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HUNT ENGINEERING

2Locals Server/Loader Example

For VxWorks

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TABLE OF CONTENTS

THE 2LOCALS EXAMPLE.....	4
COMPILING, LINKING AND RUNNING THE EXAMPLE	5
COMPILING/LINKING THE EXAMPLE	5
RUNNING THE EXAMPLE	5
COMMAND LINE.....	7
THE SERVER/LOADER COMMAND LINE.....	7
VXWORKS NETWORK FILE	8
THE VXWORKS NETWORK FILE	8
TECHNICAL SUPPORT	9

The 2locals example is a simple Server/Loader example program that shows how to boot a 2-board network with one processor module on each board, connected by inter-board modules. The booted programs don't do a lot, they just pass a small message between them, and then the programs exit. (Plural is used, as 1 program is loaded to the first processor ('mod1_h4.out') and another to the second processor ('mod2_h4.out').)

(This example will **not** work with TIM-40 carrier boards such as the HEPC2E, HEPC3, HEPC4 or HECPCI1. It will also **not** work with the HEPC6, a one 'C6x processor board.)

Compiling, linking and running the example

Compiling/Linking the Example

The Server/Loader is delivered as a 'vxwsl.o' file. This file contains both the Server/Loader library ('hesl' interface), the Server/Loader executable ('vxwsl') and HeartConf. The file is located in the 'vxworks' directory of your HUNT ENGINEERING API installation (default 'c:\heapi').

The 3 components in 'vxwsl.o' are also available separately as 'main.o' (Server/Loader executable) in the 'hesl\bin' sub-directory of your Server/Loader installation, 'vxwsl.lib.o' (Server/Loader library) in the 'hesl\lib' sub-directory, and 'heartconf.o' (HeartConf) in the 'heartconf\vxworks' sub-directory.

An environment variable 'HESL_DIR' points to the 'hesl' installation sub-directory. 'HESL_DIR' has been created and initialised by the HUNT CD installation program. Include files are located in the 'inc' directory of 'HESL_DIR'.

Running the example

The Server/Loader needs file access to the network file and the DSP executables (the *.out files). Copy the network file and the *.out files onto a floppy disk, or copy them onto a hard disk if you have a VxWorks boot image with support for that. To be able to run the example successfully you must have included the dosfs module in your VxWorks BOOT ROM configuration. Set your default path to the location of the *.out files using the VxWorks system command `ioDefPathSet("location")`, where `location` is the VxWorks style path to the *.out file.

Make sure you have loaded the API, hrn_fpga, and the Server/Loader.

```
ld<heapi.o
ld<hrnfpga.o
ld<vxwsl.o
```

The reason for loading 'hrn_fpga.o' as well is that the Server/Loader supports loading of FPGA bit-streams. But the implementation of the Server/Loader uses hrn_fpga to do the actual loading. Given that hrn_fpga is also a stand-alone utility, we have chosen to supply the Server/Loader and hrn_fpga as two separate items.

Next, for a HEPC9, run the example as follows:

```
sp vxwsl, "-rlsv network"
```

The example assumes two HERON4's, in slot 1 and slot 2. If you don't use two HERON4 modules, but 1 or 2 different HERON modules such as HERON2, you will have to change the *.out file used in the network file. Some standard *.out files are supplied: -

- mod1_h4.out and mod2_h4.out (HERON4 on HEPC9),
- mod1_h2.out and mod2_h2.out (HERON2 on HEPC9).

For any other configuration, create a new project and build a new *.out file.

You should see something that ends like:

Entering Server mode.
first HERON module has started running
Entering Server mode.
second HERON module has started running
HERON module id 2 has replied
Leaving server mode.
Bitwise echo test completed successfully.
Leaving server mode.
Serving 2 nodes completed.

The Server/Loader command line

The Server/Loader uses a command line so that a user can specify the name of a network file and a number of parameters. The most common parameters are `-r`, (reset), `-l` (load), `-s` (serve) and `-v` (verbose), but there are others as well (please have a look at the Server/Loader manual). The VxWorks Server/Loader has a default command line of:

```
sp vxwsl, "-rlsv networkfile"
```

With this command line the Server/Loader will expect to find a network description file on the drive specified by `ioDefPathSet`. (In addition, it will then expect to find the `*.out` files and bit-streams as specified in the network file on the same drive.) By default, this will reset the system, boot all processors, and then serve standard I/O requests (`printf`, `frwrite`, etc) coming from the first processor in the system. The verbose option will cause booting information to be show on the screen.

The VxWorks network file

Note that a VxWorks network file uses a few extra parameters in board definitions.

The usual way to define a board, for example a HEPC9, you would write:

```
BD API HEP9A 0 0
```

But for VxWorks you need to add three parameters:

```
BD API HEP9A 0 0 on on 12
```

The three extra parameters need to be there for any board type, whether 'hep9a', 'hep8a', 'hep3b', 'hep2e' or any other. The first extra parameter is the master mode switch, "on" in this example. The second extra parameter is interrupts, "on" in this example. The third extra parameter is the IRQ, "12" in this example. The extra third parameter is not used with PCI boards, such as the HEPC9, HEPC8 and HEPC3. But the syntax requires there's a value anyway.

Note that with an HEPC8, master mode is not supported, so you would define: -

```
BD API HEP8A 0 0 off on 12
```

Apart from this, a VxWorks network file is identical to the 'standard' network file.

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