

## RISER: RISC-V for Cloud Services

### Description

Building on the EPI and EUPilot project outcomes, RISER will develop the first all-European RISC-V cloud server infrastructure, significantly enhancing Europe's genuine strategic autonomy. RISER will leverage and validate open hardware high-speed interfaces combined with a fully-featured operating system environment and runtime system, enabling the integration of low-power components, including the RISC-V processor chips from EPI and EUPilot and LPDDR4 memories, in a novel energy-efficient cloud architecture.

RISER brings together a set of 7 partners from industry and academia to jointly develop and validate open-source designs for standardized form-factor system platforms suitable for supporting cloud services. Specifically, RISER will build two cloud infrastructures: (1) An accelerator platform, which includes the ARM-based RHEA processor from EPI and a PCIe acceleration board developed within the project, which will integrate up to four RISC-V based EPI and EUPilot chips. (2) A microserver platform, which interconnects up to ten microserver boards, all developed by the project, each supporting up to four RISC-V chips coupled with high-speed storage and networking. Embracing hyper-convergence, the microserver architecture will allow for distributed storage and memory to be used by any processor in the system with very low overhead.

The open-source system board designs of RISER will also be accompanied by low-level open-source firmware and systems software and a representative Linux-based software stack to support cloud services. To evaluate and demonstrate the capabilities of the RISER platforms, we will develop three use cases: (a) Acceleration of compute workloads, (b) Networked object and key-value storage, and (c) Containerized execution as part of a provider-managed IaaS environment. RISER will offer open access to the microserver platform, facilitating uptake and enhancing the commercialization path of project results.

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