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EUROGAM PROJECT

NSF DATA ACQUISITION SYSTEM

Eurogam Software Installation

Edition 1.0

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NSF Software Systems Group

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EuroGam Software Installation Manual

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1 Introduction

This document explains the *production* file system organisation supporting the EuroGam data acquisition system at DL. It does not cover the organisation of *source* files. The structure outlined here assumes that VxWorks-based systems and discless workstations are all supported by a single file server system.

2 VxWorks systems

2.1 Booting VxWorks

The organisation of VxWorks boot-time files is constrained by the desire to keep processor NVRAM boot parameters as constant as possible while retaining flexible control over the content of the downloaded software. All the files needed to boot VxWorks systems are found in a directory structure rooted at `/vw/boot` on the server `nnsa`. Each target system takes its kernel image from the file

`/vw/boot/`*target*`/vxWorks`

and its startup script from the file

`/vw/boot/`*target*`/startup.cmd`

Hence the NVRAM of the target `nnvd` contains the following boot parameters:

```
host name           : nnsa
file name           : /vw/boot/nnvd/vxWorks
startup script(s)   : /vw/boot/nnvd/startup.cmd
```

We have adopted the practice of using common kernels for each target architecture type. Usually each specific target's boot file is actually a symbolic link to a generic kernel for that target's architecture. Thus, in the directory `/vw/boot/`*target* we have the link

`vxWorks -> ../`*architecture*`/vxWorks`

For example, `nnvd` being an MVME147 system we have in `/vw/boot/nnvd`

```
vxWorks -> ../mv147/vxWorks
```

The VxWorks boot machinery supports booting through a symbolic link so in practice we can have the link

```
vw -> /export2/vw
```

in `nnsa`'s root directory.

2.2 Loading application code

Once VxWorks is running in a target there is considerably more flexibility in determining what further software is downloaded since each target can NFS-mount whatever remote directory structures it needs. Each target's startup script selects what role the target plays within the EuroGam system by loading a target-specific set of object modules and starting target-specific tasks. We have adopted the convention of keeping VxWorks object modules in the common directory `/vw/eg-obj` and tailoring each target by either loading target-specific data objects or by spawning tasks with target-specifc arguments. Thus the target `nnvd` (the Resource Manager processor of a VXI crate) has the following fragment in its `startup.cmd`:

```
hostAdd ("egmsg", "148.79.208.16"); /* currently nnsa */
nfsMount ("nnsa", "/vw", "/vw");
nfsMount ("nnsa", "/eg", "/eg");
iam "VxWorks"
nfsAuthUnixSet ("nnvd", 14052, 14003, 0);   /* id=VxWorks, grp=eurogam */
cd "/vw/eg-obj"
ld <test_lib.o
ld <message.o
ld <rmSpectrumServer.o
ld <resourceManager.o
ld <registerServer.o
ld <registers.o
ld <frontend.o
sp ers, "vxi1", "/eg/experiments/default/config/vxi1"
```

Startup commands common to all VxWorks systems are in the file `/vw/boot/startup.cmd` which is optionally executed by each target's startup script.

This structure allows us to keep NVRAM boot parameters fixed while permitting operational patches and parallel onward development by modifying the target-specific `startup.cmd` files. For example, selected targets can be made to load object modules from a parallel object directory, `/vw/eg-obj-jan92`, say.

In general we expect only system support staff to modify files within the `/vw/boot` and `/vw/eg-obj` directory structures.

2.3 Application-specific files

Most VxWorks applications in EuroGam need access to configuration and other files which users can modify during the course of an experiment. Examples include VXI crate register server configurations, apparatus files, trigger LCA programs, and object-code files for event building and sorting. These files are found beneath the directory

`/eg/experiments/`*experiment*

where *experiment* is a label chosen by the users for their current experiment. VxWorks targets with applications needing to access such files must NFS-mount the directory `/eg/experiments` in their `startup.cmd` script. For example, a configuration file for a register server resource called `vxi1` in an experiment named `dy152` would be placed in the file

`/eg/experiments/dy152/config/vxi1`

The directory

```
/eg/experiments/default
```

contains configuration files, apparatus files, etc., maintained by the system administrator to reflect what he/she thinks is the organisation of crates and cards. This directory can thus be thought of as representing a "default" experiment. Users may copy selected files to their own experiment directory and edit the copies if they wish, but they are not expected to use the default experiment directly.

3 Workstation systems

Workstations must be able to access the shared `/eg/experiments` directory on the file server system, preferably using this name. We do this through the automounter by installing symbolic links in each workstation's root directory:

```
eg --> /nfs/nnsa/export2/eg
```

4 File server

This has to provide the `/vw` and `/eg` directories mentioned earlier. In practice these directories can actually be on some disc other then the root file system. On `nnsa` we have a large partition mounted on `/export2` containing all the production EuroGam-related material, but with symbolic links in the root directory:

```
vw -> /export2/vw
eg -> /export2/eg
```

By convention, a EuroGam message logger running in the file server will be told to log messages into files in the directory

```
/eg/log
```

The directory must be present before the message logger is started.

Executable programs can be put in directories anywhere convenient. We recommend putting all EuroGam-related binaries in the directory

```
/usr/local/egbin
```

also NSF-automounted by each discless client.