Linux ARCNET Driver Information

Installing Updated 3.9x ARCNET Drivers on Red Hat 6.1

This document explains how to update the ARCNET driver included with Red Hat 6.1 (Linux kernel 2.2.12) to the most recent version.

At the time this document was written, the latest ARCNET driver had not yet been integrated into a released Linux kernel. If you are participating in the Linux kernel development process, you may be using kernel versions numbered 2.3.x; in this case, you will already have the most recent ARCNET driver on your computer. Furthermore, when Linux 2.4.0 is released, it will include the most recent ARCNET driver, and that will be included with the next version of Red Hat.

Note that there is a version of the Linux ARCNET driver included with Red Hat 6.1. However, you will need the upgrade if you wish to use any of the following:

- Contemporary Controls PCI20 PCI ARCNET Cards

- Contemporary Controls PCM20 PCMCIA ARCNET Cards

- "Raw" encapsulation mode (for supporting unusual ARCNET software)

To correctly follow the instructions in this file, you will need to have the following:

- A computer with Red Hat 6.1 and a C compiler installed. (The gcc C compiler is installed by default in Red Hat.)

- A Contemporary Controls ARCNET card. The PCX-CXS, PCA66, PCA20, PCI20, and PCM20 are known to work.

- The file arcnet-3.90.tar.gz (or a later version) from the Linux ARCNET support web page at http://www.worldvisions.ca/~apenwarr/arcnet/

In addition, in order to use the PCM20 PCMCIA card, you will need:

- The Red Hat 6.1 CD-ROM and a CD-ROM drive.

- The file pcmcia-cs-3.1.8.tar.gz, also available from the Linux ARCNET site (and several other Linux sites).

Installing the ISA and PCI ARCNET Drivers

The basic ARCNET driver in arcnet-3.90.tar.gz supports the PCX-CXS, PCA66, PCA20, and PCI20 cards. To use the PCM20, Linux PCMCIA support needs to be upgraded separately, as described in the following section.

To install the basic ARCNET driver, we need to extract the .tar.gz file, compile the driver source code so that it matches with the current kernel version, and then install the driver modules. Type these commands:

```
cd /usr/src
tar -xzvf arcnet-3.90.tar.gz
cd arcnet
make install
depmod -a
```

This installs the arcnet object modules (.o files) in /lib/modules/<kernel-version>/net.

You can now proceed to load the driver modules into memory, as follows. "arcnet" provides the basic ARCNET driver infrastructure; the next three modules are encapsulation drivers, and which ones you use depends on your network configuration. Please refer to technical note TN-5 for help in deciding which encapsulation drivers you need to use.

```
insmod arcnet

insmod rfc1201          # usually needed
insmod rfc1051          # usually not needed
insmod arc-rawmode      # usually not needed
```

Finally, load the appropriate hardware driver for the ARCNET card you have installed.

For the PCX-CXS or PCA66 cards, use the com90xx module:

```
insmod com90xx
```

The com90xx module has excellent device auto-probing support and should have no trouble finding one or several installed ARCNET cards as long as they have no I/O, memory, or IRQ conflicts.

For the PCX20 card, you will need to specify the I/O port manually, since it cannot be auto-probed on ISA COM20020 cards. For example,

```
insmod com20020base
insmod com20020 io=0x300
```

Do not forget the "0x" in the I/O port number; this tells the kernel that the port number is in hexadecimal, which is almost always the case.

Finally, for the PCI20 card, you can instead load the PCI ARCNET driver, which uses PCI plug-and-play support to auto-detect the card.

```
insmod com20020base
insmod com20020pci
```

Manually Setting the Node ID on COM2002x Cards

The COM20020 chipset supports a software-defined ARCNET node ID. The PCI20 and PCX20 cards have DIP switches to allow a hardware-defined *default* node ID, but the software is able to override this setting if requested. On the PCM20, there are no hardware DIP switches, so it is necessary to always set the node ID via software. You can do this upon loading the module as follows:

```
insmod com20020pci node=0x42
      or
insmod com20020 io=0x300 node=0x42
```

To set the node ID for the PCM20 card, you need to edit a configuration file since the Linux PCMCIA driver loads the com20020_cs module automatically. Add a line like the following to the file /etc/conf.modules:

```
options com20020_cs node=0x42
```

Updating the PCMCIA Modules

In order to use the Contemporary Controls PCM20 card with Linux, you will need to first install the latest PCMCIA tools. This is a fairly complicated operation and should only be attempted by relatively experienced users, or on a system configured exactly as specified above (ie. a fresh Red Hat 6.1 system). If any of these steps do not operate correctly, the operating system's PCMCIA support may cease to function.

In order to follow the steps in this section, you must have *already* finished installing the basic ARCNET driver update as described above.

First, insert the Red Hat 6.1 CD into the drive and install the Linux kernel source code package. While there is no need to recompile the Linux kernel, some parts of the source code are needed to rebuild the PCMCIA tools.

```
mount /dev/cdrom /mnt/cdrom
cd /mnt/cdrom/RedHat/RPMS
rpm -i kernel-source-*
```

Next, unpack the PCMCIA tools source code into its own directory.

```
cd /usr/src
tar -xzvf pcmcia-cs-3.1.8.tar.gz
cd pcmcia-cs-3.1.8
```

Configure the PCMCIA tools by running "make config" and answering the questions as described in the table below.

Question	*Answer*
Linux source directory	/usr/src/linux
Alternate target install directory	[blank]
Module install directory	[just press enter for the default]
Build 'trusting' versions	n
Include 32-bit (CardBus) card support	y
Include PnP BIOS resource checking	n
How to set Kernel-specific options	1 - read from currently running kernel

At this point a few commands will run and you should see the message "Configuration successful." Next, build and install the PCMCIA tools:

```
make install
```

After some time, the build will finish and the new PCMCIA tools will be installed. To start the new version, either reboot the system or run these commands:

```
/etc/rc.d/init.d/pcmcia stop
/etc/rc.d/init.d/pcmcia start
```

After this has been done, inserting the PCM20 card into a PCMCIA slot should automatically detect the card and load the driver.