



HNSciCloud PILOT PLATFORM OVERVIEW

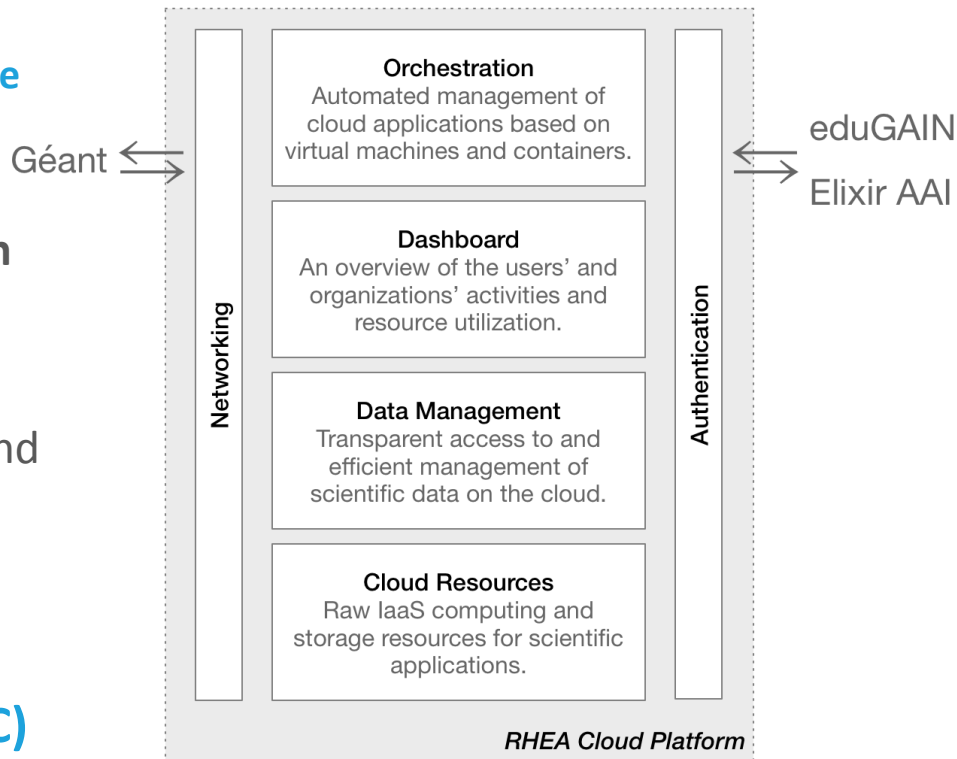
RHEA Consortium

14 June 2018

OUR VISION

Building an open, European platform for science data exploitation

- ✓ Solution delivers a **cost effective solution at scale** (10k, 1PB; 400k, 100 PB), with **minimal intrusion** into Buyers' sites.
- ✓ Built on pure IaaS to ensure **no-lock-in** and **best market pricing**.
- ✓ **Laying the foundations of the European Open Science Cloud (EOSC)**



CONSORTIUM

Established Partnership

RHEA: Prime contractor with proven management skills for large, institutional contracts and cyber-security expertise



Exoscale: Dynamic, innovative cloud provider that has worked with European scientific institutions like CERN



SixSq: Cloud experts that provide its expertise through the Nuvla service running the SlipStream platform software



CYFRONET: Provides Onedata for data management and IT services to research teams and educational institutions



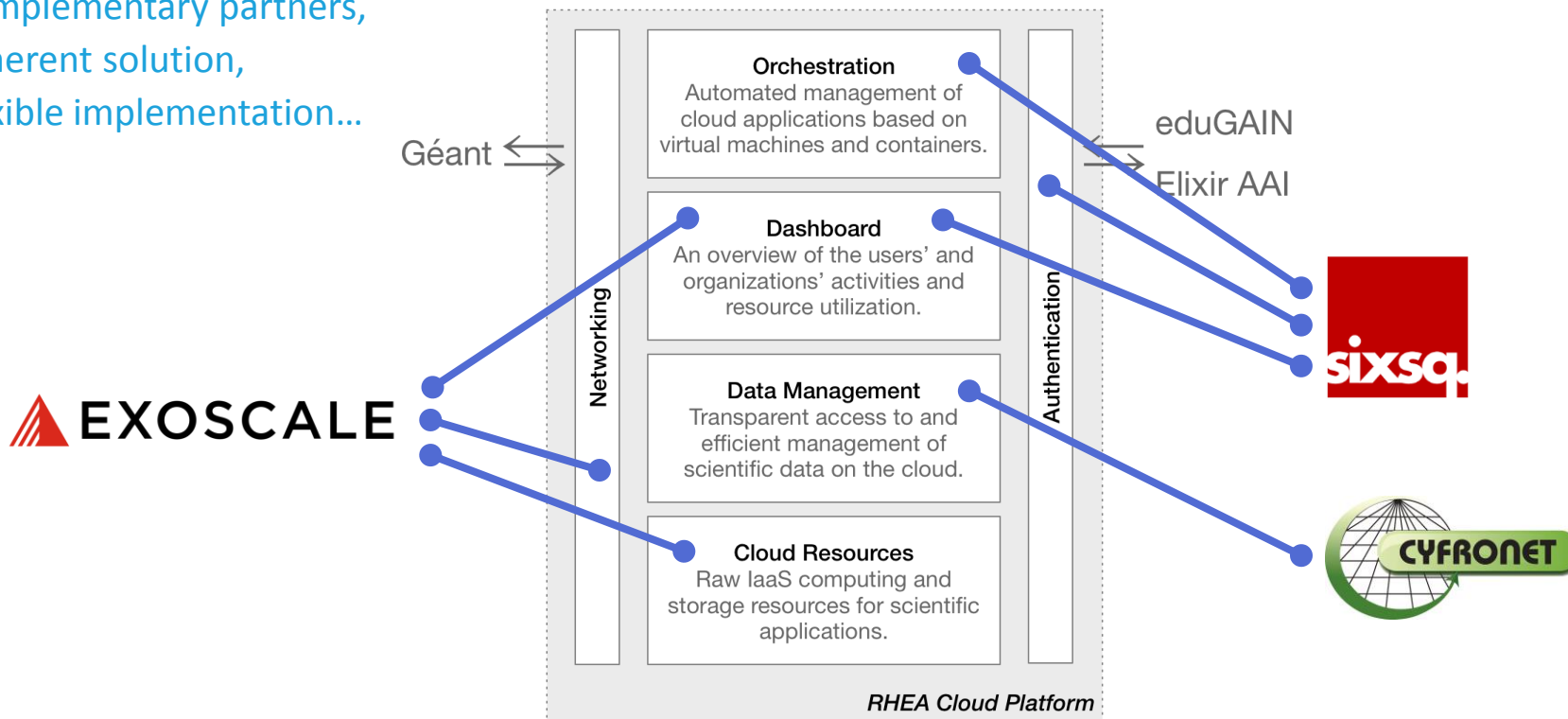
CHALLENGES

Deliver end-to-end optimized data access and analysis

- ↪ Provide seamless user access and security through **federated identities**
- ↪ Support a **wide range of applications**
- ↪ **High data throughput**: home institute ↔ cloud; data source ↔ application
- ↪ **Transparent data access** with **POSIX** support
- ↪ Support different **data layout and access patterns**
- ↪ Integrate **containers** and **container orchestration engines**
- ↪ ... with **minimum complexity!**

COMBINED SOLUTION

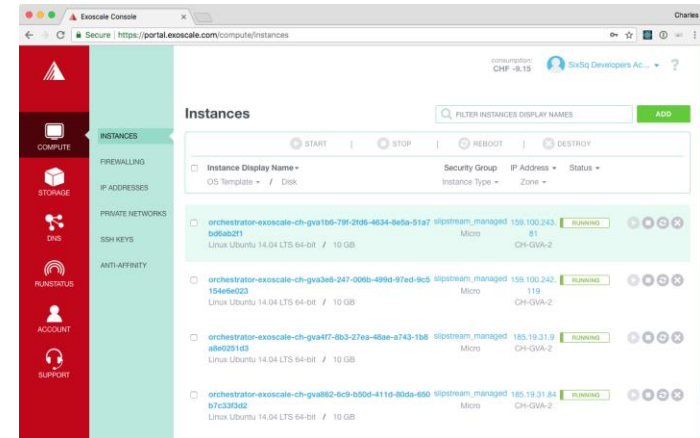
Complementary partners,
coherent solution,
flexible implementation...



EXOSCALE: IAAS CLOUD SERVICES

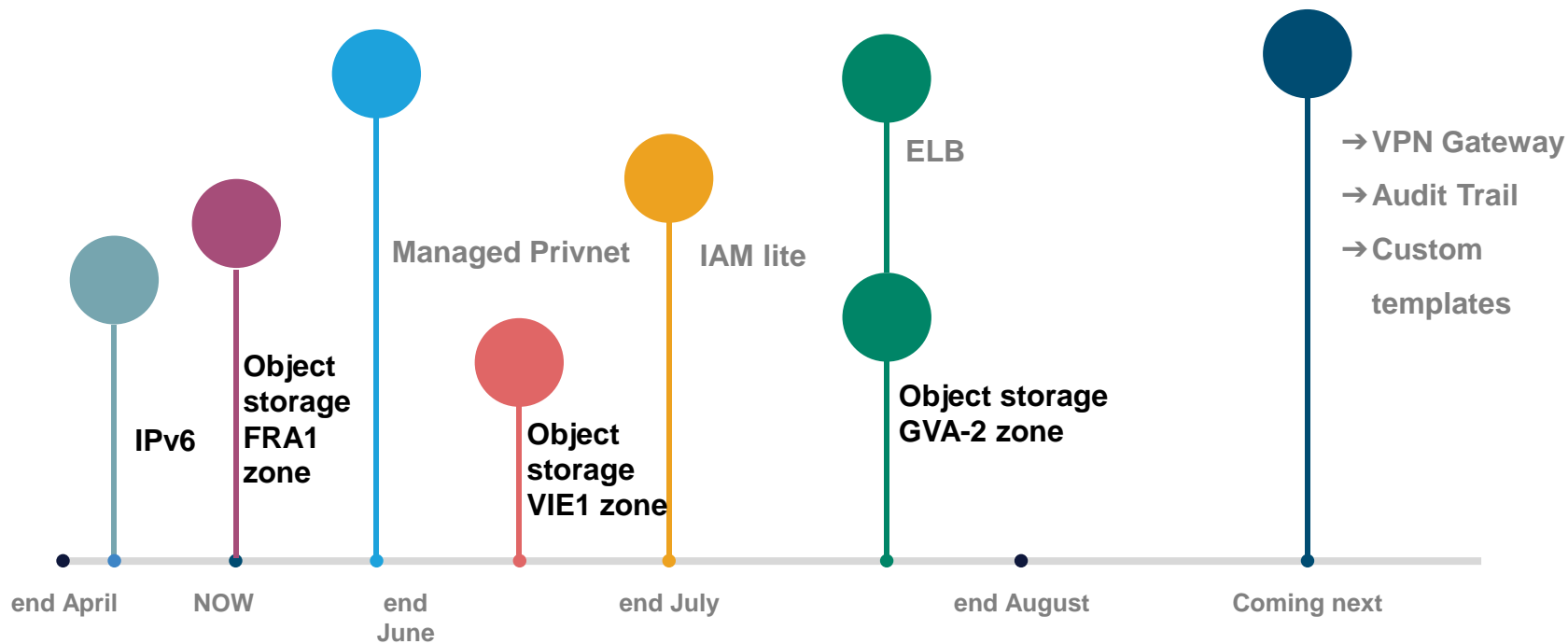
Innovative cloud service provider optimized for cloud-native applications...

- Four regions: **Geneva**, **Frankfurt**, Zurich, and Vienna
- Based on **Apache CloudStack**
 - Supports CloudStack API, **Libcloud**, and **Terraform**
- Browser-based portal**
 - Easy configuration and management of virtual machines
 - Dashboard of compute, storage, and other resource utilization
- Géant: ramping up to aggregate **40 Gb/s bandwidth**



ROADMAP

June 2018

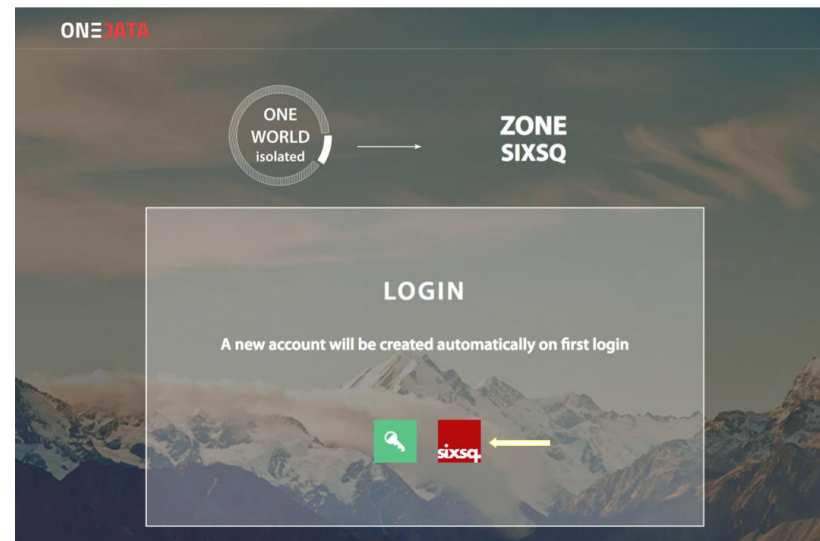


ONEDATA: DATA MANAGEMENT



Flexible, effective data management solution built around shared “spaces”...

- ✓ **Uniform view** of all shared data sets, no matter where they are stored
- ✓ **Transparent access** to all data sets with **dynamic migration**
- ✓ Support for **POSIX** access
- ✓ Integrated with the **eduGAIN** and **Elixir AAI** identity federations

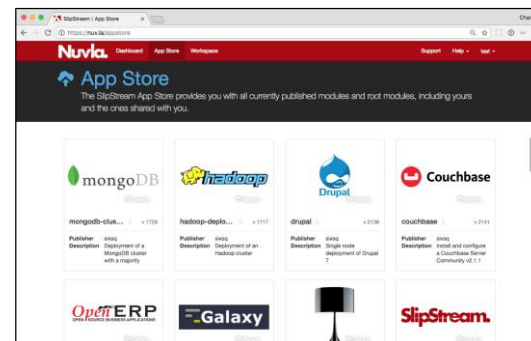
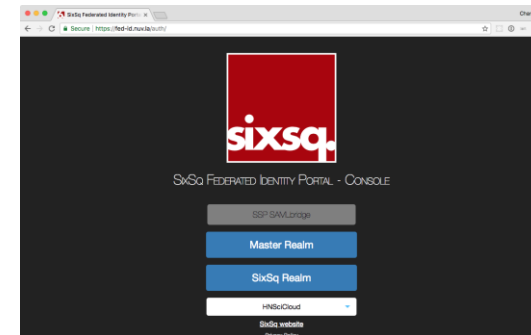


AUTHENTICATION & ORCHESTRATION



Simplifies and automates management of cloud applications...

- Full support for **eduGAIN** and **Elixir AAI** identity federations
 - Keycloak** based implementation allows management of **users**, **groups**, and their **attributes**
- Nuvla
 - Automated deployment** and dynamic management of applications to **minimize costs and maximize performance**
 - Predefined applications: **SLURM**, **Docker Swarm**, **Kubernetes**, etc.
 - Dashboard** showing cloud resource utilization



HPCAAS

Dynamically deployed batch clusters using high-performance hardware...

- Automated **SLURM** deployment supporting normal and MPI jobs
- Range of “**Super VMs**” with up to 16 vCPUs and 128 GB of RAM.
- Two profiles with available **GPUs**

GPU Profiles		
vCPU	12	48
RAM	56 GB	225 GB
SSD (max.)	2 TB	8 TB
GPU Cores	3584	14336
GPU NVIDIA Tesla P100	1	4

DEMONSTRATIONS

General documentation: <https://hn-docs.rtfid.io>

Previous Training: <https://hn-docs.readthedocs.io/en/d-pil-3.2/training/index.html>

Exoscale

- ✓ Provisioning cloud resources via **web portal**
- ✓ Use of **Libcloud** or **Terraform** with Exoscale
- ✓ Managing users and viewing **resource utilization**
- ✓ Use of **vouchers**
- ✓ ...

Onedata

- ✓ **Upload and download of data** from Onedata browser interface
- ✓ **Data access from cloud applications** with Oneclient
- ✓ Strategies for **importing and exporting data** hosted in your data center
- ✓ ...

Nuvla

- ✓ Automated deployment of platforms for **container-based applications**
- ✓ Deployment of **SLURM** through browser interface and command line
- ✓ **User and user attribute management** with Keycloak
- ✓ ...