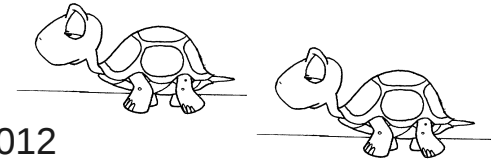


Slow Controls

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Low Voltages.



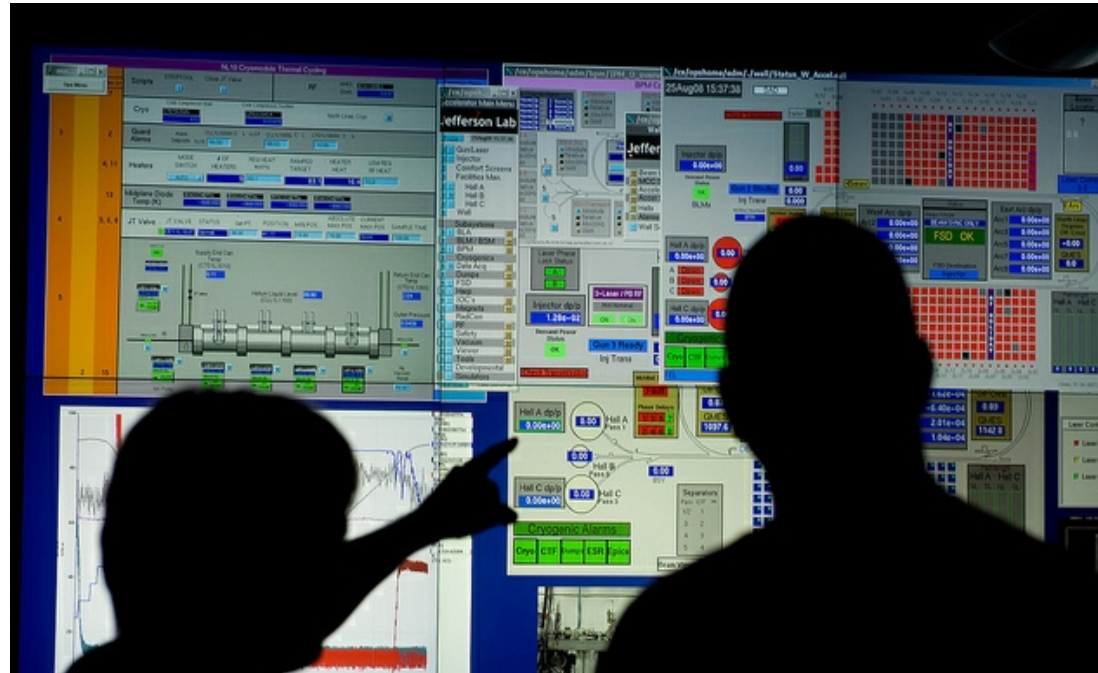
High Voltages



Temperatures



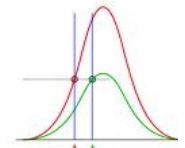
Gas pressures



Slow controls are for

**Configuring
Monitoring
Archiving**

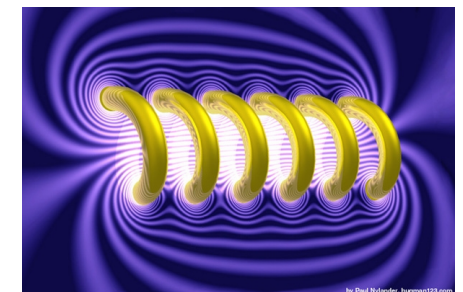
The experiment



Thresholds



Targets



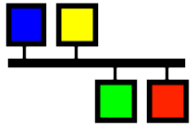
Magnets

Slow Controls: Core System

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EPICS



Experimental Physics and Industrial Control System

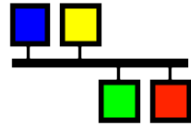
- Widely used and supported at national labs (eg ANL, BNL)
 - Drivers for most hardware
- Already used for Hall-B / CLAS
 - Expertise within collaboration
- Used at MCC
 - Lots of on-site expertise
- Communication with other control systems
 - PCL, LabView

Slow Controls: Hardware support

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EPICS



Hardware support for R3.14

- A list of “standard” supported hardware has been compiled
 - Drivers exist, or will be written, updated, tested
 - Detector groups strongly encouraged to use this.
- Identify non-standard hardware
 - Develop drivers
- Time estimate: >1 person year – on site.

Slow Controls: Front End

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Control Systems Studio

Eclipse-based collections of tools to monitor and operate large scale control systems, such as the ones in the accelerator community.

- Developed and used by many big labs (DESY, SNS, BNL)
 - Maintained and supported
 - Easy to develop user GUIs
 - Seamlessly look at live and archived values.
 - Tool to convert old style .adl GUIs. (medm)
- Will be used by Hall-D
 - Much groundwork and testing already done.
- CSS already being tested



Slow Controls: Alarms

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Best Ever Alarm System Integrated into CSS

- Single table or tree view
 - Sort by PV, Urgency, Severity ..
- Connect with:
 - Other CSS components
 - Variable passing, alarm timelines
 - E log entries
 - Send alarm PV to other PV tool
 - Web reports
- Will be used by Hall-D
 - Much groundwork and testing already done

The screenshot displays two windows from a control system interface. The 'Alarm Table' window shows a table of current alarms with columns for PV, Description, Time, Current Seve, Severity, Status, and Value. The 'Alarm Tree' window shows a hierarchical tree view of alarms, with the 'PV: CF_KL:DIWS_AIT4306B:Rs' entry highlighted in yellow.

PV	Description	Time	Current Seve	Severity	Status	Value
ICS_MPS.FPAR_CCL_BS:FP	* mps fault	2009/04/15 16:22:50	MAJOR	MAJOR	LINK_ALARM	0
CF_KL:DIWS_AIT4306B:Rs	Check polishing loop resistivity for KL4	2009/04/15 15:50:58	OK	MINOR	HIGH_ALARM	2.5

Alarm Tree

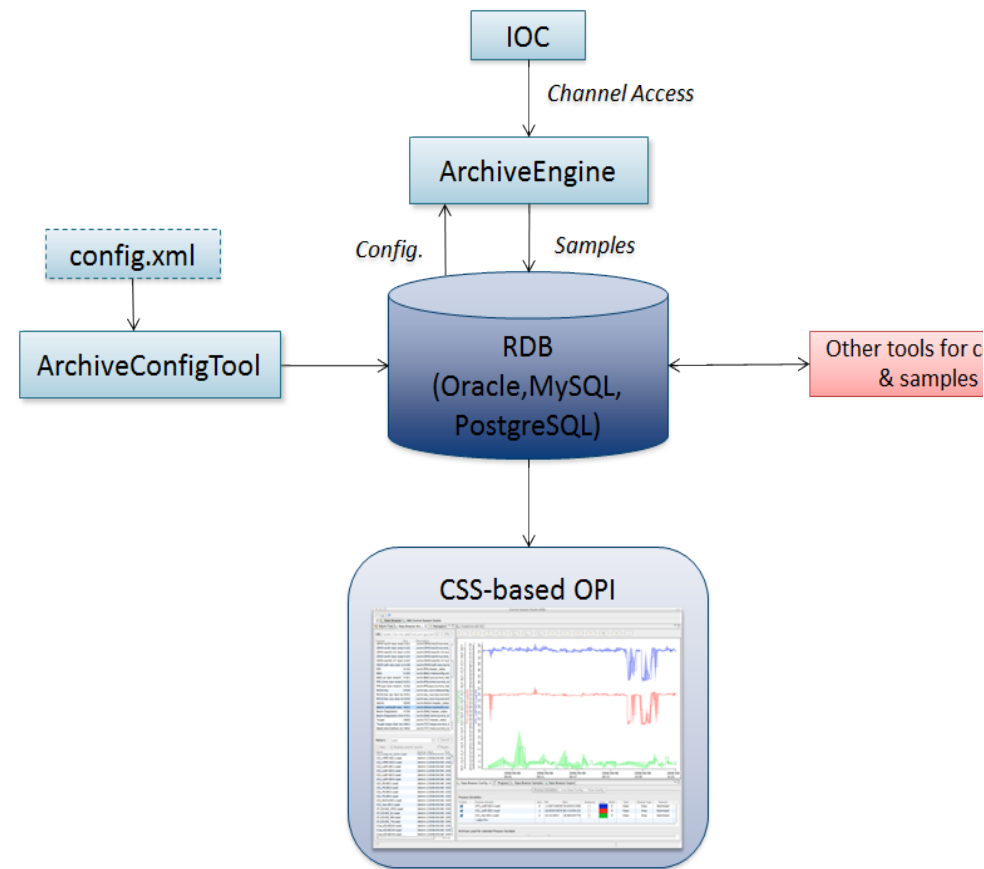
- Area: BeamPermit (MAJOR/MAJOR/LINK_ALARM)
 - System: MPS FPAR fault (MAJOR/MAJOR/LINK_ALARM)
 - System: MPS FPL fault (OK/OK/OK)
 - PV: FE_MPS:MIO CIA:status_sum
 - PV: ICS_Tim:Gate_BeamOn:Switch
- Area: CF (OK/MINOR/HIGH_ALARM)
 - System: Cooling_Tower (OK/OK/OK)
 - System: Klystron_Gallery_Temp (OK/MINOR/HIGH_ALARM)
 - PV: CF_KL:AHU_MT2153B:M (OK/OK/OK)
 - PV: CF_KL:AHU_TT2150A:T (OK/OK/OK)
 - PV: CF_KL:AHU_TT2151A:T (OK/OK/OK)
 - PV: CF_KL:AHU_TT2152A:T (OK/OK/OK)
 - PV: CF_KL:AHU_TT2153A:T (OK/OK/OK)
 - PV: CF_KL:AHU_TT2154A:T (OK/OK/OK)
 - PV: CF_KL:DIWS_AIT4300A:Rs (OK/OK/OK)
 - PV: CF_KL:DIWS_AIT4300B:Rs (OK/OK/OK)
 - PV: CF_KL:DIWS_AIT4302A:Rs (OK/OK/OK)
 - PV: CF_KL:DIWS_AIT4302B:Rs (OK/OK/OK)
 - PV: CF_KL:DIWS_AIT4303A:Rs (OK/OK/OK)
 - PV: CF_KL:DIWS_AIT4303B:Rs (OK/OK/Disabled)
 - PV: CF_KL:DIWS_AIT4306A:Rs (OK/OK/OK)
 - PV: CF_KL:DIWS_AIT4306B:Rs (OK/MINOR/HIGH_ALARM)**
 - PV: CF_KL:DIWS_PT4303B:suction (OK/OK/OK)
 - PV: CF_KL:DIWS_PT4303C:disch (OK/OK/OK)
 - PV: CF_KL:DIWS_TT4300A:T (OK/OK/OK)
 - PV: CF_KL:DIWS_TT4302A:T (OK/OK/OK)
 - PV: CF_KL:DIWS_TT4303A:T (OK/OK/OK)
 - PV: CF_KL:DIWS_TT4306A:T (OK/OK/OK)
 - PV: CF_KL:PKL02VFDB_SFlow:Sts (OK/OK/OK)
 - System: Potable_Water_Tank (OK/OK/OK)
 - System: Site_Power_Other_UPS (OK/OK/OK)

Slow Controls: Archiving

Ken Livingston

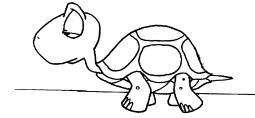
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- CSS has integrated archiving
 - RDB (Oracle, MySQL, PostgreSQL)
 - Access to timelines etc – like live system.
- MCC have developed MYA
 - MySQL base EPICS Archiver
 - Already tested and used
 - Offered as a service to other Halls
- CSS or MYA ?
 - Hall D evaluated options - they will use MYA
 - MYA integrated into CSS – best of both
 - MCC developing this
- CLAS 12 will use MYA + CSS



Slow Controls: Commissioning

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- **Commissioning**

- **Outline of commissioning plan.**

- EPICS drivers to be developed and tested (on site)
 - **Required for on-site testing and commissioning of detectors**
- CSS + BEAST + mya framework and examples to be set up
- Control / feedback GUIs and scripts to be written and tested (eg with softIOC)
- With beam – as part of commissioning of each subsystem.

- **Status and results**

- Slow controls group – 2 meetings
- Definition of recommended / supported hardware drivers complete.

- **Upcoming tasks**

- “Supported” EPICS drivers to be tested (**requires 6 months specialized FTE, on site**)
- Slow control requirements for each detector subgroup to be defined (**in progress**)
- “Unsupported” elements to be identified and drivers produced (**>6 months specialized FTE**)
- Setup of CSS + BEAST framework and examples (**Glasgow, next 6 months**)

- **Commissioning cont**

- **Time schedule and manpower allocation**

- **Jan - Jun 2013**

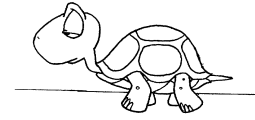
- Testing and upgrading of EPICS drivers for “standard hardware”
 - **6 months FTE, specialized, on site. ***** Urgently Required *******
- Identification of “specialized slow control requirements”
 - **1 month FTE (Glasgow + subsystem experts)**
- Setup of “specialized” slow control needs for subsystems
- Setup of CSS + BEAST framework and examples
 - **2 month FTE (Glasgow)**

- **Jun – Dec 2013**

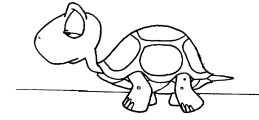
- Development of EPICS drivers for specialized needs.
 - **> 6 months FTE, specialized, on site. ***** Urgently Required *******

- **Jun 2013**

- Production / testing of GUIs, init scripts, special monitoring etc.
 - **0.2 FTE Glasgow + 0.2 FTE per detector subgroup (required)**
- Setup and test of MYA archiving framework
 - **0.2 FTE Glasgow + MCC**



- **General**



- **What is missing to proceed with the effort and be ready on day one**

- **Manpower**

- **>12 month FTE, specialized, on site. ***** Urgently Required *******
- **To test and develop device support**
- **0.2 FTE per detector subgroup**
- **Production / testing of GUIs, init scripts, special monitoring etc.**

Members of (ad hoc) Slow Control Group:

Ken Livingston

Sergey Boiarinov

Hovanes Egijan

Nerses Gevorgyan

Stepan Stepanya

Eugene Pasyuk

F.X. Girod

Krister Bruwhel

Pamela Kjeldsen (acc)

Maurizio Ungaro

Valery Kubarovsky