Database Workshop Report
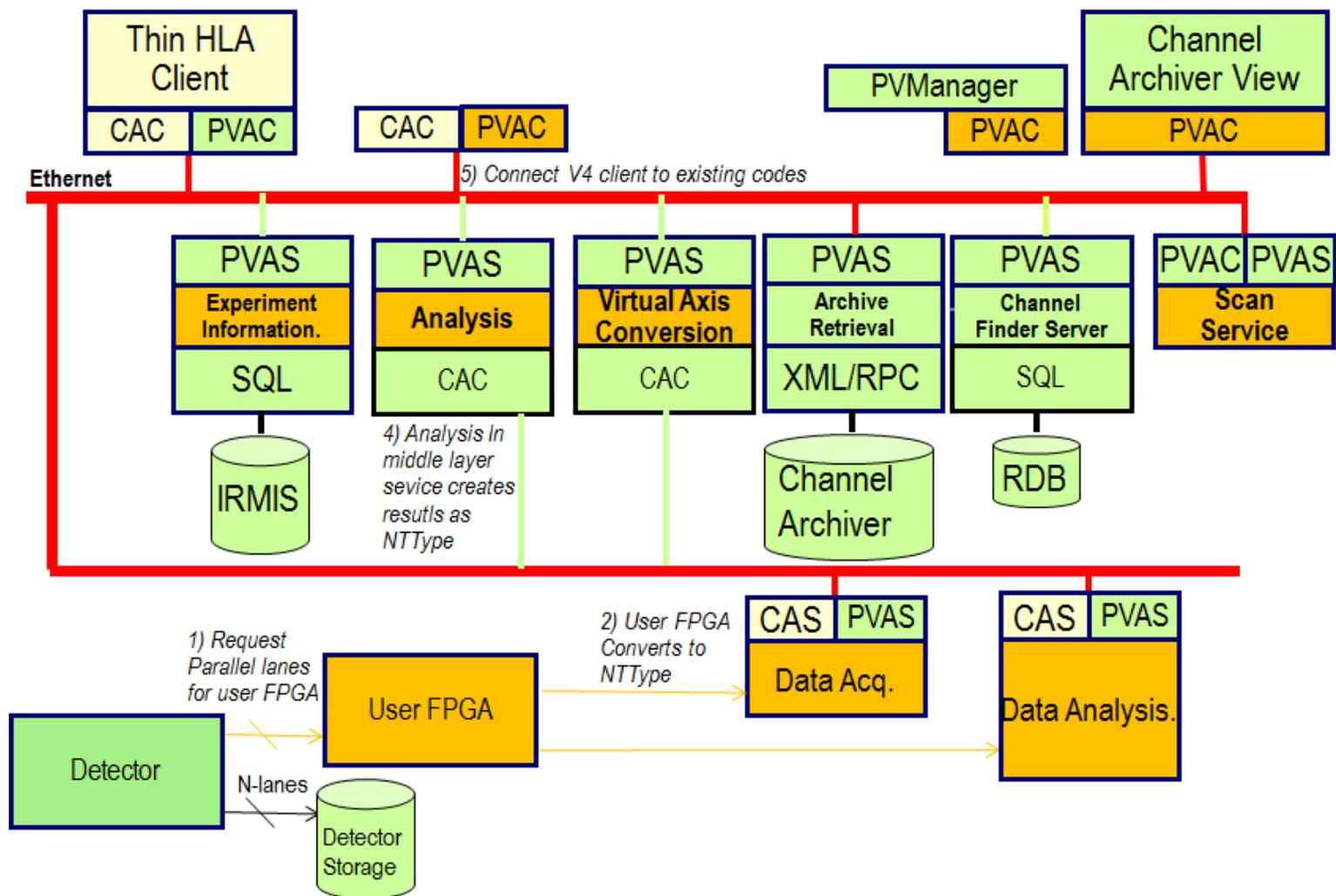
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FRIB-NSCL,
East Lansing, Michigan, USA.

V4 – DISCS
Distributed Information Services for Controls System

DISCS – Scope I

#	Data	Description
1	Logbook	Logbook entries
2	Traveler	Production, test, design data
3	Configuration	Physical and logical information about the facility and its configuration
4	Infrastructure	Cables, IOCs, Racks, Rooms etc
5	Lattice/Model	Elements and online model
6	Inventory	Spare parts, stock items
7	State	Save/restore state of machine
8	Alarm	Supervision of alarm states in the EPF, assistance to operators for diagnostics and resolution of alarm conditions

DISCS – Scope II

#	Database	Description
9	Operations	Beam statistics, run hours, beam on target, shift summary, downtime, bypass records
10	Machine Requirements	Parameter list, system and component requirements
11	MPS	Machine state dumps for Machine Protection System
12	Results	Results from physics experiments
13	Maintenance	Preventive maintenance data, failure analysis, lifetime analysis
14	Interlocks	Interlock hierarchy information [optional]
15	Physics Apps	Physics applications
16	Unit Conversion	Current-Field Mapping

DISCS Vision

To Develop Collaborating Services That Any Experimental Physics Facility Can Easily Configure, Use, And Extend For Its Design, Commissioning, Operation, And Maintenance

DISCS Architecture

Application layer
- Operator interfaces
- High-level applications
- Libraries

Service layer
- Access to data
- Programming Interface

Data layer
- Managed data
- Instrument data
- No direct access
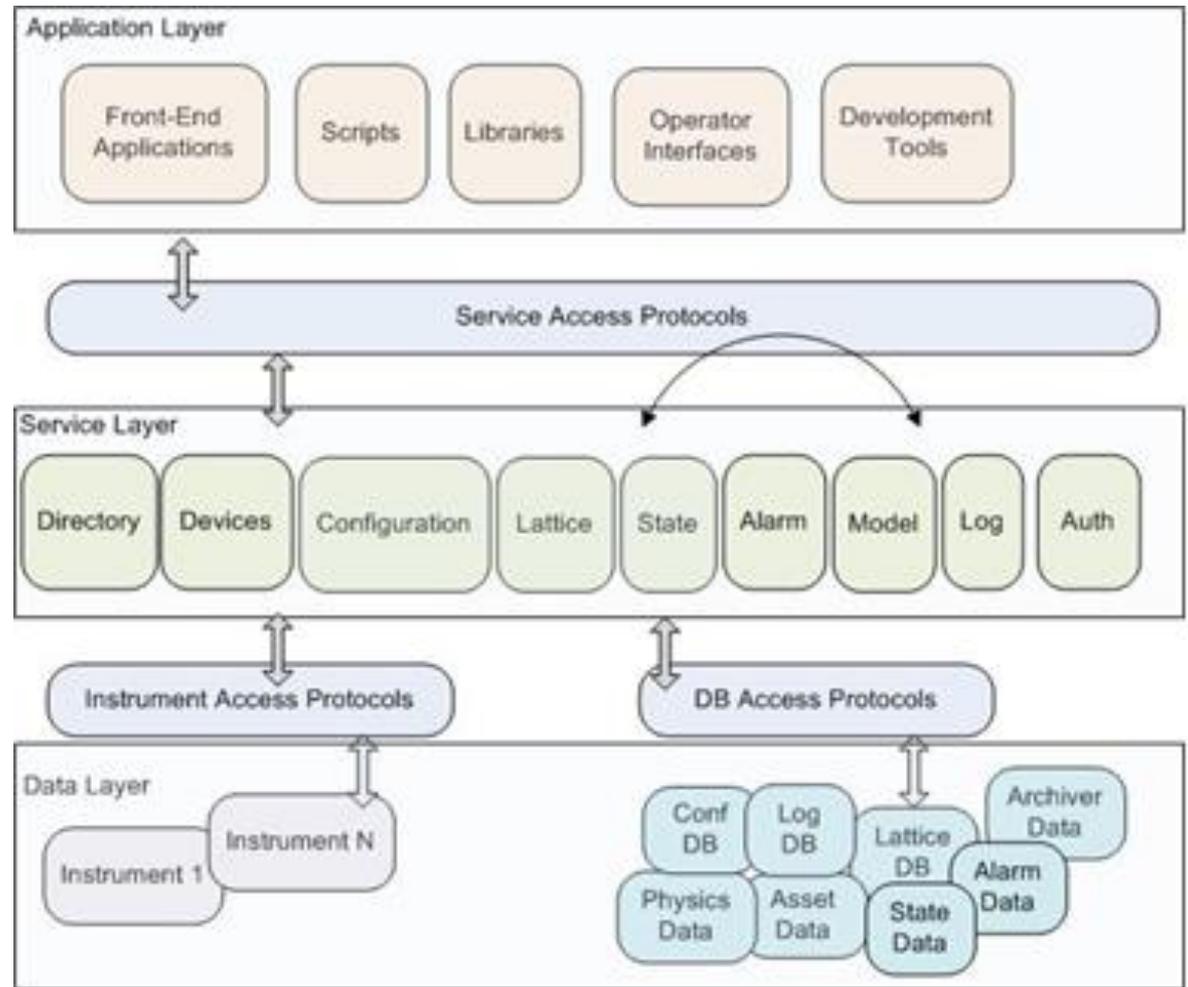
DISCS Collaborators

- Brookhaven National Lab, USA
- Cosylab, Sloven
- European Spallation Source, Sweden
- Facility for Rare Isotope Beam, USA
- Institute for High Energy Physics, Ch
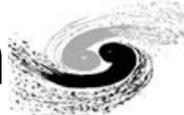
DISCS Modules

▸ Module: An Implementation Of A Domain
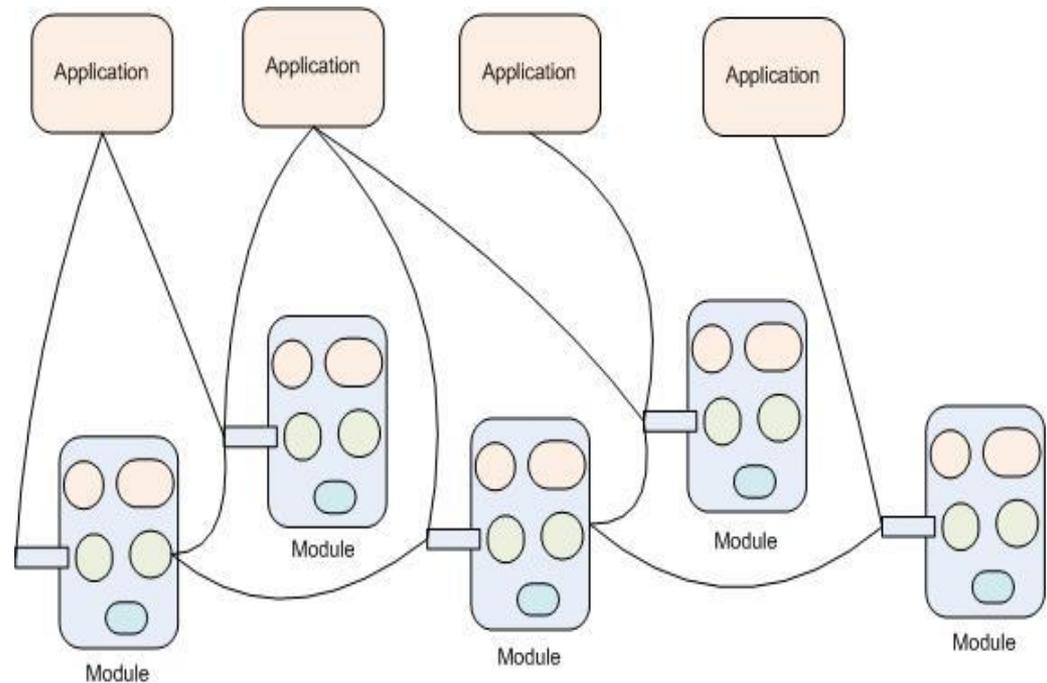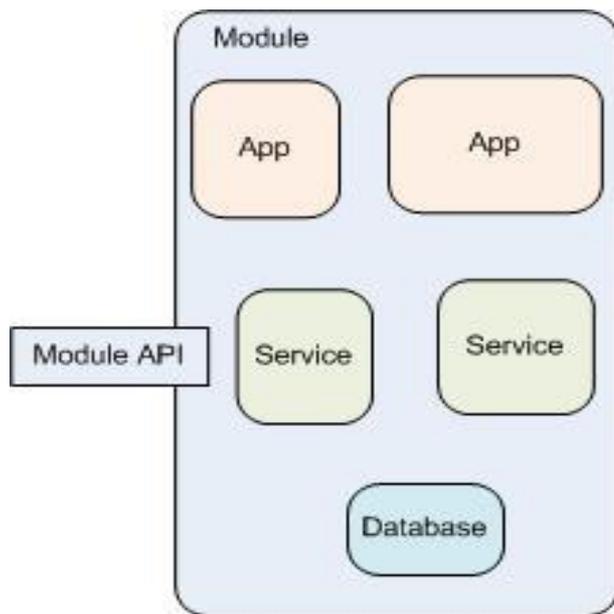
Technologies

Layer	ESS, FRIB	BNL
Data Layer	MySQL	MySQL
ORM	JPA	Django ORM
Service Layer	Java EE, Java SE	Django REST, C++ (V4)
Service Architecture	EPICS V4, REST	EPICS V4, REST
API	Java, Python	Python
Web Interface	JSF, PHP	Django
GUI	CSS	CSS
Language	Java	Python

DISCS Status

Domain	Team	Status
Configuration	FRIB,ESS,Cosylab	In Production At FRIB
Cables	FRIB	Under Development
eTraveler	FRIB	In Production At FRIB
Lattice-Model	BNL, FRIB, ESS	Prototypes At FRIB and BNL
Logbook	BNL, FRIB	In Production At FRIB & BNL.
Inventory	FRIB	Under Development
Naming System	FRIB	In Production at FRIB
Operations	FRIB	Under Development
Save/Restore	BNL	In Production at BNL
Security	ESS, Cosylab, FRIB	Under Development
Signals (PV)	BNL	In Production at BNL, FRIB (ChannelFinder)
Unit Conversion	BNL	Under Development

Presentations

Logbook: Web Client

Logbook: CSS Client

Logbook: pyOlog

eTraveler – List of Travelers

eTraveler – Devices
Integration with Configuration Module

Configuration: Component Tree

Configuration: Magnet Measurement

Configuration: Live Signals (PV)

Configuration Module: V4 Service

Configuration: Component Relationships

Configuration: Component Relationships

Configuration: Lattice

Lattice-Model: Beamlines

firstElementNa...	lastElementNa...	predecessorSeq...	sequenceDescr...	sequenceLength	sequenceName	
FE_START	FE_END		NULL	43.917797	FE	
LS1_START	LS1_END	FE	NULL	102.970489	LS1 TO STRIPPER	
CSS1_START	CSS1_END	LS1 TO STRIPPER	NULL	8.963245	CSS1	
STRP_START	CSS1-CSS2_END	CSS1	NULL	0.0	CSS1-CSS2	
CSS2_START	CSS2_END	CSS1-CSS2	NULL	14.552447	CSS2	
FS1_START	FS1_END	CSS2	NULL	4.103876	FS1	
DUMP2_START	DUMP2_END	FS1	NULL	27.503633999999977	DUMP2	
LS2_START	LS2_END	DUMP2	NULL	122.20456300000001	LS2	
FS2_START	FS2_END	LS2	NULL	40.25585799999999	FS2	
LS3_START	LS3_END	FS2	NULL	124.022672	LS3	
BDS_START	BDS_END	LS3	NULL	27.024158	BDS	

Naming Convention – Name Elements

Name Elements Are Parts of A Name: System, Subsystem, Device Type etc

Naming Convention – Submit Requests

Submit Requests to Add, Modify, or Delete Name Elements

Naming Convention – Process Requests

Naming Convention - Reports

Screenshots – Unit Conversion

Save/Restore: Multiple Selections

Save/Restore: Results

Cables – Normal View

Cables – Manager View

Cables - Types

Copy Print Save ▾

10 ▾ records per page   Search:

Name	Characteristics	Diameter	Function/Service	Voltage	Insulation	Jacket	Raceway	TID	Model	Comments	Spec
1/2HELA	1/2" heliax Type 461	0.63	Transformer Output Winding Cable	Comm	Solid PE	Flame Retardant PVC	Tray or Conduit	100	Andrew LDF4RN-50A, CATVR		Andrew_LDF4RN-50A.pdf
1/4HELA	1/4 in Heliax	0.345		N/A	Solid PE	Flame Retardant PVC	Tray or Conduit	100	Andrew LDF1RN-50A, CATVR		Andrew_LDF1RN-50A.pdf
1/4HELA_RFS	1/4 in Heliax	0.31		N/A	Foam PE	Flame Retardant PE	Tray or Conduit	100	RFS SCF14-50JFN Phase Stabilized		RFS_SCF14-50JFN_phase_stabilized.pdf
10C22OSTC	10 Conductor, 22 AWG, Stranded, Non Paired, overall shield, tray cable	0.3	RS-232 Applications	Comm	Semi-Rigid PVC	PVC	Tray or Conduit	100	Belden 9946		Belden9946
10PR22OS_RS232	10 Pair, 22 AWG, Twisted Pair, overall shield	0.44	Vacuum Rack Cables	300	SR-PVC	PVC	Tray or Conduit	100	Belden 8310		Belden8310.pdf
12C16TC6V	12 Conductor 16 AWG, Copper tape shield with copper drain wire, tray rated	0.596	PPS system cable	600	XHHW, EPR	CPE Low Smoke	Tray or Conduit	100	BICC Cables FREP II-XL-S600TC-16-12 with Copper tape shield with copper drain, K-2 color code		BICC-FREP-ll-S600TC-16-12-CDK2.pdf
12C16TC6VNR	12 Conductor, 16 AWG, overall shield, tinned copper drain, tray rated	0.59	PPS non-rad cable	600	PVC/Nylon	PVC	Tray or Conduit	1	General Cable D1501612		General-D1501612.pdf
12C16TC6VR	12 Conductor, 16 AWG, overall shield, tinned copper drain, tray rated	0.596	PPS rad cable	600	EPR	CPE Low Smoke	Tray or Conduit	300	BICC Cables FREP II-S600TC-16-12		BICC-FREP-ll-S600TC-16-12.pdf

Next Quarter Goals

▸ Online Model API

▸ Services Portal (from last meeting)

▸ Web Site (from last meeting)

▸ APIs and Domain Integration

▸ RBAC Prototype

▸ Cables, Operations, Calibration Releases

▸ Configuration Versioning, Lattice Design

▸ V4/CSS Integration

▸ Software Engineering: Requirements Backlog, Status

Conclusion

- Made Good Progress In Logbook, Traveler, Unit Conversion, Configuration, Lattice-Model, Naming
- Many Modules Under Development (Cables, RBAC, Calibration)
- Challenges
  - Integration Among Modules
  - Standard APIs
- Not Ready for General Users

- DISCS Website: http://discs.openepics.org

Thank you!

"Software is like entropy. It is difficult to grasp, weighs nothing, and obeys the 2nd law of thermodynamics i.e. it always increases.."

– Norman Augustine