SIEMENS

CERN openlab

Industrial Control & Monitoring

CERN openlab Open Day

BE-ICS

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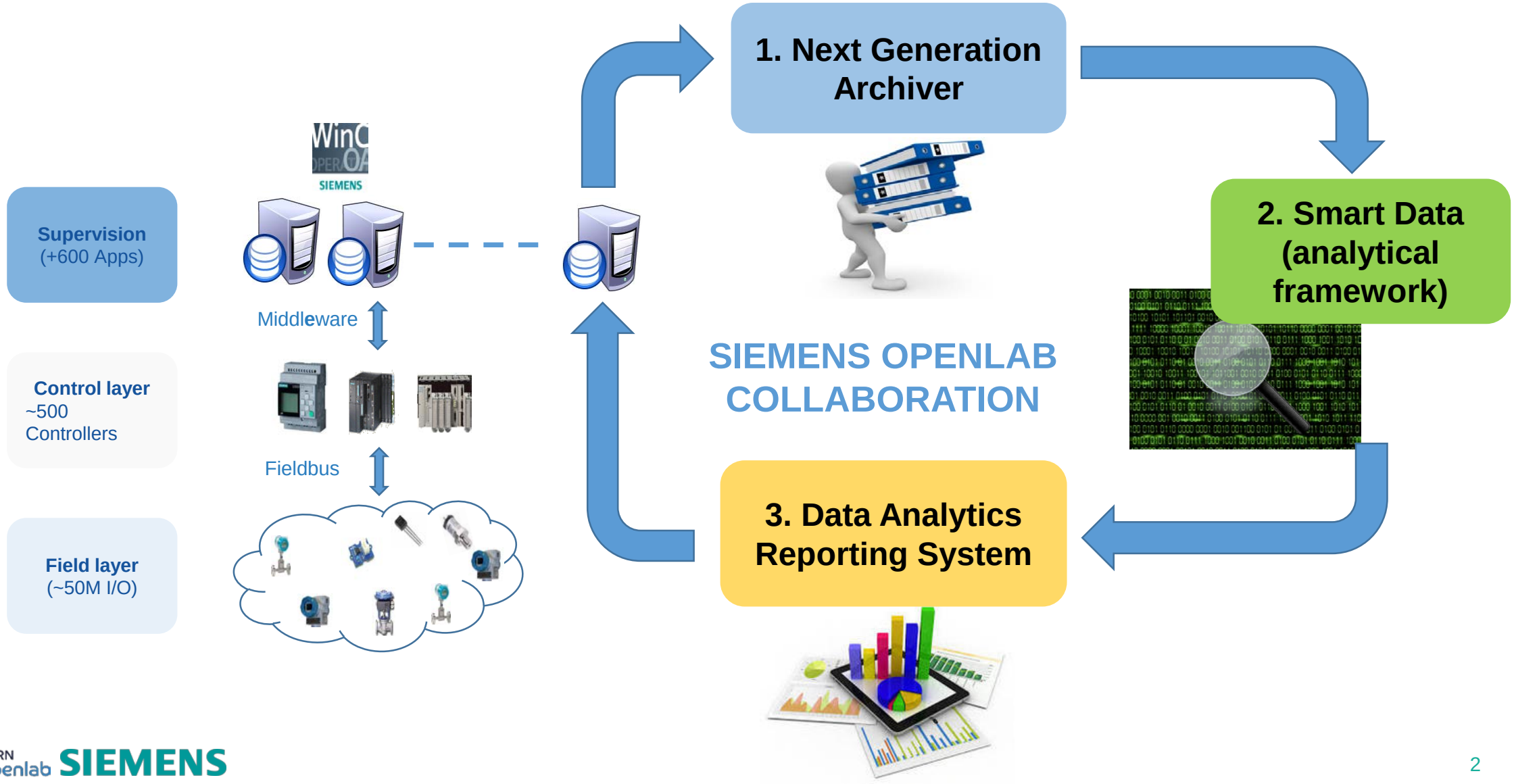
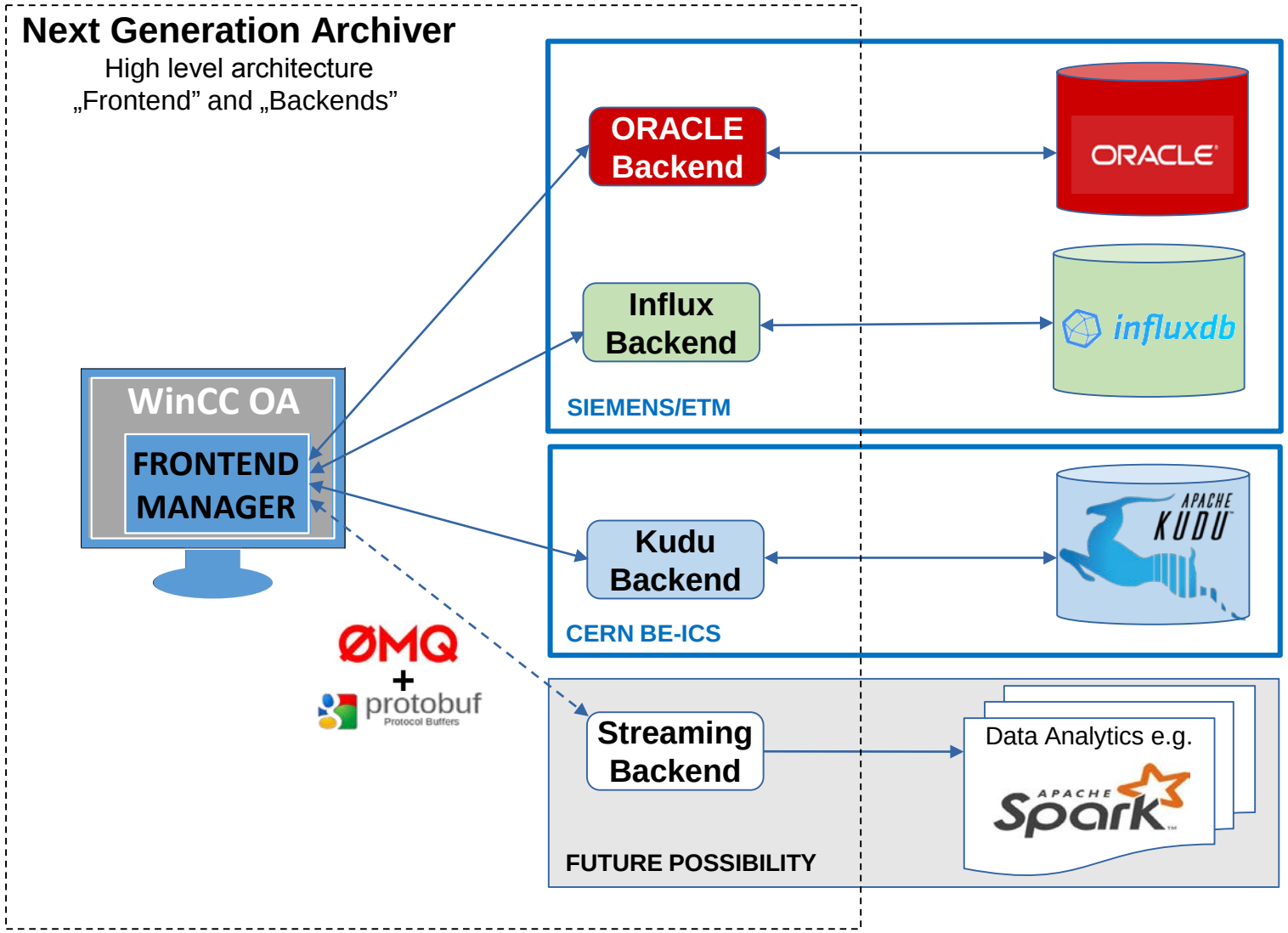
Siemens openlab projects



1. Next Generation Archiver



- Scale up to the expected data rates beyond 2020 and enable data analytics
- Successor of WinCC OA's Oracle RDB Archiver
  - high-performance, cost-effective, robustness
- Support for SQL and NOSQL databases
- Open architecture (plugin based)
- Internal prototype ready, first version for WinCC OA 3.X in mid 2018
- Joint development with Siemens/ETM:
  - One team, good communication, sprint planning, stand-ups, regular follow-up telcos!

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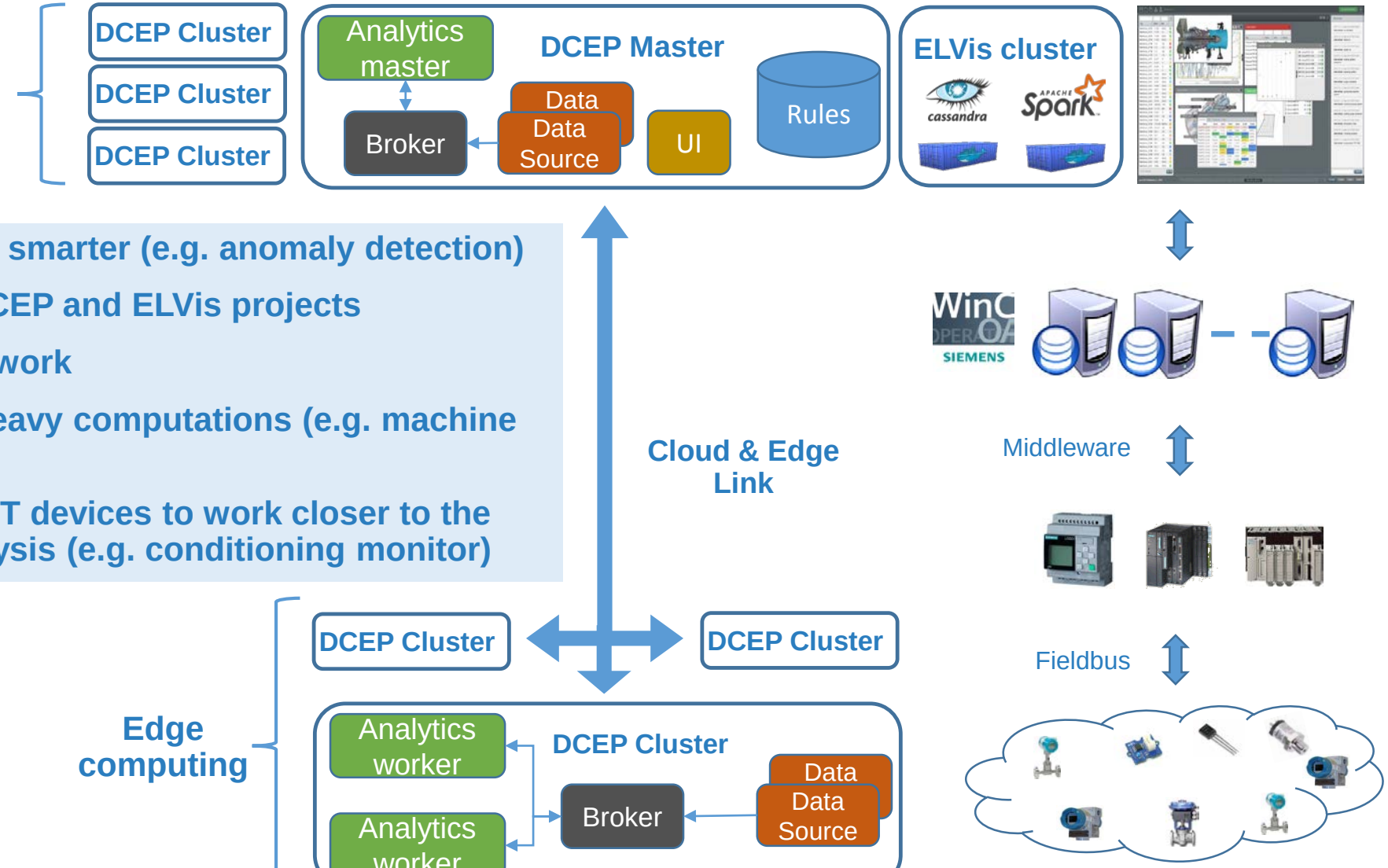
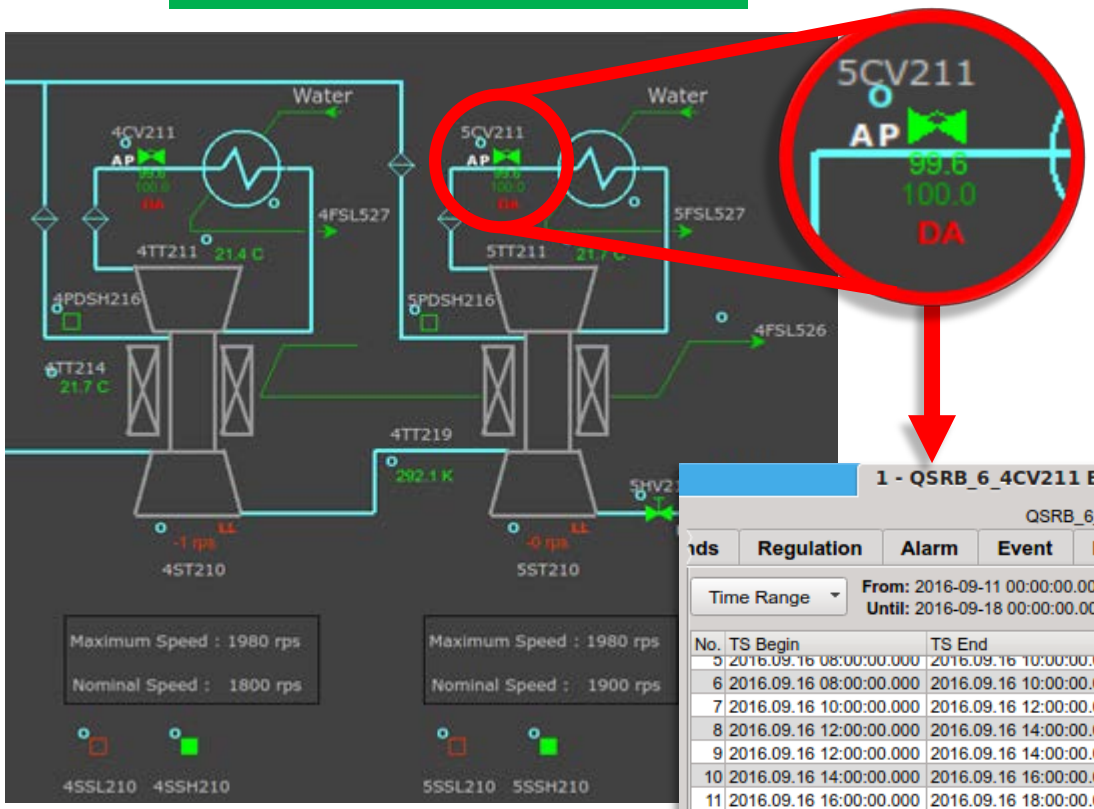
2. Smart Data for Industrial Control Systems

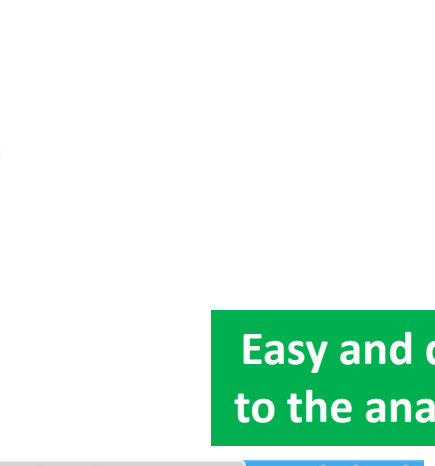
- Make controls systems smarter (e.g. anomaly detection)
- Combining Siemens DCEP and ELVis projects
- Single analytical framework
- Cloud computing for heavy computations (e.g. machine learning algorithms)
- Edge computing and IoT devices to work closer to the field layer – faster analysis (e.g. conditioning monitor)

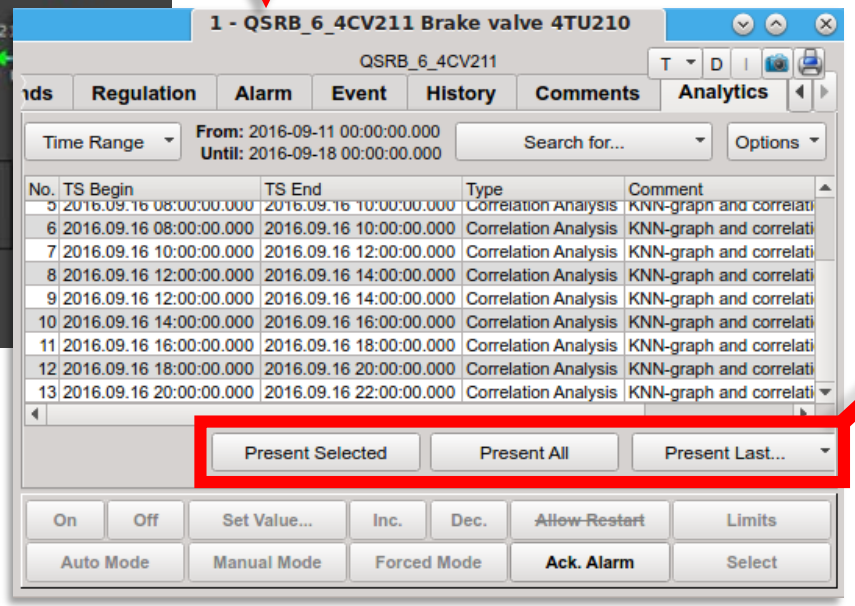


3. Data Analytics Reporting System for WinCC OA

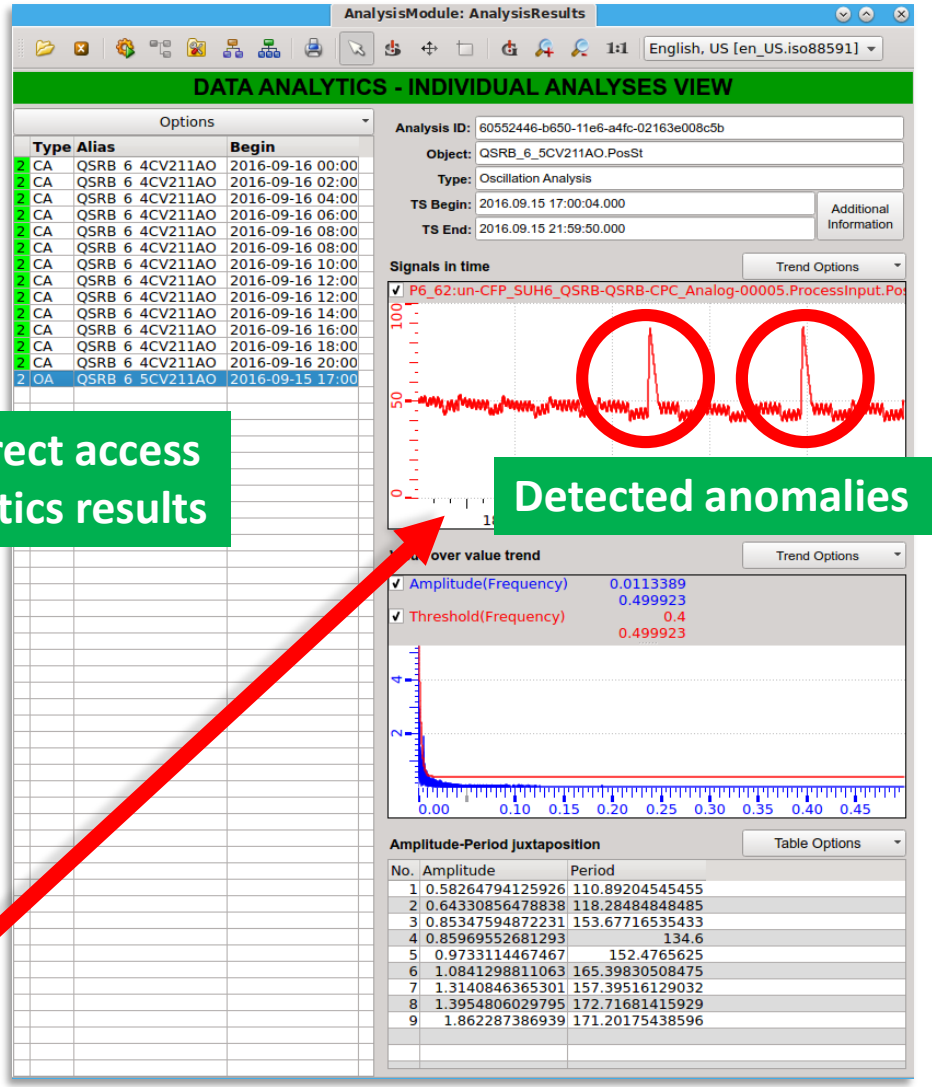
Attract operators attention







Easy and direct access to the analytics results



Detected anomalies

Summary

- 3 openlab projects developed in collaboration with Siemens to integrate their solutions including analytical frameworks in the CERN controls systems infrastructure.
- Advancing at good pace.
- A big **thanks** to **Siemens** for the fruitful collaboration and continuous support!

Summer students:

- **Lauri Sainio**: “Web reporting framework for control data analysis”.
- **Urishita Puri**: “Simplified Frontend for data generation and testing purposes”.

2017 publications in international conferences:

- *An expert knowledge based methodology for online detection of signal oscillations – CIVEMSA 2017, F. Tilaro, M. Gonzalez, B. Bradu, M. Roshchin*
- *Model Learning Algorithms for Faulty Sensors Detection in CERN Control Systems - ICALEPCS 2017, F. Tilaro, B. Bradu, M. Gonzalez-Berges, F. Varela, M. Roshchin*
- *Automatic PID Performance Monitoring Applied to LHC Cryogenics - ICALEPCS 2017, B. Bradu, E. Blanco, F. Tilaro, R. Marti*
- *Data Analytics Reporting Tool for CERN SCADA Systems - ICALEPCS 2017, P. J. Seweryn, M. Gonzalez-Berges, J. B. Schofield, F. M. Tilaro*
- *Future Archiver for CERN SCADA Systems – ICALEPCS 2017, P. Golonka, M. Gonzalez, J. Guzik, R. Kulaga*

Thank you!

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https://be-dep-ics.web.cern.ch/