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STAR Online Framework: from Metadata Collection to Event Analysis and System Control

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In preparation for the new era of RHIC running (RHIC-II upgrades and possibly, the eRHIC era), the STAR experiment is expanding its modular Message Interface and Reliable Architecture framework (MIRA). MIRA allowed STAR to integrate meta-data collection, monitoring, and online QA components in a very agile and efficient manner using a messaging infrastructure approach. In this paper, we will briefly summarize our past achievements, provide an overview of the recent development activities focused on messaging patterns and describe our experience with the complex event processor (CEP) recently integrated into the MIRA framework. CEP was used in the recent RHIC Run 14 which provided practical use cases. Finally, we will present our requirements and expectations for the planned expansion of our systems, which will allow our framework to acquire features typically associated with Detector Control Systems. Special attention will be given to aspects related to latency, scalability and interoperability within heterogeneous set of services, various data and metadata acquisition components coexisting in STAR online domain.

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