

EPICS Database Updates

Kay Kasemir

Many slides from Andrew Johnson, APS/ANL

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Comparably New Database Features

- Wildcards for 'patch' databases
- Long Strings
- JSON Notation for links and subscriptions



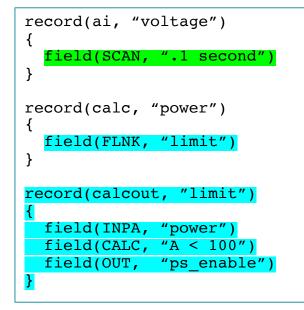
'Patch' Database

Database files can <mark>modify fields</mark> of existing records or <mark>add</mark> new fields/records

ps.db

```
record(ai, "voltage")
  field(DTYP, ... INP ...
  field(SCAN, "2 second")
  field(FLNK, "current")
record(ai, "current")
  field(DTYP, ... INP ...
  field(FLNK, "power")
record(calc, "power")
  field(INPA, "voltage")
  field(INPB, "current")
  field(CALC, "A*B")
record(bo, "ps enable")
```

limit.db



st.cmd

dbLoadRecords "db/ps.db"

dbLoadRecords "db/limit.db"

May help to organize records. "ps.db" can be used standalone, or with "limit.db".

Order of loading *.db files matters!

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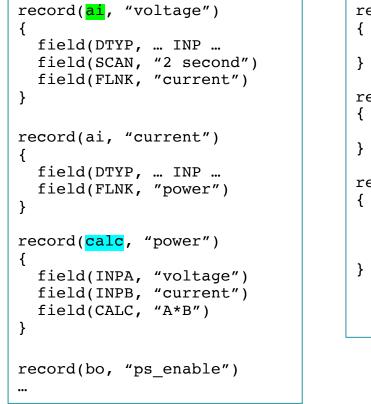
'Patch' Database ...

Note that the record type cannot be changed. Must know the type of record, or use "*" to patch any type

ps.db

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limit.db



```
record(ai, "voltage")
{
  field(SCAN, ".1 second")
}
record("*", "power")
{
  field(FLNK, "limit")
}
record(calcout, "limit")
{
  field(INPA, "power")
  field(CALC, "A < 100")
  field(OUT, "ps_enable")
}</pre>
```

In this example, the patch database doesn't care if "power" is a calc, calcout, .. type of record

See /ics/examples/02_fishtank, tank.db is patched by control*db

Long Strings

- Unfortunately, EPICS 'STRING' was initially defined as CHAR[40]
- Channel Access uses DBF_STRING = CHAR[40]

 Record names, INP links can now be much longer field(INPA, "SomeReallyLongRecordNameThatExceeds40Characters PP MS")
 ..but you cannot read/modify them via channel access

Old Workaround

Use

```
record(waveform, "long_string")
{
    field(FTVL, "CHAR")
    field(NELM, "200")
}
```

.. and (!) tell client that CHAR[] is not meant to be BYTE[] but long STRING.

```
caget -S ....,
Format: String in operator interface tools
```

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New Workaround

- IOC turns any string for VAL, INP, DOL into long-string CHAR[] if PV name ends in '\$'
- Long-String input and output records "Isi" and "Iso" default to VAL of type STRING, but VAL\$ becomes CHAR[]

• Clients still need to be told if CHAR[] is BYTE[] or long string!

JSON Notation for INP links

- New support for JSON notation allows providing more detail
- First practical use: {const:...}

```
record(lsi, "lsi_init")
{
    field(INP, {const:"Hello, this is a string and it can be really long!")
    field(PINI, "YES")
}
record(waveform, "array")
{
    field(FTVL, "CHAR")
    field(NELM, "200")
    field(INP, {const:[65, 66, 67, 68, 69])
    field(PINI, "YES")
}
```

See /ics/examples/12_long_strings.db

JSON: "JavaScript Object Notation"

- Standard text representation of data
 - Can represent "anything"
 - More compact than e.g. XML

- EPICS starts to use it to provide details for
 - Links, see https://epics.anl.gov/base/R7-0/6-docs/links.html
 - Subscriptions, see https://epics.anl.gov/base/R7-0/6-docs/filters.html
 More to come

JSON Notation for Subscription Filters

• In one window, run

```
cd /ics/examples/01_first_steps
softIoc -d ramp1.db
```

• In other window, compare the following

```
camonitor limit
camonitor 'limit.{ts:{}}'
```

```
camonitor ramp
camonitor 'ramp.{dbnd:{abs:1.9}}'
```

