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Interfacing MARTe2 to the EPICS Channel Access and pvAccess protocols

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MARTe2 (https://vcis.f4e.europa.eu/marte2-docs/master/html/) is a C++ modular and multi-platform framework for the development of real-time control system applications. The architecture promotes a bold separation between the interfacing hardware implementation (e.g. data acquisition cards), the environment details (e.g. site specific libraries for monitoring and data archiving) and the real-time algorithms (i.e. the user code). The previous version of the framework was deployed in many fusion real-time control systems, particularly in the JET tokamak. The new version of the framework follows a Quality Assurance strategy that enables the integration of contributions from a large and heterogeneous development community, which includes developers with an academic background and industrial suppliers.

MARTe2 is being used as the application framework for the development of key ITER plant systems, such as the ECRH and the magnetics diagnostics, and of ITER relevant test facilities. As a consequence, several components have been developed in order to allow the interfacing of the framework with many of the standard ITER data acquisition cards, with the real-time and data archiving networks and with both the EPICS Channel Access and EPICS pvAccess protocols. These data-driven components can be readily deployed in any MARTe application and allow to monitor application variables, to provide control references and to message and change the application state and configuration. These interfaces can also be used to deploy protocol adapters through proxying (e.g. between pvAccess and OPCUA).

This talk will provide an overview of the MARTe2 EPICS components design, complemented by examples and use-cases from running systems that are using such components.

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