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# PCnet™-Family Software SCO UnixWare 7 Driver Installation Guide

For driver Version 2.2.1

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## Installation Instructions

These instructions pertain to the packages for the AMD PCnet PCI driver for SCO UnixWare 7 and 7.1. This is an updated version of the AMD PCnet PCI adapter driver.

The configurations for the (pnt2) driver are:

1. Standard driver
2. Dynamic Load Balancing & Port Aggregation driver
3. Fast EtherChannel mode driver

The installation instructions and requirements for each of these are provided in this document.

This release consists of two packages:

1. Pnt2: This package contains the driver files
2. Pnt2fec: This package contains installation support files for Fast EtherChannel or Dynamic Load Balancing with Port Aggregation. This package requires Perl programming language of 5.0 or above to be installed on your system.

|     |                                   |
|-----|-----------------------------------|
| FEC | stands for Fast EtherChannel      |
| DLB | stands for Dynamic Load Balancing |
| PAG | stands for Port Aggregation       |

To install these packages, untar the pnt\_driv.tar file into some temporary directory and execute pkgadd command there. After that, use netcfg utility to configure the network cards.

Example:

```
cd /tmp
tar xvf pnt_driv.tar
pkgadd -d `pwd` (pwd is /tmp)
netcfg
```

## Configuring as a standard driver

1. Run netcfg menu utility to configure the driver.
2. Select the AMD PCnet Fast EtherChannel Driver and add the protocols as for standard driver.

## Configuring as a Fast EtherChannel driver

This driver supports Fast EtherChannel configuration with load balancing and link failover features. These extra features require Fast EtherChannel-compliant switch like Cisco Systems Cisco Catalyst 5000 or Cisco 2900 series. Refer to the switch documentation for the Fast EtherChannel Configuration on the switch.

For Fast EtherChannel configuration on your server you need to use a specific procedure described below for proper configuration.

A group of adapters, constituting a single logical channel is called a trunk. The operating systems is not aware of all the adapters in a trunk and can see only one device in a group which is called trunk master - this is the device configured by the netcfg utility. All other adapters in the trunk share the same MAC address and are called slave devices.

All trunk master devices should be properly configured with netcfg. Slave devices are attached to corresponding master devices during system boot time using information specified in trunk configuration file `etc/etherchannel/ethertrunk.conf`. All EtherChannel configuration is done in terms of PCI slots used by PCnet cards.

Due to a bug in the netcfg implementation, specific steps should be performed to configure systems with several PCnet-fast adapters.

1. Use netcfg to configure trunk master device, select the EtherChannel (FEC/DLB and PAg) driver and add the protocols.
2. Run the command `resmgr | grep 10222000` to see all available PCnet cards in the system. The 3-d entry from the end will be PCI slot number and the first entry will be resource database key.
3. Use `resmgr -r -k <key>` command to remove each entry not configured by netcfg.
4. Run the command `/etc/conf/bin/idconfupdate` to permanently save resource manager information.
5. Edit the file `/etc/etherchannel/etherchannel.conf` and put a list of devices (including master and all slaves) for each trunk. A sample file called `/etc/etherchannel/etherchannel.conf.sample` is provided as an example.
6. Reboot the system.
7. Use resmgr utility to check your configuration.
8. Configure the switch to support Fast EtherChannel configuration.
9. Spanning Tree has to be disabled on the ports configured for Fast EtherChannel. If VLANs are configured, care should be taken that all ports in the EtherChannel have to be in the same VLAN. Also, the regular pnt driver and the pnt2 driver cannot be used together on the server.
10. Connect all the adapters in the trunk to the switch.
11. Reboot the system. The file `/etc/.osm` should reflect current trunk configuration.

## Link Status Indication

When any trunks are configured, the driver will use syslog facility to log information about links going up and down. The driver will only detect status of used links. It will not show the status change of any link that is not currently in use by a driver.

## ethertrunk.conf Configuration File Format

The configuration of Fast EtherChannel groups is specified in the file `/etc/etherchannel/ethertrunk.conf`. The sample configuration file `/etc/etherchannel/ethertrunk.conf.sample` is provided for references.

This file contains description of each trunk, one per line. Each line consist of pairs of the type keyword = value, separated by semicolons. Lines started with hash sign or semicolon are treated as comments.

Recognized keywords are:

1. trunk: An integer, specifying trunk number. It is a required keyword. Trunks should be enumerated from 0 to the maximum of 8.
2. name: A string, specifying trunk name.
3. slot: An integer, specifying the PCI slot number of the adapter to be included in the trunk. All slots should be specified on the same line. All specified slots will be gathered in one Fast EtherChannel trunk.

## Example configuration file:

```
# Example entries. Do not use as is!! Edit for your hardware configuration!
# Define two trunks, two cards in each.
# One trunk has cards in PCI slots 5 and 9, another trunk has cards in
# PCI slots 6 and 8.
#
trunk=0: name = t0; slot = 5, slot = 9;
trunk=1: name = t1; slot = 6, slot = 8;
```

## Configuring as a Dynamic Load Balancing with Port Aggregation driver

For configuring the driver for dynamic load balancing and port aggregation follow these steps.

The switch to which the server is connected may be a non FEC aware switch. Up to 4 adapters may be configured to form a trunk.

In this case there is maximum of 400 Mbps bandwidth from server to the switch whereas there is a 100 Mbps bandwidth from switch to server if a 10/100 Mbps switch is used. A group of adapters, constituting a single logical channel is called a trunk. The operating systems is not aware of all the adapters in a trunk and can see only one device in a group which is called trunk master - this is the device configured by the netcfg utility. All other adapters in the trunk share the same MAC address and are called slave devices.

All trunk master devices should be properly configured with netcfg. Slave devices are attached to corresponding master devices during system boot time using information specified in trunk configuration file `etc/etherchannel/ethertrunk.conf`. All EtherChannel configuration is done in terms of PCI slots used by PCnet cards.

Due to a bug in the netcfg implementation, specific steps should be performed to configure systems with several PCnet-fast adapters.

1. Use netcfg to configure trunk master device, select the EtherChannel (FEC/DLB and PAg) driver and add the protocols.
2. Run the command `resmgr | grep 10222000` to see all available PCnet cards in the system. The 3-d entry from the end will be PCI slot number and the first entry will be resource database key.
3. Use `resmgr -r -k <key>` command to remove each entry not configured by netcfg.
4. Run the command `/etc/conf/bin/idconfupdate` to permanently save resource manager information.
5. Edit the file `/etc/etherchannel/etherchannel.conf` and put a list of devices (including master and all slaves) for each trunk. A sample file called `/etc/etherchannel/etherchannel.conf.sample` is provided as an example.
6. Reboot the system.
7. Use resmgr utility to check your configuration.
8. Spanning Tree has to be disabled on the ports configured for DLB/PAg. If VLANs are configured, care should be taken that all ports in the DLB/PAg have to be in the same VLAN. Also, the regular pnt driver and the pnt2 driver cannot be used together on the server.
9. Connect all the adapters in the trunk to the switch.
10. Reboot the system. The file `/etc/.osm` should reflect current trunk configuration.

## Link Status Indication

When any trunks are configured, the driver will use syslog facility to log information about links going up and down. The driver will only detect status of used links. It will not show the status change of any link that is not currently in use by a driver.

## ethertrunk.conf Configuration File Format

The configuration of Fast EtherChannel groups is specified in the file `/etc/etherchannel/ethertrunk.conf`. The sample configuration file `/etc/etherchannel/ethertrunk.conf.sample` is provided for references.

This file contains description of each trunk, one per line. Each line consist of pairs of the type keyword = value, separated by semicolons. Lines started with hash sign or semicolon are treated as comments.

Recognized keywords are:

1. trunk: An integer, specifying trunk number. It is a required keyword. Trunks should be enumerated from 0 to the maximum of 4.
2. name: A string, specifying trunk name.
3. slot: An Integer, specifying the PCI slot number of the adapter to be included in the trunk. All slots should be specified on the same line. All specified slots will be gathered in one trunk.

## Example configuration file:

```
# Example entries. Do not use as is!! Edit for your hardware configuration!
# Define two trunks, two cards in each.
# One trunk has cards in PCI slots 5 and 9, another trunk has cards in
# PCI slots 6 and 8.
#
trunk=0: name = t0; slot = 5, slot = 9;
trunk=1: name = t1; slot = 6, slot = 8;
```

## Limitations and Requirements

1. Spanning tree must be turned OFF on the ports connected to the trunk cards.
2. All the ports involved in the FEC or DLB/PAG have to be in the same VLAN.
3. Perl programming language of 5.0 or above has to be installed on the system.
4. The AMD PCnet PCI Fast, Fast+ or Fast III are supported.
5. The PNT2 driver replaces the original AMD PNT driver.
6. PNT2 driver can not be used together with the old PNT driver. The regular PNT driver cannot be used along with the PNT2 EtherChannel (FEC/DLB and PAG) driver. New driver should be used for all AMD PCnet network adapters!
7. If there are loading problems in the UnixWare 7.1 release, comment out the line `#include <sys/dlpi_ether.h>` in the `etc/inst/nd/mdi/pnt2/Space.c` file and try loading again.