



*... for a brighter future*

## *What's New in Base R3.14.10*

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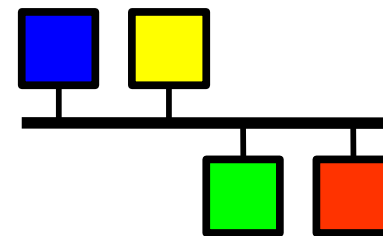
U.S. Department  
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# EPICS



## EPICS Base 3.14.10-RC2

- Version 3.14.10, Release Candidate #2
  - RC2 because Mark Rivers found a serious bug in the -RC1 version
    - *Eric Norum developed the fix, adding 'volatile' to epicsRingPointer.h*
    - *Ralph Lange reported the fix resolved the same issue in R3.14.8.2*
  - Released last Friday, October 10th
  - After 1 week we still think RC2 is good enough to ship
- If nothing changes by Friday, October 17th, we'll release 3.14.10
- Please try it out before then if you can on any “unusual” targets or configurations in use at your lab

## Known Problems

- The cygwin-x86 build fails when `HOST_OPT=NO`
  - Probably a bug in the Cygwin version of the g++ compiler.
- Also on cygwin-x86, a parallel make (`make -j`) sometimes fails
  - Just run a serial make (or try another `make -j`) to finish the build
  - On Windows, compiling Base on a network drive (Samba share) is vvvveeeerrrryyy ssslllllooooowww
    - *Using `make -j` helps a lot if you have to do this*
- All architectures: Do not build with NDEBUG set; won't work.
- Linux CA clients and IOCs sometimes report this error on shut-down:  
**FATAL: exception not rethrown**  
**Abort**
  - Nothing to be concerned about, occurs when stopping threads
  - Due to a fundamental incompatibility (on Linux systems with NPTL) between our use of both C++ exceptions and `pthread_cancel()`
  - No easy fix possible, discussing how best to solve with Jeff Hill

# What's New?

- General Time integrated into Base
  - Pluggable current and event time sources, prioritized
  - Automatic fail-over, so the current time should always be available
  - Both vxWorks and RTEMS contain a simple NTP client time provider
- 64-bit target support
  - IOCs should work properly now on -x86\_64 and -sparc64 targets
  - `DBF_LONG` → `epicsInt32`, `DBF_ULONG` → `epicsUInt32`
  - Still use `long` in many APIs (most unchanged).
- Parallel make supported in build system
  - `gnumake -j <limit>` Builds up to *limit* targets at once
  - Makefiles must list directory dependencies:
    - `DIRS += yyy xxx`
    - `xxx_DEPEND_DIRS = yyy` *yyy must be built before xxx*
- New Linux CPU architectures
  - CRIS, Xscale (MOXA UC-7408 Plus)

# What's New For IOC Developers

- Array subroutine record `aSub` built into Base
  - Same as `genSub` record for most users
  - Only supports regular array types (not arbitrary structures)
- Calc engine expressions
  - `VAL` returns the previous result
  - `min`, `max`, `finite` and `isnan` can take any number of parameters
- Breakpoint table values should be monotonic (not change direction)
  - Set `dbBptNotMonotonic` before loading any that aren't
- IOC startup and shutdown processes reworked
  - IOC shutdown now stops scan tasks and `interruptAccept`, disconnects `dbCa` links, deletes records that have extended device support
  - At startup, `iocInit = iocBuild + iocRun` (needed for redundancy)
  - `iocPause` stops scan tasks and `interruptAccept`, disconnects `dbCa` links, pauses the CA server (CA clients disconnect after 35 seconds)
  - `iocRun` restarts everything again (hopefully!)

# What's New For Perl Programmers

- Build support for installing Perl library modules in `<top>/lib/perl`
  - Perl programs using these modules need to know where to find them
  - New tool provided that substitutes `@VAR@` variables on installation
- Perl 5 wrapper for the CA library
  - Example versions of the catools programs in `<base>/src/cap5`
  - Writing CA clients in Perl is easy, here's caget:

```
use lib "@EPICS_BASE@/lib/perl";
use CA;
my @chans = map { CA->new($_); } @ARGV;
eval { CA->pend_io(5.0) };
my @live = grep { $_->is_connected } @chans;
map { $_->get; } @live;
CA->pend_io(5.0);
map { printf "%s = %s\n", $_->name, $_->value; } @live;
```

## What's New For Other Developers

- Statistics from IOC CA clients, useful for your version of vxStats
  - `void ascaStats(int *pchans, int *pdiscon);`
  - `void dbcaStats(int *pchans, int *pdiscon);`
  - `void seqcaStats(int *pchans, int *pdiscon);`
- New header file `epicsEndian.h`
  - Defines `EPICS_BYTE_ORDER` and `EPICS_FLOAT_WORD_ORDER` as `EPICS_ENDIAN_LITTLE` or `EPICS_ENDIAN_BIG` (numeric constants)
    - `#if (EPICS_BYTE_ORDER == EPICS_ENDIAN_BIG)`
- Timestamps displayed by `camonitor`
  - Can now display timestamps from both CA client and server
  - Useful when a record's process routine generates intermediate results, e.g. scan and motor records
- Lots of other stuff, read the Release Notes!

# What's Next?

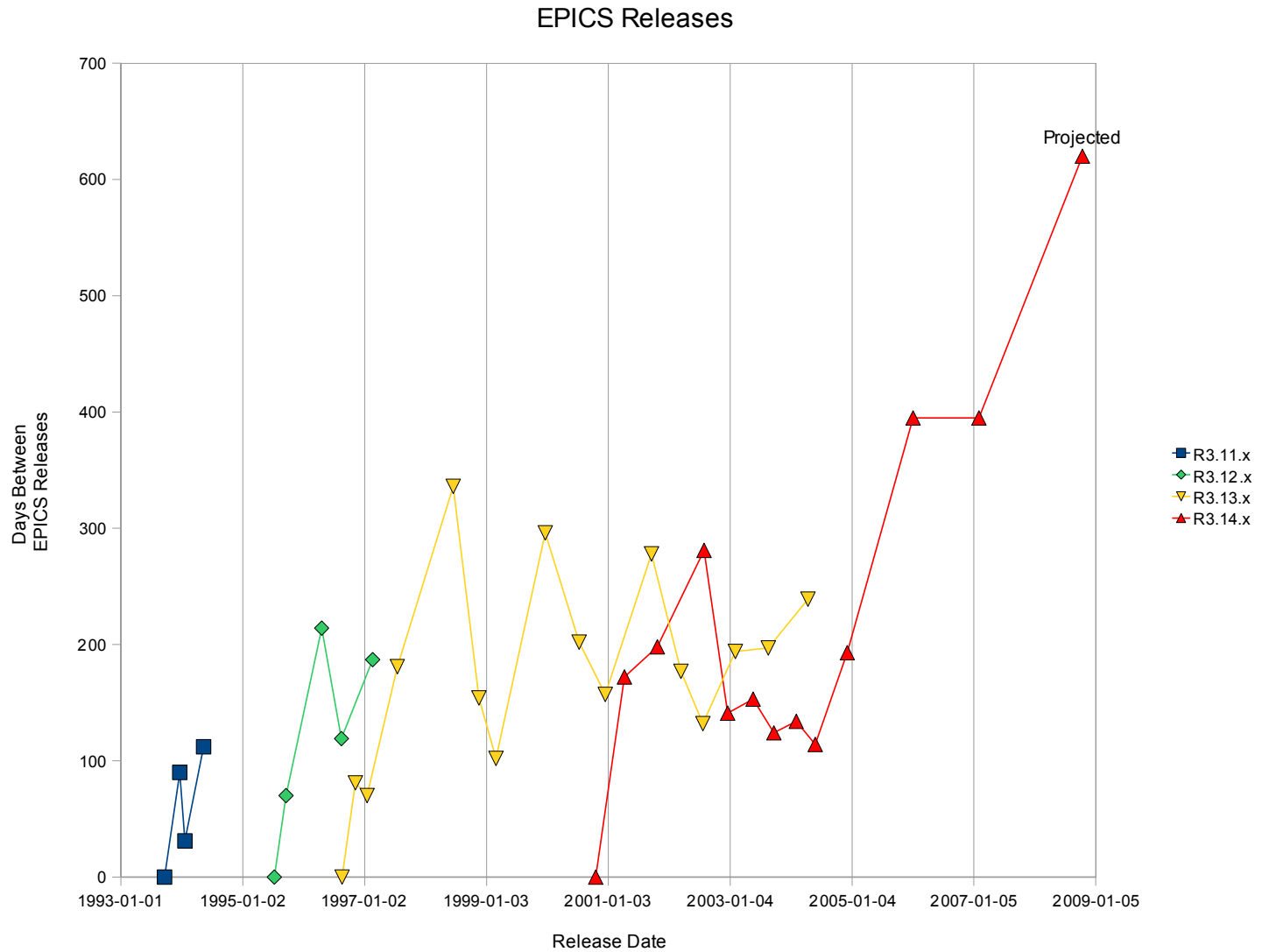
- R3.14.11 or R3.15?
  - R3.14.11 could contain
    - *PV Aliases*
    - *Longer strings using char arrays*
    - *Record's time-stamp only set when a record's value changes*
      - vs. every time a new value is generated
  - R3.15 might eventually have
    - *Compiled DBD Files*
    - *Pluggable Server API*
    - *Data Access and CA Event Filtering*
    - *Variable Length Strings*



## *When's the next version due?*

- Sooner, if we get some offers of help from other laboratories
  - Argonne has three people who do EPICS core development work, for a part of their time.
  - APS management has not replaced Marty Kraimer or Ken Evans, both of whom used to do some EPICS work.
  - If it doesn't look like there's very much happening, that's why — we're busy with other tasks.
  - The result is that R3.14.10 has historically taken the longest time to release of all EPICS Base versions ever.

# EPICS Release Development



# What can you do?

## ■ Supervisors:

- Offer some time by one of your staff to implement some new functionality in Base
- Send someone to the next EPICS Codeathon
- Take on responsibility for maintaining some code which you rely on

## ■ Developers:

- Encourage your Boss to let you do one of the above
- If you're allowed 10% time, use it for something EPICS related
- Ask me (by email) what you could work on, I keep a list...

## *In Particular*

- We are in need of a site to take over maintenance of the State Notation Compiler and Sequencer
  - Michael Laznovsky moved from SLAC to PSI
  - Ernest says he has no spare effort at SLAC to maintain it
- SNC/SEQ is a major EPICS component, needs a good programmer able to take ownership of it over the long term
- Initial jobs:
  - Review patches from DESY that add redundancy to the Sequencer
  - Remove or fix devSequencer support
- Offers of help to me please
  - If your site relies on SNL, can you afford for it to fall into disrepair?