EPICS Core Status

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Andrew Johnson, Ralph Lange, Marty Kraimer, ...
What is EPICS Core?

- EPICS Base
  - libCom, db, ca, database
- PVA Modules
  - PVD, PVA, pvaClient, pvDatabase, pva2pva
- Andrew, Marty, Michael, Ralph
Milestones since June. 2018

- [https://epics.anl.gov/](https://epics.anl.gov/)

- **Releases:**
  - 3.15.6 (Oct. 2018)
  - 3.16.2 (Dec. 2018) Last in series
  - 7.0.2 (Dec. 2018)
  - 7.0.2.1 (Mar. 2019)
  - 7.0.2.2 (Apr. 2019)
  - 7.0.X (June 2019?)
Futures of Platform Support

- Linux
- Windows
  - MSVC $\geq 9.0$
    (as long as MD supports python 2.7)
- RTEMS
  - 4.9, 4.10
  - 5.x in progress
- vxWorks
  - 5.5 is dead
- Darwin
- iOS
  - Build but not run testing
- Deprecated?
  - Solaris
  - Cygwin
  - freebsd

C++11 !?!
Recent work

- Grand source-code reorganization
  - Git Branches Recombined
- Simulation mode improvements
- Status reporting for the callback and scanOnce task queues
- GNUmake targets for debugging
  - make -C .... PRINT.PROD_SRCS
- All array recordTypes post monitors on their array-length fields
- Propagate PUTF across Asynchronous record processing
  - Fix DB_LINK loop breaking in 7.0.2.1
- RSRV expanding large buffer causes crash
  - 3.16.1 eliminates EPICS_CA_MAX_ARRAY_BYTES
  - 3.16.2 fixes regression (also in 7.0.1)
Survey (1)

- Who has compiled Base from source in the past 6 months?
  - 3.14
  - 3.15
  - 3.16
  - 7.0
Survey (2)

- Who has spent more than 30 min. troubleshooting a Makefile problem?
Retrospective

- MD joins NSLS2 in March 2009

- First Base contribution in April 2009
  - Email to ANJ

- First EPICS meeting in June 2010 @ITER

- Only person to gain Base commit privileges in a decade
How to start contributing?

- Start small
- Start simple

Mar 16, 2010

```c
@@ -236,6 +236,12 @@ void epicsShareAPI dbScanLock(dbCommon *precord)
    epicsMutexLockStatus status;
    epicsThreadId idSelf = epicsThreadGetIdSelf();
+
    /*
    * If this assertion is failing it is likely because iocInit
    * has not completed. It must complete before normal record
    * processing is possible. Consider using an initHook to
    * detect when this occurs.
    */
    assert(dbLockIsInitialized);
    while(1) {
        epicsMutexMustLock(lockSetModifyLock);
```
First Steps

- Ansification *(bye bye K&R)*
- remove STATIC
- softloc: extra dep for generated header
- remove unused iocRegister stub
- Added CONTAINER() and STATIC_ASSERT()
- [https://bugs.launchpad.net/epics-base/+bug/693534](https://bugs.launchpad.net/epics-base/+bug/693534)
  - errlog causes crash on IOC exit
Help yourself, help others

- If you trigger an error, so will others
- Miss-matched .dbd

```c
int main(int argc,char **argv)
{
    fprintf(outFile,"#ifdef __cplusplus\n");
    fprintf(outFile,"extern "C" {\n");
    fprintf(outFile,"#endif\n");
    fprintf(outFile,"#include <epicsAssert.h>\n");
    fprintf(outFile,"#include <epicsExport.h>\n");

    pdbRecordType = (dbRecordType *)ellFirst(&pdbbase->recordTypeList);
    while(pdbRecordType) {
        fprintf(outFile,"static int %sRecordSizeOffset(dbRecordType *pdbRecordType)\n{
", pdbRecordType->name);
        fprintf(outFile,"    %sRecord *prec = 0;\n",pdbRecordType->name);
        for(i=0; i<pdbRecordType->no_fields; i++) {
            char name[256];
            int j;
```
How to start contributing? (2)

- Incremental cleanup
- Writing unit-tests
  - Record support!
- Create/Update Documentation
  - RRM!
- Climb the learning curve
  - Needs Mgmt support!
- Build relationships
What does a Maintainer do?

- Answer questions
- Triage bug reports
- Mentor new contributors
- Review code
  - Our big bottleneck!
Bootstrapping Base Development?

- High quality threshold + small reviewer bandwidth
  - few new contributors
- Few contributors
  - Little incentive to review
- How to break the loop?