

NAAICE

Network-Attached Accelerators in Heterogeneous Computing Environments

Fraunhofer Institute for Telecommunications HHI, GFZ Helmholtz Centre for Geosciences, PERFACCT Performance Acceleration Technologies GmbH, University of Potsdam, Zuse Institute Berlin

1 NAAICE Project Objectives and Goals

Introduce FPGA-based accelerators as stand-alone network-attached accelerators (NAA) into HPC datacenters:

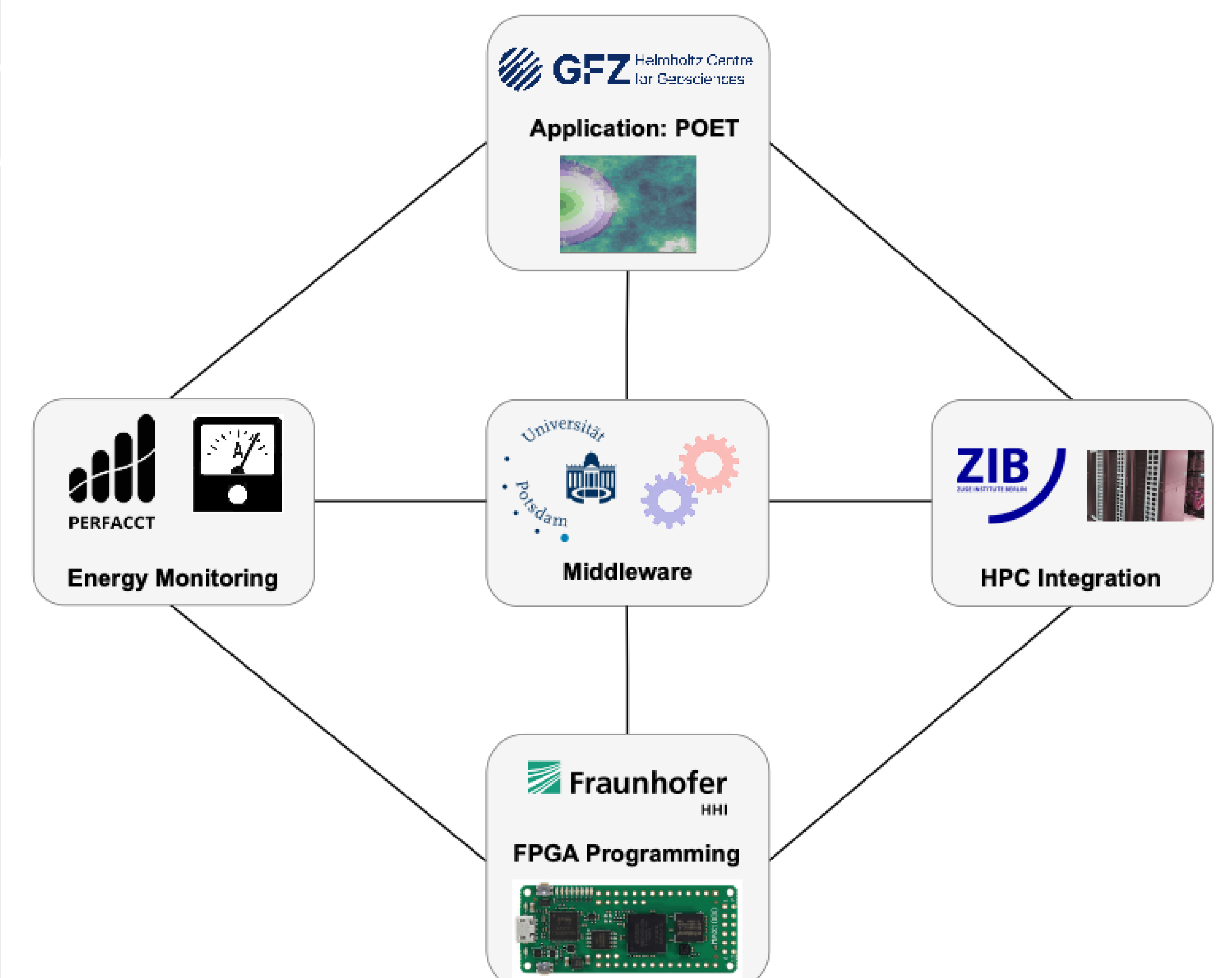
- Scalable, flexible **HW-only**, power efficient accelerator architecture based on State of the Art FPGAs
- Efficient communication via **RoCEv2 / 100Gb Ethernet only** without carrier system
- **HLS-based offloading** of POET (reactive transport simulator) component
- Implementation of a full **RPC Software Stack**

Integrate different accelerator architectures and monitor energy consumption with novel framework:

"On the Usability and Energy Efficiency of High-Level Synthesis for FPGA-based Network-Attached Accelerators"
(2025 doi: 10.1109/IPDPSW66978.2025.00139)

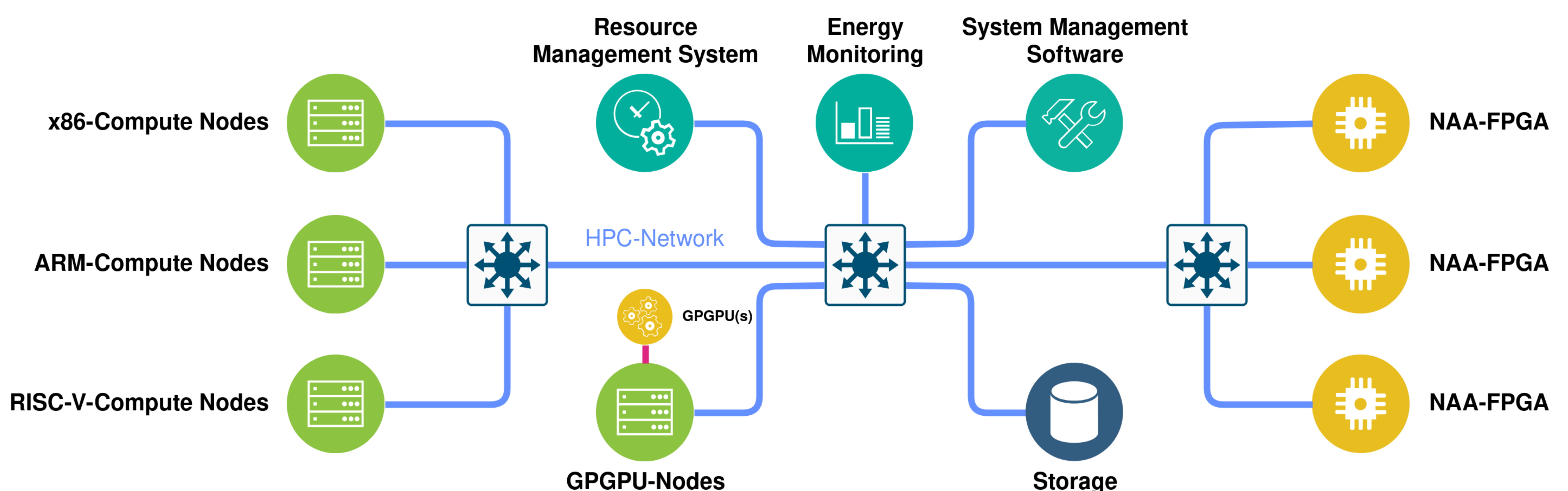


2 Partner Roles



3 Overall Architecture

HPC-Datcenter



4 Contact

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5 Project Duration and Funding

- 09/2022 – 12/2025
- Funded by the Federal Ministry of Research, Technology and Space. Grant no.: 16ME0622K