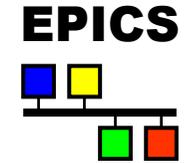


*Linux Based IOC Support  
EPICS Meeting at BESSY*

May 2002  
Marty Kraimer



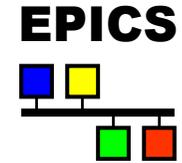
# VISION



- ◆ LINUX REPLACES VXWORKS
- ◆ BUT: Linux isn't a real time operating system
  - ◆ Non-preemptive kernel => no context switch while kernel active.
  - ◆ Interrupts can be disabled for long periods of time.
  - ◆ Worst case can be 100s milliseconds.
- ◆ Future
  - ◆ Development kernel is preemptive.
  - ◆ Work in progress so that interrupts disabled for short times.
- ◆ Other possibilities
  - ◆ RTLinux
  - ◆ RTAI



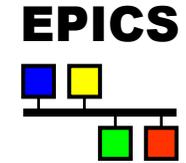
## *Modified Vision*



- ◆ Existing Linux good enough for some Applications.
- ◆ 2.6 Kernel will be good enough for additional Apps.
- ◆ Often small part of App has stricter real time requirements. In this case consider RTLinux/RTAI.
- ◆ For demanding Apps use RTEMS or stay with vxWorks.



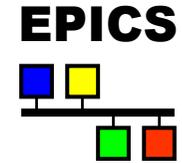
## *Near Term Goals*



- ◆ Industry Pack Support on Linux IOCs
- ◆ Work with Tim Mooney's group
  - ◆ Joe Sullivan working on PCI based motor support.
  - ◆ IP + Motor => usable for some beam line applications.
  - ◆ Expect there will be a lot of interest.



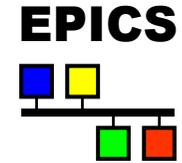
## *Progress*



- ◆ PCI-40A : SBS Quad IP Carrier for PCI Bus
- ◆ Linux Kernel support now exists for
  - ◆ Generic IP carrier support (Like ANJs IPAC support)
  - ◆ PCI-40A
  - ◆ IP-488 (Green Springs GPIB IP using the ti9914)
- ◆ EPICS Gpib driver
  - ◆ Implements Benjamin Franksen's interface
  - ◆ Talks via file system to IP488 Linux driver
  - ◆ DG535 support works (For awhile before crashing)
- ◆ Message Passing Facility MPF ported to 3.14
  - ◆ Lots of cleanup.
  - ◆ Ran several tests successfully



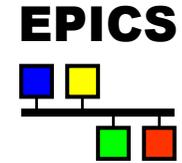
## *Still to do*



- ◆ IP Serial
- ◆ IP330 (ADC)
- ◆ DAC128V (DAC)
- ◆ ipUnidig (Digital I/O)
- ◆ BIG ISSUE
  - ◆ Existing support allows MPF support to register with interrupt routine, i.e. user code called directly by interrupt routine.
  - ◆ IP330 allows floating point in interrupt routine.
- ◆ Initial Strategy
  - ◆ Extract interrupt handlers and use insmod to put them in kernel
  - ◆ Convert floating point to integer.



## *Additional Tasks*



- ◆ Allow user level to access IP register space.
  - ◆ Have written but not tested.
  - ◆ Is this better than kernel drivers?
  - ◆ What about interrupts?
- ◆ Work with Tim's group to support synapps on Linux
- ◆ APS/ ASD can also use Linux IP support.
  - ◆ Many many records for serial I/O.
  - ◆ Quite a few using IP330.
  - ◆ Monitoring Only and not time critical
- ◆ Future hardware??? PC\*MIP, etc, etc.