KER 3 | BSC

COMPSs (COMP Superscalar)

TYPE

[SERV] [METH]

TECHNICAL READINESS LEVEL

TRL5

INTELLECTUAL PROPERTY RIGHTS

N/A

EXPLOITATION ROUTE

OPEN SOURCE

COMPSs (COMP Superscalar) is an open-source task-based parallel programming model developed at the Barcelona Supercomputing Center. Originally designed for HPC environments, COMPSs has evolved to manage distributed and parallel workloads seamlessly, now including container-based and multi-cluster support. It orchestrates tasks across heterogeneous resources, ensuring that complex workflow dependencies are handled automatically. COMPSs thus relieves researchers and developers from low-level details of distributing code, data, or tasks and lets them focus on high-level logic and performance goals.

KEY BENEFITS FOR COMPUTE CONTINUUM PROJECTS

COMPSs provides a flexible environment for automating parallel task execution and resource selection in multi-environment infrastructures. It can dynamically schedule tasks on HPC nodes for compute-intensive phases or route lighter or latency-critical workloads to the cloud or edge nodes.

FOR RESEARCHERS AND INDUSTRIAL TEAMS:

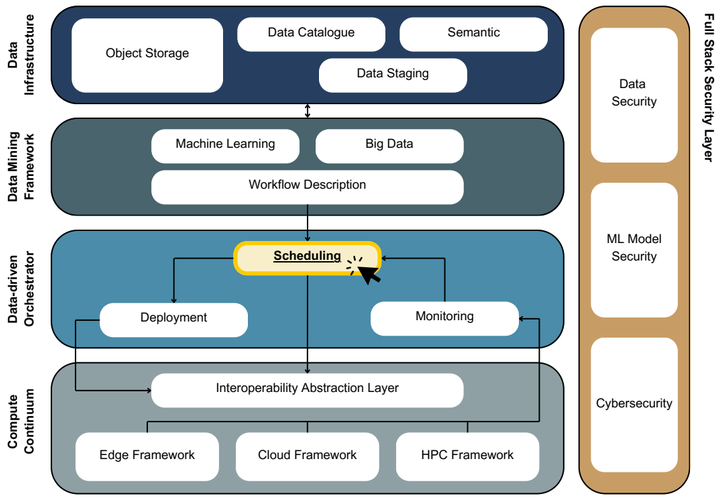
- Sequential Development: Users write code sequentially, and the runtime seamlessly offloads tasks to HPC clusters or edge devices, according to task requirements
- Automatic Data Staging: COMPSs handles inputs/outputs and ensures data is where tasks need it, without manual file transfers.

FOR ADMINISTRATORS AND CDOS

- Scalability and Performance: The COMPSs runtime can be integrated with any Prometheus-based monitoring stack, allowing infrastructure-informed scheduling in the compute continuum.
- Single-step Deployment: kubecompss allows for the deployment of COMPSs in single and multicluster Kubernetes environments, using kubeconfigs and CLI parametrization.

USE AND IMPACT BEYOND EXTRACT PROJECT AND ITS PARTNERS

As an established tool, COMPSs already has a long track record in HPC. By extending it for heterogeneous, container-based workloads in EXTRACT, its relevance is advanced for real-world compute continuum scenarios. After EXTRACT, the enhanced COMPSs version will be ready to be adopted by other multi-cluster initiatives, bridging HPC scheduling with container orchestration. These improvements will encourage broader uptake of COMPSs in future edge–cloud–HPC deployments.



https://gitlab.bsc.es/extract/extract-sa/compss

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