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OPC UA for integration of industrial components in a large scientific project

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Integration of control and data access to industrial components implies the need to handle a myriad of multiple proprietary interfacing mechanisms. OPC UA, the Industry 4.0 sponsored standard for communication, entices us with a promise of a single, well supported integration system. OPC UA is based on modern concepts, such as service-oriented architecture (SOA) and adoption of information models for the description of devices and their capabilities. Component services can be orchestrated into more abstract machines, thus increasing the flexibility and adding the possibility to configure the whole system.

The work assesses the feasibility of using OPC UA as the standard mechanism to perform integration of industrial components into ITER Plant Systems. It also investigates the benefits of the OPC UA comprehensive information model to express system components.

In this paper, performance comparisons between OPC UA and EPICS PV Access protocol are performed: configuration, monitoring and data storage, are evaluated with respect to different plant interfaces. Furthermore, several use cases are developed in order to test the performance and the integrity of the protocol checking latency, bandwidth usage, resources consumption and transactional behaviour.

Finally, both Server and Client interfaces are tested on ITER CODAC Core System environment by making use of programmable logic controllers (PLCs) and desktop workstations.

Minioral

No

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Yes

Are you a student?

Yes

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