

**Stanford Linear Accelerator Center**



## PowerPC and VXI

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Kinetic Systems V152  
Embedded PowerPC Slot-0 Controller



# Objective

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- **Port the EPICS low-level RF Application**
  - ✓ vxWorks 5.3.1 to 5.4.2
  - ✓ EPICS R3.13.2 to R3.13.6
  - ✓ BSP architecture 68K to ppc
- **Why choose the PowerPC**
  - ✓ Current cpu, niCpu030 has been discontinued
  - ✓ Consistency; currently use ppc for other SLAC projects
  - ✓ byte orientation (big endian) - same as the 68K



# Hardware Issues

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- Automatic Slot-0 Master configuration
- SYSRST not asserted on reboot
- D8/D16 IACK Cycle - (V152-S002)
- SLAC VXI modules and the VXI spec
- Interrupt controller uses a mechanism for autovectoring VME interrupts



# Software Issues

- **Interrupts**
  - ✓ **Missing functions intVecGet**
  - ✓ **Slow boot – change to boot flash fixes this!**
  - ✓ **Must use VXI Interrupt functions – sysUnivVmeIntr() change**
- **Lack of atomic Read-Modify-Write**
- **A32 Space – device window configuration**
  - ✓ **EPICS\_VXI\_A32\_BASE 0x20000000 0x9000000**
  - ✓ **EPICS\_VXI\_A32\_SIZE 0x00100000 0x1000000**
- **Resman**
  - ✓ **CPU is a message base instead of register based module**
  - ✓ **Force sysReset to be asserted on reboot (sysUniverseHardReset)**



# Slow Boot

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## Description

The problem was due to the latest hw issue of the Motorola MVME2400 board which relocated (remapped) the address of the ethernet chip, so during boot, every pci address had to be probed until the device was found. WindRiver will issue a SPR and will fix this, but it will be several months before a fix is released.

## Instructions

- 1) Install the latest driver update from WindSurf (e.g. June 2001)
- 2) The driver update causes one problem, so you will also have to install patch SPR 69093. The release note will explain the nature of the patch.
- 3) Put dec21x40End.obj into your mv2400 directory. Add this file to makefile under MACH\_EXTRA. This is the file that hardcodes the address.
- 4) Remake bootrom and flash.



# SysReset

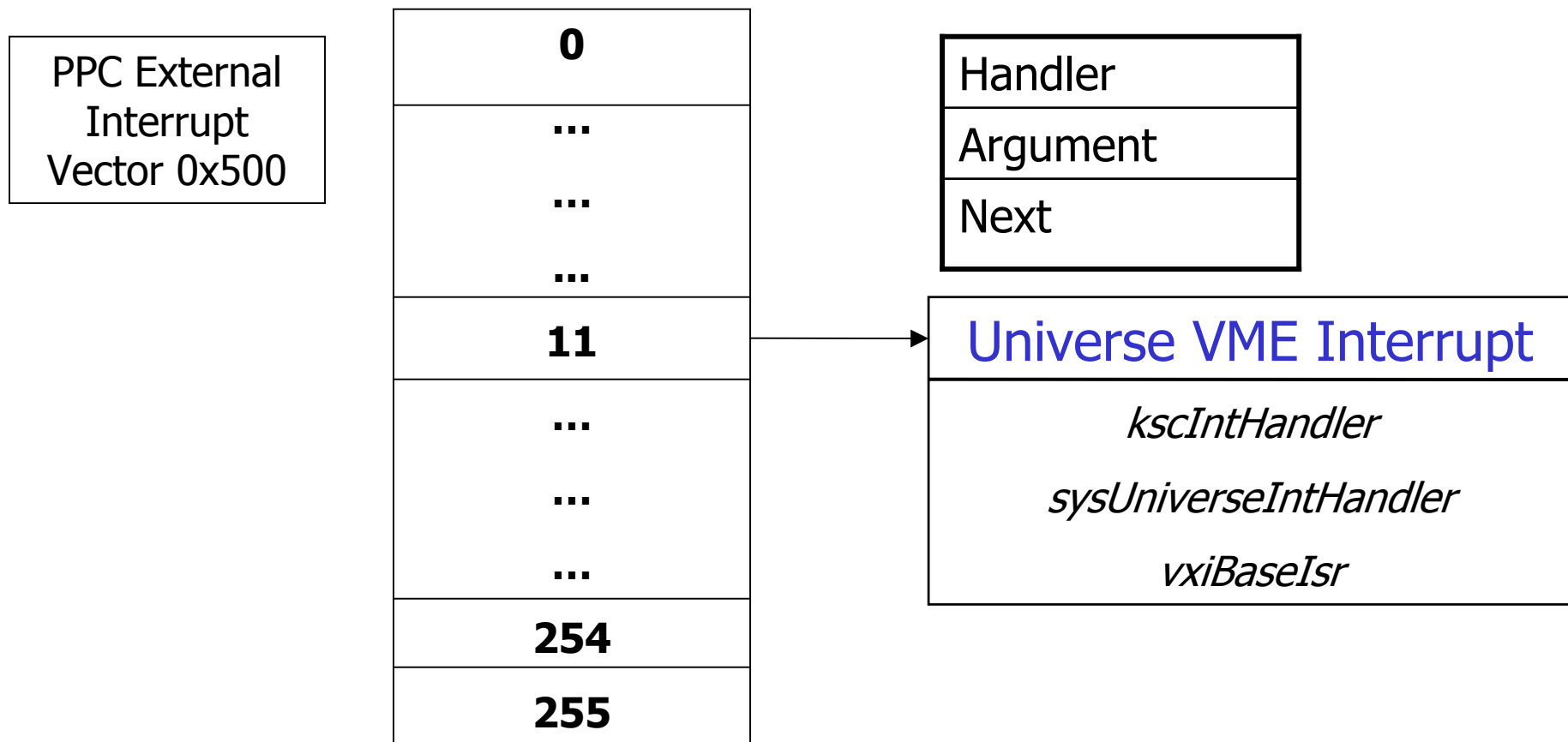
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- \* sysUniverseHardReset - Hard Reset of the Universe VME chip
- \*
- \* This routine performs a hard reset of the Universe chip by
- \* asserting (low) the SYSRST line on the VMEbus.
- \*
- \* RETURNS: N/A
- \*/

```
void sysUniverseHardReset (void)
{
    printf("\n\n\r Hard Reset, via Universe VME reset\n\r");
    taskDelay(10);
    UNIV_OUT_LONG( UNIVERSE_MISC_CTL,(UINT32)MISC_CTL_SW_SRST );
}
```



# Vector Table





# VXI Vector Table

Level	ISR
1	DefaultVXIintHandler
2	DefaultVXIintHandler
3	DefaultVXIintHandler
4	DefaultVXIintHandler
5	DefaultVXIintHandler
6	DefaultVXIintHandler
7	DefaultVXIintHandler





## Conclusions

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- Installation was relatively painless
- Kinetic Systems Support was great
- V152-S002 testing underway.