

HNSciCloud –Large-scale data processing and HPC for science with T-Systems hybrid cloud

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As the result of joint R&D work with 10 of Europe's leading public research organisations, led by CERN and funded by the EU, T-Systems provides a hybrid cloud solution, enabling science users to seamlessly extend their existing e-Infrastructures with one of the leading European public cloud services based on OpenStack – the Open Telekom Cloud.

With this new approach large-scale data-intensive and HPC-type scientific use cases can now be run more dynamically, reaping the benefits of the on-demand availability of commercial cloud services at attractive costs.

Over the course of the last year, the prototyping and piloting has confirmed, that science users can get seamless, performing, secure and fully automated access to cloud resources over the GÉANT network, simplified by the identity federation with eduGAIN and Elixir AAI. Users can work in a cloud-native way, maintaining existing toolsets or choose from a large and fast-growing community other OpenStack and S3-compatible tools, e.g. Ansible and Terraform to run and manage applications. Users remain in full control and have access to all native functions of the cloud resources, either through web browser, APIs or CLI. Cloud Management Platforms or Broker solutions are not needed, but may be added if further abstraction is required.

The extensive service menu of Open Telekom Cloud –based on OpenStack –is opening up new functionality and performance for scientific use cases with build-in support for e.g. Docker, Kubernetes, MapReduce, Data Management, Data Warehouse and Data Ingestion services. The services can be combined with a wide range of compute and storage options. Compute can consist of any combination of containers, virtual, dedicated or bare metal servers. Server-types can be optimized for disk-intensive, large-memory, HPC or GPU applications. The extensive network and security functions enable users to maintain a private and secure environment, whereby access to services can make full use of 10G networking. The is extended with the new Hybrid service, providing the user with a dedicated fully managed on-premise cloud as complement to the public cloud service.

The presentation will give an overview of the performance and scale of use cases that have been successfully deployed. It will address how large-scale data can be processed at new performance levels with hundreds of containers and how data can be processed in an intelligent way by pre-fetching the data or leaving the data remote at the existing infrastructure, making use of the state-of-the-art Onedata Data Management solution from Cyfronet. Furthermore, the results of the new high level of transparency and budget control developed will be demonstrated.

Ten of Europe's leading public research organisations led by CERN launched the Helix Nebula Science Cloud (HNSciCloud) Pre-Commercial Procurement to establish a European hybrid cloud platform that will support the high-performance, data-intensive scientific use-cases of this "Buyers Group" and of the research sector at large.

Type of abstract

Presentation

Summary

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