



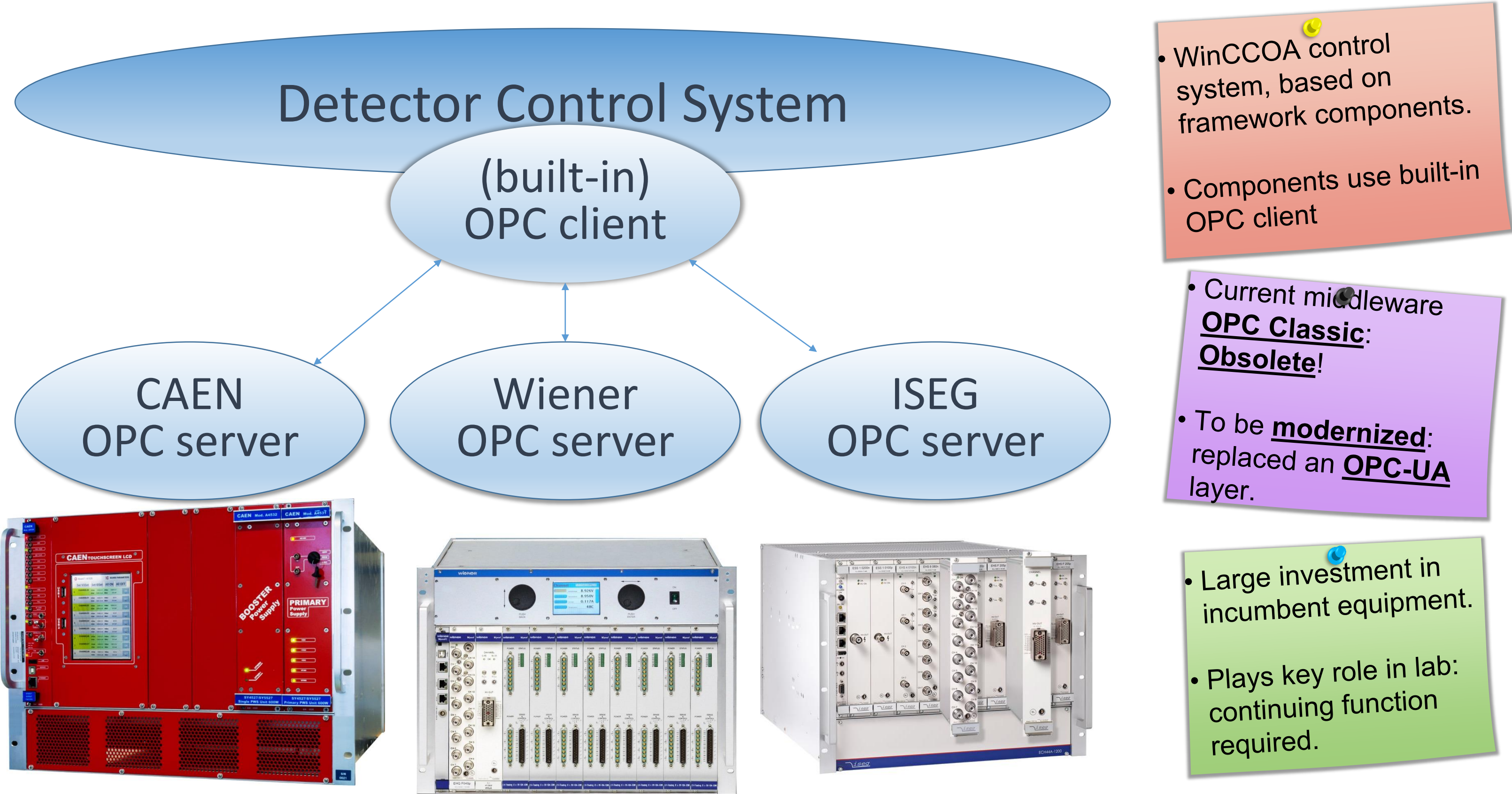
A HOMOGENOUS APPROACH TO CERN/VENDOR COLLABORATION PROJECTS FOR BUILDING OPC-UA SERVERS

Authors: Ben Farnham, Nick Ziogas, Fernando Varela Rodriguez. CERN Switzerland

Requirement: Modern software components (based on industrial standards) to integrate commercially sourced power supplies into CERN control systems...

- 3 commercial power supply vendors: CAEN, ISEG, Wiener.
- Complex devices, with per-vendor specific interfaces for low-level control.
- Many units already deployed through CERN (considerable investment in existing equipment).
- Existing units controlled via OPC 'Classic' protocol: now approaching obsolescence. This layer is to be modernized.

Paper: THPHA009

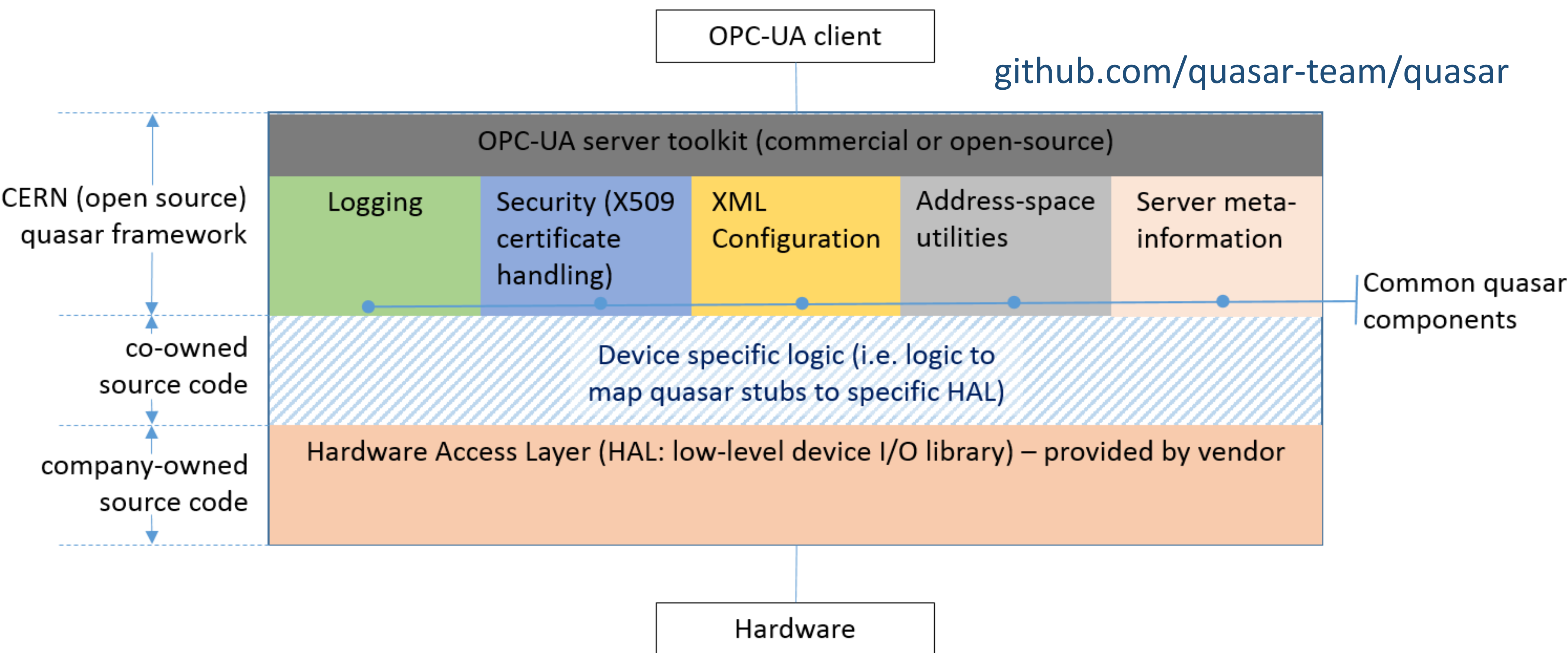


1. Key driver for the modernization project: **Homogeneity**. Goal: Integrate an inhomogeneous mix of hardware into control systems.
2. CERN: Wealth of operational experience built up from OPC-classic based operations. Vendors: Deep knowledge of how best to integrate their hardware.
3. Three **collaborative projects** put in place, one per vendor to: Leverage respective strengths, optimise development and maximize opportunities.

Key lessons learnt from OPC-classic operations

Lessons learnt during OPC-classic operations	Inconsistent end-user interfaces for installation, configuration and runtime operation cause extra support load.	Black-box control chain components cause hard-to-diagnose problems.	Different internal implementation architectures widen support surface area.	Many defects presumed to be at OPC level actually originate from internal device firmware.
Mitigating approach in OPC-UA project	CERN defines and implements these interfaces; e.g. configuration largely handled by a standard component of the quasar framework.	Source code for OPC server layer shared by collaborating parties.	OPC-UA servers to be built using the quasar framework and based on a template architecture.	Equipment experts from the companies need to be closely involved in hardware integration (and best practise encapsulated in a HAL library – see tech. outline)

Template Architecture for OPC-UA server implementations



- Based on open source quasar framework.
- Low-level hardware integration expertise encapsulated in HAL library, provided by vendors.
- Homogenous interfaces generated using quasar with per-HAL specific code encapsulated in device logic layer.
- All source code shared.

Commercial partner collaboration projects outline

- Co-signed agreements form contractual background to collaboration projects.
- Commitments from both collaborating parties outlined.
- Joint ownership agreement defines intellectual property rights for each party.
 - CERN licensing offers free access to related institutes.
 - Vendors may offer proprietary licenses to other customers.

Status and conclusion

- Homogenous server implementations and consistent project definitions reduce development and maintenance cost.
- CAEN and ISEG: collaboration projects in full flight: advanced beta servers performing well in pre-production tests.
- Further tests planned.
- Wiener collaboration agreement definition in progress.
- External institutes interested in using and contributing to the OPC-UA server implementation effort.