D8.1

Overview of Available Commercial Services

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Abstract

This document describes the commercial cloud and digital services offerings that are currently available for procurement through frameworks implemented by the OCRE project.

EOSC Future WP8 Commercial Team (commercial-team@eoscfuture.eu) will procure commercial services on behalf of the other EOSC Future work packages, where necessary, and will also distribute the associated consumption funding via a series of procurement activities based on the requirement outcomes of a series of open calls. Several the project's participants (other than GÉANT), beneficiaries and awarded institutions, are also eligible to procure commercial services via these frameworks.

It is anticipated that it will be necessary for WP8 Task 8.1 to construct other procurement mechanisms/frameworks to facilitate the procurement of commercial services that have not been described in this document. Such services could include those in support of Earth Observations (consuming Copernicus data) and commercially available datasets that could be consumed by researchers, resulting in improved research outcomes. All services pertaining to future procurements will be catalogued in an updated version of this document (D8.1).

WP8 provides an extensive analysis of these additional services (constituting a sub-section of the European research dataspaces). The team uses the services described in this document as a basis for a series of surveys to identify commercial services not yet represented.

Version History

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List of Abbreviations

Acronym	Definition
AAI	Authorisation, Authentication, and Identity
AI	Artificial Intelligence
API	Application Programming Interface
AR	Augmented Reality
AWS	Amazon Web Services
CDN	Content Delivery Network
CLI	Command-Line Interface
CMT	Contract Management Team
DIAS	Data and Information Access Services
DNS	Domain Name System
DRaaS	Disaster Recovery as a Service
EO	Earth Observation
EOSC	European Open Science Cloud (https://eosc-portal.eu/about/eosc)
ESA	European Space Agency (https://www.esa.int/)
FWaaS	Firewall as a Service
GDPR	General Data Protection Regulation
HDD	Hard Disk Drive
IaaS	Infrastructure as a Service
IoT	Internet of Things
LBaaS	Load Balancer as a Service
LSP	Licensing Solutions Partner
NREN	National Research and Education Network
OCRE	Open Clouds for Research Environments see https://www.ocre-project.eu/ and https://www.ocre-project.eu/services/cloud-suppliers.
PaaS	Platform as a Service
PB	Petabyte
PHP	Hypertext Pre-processor (scripting language)
PoC	Proof of Concept
SaaS	Software as a Service
SOC	Security Operations Centre
SSD	Solid-State Drive
VDI	Virtual Desktop Infrastructure
VM	Virtual Machine

VPC	Virtual Private Cloud
VPN	Virtual Private Network
VR	Virtual Reality

1 Introduction

1.1 Focus and History

This document currently provides a collection of commercial service offerings that could underpin the community services (as currently onboarded onto the EOSC Hub portal) provided by the e-Infrastructures that support the EOSC. As mentioned, many of these entities are already listed as eligible to procure via the OCRE frameworks.

The services and suppliers that are listed and described in this document are also catalogued by country on the OCRE project website (where the local NREN contact details are also provided)[1].

The Open Clouds for Research Environments project (OCRE) project began in early 2019, with specific mandates and the aim to accelerate cloud adoption in the European research community, by bringing together cloud providers, Earth Observation (EO) organisations and the research and education community, through ready-to-use service agreements and adoption funding.

[1] Please refer to https://www.ocre-project.eu/services/cloud-suppliers.

2 Commercial services and the EOSC

2.1 OCRE & EOSC

OCRE makes selected commercial cloud-based digital services an integral part of the European Open Science Cloud (EOSC). The project ensures that these services are accessible by means of frameworks signed by GÉANT Association and suppliers that are compliant in terms of European procurement legislation, within the qualifications of the Green Public Procurement initiative and provide visibility of such on the EOSC Service Catalogues. As a result of these frameworks, institutes will be able to procure and use Cloud Services.

2.2 OCRE & Copernicus

OCRE will stimulate both the development and adoption of Earth Observation (EO) Services consuming Copernicus data from the Data and Information Access Services (DIAS) platforms, providing centralised access to Copernicus data and bespoke processing tools (value add), enabling the research community to identify and consume these services.

2.3 Adoption

The OCRE project also committed to the distribution of €9 million in adoption funding to expose the European research community to the agility and improved research outcomes resulting from the consumption of these services in support of research activities. In allocating this funding it is anticipated that the OCRE project will explore potential business models in support of the distribution of commercial resources via EOSC.

2.4 Procurement

These services will be procurable by the European research community, including the e-Infrastructures who are now easily able to underpin and evolve their end-services using commercial platforms. GÉANT and the NRENs (National Research and Education Networks) are also able to act as underwriters and procure services on behalf of their research constituents[2].

2.5 Benefits of utilising EOSC frameworks when procuring commercial services

The benefits of procuring commercial Infrastructure as a Service (IaaS); Platform as a Service (PaaS); and Software as a Service (SaaS) to the research community using the OCRE call-off contracts are numerous as stated below:

1. The suppliers awarded framework contracts in each of the 40 countries were required to compete in terms of pricing, discounts, support capabilities in country, data ingress/egress charge waivers, and assistance with the on/off-boarding of workloads.
2. Each of the platforms represented on the OCRE framework have been tested in terms of research workloads using the Test-Suite developed (and subsequently enhanced to include such toolsets in support of machine learning and AI/Artificial Intelligence) by the HNSciCloud team (Helix Nebula project).
3. All the OCRE suppliers are in the process of onboarding onto eduGAIN (global research inter-federation in support of AAI/Trust and Identity).
4. The associated cloud platforms have direct peering points into the GÉANT network, ensuring the lowest possible latency in terms of bandwidth.
5. The cloud platforms operate Security Operations Centres (SOCs), which provide unprecedented capacity in terms of security threat surveillance and response. Securing research workloads is far more effective on commercial cloud platforms (vs on premise) as a result.
6. National research and education networks (NRENs) will facilitate training and webinars is support of community enablement in terms of the use of these services.

[2] Please see for the geographical coverage in online map and service providers overview per country/lot: https://www.ocre-project.eu/services/cloud-suppliers.

7. The OCRE framework mandates that suppliers provide quarterly reporting on consumption by service/country. This allows the GÉANT Contract Management Team (CMT) to accurately report commercial cloud services consumption trends back into EOSC and the European Commission. To drive accuracy with regards this reporting, it is imperative that the OCRE contracts facilitate all consumption and institutes are not forced to run their own tenders based on lack of support.

2.6 End user considerations

Many of the research institutes, individual researchers, and e-Infras are already working in virtualised environments, be these in on-premises data centres, community cloud platforms, or commercial cloud platforms (including the American hyperscalers, e.g. AWS, Azure, Google - and larger European providers, such as Orange and T-Systems). Transitioning workloads to the commercial platforms via OCRE call-offs could simply require extending these virtualised environments to include multi-cloud capabilities.

2.7 Next steps

The OCRE cloud (IaaS+) framework contracts across 40 countries in Europe were signed in Q1 2021, and many call-off contracts between the suppliers and institutes have already been signed. Call-offs are available for use by the many entities representing the broader EOSC environment, including those supporting the distribution of services supported by the adoption funding activities in EOSC Future.

WP8 is working to identify services required by the research community, particularly in relation to the activities anticipated by the other work packages in the EOSC Future projects. Other procurement/distribution mechanisms will be constructed, and extended portfolios will be catalogued in subsequent publications of this document.

It has not yet been fully established by what mechanism the native commercial services could be distributed directly to individual researchers via the Hub/future portals. The EOSC Future WP8 team will work closely with those responsible for the distribution of services via the EOSC core architecture in order to demonstrate possible mechanisms.

2.8 Proof of Concept

In summary, WP8 will endeavour to identify all digital services required by the European research community which could be sustainably delivered by commercial providers. All other WPs in the EOSC Future project will be approached for input. These services include:

1. Commodity cloud-based IaaS; PaaS and SaaS services that are already procurable via EOSC frameworks (OCRE);
2. PaaS; SaaS and DATA services that are not yet available via existing frameworks;
3. Bespoke research services not yet available but requiring development by means of the co-innovation/creation opportunities identified by WP8 T8.2's Digital Innovation Hub.

WP8 will procure and deliver these services in support of the activities in the other WPs. In doing so, the WP will attempt to describe a model that supports the distribution of supplier based digital services to the European research community via the European Open Science Cloud.

3 Commercial Digital Service Portfolio

The current OCRE portfolio includes cloud-based commercial digital services that extend well beyond the commodity compute and storage facilities associated with cloud services. These services are available via the various marketplaces hosted by the cloud platforms and suppliers. These services are in scope in terms of procurement by virtue of the fact that they were specified by the Infrastructure as a Service (IaaS) suppliers in their responses to the OCRE tender. These services span many areas and can be categorised as detailed below. Institutions can order these services through call-off contracts offered via the OCRE framework.

- **Artificial intelligence (AI)**: An AI cloud consists of a shared infrastructure for AI use cases, supporting numerous projects and AI workloads simultaneously, on cloud infrastructure at any given point in time.
- **Blockchain**: An encrypted system that uses different styles of encryption and hash to store data in protected databases. Blockchain-based cloud storage perfectly combines security and scalability with its interlinked blocks, hashing functions, and decentralised architecture. It makes the technology an ideal choice for adding an extra layer of security to the cloud storage.
- **Compute**: virtual machines, dedicated bare metal servers, containers, operating system, and software images. For example:
  - **AWS**: The compute category of services are key resources that allow the user to carry out computational abilities via a series of instructions used by applications and systems. These resources cover a range of different services and features, including: EC2 - Amazon Elastic Compute Cloud. ECS - Amazon Elastic Container Service.
  - **Azure**: Compute is an on-demand computing service for running cloud-based applications. It provides computing resources such as multi-core processors and supercomputers via virtual machines and containers.
- **Containers**: Containers are packages of software that contain all of the necessary elements to run in any environment. Containers virtualise the operating system and run anywhere. Such as microservices architecture applications, batch processing, machine learning applications, and migrating on-premises applications to the cloud. A disturbed environment may be deployed with high availability in no time with open stack containers such as Magnums and Kubernetes.
- **Databases**: Database service are built and accessed through the cloud platform. Users install software on a cloud infrastructure to implement the database. Key features: Enables enterprise users to host databases without buying dedicated hardware.
- **Developer tools**: Manage Cloud resources and applications with command-line tools and libraries. Configuration management tool to help you automate the setup and execution of the software on those resources.
- **Internet of Things (IoT)**: Cloud computing in IoT works as part of a collaboration and is used to store IoT data. The Cloud is a centralised server containing computer resources that can be accessed whenever required. Cloud computing provides an easy transport for the large data packages generated by the IoT through the Internet.
- **Migration and transfer**: Cloud migration is the process of moving data, applications, or other business elements to a cloud computing environment. There are various types of cloud migrations an enterprise can perform all offer tools and services to help migrate workloads and applications.
- **Networking and content delivery**: A content delivery network (CDN) refers to a geographically distributed group of servers which work together to provide fast delivery of Internet content. A CDN allows for the quick transfer of assets needed for loading Internet content including HTML pages, JavaScript files, stylesheets, images, and videos. Amongst others to manage regional networking, routing, VPN and load balancing and cloud system management.
- **Quantum Technologies**: Cloud-based quantum computing is the invocation of quantum emulators, simulators, or processors through the cloud. Increasingly, cloud services are being looked on as the method for providing access to quantum processing. Users are allowed access to these quantum-powered computers through the internet.

- **Security, identity, and compliance**: Include authentication and authorisation service (OpenStack Keystone), access groups, Firewall as a Service (FaaS) virtual appliance, VPN as a Service, software upgrades.
- **Serverless**: Serverless computing is a cloud computing execution model in which the cloud provider allocates machine resources on demand. Including data processing, Internet of Things (IoT), real-time stream processing, web and mobile backends, social media trend analysis, image resizing, etc.
- **Storage**: Cloud storage is a cloud computing model that stores data on the Internet through a cloud computing provider which manages and operates data storage as a service. On demand delivery with just-in-time capacity and costs and eliminates buying and managing your own data storage infrastructure. Amongst others storage is HDD, SSD storage, VM images and snapshots, block, object and image storage and backup solution.
- **Virtual Reality and augmented reality**: Virtual Reality (VR) is a computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way. An Augmented Reality (AR) cloud is a technology that aims to create immersive experiences by unifying the physical and digital worlds. Augmented reality is a technology that digitally augments the reality around a user when viewed through a phone or other digital viewing device.

4 Cloud Suppliers and Offered Services

The service descriptions below have been provided by the commercial OCRE Cloud service providers, in order of receipt.

4.1 A1

A1 is Austria's leading communications provider with around 5.1 million mobile customers and 1.9 million fixed lines. Customer offer includes connectivity, cloud services and digitisation services.

4.1.1 A1 Cloud Portfolio[3]

With the A1 cloud computing platform, Exoscale, listed in the OCRE cloud catalogue, A1 offers a European cloud hosting alternative and premium support including, managed cloud services and professional services in the field of DevOps and cloud-native technologies, from advisory and tool selection to operations.

Exoscale and the A1 IaaS+ services provide research and education clients the access to a reliable cloud platform that meets the strictest data protection requirements and stores data locally in Austria. Applying experience from xoscale in academia and the CERN Cosmics Leaving Outdoor Droplets projects, as well as a commitment to the open-source philosophy, cloud adoption is offered without vendor-lock in. The Exoscale product features include compute instances, GPUs, object storage, networking, Managed Kubernetes, DBaaS, DNS, CDN and a GDPR-compliant VDI solution.

4.2 T-Systems

With locations in more than 20 countries and around 29,000 employees, T-Systems is one of the world's leading IT service providers and suppliers of digital services. Its Open Telekom Cloud is the leading European OpenStack Cloud, secure, reliable, and unique. It is highly regarded by researchers and manages more than 500 PB of customer data.

Open Telekom Cloud has been qualified as OCRE supplier in 29 countries. The cloud services are certified for all relevant standards and provided from data centres that run 100% on green energy in Netherlands and Germany. The services can be federated with existing e-Infrastructures, include a wide range of integrated and easy-to-use leading open-source solutions e.g., an AI-Framework, Data Management, Databases, HPC, Kubernetes, Elasticsearch and storage with hot, warm, and cold tiers including data lifecycle management functions.

4.2.1 T-Systems Cloud Portfolio

The services are supported by a strong team with competences resulting from projects performed with leading research in various scientific domains including biology, physics, life sciences and Earth sciences, for a number of various universities. Support is provided 24/7 in enterprise quality. Online tools, including a price calculator, health status dashboard, extensive knowledge base, FAQ, community forum, blog and YouTube channel provide users with various tutorials and enable a very quick onboarding.

4.3 CloudSigma

CloudSigma is a leading European infrastructure-as-a-service (IaaS) provider with a focus on flexibility, performance, and excellent customer support. CloudSigma has built its own cloud stack that delivers real utility computing in the cloud for the first time and allows to enable the digital economy through flexible, enterprise-class public, hybrid and private cloud servers and hosting solutions, worldwide.

All services of CloudSigma are offered via European companies and highest-quality ISO-certified European locations providing a 100% European law compliant solution without exposure to the USA Patriot Act or other legal jurisdictions.

CloudSigma has a long track record of collaborating in the academic sector to assist institutions and end users adopt the cloud. Experience has helped us formulate specific use cases and develop services targeted at various

[3] More information: https://www.a1.net/exoscale

infrastructure challenges faced by the academic community. Direct peering to GÉANT as well as eduGAIN authentication have been part of CloudSigma's service portfolio for years.

The high flexibility of the infrastructure is enjoyed by more than 50 scientists, researchers, and academic institutions. Our active customers include institutions such as ESA, ECMWF, Leibniz Institute for Plasma Science and Technology, Oxford Brookes University, and many others.

4.3.1 CloudSigma Portfolio

4.3.1.1 Infrastructure-as-a-Service

CloudSigma provides a customisable approach to cloud services. Customers are able to provision compute, storage, networking and other resources independently to allow the best combination of cloud resources without the limitation of fixed server sizes.

Each resource is billed separately and transparently as either subscription or as on-demand, 5-minute billing segments, enabling customers to achieve maximum cost savings. Any operating system and software can be installed unmodified with complete admin/root control.

Customers are able to extend private networks out of their existing infrastructure and elastically fit into CloudSigma's public cloud. This allows them to create easy to manage and transparent private or hybrid cloud solutions.

4.3.1.2 Platform-as-a-Service

CloudSigma's turnkey PaaS microservices environment is a next-generation container-based cloud platform with certified runtimes for Java, PHP, Ruby, Python, .NET, Node.js, and Go. It offers one-click clustered solutions that reduce customers' IT infrastructure management costs and efforts.

4.3.1.3 Other Solutions

CloudSigma offers a range of value-added solutions such as business continuity features, disaster recovery-as-a-service, virtual router, free migration services and security features.

4.3.1.4 Special Offerings

CloudSigma invites every single customer under the OCRE Framework Agreement to test our cloud free of charge.

4.4 Setcor

Setcor (Previously itSoft) has been cooperating with the world's leading ICT companies for over 30 years, providing telecommunications and Cloud services, as well as complex network and security solutions.

The main focus of Setcor is to provide customers with solutions that will reduce unnecessary loss of large amounts of expensive, upfront investments and human resources in an attempt to manage their ICT needs. Instead of focusing on solving ICT problems, our goal is to strengthen companies' market position by supporting the management and maintenance of the ICT infrastructure.

Setcor Cloud is an ICT solution that moves the entire user's business to the Cloud. Adapting to the user needs, user has access to the system via the network, anytime and anywhere with unlimited amounts of resources (hard drive, processor, memory and more).

Setcor's solutions help customers to modernise their entire ICT infrastructure without investing in their own equipment, raising their value, and enabling them to be fully digitally transformed that is necessary for every company that wants to operate in a transparent and competitive way.

4.4.1 Setcor Cloud Portfolio

Setcor is primarily focused on the cloud solutions business and are market leaders in Cloud solutions and services space.

Setcor provides the following services: Cloud, Collocation, Telco, System integration, System maintenance, Consulting.

Cloud Solutions:

- Infrastructure as a Service (Setcor IaaS);
- Software as a Service (Setcor SaaS);
- Security as a Service (Setcor SECaaS);
- Backup as a Service (Setcor BaaS);
- Platform as a Service (Setcor PaaS);
- Disaster Recovery (Setcor DRaaS).

Setcor Support Center:

- Setcor Support Center eliminates all customer difficulties in the fastest possible time, easily and without stress. Professional support is at disposal 24/7/365 whether it is technical support or need for information about our products or services.
- There are currently more than 4,000 clients, including large banking institutions, insurance companies, the auto industry, hospitals, educational as well as state institutions.

4.5 Exoscale

Exoscale is powered by A1 Macedonia – a part of the A1 Telekom Austria Group.

A1 Macedonia has been contracted to supply the European research and academic communities with Exoscale.com cloud computing services. This includes Exoscale infrastructure services (IaaS: compute, storage, networking) and Professional Services.

Exoscale – a part of A1 Telekom Austria Group – is a cloud service provider offering scalable infrastructure and platform hosting.

4.5.1 Exoscale Cloud Portfolio

Exoscale offers all the building blocks needed to build your cloud native application: Compute, Object Storage, Kubernetes, DNS management, and more, acessible from a web portal, API or CLI. Exoscale provides costs predictability and granularity

With six (6) datacenters located in Germany and across Europe, application owners can select the best location for their data – no hidden backups. Operated and serviced by our local team of experts and developers, experienced in highly critical environments and industries to ensure data and services are safe from any technical or legal harm.

4.6 CloudFerro

CloudFerro is a provider of innovative cloud services, providing cloud computing and data storage in the service mode (IaaS - Infrastructure as a Service). CloudFerro builds and operates cloud computing platforms for specialised market segments, such as the European space and meteorological sector. The broad experience in storing and processing big data sets includes multi-petabyte repositories of Earth Observation satellite data.

CloudFerro is fully European private ICT company with Polish roots. They offer elastic cloud solutions in a public, private or hybrid cloud deployment model, based on cost-effective open-source technologies (such as OpenStack and Ceph), customised to meet user needs. The extensive range of ancillary services and dedicated, technical support is delivered by an experienced, local team with unique competences.

CloudFerro's solutions are used by leading European firms and scientific institutions from various market sectors, which process big data, including the European Space Agency (ESA), the European Centre for Medium-Range Weather Forecasts (ECMWF), Mercator Ocean International, German Aerospace Centre (DLR), the EGI and many others.

4.6.1 Cloudferro Cloud Portfolio

On a CREODIAS platform is offered:

- Cloud computing environment based on OpenStack system with all key elements: virtual machines, dedicated bare metal servers, containers, operating system, and software images. Our public cloud is available at CREOIDAS.eu.
- Storage services: HDD, SSD storage, VM images and snapshots, object storage and backup solution.
- Data related services: over 20 PB of free EO data - near real time satellite imagery and time series from Copernicus program with EO Browser and EO Finder for data search, ordering and API access, plus VHR EO data (up to 50 cm spatial resolution).
- Virtual networking services: virtual networks, virtual routers, Internet connectivity, public IP numbers, Load Balancer as a Service virtual (LBaaS) appliance.
- Security services: authentication and authorization service (OpenStack Keystone), access groups, Firewall as a Service (FWaaS) virtual appliance, VPN as a Service, software upgrades.
- Jupyter Notebooks - free of charge web-based programming environment, seamlessly connected with Earth Observation data repository. Perfect platform for prototyping and developing new ideas for algorithms and services.
- Professional Support: The support based on the internal support team, covered by in-house teams as CloudFerro controls its full technology stack (from hardware to open-source software).
- Full offer available at: https://creodias.eu/price-list.

4.7 Sparkle

Sparkle is the first international service provider in Italy and among the top ten global operators, offering a complete range of IP, Data, Cloud, Data Center, Mobile and Voice solutions, with a global proprietary network of over 600,000 km of fibre, a direct presence in 33 countries and an international workforce distributed worldwide.

Selected in 2016 as qualified provider in the context of GÉANT IaaS Cloud Framework project, Sparkle works with major institutions and cloud service providers enabling research and education organisations to provision cloud services avoiding time-consuming and costly procurement processes.

Within OCRE, Sparkle worked as a Google Cloud integrator and provider of professional services in 27 European countries.

4.7.1 Sparkle Cloud Portfolio

Sparkle will provide Google Cloud based solutions, Google Workspace and Workspace for Educations services, along with customer support tools, to facilitate the provisioning activities and the consumption control, everything accessible in Single Sign On thanks to the Federation with eduGAIN.

Sparkle's experienced team, augmented by the sister company Noovle, TIM Group's centre of excellence for cloud and edge computing, will support institutions throughout their cloud journey, by providing services of design, migration, management, consultancy, to make sure that cloud services are integrated into their daily research activities.

4.8 Phoenix Software

Phoenix Software is the leading education solution and managed service provider in the UK. Offering internal consultancy services, as well as a strong stable of leading partners, we can support from inception, to scope, to delivery and user adoption.

The education and research institutes experience has changed rapidly and will continue to evolve as more and more institutes are looking to meet their strategic demands and deliver innovations whether on-premises, at home or in a hybrid environment.

4.8.1 Phoenix Software Cloud Portfolio

By working with OCRE, Phoenix will accelerate cloud adoption and enhance capabilities in the education and research community. Phoenix will assist with procuring Microsoft Azure services through the OCRE framework.

Making Azure adoption easier, the OCRE framework is available to GÉANT members, enables over 10,000 universities and research institutions, served by 40 National Research and Education Network (NREN) organisations across Europe, to benefit from:

- Significant discounts across Azure services;
- Ready-to-use contracts designed to satisfy national and European public sector procurement regulations and GDPR requirements;
- Significantly reduced network traffic costs with Microsoft services connected to the high-performance data networks provided by GÉANT and its NREN partners;
- Leverage Azure AD to provide federated SSO and enable RBAC and governance of Azure services;
- Azure Professional Direct Support discounts;
- Leverage Microsoft Software Assurance and Student Use Benefits to further reduce Azure costs.

4.9 Rackspace

Rackspace Technology is a leading Cloud Systems integrator providing the resale of AWS Cloud infrastructure together with Professional, Consulting and Managed Services to support customers in their Cloud Journey. With 15 AWS competencies and 2,700 certifications, Rackspace Technology has the breadth of technical capability to address the wide variety of use cases we see across Education and Research. Rackspace works closely with its partner, AWS, to offer support from the inception of your project through to delivery, operational support, and optimisation.

4.9.1 Rackspace Technology Cloud Portfolio

Rackspace Technology delivers the full AWS portfolio as per the AWS catalogue available at AWS.Amazon.com. Rackspace Technology also offers Professional and Managed Support Services from either the Rackspace team or from the AWS ProServe Organisation. The product portfolio is further complemented by a range of security, networking, and data products available in the AWS marketplace (available via Private offer and not Public Offer). The full complement of commercial price programs such as Spot, Reserved Instances and Savings Plans are also available in the OCRE framework via Rackspace as are the various funding programs to support NREN cloud adoption.

4.10 VSHN[4]

VSHN/Exoscale is providing cloud services such as compute, network storage (SSD & S3), GPU, VPC) in fully guaranteed data locations in Europe. This also includes different Kubernetes services, DBaaS SaaS with DevOps and professional services support as well as application management.

VSHN is ISO27001, ISO27018 certified, it is also GDPR compliant and an ISAE 3402 audit report Most services are billed by the hour with additional framework discounts available (10% on compute services and 5 to 10% on pre-commit contracts). Existing customers include banks, insurance companies, CERN, and the Swiss Federal Archives

4.11 Jisc

Jisc Cloud Solutions is a division of Jisc offering cloud consultancy, professional services, and managed services across multiple cloud platforms. Jisc is an AWS Advanced Consulting partner and Public Sector Solutions Provider

Jisc provides UK universities and colleges with shared digital infrastructure and services, such as the superfast Janet Network. Jisc offers expert and trusted advice on digital technology for education and research, built from over 30 years' experience.

[4] For more detailed info visit https://www.vshn.ch/ocre/

4.11.1 Jisc Cloud Portfolio[5]

Jisc is the UK AWS reseller on the OCRE Cloud Framework. We offer a 14% discount on AWS services coupled with a range of free and paid-for managed services, professional services, and cloud consultancy. The AWS discount covers most AWS services but excludes the AWS Marketplace. The discount comes with no spend commitments or growth commitments and so is really flexible.

4.12 Cloud&Heat

Since its foundation in 2011, Cloud&Heat's mission has been to make sustainability and security the drivers of digital innovation. The Dresden based company develops, builds, and operates energy-efficient and secure digital infrastructures, which address the requirements of a digital future. With its innovative products and patented technology, Cloud&Heat meets the rapidly growing demand for digitalization and confronts the challenges of energy transition and climate change.

4.12.1 Cloud & Heat Cloud Portfolio

As a cloud provider and data centre infrastructure specialist, Cloud&Heat offers green, secure, and tailored IaaS within the OCRE framework. The IaaS offer is based on OpenStack and further includes lifecycle management and cloud infrastructure operation, monitoring, maintenance, and optimization.

In addition, Cloud&Heat has developed SecuStack, a security-hardened cloud operating system, as part of a joint venture together with secunet AG. SecuStack combines the API-compatible OpenStack version with enhanced security functions. By integrating cryptographic mechanisms, the transmission, storage, and processing of data as well as resource networking are consistently secured to enable digital sovereignty for the user and to raise trust in digital infrastructures. For highly facilitated management of containerized applications with further helpful standard components, Cloud&Heat also offers a Managed Kubernetes Service.

4.13 Orange

As leading European IT integrator and telecoms operator, our priority at Orange (Business Services) is to provide the right tools and expertise to build and manage IT, from infrastructure, to data security.

Through the Open Cloud for Research Environments (OCRE) framework, Orange is proud to provide in 20 countries its global public cloud platform: Flexible Engine, which has been designed to bring you all the benefits of cloud including flexibility, improved collaboration, security, and efficiencies.

4.13.1 Orange Cloud Portfolio

Trust is fundamental to Flexible Engine's DNA, assuring security and data sovereignty, with Flexible Engine You can be safe in the knowledge that your most sensitive data is safe with us. Orange Cloud portfolio offers European hosting via 5 data centres located in Europe, European contact, and very important European compliance.

Artificial Intelligence (AI) can revolutionize research, sifting through vast amounts of data and analysing data sets for invaluable insight. ModelArts, the AI development platform on Flexible Engine, is an affordable, inclusive tool adaptable to all levels of expertise. It has been to be ready to go straight from the box. It allows you to develop AI models for all your use cases.

4.14 OVHcloud

OVHcloud is a global player and the leading European cloud provider operating 400,000 servers within over 30 data centres across 4 continents. For 20 years, the Group has been leveraging an integrated model that provides full control of our value chain, from designing our servers to managing our data centres through to orchestrating our fibre-optic network. This unique approach enables OVHcloud to cover, independently, the full spectrum of use cases for our 1.6 million customers across 140 countries. OVHcloud now offers customers latest-generation

[5] For more information see https://www.jisc.ac.uk/ocre-and-aws-cloud

solutions that combine high performance, predictable pricing, and full data sovereignty to support their unfettered growth.

4.15 100 Percent IT

A long-standing partner of academic and research institutions, 100 Percent IT is a multi-award-winning Berkshire-based organisation developing innovative technology for academic and research communities using our expertise to provide several IaaS and Cloud hosting solutions designed for sensitive data. With over 20 years' experience in IT, 100 Percent IT is a trusted partner to our clients including Government and numerous public sector organisations. As members of the UK's cyber innovation ecosystem through partnerships such as LORCA we are committed to provide the tools and technology to drive UK research and education in IT and cybersecurity.

After significant investment in improving the OpenStack cloud suite we have created a fully managed, ultra-reliable, self-healing public cloud platform which combines the flexibility and cost efficiency of a public cloud, with the security, privacy, and performance of a private cloud. Developed with the University of Oxford, our patented 'Trusted Cloud' platform under our CyberHive brand further secures the integrity of this platform from hacking, human error, and security vulnerabilities by providing real-time anomaly and breach detection.

Our IaaS services pair with highly interconnected collocated datacentres in London via LINX, and with access to Jisc's Janet network securely and cost-effectively empowering education and research across the UK.

4.15.1 100 Percent Cloud Portfolio

100 Percent IT offers several IaaS platform services based on its Trusted Cloud technology. Partners are offered a multi-tenant cloud platform based on the OpenStack framework with the ability to manage their environments and resources including highly scalable distributed persistent storage with a choice of HDDs or high-performance SSDs, compute nodes, and SDN via a self-service portal or API. All services offer options for distributed backup and disaster recovery within the UK. Provisioned servers support physical failover, triple data redundancy, customisable firewall protection and UK based tech support.

Based on our Trusted Cloud technology developed with the University of Oxford our IaaS platforms can detect intrusions and anomalies in seconds and use hardware-backed distributed whitelisting which is virtually impervious to hacking, secure against human error, and offers integrity verification independently of the cloud provider through use of a secure audit trail to an in-house trust verification platform.

Compute resources are fully elastic and can be configured with vCPU, RAM, HDD (650 IOPS) or SSD (10K IOPS), IPv4 addressing, GPU resource, and software-defined networking components such as firewalls, load balancers and DDoS protection. As a Microsoft SPLA partner, we can also provide any Microsoft software as required including Exchange, Office, SQL Server etc.

4.16 Vancis

Vancis is the managed cloud company in the Netherlands, helping organizations to discover the benefits of the cloud. By offering vision and strategy, Vancis helps to reduce costs and complexity.

Vancis' goals are to offer our customers peace of mind by automating their business IT and provide efficient solutions. So that customers can focus on their core business.

Vancis provides cloud and network solutions for education, healthcare, research, biopharma and industry. For profit and non-profit organisations. Vancis has over 20 years of experience in these fields. Our team of over 100 enthusiastic experts have all the necessary technical skills, business insights and market knowledge to help you with the solution or goal that you require.

Vancis advises customers the cloud strategy that is best for their organization, workflows, and goals.

Vancis Cloud Portfolio

The portfolio provides a secure, regularly audited environment, with a cloud service for easy access and sharing of documents and files.

Applications and functionality can be added or removed, with reports and billing based on resources used.

The Cloud platform is located in the two best-connected datacentres in the Amsterdam region providing fast connections, high availability and low costs. Security and privacy are also a priority.

4.17 x-ion

X-ion is a pioneer for cloud services based in Hamburg, Germany. X-ion creates tailor-made and high-quality solutions. Our cloud infrastructure (IaaS) is managed and supported by us, a manufacturer-independent team of experts. The services we provide are the basis for our customers' success. Via a clear and intuitive UI (xBoard) our customers can select the services they need and start right away.

When designing the services, we respond to individual requirements and are able to create the best possible solution for our customers. Therefore x-ion uses its knowledge in state-of-the-art technologies and open source frameworks, e.g. OpenStack, CEPH and Kubernetes.

4.17.1 x-ion Cloud Portfolio

xStack - OpenStack-as-a-Service To make IT infrastructure highly scalable, flexible, and efficient, we rely on the power of OpenStack. This open-source project has become the de facto standard to provide complex cloud architectures (public and private). It allows you to build and securely manage a network ecosystem.

xKube - Managed Kubernetes orchestrates all necessary administrative work and make its simple for customers. You get dashboard access, manage the required instances, and install addons and features as needed. In short: full control for you and therefore full focus on your applications.

xStore - Object Storage-as-a-Service (CEPH) The exploding data generated by new technologies such as IoT, Artificial Intelligence or Machine Learning quickly push classic and established storage systems to their limits, especially when running a cloud-based IT infrastructure. With xSTore Object Storage based on CEPH companies can store their data in a meaningful and efficient way and give them the opportunity to utilize the potential hidden in the flood of data.

xBackup - Backup-as-a-Service (S3) Unrestrained data growth leads to an increasing burden on IT budgets and the fact that managers and administrators are forced to find more efficient and effective ways to protect the vast amount of data. One of the easiest ways is a backup via our S3 endpoint.

xScan - SecScan-as-a-Service With the increasing complexity of IT systems, the number of potential attack points grows. Compared to traditional IT systems, the security requirements for a highly scalable, flexible, and efficient cloud infrastructure are even higher. xScan can quickly detect and permanently eliminate all possible vulnerabilities before anyone can take advantage of them.

4.18 City Network Sweden

A global public cloud provider of IaaS, Infrastructure as a Service We deliver public, compliant and private clouds based on OpenStack.

Certified according to ISO 9001, 14001, 27001, 27010, 27013, 27015, 27017 and 27018 – internationally recognized standards for quality, sustainability, and information security.

4.18.1 City Network Sweden Cloud Portfolio

With our service compliant cloud, it is ensured that customers comply with demands originating from specific laws and regulations concerning auditing, reputability, data handling and data security such as Basel, Solvency and GDPR. Unique in providing programmable infrastructure with the correct regulatory compliance for European organizations with any type of data.

City Network offers a global Public Cloud as well as Compliant Cloud for companies with higher regulatory challenges and a private Cloud option. Bespoke consulting is also available for online educational services.

4.19 Proact

PHC is Proact's very own Infrastructure as a Service platform. Essentially, it provides all the scalable infrastructure you would normally get from a public cloud hyperscaler, but with some very important advantages.

Besides the right technology, Proact can offer all the help that you need, in the shape of professional services that cover everything from consultancy, design and implementation, to maintenance, service management and optimisation.

4.19.1 Proact Cloud Portfolio[6]

PHC is our own platform: We blueprinted and built PHC from the ground-up, based on our knowledge and experience. If you take advantage of PHC's resources, you're dealing directly with the company that offers it, not with a third party that is managing resources from one of the big hyperscalers.

PHC is the local option: Many of our customers prefer to use PHC IaaS because completely European. As a PHC customer, you can even choose your preferred location. This means that no foreign government can request access to your data (such as the CLOUD Act).

Cost efficiency: Because we create an environment that matches your needs exactly. Should your needs change, your service delivery manager will be able to optimise your infrastructure as necessary.

4.20 Micromail

Micromail is a Microsoft Licensing Solutions Partner (LSP) based in Ireland with offices in Cork and Dublin. Micromail has been selected as the exclusive supplier of Microsoft Azure in Ireland under the OCRE IaaS+ framework agreement. For the past 4 years Micromail has been a supplier of Microsoft Azure under the GEANT framework. OCRE is the successor to GEANT, so we are very happy to continue to supply Azure and associated services to the Higher and Further Education community within Ireland for the next 4 years.

4.20.1 Mircomail Cloud Portfolio

Micromail offer the following to Higher and Further Education organisations in Ireland as part of the OCRE framework:

- Discounted Azure consumption rates;
- Expert licensing, billing, contractual and procurement advice from our dedicated Education team;
- Azure Professional Services such as Migration, Modernisation of Applications and Cloud Management & Operations delivered by our parent company Ergo, Microsoft Ireland Partner of the Year 2020 and recently announced as one of three global finalists from 4,400 entries across 100 countries for Microsoft Education Partner of the Year 2021;
- LinkedIn Learning at special pricing with Campus-wide licensing options giving access to a digital library of over 16,000 expert-led courses.

4.21 Comtrade

Comtrade System Integration (CTSI) is one of the leading regional system integrators, with access to many European markets. By moving operations to the cloud, customers can gain the flexibility, scalability and agility your business needs to stay competitive and responsive to market changes and opportunities. Therefore, all parameters aimed to be solved through OCRE.

4.21.1 Comtrade Cloud Portfolio

CTSI can provide many services through Comtrade Cloud, especially tailor-made cloud solutions that can be customized to unique business processes. Aside from the customized service portfolio, CTSI is also offering the following services in the Comtrade Cloud:

[6] For a first look and feel go to: https://vimeo.com/555134053

- Platform as a Service - Platform as a service provides you with a production-ready cloud environment for building and deploying applications. Infrastructure as a Service - helps you create and manage a virtual infrastructure built on world-class computing resources inside Comtrade data centres. No investment in hardware.
- Disaster Recovery as a Service - Our disaster recovery solutions hosted in the cloud are perfect for businesses that need to protect their IT environment, to avoid high costs of building and maintaining a secondary physical site.
- Backup as a service - Data is one of your most valuable assets - and as such, it needs to be protected. Our cloud backup solution, which reduces the need for on premise technology, the cost of storage and the time spent on managing complex data backups.

4.22 Bechtle Azure

Bechtle is your strategic partner for IT consultancy, procurement, and implementation.

Bechtle has local offices in 14 European countries and works across Europe as your trusted advisor with extensive capabilities. One of them is our AZURE OCRE cloud promise.

Providing a secure, affordable and data protection law compliant solution to more global regions than any other cloud provider. Organizations around the world value Microsoft Azure's most trusted cloud service for enterprise and hybrid infrastructures.

4.22.1 Bechtle Cloud Portfolio

The Bechtle and AZURE offering gives you access to Azure Marketplace with access to purchase also other vendor and third-party licensing, Git Hub and LinkedIn Learning.

- Bechtle has 12 Microsoft Gold Partner statuses in all areas. Over 600 of our consultants and sales specialists have been trained in Azure and Microsoft 365 to date and over 1,700 Microsoft certifications have been gained.
- Bechtle as an Azure Expert MSP counts as one of Microsoft's strongest global partners.
- Bechtle offers a broad Azure portfolio within the OCRE framework agreement.

In addition to standardized offers for the introduction of Azure, migrations of workloads and the associated establishment of a modern and secure IT infrastructure, we also offer individual projects tailored to the customer. Our goal is to provide the customer with complete advice. In addition, with our specialists we also have the opportunity to offer projects in the areas of IoT, Data & AI. Here we also offer individual solution development based on Azure. The offer is rounded off by a managed service in which we take parts or the entire Azure infrastructure into our operation.

Here, too, we attach great importance to cost optimization and security. Our individual services and portfolio differ from the different countries and customers.

- Bechtle IONOS Bechtle is your strategic partner for IT consultancy, procurement, and implementation. Bechtle has local offices in 14 European countries and works across Europe as your trusted advisor with extensive capabilities. One of them is our Bechtle IONOS cloud promise.
- Bechtle has a lot of experience as a Multicloud Provider and our cloud team offers our customers the perfect individualized cloud solutions. IONOS cloud is a European cloud alternative and part of the Bechtle portfolio that, with eight million customer contracts, is the leading European provider of cloud infrastructure, cloud services and hosting services.
- Bechtle is by your side, every step of the way, with a dedicated Bechtle team. Bechtle helps with the setup and migration to the cloud, and with our experts Bechtle helps to find the right approach for each customer individual setup.

Advice on and access to Infrastructure-as-a-Service technology (IaaS) made in Germany by IONOS cloud without the need for writing new tenders. With the IONOS Cloud, we support our customers in obtaining cloud services from Germany in a data protection compliant manner. Giving our customer the freedom to decide where the data are is stored (e.g. only in European data centres). 100% flexibility and scalability at attractive

conditions. Bechtle helps to identify which workloads can be sensibly moved to the cloud to achieve the greatest benefit. Transparent pricing model without any hidden costs or subscriptions. Cloud workshops onsite or online.

End-to-end support in the migration of cloud-based services. IONOS data centres and offices are powered with green energy from a sustainable service provider.

4.23 Neos

Neos provides business solutions and services covering System Infrastructure and Cloud Integration based on relational and Big Data platforms in Multicloud and Hybrid environments. Neos has been an Oracle Certified Partner since 2002, attaining numerous Oracle specialisations.

In recognition of our expertise in Cloud Platform Data Management, Cloud Native and other areas, Neos has been awarded 35 Cloud Expertises in all Oracle Partner Network tracks: Cloud Build, Cloud Sell, Cloud Service and License & Hardware.

As of the beginning of 2021, Neos has been assigned to offer Oracle Cloud Services as part of the OCRE Framework.

The OCRE Cloud Framework is a standardized contractual vehicle and procurement process offering to the R&E community an easy, safe, predictable, and controlled modality to purchase cloud solutions and ancillary professional services.

Under the OCRE Framework Agreement, Neos is Oracle Cloud integrator and provider of professional services to support the move to the cloud or start the cloud journey for R&E institutions in Croatia.

4.23.1 Neos Cloud Portfolio

Working with OCRE allows Neos to provide reliable Oracle services and infrastructure at best terms and conditions for research institutions and universities.

- Autonomous services;
- Autonomous Database delivers higher performance, better security, and improved operational efficiency, and frees up more time to focus on building research platforms and other applications;
- Reduced cost and enhanced performance;
- Oracle Cloud Infrastructure is built for institutions seeking higher performance, lower costs, and easier cloud migration for their existing on-premises services, and better price-performance for cloud native workloads;
- Easy migration of complex workloads;
- Designed to deliver bare-metal compute services, network traffic isolation, and the only service-level guarantees for performance, Oracle Cloud enables rapid migration and faster time to innovation. Build new value around migrated workloads faster with Autonomous Database, data science tools, and our cloud native development tool;
- Best support for hybrid architectures;
- Deploy your cloud workloads – applications and databases – anywhere with a wide choice of options, ranging from public regions to edge devices. Additionally, Oracle offers full private Dedicated Regions in customers data centres. With full support for VMware environments in the customer tenancy as well, Oracle offers cloud computing that works the way you expect;

Also, we have set up the following landing page: https://www.neos.hr/ocre/.

4.24 Layershift

Layershift are a Manchester-based Managed Cloud Hosting provider with datacentre presence in the UK, US, and Singapore. Since 2001, we have been delivering Enterprise-class Managed hosting solutions focused on flexibility, security, and business continuity.

We stand out from the competition by actively listening and understanding the challenges our clients are facing. We work with you to review your technology strategy, implementation options and what matters most to your business and then deliver a long-term solution that's fairly and transparently priced.

We are a team of dedicated consultants and IT support professionals who value close partnerships with our clients, and we strive to always deliver exceptional services. Our hosting experts are constantly going above and beyond the call of duty to support our clients.

4.24.1 Layershift Cloud Portfolio

- Jelastic PaaS - DevOps focused platform-as-a-service designed to simplify IT infrastructure management and reduce hosting related costs, with the help of automatic vertical and horizontal scaling and pay-per-use hourly billing;
- EhloMail - Cloud-based email and collaboration platform managed and hosted by Layershift. A cost-effective alternative to an in-house email server, EhloMail includes enhanced Security, built-in Redundancy and Archiving & Discovery support;
- Platform Management & Support;
- SL Certificates.

4.25 Safespring

Safespring is a Swedish cloud service provider that offers Compute, Kubernetes, Storage, Backup and Networking based on open-source technology. Safespring's platform is designed to follow European regulations and laws including GDPR. The service is suitable for organisations that handle research data and must comply with all laws and regulations but want all the benefits of powerful and scalable cloud resources. Safesprings customers are found mainly within the public sector and include government organisations, research projects, and universities.

4.25.1 Safespring Cloud Portfolio

The Compute service is based on the market leading cloud platform OpenStack. The service is flexible, fully automated and based on self-service through a portal. The user can with few, simple steps start and stop new servers. It is also possible to manage and control provisioning of servers programmatically via an API.

Safespring offers a ISO27001 and GDPR compliant distribution of Kubernetes that is delivered as a service.

Safespring also provides an object-storage service that expose an S3 interface to your application. The service is optimized for large and cost-efficient storage and is well suited for research data in the petabyte range. In addition, Safespring provide a cloud backup service.

4.26 ATEA

ATEA is the market leader in IT infrastructure in the Nordic & Baltic region and third largest IT infrastructure provider in Europe. With over 60 years presence in the industry ATEA offers professional, quality-conscious, and competent assistance to 30,000 customers with value-adding digital solutions. Atea supplies its customers as an IT reseller, System Integrator and Service Provider, creating value within Information Management, Digital Workplace and Hybrid Platforms.

4.26.1 Atea Cloud Portfolio

ATEA offers its customers a full range of IT infrastructure solutions from a single source and has the highest level of vendor certification across its key technology partners. Through experience and the well-defined CloudTrack framework ATEA will support and guide institutions in their digital transformation with Oracle Cloud.

4.27 AppXite

AppXite is proud to be awarded EU tender in 21 countries and can't wait to deliver ground-breaking IaaS, PaaS and SaaS IBM solutions to the OCRE research community in cooperation with IBM Cloud, IBM Research, IBM Data and AI, IBM Watson Health, IBM Watson and creating a focused success over the next 4 years together with specialist research IBM partners in all the 21 countries. We are an experienced multi-cloud provider with extensive partner network, know how, support and ease of use platform. We are not an agreement engine, but a usage engine – we focus on how customers can achieve results by using IBM solutions.

4.27.1 Appxite Cloud Portfolio

AppXite maintains an IBM catalogue of over 200 software and services making it available for the public via the AppXite Platform.

Higher education institutions are undergoing a major shift from the digital age to a new generation of automation -The Cognitive Era, that includes artificial intelligence, robotic process automation and insightful analytics helping universities create more personalized services for students and employees. While attracting, retaining, and training faculty, professors, and administrators is essential, the university must also keep pace with cognitive solutions focused on the student. Cognitive solutions leveraged through IBM Public Cloud like IBM Watson and AI are being used to address the critical needs of student engagement, academic discovery and teacher advising.

IBM cloud delivers also HPC computing, Look to the IBM Cloud for a security-rich, hybrid model and fully cloud-contained options that allow you to build tailored HPC solutions using the latest technologies. In the era of ever-present attacks and breaches, IBM offers a scalable suite of cloud security technologies and solutions that are made more robust and complete through pervasive encryption and AI plus automation and integration

Going above and beyond, IBM Cloud can also provide Quantum computing, produce high-quality research, and test ideas using cutting-edge software, systems, and quantum development tools. IBM Quantum is your most passionate collaborator to advance foundational quantum computing research that will make real-world impact. Work with the best experts across experimentation, theory, and computer science and explore new possibilities in the field of quantum computing.

IBM Quantum Experience is quantum on the cloud, Accelerate your research and applications with the next generation of the leading quantum cloud services and software platform.

IBM Quantum Experience, New to quantum computing? Try out the IBM Quantum Experience to get started with Qiskit in the cloud. No installation required and free hosted tutorials. Work is saved in the cloud and automatically updated with every Qiskit release.

4.28 Telefónica

Telefónica, together with Google, offers a series of services under the OCRE framework agreement to help promote the use of IaaS/PaaS all around GEANT community.

Telefónica as Google's Premier Partner in Spain with preferential conditions for the commercialization of GCP and Google Workspace.

The solution is offered through a series of support flavours: BASIC, SELF-MANAGED and MANAGED. Specific Telefónica Portal (Soy Clouder) to manage them.

In addition, to accompany universities and research centres throughout their journey to the Cloud, we put PROFESSIONAL and MANAGED SERVICES at their disposal, incorporating Telefónica communications as differential values for customers.

4.28.1 Telefonica Cloud Portfolio

New Google Cloud region in Spain, located in Madrid at Data Centre.

- Moodle on Google;
- VDI on Google;
- Infrastructure Modernization;
- IA Capabilities: Student Success Platform;
- High Performance Computing;
- Data Securitization/Cloud environment (Chronicle + Beyondcorp Remote access + Elevenpaths);
- Cloud on board on Air for new GCP Users;
- Cloud Study Jams and Cloud Hero Workshops;
- Coursera Learning Platform;
- Kickstart program and other specific Training Resources;

- Google Cloud Learning Centre for Researchers;
- Academic Research Credits;
- Partner Services Funds;
- PoC/ Free Trials.

4.29 Quistor

Education and research institutions are entering a new era of unpredictable change. It's more important than ever to stay connected, deliver value, and be agile. To keep up with this change, organisations need to rethink their digital strategy. Quistor is your trusted partner to embark with you on this new journey. Offering technical expertise and in-depth knowledge, we will work with you towards digital transformation in your organisation following your personalised roadmap.

4.29.1 Quistor Cloud Portfolio:

- Cloud Consulting
- Native Migration
- Lift & Shift
- Managed Services
- Technical Support
- Disaster Recovery
- Exit Migration
- Tailored Solutions (i.e., Chatbots, API Connections, et cetera)

Quistor available by the GÉANT Association in Europe. Under the OCRE Framework Agreement Quistor is the exclusive reseller of Oracle Cloud services in six European countries: Belgium, the Czech Republic, Italy, the Netherlands, Spain, and the United Kingdom. Quistor supports European R&E institutions in their personalised journey to the cloud with our wide variety of service offerings.

Our experience in cloud consulting, project management and managed services in partnership with Oracle cloud solutions for the education and research sectors sets us apart from other cloud service providers. Our innovative approach led Quistor to win several Oracle Partner Awards: Oracle Cloud Infrastructure (FY20), Build a Cloud Culture (FY21) and Oracle Cloud Platform (FY21). With our strong European presence, Quistor is committed to offering the best software solutions, 24×7 services and expertise to provide ultimate flexibility to our customers' unique requirements.

4.30 Equinix

Equinix Business Cloud is the Infrastructure as a Service (IaaS) platform offering from Equinix Managed Services in the Netherlands. This IaaS platform offers a proven, flexible, and future-proof solution to the IT challenges of leading businesses in the public and private sectors.

With EBC, businesses can anticipate all possible growth scenarios while eliminating the need for a costly on-premises server infrastructure. And as an integrated part of Equinix FabricTM, which connects 200+ cloud and service providers, Equinix Business Cloud lies at the heart of the internet.

To meet different needs in performance, flexibility, and scalability, EBC is offered in three unique service models: EBC Shared, EBC Single Tenant and EBC Core.

Each service model also offers Network Functions Virtualization features like routing, load balancing and firewall services, as well as configuration and management of compute, storage and network via APIs or the self-service portal.

4.30.1 Equinix Cloud Portfolio

The most flexible service model in terms of scalability and consumption. EBC Shared offers the best price performance ratio for flexible compute, storage, and network. Applications use shared resources on a multitenant platform.

- *EBC Single Tenant (ST)*

The most robust and secure service model. Offers best-in-class performance levels for compute, storage, and network for your private cloud.

EBC ST is the designated platform for software licenses requiring dedicated non-shared compute resources or to bring your own licenses. This model uses dedicated resources in a secure, isolated environment.

- *EBC Core*

The most customizable service model. Like EBC Single Tenant, EBC Core also offers best-in-class performance levels, and customization options.

The model is also the designated platform for virtual workspace solutions and workloads that need direct access to the vCenter. EBC Core uses dedicated resources in a secure, isolated environment.

4.31 Computas

Computas is the cloud service provider on Google Cloud Platform for GÉANT member institutions in the Nordics, Romania, Moldova, Greece, and North Macedonia. Google and Computas have a unique partnership - Computas is Google Cloud Premier Partner and has one of the Nordic leading expert environments on Google Cloud Platform. We have specialization in Application Development and Machine Learning, experts in relevant areas (systems and application development, data management and analysis, machine learning and security, infrastructure) and consultants with expertise in methodology and innovation processes. Computas is a Nordic and South-Eastern European provider of IT solutions and consulting services, specializing in artificial intelligence, machine learning, and cloud-based solutions. We have over 280 consultants with cutting-edge expertise and experience in a wide range of disciplines. The professional culture is strongly rooted in the company and over 90% of the employees have a master's degree or higher.

Computas supports the research community and is working with the Norwegian Institute for Water Research, Norwegian Institute for Nature Research, National Library of Norway, Simula Research Laboratory, ICS Forth, SINTEF, CESSDA ERIC and University of Athens.

4.31.1 Computas Cloud Portfolio

Computas offers Google Cloud Platform services and other specific consulting services related to cloud adoption. Computas has created an Information and Ordering Portal that specifies in full detail our portfolio. Please visit our dedicated OCRE webpage to ask for access[7].

Under this agreement we are offering a general framework where GÉANT members can benefit from a whole list of discounted or free services:

- Local discounts applied for GÉANT customers when using Google Cloud Platform services;
- Free peering connection;
- Free trial Google Cloud credits;
- Free Trainings & Adoption Support;
- Free Cloud workshops – 4 events / year;
- No data egress fees (ingress/egress), up to a maximum discount of 15% of the total monthly Google Cloud fees;
- Sustained use discounts for Google Cloud Compute Engine;
- Discounts for committing for Google Cloud resources for 1 or 3 years;
- Computas cloud professional services on cloud adoption.

4.32 Logicalis

Logicalis has been selected on the OCRE Framework as an Oracle Platinum Partner and has a highly qualified consulting and managed service team. Our Oracle database, network, Linux, and Unix specialists, who already

[7] This is required for any new user since some administrative details are needed. No worries, we will walk you through the onboarding process.

operate various on-premises and cloud environments for customers and support our customers with complex database, Exadata, operating system and infrastructure problems, are at your disposal.

4.32.1 Logicalis Cloud Portfolio

Logicalis, as a HEAnet solution provider for the Oracle Cloud with a focus on IaaS and PaaS services, supports the members of the Irish research network in the following areas in order to enable the successful implementation of cloud projects:

Architecture and technology workshop with a focus on IaaS and PaaS

Advice from our architects and consultants with the aim of jointly designing a future-oriented system architecture that is adapted to customer specifications, considering new topics and corporate strategies, in order to meet customer requirements in terms of performance, availability and latency.

Migration and Upgrade

Migration of servers and databases to the cloud, considering the security recommendations and best practices applicable to the cloud infrastructure. An efficient upgrade and migration plan simplifies the processes.

Proof of Concepts for Cloud Solutions

In order to give you a secure feeling for the operation of your infrastructure, we offer you the possibility to test the desired solution in a PoC. If the requirements are met, a PoC environment can be converted into permanent use.

Managed Services

Relief of the database and system administrator team by outsourcing the operation of the cloud systems.

Oracle database Consulting

Solving problems in connection with the customer's existing Oracle databases, such as performance tuning of the environment.

4.33 Revolgy

Revolgy is a Premier Google Partner with 9+ years of experience in the Cloud Market. We have officially been awarded as a winner in the OCRE tender for 3 important countries: Czech Republic, Estonia, and Serbia.

So far, there were a lot of ongoing activities ran by us together Google, NREN managers, or key stakeholders from the organizations eligible for the OCRE project, as you will see below:

- Landing page GEANT + OCRE CZ;
- Landing page GEANT + OCRE EN;
- Webinar Landing page CZ;
- Webinar Landing page EN.

Webinar Learn how to get started with Google Cloud and OCRE framework:

- EN, March 31th 2021, recording;
- CZ, March 30th 2021, recording;
- Follow up slides in EN, CZ;
- Speakers - Bob Dohnal, Petr Dupák, Vlad Birsan.

Webinar for GEANT Vlad and Felix about Google Cloud and OCRE:

- May 27th 2021, speakers Vlad Birsan and Felix Manoharan

Webinar organized by Cesnet:

- CZ, June 1st 2021, recording, slides, speaker Michal Bém, 33 attendees + other cloud providers

4.33.1 Revolgy Cloud Portfolio

When it comes to the service portfolio, our experience helped us define flexible service stacks capable of meeting the companies exactly where they are in the cloud journey.

From creation of the architecture of the Cloud environment based on the customer needs and Google best practices up to the smooth Operations on the Cloud, using the Revolgy Managed Services. All of this, while acting as a single point of contact for all the important Google Services like GCP, Google Workspace, Google Maps, AppSheet, Apigee, and others.

4.34 SoftwareONE

SoftwareONE is a global system integrator and service company. We are proud of our unique ability to offer innovative and market-leading solutions for Academic Clients and we are delighted to provide GEANT members with the special OCRE framework agreement with discount on cloud infrastructure, network paired with service solutions.

4.34.1 SoftwareOne Cloud Portfolio

OCRE education and research members take advantage of discounted prices and reduced networks costs as well as services to scale academic research, support hybrid teaching and learning, improve personalize learning experience and can modernize academic institute operations.

Introducing new technologies into an organization creates many different challenges. These challenges can be as simple as cost monitoring, change management, user adoption, communication enablement and training requirements.

- *Free Value-Add Cloud Spent Management Service*

PyraCloud - For all OCRE members that enter this agreement, SoftwareONE will recommend to implement our own state of the art Service PyraCloud for license reporting, cost management, license usage and much more. PyraCloud will help accurate reporting to Microsoft and to maximize the value of your software estate. With a Software Portfolio Management software tool like PyraCloud you can save up to 30% on your annual spend, this spend you can free up an reinvest in further infrastructure resources.

- *Free Value-Add Provisioning and EDU ISV Service*

AcadCloud – SoftwareONE cloud-based solution that allows academic institutions to centrally manage and distribute all their software and other digital resources. Full web shop service – provides software and cloud dependant on user profile, built educational institutes and specifically higher education needs. More than 200 functions and reports on which software has been provisioned on students, faculty, and staff workstations all from an advanced admin console. SoftwareONE has a full-time team of 35 developers who are chartered for new features, functionality which is driven by customer feedback and demand.

4.35 Robotron

Robotron is Oracle Partner with specialization tracks in all fields of the Oracle Partner Environment (Cloud Sell, Cloud Build, Cloud Service and License and Hardware). Our company provides access and reselling to the Oracle Cloud Infrastructure (OCI) over the OCRE Framework. Additionally managed Services for Projects (Kick-off, Architecture, Implementation, Migration, Setup, Proof of concepts) and Operating (Monitoring, Budget Management, etc.) for all OCI services are provided as well.

4.36 Sentia

Sentia enables their customers to 'Lead the Way' by offering the Cloud Foundation for their business IT, successfully executing your Digital Transformation, and by making sure you have Control over their applications, data, security, and performance. We guarantee success with our Vested approach, 5D model, Managed Landing Zone and Application Performance Monitoring expertise.

Sentia is a leading European provider of hybrid cloud services and application management. The company designs, develops, manages, and monitors complex business-critical application landscapes in the cloud to help

its customers gain a leading position in their market. Sentia is a full-stack MSP offering solutions such as the 'Landing Zone' that provides automated 'infrastructure-as-code' platforms for hybrid cloud applications. Sentia has also further developed the 'vested' contract form, which focuses on continuous improvement of IT processes.

Sentia is premium Azure, Amazon Web Service and Google Cloud partner and offers the cloud journey integrated with Sentia's own cloud. Customers have in common that they place extremely high demands on the availability, performance, stability and security of systems and data. Sentia is able to offer a hybrid 'Cloud Foundation' for every application in every lifecycle and guide customers' 'Digital Transformation'. Moreover, we can optimize your IT environment with specialist application performance monitoring (APM). This gives Sentia a unique portfolio to realize its customers' digital ambitions.

4.37 CSI

The Nivola cloud services are now available through the new OCRE framework in Albania, Armenia, Bulgaria, Croatia, Italy, North Macedonia, and Serbia. Though this framework agreement CSI Piemonte, our partners and the Nivola platform will support the OCRE project in accelerating cloud adoption in the European research and education community.

CSI Piemonte Nivola cloud services are fully compliant with the General Data Protection Regulation (GDPR) and the International Organization for Standardization (ISO) standards. The Nivola platform is 100% Open Source, free from market technologies guarantees the stability necessary to build a state-of-the-art IT system.

CSI collaborates with a network of local partners to set up the closest possible relation with its customers, ensuring a better understanding of the territory and institutions, more rapidity in assistance and on-site interventions, support in the customers' native language.

The partnership provides a data centre with the flexibility of a software, offering computing power, storage, network, database, backup services available according to the logic of the Software Defined Data Centre, a model that the major IT organizations are adopting. Indeed, it guarantees complete autonomy in the creation of its information system and allows the migration of applications in absolute safety.

4.37.1 CSI OCRE Portfolio

The partnership offers:

- Cloud Enabling services:
  - assessment - on what to migrate on the cloud;
  - planning - to define the architecture that can facilitate the management of services;
  - rationalisation - to optimize resources and consumption;
  - migration - to manage the entire service migration phase process.
- Cloud services:
  - Compute Services - virtual servers, configurable by combining virtual CPU, RAM memory and storage space;
  - STaaS - performance or low-range disk space accessible via network;
  - DBaaS - fully managed open source and commercial database instances, with backup included;
  - BaaS - safeguard and restore data even after failures or malfunctions;
  - Network Security - network and security technologies to build a simple and high-performance cloud architecture.
- Cloud Management:
  - Virtual data centre management - guarantee of availability, integrity and confidentiality of information and data;
  - System management - Windows or Linux system management according to different service levels;
  - Monitoring - web interface to independently check the usage status of cloud resources (CPU, RAM and disk);
  - Log management - web interface for managing the logs of your applications and systems;

- Assistance - all the technical support you need to always get the most out of your cloud.

Appendix A-Supplier URL References

100 Percent IT	https://100percentit.com/
A1	https://www.a1.net/exoscale
AppXite	https://www.appxite.com/
ATEA	https://www.atea.com/
Bechtle Azure	https://azure.microsoft.com/
City Network Sweden	https://citynetwork.eu/company-information
Cloud&Heat	https://www.cloudandheat.com/
CloudFerro	https://creodias.eu
CloudSigma	https://www.cloudsigma.com/
Computas	https://computas.com/en/
Comtrade	https://comtradeintegration.com/en/
CSI	https://www.csipiemonte.it/en/cosa-facciamo/eccellenze/cloud
Equinix	https://www.equinix.co.uk/
Exoscale	https://www.exoscale.com/
Jisc	https://www.jisc.ac.uk/ocre-and-aws-cloud
Layershift	https://www.layershift.com/
Logicalis	https://www.ie.logicalis.com/solutions-services/oracle-cloud-services-for-heanet/overview/#
Micromail	https://www.micromail.com/
Neos	https://www.neos.hr/ocre/
Orange	https://www.orange.com/en
OVHcloud	https://www.ovh.co.uk/
Phoenix Software	https://www.phoenixs.co.uk/
Proact	https://www.proact.eu/?lang=en
Quistor	https://www.quistor.com/en/
Rackspace Technology	https://www.rackspace.com
Revolgy	https://revolgy.com/
Robotron	https://www.robotron.de/en/
Safespring	https://www.safespring.com/
Sentia	https://sentia.com/
Setcor	https://www.setcor.com/
SoftwareONE	https://www.softwareone.com/en-gb/
Sparkle	https://www.tisparkle.com/

Telefónica	https://www.telefonica.com/en/
T-Systems	https://www.t-systems.com/gb/en
Vancis	https://www.vancis.nl/
VSHN	https://www.vshn.ch/ocre/.
x-ion	https://www.x-ion.de/