

ALS control system status update 2024

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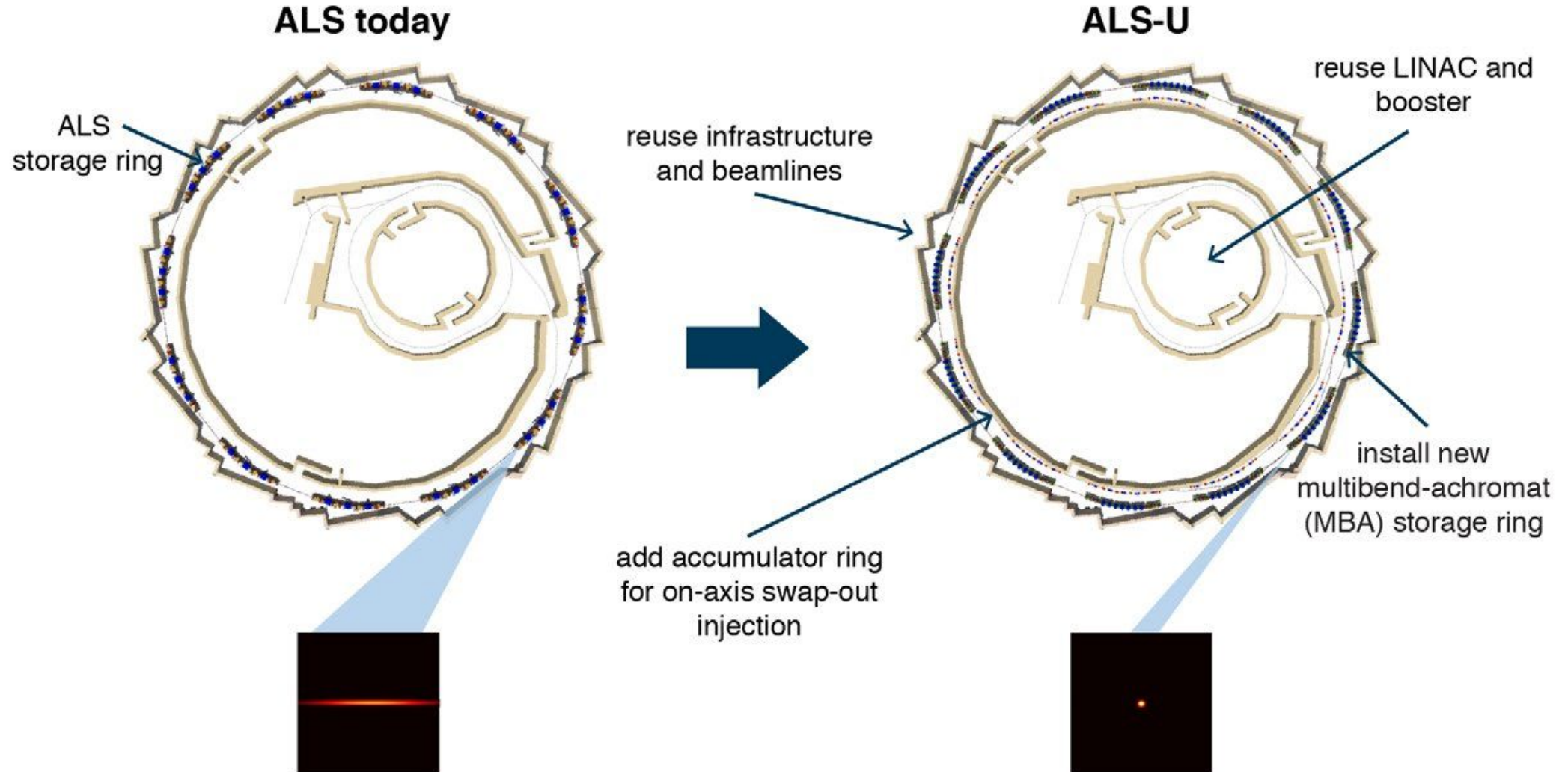


Contents

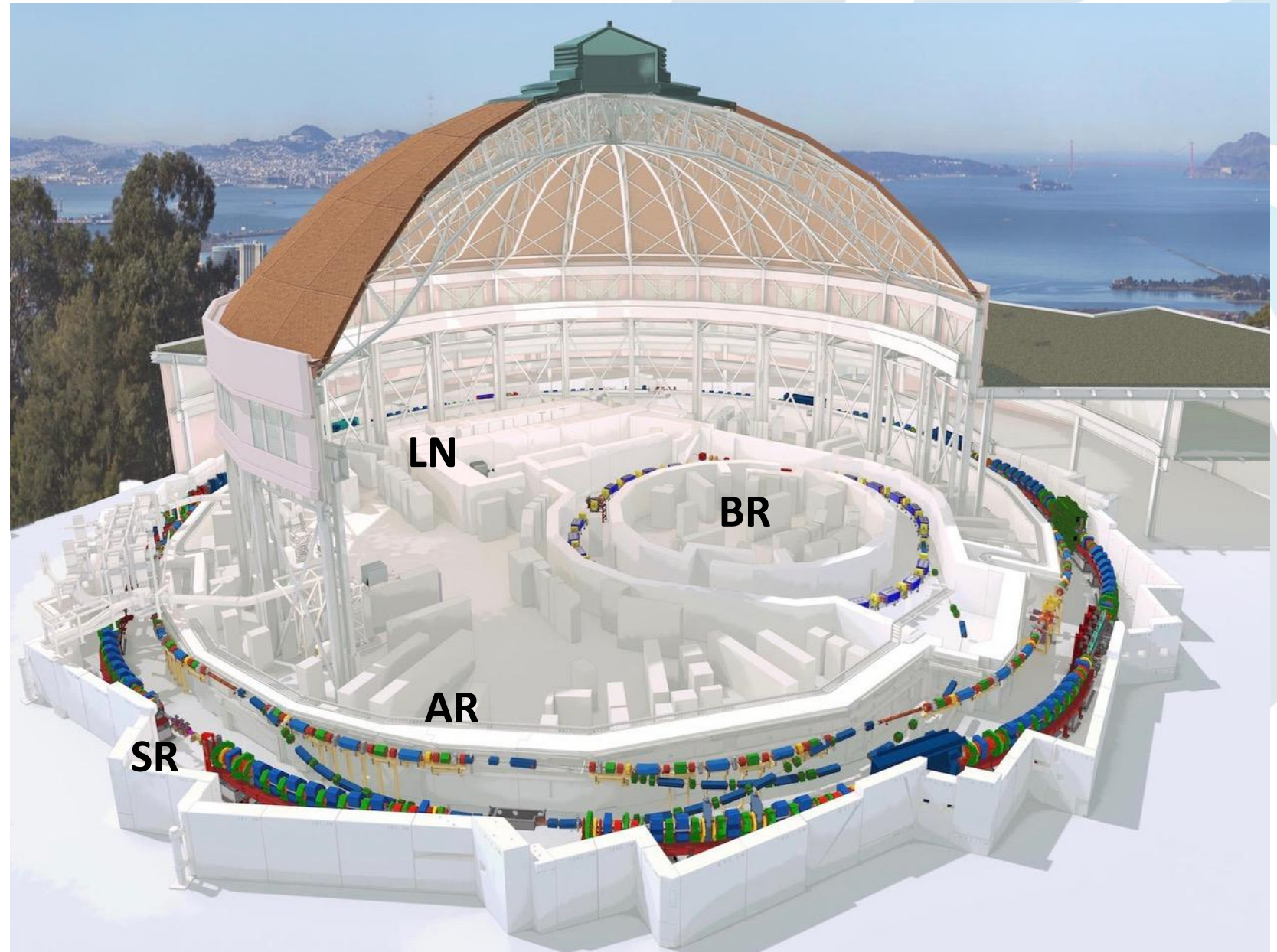
- ALS Control system
 - Software (EPICS services and tools)
 - Hardware



ALS-U upgrade project



ALS-U upgrade project



ALS control system software

- Extensive use of virtual hosts (VMWare cluster)
 - The primary OS is Linux (RockyLinux8)
(migration from CentOS7 is in progress)
- Extensive use of virtual desktops (RealVNC)
(the only positive side effect of COVID pandemic)
 - ALS control room uses virtual desktops

ALS control system software

- Migration of our Linux systems from CentOS7 to RockyLinux8
 - Lack of NFS version 2 support (required by legacy RTEMS systems)
 - Phoebus GUIs with default GPU rendering shows high CPU load (software rendering solves the problem)



ALS control system software

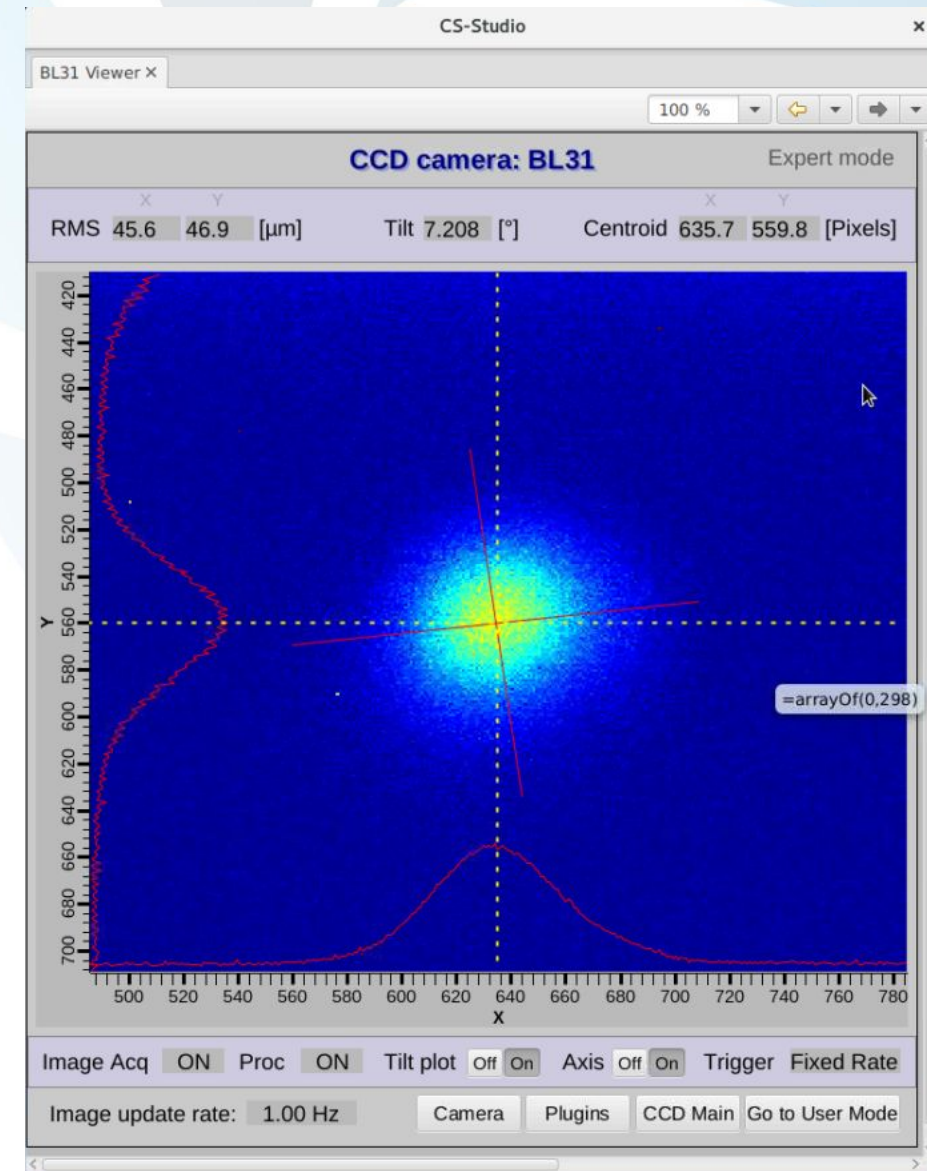
- IOCs migration from EPICS 3.15.8 to EPICS7.0.7 (99% soft iocs were converted)
 - Some IOCs with many PVs require to increase: callbackSetQueueSize
 - modbus device driver R3-3 in not backward compatible with R2-9 (modicon PLCs)
 - mrfioc2 EVG driver v231 (2023) not backward compatible with v204 (2015)



ALS control system software Benefits of PV access

- Area Detector with PVA plugin compressed images are sent from the IOC with PVaccess to Phoebus client app.

Phoebus image widget requires only the PV image name for the configuration.



ALS control system services

- EPICS services and tools
 - Channel finder (in use)
 - Archiver appliance (in use)
 - PV Web Socket (used by [PV Info](#) web application)
 - Legacy Alarm Handler (will be decommissioned)
 - **New Alarm Handler and Alarm Logger (job in progress)**
 - Name server (with channel finder connectivity) (planned)

- Channel finder in ALS contains the metadata to:
 - populate the Archiver Appliance (in use)
 - serve as backend for PV Info web application (in use)
 - auto generated Phoebus screens for group/categories of PVs (in progress)
 - to provide the Name Server with relevant information (planned)

ALS control system services

Channel finder use case

CS-SI

File Applications Window Help

Ops Launcher X ALS Launcher X Controls Main X IOC Stats X Channel Table X

Query: SR01C*QFA*1S*BC*

name	alias	Acc	archive	Family	Field	Device	Sector	hostName	iocName
SR01C__QFA1S1_BC19	irm:053:B19Out	SR	MediumControlled	QFA	Shunt1Control	1	1	b04lx-irm.als	irm
SR01C__QFA1S2_BC18	irm:053:B18Out	SR	MediumControlled	QFA	Shunt2Control	1	1	b04lx-irm.als	irm

name	Location	Position	recordDesc	owner	Engineer	iocid	pvStatus	irm	recordType
SR01C__QFA1S1_BC19	SoftIOC	6.301233	QFA1 SHUNT1	mdach	mdach	131.243.89.15:34872	Active	053	bo
SR01C__QFA1S2_BC18	SoftIOC	6.301233	QFA1 SHUNT2	mdach	mdach	131.243.89.15:34872	Active	053	bo

ALS control system hardware

- PLCs:
 - **Modicon** (EPS), -> migration to AB
 - **WAGO** (Temperature measurement, EPS), -> migration to AB
 - **Horner** (RF system), -> migration to AB
 - Allen-Bradley (MPS, EPS, New Scandinova modulators)



ALS control system hardware

- GPIB devices
 - 12 GPIB gateways were replaced by IRMs (PLC like) for ADC and Digital signals readout.
- cPCI with RTEMS 4.10 EPICS 3.14.12 migration to RTEMS 5.0 EPICS 7.0.7 failed (too small RAM of MCP750)
- Mini IOC VxWorks (PLC like) devices will be replaced with IRMs (PLC like) June this year



ALS control system hardware

- VME with VxWorks
 - Last OMS motion controller will be replaced with Galil (network based controller) in June this year
- VME (timing EVR systems) with RTEMS 4.10 EPICS 3.14.12 were migrated to RTEMS 5.0 EPICS 7.0.7





Thank you

Acknowledgement

- ALS-U controls team
- Unix team
- LBLnet team: networking team
- Cyber security team
- Physics team
- ALS operators
and many others