Downloading Front-ends from fecode-bd

This note outlines the procedure for configuring the resources necessary to boot and download front-ends from the Controls Department's operational boot server named fecode-bd. This procedure assumes use of the rfies development tools which establish the convention of front-ends having the same name as their CVS project (e.g., the rrxdmp project runs on the rrxdmp.fnal.gov front-end node which boots from a directory on fecode-bd named vxworks_boot/fe/rrxdmp.)

1) To begin log in to outland as you normally would (e.g., using Kerberos or a CRYPTOCard) to get situated inside the control system firewall. Now from outland, log in to fecode-bd as user vxworks_boot:

```
        rlogin -l vxworks_boot fecode-bd
```

2) Run the addhost program to add your front-end's network node name and user name to fecode-bd's .rhosts file. The network node name is the name, in dot notation form (e.g., `millrf.fnal.gov`), that was assigned when you registered your node for an IP address. The user name vxworks_boot is recommended, indeed required if you need read/write file access on fecode-bd.

```
        addhost
        Adding .rhosts file entry...
        Node to add [default-> none]: xxx
        User to add [default-> vxworks_boot]: vxworks_boot
```

where xxx is the network node name of your front-end. Except for special cases the user should be vxworks_boot. If your front-end does not require file system write file access you may log out of fecode-bd and go on to #4 below.

3) To provide file system write access on fecode-bd for front-end files you must create a directory with the same name as your project under the `/fecode-bd/vxworks_write/fe` directory. You must be logged-in to fecode-bd as vxworks_boot (see #1 above.) The vxworks_boot login has very limited UIN*X command access (e.g., you can't do a cd command) so the creation of such directories is accomplished by specifying path names relative to the login directory:

```
        mkdir vxworks_write/fe/xxx
```

where xxx is the name of your project. Any write access directories required by your project must be created within this directory. For example the sequence:

```
        mkdir vxworks_write/fe/xxx
        mkdir vxworks_write/fe/xxx/ksvxi
        mkdir vxworks_write/fe/xxx/ksvxi/v152
        mkdir vxworks_write/fe/xxx/ksvxi/v152/tbl
```

creates a read/write directory structure for a project xxx using a KineticSystems V152 resource manager tbl directory. Note that the directory paths must be built one level at a time as shown above. When all read/write directories have been created you may log out of fecode-bd and continue with #4 below.

4) To provide read-only access on fecode-bd for front-end object files, startup scripts and any other initialization files, you must create a boot directory with the same name as your project under the `/fecode-bd/vxworks_boot/fe` directory. You must be logged into your development machine (e.g., nova) as yourself and type:

```
        mkdir /fecode-bd/vxworks_boot/fe/xxx
```

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```
      chmod 775 /fecode-bd/vxworks_boot/fe/xxx
```

where xxx is the name of your project. Alternatively, you can use make to create this download directory from your project's sandbox:

```
      setup xxx
      make downloaddirectory
```

where xxx is the name of your project.

You are free to create any desired directory structure within your /fecode-bd/vxworks_boot/fe/xxx directory. Remember to use the chmod 775 command on each new directory to provide group access permissions. Note that the front-end will have only read access to these directories. You can install most of the files that your front-end will be downloading or reading into this directory structure with the make tool :

```
      make installscript
      make development | test | production
```

5) Initialize the front-end's VxWorks boot parameters as necessary. A typical boot parameter set might look something like this:

```
      nova-->bootChange

      '.' = clear field;  '-' = go to previous field;  ^D = quit

      boot device          : dc0
      processor number     : 0
      host name            : fecode-bd
      file name            : vxworks_boot/fe/deadoak/vxWorks
      inet on ethernet (e) : 131.225.124.140:ffffff00
      inet on backplane (b):
      host inet (h)        : 131.225.121.145
      gateway inet (g)     : 131.225.124.200
      user (u)             : vxworks_boot
      ftp password (pw) (blank = use rsh):
      flags (f)            : 0x0
      target name (tn)     : deadoak_0xa22
      startup script (s)   : vxworks_boot/fe/deadoak/deadoakstartup
      other (o)            :
```

5.1) The **host name** is fecode-bd.

5.2) If using a Controls Department standard kernel in situ the complete kernel **file name** is:

```
      vxworks_boot/kernel/yyy/vxWorks,
```

where yyy is the name of your single board computer family (e.g., mv162, mv2400 or mv5500). Note that using this scheme is risky business because kernels referenced in this manner may be modified by the Controls Department without being tested on your front-end. A much safer scheme would be to place a copy of a tested standard kernel in the boot directory created in #4 above and load from there. In this case the complete kernel **file name** would be:

```
      vxworks_boot/fe/xxx/vxWorks,
```

where xxx is your project name.

5.3) The **inet on ethernet** should be `131.225.xxx.yyy:ffffff00`, where xxx and yyy represent your subnet and node designations. The subnet mask shown above (`:ffffff00`) is typical but may be different for your front-end's assigned subnet. Contact Network Administration to determine the correct value for your particular case.

5.4) The **host inet** address for fecode-bd is `131.225.121.145`

5.5) The **gateway inet** address should be `131.225.xxx.200`, where xxx is your node's subnet designation as specified in 5.3 above. Again, this value is typical but may be different for your front-end's assigned subnet. Contact Network Administration to determine the correct value for your particular case.

5.6) The **user** should be identical to that specified while running addhost in #1 above, typically vxworks_boot.

5.7) The **ftp password** should be left blank as we are using rsh for downloading front-ends.

5.8) The **startup script** path should be

```
        vxworks_boot/fe/xxx/yyy.
```

This path is the one set up in #4 above where xxx is your project name and yyy is your startup script's name.

5.9) The **boot device**, **processor number**, **inet on backplane**, **flags**, **target name** and **other** boot parameters are unique to your project and are provided by the front-end designer.

6) If your front-end requires NFS access to the vxworks_write and/or vxworks_boot directories created in #3 and #4 above you must contact the fecode-bd system administrator and request that your front-end be given NFS access privileges on fecode-bd. You can then use the following code in your startup script to mount fecode-bd:

```
        #mount NFS files - 1217, 5143 is user vxworks_boot, group bdmicrop
        nfsMount( "fecode-bd", "vxworks_boot/fe/xxx", "/home" )
        nfsMount( "fecode-bd", "vxworks_write/fe/xxx", "/write" )
        nfsAuthUnixSet( "fecode-bd", 1217, 5143, 0, 0 )
```

where xxx is the name of your project name.

7) If your node is to be an ACNet front-end you will have to contact Brian Hendricks (or his alternale) requesting an ACNet trunk/node assignment. Hopefully you followed the convention of giving your node a six-character-or-less network node name so that you can use that name as the ACNet node name. The Controls folks will want to know that this is a VxWorks node running MOOC and its building and rack locations.

If you want your node to be able to SLAM specified ACNet parameters at boot time (as specified on D121) you will also have to request that that feature is activated

Your network node name must be in the DNS system for your front-end to successfully load code from fecode-bd, for NFS access to work and/or for an ACNet trunk/node activation to work. In theory the DNS system gets updated between 8:00 and 9:00 AM of the morning after your network address is assigned by the Networking Group, but this does not always happen as expected.

End.

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