

PC based control system at STAR

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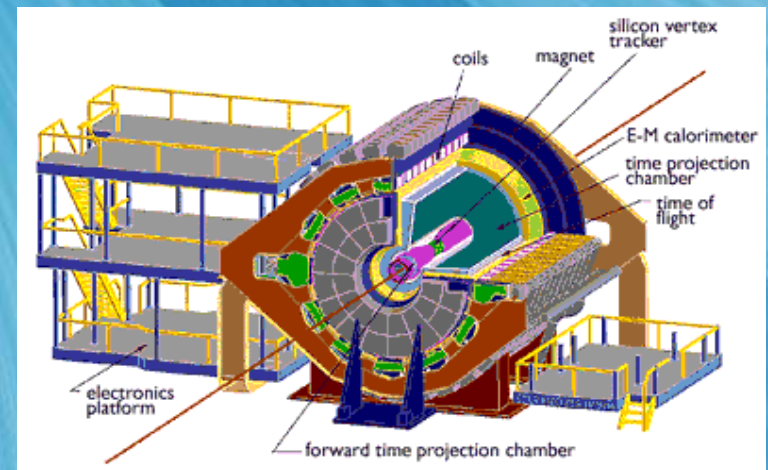
for STAR Slow Control Group

Creighton University

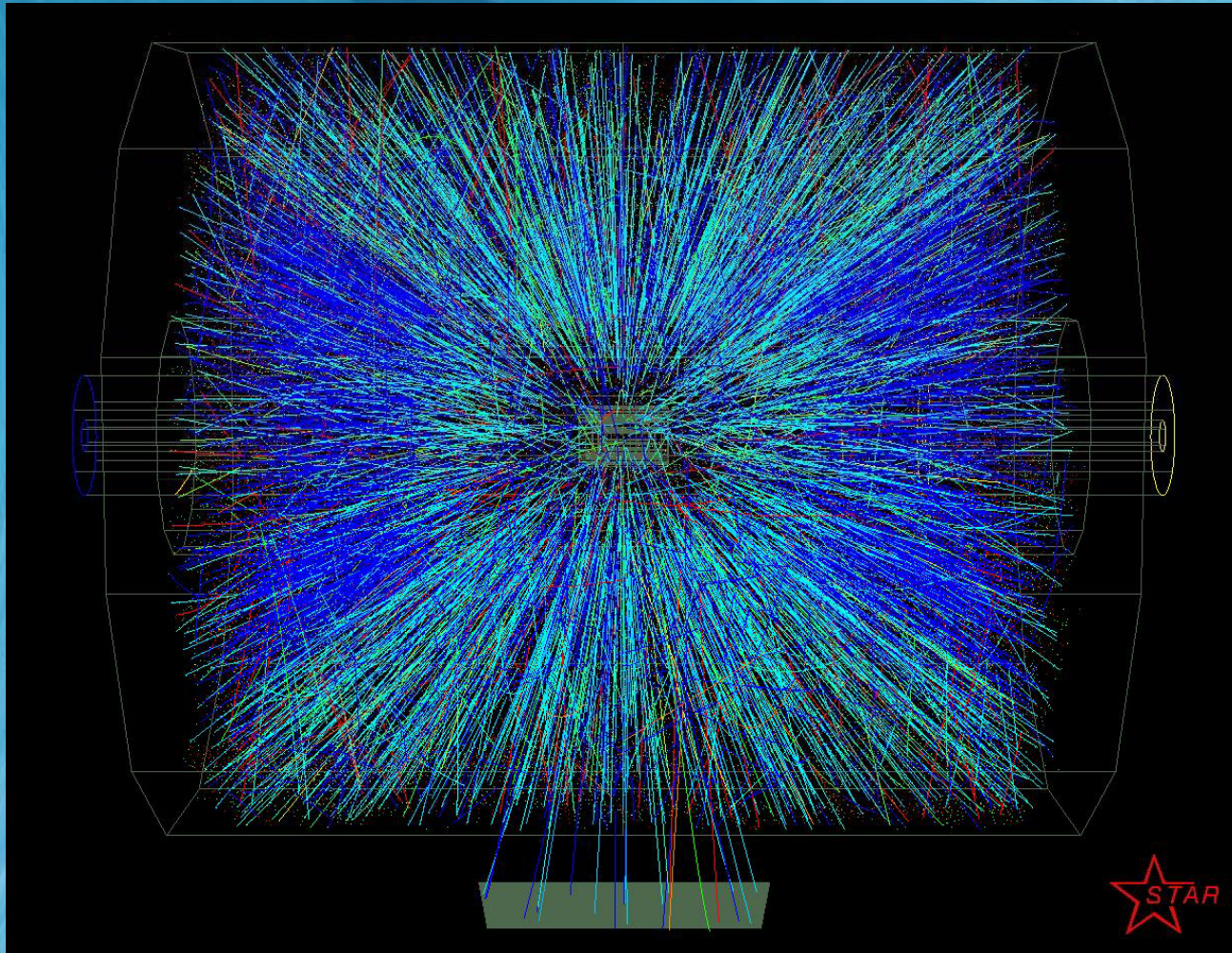
STAR collaboration

STAR Detector

- ◆ STAR (Solenoidal Tracker At RHIC)
 - ◆ RHIC (Relativistic Heavy Ion Collider)
- ◆ Located at Brookhaven National Laboratory (Long Island)

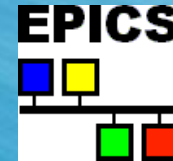


STAR Experiment



Current STAR Control System

- ◆ Experimental Physics and Industrial Control System (EPICS) 3.12 & 3.13
- ◆ Sun Solaris Host computer
- ◆ VME boards for IOC
 - ◆ MVME 162 and 167
- ◆ VxWorks for IOC OS
 - ◆ VxWorks 5.2



EPICS tools currently in use

- ◆ MEDM (Motif Editor and Display Manager)
- ◆ Channel Archiver
- ◆ Alarm Handler
- ◆ Sequencer
- ◆ Channel Archiver CGI interface
- ◆ GDCT (Graphical Database Configuration Tool)

Control System Requirement

- ◆ Many IOCs are in high radiation area during the run
- ◆ IOCs must be able to boot over the network
- ◆ Must be able to reset over the network if necessary
 - ◆ Wiener VME crates with CANBus chain
 - ◆ Serial console
 - ◆ telnet access

Motivation for Change

- ◆ Old version of EPICS
 - ◆ Limited support for new devices
- ◆ Old VME boards
 - ◆ Harder to support/replace
- ◆ New subsystems
 - ◆ Time-of-flight and Heavy Flavor Tracker is coming

Original Upgrade Plan

- ◆ Transition to EPICS 3.14
- ◆ Scientific Linux 3 as host
- ◆ PCs running RTEMS (Real-Time Executive for Multiprocessor Systems) for IOC
- ◆ MEDM on PCs running Windows

Current Upgrade Plan

- ◆ Transition to EPICS 3.14
- ◆ Scientific Linux 3 as host
- ◆ Linux soft IOC for serial devices
- ◆ RTEMS for VME

Why the change...

- ◆ Soft IOC provides excellent development platform for testing
- ◆ Serial connection can be easily done by soft IOC
- ◆ Some security concerns on MEDM on Windows

What has been done so far...

- ◆ Implementation of Scientific Linux host
- ◆ EPICS 3.14
- ◆ EPICS Archive Viewer
- ◆ Hygrometer in DAQ Room
- ◆ GID (Ground Integrity Detector) prototype

Upgrade Plan Summary

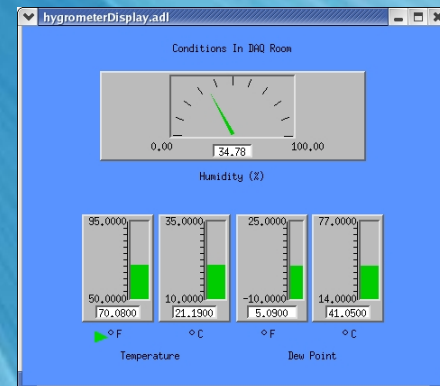
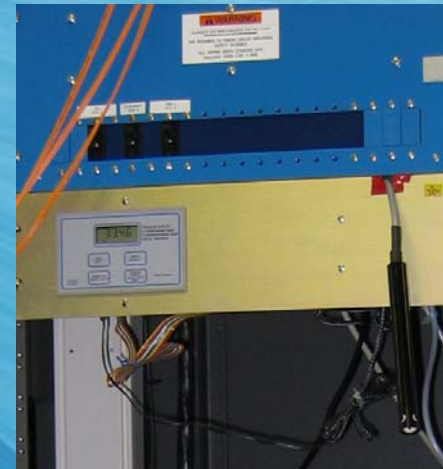
	Current	Future
EPICS Host	Sun Solaris	Linux PC
EPICS version	Base 3.12	Base 3.14
IOC Target Hardware	VME	VME and Linux PC
IOC OS	VxWorks 5.2	RTEMS and Linux

Control room host

- ◆ EPICS host computer running Scientific Linux 3
- ◆ EPICS 3.13 & 3.14
- ◆ MEDM
- ◆ Alarm Handler
- ◆ Channel Archiver
- ◆ EPICS Archive Viewer

Hygrometer in DAQ Room

- ◆ Located in the DAQ Room
- ◆ Monitors temperature, relative humidity, and dew point
- ◆ EPICS 3.14 on a Linux soft IOC connected via RS-232
- ◆ Planned for run year 2006-2007



Ground Integrity Detector

- ◆ GID (Ground Integrity Detector)
 - ◆ In-house design device to monitor the common ground
 - ◆ Never been in the part of control system
 - ◆ RS-422 device
 - ◆ Currently in prototype
 - ◆ Located in the Assembly Hall



TOF subsystem

- ◆ UCLA group is working on
 - ◆ Creighton group is in close contact with UCLA group
- ◆ Linux soft IOC
 - ◆ CAEN High Voltage support by Canadian Light Source
- ◆ Possibly Windows soft IOC
 - ◆ Wiener PL512 with OPC for control
 - ◆ OPC needs Windows

VME & RTEMS

- ◆ Many IOCs must use VME boards
- ◆ Motorola 68k boards
- ◆ RTEMS on MVME 167 is under evaluation

Future EPICS tools planned??

- ◆ EPICS IDE with Eclipse
- ◆ VDCT (Visual Database Configuration Tool)
- ◆ EPICS Control System Suite

Special Thanks

- ◆ EPICS community world wide
- ◆ US Department of Energy
- ◆ Brad Cumbia (Jlab)
- ◆ Ken Evans (APS/ANL)
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- ◆ Eric Norum (APS/ANL)
- ◆ The College of Arts & Science, Creighton University