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ERSAP: Towards better HEP/NP data-stream analytics with flow-based programming

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This paper presents an reactive, actor-model and FBP paradigm based framework that we develop to design data-stream processing applications for HEP and NP. This framework encourages a functional decomposition of the overall data processing application into small mono-functional artifacts. Artifacts that are easy to understand, develop, deploy and debug. The fact that these artifacts (actors) are programmatically independent they can be scaled and optimized independently, which is impossible to do for components of the monolithic application. One of the important advantages of this approach is fault tolerance where independent actors can come and go on the data-stream without forcing the entire application to crash. Furthermore, it also makes it is easy to locate the faulty actor in the data pipeline. Due the fact that the actors are loosely coupled, and that the data (inevitably) carries the context, they can run on heterogeneous environments, utilizing different accelerators. This paper describes the main design concepts of the framework and presents a “proof of concept” application design and deployment results obtain processing on-beam calorimeter streaming data.

Minioral

Yes

IEEE Member

No

Are you a student?

No

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