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An approach to architectural design for exascale systems

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This talk will explore the parameters upon which architectural decisions for exascale systems will be based. It is over a decade since the first Petascale systems were introduced using accelerators. Since that time there have been many significant changes in the technology landscape with the widespread adoption of GPUs and other forms of accelerators now meaning that almost all high end supercomputers are using these technologies. While the raw performance advantages of these technologies are obvious, there are clear implications for programmability and energy efficiency. With other technologies, such as quantum accelerators and neuromorphic processing on the immediate horizon, and the ever increasing use of machine learning as part of the scientific process, the options available to scientists and engineers is becoming even more diverse. The talk will cover the next generation of technologies and an approach to architectural design which aims to simplify this complexity and lead to a new generation of energy efficient supercomputers with the flexibility to address the next wave of scientific challenges.

Primary author: Mr PANZIERA, Jean-Pierre (Atos)

Presenter: Mr PANZIERA, Jean-Pierre (Atos)

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