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STAR Online Meta Data Collection Framework: Integration with the Pre-existing Controls Infrastructure

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One of the STAR experiment's modular Messaging Interface and Reliable Architecture framework (MIRA) integration goals is to provide seamless and automatic connections with the existing control systems. After an initial proof of concept and operation of the MIRA system as a parallel data collection system for online use and real-time monitoring, the STAR Software and Computing group is now working on the integration of Experimental Physics and Industrial Control System (EPICS) with MIRA's interfaces. This integration goals are to allow functional interoperability and, later on, to replace the existing/legacy Detector Control System components at the service level.

In this report, we describe the evolutionary integration process on the example of EPICS Alarm Handler conversion. We review the complete upgrade procedure starting with the integration of EPICS-originated alarm signals propagation into MIRA, followed by the replacement of the existing operator interface based on Motif Editor and Display Manager (MEDM) with modern portable web-based Alarm Handler interface. To achieve this aim, we have built an EPICS-to-MQTT bridging service, and recreated the functionality of the original Alarm Handler using low-latency web messaging technologies. The integration of EPICS alarm handling into our messaging framework allowed STAR to improve the DCS alarm awareness of existing STAR DAQ and RTS services, which use MIRA as a primary source of experiment control information.

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Authors: ARKHIPKIN, Dmitry (Brookhaven National Laboratory);   Dr LAURET, Jerome (Brookhaven National Laboratory)

Presenter: ARKHIPKIN, Dmitry (Brookhaven National Laboratory)

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