News from StreamDevice

EPICS Collaboration Meeting ITER June 2019
Flashback: What was StreamDevice again?

Modular design allows to plug in new functionality
What's New?

• EPICS 7 support
  – New data types: INT64 and UINT64 for arrays (aai, aao, waveform)
  – New record types: int64in, int64out, lsi, lso
    (64 bit I/O probably works only on systems, where long has 64 bits)

• Connection handling (only when supported by asynOctet driver)
  – Set .STAT to COMM when disconnected
  – Run @init handler (again) when reconnecting

• Error Messages
  – Errors switched off after iocInit to prevent message flooding
    – Controllable with var streamError
  – Repeating asyn errors suppressed (thanks to Benjamin Franksen)
  – Does not mess with asynTraceMask any more
• GIT: https://github.com/paulscherrerinstitute/StreamDevice
  – Old "master" branch renamed to "2.7", new "master" is version 2.8.
  (Was probably not the best idea. Sorry. I did not know what I was doing.)

• Documentation: https://paulscherrerinstitute.github.io/StreamDevice

• Have now a standard configure/ directory
  – Compatible with "standard EPICS" way to build
  – Still supports being in external <top>/ directory like before
  – PSI specific GNUmakefile calls "standard EPICS" Makefile
    if no PSI environment is found
  – Documentation moved to docs/ for github.io compatibility
  – Directory srcSynApps/ removed
  – sCalcout record support moved to src/
Windows Support

• Dynamic libraries supported
  – Fixed epicsExport.h and epicsShare* usage (I hope)

• Color support for error output like on Linux console
  – Required some console setup call

• Problems to build with VS 2010
  – Cannot test as I have no VS 2010
  – No problem with VS 2017

• Dropped support for old Cygwin version
  – Used old cygnus-2.7.2 gcc which fails to compile some code
  – required preprocessor switches
Regular expressions

• Normal regex: %/expression/ returns a string
  - E.g. find keyword in long text: in "%.1/(?im)<title>(.*)</title>/";

• Regsubst: %#/expression/substitution/ rewrites input/output
  - Make strange input readable:
    - 1.23- → -1.23 in "%#/([^+-]+)*([-+-])/*/21/%f";
    - 86+3 → 8.6e+3 in "%#/([0-9]+)[0-9]*(\[-+][0-9]+)/1.2e3/%f";
  - Convert certain characters:
    - Lower case hex checksum out "%0<xor>%#-2/*./*\L/";
    - Text 1 → TEXT_1 out "%s#/./\U/%#/ /_/";
    - \path\x\y → /path/x/y out "%s/\//";

• Future plan: implement "translate characters" format
  - %|charset|replacement|, e.g. "%|[a-z] \|[A-Z]_/|"
• Error/Debug message handling
  – Filter messages per record (pattern)
  – Send messages through driver layer (asyn)
• Propagate errors along redirections
• Support interlaced arrays (aka tables)
• Syntax improvements
  – Include other protocol files
  – Call other protocols with parameters
  – Load-time and run-time calculations (e.g. $\text{0x10}+\$1\text{, "}\%(\text{VAL}^{\text{0.01}})\text{f}\text{"}\text{)}$
  – Conditionals (e.g. $\text{\$1?"ADDR=\$1"\text{)}$)
• Change settings dynamically, in particular number of bytes to read (MaxInput)
  – Support dynamic array sizes, e.g. GPIB "#6008000..."
• Other interfaces than asynOctet
  – records (string fields or char arrays)
  – sysfs (Linux)
What else?

- Motor record support?
- Unicode?
- ...
Many Thanks to the EPICS Community

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