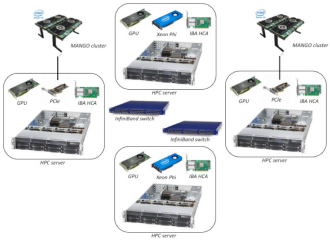
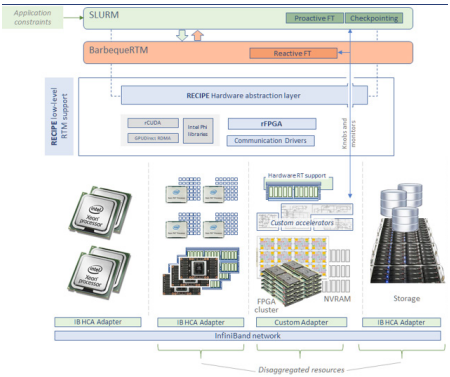
RECIPE

RECIPE (REliable power and time-ConstraInts-aware Predictive management of heterogeneous Exascale systems) provides the tools needed to make the heterogeneous resources in future High Performance Computing (HPC) systems more robust and reliable.

Goals

- 25% increase in energy efficiency
- 15% increase in mean to time failure
- Up to 25% improvement in energy-delay product
- Occurrence of fault executions reduced by 20% with recovery times compatible with real-time performance
- Full exploitation of available resources under non-saturated conditions



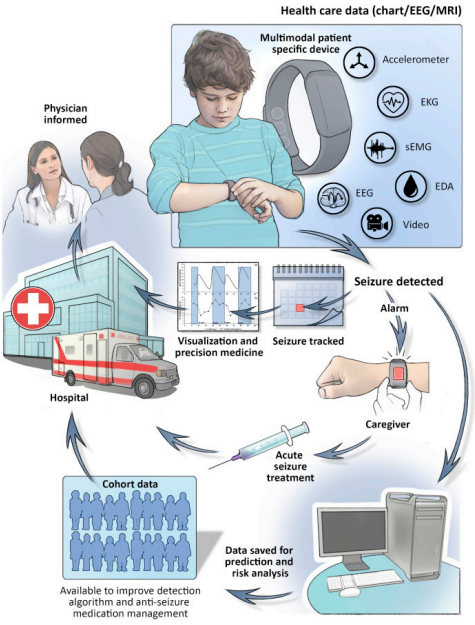


Methodology

RECIPE provides a hierarchical runtime resource management infrastructure to optimise energy efficiency and minimise the occurrence of thermal hotspots. This preserves the time constraints imposed by the applications, and ensures reliability for both time-critical and throughput-oriented computation.

Epilepsy and MHealth

Epileptic seizures induce a number of autonomic system changes that can be monitored via wearable electronics. However, the huge variation in seizures from one patient to another makes their detection very challenging and militates for individually setting algorithm.



Ulate-Campos et al., Seizure, 2016

Once stabilized, patients' wearable devices should access their own specific algorithm in due time to offer real-time seizure detection. To do so, **biomedical traces** obtained via a monitoring system are labelled as potential seizures, and **are sent to computing infrastructures with enough computational power** to execute the required machine-learning and deep learning algorithms needed **to detect whether the biomedical traces seem to correspond to an upcoming epileptic seizure.**

The main goal in this project is to develop the required software infrastructure to enable the deployment of the seizure detection algorithms in a prototype platform able to manage a large-scale population while meeting the real-time requirements of the application.

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RECIPE website:
http://www.recipe-project.eu