VINEYARD aims to:

- Build an integrated platform for energy-efficient data centres based on novel programmable hardware accelerators: coarse-grain (Dataflow engines) and fine-grain (FPGA-based servers).
- Develop a high-level programming framework and big data infrastructure for allowing end-users to seamlessly utilize these accelerators in heterogeneous computing systems by employing typical data-centre programming frameworks (Storm, Spark, etc.). The main goal is to increase significantly the performance and the energy efficiency of the data centers.

1. The VINEYARD vision

Low performance
High power consumption
Best effort
TODAY’s DCs

Higher performance
Lower power consumption
Predictable performance
Future Heterogeneous DCs with VINEYARD infrastructure

2. Integrated framework for efficient utilization of accelerators

VINEYARD: Versatile Integrated Accelerator-based Heterogeneous Data Centers

Requirements:
- Speed
- Power
- Resources

VINEYARD Servers with dataflow-based accelerators (DFE)

3. The Consortium covers the whole value-chain of a data-centre ecosystem

4. Demonstration in three commercial applications

The VINEYARD project will be demonstrated on three real-word applications:

- **Computational neuroscience:** high-accuracy simulation of the Olivocerebellar system of the brain, crucial to the understanding of brain functionality

- **Financial applications:**
  - Trading system operations
  - Pre-trade risk management

- **Data analytics:**
  - TPC-C (on-line transaction processing (OLTP) benchmark)
  - TPC-H (decision support benchmark)
  - IoT application (Linear Road will also be used as a representative workload in IoT applications)

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