Call for Papers

AHPC³: The 1st Workshop on Accelerated HPC in the Cloud-Edge Continuum

Affiliated with the 33rd Euromicro International Conference on Parallel, Distributed and Network-Based Processing (PDP 2025)

Website: http://ahpc3.di.unipi.it/

Important Dates **(extended)**

Date	Milestone
~~October 30, 2024~~, November 11, 2024	Submission of *paper abstracts*
~~November 11, 2024~~, November 20, 2024	Submission of *short/regular papers*
December 16, 2024	*Notification* to authors
January 27, 2025	Submission of *camera-ready*

Today, we are witnessing an increasing demand for **high-performance computing** infrastructures. Modern applications imply the need to process computationally intensive workloads. Unlike in the past, when just a handful of application domains used HPC infrastructures, nowadays, they are requested by a plethora of domains and applications. This is mainly due to the high availability of a large amount of data. Traditionally, HPC infrastructures were sharply distinct from cloud infrastructures by their unique software and hardware requirements and their on-premises nature.

However, in recent times, such distinctions have become increasingly blurry, driven by the proliferation of applications such as **Big Data and AI/ML**. Modern cloud infrastructures are getting closer to HPC systems in terms of performance capabilities and hardware specifications.

This workshop aims to explore the intersection of high-performance computing and modern cloud edge continuum architectures. The focus will be on achieving HPC by relying on **Cloud-Edge architectures**. The workshop will investigate how technologies that are typically exploited in the context of cloud and edge environments, including serverless computing, microservices, and load balancers, must be adapted, tailored, and managed to achieve efficient and scalable solutions that can support the execution of HPC applications.

The key topics include lightweight virtualisation, dynamic execution environments, and advanced scheduling technologies crucial to deploying high-performance workflows in cloud environments, but not limited to them. In addition, the workshop will focus on orchestration and deployment techniques.

The workshop aims to attract submissions on innovative programming paradigms for high-performance cloud edge computing, including network communication, data management and fault tolerance, reliability, and security strategies. It seeks insights on managing data-intensive workloads, heterogeneous resource management tools, and HPC application monitoring in cloud-edge environments. Emphasis will be placed on sustainability, highlighting efficient and green practices.

In addition, contributions to the potential for FPGA/GPU acceleration architectures for data flow processing and joint resource-sharing mechanisms in hybrid HPC environments are welcome. Similarly, we aim to explore the latest innovations, challenges, and applications in cloud/edge continuity and hybrid cloud HPC, focusing on accelerated environments such as FPGA and GPU architectures.

Improvement and innovation opportunities like these call for new solutions and theoretical frameworks. The **1st International Workshop on Accelerated HPC in the Cloud Edge Continuum (AHPC[3])** aims to bring together cloud, edge computing, and HPC experts from academia and industry to identify new challenges, discuss novel systems, methods, and approaches for Hybrid and accelerated HPC cloud-edge infrastructures and architectures, and promote this vision toward academia and industry stakeholders.

Topics of interest

Topics of interest for the workshop include but are not limited to the following ones:

- Adaptation of cloud-edge technologies and methodologies for HPC (e.g., serverless, microservices, task offloading)

- Cloud-edge computing architectures for HPC (e.g., resource federation)
- Lightweight virtualisation tools, execution environments and scheduling techniques
- Orchestration, deployment techniques and algorithms for High-performance workflows in Cloud-Edge environments
- Programming paradigms for High-Performance Cloud-Edge computing
- Communication and Data management for Cloud-Edge computing
- Fault tolerance, reliability and security in the Cloud-Edge continuum
- Data-intensive workloads and tools
- Methodologies and tools for heterogeneous resource management
- Tools and techniques for monitoring HPC Cloud-Edge applications
- Sustainability for HPC Cloud-Edge computing
- Accelerated FPGA/GPU architectures for cloud-edge computing
- Data stream processing with FPGA/GPU in cloud-edge computing
- Federated resource-sharing mechanisms for hybrid HPC

Submissions and attendance

Accepted papers will be published in the conference Proceedings. Submitted papers must be original work that has not appeared in and is not under consideration for another conference or a journal. Every submitted paper will be reviewed by at least three members of the Program Committee. Reviewing will be single-blind. Authors are invited to submit papers of the following types and lengths in the [IEEE Conference proceedings format](#) style:

- **Regular papers** (maximum 8 pages) should present innovative works whose claims are supported by solid justifications.
- **Short papers** (maximum 4 pages) should target position papers that articulate a high-level vision or describe challenging future directions.

Please note that registering on the submission site with a title and meaningful abstract by the earliest deadline is required to enable the actual paper submission.

The authors must be prepared to sign a copyright transfer statement. At least one author of each accepted paper must register for the workshop by the early date, to be indicated by the organisers, and ***must*** present the paper.

SUBMISSION LINK: http://ahpc3.di.unipi.it/submissions.html

Special Issue

The conference chairs will invite authors of outstanding research papers to submit an extended version of their work to a special issue held by the **International Journal of Networked and Distributed Computing**, published by Springer. More information about the special issue will be available as soon as possible after the event.

Organisers

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