



irfu

EPICS Java IRFU's developments

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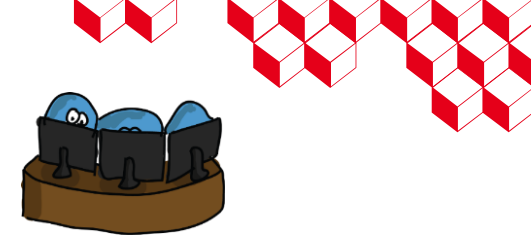


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Technical and human context

2 frameworks of control system coexist at IRFU : MUSCADE & EPICS



Small compacts experiences :

- In-house solution
- Embedded SCADA
- Only 2 developers



Mains features :

- Windows OS
- SIEMENS PLC protocol
- Optimized archiving system
- Alarms manager
- Muscade server only in Java
- GUI based on Java AWT and AutoCAD
- Secured and remote access (Java Web Start)
- Replay mode



Large accelerators :

- International projects (ESS, SARAF ...)
- Complete frameworks
- Large community of developers



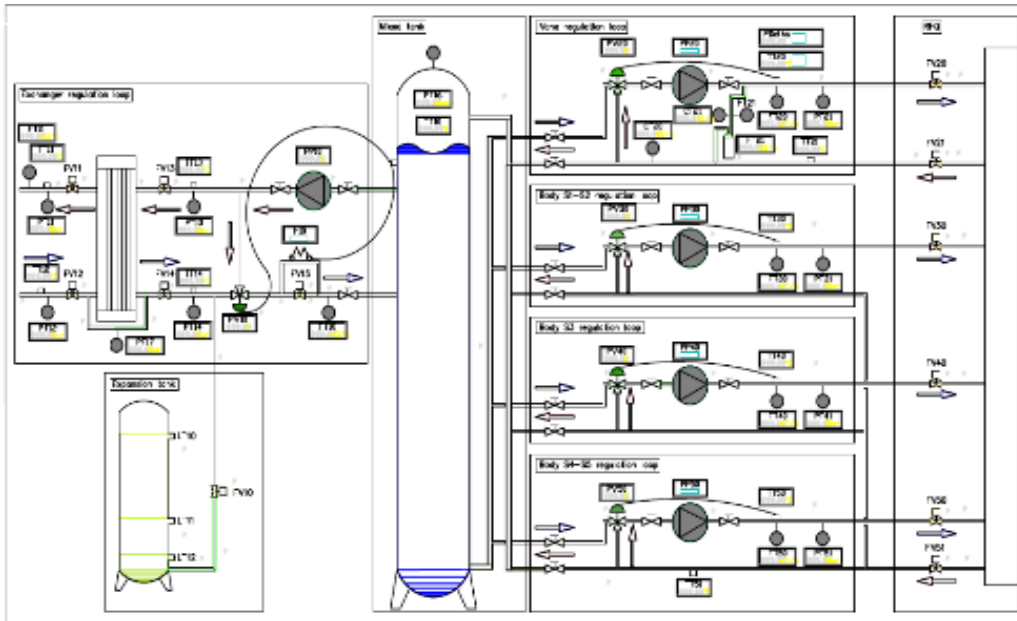
Mains features :

- Linux and Windows OS
- Several drivers and protocols including SIEMENS
- Archiving Appliance
- Alarms manager (Based on Kafka)
- EPICS server in C , C++, Python, Java, LabVIEW's.
- GUI based on Java SWT, Java FX, python, QT
- GUI development with CS-Studio (Java FX)
- Web client (DBWR)

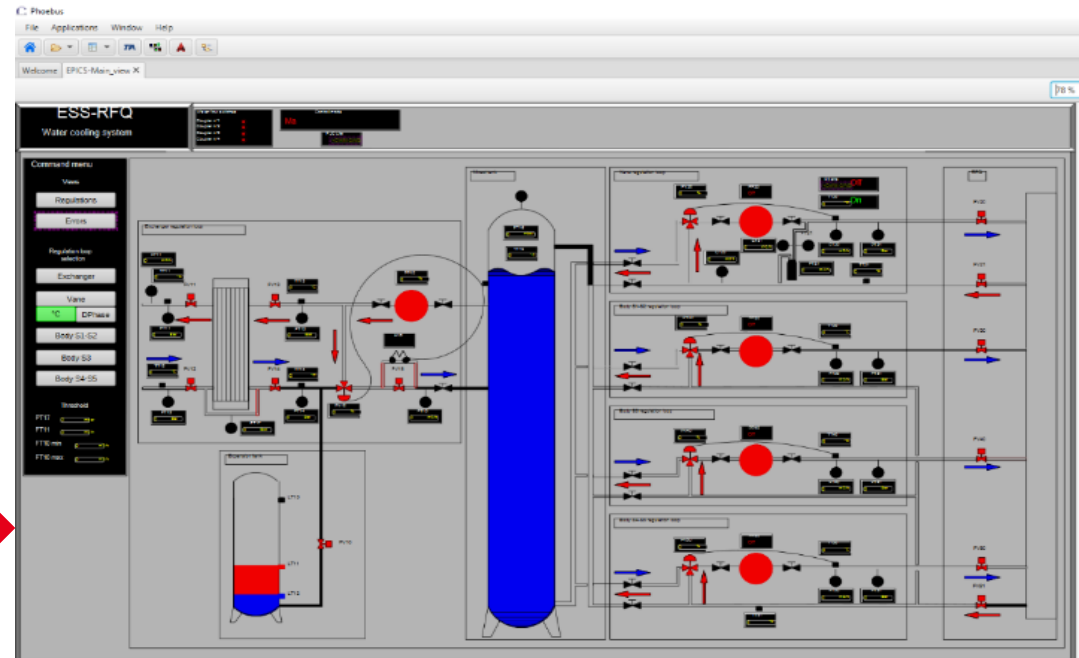


AutoCAD to CS Studio convertor

A AUTOCAD



DXF2BOB convertor



Accelerate and simplify EPICS GUI development



elastic



kafka



MQTT



TANGO

MUSCADE TO EPICS Gateway



VI/2 BAT472-1IER.IAR : BATIMENT 472.1ER.ETAGE

TREND ARRAY HISTORICS RECORD PRINT TOOLS ? ADD-ON

Previous Next Main Command... Views... Scripts... Center Mag/Alm...

2023/09/29 18:45:02.490 +0200 GMT TCP Bytes:12 Raf:0.5 s Mem:292/536 MBytes Mag/Alm: 29

ARRAY Q: TEMPERATURE

TREND ARRAY HISTORICS RECORD PRINT TOOLS ? ADD-ON

Previous Next Main Command... Views... Scripts... Center Mag/Alm...

2023/09/29 18:45:02.469 +0200 GMT TCP Bytes:12 Raf:0.5 s Mem:292/536 MBytes Mag/Alm: 29

DEV01.tt (°C)	DEV02.tt (°C)	DEV03.tt (°C)	DEV04.tt (°C)	DEV05.tt (°C)	TT01 (°C)
23.07	21.98	24.99	21.34	21.00	25.8
DEV01.rh (%)	DEV02.rh (%)	DEV03.rh (%)	DEV04.rh (%)	DEV05.rh (%)	
56	52	57	66	70	
DEV01.signal_dbm (dbm)	DEV02.signal_dbm (dbm)	DEV03.signal_dbm (dbm)	DEV04.signal_dbm (dbm)	DEV05.signal_dbm (dbm)	
-76	-76	-111	-22	-89	
DEV01.supply_mv (mV)	DEV02.supply_mv (mV)	DEV03.supply_mv (mV)	DEV04.supply_mv (mV)	DEV05.supply_mv (mV)	
8397	8300	8317	8302	8327	
DEV01.count	DEV02.count	DEV03.count	DEV04.count	DEV05.count	
4663	4656	811	810	13890	
DEV01.err_code	DEV02.err_code	DEV03.err_code	DEV04.err_code	DEV05.err_code	
0	0	0	0	0	
DEV01.LastEx	DEV02.LastEx	DEV03.LastEx	DEV04.LastEx	DEV05.LastEx	
2023/09/29 18:38:02	2023/09/29 18:40:48	2023/09/29 18:31:55	2023/09/29 17:54:58	2023/09/29 18:07:57	

EXTERIEUR

Dev05 TT: 21.00 °C

Dev05 Rh: 70 %



EPICS4MUSCADE



CS|studio



phoebus/TT472/#rdc

Irfu

Températures et hygrométries du Bâtiment 472

Rez-de-Chaussée 1er étage températures hygrométries

EPICS Archiver Appliance Viewer

30s 1m 5m 15m 30m 1h 4h 8h 1d 2d 1w 2w 1M 6M 1Y YTD Live

Temp °C	Hygr %
DEV01 23.07	56
DEV02 21.97	59
DEV03 24.99	57
DEV04 21.34	66
Exterieur Temp °C	Hydr %
DEV05 21.00	70

20

0

-20

-40

Nov 2022 Jan 2023 Mar 2023 May 2023

lastSample[14400(s)]

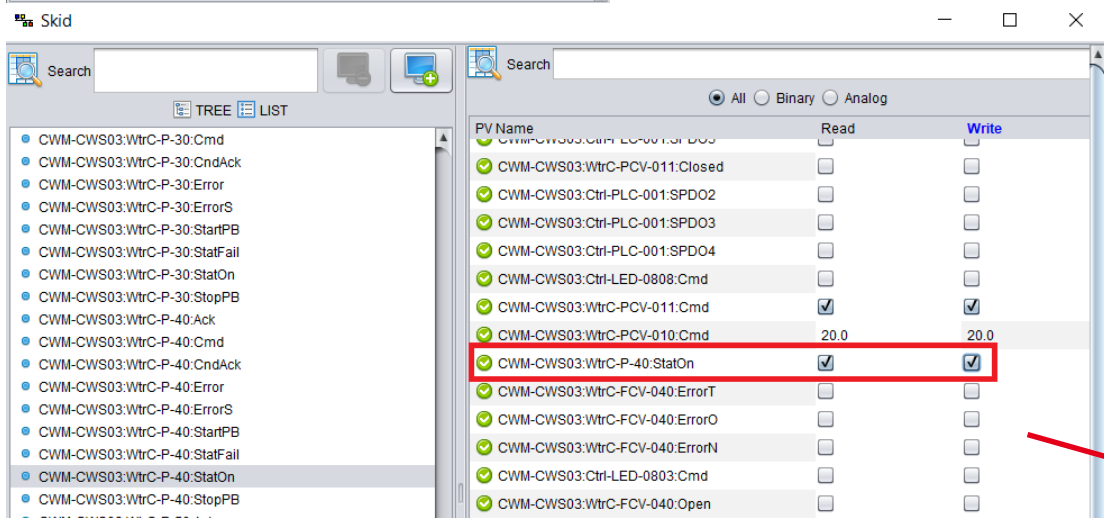
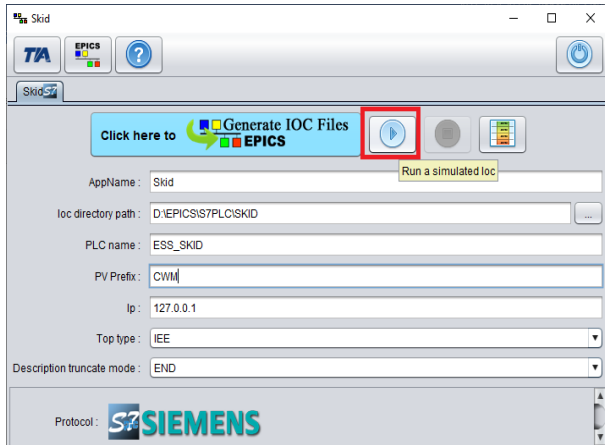
Contacts techniques (LDISC): Katy

SAINTIN Loïc CAOUËN

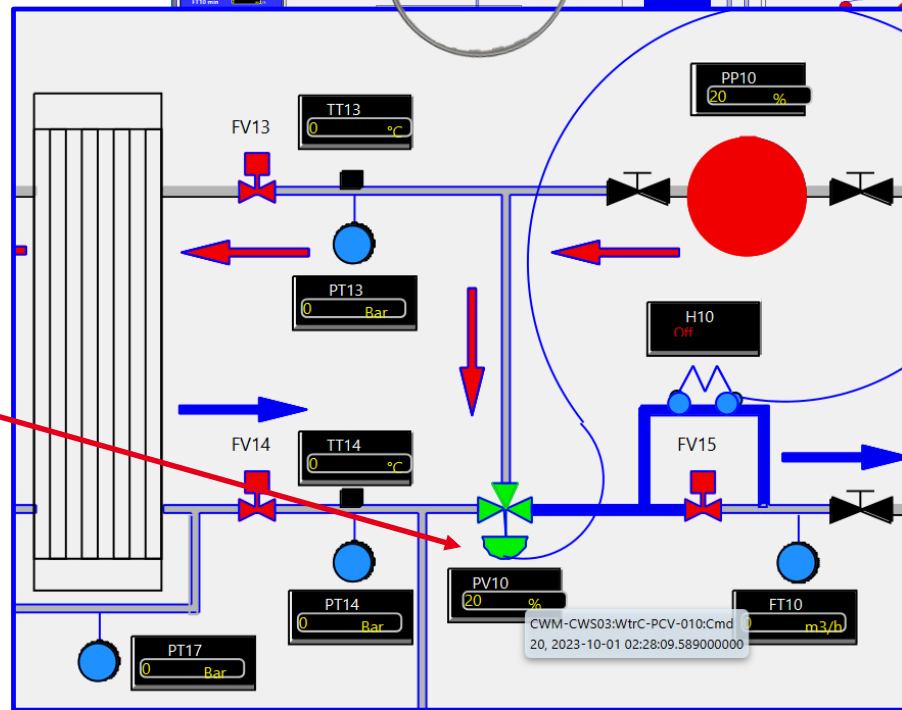
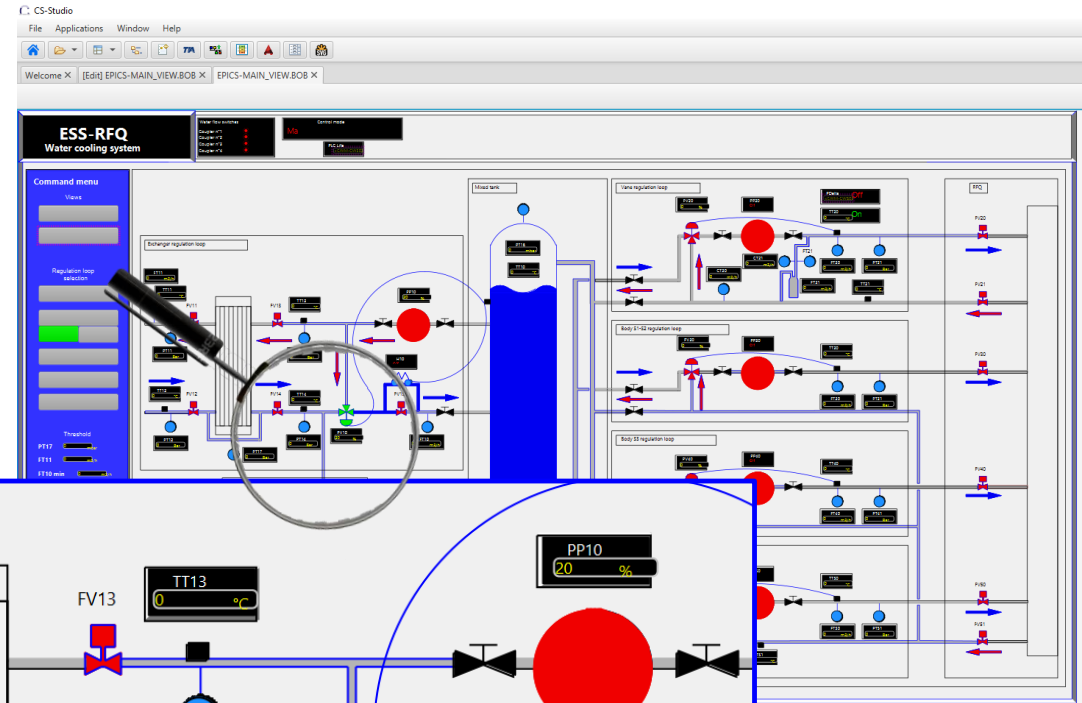
Technologies:

Progressive EPICS's migration

EPICS IOC Server simulation



GUI testing improvement and reliability



Conclusion & Prospective

Software quality :

- GitLab DevOps platforms
- Maven build and packaging
- Junit tests, Javadoc and documentation
- Continuous integration with GitLab CI
- EPICS developers' support for high level applications (CS-Studio , Appliance ...)

Limitations

- Temporary solution until full EPICS migration
- Bring MUSCADE functionalities to EPICS (optimized for small experiments)

Prospective :

- Migrate MUSCADE to EPICS
- Replay mode feature, Java EPICS server connected to Archiver Appliance



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Any questions ?

Thank you for your attention



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