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An SOA based Design of JUNO DAQ Online Software

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The Online Software, manager of the JUNO data acquisition (DAQ) system, is composed of many distributed components working coordinately. It takes the responsibility of configuring, processes management, controlling and information sharing etc. The design of service-oriented architecture (SOA) which represents the modern tendency in the distributed system makes the online software lightweight, loosely coupled, reusable, modular, self-contained and easy to be extended. All the services in the SOA distributed online software system will send messages each to another directly without a traditional broker in the middle, which means that services could operate harmoniously and independently.

ZerMQ is chosen but not the only technical choice as the low-level communication middle-ware because of its high performance and convenient communication model while using Google Protobuf as a marshaling library to unify the pattern of message contents. Considering the general requirement of JUNO, the concept of partition and segment are defined to ensure multiple small-scaled DAQs could run simultaneous and easy to join or leave. All running data except the raw physics events will be transmitted, processed and recorded to the database. High availability (HA) is also taken into account to solve the inevitable single point of failure (SPOF) in the distribution system. This paper will introduce all the core services' functionality and techniques in detail.

Index Terms—online software, service-oriented, broker less, HA

Minioral

Yes

Description

system

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