

ALS control system status report

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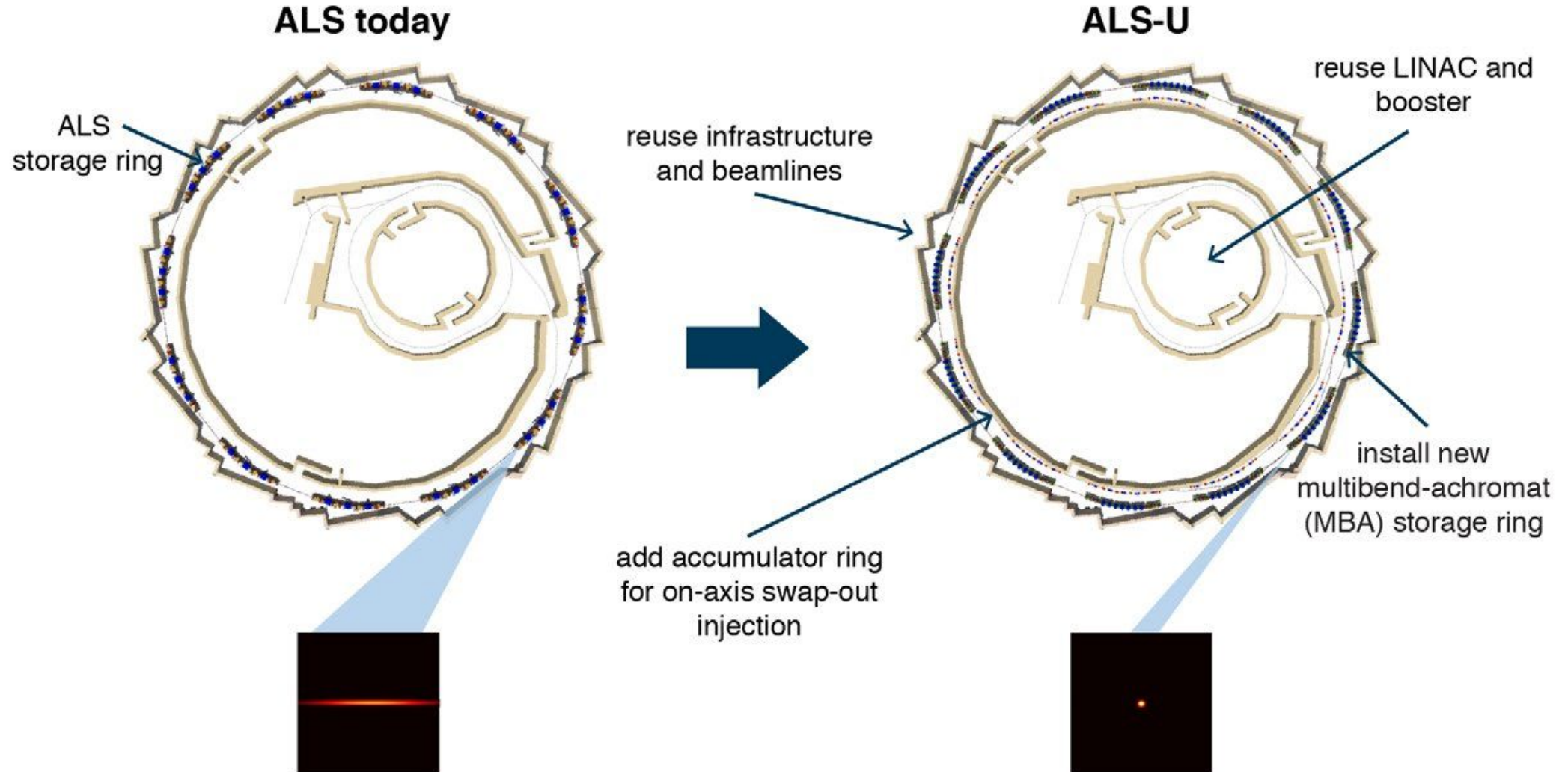


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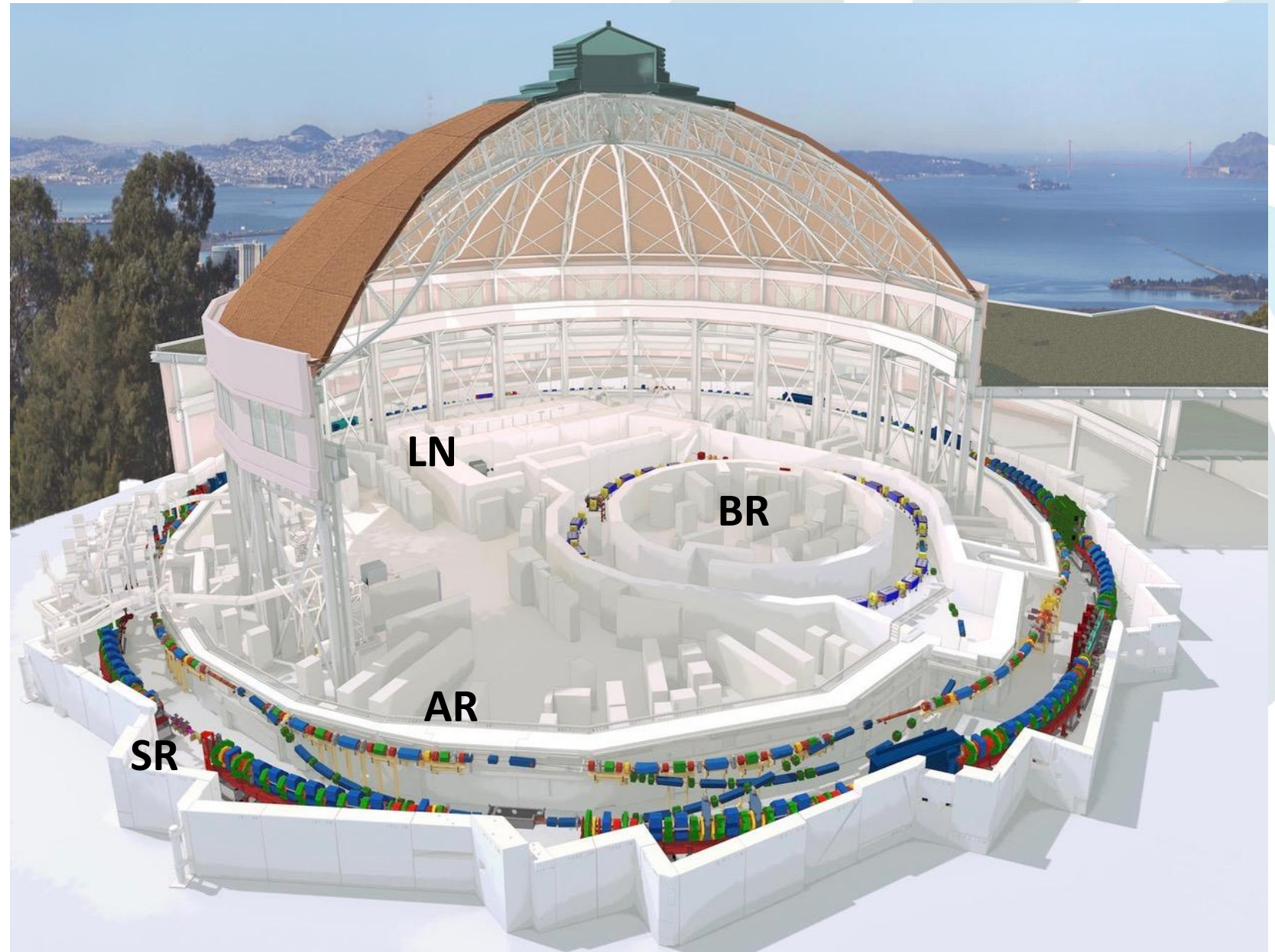
- ALS-U upgrade project in brief
- ALS Control system
 - Infrastructure and architecture
 - Hardware
 - Software (EPICS services and tools)
- New Network Model



ALS-U upgrade project



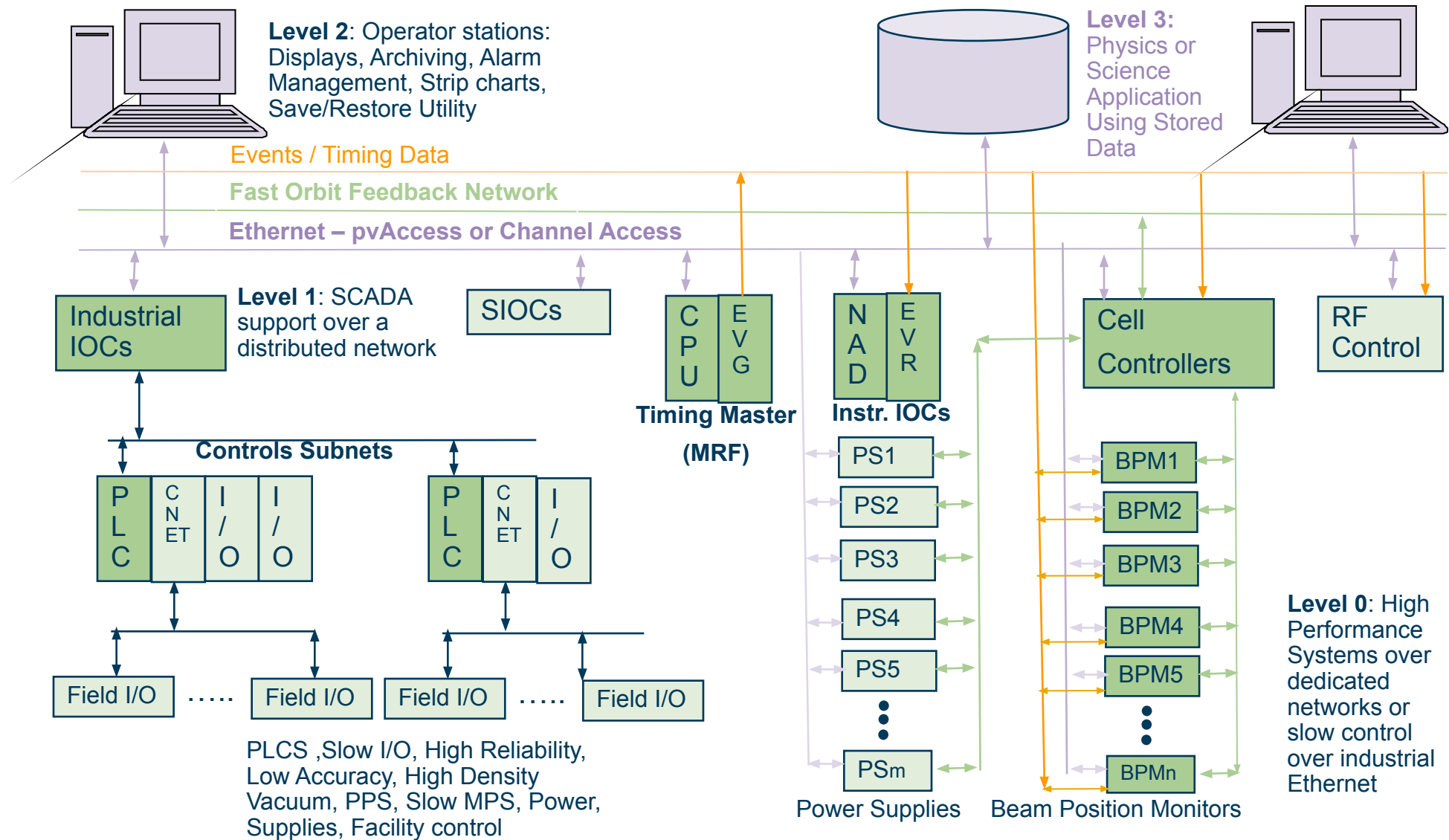
ALS-U upgrade project



ALS control system infrastructure

- Extensive use of virtual hosts (VMWare cluster)
 - The primary OS is Linux (CentOS 7)
(migration to Rocky Linux 8 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 architecture



ALS control system hardware

- **Crate based systems: (will not be used in ALS-U)**
 - VME (timing system MRF, Scrapers OMS) ,
 - cPCI (FOFB, Super Band Magnets, ..)
- **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

- Standalone (home made) Xilinx FPGA based:
BPMs, BCMs ,HSD scopes , IRMs, User Timing ...
- Standalone (Commercial): Power PMAC, BLM (ITech), CAEN PS and many others



ALS control system software

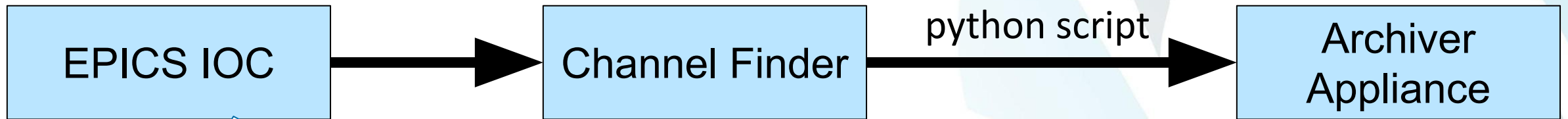
- EPICS base
 - migration from V3.15 to V7 in progress
- EPICS GUIs and higher level applications
 - Phoebus
 - qt and C# GUIs already migrated to phoebus
 - migration of EDM screens to phoebus in progress
 - Matlab

ALS control system software

- EPICS services and tools
 - Channel finder
 - Archiver appliance
 - 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)



ALS control system software Channel finder use case



```
record(stringin, "$(IOCNAME):STARTTOD")
{
  field(DESC, "Time and date of startup")
  field(DTYP, "Soft Timestamp")
  field(INP, "@%m/%d/%Y %H:%M:%S")
  info(archive, "VerySlow")
}
```

ALS control system software 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 software

Channel finder use case

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

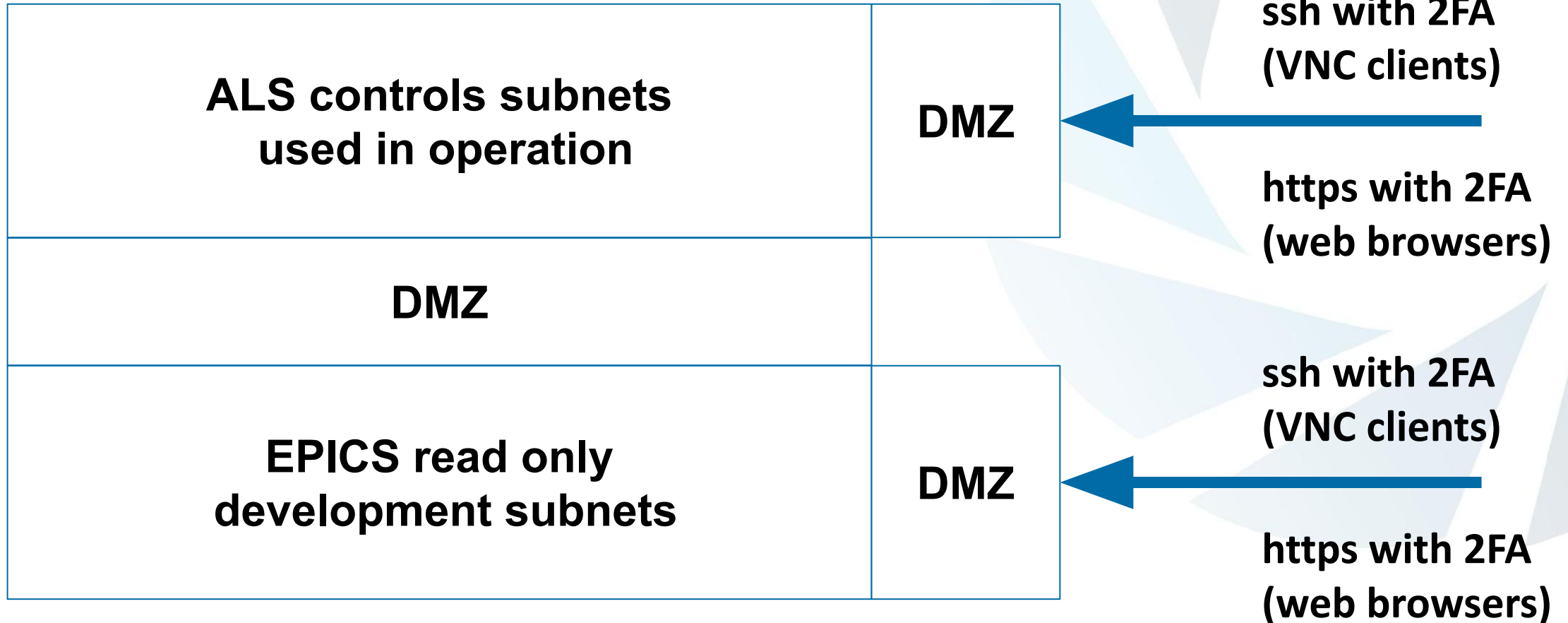


New Network Model

- The New Network Model was recently introduced in order to:
 - Increase the security when connecting to all ALS hosts
 - Decouple hosts used in operation from the ones used in development



New Network Model



Acknowledgement

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