Netrom−Node mini−Howto

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This document describes how to setup the ax25−utilities package for Amateur Radio such that it makes Netrom Nodes for the Node program and the BBS software from John−Paul Roubelat, F6FBB. The DOS G8BPQ Switch makes a bbs node and many features, it was expected that the Linux ax25−utils would have a similar capability. This was not the case. Help came from John Ackerman, N8UR who put a message on the Linux−Ham SIG that he had done the BBS node and the info was on his web site! When the information was tried it didn't work properly but much was learned about the technique. Help from Tomi Manninen, OH2BNS did the trick. Nodes for the BBS and the Node and the DX Cluster were made and work fine.

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1. Introduction

It is possible, using just the ax25−util's to generate node listings for the Node application and the FBB BBS and the DXNet DX Cluster. This is done by changing the configuration files for Netrom and making a Netrom entry for each application. At present there is a kernel imposed limit of 4 Netrom entries. The new kernels are expected to drop this limit.

Now users look for CRUCES:K5DI−4 and LCBBS:K5DI−3 and LCDX:K5DI−5 on the many nodes here in New Mexico, Texas and Arizona and are connected like magic. They no longer need to remember anything.

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2. How to Begin

Obtain and read the AX25−HOWTO:

`ftp`:/sunsite.unc.edu/pub/Linux/docs/HOWTO/AX25−HOWTO/

Using the AX25−HOWTO set up the normal Amateur Radio ax.25 and Netrom system and make certain it is operating properly. When the software "CALL" can be used to make either a ax25 or Netrom connection to a distant node, the system is ready to change to one using node listings like the BPQ Switch.

3. Some Details of the AX.25 Utilities

Below is a list of all the applications and files that are needed to set up a working ax.25 system. The Applications are all in the /usr/sbin/ directory and the Configuration files are in the /etc/ax25/ directory. Note: Kissattach is used only if you have TNC's in the Kiss Mode.

- kissattach Application
- call Application
- ax25d Application
- ax25d.conf Configuration file
- axspawn Application
- axspawn.conf Configuration file
- axports Configuration file

There are several names that a ax25−util user must invent. Since this paper uses the files of k5di, a listing of those names can be made.

```
Name            Call-sign       Alias           Other

ax0             k5di-9                          ax25 9600 baud
ax1             k5di-10                         ax25 1200 baud
Netrom          k5di-1          #CRUCE          Real Netrom
netnod          k5di-4          CRUCES          Node node-list
netbbs          k5di-3          LCBBS           BBS  node-list
netdx           k5di-5          LCDX            DX-Cluster
```

It's a good idea to make a list like this on paper before you start to change things. It is easy to put the wrong name in a control file.

Kissattach is an application that connects the kernel to the TNC, sets the tcp/ip address up, sets the speed of the connection, and is given the serial port to use.

Axports is a file that defines the name of the ax.25 ports and tells kissattach what call−sign, baud−rate and window size to use. Below is an example of a 2 TNC system.

```
# /etc/ax25/axports
# Be very careful with the speed setting. This is the speed in
# bits/second that data passes from the computer to the TNC, and has
# nothing to do with the radio baud rate!
#
# The format of this file is:
#
# name call-sign speed paclen window description
#
ax0     K5DI-9          9600    255     3       445.1 (9600 bps)
ax1     K5DI-10         9600    255     1       145.07 (1200 bps)
```

AX25D is the application that reads the ax25d.conf Configuration file and answers calls made to the system. Below is a sample ax25d.conf that has no Netrom defined. In fact all it will do is answer calls to k5di−9 and k5di−10. When it answers it starts the node application and logs the caller in.

```
# /etc/ax25/ax25d.conf
#
#  AX25D Configuration File.
#
# AX.25 ports begin with a '['.
#
[k5di-4 VIA ax0]
default  * *    *   *   *    0 - root   /usr/sbin/node  node
[k5di-4 VIA ax1]
default  * *    *   *   *     0 - root  /usr/sbin/node  node
#
```

The next step is to get ax25d to answer a call to the alias CRUCES as well as the call−sign. This is easy to do and is shown below:

```
# /etc/ax25/ax25d.conf
#
#  AX25D Configuration File.
#
# AX.25 ports begin with a '['.
#
[CRUCES VIA ax0]
default  * *    *   *   *    0 - root   /usr/sbin/node  node
[k5di-4 VIA ax0]
default  * *    *   *   *    0 - root   /usr/sbin/node  node
[CRUCES VIA ax1]
default  * *    *   *   *    0 - root   /usr/sbin/node  node
[k5di-4 VIA ax1]
default  * *    *   *   *     0 - root  /usr/sbin/node  node
#
```

If you have trouble, as root kill ax25d if it is running and then at the prompt type ax25d &. As ax25d loads the ax25d.conf file it will print out any errors it finds. This print out is very accurate and tells you which row in the file is wrong.

A connect from any adjacent node to k5di−4 or CRUCES will connect to the k5di node. But Netrom is not transmitting a node listing for CRUCES or k5di−4. This is done by changing some Netrom Configuration files.

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4. Setting Up Netrom

Netrom has applications and files that control it's function and to achieve the G8BPQ look and function we must use these in ways never intended. Below is a list of these components of Netrom:

- nrattach Application
- netromd Application
- nrports Configuration File
- nrbroadcast Configuration File

Nrattach is the application that works with the kernel and establishes the ports and tcp−ip used by Netrom. To use nrattach you place it in your startup file and the example looks like this:

```
/usr/sbin/nrattach −i 44.30.2.5 netrom
/usr/sbin/nrattach −i 44.30.2.5 netnod
```

Nrattach gets some of it's information from a configuration file called nrports. This file is shown below:

```
# /etc/ax25/nrports
#
# The format of this file is:
#
# name call−sign alias paclen description
#
netrom          K5DI−1  #CRUCE   235    Switch
netnod          K5DI−4  CRUCES   235    Real Node
```

There is no change to the nrbroadcast file so the remaining changes will be made to the ax25d.conf file. In this file you normally put the real netrom application called k5di−1, but since a call to k5di−1 or #CRUCE gets undesirable results, leave that entry out of ax25d.conf and a user will get just a "busy" when calling.

Instead put in the netnod and that will allow ax25d to answer a call to CRUCES. This is shown in the example below:

```
# /etc/ax25/ax25d.conf
#
#  AX25D Configuration File.
#
# AX.25 ports begin with a '['.
#
[CRUCES VIA ax0]
default  * *    *   *   *    0 − root   /usr/sbin/node  node
[k5di−4 VIA ax0]
default  * *    *   *   *    0 − root   /usr/sbin/node  node
[CRUCES VIA ax1]
default  * *    *   *   *    0 − root   /usr/sbin/node  node
[k5di−4 VIA ax1]
default  * *    *   *   *     0 − root  /usr/sbin/node  node
#
# NET/ROM ports begin with a '<'.
#
<netnod>
default         * *     *   *   *   * −  root   /usr/sbin/node node
#
```

With these changes netrom node broadcasts will include the node K5DI−4:CRUCES and K5DI−1:#CRUCE. By testing it was determined that a call from any node to k5di−1 or #CRUCE got a busy, and a call to k5di−4 or CRUCES connected to the node on this system.

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5. Setting Up FBB and DXNet:

The FBB packet BBS and DXNet Linux software are written to answer calls to a call−sign defined in the configuration files. In these examples the FBB call−sign is k5di−3 and the DXNet is k5di−5.

Since calls to k5di−3 and k5di−5 are answered by other software, ax25d is not used and these calls should NEVER be found in a ax25d.conf file. But the nrports file needs to have the information added and 2 more nrattach lines are added to the start file. The nrattach lines (4 each) and the file "nrports" are shown below:

```
/usr/sbin/nrattach −i 44.30.2.5 netrom
/usr/sbin/nrattach −i 44.30.2.5 netbbs
/usr/sbin/nrattach −i 44.30.2.5 netnod
/usr/sbin/nrattach −i 44.30.2.5 netdx

# /etc/ax25/nrports
#
# The format of this file is:
#
# name call−sign alias paclen description
#
netrom          K5DI−1  #CRUCE   235    Switch
netnod          K5DI−4  CRUCES   235    Real Node
netbbs          K5DI−3  LCBBS    235    FBB BBS
netdx           K5DI−5  LCDX     235    DXNet DX Cluster
```

These changes will make the node listings wanted but a call to LCBBS will not work yet. Recall that FBB answers a call to k5di−3 but not the alias. To achieve this a change to the /usr/local/fbb/system/port.sys file is required. Before these changes port.sys had a listing for the name "netrom". With these changes replace "netrom" with "netbbs". That section of port.sys is shown below:

```
#TNC NbCh Com MultCh Pacln Maxfr NbFwd MxBloc M/P−Fwd Mode  Freq
 0    0    0   0      0     0     0     0      00/01   −−−−  File−fwd.
 1    8    1   ax0    250   4     1     10     30/60   XUWY  UHF port
 2    2    1   ax1    250   4     1     10     00/60   XUWY  VHF port
 3    6    1 netbbs   250   4     4     10     30/60   XUWY  BPQ look
 4    8    2   0      250   5     4     1000    5/15   TUWY  Telnet
#
```

A similar change is made to the "dxnet.cfg" file where netrom is replaced with netdx. When these changes are made and a few hours have passed to let Netrom send node lists, any nearby node will have nodes listed to your Netrom for CRUCES and LCBBS and LCDX, and they will all work just as they do when using the G8BPQ Switch under DOS.