DARE to Deliver Research Agility on Cloud E-Infrastructures

[Abstract]

The DARE e-science platform (http://project-dare.eu) is designed for efficient and traceable development of complex experiments and domain-specific services on the Cloud. DARE will be validated via two scientific pilots: Working with the ENES community for climate, the first will enhance part of the data-access and pre-processing procedures of the Climate4Impact portal. The second will extend part of the VERCE science-gateway functionality for seismology, in coordination with the EPOS community.

The DARE platform addresses the requirements of research developers and scientists, and empowers them to overcome technical and collaboration hurdles. It achieves these goals by exploiting the elasticity of the Cloud in resource acquisition and allocation. Crucially, it combines data provenance with other metadata and registries regarding datasets, experiments and resources to intelligently distribute scientific workflows across diverse platforms. The DARE platform interfaces with domain-specific platforms (e.g. VREs, portals, etc.) via high-level workflow specifications expressed in the Python language. It is designed with heterogeneous, distributed computation and data environments in mind, such as the European Open Science Cloud (EOSC). DARE platform components include (1) Fine-grained, high-level workflow specifications, (2) Data provenance with tools to make it immediately beneficial to users, (3) Support for a single, consistent view of catalogs, vocabularies and provenance records, (4) Optimized execution on the cloud within DARE as well as through delegating parts of processing to external resources, and (5) Packaging of internal and third-party technologies within scalable and readily deployable container-based distributions.

The DARE platform, rationale and components will be presented, along with usage and deployment scenarios drawn from the two DARE use-cases.

[Bibtex]

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