Addressing scalability with message queues: architecture and use cases for DIRAC interware

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The Message Queue architecture is an asynchronous communication scheme that provides an attractive solution for certain scenarios in the distributed computing model. The introduction of the intermediate component (queue) in-between the interacting processes, allows to decouple the end-points making the system more flexible and providing high scalability and redundancy. The message queue brokers such as RabbitMQ, ActiveMQ or Kafka are proven technologies widely used nowadays.

DIRAC is a general-purpose Interware software for distributed computing systems, which offers a common interface to a number of heterogeneous providers and guarantees transparent and reliable usage of the resources. The DIRAC platform has been adapted by several scientific projects, including High Energy Physics communities like LHCb, the Linear Collider and Belle2.

A Message Queue generic interface has been incorporated into the DIRAC framework to help solving the scalability challenges that must be addressed during LHC Run3 starting in 2021. It allows to use the MQ scheme for the message exchange among the DIRAC components, or to communicate with third-party services. Within this contribution we will describe the integration of MQ systems with DIRAC, and several use cases will be shown. The focus will be put on the incorporation of MQ into the pilot logging system. Message Queues are also foreseen to be used as a backbone of the DIRAC component logging system, and monitoring.

The results of the first performance tests will be presented.

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