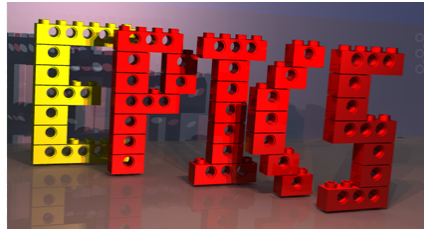


EPICS Collaboration Meeting



Report of Contributions

Contribution ID: 6

Type: **Regular Talk (15min)**

Middle Layer Service Framework for NSLS-II Beamlines

Wednesday, September 21, 2016 1:20 PM (15 minutes)

NSLS-II supports the DOE scientific mission by providing the most advanced tools for discovery class science in condensed matter and materials physics, chemistry, and biology - science that ultimately will enhance national and energy security and help drive abundant, safe, and clean energy technologies. The state-of-the-art hardware, the variety of scientific applications, and data size make it difficult to tackle data management challenges using traditional techniques. NSLS-II middle layer framework addresses these challenges in a flexible and efficient fashion via its data indexing capabilities hidden behind a service oriented architecture.

Primary author: ARKILIC, Arman (Brookhaven National Lab)

Presenter: ARKILIC, Arman (Brookhaven National Lab)

Session Classification: V4

Track Classification: Experiment control, data acquisition

Contribution ID: 7

Type: **Regular Talk (15min)**

EPICS V4 Roadmap

Wednesday, September 21, 2016 9:40 AM (30 minutes)

This presentation covers the key aspects of version 4 and the impact of this on experimental beam line and accelerator architectures and capabilities.

Primary author: DALESIO, Leo

Presenter: DALESIO, Leo

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 8

Type: **Regular Talk (15min)**

V4 Support in Display Builder

Wednesday, September 21, 2016 10:25 AM (15 minutes)

How the display builder interfaces to V4

Primary author: KASEMIR, Kay

Presenter: KASEMIR, Kay

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 9

Type: **Regular Talk (15min)**

lvPortDriver - a platform independent interface between LabVIEW software and EPICS device support

Tuesday, September 20, 2016 3:45 PM (15 minutes)

lvPortDriver and the lvPortDriver virtual library are functions that enable LabVIEW code run an EPICS IOC and communicate with the EPICS database via EPICS device support. The EPICS records interface just as they would with any other asynPortDriver device. lvPortDriver is an asynPortDriver class that stores parameters in the parameter library. A LabVIEW virtual library calls functions that permit LabVIEW to read and write parameters and be notified of changes in parameters by Asyn via user events that provide LabVIEW with the new value and status. The LabVIEW code is responsible for initializing the driver, and creating all the parameters that will be used. Thus making changes only involves modifying the contents of the EPICS database and the LabVIEW software, no other interface software needs to be modified. As the EPICS IOC is started by the LabVIEW software, both run as the same process, and so lvPortDriver can be used on any platform that supports both LabVIEW and EPICS.

Primary author: BAILY, Scott

Presenter: BAILY, Scott

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: **10**

Type: **Regular Talk (15min)**

Welcome

Tuesday, September 20, 2016 9:30 AM (20 minutes)

Introductory remarks

Primary author: Dr JONES, Kevin (SNS)

Presenter: Dr JONES, Kevin (SNS)

Session Classification: EPICS Collaboration Meeting

Track Classification: Other

Contribution ID: 12

Type: **Regular Talk (15min)**

ITER & CODAC Core System - Status Update

Tuesday, September 20, 2016 9:50 AM (20 minutes)

Within the ITER international organization, 35 nations are collaborating to build the world's largest fusion facility in the South of France. Most contributions are in-kind - integration of more than 200 plant systems will be the main challenge when building the control system.

To support the control system development of plant systems, ITER created CODAC Core System (CCS), a Linux Distribution based on RedHat Enterprise Linux, EPICS and ITER specific tools.

Primary author: WALLANDER, Anders (ITER Organization)

Presenter: WALLANDER, Anders (ITER Organization)

Session Classification: EPICS Collaboration Meeting

Track Classification: Status Reports

Contribution ID: 13

Type: **Regular Talk (15min)**

Brief History Of EPICSV4

Wednesday, September 21, 2016 11:45 AM (15 minutes)

This talk provides a brief history of EPICSV4 from 2006 until EPICSV4 release 4.6

Primary author: KRAIMER, Martin (ANL Retired)

Presenter: KRAIMER, Martin (ANL Retired)

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 14

Type: **Fast Talk (Single slide)**

Future of edm

Thursday, September 22, 2016 2:00 PM (10 minutes)

Various edm users have expressed a desire to retain a display manager which is compatible with edm, independent of X and motif, and not constrained by the Eclipse environment. A new display manager will be developed that will achieve these objectives and include additional enhancements.

Primary authors: Dr KEITEL, Rolf (TRIUMF); SINCLAIR, john (ORNL)

Presenter: SINCLAIR, john (ORNL)

Session Classification: EPICS Collaboration Meeting

Track Classification: Client Tools and User Interfaces

Contribution ID: 15

Type: **Regular Talk (15min)**

Malcolm

Wednesday, September 21, 2016 2:05 PM (15 minutes)

Diamond Light Source is developing a middlelayer framework known as Malcolm, which is targeted initially at high-level configure/run control of control system components generally involved in continuous scans. Malcolm is based on a distributed object system and currently implemented Python. An overview of Malcolm, including the use of EPICS Version 4, will be given.

Primary author: Mr HICKIN, Dave (Diamond Light Source)

Presenter: Mr HICKIN, Dave (Diamond Light Source)

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 16

Type: **Regular Talk (15min)**

MASAR Status Update

Wednesday, September 21, 2016 1:35 PM (15 minutes)

latest status

Primary author: SHEN, Guobao (FRIB)

Presenter: SHEN, Guobao (FRIB)

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 17

Type: **Regular Talk (15min)**

Display Builder Update

Thursday, September 22, 2016 11:00 AM (20 minutes)

Status of ongoing display builder work: Standalone mode, support for “real” C Python in addition to Jython

Primary author: KASEMIR, Kay

Co-author: GRODOWITZ, Megan (Oak Ridge National Labs)

Presenter: KASEMIR, Kay

Session Classification: EPICS Collaboration Meeting

Track Classification: Client Tools and User Interfaces

Contribution ID: **18**

Type: **Regular Talk (15min)**

CS-Studio and ESS continuous delivery process

Thursday, September 22, 2016 2:10 PM (20 minutes)

I'll explain

- how at ESS we managed having the “ESS version” of CS-Studio,
- how at ESS we accomplished the 3 Jenkins pipelines related to ESS CS-Studio delivery,
- what is still missing and what is planned.

Primary author: ROSATI, Claudio (European Spallation Source ERIC)

Co-author: Mr FERNANDEZ, Leandro (European Spallation Sources ERIC)

Presenter: ROSATI, Claudio (European Spallation Source ERIC)

Session Classification: EPICS Collaboration Meeting

Track Classification: Client Tools and User Interfaces

Contribution ID: 19

Type: **Regular Talk (15min)**

Current uses of CS-Studio at Diamond Light Source

Thursday, September 22, 2016 10:00 AM (20 minutes)

Diamond Light Source has been adopting CS-Studio for its control interface and eventually intends to replace EDM entirely. At the moment an automated framework for generating Synoptic GUIs for beamlines has been created and has been used to commission Diamond's two newest beamlines, I14 and I21. A description of this framework combined with examples of the GUI layout used with it will be given. A large part of moving from EDM has been the automated conversion process which is designed to produce CS-Studio screens that are visually and functionally identical to our existing EDM screens. As we have around 7000 of these screens the automated conversion is necessary for making the transition, and the familiarity of converted screens will allow the machine operators to continue as usual during the transitional period. The difficulties and our achievements in this process will also be described.

Primary author: FURSEMAN, Matthew (Diamond Light Source Ltd)

Presenter: FURSEMAN, Matthew (Diamond Light Source Ltd)

Session Classification: EPICS Collaboration Meeting

Track Classification: Client Tools and User Interfaces

Contribution ID: 20

Type: **Regular Talk (15min)**

The CI Setup for EPICS Base

Thursday, September 22, 2016 2:30 PM (20 minutes)

A view under the hood of the Continuous Integration setup for EPICS Base, in the cloud and on the ground.

An invitation to share ideas, tricks and experiences.

Primary author: LANGE, Ralph (ITER Organization)

Co-author: Mr JOHNSON, Andrew (APS)

Presenter: LANGE, Ralph (ITER Organization)

Session Classification: EPICS Collaboration Meeting

Track Classification: EPICS Core, EPICS V4

Contribution ID: 21

Type: **Regular Talk (15min)**

Bluesky and Ophyd

Wednesday, September 21, 2016 1:50 PM (15 minutes)

A lightweight framework for interactive and automated data collection

Primary author: ARKILIC, Arman (Brookhaven National Lab)

Co-authors: ALLAN, Daniel (NSLS2); LAUER, Kenneth (NSLS2); CASWELL, Thomas (NSLS2)

Presenter: ARKILIC, Arman (Brookhaven National Lab)

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 22

Type: **Regular Talk (15min)**

EPICS Base: The State of the Toolbox

Wednesday, September 21, 2016 2:20 PM (20 minutes)

What has happened recently in EPICS Core development, and how we think we can get to wherever it is that we might want to go - 3, 4, 7, ...

Primary author: JOHNSON, Andrew (Argonne)

Presenter: JOHNSON, Andrew (Argonne)

Session Classification: EPICS Roadmap

Track Classification: EPICS Core, EPICS V4

Contribution ID: 23

Type: **Regular Talk (15min)**

Signal Archiving System Setup and Test for SRF Test Facility

Thursday, September 22, 2016 4:45 PM (20 minutes)

Rare Isotope Science Protect (RISP) control system uses the EPICS control system to control and monitor all accelerator software and hardware. RISP control group has conducted test of the archiver appliance, and will customizing signal archiver system. This talk will present the archiver appliance test that we have used.

Primary author: Mr NAM, Seung Hee

Co-author: LEE, Sangil (Institute for Basic Science)

Presenter: Mr NAM, Seung Hee

Session Classification: EPICS Collaboration Meeting

Track Classification: Operational Tools

Contribution ID: 24

Type: **Regular Talk (15min)**

Further uses of fast orbit feedback controllers

Tuesday, September 20, 2016 4:30 PM (15 minutes)

Diamond has had an operational fast orbit feedback system since 2007 which has proved to be reliable through routine use since that time. The implementation of the feedback controllers uses distributed VxWorks IOCs for calculating the required correction values in each corrector magnet. These IOCs are more easily modified than systems using FPGAs, allowing us to introduce additional features into our soft real time control system and control these features using EPICS. We have used this functionality to produce dynamic closed bumps into our electron beam orbit, measure the BPM to corrector response matrix and characterise the response of our corrector magnets. In the future an additional feature we would like to implement is feed-forward suppression of electron beam noise introduced by I10's fast switching chicane.

Primary author: FURSEMAN, Matthew (Diamond Light Source Ltd)

Presenter: FURSEMAN, Matthew (Diamond Light Source Ltd)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 26

Type: **Regular Talk (15min)**

Drinking from the firehose: the ADEiger driver

Tuesday, September 20, 2016 1:55 PM (15 minutes)

This talk will showcase the ADEiger areaDetector driver for the Dectris' Eiger family of X-Ray detectors. The architecture of the driver as well as its capabilities will be presented.

Primary author: MARTINS, Bruno (Brookhaven National Laboratory)

Presenter: MARTINS, Bruno (Brookhaven National Laboratory)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 27

Type: **Regular Talk (15min)**

JLab Hall B Controls Infrastructure and IT Integration

Tuesday, September 20, 2016 4:45 PM (15 minutes)

For Jefferson Lab's Hall B, the EPICS control systems have migrated from EPICS 3.13.4 to 3.14.12.5. During this time we moved to modern tools such as CS-Studio and BEAST, replacing MEDM and ALH. We have also fully converted to 64-bit Red Hat Enterprise Linux 7 (RHEL7) for all workstations and servers. Management of the controls infrastructure now leverages our on-site IT expertise in several aspects. All desktops and servers are fully managed by Puppet and monitored with Nagios. Using our IT VM cluster, we are pioneering site-wide usage of VMware's Linux Virtual Desktop Infrastructure (VDI). This technology is proving valuable for secure, remote access to the control system without issues and lag of X-forwarding. Read-only access is also being provided over the web via WebOPI. Discussion will include our general findings in this major transition and our future plans.

Primary author: MOORE, Wesley (Jefferson Lab)

Presenter: MOORE, Wesley (Jefferson Lab)

Session Classification: EPICS Collaboration Meeting

Track Classification: System Management

Contribution ID: 28

Type: **Regular Talk (15min)**

How to build an EPICS database from a Microsoft Excel spreadsheet.

Thursday, September 22, 2016 4:10 PM (15 minutes)

This talk describes how to build EPICS databases from a Microsoft Excel spreadsheet. I will explain how we updated the APS experimental beamline Personal Safety System (PSS) EPICS databases with Excel. Building EPICS databases from an Excel spreadsheet is helpful when number of records required for a particular database vary widely for a generic controls application.

Primary author: STEVENS, James

Presenter: STEVENS, James

Session Classification: EPICS Collaboration Meeting

Track Classification: System Management

Contribution ID: 29

Type: **Regular Talk (15min)**

Diirt and v4

Wednesday, September 21, 2016 10:10 AM (15 minutes)

An overview of the use of pvmanager to access pvData structures.

Primary author: SHROFF, Kunal

Co-author: ARKILIC, Arman (Brookhaven National Lab)

Presenter: SHROFF, Kunal

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 30

Type: **Regular Talk (15min)**

A second life for NSLS1 beamlines: CMS, a new beamline from refurbished NSLS1 components

Thursday, September 22, 2016 9:00 AM (20 minutes)

Complex Material Scattering (CMS) beamline, one of two first beamlines from BDN portfolio (Beamlines Developed by NSLS2, former NextGen), has seen its first light on Aug. 26 2016. CMS beamline will be dedicated to studies of the bulk and interfacial structures of complex materials on multiple length scales ranging from Angstroms to submicrons, such as molecular size and distribution, ordering, and domain sizes. CMS beamline is developed in partnership with Center of Functional Nanomaterials (CFN) at NSLS2. Monochromator, focusing mirror, KB micro-focusing mirror, sample chamber, detectors, and other components from NSLS1 were reused in CMS beamline on 11BM. Control's efforts, challenges and wins of making it ready to see X-rays in 6 month will be discussed.

Primary author: IVASHKEVYCH, Oksana (BNL)

Presenter: IVASHKEVYCH, Oksana (BNL)

Session Classification: EPICS Collaboration Meeting

Track Classification: Status Reports

Contribution ID: 31

Type: **Regular Talk (15min)**

Service-layer IOCs and their implementation in Python

Tuesday, September 20, 2016 3:20 PM (15 minutes)

The EPICS system provides a robust process variable distribution system upon which software clients and servers are able to interact. The servers interface to physical inputs and outputs of the machine, while the clients interface to users and operators (humans). During the beamline instrumentation upgrade at the SNS, we faced challenges in reproducing similar levels of instrument control automation present in the previous system while holding to a common set of servers and avoiding extensions in the user interface clients. To overcome these challenges, we introduce the service-layer IOC that acts as both client and server and operates autonomously. Our implementations to date provide such functions as automated 3-axis alignment, nested scan generation and experiment completion estimation, temperature-compensated experiment control and auto-reduction visualization. This talk will describe our implementation using the Python language and its EPICS components.

Primary author: VACALIUC, Bogdan (Spallation Neutron Source)

Presenter: VACALIUC, Bogdan (Spallation Neutron Source)

Session Classification: EPICS Collaboration Meeting

Track Classification: Experiment control, data acquisition

Contribution ID: 32

Type: **Regular Talk (15min)**

Steps and motors in EPICS: how to interface modern motion controllers

Wednesday, September 21, 2016 4:30 PM (15 minutes)

Stepper motors have been used in EPICS based systems for a long time.

Since that, motion control units have been evolved, and servo motors may be used for advanced applications.

ESS is still in an early phase for the neutron instruments, so we are looking at the new developments.

Give a short description how a stepper motor works, and why we want to improve the integration for modern motion controllers.

Primary author: Mr BOGERSHAUSEN, Torsten (ESS)

Presenter: Mr BOGERSHAUSEN, Torsten (ESS)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 33

Type: **Regular Talk (15min)**

webopi - CSS for the web

Thursday, September 22, 2016 11:40 AM (20 minutes)

CSS is widely used at SNS by operators, scientists and instrument staff with a large set of existing user interface files. Users expressed desire to monitor experiment progress and operational status while not on-site and while loading CSS is possible over remote access, it's bandwidth intense and not convenient for quick access. A new project has been started to reuse existing CSS files and convert them into web application. It's using modern web technologies to provide user with a familiar experience on their device of choice from the reach of internet. OPI and BOB files get converted to HTML5 format and can be displayed in any supported browser. While default look resembles CSS one, most of the layout is themable. Once the layout is displayed in the browser, WebSocket protocol is used for communication with the CA/PVA enabled server to receive PV updates and display them on web interface. We will present and discuss project features and architecture as well as future plans.

Primary author: Mr VODOPIVEC, Klemen (SNS)

Presenter: Mr VODOPIVEC, Klemen (SNS)

Session Classification: EPICS Collaboration Meeting

Track Classification: Client Tools and User Interfaces

Contribution ID: 34

Type: **Fast Talk (Single slide)**

CS-Studio at NSLS2

Thursday, September 22, 2016 9:50 AM (10 minutes)

There were 2 major developments associated with cs-studio at nsls2. Firstly the users are recognizing the benefits of the integrated environment provided by CS-Studio and requesting for new applications to be developed which exploit the cs-studio framework. Secondly, with the cs-studio 4.3.3 release and the ability to save and load perspectives, users are now able to put together dedicated perspectives for various activities and workflows.

Primary author: SHROFF, Kunal**Presenter:** SHROFF, Kunal**Session Classification:** EPICS Collaboration Meeting**Track Classification:** Client Tools and User Interfaces

Contribution ID: 35

Type: **Regular Talk (15min)**

An Overview of EPICS v4 Modules

Wednesday, September 21, 2016 11:00 AM (15 minutes)

A walking tour of the ever expanding EPICS universe with stops at the various components sometimes known as “EPICS V4”.

Primary author: DAVIDSAVER, Michael (Osprey DCS)

Presenter: DAVIDSAVER, Michael (Osprey DCS)

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 36

Type: **Fast Talk (Single slide)**

Open Source FPGAs, really

Thursday, September 22, 2016 3:40 PM (10 minutes)

A shameless promotion for the Project Icestorm
free and open FPGA development toolchain.

Primary author: DAVIDSAVER, Michael (Osprey DCS)

Presenter: DAVIDSAVER, Michael (Osprey DCS)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 37

Type: **Regular Talk (15min)**

Beam Diagnostics and Timing Integration at FRIB

Tuesday, September 20, 2016 1:20 PM (15 minutes)

Summary of experiences working with beam diagnostics and timing for the FRIB project. Including an introduction to uTCA systems, and integration of several cards.

Primary author: DAVIDSAVER, Michael (Osprey DCS)

Presenter: DAVIDSAVER, Michael (Osprey DCS)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: **38**

Type: **Fast Talk (Single slide)**

EPICS Packaging for Debian Linux

Thursday, September 22, 2016 2:50 PM (10 minutes)

Shameless promotion of the EPICSDEB effort to create/maintain Debian packages of EPICS modules.

Primary author: DAVIDSAVER, Michael (Osprey DCS)

Presenter: DAVIDSAVER, Michael (Osprey DCS)

Session Classification: EPICS Collaboration Meeting

Track Classification: System Management

Contribution ID: 39

Type: **Regular Talk (15min)**

An ATCA Based Accelerator Controls & RF Detector Platform

Tuesday, September 20, 2016 4:15 PM (15 minutes)

SLAC is currently developing an upgrade of its Linac Coherent Light Source (LCLS) that will be at the forefront of X-ray science. This upgrade will replace the first 1KM of its existing accelerator tunnel with a superconducting 1Mhz accelerator requiring a major upgrade to the existing control infrastructure. This new control system moves operations and computations previously performed in software and EPICs into FPGA firmware capable of operating at 1Mhz. SLAC has developed an ATCA based control platform to facilitate this high rate control operation.

The high rate and power of the new LCLS-2 accelerator requires a control platform that is powerfull and flexible, supporting a core set of accelerator systems which must operate at the full 1Mhz rate of the accelerator beam. These High Performance Systems (HPS) include Machine Protection System (MPS), Beam Position Monitors (BPMs) and the core timing distribution system for the accelerator and associated detectors.

Primary author: HERBST, Ryan (SLAC National Accelerator Laboratory)

Presenter: HERBST, Ryan (SLAC National Accelerator Laboratory)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 40

Type: **Regular Talk (15min)**

IPython Command Line Interface to EPICS IOCs

Tuesday, September 20, 2016 5:00 PM (15 minutes)

Python is simple, powerful, and easy to learn. Many scientists and engineers come to LCLS knowing much about Python, but little about EPICS. Using a robust, lightweight Python interface to EPICS, we have developed a Python library of device classes, each connected to an IOC. This layer of abstraction has enabled the development of a variety of Python scripts from a wide pool of contributors, including individual users. The code base comes together in a convenient IPython terminal, which we can use as the primary means to control EPICS IOCs. From this IPython environment we can incorporate other powerful tools, such as MySQL and our DAQ, to optimize experimental setup and facilitate scans and automated data collection.

Primary author: LENTZ, Zachary**Presenter:** LENTZ, Zachary**Session Classification:** EPICS Collaboration Meeting**Track Classification:** Experiment control, data acquisition

Contribution ID: 41

Type: **Regular Talk (15min)**

Realtime display of EPICS data with HTML5 and Websockets

Thursday, September 22, 2016 1:20 PM (20 minutes)

This presentation will cover work done within the LIGO lab to display complex screens on phones, tables, and standard web browsers. We utilize websockets and the webopi javascript libraries to display data to laboratory personal in real time.

Primary author: HANKS, Jonathan (California Institute of Technology)

Presenter: HANKS, Jonathan (California Institute of Technology)

Session Classification: EPICS Collaboration Meeting

Track Classification: Client Tools and User Interfaces

Contribution ID: 42

Type: **Regular Talk (15min)**

Easiest Alert System Ever (EASE)

Wednesday, September 21, 2016 9:00 AM (20 minutes)

EASE is a Django and PSP (PyCA derived) alert system for EPICS. A Django app is used to store alert settings for users and provide a way for users to share their alert settings. The EASE user interface is accessed via a browser, and is focused on providing a way for everyone to effortlessly establish alerts.

Primary author: WALLACE, Alex (SLAC)

Presenter: WALLACE, Alex (SLAC)

Session Classification: EPICS Collaboration Meeting

Track Classification: Operational Tools

Contribution ID: 43

Type: **Fast Talk (Single slide)**

Beckhoff PLC Interfaces

Wednesday, September 21, 2016 3:40 PM (10 minutes)

Beckhoff has been proven to be a solid choice for PLC systems in the photon beamlines at SLAC/LCLS. For interfacing the PLC to EPICS, Modbus is the reigning champion for its simplicity, but is now a limiting factor. A new interface to EPICS must be selected. Two choices are considered, Beckhoff's ADS, and OPC UA.

Primary author: WALLACE, Alex (SLAC)

Presenter: WALLACE, Alex (SLAC)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 44

Type: **Regular Talk (15min)**

EPICS Device/Driver for RTP Hardware

Wednesday, September 21, 2016 4:00 PM (15 minutes)

The RTP product requirements contained two other major items, the functionality of a DCS and the speed of a PLC. To meet the DCS requirements all Analog cards are designed with 16 ADCs and DACs. A multi CPU architecture that adds processing capability as the system is expanded makes it the fastest control system available and satisfies the PLC requirement. The RTP3000 was designed to meet the stringent requirements of IEC61508 2010 without later additions or modifications. In this paper, it will be presented how to configure the RTP hardware and develop a EPICS device/driver interface.

Primary author: LEE, Sangil (Institute for Basic Science)

Co-authors: Mr SON, Changwook (Institute for Basic Science); Dr JIN, Hyunchang (Institute for Basic Science); Ms PARK, Mijeong (Institute for Basic Science)

Presenter: LEE, Sangil (Institute for Basic Science)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 45

Type: **Regular Talk (15min)**

PyDM: A Python alternative to EDM

Thursday, September 22, 2016 1:40 PM (20 minutes)

While a laboratory environment can present a number of unique computational challenges, the display and modification of information is a global issue with global solutions. PyDM, an interface between the open-source Qt framework and EPICS Channel Access, offers a cross-platform alternative to existing display managers. By packaging a set of tools specifically for the display of EPICS data within the easily configurable PyQt environment, PyDM maintains all of the capabilities of EDM while presenting the user with a flexible environment to create screens. In this presentation, a general overview of the structure of the PyDM application is given, as well as a brief description of recent developments and deployments at SLAC. This includes the potential to use PyDM's plugin system to unify Data Acquisition and EPICS information in a single user interface, as well as the creation of screens programmatically generated at runtime.

Primary author: RENDAHL, Theodore**Presenter:** RENDAHL, Theodore**Session Classification:** EPICS Collaboration Meeting**Track Classification:** Client Tools and User Interfaces

Contribution ID: 46

Type: **Regular Talk (15min)**

EPICS based remote control system for ECR-IS & LEBT in SCL Demo at RISP

Wednesday, September 21, 2016 9:20 AM (20 minutes)

SCL Demo(Superconducting linear accelerator demonstration) was installed in SRF test facility at RISP. SCL Demo has ECR-IS, LEBT, RFQ, MEBT, QWR cryomodule, RF, and beam diagnostics. ECR-IS and LEBT section is the starting point to extract and accelerate heavy ion beam. ECR-IS started to beam extraction experiment, and remote control system is a precondition to run the the machine. In short term, the control system was developed on the EPICS platform. This system is the first self-developed remote control system for real machine at RISP. This report is about the beginning and the end of ECR-IS & LEBT remote control system development.

Primary author: Dr CHOI, Suk (RISP/IBS)

Co-authors: Dr LEE, Jinho (RISP/IBS); Dr KIM, Mijung (RISP/IBS); KIM, Yonghak

Presenter: Dr CHOI, Suk (RISP/IBS)

Session Classification: EPICS Collaboration Meeting

Track Classification: Status Reports

Contribution ID: 47

Type: **Regular Talk (15min)**

Development of ISOL Off-line Test Facility Control & Safety System at RISP

Thursday, September 22, 2016 9:20 AM (20 minutes)

The control system of ISOL Off-line test facility at RISP(Rare Isotope Science Project) is composed of two major parts of the control for RI beam production/separation/transportation and the safety for high voltage power supply and utility.

It controls the devices and monitors the current status of each device remotely through GUI using CSS. The conditions from the monitoring are saved to archive server. And the saved values can be checked at control and monitoring PC as graphs by archive viewer.

The device driver of EPICS IOC controls a power supply for target/ion-source using serial device server, another power supply for EQT/steerer using analog I/O card and vacuum, utility & safety using PLC.

The safety system has been designed and run to protect the facility and people considering that the platform of target & ion source is biased by high voltage up to 50kV with high current.

In this talk, the details of the system for the ISOL off-line test facility will be presented.

Primary author: Mr KIM, Yong-Hak (IBS/RISP)

Co-authors: Dr KANG, Byoung-Hwi (IBS/RISP); Mr SEO, Chang-Seog (IBS/RISP); Dr ISHIYAMA, Hironobu (IBS/RISP); Dr LEE, Jin-Ho (IBS/RISP); Dr KIM, Mi-Jung (IBS/RISP); Dr CHOI, Suk (IBS/RISP); Dr PARK, Sung-Jong (IBS/RISP)

Presenter: Mr KIM, Yong-Hak (IBS/RISP)

Session Classification: EPICS Collaboration Meeting

Track Classification: Status Reports

Contribution ID: 48

Type: **Regular Talk (15min)**

THE TURN-KEY CONTROL SYSTEM FOR THE ELI-NP GAMMA BEAM SYSTEM

Tuesday, September 20, 2016 10:10 AM (20 minutes)

This talk describes the ELI-NP Gamma Beam System (GBS) turn-key Control System. It is based on EPICS and developed by Cosylab as part of EuroGammas consortium. System is ready for installation at Magurele RO. It will enable configuration and monitoring of all major sub-systems along the 100 m electron linac. Presentation will touch hardware integration, micro-bunches diagnostics, high level applications, the data network and the pico-second timing system.

Primary author: SABJAN, Rok (Cosylab)

Presenter: SABJAN, Rok (Cosylab)

Session Classification: EPICS Collaboration Meeting

Track Classification: Status Reports

Contribution ID: 49

Type: **Regular Talk (15min)**

Kegnote Address: EPICS, Brewing, and the Maker Ecosystem

Wednesday, September 21, 2016 4:45 PM (20 minutes)

The maker ecosystem has flourished due to the widespread availability of common open hardware platforms and open source software frameworks coupled with the emergence of physical and virtual communities. Many of the problems EPICS solves are shared with makers. This presentation explores the potential overlap of these communities by documenting the ongoing progress of a computer controlled system for homebrewing beer, built at three Chicago makerspaces and implemented using EPICS, Raspberry Pi, and Arduino.

Primary author: PIERCE, Ryan (Analytics Lounge, NFP)

Presenter: PIERCE, Ryan (Analytics Lounge, NFP)

Session Classification: EPICS Collaboration Meeting

Track Classification: Status Reports

Contribution ID: 50

Type: **Fast Talk (Single slide)**

EPICS Support for OPC UA

Wednesday, September 21, 2016 3:50 PM (10 minutes)

OPC Unified Architecture (UA) is gaining ground as a communication protocol for industrial controls.

Bernhard Kuner (HZB/BESSY) has released EPICS Support that uses the commercial OPC UA Client SDK by Unified Automation GmbH, allowing a Linux based IOC to act as an OPC UA client.

Primary author: Mr KUNER, Bernhard (HZB / BESSY II)

Co-author: LANGE, Ralph (ITER Organization)

Presenter: LANGE, Ralph (ITER Organization)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 51

Type: **Regular Talk (15min)**

MQTT Support for CS Studio

Thursday, September 22, 2016 11:20 AM (20 minutes)

We report on adding support for the MQTT internet of things communication protocol to CS Studio. This support allows for the creation of widgets connected to MQTT topics on a configured broker.

Primary author: GRODOWITZ, Megan (Oak Ridge National Labs)

Co-author: KASEMIR, Kay

Presenter: GRODOWITZ, Megan (Oak Ridge National Labs)

Session Classification: EPICS Collaboration Meeting

Track Classification: Client Tools and User Interfaces

Contribution ID: 52

Type: **Regular Talk (15min)**

Instrument Control System Interface: Experimenting the UX Way

Thursday, September 22, 2016 10:20 AM (20 minutes)

We will report what we've learned in the past year developing user-centered SNS instrument control system interfaces, which will include our reflections on user-centered design and user experience (UX), what worked in our projects, as well as lessons learned. We hope to promote user-centered interface design practices within the EPICS controls community.

Primary author: YAO, Marie (ORNL)

Presenter: YAO, Marie (ORNL)

Session Classification: EPICS Collaboration Meeting

Track Classification: Client Tools and User Interfaces

Contribution ID: 53

Type: **Regular Talk (15min)**

Automatic Formal Verification for EPICS

Thursday, September 22, 2016 3:50 PM (20 minutes)

The Clinical Neutron Therapy System (CNTS) is a unique cyclotron-based radiation therapy machine at the University of Washington Medical Center. CNTS uses EPICS in its control system. This is a safety-critical medical application so we have undertaken a research project to supplement our usual software quality assurance by formal verification. The project includes an intensive review, analysis, and re-implementation of parts of EPICS. Several tools are under development. The EPICS Symbolic Evaluator automatically checks properties of an EPICS database. It either confirms the property or provides a counterexample. The EPICS Verified Interpreter is a re-implementation of the EPICS database engine, proved correct with an automated theorem prover, and validated by automated differential testing against an EPICS IOC. The EPICS Verified Compiler will compile an EPICS database to a standalone program that replaces the present EPICS runtime with a smaller trusted core.

Primary author: JACKY, Jonathan (University of Washington Medical Center)

Co-authors: LONCARIC, Calvin (University of Washington Department of Computer Science); Prof. TORLAK, Emina (University of Washington Department of Computer Science); Prof. ERNST, Michael (University of Washington Department of Computer Science); BANERIAN, Stefani (University of Washington Medical Center); PERNSTEINER, Stuart (University of Washington Department of Computer Science); Prof. TATLOCK, Zachary (University of Washington Department of Computer Science)

Presenter: JACKY, Jonathan (University of Washington Medical Center)

Session Classification: EPICS Collaboration Meeting

Track Classification: Other

Contribution ID: 54

Type: **Regular Talk (15min)**

Performance of neutron detector diagnostic tools

Tuesday, September 20, 2016 2:40 PM (15 minutes)

Calibration and diagnostic of neutron detectors requires raw data that is significantly larger than usual neutron data. Diagnostic in particular is useful when run continuously for longer time on many detectors simultaneously, requiring high bandwidth processing capabilities. Python tools have been developed to visualize and explain detector features as well as help to optimize configuration and spot problems. Python implementation could barely support single detector at a time. This lead to optimizing CPU hungry code. Data received over V4 channel is collected and processed in C++ extension and passed to Python for visualization. Detector and data acquisition system configuration as well as plotting is implemented in pure Python. This approach allows us to diagnose up to 35 wavelength-shifting detectors simultaneously.

Primary author: VODOPIVEC, Klemen

Co-author: Mr GUYOTTE, Greg (SNS)

Presenter: VODOPIVEC, Klemen

Session Classification: EPICS Collaboration Meeting

Track Classification: Experiment control, data acquisition

Contribution ID: 55

Type: **Regular Talk (15min)**

Migrating EPICS version history to git at SLAC

Thursday, September 22, 2016 4:25 PM (20 minutes)

SLAC faced a number of challenges when we looked into migrating our existing CVS and svn based EPICS development environments to git. I will discuss the issues we identified, along with how we addressed each of them.

One of the big challenges was how to preserve our existing version history, so our resulting git master repo for each EPICS module would include full version history from both our CVS and svn repositories, along with the history from the github collaboration. Sample source code in python will be provided that was used to accomplish this.

Primary author: HILL, Bruce (SLAC National Accelerator Lab)

Co-author: SHANKAR, Murali

Presenter: HILL, Bruce (SLAC National Accelerator Lab)

Session Classification: EPICS Collaboration Meeting

Track Classification: System Management

Contribution ID: 56

Type: **Regular Talk (15min)**

Update on ADnED - Visualizing neutron event data in areaDetector

Tuesday, September 20, 2016 2:25 PM (15 minutes)

ADnED acts as a client to a V4 service that provides neutron event data. ADnED converts the event data into NDArray objects and processes them in areaDetector plugin chains for visualization and use in experimental data acquisition. ADnED is in use at the SNS on many beamlines.

An update to ADnED is presented, along with details on the plugin chain and plans for the future.

Primary author: PEARSON, Matt (ORNL)

Presenter: PEARSON, Matt (ORNL)

Session Classification: EPICS Collaboration Meeting

Track Classification: Experiment control, data acquisition

Contribution ID: 57

Type: **Regular Talk (15min)**

Time Correlated Data Acquisition (DAQ) for the APS Upgrade

Tuesday, September 20, 2016 11:30 AM (15 minutes)

(presented on behalf of Ned Arnold and Sinisa Veseli)

The DAQ software captures synchronously sampled, time-correlated data from several critical subsystems: beam position monitor (BPM) values, storage ring RF cavity field measurements, fast injection kickers, beam diagnostics, and power supply read-backs. The key features of the system include the capability to acquire data from multiple subsystems at various sample rates, support for continuous data acquisition, and the ability to route the data to any number of applications. In this talk we present progress and future plans.

Primary author: JOHNSON, Andrew (Argonne)

Presenter: JOHNSON, Andrew (Argonne)

Session Classification: EPICS Collaboration Meeting

Track Classification: Experiment control, data acquisition

Contribution ID: 58

Type: **Regular Talk (15min)**

Pandabox: a new open hardware platform for on the fly data acquisition

Tuesday, September 20, 2016 11:45 AM (15 minutes)

Pandabox: a new open hardware platform for on the fly data acquisition

Primary author: HERON, Mark (Diamond Light Source)

Presenter: HERON, Mark (Diamond Light Source)

Session Classification: EPICS Collaboration Meeting

Track Classification: Experiment control, data acquisition

Contribution ID: 59

Type: **Regular Talk (15min)**

AreaDetector Status and Updates

Tuesday, September 20, 2016 1:35 PM (20 minutes)

An update on areaDetector

Primary author: RIVERS, Mark (University of Chicago)

Presenter: RIVERS, Mark (University of Chicago)

Session Classification: EPICS Collaboration Meeting

Track Classification: Experiment control, data acquisition

Contribution ID: **60**

Type: **not specified**

EPICS/V4 Discussion Time

Wednesday, September 21, 2016 2:40 PM (20 minutes)

Session Classification: EPICS Roadmap

Contribution ID: **61**

Type: **not specified**

Timing and Open FPGA HW Platform

Thursday, September 22, 2016 9:40 AM (20 minutes)

Presenter: PIETARINEN, Jukka

Session Classification: Timing and Open FPGA HW

Contribution ID: **62**

Type: **not specified**

Timing and Open HW Discussion

Thursday, September 22, 2016 10:00 AM (40 minutes)

Session Classification: Timing and Open FPGA HW

Contribution ID: 63

Type: **Regular Talk (15min)**

Applications of Lua-based Embedded Scripting within EPICS at LANSCE

Wednesday, September 21, 2016 4:15 PM (15 minutes)

During our retrofit of LANSCE LINAC instrumentation systems we implemented fundamental upgrades to EPICS facilitating the rapid-prototype approach to software-development based upon the Lua embedded scripting language. Selection of Lua facilitates new advanced capabilities within EPICS satisfying requirements at LANSCE, but without compromising the general utility of EPICS for use within the wider context of its different sites and projects. At LANSCE Lua implements subscription update filtering of logical beam gate combinatorials selecting subsets of produced beam species, implements configuration scripting during EPICS IOC startup, and also implements advanced rapid-prototyping approach to algorithmic building blocks based on a new Lua-script-based EPICS record. We will discuss some details of how these new features are programmed and configured for implementing LANSCE requirements along with some rough measurements of the computational efficiency of Lua within these applications.

Primary author: HILL, Jeffrey (Los Alamos Neutron Science Center)

Presenter: HILL, Jeffrey (Los Alamos Neutron Science Center)

Session Classification: EPICS Collaboration Meeting

Track Classification: EPICS Core, EPICS V4

Contribution ID: 65

Type: **Regular Talk (15min)**

CS-Studio Collaboration Status

Thursday, September 22, 2016 9:40 AM (10 minutes)

The Control System Studio Collaboration Status Report

Primary author: BERRYMAN, Eric (Facility for Rare Isotope Beams)

Presenter: BERRYMAN, Eric (Facility for Rare Isotope Beams)

Session Classification: EPICS Collaboration Meeting

Track Classification: Status Reports

Contribution ID: 66

Type: **Regular Talk (15min)**

Status and development in the Integrated Control System project at ESS

Tuesday, September 20, 2016 11:00 AM (15 minutes)

An overview is given on the progress and development of the Integrated Control System Project at ESS. Details about planning, budget, schedule, as well as technical development activities and strategies for collaboration and community interaction are presented.

Primary author: CARLING, Henrik (European Spallation Source ERIC)

Presenter: CARLING, Henrik (European Spallation Source ERIC)

Session Classification: EPICS Collaboration Meeting

Track Classification: Status Reports

Contribution ID: 67

Type: **Regular Talk (15min)**

From ASKAP-12 to ASKAP-36 and Beyond

Wednesday, September 21, 2016 3:20 PM (20 minutes)

The EPICS IOC development for ASKAP is largely complete and ASKAP-12 is operational as a science instrument. We are beginning a formal early science program soon with the current array of 12 dishes and the remaining 24 are in production for installation over the next year. We review our design decisions, wrong turns and where we are headed next.

Primary author: HASKINS, Craig (CSIRO)

Presenter: HASKINS, Craig (CSIRO)

Session Classification: EPICS Collaboration Meeting

Track Classification: Status Reports

Contribution ID: 68

Type: **Fast Talk (Single slide)**

Using StreamDevice to Connect Network Attached Devices to EPICS-View from an EPICS Beginner

Tuesday, September 20, 2016 3:35 PM (10 minutes)

The following is a short talk concerning a student led EPICS project and the various lessons learned. The Beam Test Facility (BTF) is a test stand for Radio Frequency Quadrupole (RFQ) conditioning and low level beam experiments. The BTF has a Protection System (PPS) that monitors radiation levels and controls entry around the accelerator equipment. The PPS uses a Farwest brand detector to alert users if there is high level radiation. Using the ASYN and StreamDevice modules, this detector can send data to EPICS. Sending the the data to EPICS allows operators, using EDM screens, to observe any radiation spikes. Also, since it communicates with the test network, any data can be recorded in the data-archiver for analysis. As a first time student user of EPICS, this network driver project was an excellent intro into the ins and outs of EPICS and its applications. This talk will go into my views on how the EPICS system functions and the various tools that helped along the way.

Primary author: Mr MCCULLOUGH, William (ORNL)

Presenter: Mr MCCULLOUGH, William (ORNL)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 69

Type: **Regular Talk (15min)**

ESS Experience with Ion Source and LEBT control system development and commissioning

Thursday, September 22, 2016 3:20 PM (20 minutes)

An overview of ESS experience in developing and commissioning the first part of the accelerator - Ion Source and LEBT. Details about control system development using ESS software framework and support tools for EPICS development (Controls Configuration DB, Naming Service, EEE).

Primary author: LEVCHENKO, Nikolay (European Spallation Source)

Presenter: LEVCHENKO, Nikolay (European Spallation Source)

Session Classification: EPICS Collaboration Meeting

Track Classification: System Management

Contribution ID: 70

Type: **Regular Talk (15min)**

Plans for EPICS V4 at the European Spallation source

Wednesday, September 21, 2016 11:15 AM (15 minutes)

The European Spallation Source is presently in construction in Lund, Sweden. The ESS a green field facility, which gives us the opportunity to build a system without legacy constraints. One of the goals for the control system is to be fully EPICS 4 compliant, that is, use pvAccess as the sole protocol in the control system.

To accomplish this, a comprehensive set of tools and services has to be put together. Although they have been built and also used in other facilities, until now have all the services been used together in a single place as a coherent set.

Using EPICS 4 facilities will change the way in which control systems of scientific facilities work. Many new features will become possible, handling complex and large data becomes an integrated function of the control system. We present some ideas how to take advantage of this. However, we have only started to imagine yet the biggest impacts.

Primary author: KORHONEN, Timo (European Spallation Source ERIC)

Presenter: KORHONEN, Timo (European Spallation Source ERIC)

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 71

Type: **Regular Talk (15min)**

ESS Controls hardware plans and status

Tuesday, September 20, 2016 11:15 AM (15 minutes)

We present the strategy and plans for control system hardware at ESS. The ESS is following a hardware selection that consists of three levels of performance:

MTCA.4 for the high performance systems, EtherCAT for fast distributed I/O and PLCs for industrial I/O and high reliability requirements. We present the status and progress in each of these platforms and the features of our standard solutions.

Primary author: KORHONEN, Timo (European Spallation Source ERIC)

Presenter: KORHONEN, Timo (European Spallation Source ERIC)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 72

Type: **not specified**

Working Dinner: A History of Control Systems at ORNL

Wednesday, September 21, 2016 5:50 PM (3 hours)

Meal will be served at 18:30

Presenter: WHITE, Karen (ORNL)

Session Classification: Dinner

Contribution ID: 73

Type: **Regular Talk (15min)**

AreaDetector use and developments at Diamond

Tuesday, September 20, 2016 2:10 PM (15 minutes)

Diamond have been using the area detector framework for several years and are involved in recent developments. This talk covers some history, status, current applications and their context in the work of the facility.

Primary author: MERCADO, Ronaldo (Diamond Light Source Ltd)

Presenter: MERCADO, Ronaldo (Diamond Light Source Ltd)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 74

Type: **not specified**

Safety Period

Contribution ID: 75

Type: **Regular Talk (15min)**

ADStream

Tuesday, September 20, 2016 4:00 PM (15 minutes)

ADStream makes it easy to configure an areaDetector camera IOC for one or more image streams, each of which has its own dedicated stdArray, ROI, CC, Overlay, and Process plugin, along w/ some extra PV's to characterize the stream type, input source, height, width, and desired update rate.

You can also do image averaging, and view and adjust 4 crosses and 4 ROI overlay boxes. The overlays have calc records to handle binning differences between streams. A python script is used to reconfigure each stream's plugin chain as needed to produce the desired result.

Primary author: HILL, Bruce (SLAC National Accelerator Lab)

Presenter: HILL, Bruce (SLAC National Accelerator Lab)

Session Classification: EPICS Collaboration Meeting

Track Classification: Hardware, Driver/Device support

Contribution ID: 76

Type: **not specified**

Logistics

Tuesday, September 20, 2016 9:20 AM (10 minutes)

Presenter: WHITE, Karen (ORNL)

Session Classification: EPICS Collaboration Meeting

Contribution ID: 77

Type: **Regular Talk (15min)**

pvaPy Status

Wednesday, September 21, 2016 11:30 AM (15 minutes)

Update on python support for places

Primary author: JOHNSON, Andrew (Argonne)

Presenter: JOHNSON, Andrew (Argonne)

Session Classification: V4

Track Classification: EPICS Core, EPICS V4

Contribution ID: 78

Type: **not specified**

Closeout

Friday, September 23, 2016 12:15 PM (20 minutes)

Presenters: WHITE, Karen (ORNL); KASEMIR, Kay; HARTMAN, Steven

Session Classification: Closeout