Higher

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Coordination by

FORTH
INSTITUTE OF COMPUTER SCIENCE

European Heterogeneous Cloud / Edge Infrastructures
for Next Generation Hybrid Services

HIGHER aims to prototype and demonstrate the first all-European data center-ready processor and management modules and integrate them into cloud and edge infrastructures using European technologies and Open Compute Project (OCP) standards. HIGHER will adhere to the OCP Data Center Stack (DC-Stack) family of standards, aiming to provide data center-ready integrated systems for edge, private cloud, and large-scale data centers.

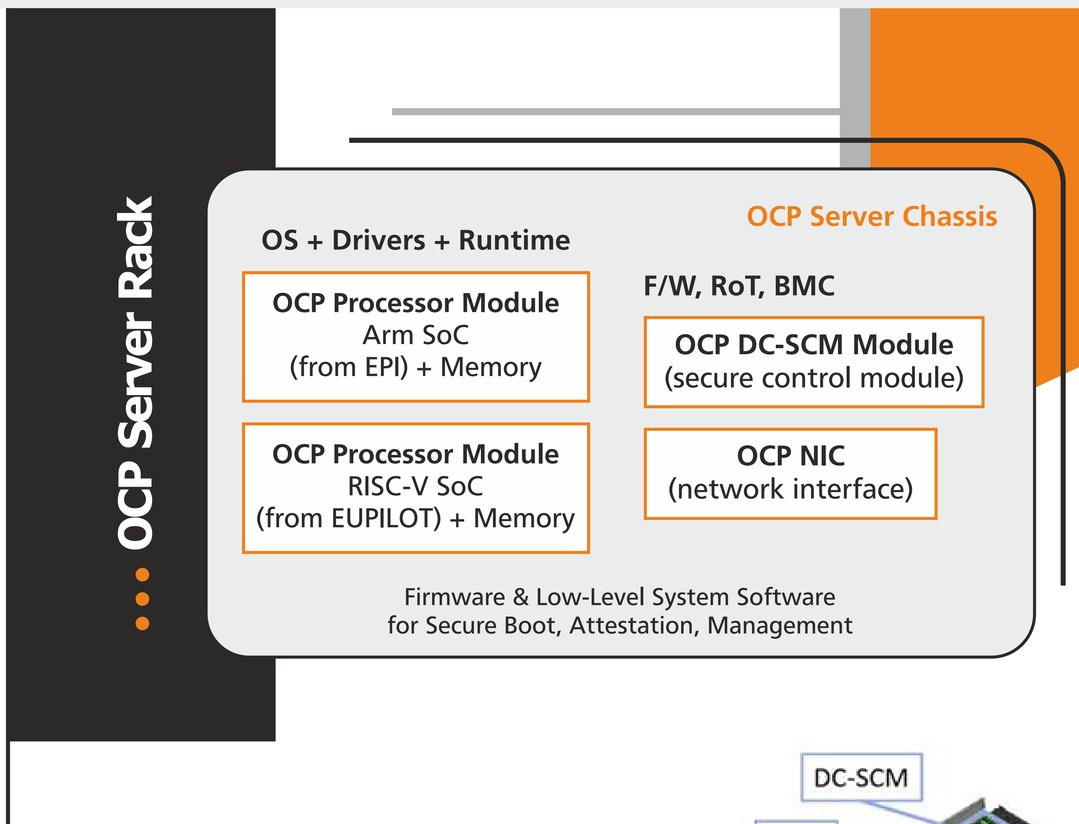
Following the OCP Data Center – Modular Hardware System (DC-MHS) specifications for modules compatible across servers, chassis and vendors, HIGHER will develop the following hardware modules:

1. **Processor Modules**: Two OCP-compliant processor modules, which will be based on the OCP Host Processor Module (HPM) or the OCP Universal Baseboard (UBB) standard, one hosting an Arm chip (SiPEARL's Rhea2, derived from the EPI project) and the other hosting a RISC-V chip (VEC, from the EUPILOT project).

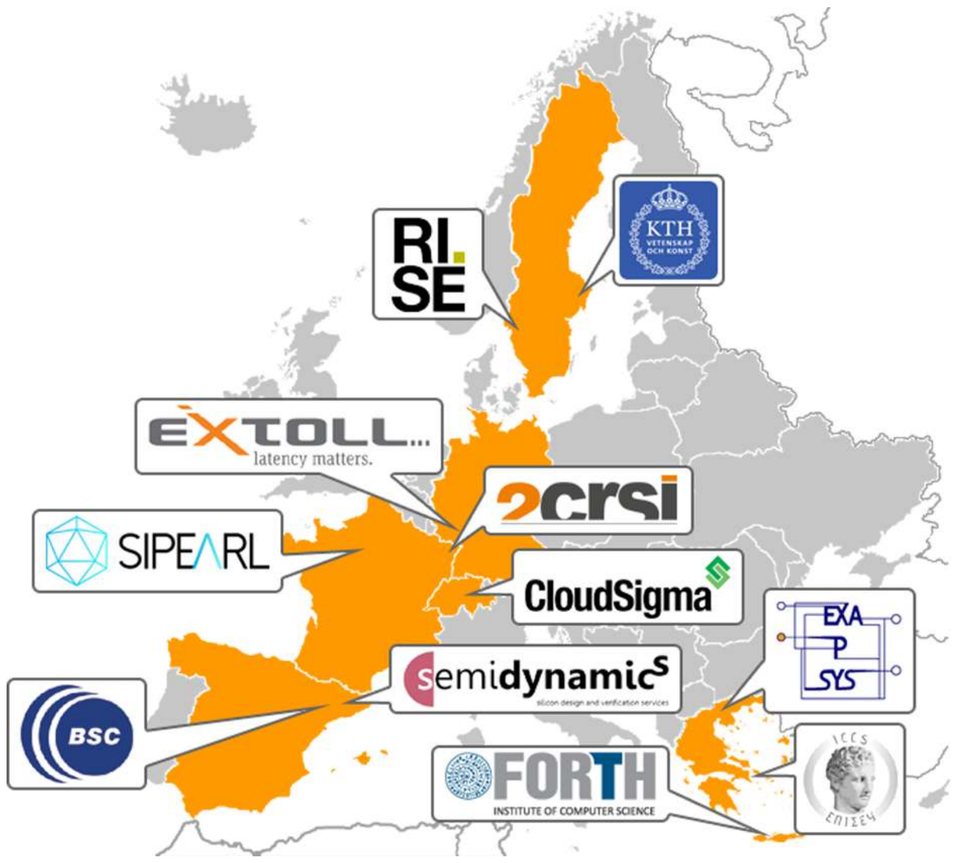
2. **Management Module**: A Data Center-ready Secure Control Module (DC-SCM), hosting a RISC-V processor inside an FPGA-based board for server management, security, and control functionality.

Use cases of HIGHER platforms capabilities:

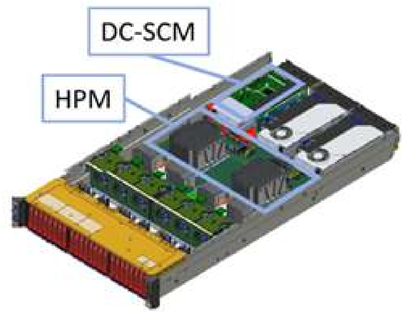
a. Accelerated data processing and analysis;
b. Infrastructure as a Service;
c. Platform as a Service;
d. Remote CXL-based disaggregated memory.



Integrated all-European Hardware & Open-Source Software for Cloud Services and Applications



HIGHER intends to:



- Provide Linux OS and driver support for the OCP compute modules, while creating appropriate software sets for them.

- Provide firmware and system software support for the management module. The management module will be built and expand OpenTitan, an open-source Root-of-Trust project, incorporating a RISC-V core together with hardware and software elements for secure measurements, signature checks, and key management. This is crucial functionality for supporting secure boot and remote attestation procedures for the HIGHER processor modules.

- Incorporate a Meta-OS, i.e. middleware to the software stack for facilitating efficient data processing, storage, and networking across a distributed computing continuum comprising IoT, Edge, and Cloud platforms.

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