERS menu and COMMUNICATIONS PARAMETERS CATEGORY sub-menu in the Novell supplied "monitor" utility.

Or

copy MAXIMUM PACKET RECEIVE BUFFERS 300 to AUTOEXEC.BAT

copy MINIMUM PACKET RECEIVE BUFFERS 100 to STARTUP.NCF

1.2.2.

There are four methods for loading the NetWare Server driver:

- (1) Manual loading (Use the server command line prompt (:).
- (2) Edit the AUTOEXEC.NCF file.
- (3) Using Installation Driver Option.
- (4) Using portcfg.

__1 Manual loading (for Normal mode only)

1.2.2.1.

__1.1 To manually load the driver for a PCnet-ISA adapter card:

- a. Type the following command at the file server console (which also changes the default settings for PCnet-ISA adapter cards):

```
LOAD CPCNTNW ISA PORT=320 INT=5 DMA=7
```

The PORT, INT, and DMA values used above *must* correspond to the PCnet-ISA adapter card's jumper settings.

Note: *IOP, IRQ, and DRQ are older keywords previously used in place of PORT, INT, and DMA, respectively. However, they are not supported starting from Release 4.0.*

- b. Next, bind the driver to the IPX protocol stack by typing:

```
BIND IPX CPCNTNW NET=xxxx  
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

- c. Then press <Enter>.

The installation of the NetWare Server driver for a PCnet-ISA adapter card is now complete.

__1.2 To manually load the driver for PCnet-ISA+, PCnet-ISA II adapter cards:

- a. Type the following command at the file server console:

```
LOAD CPCNTNW ISAPNP
```

b. Then press <Enter>.

c. Next, bind the driver to the IPX protocol stack by typing:

```
BIND IPX CPCNTNW NET=xxxx
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

d. Then press <Enter>.

The installation of the ODI driver for PCnet-ISA+, PCnet-ISA II adapter cards is now complete.

__1.3 To manually load the driver for PCnet-32 adapter cards:

a. Type the following command at the file server console:

```
LOAD CPCNTNW VESA
```

b. Then press <Enter>.

c. Next, bind the driver to the IPX protocol stack by typing:

```
BIND IPX CPCNTNW NET=xxxx
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

d. Then press <Enter>.

The installation of the ODI driver for PCnet-32 adapter cards is now complete.

__1.4 To manually load the driver for PCnet-PCI, PCnet-PCI II, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III adapter cards:

a. Type the following command at the file server console:

```
LOAD CPCNTNW PCI
```

b. Then press <Enter>.

c. Next, bind the driver to the IPX protocol stack by typing:

```
BIND IPX CPCNTNW NET=xxxx
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

d. Then press <Enter>.

The installation of the ODI driver for PCnet-PCI, PCnet-PCI II, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III adapter cards is now complete.

1.2.2.2.

__2 Edit AUTOEXEC.NCF file

To load the driver using the AUTOEXEC.NCF file, you must first edit the AUTOEXEC.NCF file.

Note: 1) *If you use the server command line, you will need to load the driver each time the system is booted. If you edit the AUTOEXEC.NCF file, it will automatically load the driver each time your system is booted.*

- a. Type `LOAD INSTALL` at the server prompt (:) for NetWare 4.11/4.2 or type `NWCONFIG` at the server prompt (:) for NetWare 5.0.
- b. Choose the NCF files options at Installation Options Console.
- c. Open the `EDIT AUTOEXEC. NCF` file.
- d. Then add the following command lines to the AUTOEXEC.NCF file.

d.1 Normal mode:

d.1.1 For PCnet-ISA adapter card:

```
LOAD CPCNTNW ISA DMA=5 INT=3 PORT=320 FRAME=Ethernet_802.2
```

```
BIND IPX CPCNTNW NET=xxxx
```

(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)

Note: *IOP, IRQ, and DRQ are older keywords previously used in place of PORT, INT, and DMA, respectively. They are still supported in order to be backward compatible.*

Exit and save the file, then restart server.

The installation of the NetWare Server driver for PCnet-ISA is now complete.

d.1.2 For PCnet-ISA+ & PCnet-ISA II adapter cards:

```
LOAD CPCNTNW ISAPNP FRAME=Ethernet_802.2
```

```
BIND IPX CPCNTNW NET=xxxx
```

(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)

The installation of the ODI driver for PCnet-ISA+ or PCnet-ISA II is now complete.

d.1.3 For PCnet-32 adapter card:

```
LOAD CPCNTNW VESA FRAME=Ethernet_802.2
```

```
BIND IPX CPCNTNW NET=xxxx
```

(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)

The installation of the NetWare Server driver for PCnet-32 is now complete.

1.2.2.3.

d.1.4 For PCnet-PCI, PCnet-PCI II, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III adapter cards:

```
LOAD CPCNTNW PCI FRAME=Ethernet_802.2
```

```
BIND IPX CPCNTNW NET=xxxx
```

(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)

The installation of the ODI driver for PCnet-PCI, PCnet-PCI II, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III is now complete.

d.2 For driver works at Link Fault Tolerance (LFT) mode (PCnet-PCI, PCnet-PCI II, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III only):

```
Load CPCNTNW PCI slot=xxxxx secondary=yyyyy Frame=Ethernet_802.2
```

(xxxxx is the slot number of primary card, yyyyy is the slot number of secondary)

```
BIND IPX CPCNTNW NET=zzzzz
```

(Bind to IPX or any other protocol stack; where e.g., zzzzz=1234)

The installation of the NetWare Server driver for LFT mode is now complete.

d.3 For driver works at DLB & PAg or FEC mode (PCnet-FAST, PCnet-FAST+ or PCnet-FAST III only):

Note: *The PermaNet driver setting for DLB & PAg or FEC are same. The difference is the switch, DLB & PAg use normal switch, FEC use the switch that support Fast EtherChannel function.*

Example for 2 Card Group:

```
LOAD CPCNTNW PCI SLOT=1 FRAME=Ethernet_802.2 CONFIGMODE=2  
POSITION=0 NAME=CPCNTNW_82  
LOAD CPCNTNW PCI SLOT=1 FRAME=Ethernet_802.3 CONFIGMODE=2  
POSITION=0 NAME=CPCNTNW_83  
LOAD CPCNTNW PCI SLOT=1 FRAME=Ethernet_II CONFIGMODE=2  
POSITION=0 NAME=CPCNTNW_II
```

```
LOAD  CPCNTNW PCI SLOT=1  FRAME=Ethernet_SNAP  CONFIGMODE=2
POSITION=0 NAME=CPCNTNW_SP
```

```
LOAD  CPCNTNW PCI SLOT=2  FRAME=Ethernet_802.2  CONFIGMODE=2
POSITION=1
```

```
LOAD  CPCNTNW PCI SLOT=2  FRAME=Ethernet_802.3  CONFIGMODE=2
POSITION=1
```

```
LOAD  CPCNTNW PCI SLOT=2  FRAME=Ethernet_II      CONFIGMODE=2
POSITION=1
```

```
LOAD  CPCNTNW PCI SLOT=2  FRAME=Ethernet_SNAP  CONFIGMODE=2
POSITION=1
```

```
BIND IPX CPCNTNW_82 net=11
```

```
BIND IPX CPCNTNW_83 net=12
```

```
BIND IPX CPCNTNW_II net=13
```

```
BIND IPX CPCNTNW_SP net=14
```

The installation of the NetWare Server driver for DLB & PAg or
FEC mode 2 Card Group is now complete.

Example for 4 card group:

```
LOAD  CPCNTNW PCI SLOT=1  FRAME=Ethernet_802.2  CONFIGMODE=4
POSITION=0 NAME=CPCNTNW_82
```

```
LOAD  CPCNTNW PCI SLOT=1  FRAME=Ethernet_802.3  CONFIGMODE=4
POSITION=0 NAME=CPCNTNW_83
```

```
LOAD  CPCNTNW PCI SLOT=1  FRAME=Ethernet_II      CONFIGMODE=4
POSITION=0 NAME=CPCNTNW_II
```

```
LOAD  CPCNTNW PCI SLOT=1  FRAME=Ethernet_SNAP  CONFIGMODE=4
POSITION=0 NAME=CPCNTNW_SP
```

```
LOAD  CPCNTNW PCI SLOT=2  FRAME=Ethernet_802.2  CONFIGMODE=4
POSITION=1
```

```
LOAD  CPCNTNW PCI SLOT=2  FRAME=Ethernet_802.3  CONFIGMODE=4
POSITION=1
```

```
LOAD  CPCNTNW PCI SLOT=2  FRAME=Ethernet_II      CONFIGMODE=4
POSITION=1
```

```
LOAD  CPCNTNW PCI SLOT=2  FRAME=Ethernet_SNAP  CONFIGMODE=4
POSITION=1
```

```
LOAD  CPCNTNW PCI SLOT=3  FRAME=Ethernet_802.2  CONFIGMODE=4
POSITION=2
```

```
LOAD  CPCNTNW PCI SLOT=3  FRAME=Ethernet_802.3  CONFIGMODE=4
POSITION=2
```

```
LOAD  CPCNTNW PCI SLOT=3  FRAME=Ethernet_II      CONFIGMODE=4
POSITION=2
```

```
LOAD  CPCNTNW PCI SLOT=3  FRAME=Ethernet_SNAP  CONFIGMODE=4
POSITION=2
```

```
LOAD  CPCNTNW PCI SLOT=4  FRAME=Ethernet_802.2  CONFIGMODE=4
POSITION=3
```

```
LOAD  CPCNTNW PCI SLOT=4  FRAME=Ethernet_802.3  CONFIGMODE=4
POSITION=3
```

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```
LOAD CPCNTNW PCI SLOT=4 FRAME=Ethernet_II CONFIGMODE=4  
POSITION=3  
LOAD CPCNTNW PCI SLOT=4 FRAME=Ethernet_SNAP CONFIGMODE=4  
POSITION=3
```

```
BIND IPX CPCNTNW_82 net=11  
BIND IPX CPCNTNW_83 net=12  
BIND IPX CPCNTNW_II net=13  
BIND IPX CPCNTNW_SP net=14
```

The installation of the NetWare Server driver for DLB & PAg or FEC mode 4 card Group is now complete.

3 Using Installation Driver Option

To use Installation Driver Option (for Normal mode only), you need to make sure the CPCNTNW.LAN and CPCNTNW.LDI are already copied to server file system partition.

- 1) Type `LOAD INSTALL` at the server prompt (:) for NetWare 4.11/4.2 or type `NWCONFIG` at the server prompt (:) for NetWare 5.00.
- 2) Choose the Driver Options at Installation Options Console.
- 3) Choose the Configure Network Drivers.
- 4) Choose the Discover and Load Additional Drivers and follow the screen instructions.

1.2.2.4.

4 Using PORTCFG.NLM

To use PORTCFG.NLM for Normal, PermaNet or Fast EtherChannel mode, you need to make sure the CPCNTNW.LAN and PORTCFG.NLM are already copy to server file system partition.

- 1) Type `LOAD PORTCFG` at the server prompt (:)
- 2) Choose the PORT Options at Main Menu Console:

```
Aggregated Group of 2 Ports (for DLB & PAg or FEC)  
Aggregated Group of 4 Ports (for DLB & PAg or FEC)  
PermaNet Port (for LFT)  
Normal Port
```

For Aggregated Group of 2 Ports, select 2 card's slot number for Primary and Secondary.

For Aggregated Group of 4 Ports, select 4 card's slot number for Primary, Secondary #1, Secondary #2, and Secondary #3..

For PermaNet Port, select 2 card's slot number for Primary and Secondary.

For Normal Port, select a card's slot number.

- 3) Press ESC key.
- 4) Choose YES at Save Group Information.
- 5) Choose Display Configuration Information to check slot number is correct.
- 6) Press ESC key.
- 7) Choose Exit.
- 8) Choose Save and Exit. (Make sure the AGP.NCF already created.)
- 9) Down the server and restart the server.

1.2.3. Keyword Examples

1.2.3.1. CONFIGMODE

1.2.3.2. The CONFIGMODE keyword is used to specify the Normal, PermaNet, or Fast EtherChannel.

1.2.3.3.

1.2.3.4. Example:

1.2.3.5.

```
LOAD CPCNTNW PCI SLOT=1    FRAME=Ethernet_802.2    CONFIGMODE=2 POSITION=0
LOAD CPCNTNW PCI SLOT=1    FRAME=Ethernet_802.3    CONFIGMODE=2 POSITION=0
LOAD CPCNTNW PCI SLOT=1    FRAME=Ethernet_II       CONFIGMODE=2 POSITION=0
LOAD CPCNTNW PCI SLOT=1    FRAME=Ethernet_SNAP     CONFIGMODE=2 POSITION=0
```

1.2.3.6.

1.2.3.7. BUSTYPE

Note: Only applies to drivers before Release 3.2. Starting from Release 4.0, BUSTYPE keyword is no longer supported. Use Novell standard keyword, SLOT.

If the bus type is known for the PCnet adapter card installed in the system, the BUSTYPE keyword may be used with the LOAD command. If the BUSTYPE keyword is specified, then the driver will not scan other buses. The available bus types are:

Bus Type	PCnet Adapter Card	Keyword (before 3.2)	Keyword (after 4.0)
ISA	PCnet-ISA	ISA	ISA
ISA Plug and Play (PnP)	PCnet-ISA+, PCnet-ISA II	PNP	ISAPNP
VESA Local Bus (VL)	PCnet-32	VESA	VESA
PCI Local Bus	PCnet-PCI, PCnet-PCI II, PCnet-FAST, PCnet-FAST+	PCI/PCI1/PCI2	PCI

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Examples:

	Before 3.2 Release	After 4.0 Release	After 4.5 Release
For PCnet-ISA:	LOAD PCNTNW BUSTYPE=ISA	LOAD PCNTNW ISA	LOAD CPCNTNW ISA
For PCnet-ISA+ and PCnet-ISA II:	LOAD PCNTNW BUSTYPE=PNP	LOAD PCNTNW ISAPNP	LOAD CPCNTNW ISAPNP
For PCnet-32:	LOAD PCNTNW BUSTYPE=VESA	LOAD PCNTNW VESA	LOAD CPCNTNW VESA
For PCnet-PCI:	LOAD PCNTNW BUSTYPE=PCI	LOAD PCNTNW PCI	LOAD CPCNTNW PCI
For PCnet-PCI:	LOAD PCNTNW BUSTYPE=PCI1	LOAD PCNTNW PCI	LOAD CPCNTNW PCI
For PCnet-PCI:	LOAD PCNTNW BUSTYPE=PCI2	LOAD PCNTNW PCI	LOAD CPCNTNW PCI
For PCnet-FAST:		LOAD PCNTNW PCI	LOAD CPCNTNW PCI
For PCnet-FAST+:		LOAD PCNTNW PCI	LOAD CPCNTNW PCI

Note: If the PCI Configuration Access mechanism is known for the PCI system, the user may use PCI1 or PCI2 with the BUSTYPE keyword. However, using PCI with the BUSTYPE keyword will cause the driver to attempt to determine the proper mechanism in the PCI system.

1.2.3.8. FDUP (PCnet-ISA II, PCnet-PCI-II)

The PCnet-ISA II adapter card provides full duplex operation. For example:

Enable full duplex on 10BaseT port:	Load CPCNTNW FDUP = UTP
Enable full duplex on AUI port:	Load CPCNTNW FDUP = AUI
Disable full duplex:	Load CPCNTNW FDUP = OFF

Note: If FDUP = AUI then the TP (Twisted Pair) keyword is void.

1.2.3.9. FRAME (Multiple Frame Type Support)

The FRAME keyword should be used with the LOAD command to designate the desired frame type. In addition, to support multiple FRAME types, the SLOT keyword must be used in conjunction with the FRAME keyword if no IO Address is specified. The available FRAME values are the following:

```
Ethernet_802.2
Ethernet_802.3
Ethernet_SNAP
Ethernet_II
```

Refer to the appropriate *Novell NetWare* documentation for details regarding each frame type. The user designates the BOARD keyword value. The range available for SLOT is 0-99999.

```
LOAD CPCNTNW FRAME=Ethernet_802.2 SLOT=1
LOAD CPCNTNW FRAME=Ethernet_802.3 SLOT=1
LOAD CPCNTNW FRAME=Ethernet_II SLOT=1
LOAD CPCNTNW FRAME=Ethernet_SNAP SLOT=1
```

Then press <Enter>.

Finally, the driver must be binded to the IPX protocol for each frame type based on the procedure provided in the *Novell NetWare* documentation. Note that if

memory is low to support multiple frames, the buffer size must be increased in the STARTUP.NCF file in NetWare. For example, if the SET RESERVED BUFFERS is below 16 Mbytes, it should be set to 32 from the default setting of 16. For example:

```
Set Reserved Buffers below 16 Meg=32
```

1.2.3.10. FRAME (Single Frame Type Support)

The FRAME keyword should be used with the LOAD command to designate the desired frame type. For single FRAME support, no SLOT keyword is needed to designate one frame type. The available values and description to load FRAME types is explained above in the *Multiple Frame Type Support* section.

1.2.3.11. LINESPEED

The LineSpeed keyword is used to force the line to a special speed and duplex mode. For example:

```
LOAD CPCNTNW 100F
```

1.2.3.12. LOADING MULTIPLE PCnet ADAPTER CARDS

The driver must be loaded again for each new PCnet adapter board installed in the system. For example, to load three PCnet-ISA+, PCnet-32, or PCnet-PCI, PCnet-FAST, and PCnet-FAST+ adapter cards in the system for the Novell NetWare environment, the following must be entered.

First PCnet Adapter Card:	LOAD CPCNTNW	SLOT=10001
Second PCnet Adapter Card:	LOAD CPCNTNW	SLOT=10002
Third PCnet Adapter Card:	LOAD CPCNTNW	SLOT=10003

Then press <Enter>.

If more than one PCnet-ISA adapter card will be installed, the user must specify the IRQ and DMA channel for each card. For example, to load two PCnet-ISA adapter cards:

PCnet-ISA Adapter Card 1:	LOAD CPCNTNW	ISA	PORT=300	DMA=5	INT=3
PCnet-ISA Adapter Card 2:	LOAD CPCNTNW	ISA	PORT=340	DMA=6	INT=5

Then press <Enter>.

1.2.3.13. MPMODE

The MPMODE keyword is used to set up Magic Packet mode. For example:

```
LOAD CPCNTNW MPMODE=ON
```

1.2.3.14. POSITION

1.2.3.15. The POSITION keyword is used to set the Primary and Secondary adapters at Fast EtherChannel mode.

1.2.3.16.

1.2.3.17. Example:

1.2.3.18.

1.2.3.19. POSITION=0 Primary

1.2.3.20. POSITION=1, 2, 3 Secondary

1.2.3.21. SECONDARY

The Secondary keywords are used to set a pair of adapters PermaNet Fail-Over mode. For example:

```
LOAD CPCNTNW PCI SLOT=10001 SECONDARY=10002
```

1.3. Novell NetWare Client32 for DOS and Windows 3.11

Before loading the driver, follow the steps listed below:

__1 Install Novell NetWare Client32 for DOS or for Windows 3.11 from NetWare 5 CD # 2 on your system.

__2 Copy the AMD ODI driver (CPCNTNW.LAN) from the AMD NetWare driver diskette to the hard disk directory where the NetWare Client32 files are located. The following path should be used to access the files from the AMD NetWare driver diskette:

A:\NOVELL\SERVER\CPCNTNW.LAN

__2.1 To load the driver for a PCnet-ISA adapter card:

a. Type the following command at the file server console (which also changes the default settings for PCnet-ISA adapter cards):

```
LOAD CPCNTNW ISA PORT=320 INT=5 DMA=7 Frame=Ethernet_802.2
```

The PORT, INT, and DMA values used above *must* correspond to the PCnet-ISA adapter card's jumper settings.

Note: *IOP, IRQ, and DRQ are older keywords previously used in place of PORT, INT, and DMA, respectively. However, they are not supported starting from Release 4.0.*

b. Next, bind the driver to the IPX protocol stack by typing:

```
BIND IPX CPCNTNW NET=xxxx  
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

c. Then press <Enter>.

The installation of the ODI driver for a PCnet-ISA adapter card is now complete.

__2.2 To manually load the driver for PCnet-ISA+, PCnet-ISA II adapter cards:

a. Type the following command at the file server console:

```
LOAD CPCNTNW ISAPNP Frame=Ethernet_802.2
```

b. Then press <Enter>.

c. Next, bind the driver to the IPX protocol stack by typing:

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```
BIND IPX CPCNTNW NET=xxxx
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

- d. Then press <Enter>.

The installation of the NetWare ODI driver for PCnet-ISA+, PCnet-ISA II adapter cards is now complete.

__2.3 To manually load the driver for PCnet-32 adapter cards:

- a. Type the following command at the file server console:

```
LOAD CPCNTNW VESA Frame=Ethernet_802.2
```

- b. Then press <Enter>.

- c. Next, bind the driver to the IPX protocol stack by typing:

```
BIND IPX CPCNTNW NET=xxxx
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

- d. Then press <Enter>.

The installation of the NetWare ODI driver for PCnet-32 adapter cards is now complete.

__1.4 To manually load the driver for PCnet-PCI, PCnet-PCI II, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III adapter cards:

- a. Type the following command at the file server console:

```
LOAD CPCNTNW PCI Frame=Ethernet_802.2
```

- b. Then press <Enter>.

- c. Next, bind the driver to the IPX protocol stack by typing:

```
BIND IPX CPCNTNW NET=xxxx
(Bind to IPX or any other protocol stack; where e.g., xxxx=1234)
```

- d. Then press <Enter>.

The installation of the NetWare Server driver for PCnet-PCI, PCnet-PCI II, PCnet-FAST, PCnet-FAST+ or PCnet-FAST III adapter cards is now complete.

1.3.1.1.

- ___4 Start NetWare Client32 by executing STARTNET.BAT.
- ___5 After Login server, if you want start Windows 3.11 just type WIN. The connection and network drive letter still keep. You can from Windows File Manager get the Network drive.

1.4. Novell NetWare 16 bit ODI Client for DOS

AMD's NetWare DOS ODI client driver (16bit driver) may be installed using the automated AMINSTAL utility or manually from the command line prompt. Both methods are explained below.

Note: The user may need to make modifications to *autoexec.bat*, using the AMD-supplied sample *autoexec.net* file as reference.

1.4.1. 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.

After you have completed the configuration of your PCnet adapter card using the AMINSTAL utility, 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 Novell ODI DOS Client driver for the NetWare environment. Change the default path if necessary.
- __5 Press the Continue button to install the driver. The AMINSTAL utility will then copy the driver into the specified directory, create a NET.CFG file in the specified directory, and copy a sample AUTOEXEC.NET file into the specified directory. The AUTOEXEC.NET file contains the following command lines:

```
LSL
PCNTNW
IPXODI
NETX
```

The user must copy the following files into the specified directory above:

- | | |
|--------------|-------------------------------------|
| • LSL.COM | (Link Support Layer) |
| • PCNTNW.COM | (AMD NetWare DOS ODI Client driver) |
| • IPXODI.COM | (An IPX protocol stack file) |

- NETX.EXE (NetWare Shell, used with conventional memory workstations)

The LSL.COM, IPXODI.COM, and NETX.EXE files can be obtained from the Workstation Driver Diskette in the Novell Client Software Package or from CompuServe. The AMD-supplied client driver file PCNTNW.COM can be obtained from the DOS ODI directory of the AMD NetWare driver diskette (i.e., a:\novell\wkstn\dosodi).

__6 Exit from the AMINSTAL utility when the installation has completed.

The installation of the NetWare DOS ODI client driver is now complete.

1.4.2. Driver Installation From The Command Line Prompt

Follow the steps listed below:

- __1 Insert the AMD DOS ODI driver diskette into the floppy drive.
- __2 Create a subdirectory in your client's main boot drive with the following files:

- | | |
|--------------|---|
| • LSL.COM | (Link Support Layer) |
| • PCNTNW.COM | (AMD Netware DOS ODI Client Driver) |
| • IPXODI.COM | (An IPX protocol stack file) |
| • NETX.EXE | (Netware Shell, used with conventional memory workstations) |
| | |
| • NET.CFG | (Optional (used for configuring options different from the default settings). See <i>Appendix A</i> or the Novell Netware Operating System Keywords section.) |

The NETX.EXE, LSL.COM, and IPXODI.COM files can be obtained from the Workstation Driver Diskette in the Novell Client Software Package or from CompuServe. Copy the AMD-supplied client driver file (PCNTNW.COM) from the DOS ODI directory of the AMD NetWare driver diskette to the appropriate subdirectory. To do this, copy the file using the following path:

A:\NOVELL\WKSTN\DOSODI

- __3 To manually load these files from the DOS prompt, type the following commands in the given order to initialize DOS ODI driver support and the IPX protocol stack:

- | | |
|------------|---------------------|
| LSL.COM | Followed by <Enter> |
| PCNTNW.COM | Followed by <Enter> |
| IPXODI.COM | Followed by <Enter> |
| NETX.EXE | Followed by <Enter> |

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Note: NETX.EXE is compatible with DOS Versions 3.x, 4.x, 5.x, and 6.x.

- __4 To automatically load these files, use a DOS text editor to create and/or modify an AUTOEXEC.BAT file. Load the files in the following order: (1) link support layer, (2) LAN driver, (3) protocol stacks, and (4) the shell. Your AUTOEXEC.BAT file should look similar to the following:

```
\<subdirectory>\LSL
\<subdirectory>\PCNTNW
\<subdirectory>\IPXODI
\<subdirectory>\NETX
```

- __5 When the commands have been added to the AUTOEXEC.BAT file, reboot the workstation. After the commands execute and if a server is present, the workstation will attach to the server and display the server's name.

- __6 Log onto the network.

The installation of the NetWare DOS ODI client driver is now complete.

1.4.3. Driver Installation For The LAPP Driver

Follow the steps listed below:

- __1 Insert the AMD DOS LAPP driver diskette into the floppy drive.
- __2 Create a subdirectory in your client's main boot drive with the following files:

- | | |
|--------------|---|
| • LSL.COM | (Link Support Layer) |
| • PCLAPP.COM | (AMD Netware DOS ODI LAPP Driver) |
| • IPXODI.COM | (An IPX protocol stack file) |
| • NETX.EXE | (Netware Shell, used with conventional memory workstations) |
| • NET.CFG | (Optional (used for configuring options different from the default settings). See <i>Appendix A</i> or the Novell Netware Operating System Keywords section.) |

The NETX.EXE, LSL.COM, and IPXODI.COM files can be obtained from the Workstation Driver Diskette in the Novell Client Software Package or from CompuServe. Copy the AMD-supplied client driver file (PCLAPP.COM) from the DOS ODI directory of the AMD NetWare driver diskette to the appropriate subdirectory. To do this, copy the file using the following path:

```
A:\LAPP\DOSODI
```

- ___3 To manually load these files from the DOS prompt, type the following commands in the given order to initialize DOS ODI driver support and the IPX protocol stack:

LSL.COM	Followed by <Enter>
PCLAPP.COM	Followed by <Enter>
IPXODI.COM	Followed by <Enter>
NETX.EXE	Followed by <Enter>

Note: *NETX.EXE is compatible with DOS Versions 3.x, 4.x, 5.x, and 6.x.*

- ___4 To automatically load these files, use a DOS text editor to create and/or modify an AUTOEXEC.BAT file. Load the files in the following order: (1) link support layer, (2) LAN driver, (3) protocol stacks, and (4) the shell. Your AUTOEXEC.BAT file should look similar to the following:

```
\<subdirectory>\LSL
\<subdirectory>\PCLAPP
\<subdirectory>\IPXODI
\<subdirectory>\NETX
```

- ___5 When the commands have been added to the AUTOEXEC.BAT file, reboot the workstation. After the commands execute and if a server is present, the workstation will attach to the server and display the server's name.
- ___6 Log onto the network.

The installation of the NetWare DOS ODI LAPP driver is now complete.

Note: *The LAPP driver cannot work on a PCnet-ISA board.*

1.4.4. Keyword Examples

To change any default settings after the driver is loaded, the user must create a NET.CFG file on the workstation diskette. See Section 5.6, *Novell NetWare Operating System Keywords* for more information on valid keywords. See Appendix A for sample NET.CFG files using various keywords.

Note: The Novell Netware ODI DOS installation documentation will provide additional information on installing the DOS ODI driver and using keywords during installation.

1.5. Novell NetWare 16 bit ODI Client for OS/2

To install AMD's OS/2 ODI client driver, the Novell OS/2 Requester should be used.

Load the NetWare OS/2 ODI client driver from the OS/2 CONFIG.SYS file in the sequence given below. See the *Novell NetWare Requester OS/2 Installation* documentation for more information.

After installing the OS/2 Requester, follow the steps listed below:

- __1 Using the Netware OS/2 disks provided by Novell, install the Netware OS/2 Requester files on the client. Follow the instructions displayed to configure the Netware OS/2 Requester for a Netware-supported LAN adapter card. If the Netware-supported LAN adapter card contains the PCnet adapter option, select it; otherwise, select any other LAN adapter.
- __2 Insert the AMD NetWare driver diskette into the floppy drive.
- __3 Copy the OS/2 ODI driver (PCNTNW.OS2) from the AMD NetWare driver diskette to the C:\NETWARE directory of the boot drive using the following path:

```
A:\NOVELL\1\WKSTN\OS2ODI\PCNTNW.OS2
```

- __4 Edit the CONFIG.SYS file and replace the Netware-supported LAN adapter driver with the name of the AMD OS/2 ODI driver (PCNTNW.OS2). For example:

```
DEVICE=C:\NETWARE\PCNTNW.OS2
```

If the Novell OS/2 Requester is used to install the driver, the Requester will automatically make modifications to the CONFIG.SYS file.

The following is an example of the CONFIG.SYS load sequence for NetWare 3.12 OS/2 ODI driver support using the IPX protocol stack:

```
REM --- Netware Requester Statements BEGIN ---
SET NWLANGUAGE=ENGLISH
DEVICE=C:\NETWARE\LSL.SYS
RUN=C:\NETWARE\DDAEMON.EXE
REM -- ODI-Driver Files BEGIN --
DEVICE=C:\NETWARE\PCNTNW.OS2
REM DEVICE=C:\NETWARE\ROUTE.SYS
REM -- ODI-Driver Files END --
DEVICE=C:\NETWARE\IPX.SYS
DEVICE=C:\NETWARE\SPX.SYS
RUN=C:\NETWARE\SPDAEMON.EXE
DEVICE=C:\NETWARE\NWREQ.SYS
IFS=C:\NETWARE\NWIFS.IFS
```

```
RUN=C:\NETWARE\NWDAEMON.EXE
DEVICE=C:\NETWARE\VIPX.SYS
DEVICE=C:\NETWARE\VSHELL.SYS GLOBAL
REM --- Netware Requester Statements END ---
```

The default settings may be modified when the driver loads by creating the NET.CFG file. The AMD OS/2 ODI client driver may also be installed to support multiple protocol stacks and Ethernet frame types. Refer to Appendix A for sample NET.CFG files using the optional keywords. Also, refer to the *Novell Netware Requester OS/2 Installation* documentation for more information on configuring the NET.CFG file.

__5 Reboot the system.

The installation of the NetWare OS/2 ODI client driver is now complete.

1.5.1. Keyword Examples

To change any default settings when the driver is loaded, the user must create a NET.CFG file on the workstation diskette. The *Novell NetWare Operating System Keywords* section provides a list of the available keywords. See Appendix A for sample NET.CFG files using common keywords used when installing the OS/2 ODI client driver.

1.6. Novell NetWare Operating System Keywords

Keywords for Novell NetWare 16 bit ODI client for DOS and OS/2 drivers shown in Tables 1 , and for 32 bit ODI drivers shown in Table 2.

Table 1. Novell NetWare 16 bit ODI Client for DOS and OS/2 Keywords

Keyword Description	Keyword Name	Additional Keyword Details	Range	Default
I/O Address	PORT IOP	See Common Keywords.		
Interrupt	INT IRQ	See Common Keywords.		
DMA	DMA DRQ	See Common Keywords.		
FASTISA	FASTISA * Not supported with OS/2 ODI	FASTISA is a mode that increases the performance of the PCnet-ISA, PCnet-ISA+, and PCnet-ISA II by reducing the memory write cycle time from 450 ns to 350 ns. Some older machines with slower memory may not be compatible, if they do not have an EISA mode. Refer to Appendix A for more details on NET.CFG options.	Present or Not Present	Not Present
Ethernet Frame type	FRAME	See Ethernet Frame type from the IEEE Specification.	Ethernet_802.2 Ethernet_802.3 Ethernet_SNAP Ethernet_II	Ethernet_802.2 (NetWare 3.12, 4.x) Ethernet_802.3 (NetWare 3.11)
Bus Timer Off	BTO * Not supported with OS/2 ODI	BTO will reset bit 13 in CSR4 of the PCnet device to enable the Bus Timer register (CSR82). By default the timer is always on.	Present or Not Present	Not Present

Keyword Description	Keyword Name	Additional Keyword Details	Range	Default
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 EEPROM)
Disable write buffers (CDC chip)	CDCOFF * Not supported with OS/2 ODI	CDCOFF keyword is used to disable the write buffers on the Intel CDC chip.	Present or Not Present	Not Present
MII Mode (Line Speed and Duplex)	LineSpeed	LineSpeed keyword is used to force line to a special speed and duplex mode.	100F 100H 10F 10H Auto	Auto Negotiation

Note: All of the keywords available to the Novell ODI client drivers may be automatically activated by creating or modifying the NET.CFG file. See Appendix A for sample NET.CFG files.

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Table 2. Novell NetWare 32 bit ODI driver Keywords

Keyword Description	Keyword Name	Additional Keyword Details	Range	Default
I/O Address	PORT	See Common Keywords.		
Interrupt	INT	See Common Keywords.		
DMA	DMA	See Common Keywords.		
Ethernet Frame type	FRAME	See Ethernet Frame type from the IEEE Specification.	Ethernet_802.2 Ethernet_802.3 Ethernet_SNAP Ethernet_II	Ethernet_802.2 (NetWare 3.2, 4.11 & 5.0) Ethernet_802.3 (NetWare 3.11)
Physical Slot Number	Slot	Specifies the physical slot number	0-9999	Not Present
Physical Board Number	BOARD	Specifies the physical board number. (Used before 3.2 release)	0-254	255 (No BOARD keyword specified)
Name of Logical Board Number	NAME	Used to identify the logical board for different FRAME types	Any ASCII characters	None
Bus Timer Off	BTO	BTO will reset bit 13 in CSR4 of the PCnet device to disable the Bus Timer register (CSR82). By default the timer is always on.	Present or Not Present	Not Present

Keyword Description	Keyword Name	Additional Keyword Details	Range	Default
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 EEPROM)
Disable write buffers (CDC chip)	CDCOFF * Not supported with OS/2 ODI	CDCOFF keyword is used to disable the write buffers on the Intel CDC chip. (Used before 3.2 release)	Present or Not Present	Not Present
PCI Bus Type	PCI	PCI is used with PCnet-PCI, PCnet-PCI-II, and PCnet-FAST.	Present or Not Present	Not Present
ISA Bus Type	ISA	ISA is used with PCnet-ISA,	Present or Not Present	Not Present
PnP ISA Bus Type	ISAPNP	ISAPNP is used with PCnet-ISA+ & PCnet-ISA II.	Present or Not Present	Not Present
VESA Bus Type	VESA	VESA is used with PCnet-32.	Present or Not Present	Not Present
Slot Number	Slot	Slot keyword is used with the LOAD command to specify the slot number to selected physical adapter board.	Number of Slot	Not Present
MII Mode (Line Speed and Duplex)	LineSpeed	LineSpeed keyword is used to force the line to a special speed and duplex mode.	100F 100H 10F 10H Auto	Auto Negotiation

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Keyword Description	Keyword Name	Additional Keyword Details	Range	Default
Magic Packet	MPMode	MPMODE is used to set Magic Packet mode.	On Off	Not Present
LED Light Setting	LEDx	LEDx keyword is used to program the adapter's LEDs.	For Values see User's Guide	Not Present
PermaNet (Fail-Over)	Slot/ Secondary	Slot/Secondary keywords are used to set a pair of adapters to Fail-Over mode.	Number of slot	Not Present
Switch back to the Primary adapter	SCAN	SCAN keyword is used to switch back to the Primary adapter after Primary adapter Fail-Over and hot-swap. (It is for PCNTNW.LAN)	Present or Not Present	Not Present

