EPICS SlowControl for SRS/APV

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Outline



- new experiment -> new slow control
- EPICS in a nutshell
- EPICS 4 SRS
- GUI / CSS



Decide which system to use



Centralized	<structure></structure>	Decentralized
Implement it	<reinvent the="" wheel?=""></reinvent>	Use existing
For lab	<scope></scope>	For experiment
Flexibility	<stiffness></stiffness>	Stability



EPICS

Experimental Physics and Industrial Control System

10 Things...



Ten Really Neat Things About EPICS

- 1) It is free. No license fees, no new payment for every upgrade. You can download EPICS free of charge from the web.
- 2) It is Open Source (i.e. the source code is accessible). Adaptions and changes due to a special environment are therefore possible.
- 3) There are lots of users. It is tested and most bugs are already found.
- 4)All a client needs to know to access data is a PV name. No single point of failure due to a nameserver and no messing around with fixed addresses.
- 5) You can pick the best tools out there ...
- 6)... or build your own.
- 7) The boring stuff is already done. For example the communication with Channel Access is stable and well tested.
- 8) There is a lot of expertise available close by.
- 9) A good contribution becomes internationally known.
- 10)It doesn't matter whether you need 10 PVs or 10 Million PVs. You can scale EPICS almost freely.

http://www.aps.anl.gov/epics/neat.php

2 (4) Names...



PVs (Process Variables)

- Holding the values
- Different datatypes
- Unique name
- Several control fields
 - Operational range
 - Alarm levels
 - Accuracy
 - Update rate
 - .
- Defined in .db files

IOCs (Input Output Controller)

- Server
- Loads the PVs
- Loads the drivers
- Defined in st.cmd files

OPI (Operational Interface)

• Hardware running EPICS

CA (Channel Access)

 Network independent access to IOCs

1 Broadcast...





3 Commands...



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How to get the system running?



SRS Request





https://espace.cern.ch/rd51-wg5/srs/Documentation/SRS_Slow_Control_Manual.pdf



Load record instances # Set up ASYN ports # drvAsynSerialPortConfigure port ipInfo priority noAutoconnect noProcessEos drvAsynIPPortConfigure("SRS App", "10.0.0.2:6039:6007 UDP", 0, 1, 0) asynSetTraceIOMask("SRS App",-1,0x2) asynSetTraceMask("SRS App",-1,0x9) #0x1 print only error 0x9 print all information drvAsynIPPortConfigure("SRS Hybrid", "10.0.0.2:6263:6007 UDP", 0, 1, 0) asynSetTraceIOMask("SRS Hybrid",-1,0x2) asynSetTraceMask("SRS Hybrid",-1,0x9) #0x1 print only error 0x9 print all information drvAsynIPPortConfigure("SRS ADCCARD", "10.0.0.2:6519:6007 UDP", 0, 1, 0) asynSetTraceIOMask("SRS ADCCARD", -1,0x2) asynSetTraceMask("SRS ADCCARD",-1,0x9) #0x1 print only error 0x9 print all information drvAsynIPPortConfigure("SRS System", "10.0.0.2:6007:6007 UDP", 0, 1, 0) asynSetTraceIOMask("SRS System", -1,0x2) asynSetTraceMask("SRS System",-1,0x9) #0x1 print only error 0x9 print all information ## Load record instances cd "\$(TOP)" dbLoadRecords("db/devSRS AppReg.db", "P=Specs:GEM:SRS, PORT=SRS App") dbLoadRecords("db/devSRS HybridReg.db","P=Specs:GEM:SRS, PORT=SRS Hybrid") dbLoadRecords("db/devSRS_ADCCARDReg.db", "P=Specs:GEM:SRS, PORT=SRS_ADCCARD") dbLoadRecords("db/devSRS_SystemReg.db","P=Specs:GEM:SRS, PORT=SRS_System") dbLoadRecords("db/devSRS TmpReg.db", "P=Specs:GEM:SRS") dbLoadRecords("db/devCAEN Calc.db", "P=Specs:GEM:HV, N=hvpower")

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st.cmd file







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Control System Studio

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- drag and drop GUIs
- based on Eclipse
- BOY specialized for usage with EPICS
- Lots of knobs, bars, graphs
- Webkit available
- controlsystemstudio.org





Detector 3

ON.

Off



Fain Speed





Status

Detector 2

ON.

OFF

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Detector 1

ON.

OFF







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Summary



Build slow-control-system on EPICS

- flexible
- stable
- scalable
- all components included

Implemented UDP communication for SRS/APV

- full functionality
- more stable than SRSDCS and Labview-program
 - most likely due to initialization routine
- GUI has to be improved
- try it for VMM3





THANK YOU FOR YOUR ATTENTION!

http://magix.kph.unimainz.de

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<u> -</u>

MXSlowControl



Features of MXSlowControl:

- autocompletion (bash and zsh)
- real drivers (no clients)
- GUI seperated from control algorithms
- pyEPICS