

EPICS Base: The State of the Toolbox

What has happened recently in EPICS Core development, and how we think we can get to wherever it is that we might want to go – 3, 4, 7 ...

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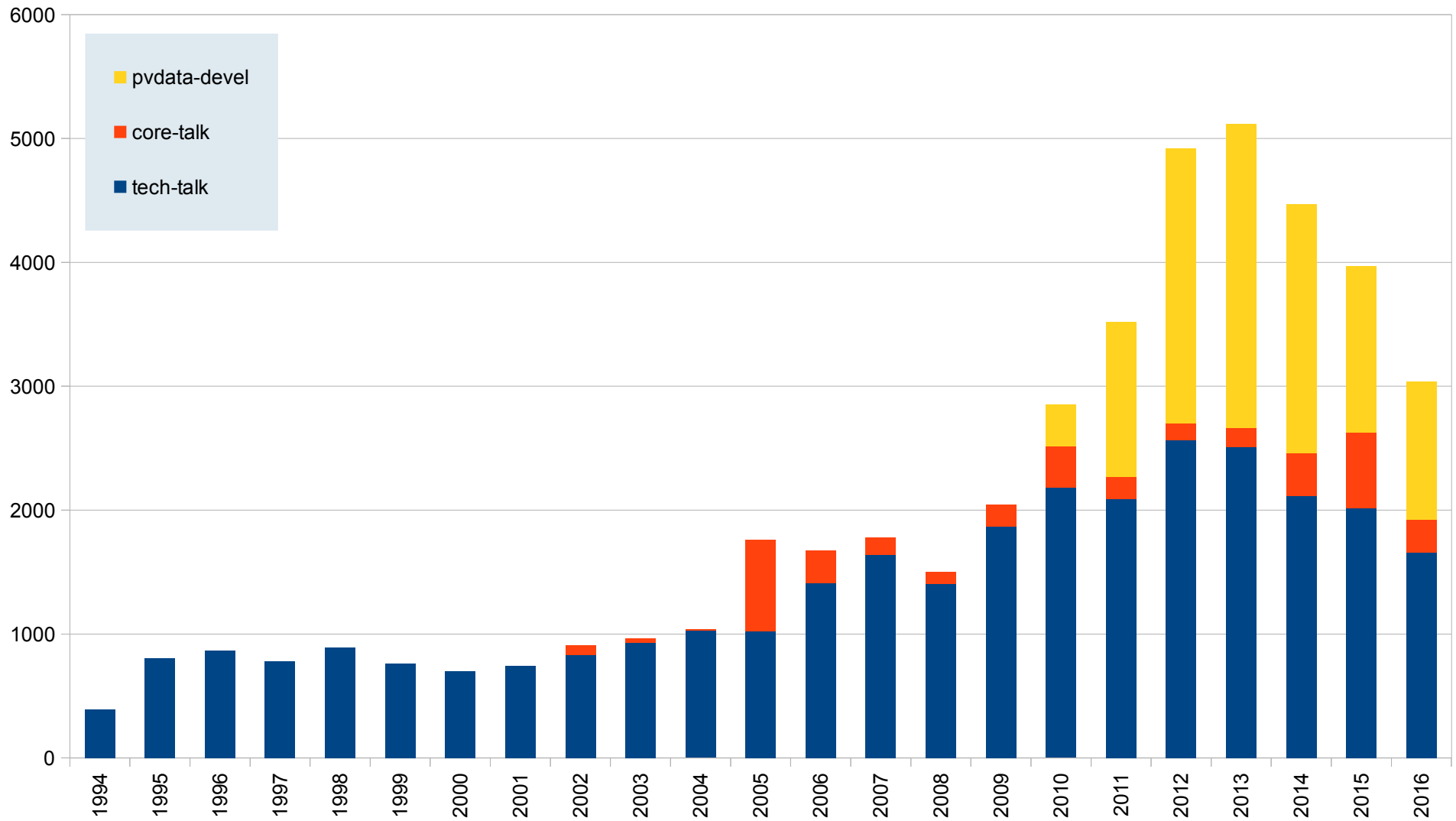


Outline

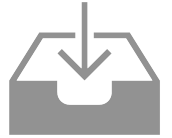
- Website Statistics
- Releases
 - Base 3.15.4 – 27 May 2016
 - EPICS V4.6.0 – 18 September 2016
 - Base 3.14.12.6 – Halloween 2016
- Base 3.16
 - Base 3.16.1 Release
- EPICS 7



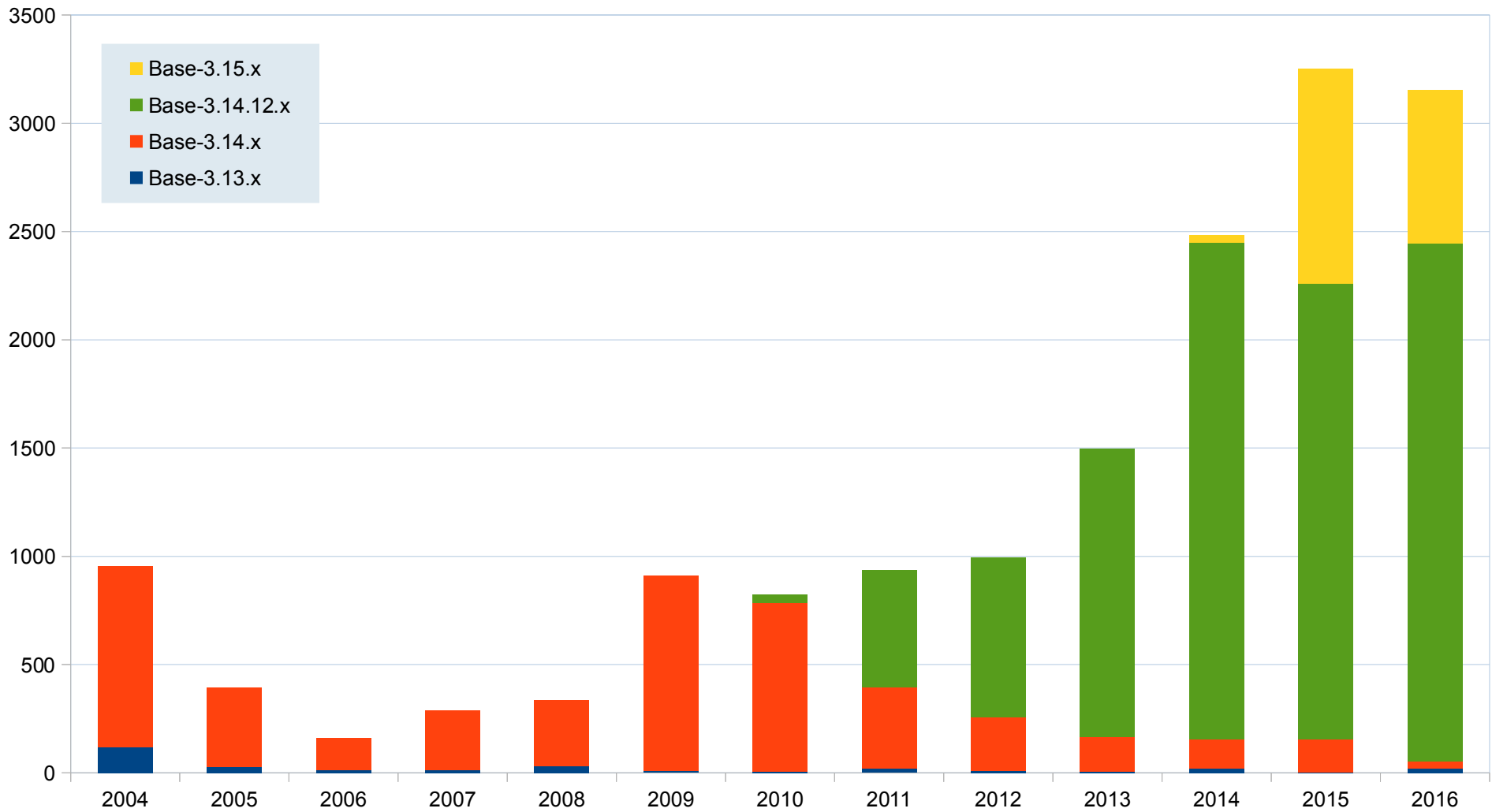
Mailing List Messages



EPICS Base Downloads



Web Spiders/Bots excluded from these counts



Base 3.15.4 – 27 May 2016

- Release managed by Ralph Lange
- Most new features are backwards-compatible:
 - IOC's CA server can be configured to connect to specific network interface(s)
 - EPICS_CAS_INTF_ADDR_LIST, EPICS_CAS_IGNORE_ADDR_LIST, EPICS_CAS_BEACON_ADDR_LIST
 - IPv4 multicast addresses can be used for UDP traffic (PV name searches & beacons)
 - Some environment variables are now set by the IOC to provide the Base version and build architecture. An application can now use one iocBoot/ioc directory for all unix-like OS's.
 - The DBD file's promptgroup() is now a free string, and all record types in Base have been updated with better group names and groupings
 - VisualDCT users will need the latest release to accept the new group names.
 - Other DCTs or tools that read DBD files may need to be similarly modified.
 - Unmodified record types will have the old GUI_xxx strings replaced
 - New device support “getenv” added for stringin and lsi (long string input) record types.
- Also includes changes from the 3.14 branch



EPICS V4.6.0 – 18 September 2016

- Major updates included in this release
 - Fixed problems with Boost version in pvCommonCPP clashing with OS's Boost
 - All V4 shared libraries now install with their own version number (e.g. libpvData.so.6.0)
 - pvStructure and pvUnion field names are now validated (C identifier rules)
 - pvDataJava PVStructure.equals() method now matches C++ behavior
 - pvAccess data Pipelining — window configurable at connection time
 - pvDatabase supports channelRPC on the same channels as get/put/monitor
 - pvaClient now supports channelRPC
 - pvaPy supports putGet & getPut; direct access to structure subfields (x.y.z); numpy arrays; performance measurements and significant improvements since V4.5.0
 - Major reorganization of examples (exampleCPP and exampleJAVA), documented
 - New C++ bundling module with support for parallel builds
 - Java modules now uploaded to Maven Central when released



Base 3.14.12.6 – Halloween 2016



- Stable release, mostly bug-fixes

- Some fixes have been published as patch files against Base-3.14.12.5
 - Fix for the CALC engine's bit-wise operators when an operand has the MSB set.
 - CA get operation with a compound data type is now atomic.
 - CA monitors have always been atomic (both data and metadata fetched with lock held).
 - Additional build-time check of module RELEASE files:
 - Pointers to other modules may only share a path when listed on adjacent lines.
 - Important for Debian where packaged modules all share one INSTALL_LOCATION.
 - Improvements to generalTime and the NTP time provider on RTEMS and VxWorks.
 - Various buffer-overflow / stack corruption / race condition / IOC shutdown bugs fixed.
 - Fixes for newer versions of compilers: gcc-6, Microsoft Visual Studio 2015
 - Removed \$Release-Id\$ keywords from sources, not supported by git
 - cas: Update enum string table correctly



Base 3.16.0.1 – 3 March 2016

- Developer release, not for production use!
- Features:
 - Record locking code rewritten: No global locks, code can lock multiple lock-sets at once.
 - The `epicsTime` routines now return a status value `S_time_...`, not just `epicsTimeERROR`
 - General Time provider routines must be updated, see Release Notes for details.
 - Internal memory allocator APIs instrumented for use with valgrind.
 - GNU Readline can be disabled at runtime, useful for controlling a soft IOC from a script.
 - Compress record type now supports both FIFO (default) and LIFO buffering.
- Also included changes from the 3.15 and 3.14 branches



Base 3.16.1 Release – 2016

- New features already in Base 3.16 branch:
 - iocsh does not echo comments in st.cmd files that start with #-
 - Cleanup / removal of unused or unnecessary C++ APIs
- Feature branches currently being reviewed
 - Optimize loading of IOC databases
 - IOC support for 64-bit field types (DBF_INT64, DBF_UINT64)
 - Extensible link-types using JSON (needed for IOC support of pva links)
 - Add your own link types, supported by any INP/OUT field (non-blocking I/O)
 - Constant link type implements array and string literals
 - New Calculation link type
- Work still in development:
 - New type of device support with JSON link address
 - Automated Testing of Base on Linux using QEMU (RTEMS) and WINE (Windows)

EPICS Beyond Base-3.16

- After Base 3.16.x we will combine Base with the V4 modules
 - We will continue to provide V4 software for use with earlier Base releases
 - The older Base branches will continue to receive bug fixes & patch releases
- Convert Base source code repository to git
 - Continue to use Launchpad — supports git & merge proposals, existing bug tracker
 - May accept pull requests through Github as well as Launchpad
- When combining we will split the Base source tree into separate repositories
 - Some V4 modules will be released separately (including Java)



Why EPICS 7?

$$3 + 4 \Rightarrow 7$$

$$3 | 4 \Rightarrow 7$$

$$3 \wedge 4 \Rightarrow 7$$

Combination of V3 and V4 \Rightarrow EPICS 7

Note: EPICS 7, not EPICS V7

