



# GÉANT – Cloud activities 2024

GN5-1/WP4 - Above-the-Net Services

**Dave Heyns**  
Cloud Services

CS3 2024 - Cloud Storage Synchronization and Sharing, CERN  
March 11<sup>th</sup>, 2024

Public

The AtNet logo is located in the bottom right corner, partially enclosed by a white circular border. It consists of the text "AtN" in a dark blue font above the text "et" in an orange font.

AtN  
et

1

# Renewal of IaaS+ framework (OCRE 2024)

- In 2016 GÉANT tendered the first IaaS agreements
  - Mandated by all NRENS to tender on their behalf
  - 14 framework agreements were awarded
  - Frameworks expired on 31 December 2020
- 2020 IaaS+ tender was launched – OCRE project
  - GÉANT mandated by NREN's to tender on their behalf
  - Each country = 1 lot. -> suppliers dedicated
  - ~ 1150 proposal received / 473 framework agreements awarded (avg. 14 different Cloud platforms available per country).
- March 2024 the new IaaS+ | **OCRE2024** published

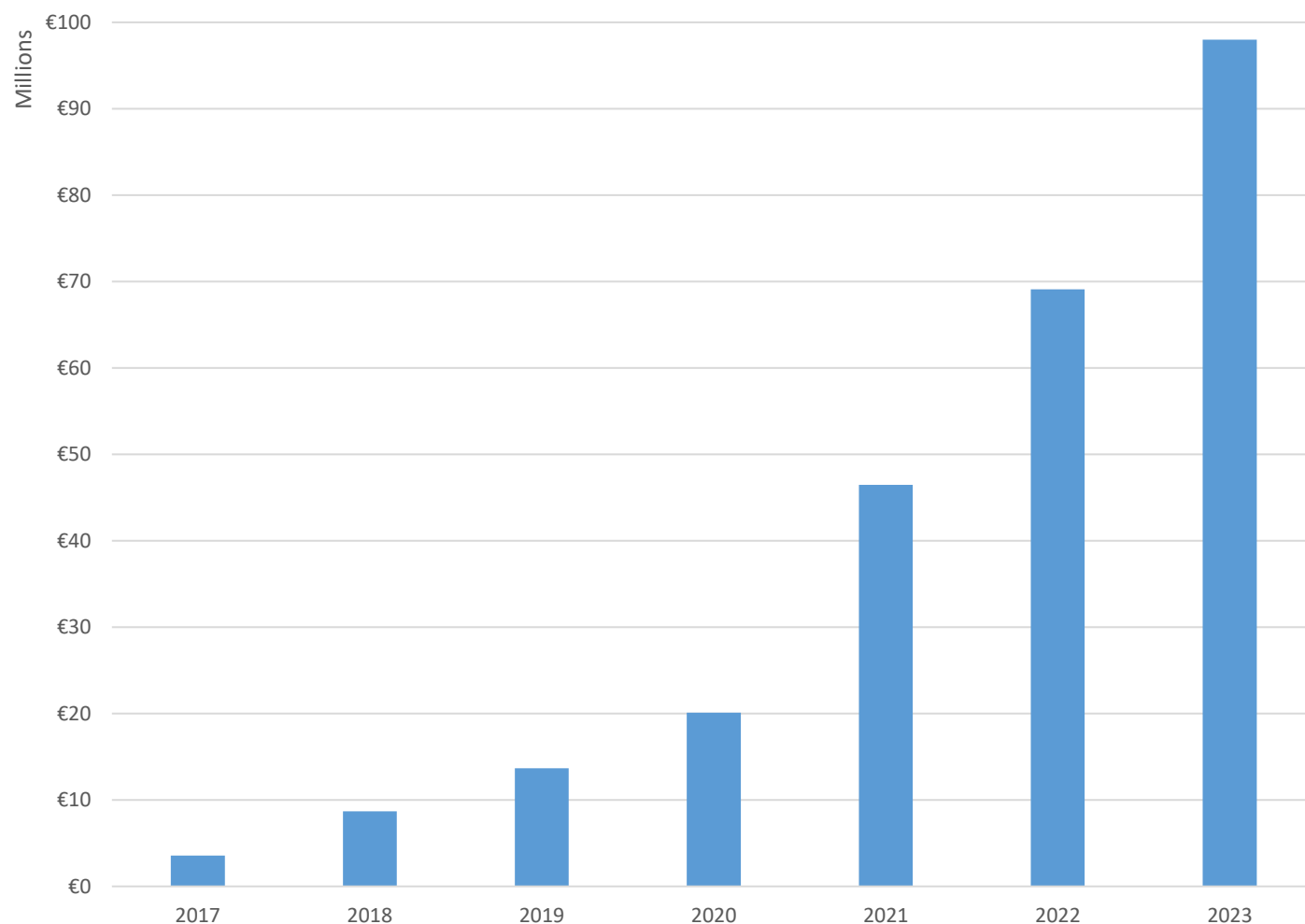


**OCRE**  
Open Clouds for Research  
Environments



1

# Annual consumption - OCRE



as at 31/12/2023

- 98M EURO
- 28 countries
- 950 institutions

**OCRE**  
Open Clouds for Research  
Environments

**AtNet**  
et

1

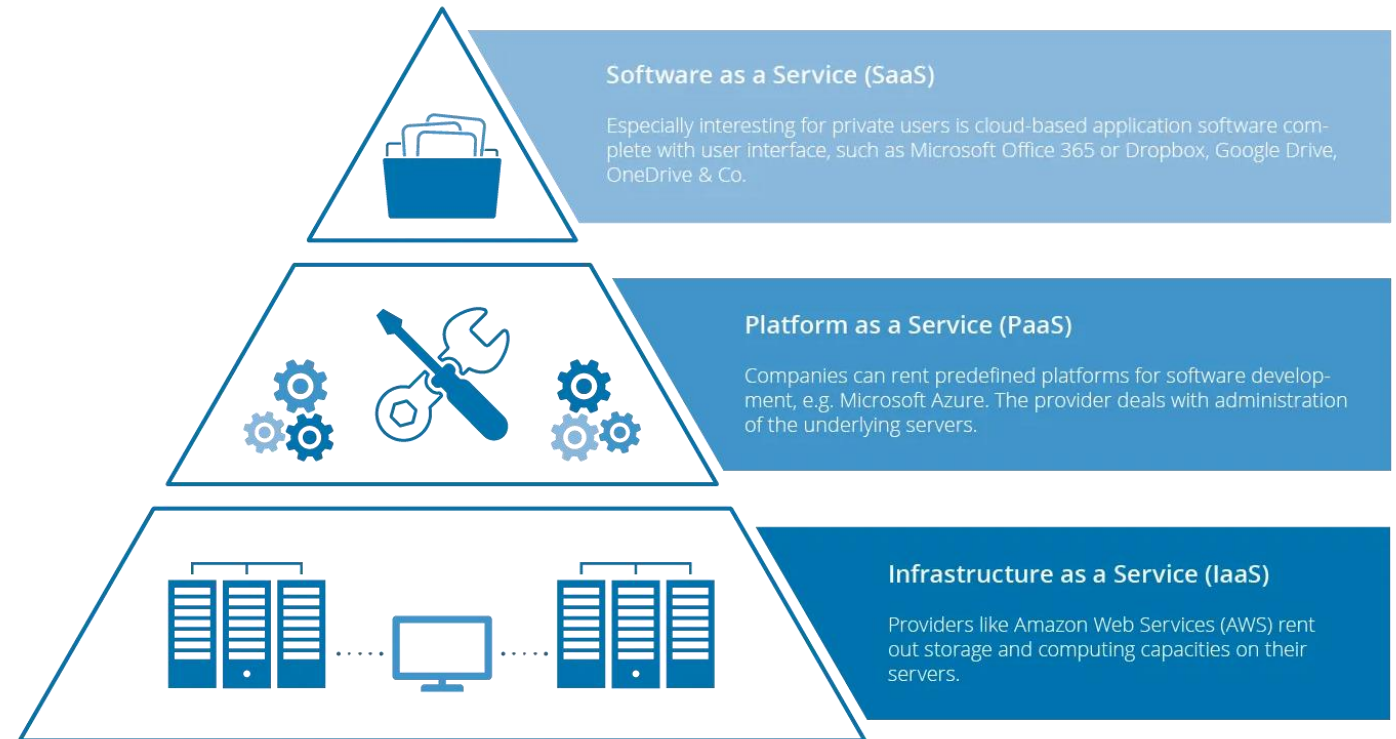
# OCRE 2024 - Scope

## ✓ IaaS+

## ✓ Contracts:

- FW under Dutch law
- CoC under local law

- 1 Lot per country
- Sublots per platform
- Max 3 suppliers per sub-lot
- Expected total contract value\*  
1+ B euro
- 5 years duration
- Customisation per NREN
- Hybrid approach
- No obligation to procure



OCRE 2024

2

# Hearing the European researchers

- ✓ €8Mill adoption funding distributed
- 120 Proposals received
- 22 Countries participated
- All OECD disciplines

**OCRE**  
Open Clouds for Research  
Environments

## BIOLOGY

Federated deep learning on large-scale and structured data.  
Biomaterials, Nanotechnology

## IMAGE COMPUTING

Robust neural network backbones for medical image computing: large-scale training and adaptation

## HEALTH SCIENCES

Predict the disease risk including age related functional decline, injury, and disability (Precision Preventive Medicine).  
specific phenotypes  
Biomarkers.

## PHYSICS

Power electronics  
Semiconductor manufacturing,  
Industry 4.0

## ROBOTICS

Decentralized Machine Learning Control for Intelligent Multi-Agent Dynamical Systems

## SOCIETAL WELLNESS

Predictive Algorithms for Detection of Intimate Partner Violence in the Healthcare System.  
Using virtual AI and HPC services

## CARDIOLOGY

Prediction of aortic aneurysm using analysis of mapped virtual aorta (digital twinning).

## MEDICINE

Modelling of Drug Deposition with Realistic Dosages in Patient-Specific Lung Airways

## DATA SCIENCE

Active learning for Systematic Reviews

37 awards

AtNet

2

# Hearing the research infrastructures

- ✓ €4.5Mill adoption funding distributed
- 22 **COLLABORATIVE** Proposals (RI/NREN + Supplier/Platform)



**CNR Italy**  
**National Research Council**  
 D4Science aggregates “science domain agnostic” service providers as well as science community-specific ones to build a unifying space where the aggregated resources can be exploited via VREs and their services

**SURF NL** European Environment for Scientific Software Installation/ SURF Research Cloud to deploy their VREs on community clouds via hybrid landing zone

**GWDG TRE Germany**  
 TRE is an open-source tool that helps research organizations create secure, compliant environments for collaborating scientists across multiple jurisdictions. GWDG TRE grants access to cloud-based agility, scalability, and cost efficiency.

**CoQREATE IR**  
**Uni Collaboration**  
 Quantum computers will be a core component of future networks, offering capabilities in cryptography, networking, data analysis, optimization. TRE distributes quantum cloud access for researchers, educators across Ireland.

**National Distributed Computing Infrastructure Portugal (INCD)**  
 Provides a single entry point for researchers to manage computationally-intensive applications by via containerised workloads and computing clusters across multiple clouds

**OpenScienceLabs for HPC Austria**  
 Offers a user-friendly and secure environment for researchers to carry out HPC workflows and share their scientific findings in a transparent and reproducible manner.

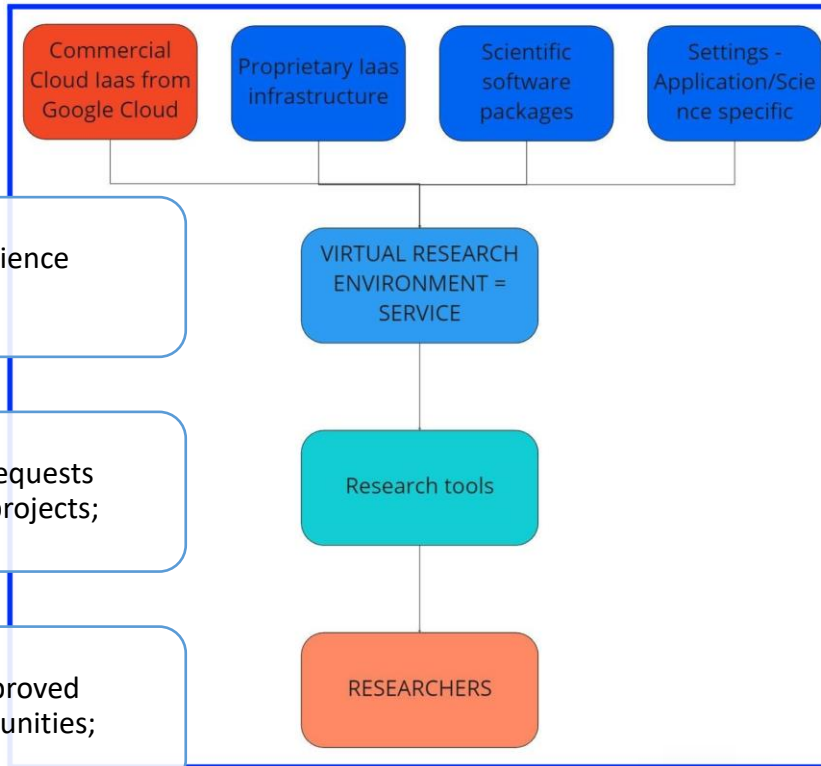
7 awards

**AtNet**

2

# Hybrid cloud- Case studies

## impact



Scalability

- complement and scale the D4Science infrastructure in the long term;

Elasticity

- enable elasticity for specific IT requests related to short-term research projects;

Richness

- provide additional, new and improved services to their research communities;

Affordable

- be easy to integrate in their current infrastructure set-up as the VRE system allows them to easily configure and take advantage of commercial cloud resources.



### D4Science

- Increased scalability and fault-tolerance
- Increased quality of service
- Shaping future sustainability

### Scientific Community

- Virtually unlimited computing power to handle large and complex data sets
- Faster and reliable data processing and analysis technologies

### EOSC

- EOSC capacities closer to the users
- EOSC enriched with open-access services exploiting hybrid infrastructures

AtNet

2

# Hybrid... GWDDG

Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen

## Development

- Customized web-based interface built on AWS Service Workbench as the primary entry point
- AWS Landing Zone design as technical framework, extended by an AWS Trusted Research Env (TRE)
- Infrastructure-as-Code framework for AWS (AWS CloudFormation and Cloud Development Kit - CDK)
- Standard GitOps workflow (dev/deploy)

## Impact

- Vast, scalable, elastic, cost-effective compute resources
- Limitless processing; analytical capabilities; innovative services

## GWDDG TRE

- Tailored Services and Workflows
- Pre-configured services
- Integration of more specialized AWS Services (AI)



UNIVERSITY OF  
**BATH**

## Development

- MS Azure and servers were configured to mimic the Bath HPC environment for ease of rapid testing (replicating the slurm scheduler, linux environment, and with codes installed from Spack)
- First-principles code was Quantum Espresso, for backwards compatibility, but also VASP

## Impact

- Length of time before publication reduced
- Completion of simulation studies between consecutive synchrotron beamtime allocations local and optimized, as opposed to at highly expensive and competitive facilities

## Bath hybrid HPC

- Immediate access to HPC resources by undergrads
- Research training on cloud-based services



AtNet



3

## NREN support for Open Science

- Institutional data autonomy
- Access policy (Role of AAI)
- Data-sharing / FAIR / Metadata
- NREN as national EOSC node
  1. Portfolio of standardized services
  2. Promotion of Regional/National policies
  3. Pan-European horizontal services
  4. Trusted Research Environment (community)

# GN5-2



**Co-funded by  
the European Union**

 **eosc**



*data space - a virtual entity that facilitates the visitation of specific/ thematic data by a computational workload on behalf of an authorized user*

**AtN  
et**



Thanks for your attention 😊

Questions to [david.heyms@geant.org](mailto:david.heyms@geant.org)

