VxWorks Licenses for EPICS Application Developers

Andrew Johnson

Controls Group, AES Division
Argonne National Laboratory

Argonne

NATIONAL
LABORATORY

… for a brighter future

U.S. Department
of Energy

UChicago ▶
Argonne LLC

Office of
Science
U.S. DEPARTMENT OF ENERGY

A U.S. Department of Energy laboratory
managed by UChicago Argonne, LLC

Outline

- History of vxWorks at APS

- Problems with Existing Licenses

- Wind River Enterprise Licensing

- EPICS Application Developers

- Workbench Desktop with Special Terms

History of vxWorks at the APS

- VxWorks license #1954, vxWorks 4.0.2, for APS Controls group
  - 10 seat perpetual license for 68K family, purchased June 1989
- Additional license for Beamline Controls group and CAT developers
- OS upgrades covered by the annual support/maintenance fees
- Added another CPU family for vxWorks 5.3.1 (Tornado 1.0.1)
  - 10 seat perpetual license for PowerPC, purchased July 1999
- Currently running vxWorks 5.4.2 (Tornado 2.0.2) on 68K and PowerPC
  - Doesn't support new CPUs (MVME3100, MVME6100)
- May upgrade our R3.14 IOCs to vxWorks 5.5.2 (Tornado 2.2.2)
  - This is the End of Life for 68K CPUs, not supported in vxWorks 6.x

Problems with Existing Licenses

- Poor support for new hardware

  - BSPs for new CPU boards will soon be vxWorks 6.x only

  - USB and FireWire (IEEE-1394) only supported on vxWorks 6.x

- Old software

  - GCC for vxWorks 5.5 does not support standard C++

  - No support for IPv6, SSH, ...

- Restrictive license

  - Specific to a particular project, CPU family and host OS

- Upgrade to vxWorks 6 not covered by support/maintenance

The Enterprise Licensing Model (ELM)

- A perpetual license for vxWorks 6.x would be expensive

    - No more 10 seat licenses, Wind River now charge per seat

    - Annual support/maintenance fees would increase

    - Still limited to specific CPU families purchased

- ELM licenses are valid for one year, but are less restrictive

    - Can be used on any supported project, target CPU and host OS

    - Include extra tools (USB stack, SNMP stack, VxVMI etc.)

    - Provide access to the vxWorks Source Code

- However on talking to our salesman we worked out that a regular ELM license for vxWorks 6.x would be as expensive as a perpetual one

Argonne
NATIONAL LABORATORY

EPICS Application Developers

- The needs of an EPICS IOC application developer are modest
  - Access to the VxWorks header files for compiling applications
  - Cross-compiler (gcc)
    - *Licensed under the GPL*
      - WRS cannot restrict usage
      - They must provide their source code on request
    - *We could build our own compiler from source if necessary*
  - A boot file that includes the VxWorks Target shell and linking loader
    - *Provides debugging facilities*
- Source-level debugging helps with driver development
  - Not essential, especially if only creating databases and SNL

Argonne
NATIONAL LABORATORY

Wind River Workbench Editions

- Wind River sell their Workbench product in three editions:
  - Platform Developer: Full Linux cross-development, User + Kernel code
  - Application Developer: User code cross-development only
  - Desktop: IDE for host code development only
- An EPICS IOC application developer only needs the equivalent of the Application Developer edition for vxWorks
  - Unfortunately the Application Developer edition is for Linux targets only

Workbench Desktop Edition with Special Terms

" **During the Subscription License Term and subject to the terms and conditions of this agreement, Wind River grants Customer access to Header Files contained in the Software to enable compilation of the GPP Desktop Edition Software licensed and listed above. Customer is responsible for configuration and support of any third party compiler to be used with the Software. Transfer of, or access to any person or party other than Customer is strictly forbidden.**

- Price is a quarter that of the equivalent Platform Developer seat

Conclusion

- We are replacing our perpetual licenses with an Enterprise License Agreement

    - 2 Floating Platform Developer seats

    - 1 Unique User Platform Developer seat

    - 12 Floating Special Desktop seats

- These are for 54 EPICS IOC and support application developers

- Annual cost is very similar to our previous support/maintenance fees