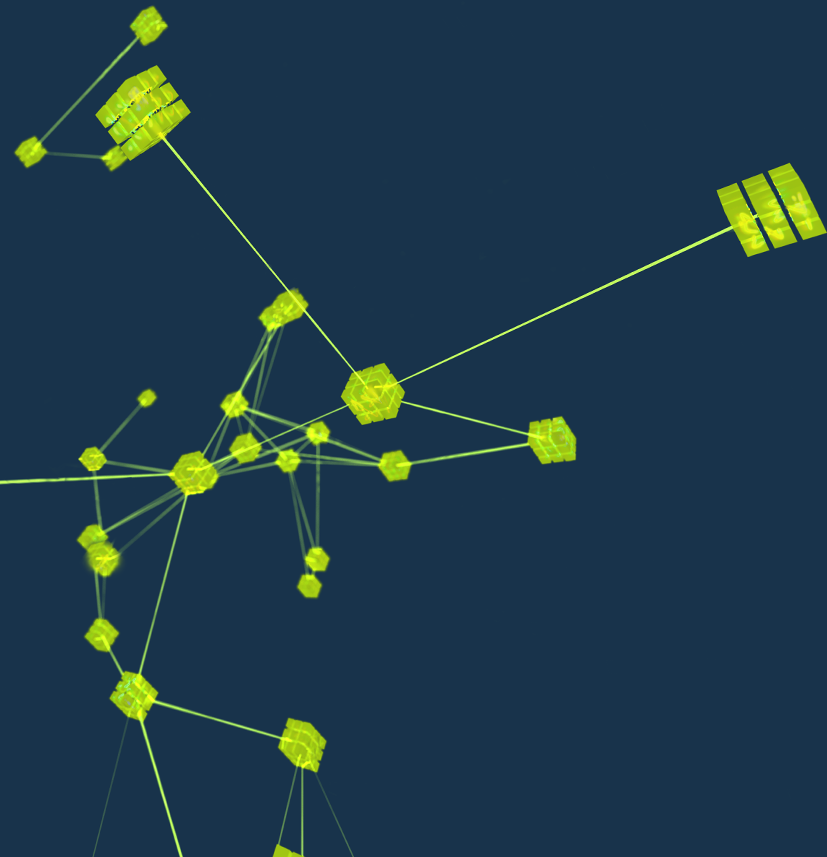


EPICS Collaboration Meeting 16–20 September, 2024

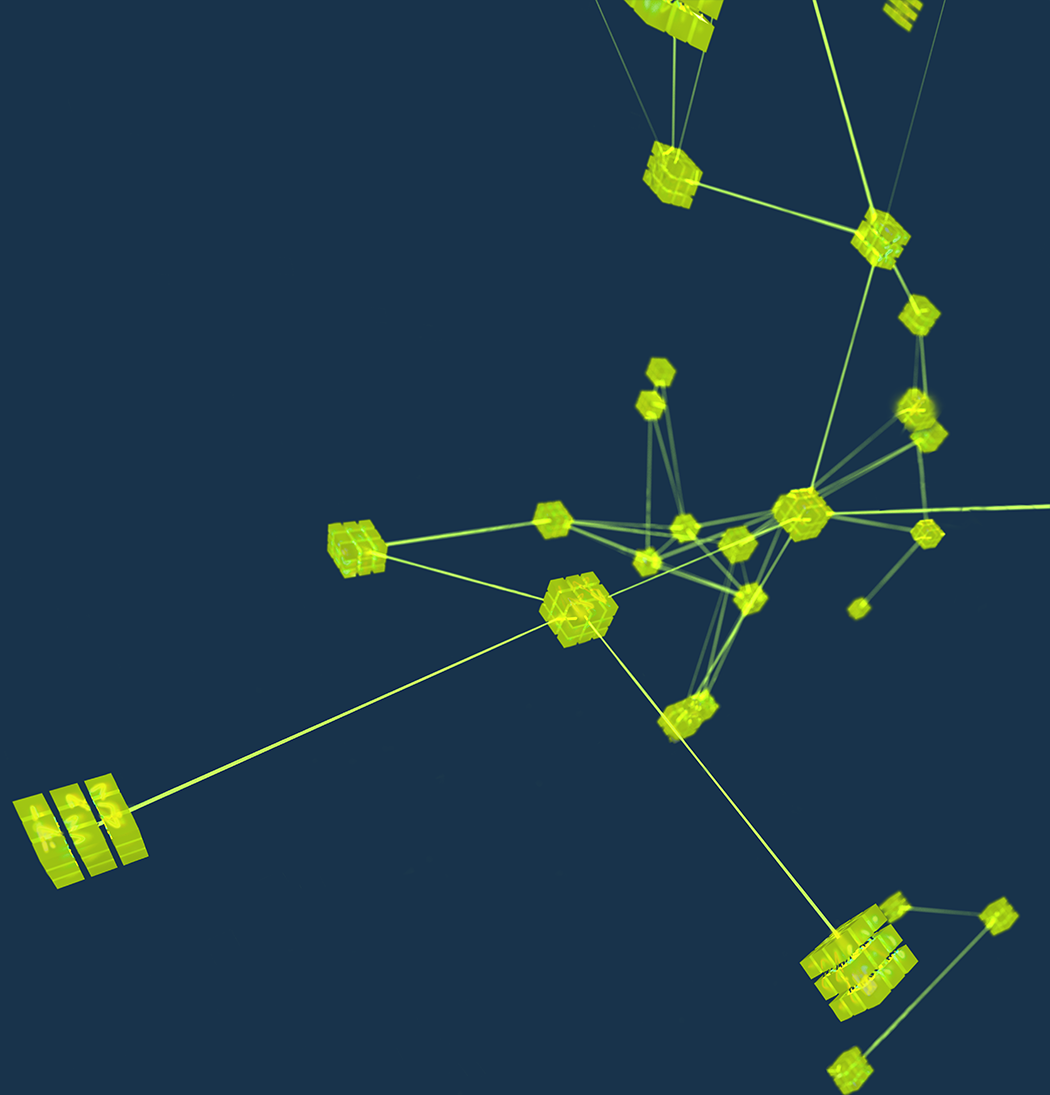


What's New in EPICS Base

Andrew Johnson for the EPICS Core Developers

Outline

- Released
 - Changes in EPICS 7.0.8 (Dec 2023) and 7.0.8.1 (Jun 2024)
- Merged
 - Changes already merged onto the 7.0 branch since 7.0.8.1
- Developing
 - Many pull requests still pending
 - Ideas in development or under consideration
 - Longer term plans



RELEASED

FEATURES PRESENT IN EPICS 7.0.8 & 7.0.8.1

EPICS Releases in last 3 years

- EPICS 7.0.6.1 6 October 2021
- EPICS 7.0.7 7 September 2022
- EPICS 7.0.8 15 December 2023
- EPICS 7.0.8.1 27 June 2024

Changes in EPICS 7.0.8 (December 2023)

- pva2pva (QSRV1): Fix for dbLoadGroup (broken in 7.0.7)
- Calc expressions may now use new function `FMOD(NUM, DEN)`
- When built with GNU Readline, iocShell supports tab-completion of commands, filenames, record names, var names and `pdbbase`. The IOC's shell history is now saved to a `.iocsh_history` file
- MacOS builds will detect and use GNU Readline from Homebrew or MacPorts if available. Apple's libedit can't do tab-completion
- Menu fields can be values that are not a valid choice. Fetching one as a string now returns the numeric value as a string instead of an error

Changes in EPICS 7.0.8 from the 2023 Codeathon

Changes developed at the Codeathon at Diamond in March 2023:

- Setting the new compress record's `PBUF` field to `YES` enables partially-filled buffers to be processed by the N-to-1 algorithms
- The new `OOPT` field in the longout record controls whether the output value gets written to device support, similar to the calcout record
- A subroutine record with invalid `INP*` links no longer fails silently
- Many C & C++ compiler and `ubsan` warnings have been cleaned up
- An `.editorconfig` file was added, formatting is checked by CI builds
- The “ts” server-side filter can now fetch a record's timestamp with a choice of formats. The updated filter documentation has details
- A new `dbCreateAlias` `iocsh` command allows record aliases to be defined (before `iocInit`) without loading a separate `.db` file

More Changes in EPICS 7.0.8

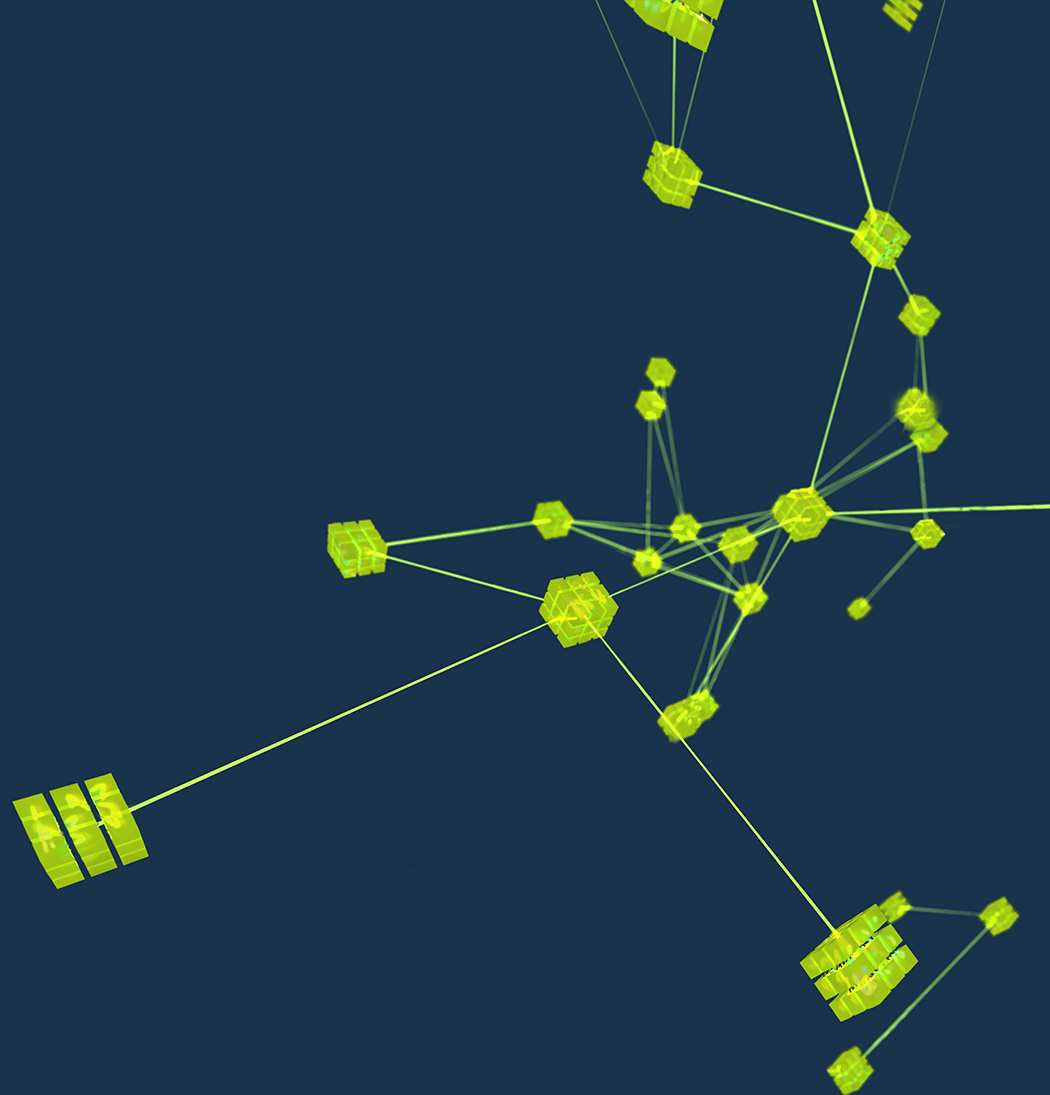
- Error symbol names can be registered with `errSymbolAdd()`
- The bi record's "Raw Soft" device support now applies a non-zero MASK field to the raw values to generate VAL
- A new environment variable `EPICS_CLI_TIMEOUT` sets the default CA timeout for the catools programs (the `-w` option still overrides)

See Release Notes from the epicscontrols.org website for details

Changes in EPICS 7.0.8.1 (June 2024)

Not many, this mostly was a bug-fix release

- Older Base versions won't build with `_FORTIFY_SOURCE=3`, now the default in GCC 12+. Fixes to the code are coming, this just sets it to 2
- Fix for the new partially-filled buffers feature in the compress record
- `epicsSocketAccept()` now returns `SOCKET` type, not `int`
- `dbLoadRecords` `iocsh` command accepts macros with default values
- Hostname length limit in CA removed, previously truncated at 255



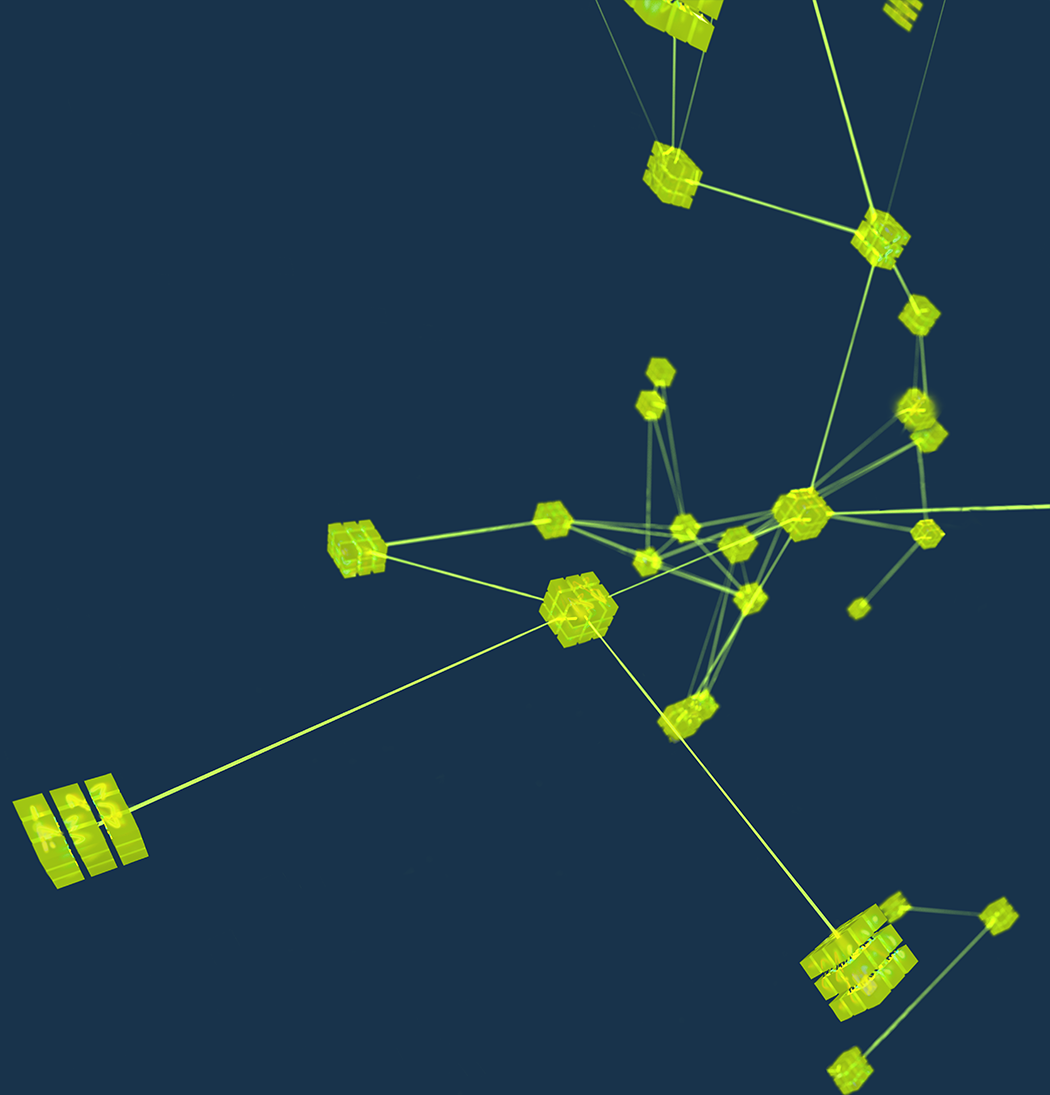
MERGED

FEATURES ON 7.0 BRANCH NOT YET RELEASED

Changes already merged onto the 7.0 branch since 7.0.8.1

Some of these PRs were from the Codeathon at Diamond in March 2024:

- Validate record alias target names
- Many documentation improvements
- A .db file can delete already-loaded records using the record type #
`record("#", "unwanted") {}`
- Readline history stored by iocsh now only contains commands that were typed in, not commands from the `st.cmd` file
- Many memory leaks, compiler warnings and minor bugs cleaned up



DEVELOPING
FUTURE FEATURES

Many Pull Requests still pending

Many PRs, some dating from the 2022, 2023 and 2024 Codeathons still need completing, reviewing and/or merging:

- Convert the IOC Component Reference Manual (was called the Record Reference Manual) and Doxygen header annotations to Read-the-docs
- More Doxygen annotations for header files in libCom and ca
- More detail and better-formatted IOCSH “help” command output
- Unit tests for standard record types (ai, bi, bo, printf)
- Full support for RTEMS-6; this can talk NFSv3 and NFSv4 with libbsd
- New `EPICS_PRINTF_FMT(format_string)` annotation macro to let Microsoft compilers check printf-like declarations
- More work from the 2024 Codeathon at BNL that I can't fit here!

Ideas in development or under consideration

- A makeBaseApp template for creating your own site template repository application (`makeSNSapp`, `makeBNLapp` etc.)
- Local `iocsh` variables with the scope of an `iocshLoaded` file
- Send out `DBE_PROPERTY` events only when the property field changes
- Explicit `INT` and `EXT` link modifiers to help detect typos in PV names
- Add `OOPT` to more output record types (only write “On Change” etc.)

The EPICS Core Developers group needs help reviewing and testing PRs!

Longer Term Plans

- Next major release branch will be 7.1
 - Still no specific timetable for creating this yet, but getting closer
 - Will require C99 and C++11 compilers (GCC 4.8.1 or later)
 - Will not support VxWorks or RTEMS 4.x
 - Will replace the PVA libraries with PVXS and QSRV2
 - PVXS supports IPv6, does CA need to support that?
- APS will want to continue releases of IOC updates from the 7.0 branch with the older pvDataCPP/pvAccessCPP/pva2pva modules
- We're likely to drop support for the 3.15 series when 7.1 is released
 - R3.15.9 was released in June 2021, only 20 commits since then

Thank You!

Questions or Comments?

