



EOSC EU Node

Overview and Operations

EOSC-Projects Coordination Meeting 2024

20 June 2024

Peter Szegedi (DG CONNECT)

Spiros Athanasiou (Athena RC)

Norbert Meyer (PSNC)

EOSC EU Node

Overview

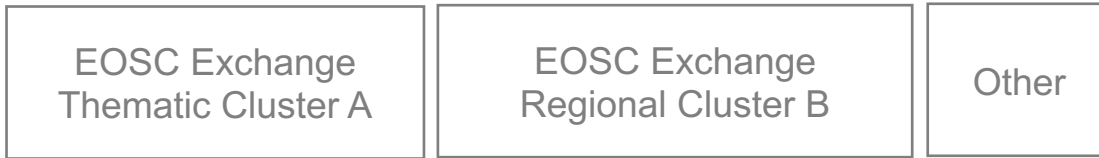
Peter Szegedi (DG CONNECT)

EOSC EU Node Characteristics

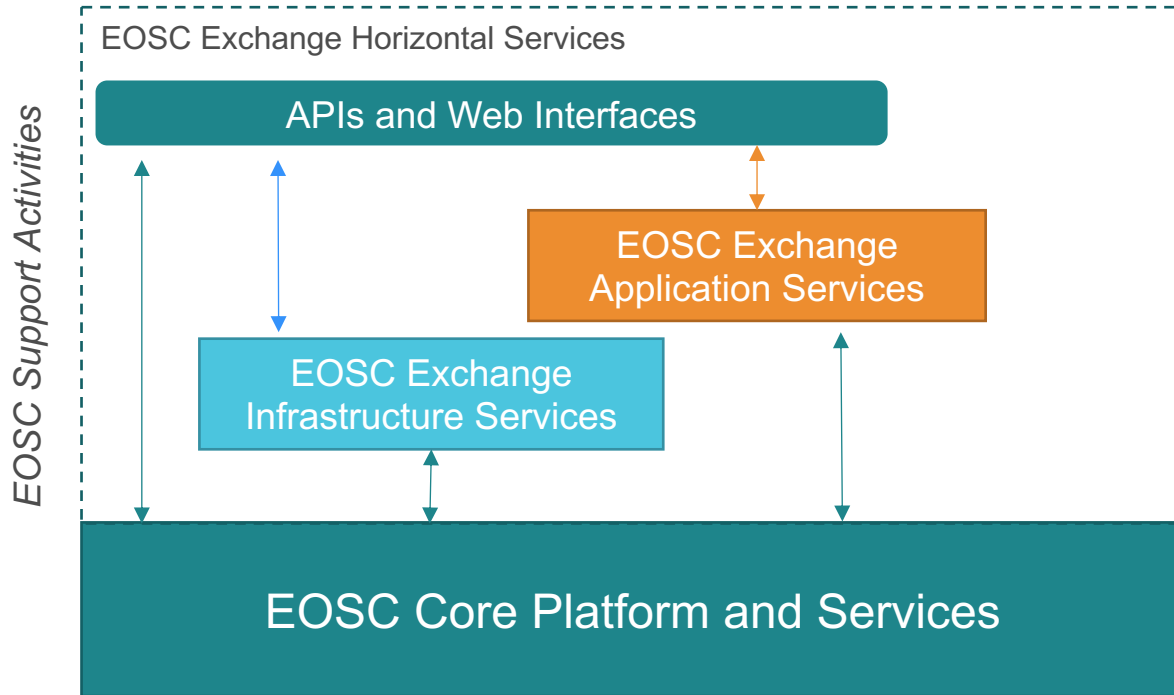
- **The first node of the EOSC Federation** provisioned from the EC (Lots 1/2/3) as the Service Business owner (DG CONNECT)
 - **European level multi-disciplinary and multi-national** scientific data/service portfolio for all research users and citizen scientists
 - **Serves as a blueprint for other EOSC Nodes**; architecture and open-source software
 - **Provides federating** capabilities (e.g. AAI via GEANT) and **SaaS** (e.g., Helpdesk) offerings to other Nodes (optional; lower the entry barrier/costs)
- **Discovery and sharing** of European **Research Output** (pubs, data, software, services) and **Tools** (recipes/templates) via the EOSC EU Node Metadata **Knowledge Graph** (MKG; OpenAIRE, EC data sources, EOSC Federation, Service Providers)
- **Provision of guaranteed and high-quality integrated compute and storage** services (Exchange) to support researchers (Notebooks, VMs, Kubernetes, Cloud storage, data/file transfer) via quota/time-based access (per service/credits)

Procurement Lot Structure

EOSC Exchange Thematic/Regional Services



EOSC Exchange Horizontal Services

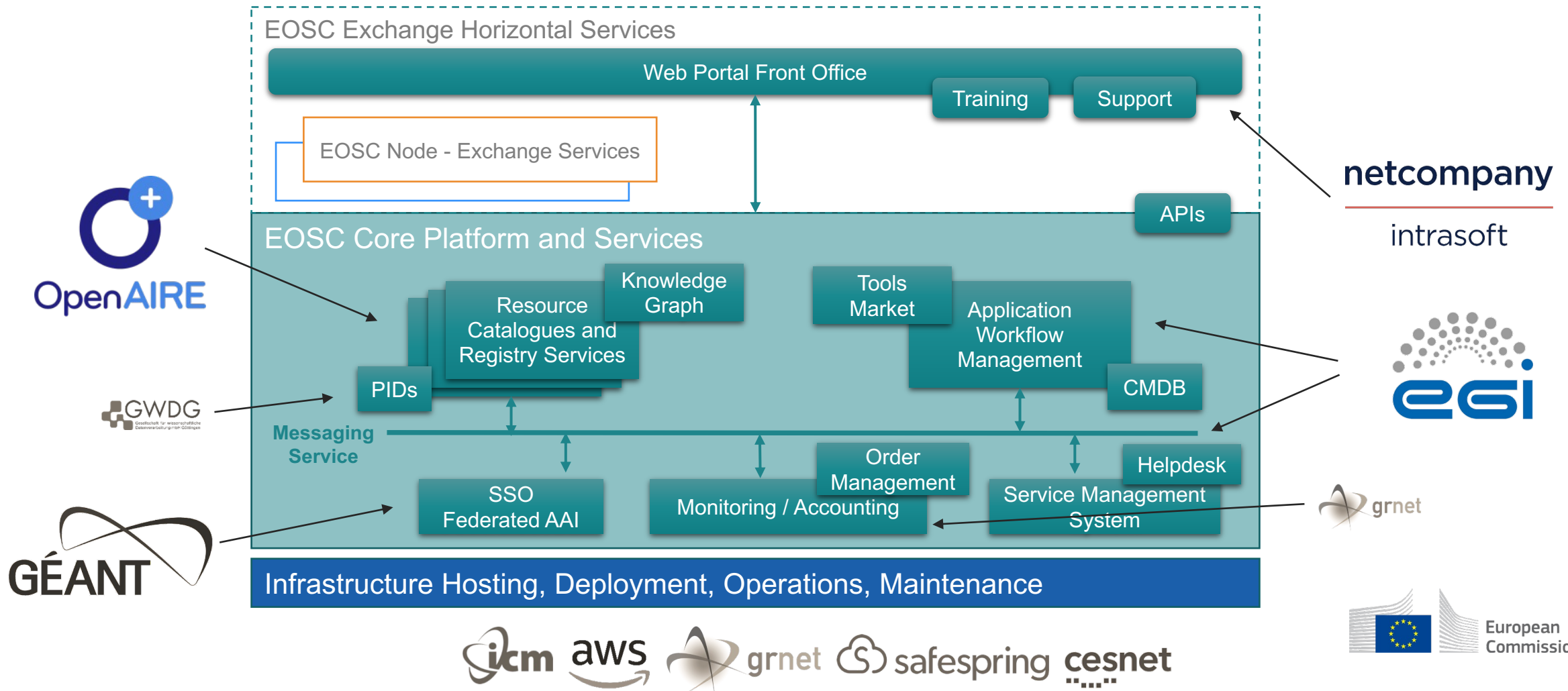


Procurement Lot Structure

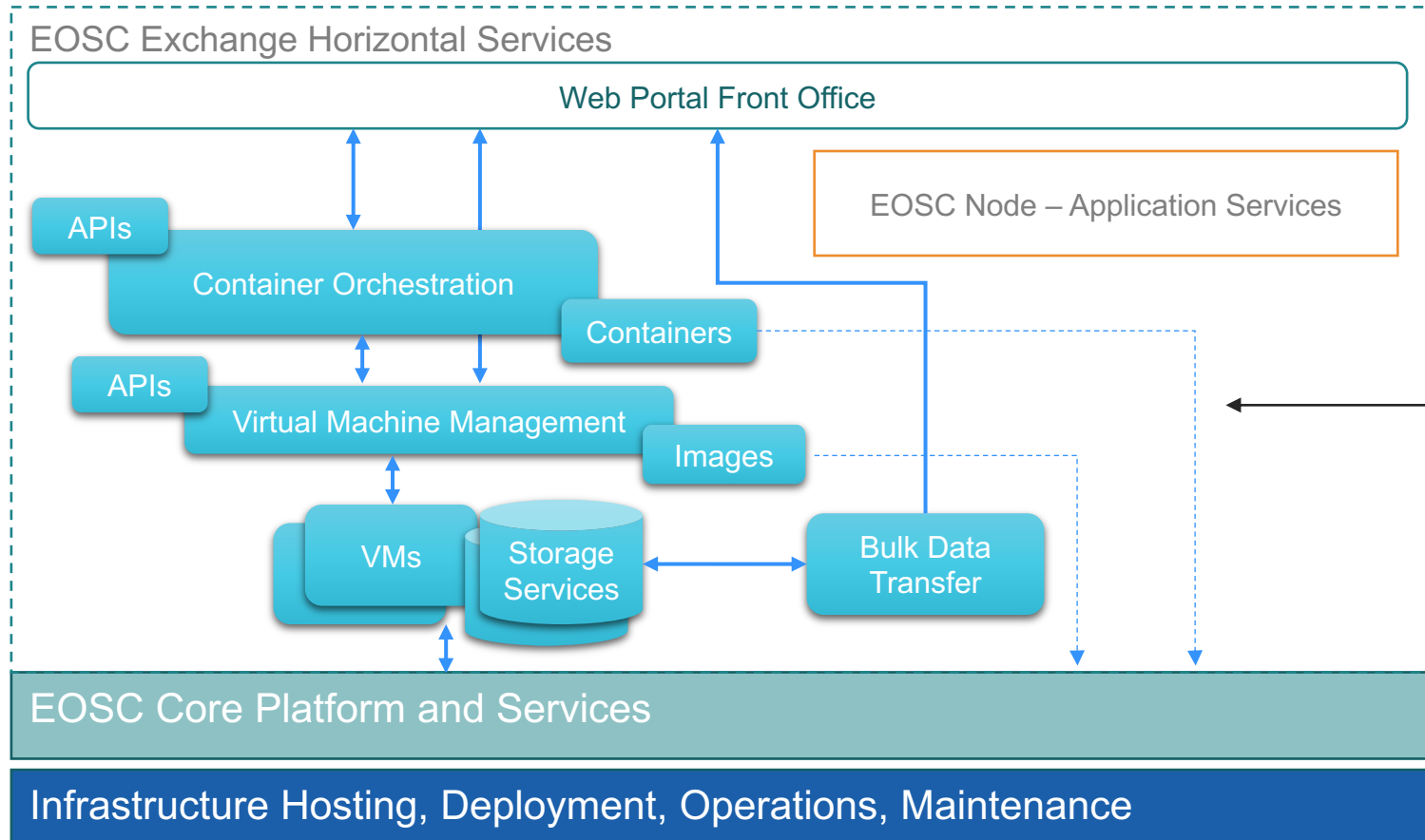
- Lot 3** Managed Collaborative Data Platform, Interactive Data Analytics Platform and Visualization Services for the EOSC Exchange (Application Services)
- Lot 2** Managed Container Platform and Virtual Machine Services for the EOSC Exchange (Infrastructure Services)
- Lot 1** Managed Services for the Development, Integration, Deployment and Operations of the Federated EOSC Core



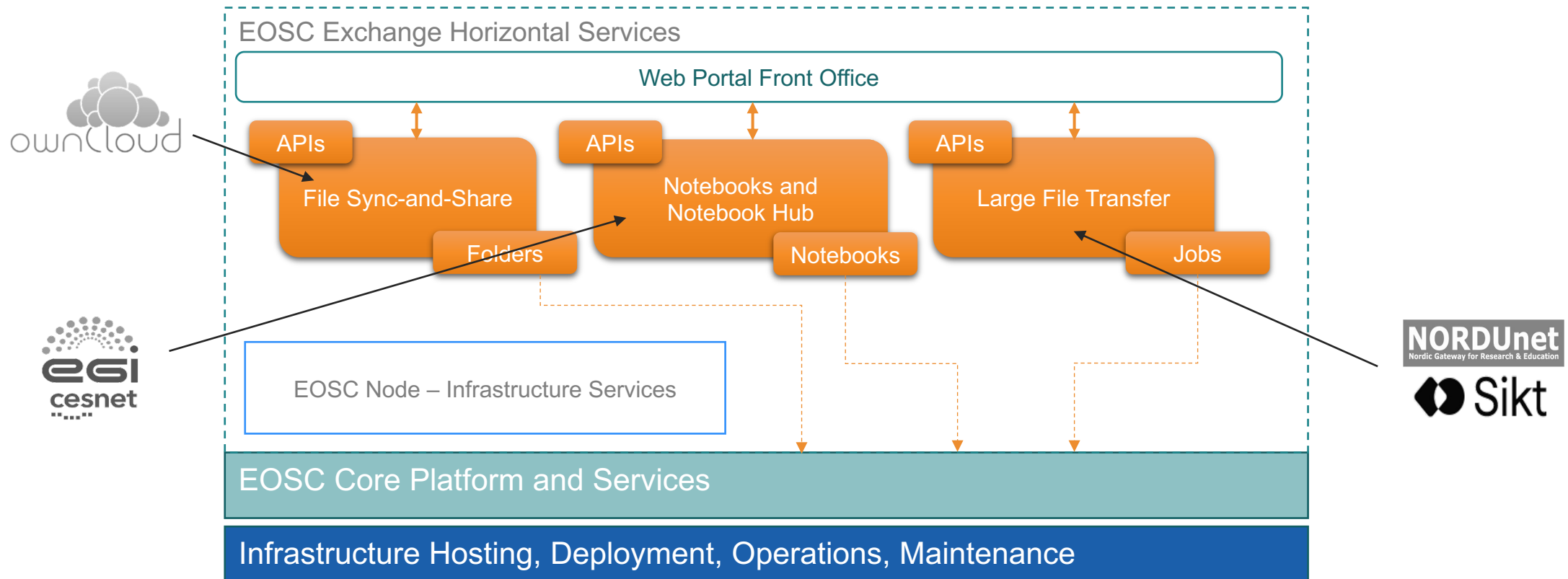
Procurement Lot 1 – EOSC Core Platform Services (Open Science Agora)



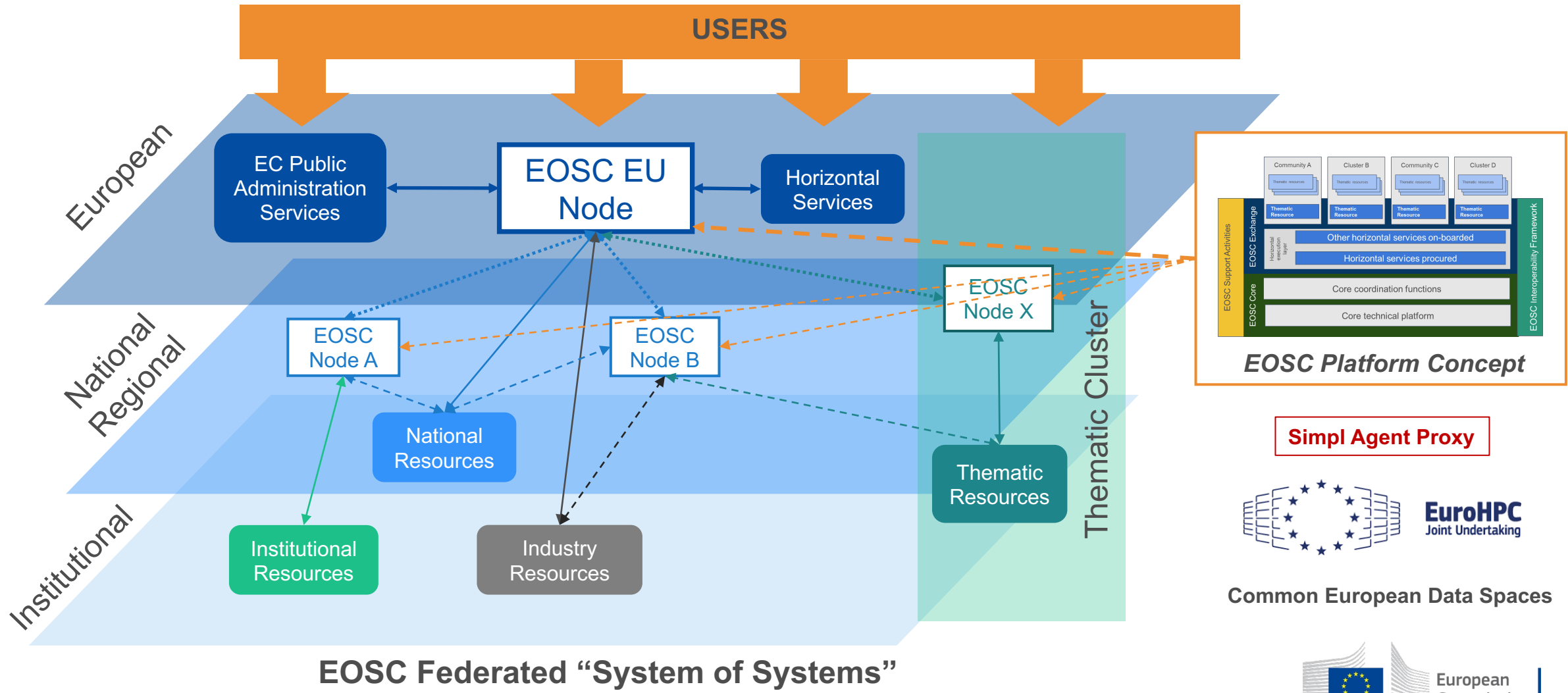
Procurement Lot 2 – EOSC Exchange Infrastructure Services (PSNC)



Procurement Lot 3 – EOSC Exchange Application Services (PSNC)



EOSC EU Node – Federation Approach



EOSC Federated "System of Systems"

EOSC EU Node Planned Timeline and Milestones



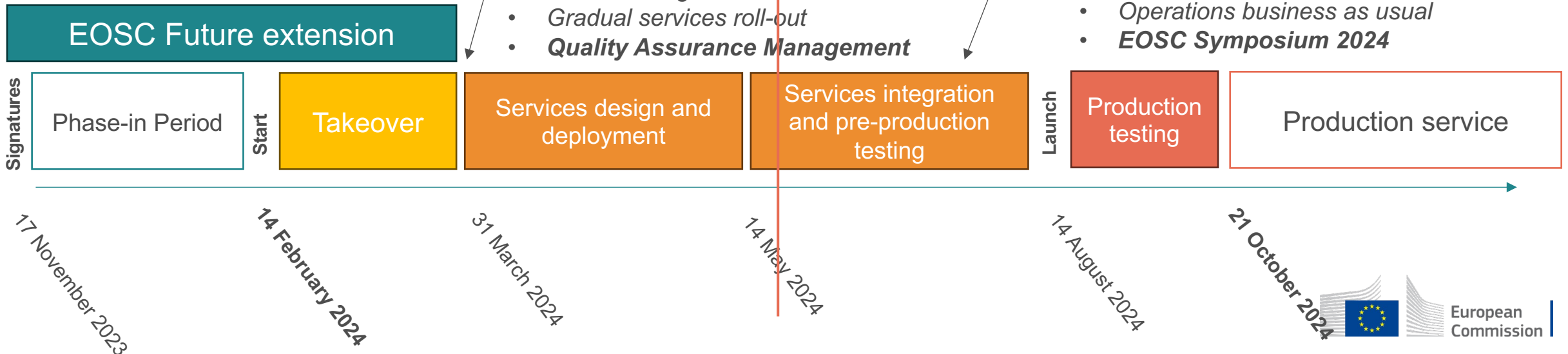
- *Planning and architecting of service components*
- *Compliances and approvals (EC IT Governance)*
- *Definition of policies (RoP, AUP, AP)*
- *Production launch of the EOSC EU Node web front-office*

- *Handover of relevant EOSC Portal functionalities (specs, software, IPO, etc.)*
- *Managing expectations of all stakeholders (providers, users, etc.)*

- *Full integration testing of core and exchange services*
- *Integration of EC services (ORE, ODP, CORDIS/Cellar)*
- **Onboarding of flagships to EOSC EU Node**

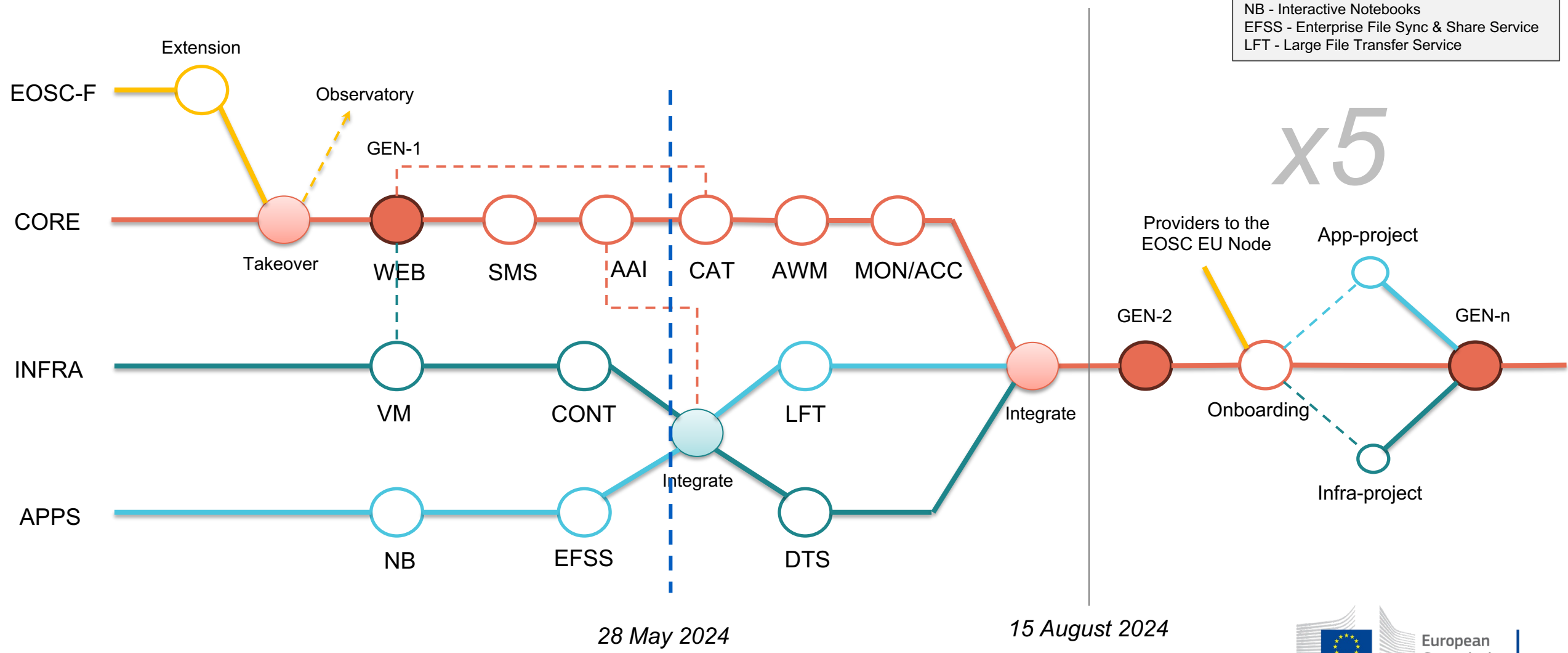
- *Deployments and staging of core/exchange functionalities*
- *Gradual services roll-out*
- **Quality Assurance Management**

- *Pre-production and production testing*
- *First user experiences*
- *Operations business as usual*
- **EOSC Symposium 2024**



EOSC EU Node – Roadmap

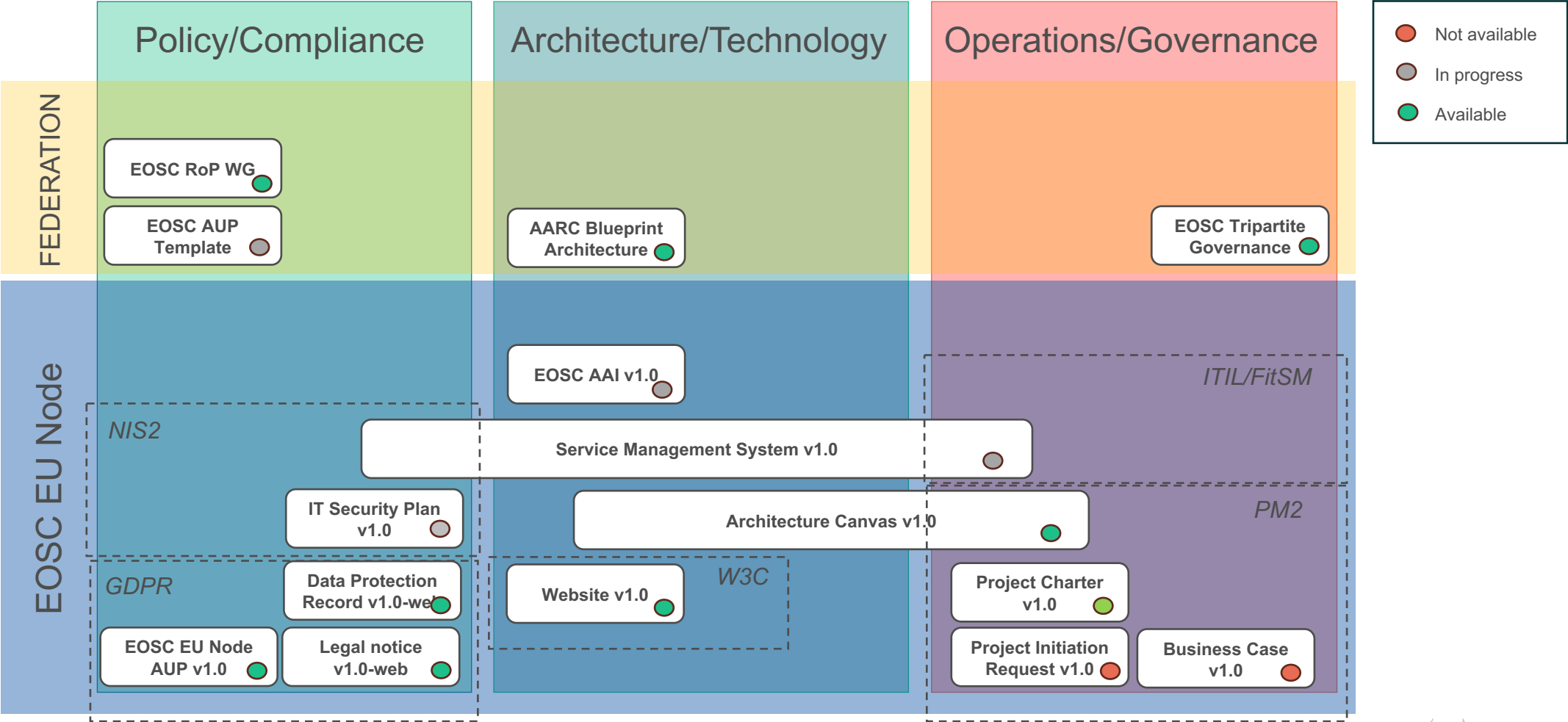
- WEB - Web Portal Front Office
- SMS - Service Management System
- AAI – Federated Identity Management
- CAT - Catalogues & Registry Services
- AWM - Application Workflow Management
- MON/ACC - Monitoring & Accounting
- VM – Compute/Storage Service
- CONT - Container Platform Service
- DTS - Bulk Data Transfer Service
- NB - Interactive Notebooks
- EFSS - Enterprise File Sync & Share Service
- LFT - Large File Transfer Service



28 May 2024

15 August 2024

EOSC EU Node Available artefacts

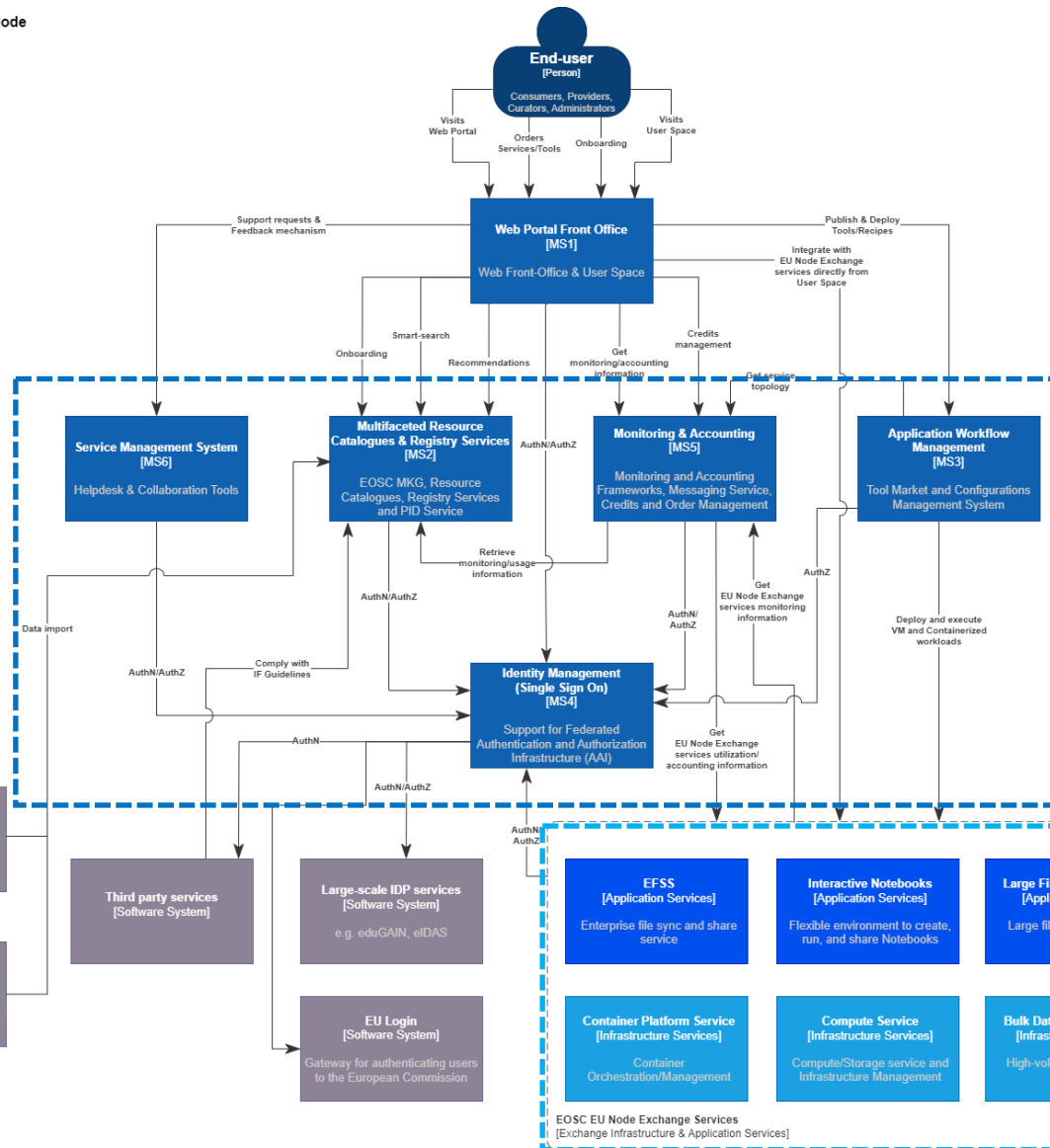


High-level EOSC EU Node Architecture

[System Landscape] EU Node
Conceptual view

Legend

Person
Lot-1 Managed Service
Lot-2 Managed Service
Lot-3 Managed Service
External Software System



EOSC EU Node Core

Federating Capabilities

- Identity Management
- Resource Catalogues and Registry services
- Application Workflow Management
- Monitoring and Accounting
- Service Management System (incl. Helpdesk)

EOSC EU Node Exchange Services

Data Management and Infrastructure Services

- File Sync and Share
- Notebooks
- Large File Transfer
- Compute/Storage
- Containers
- Bulk Data Transfer

EOSC EU Node initial web presence

European Commission

European Open Science Cloud - EU Node

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EOSC EU Node

A European platform and information gateway to explore, engage, and enrich your research collaborations.

Explore our services >

Who is it for

Researchers

If you are a researcher or citizen scientist in Europe interested in collaborative, data-driven open science, the EOSC EU Node offers easy access to diverse data, publications, software, and services from across Europe's research networks.

Contributors

If you are a scientific resource provider in Europe, the EOSC EU Node invites you to contribute your research objects - software, services, and tools - to support the mission of Open Science.

Discover European Research Outputs

Search in all resources

Search by Resource type

DATA PUBLICATIONS SOFTWARE SERVICES TRAINING

Explore the Resource Hub >

Upcoming Services

The EOSC EU Node will offer the following services (currently under development):

File Sync & Share Enable automatic file syncing and secure sharing across locations and teams.	Interactive Notebooks Create and share documents with real-time code execution.	Large File Transfer Streamline large file transfers online with added security and integrity.
Virtual Machines Design and conduct experiments with flexibility while ensuring reproducibility.	Cloud Container Platform Deploy cloud-native containerised applications that can easily scale.	Bulk Data Transfer Move data effortlessly to data-intensive execution environments.

<h4>Enrich your Scientific Endeavours</h4> <p>Explore the Web of FAIR data and interoperable service</p>	<h4>Enter the Gateway to Open Science</h4> <p>Access a diverse range of research objects and supplementary services all in one place</p>	<h4>Manage your Research Workflows</h4> <p>Conduct your research while ensuring interoperability throughout the entire lifecycle</p>	<h4>Exchange with your Peers</h4> <p>Collaborate, disseminate, and reuse research outputs across teams and domains</p>
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Events

See All >

27-28 MAY 2024 Conferences and summits EOSC Association 8th General Assembly	12-16 JUN 2024 Conferences and summits EuroScience Open Forum 2024	20-21 JUN 2024 Conferences and summits 2024 Coordination meeting of EOSC-related projects funded under Horizon Europe
21-23 OCT 2024 Conferences and summits EOSC Symposium 2024		

European Open Science Cloud - EU Node

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Policy statement

EOSC EU Node Acceptable Use Policy

About us

The European Open Science Cloud aims to establish a federation of infrastructures facilitating effortless access to interoperable research assets and enhanced services spanning geographical boundaries and diverse academic fields.

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Updates from EOSC Community

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28 March 2024 EOSC Future signs off March marked the end of the EOSC Future project, which paved the way for the emergence of the EOSC EU Node in its place. Get a breakdown of how this transition will take place and what it	14 December 2023 Commission awards €41 million contract to develop infrastructure for Common European Data Spaces The European Commission has awarded a €41 million contract to develop Simpl, a robust middleware platform aimed at enhancing data access and interoperability across European data spaces.	24 November 2023 The Commission announces winners of the EOSC Procurement The European Commission's DG Connect has revealed the winners of the EOSC Procurement, a key step in advancing the European Open Science Cloud (EOSC).
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EOSC EU Node AUP v1.0



EUROPEAN COMMISSION
DIG COMMUNICATIONS NETWORKS, CONTENT AND TECHNOLOGY
Directorate Digital Excellence and Science Infrastructure
Unit C.1 Open Science and Digital Modelling

EOSC EU Node Acceptable Use Policy

Version 1.0

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1. You shall only use the Services in a manner consistent with the purposes and limitations described above; you shall show consideration towards other users including by not causing harm to the Services; you have an obligation to collaborate in the resolution of issues arising from your use of the Services.
2. You shall only use the Services for lawful purposes and not breach, attempt to breach, nor circumvent legal, administrative or security controls. Services shall not be used:
 - a. to threaten, incite, promote, or actively encourage violence, terrorism, or other serious harm;
 - b. for any content or activity that promotes child sexual exploitation or abuse;
 - c. to violate the security, integrity, or availability of any user, network, computer or communications system, software application, or network or computing device;

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- d. to distribute, publish, send, or facilitate the sending of unsolicited mass email or other messages, promotions, advertising, or solicitations (or "spam").
3. You shall respect intellectual property, licenses, and confidentiality agreements.
4. You shall protect your access credentials (e.g., passwords, private keys or multi-factor tokens), no intentional sharing is permitted. You shall not attempt:
 - a. gaining unauthorized access to Services, acting to deny others access to Services, or authorizing any third party to access or use the Services on your behalf;
 - b. using the Services to try to gain unauthorized access to any other service, data, account or network by any means.
5. You shall keep your registered information correct and up to date.
6. You shall promptly report known or suspected security breaches, credential compromise, or misuse to the Security Contact stated below; and report any compromised credentials to the relevant issuing authorities.
7. Reliance on the Services shall only be to the extent specified by any applicable Service Level Agreements listed below. Use without such agreements is at your own risk.
8. Your personal data will be processed in accordance with the Privacy Statements referenced below.
9. Your use of the Services may be restricted or suspended, for administrative, operational, or security reasons, without prior notice and without compensation.
10. If you violate these rules, you may be liable for the consequences, which may include your account being suspended and a report being made to your home organisation or to law enforcement.
11. You shall comply with restrictive measures and export control measures in place pursuant to Article 215 of the Treaty on the Functioning of the European Union when accessing or authorising the access to the Services.
12. You shall acknowledge that information you provide or upload to the Services may be stored outside of the country in which you reside but stays in EU/EEA jurisdiction.

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- Privacy Policy for websites managed by the European Commission: https://commission.europa.eu/privacy-policy-websites-managed-european-commission_en
- Copyright Notice: https://commission.europa.eu/legal-notice_en#copyright-notice
- Cookies Policy: https://commission.europa.eu/cookies-policy_en
- Services accessible via the Websites may have additional Privacy Statements published in their domains.

The acceptable Service Level Agreements are published on the Websites of the Services.

The Data Protection Officer of the Commission is: data-protection-officer@ec.europa.eu

The Security Contact for this AUP is: CNECT-LISO@ec.europa.eu

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European
Commission

EOSC EU Node

Technical Overview & Operations

Identity - (re)Introduction

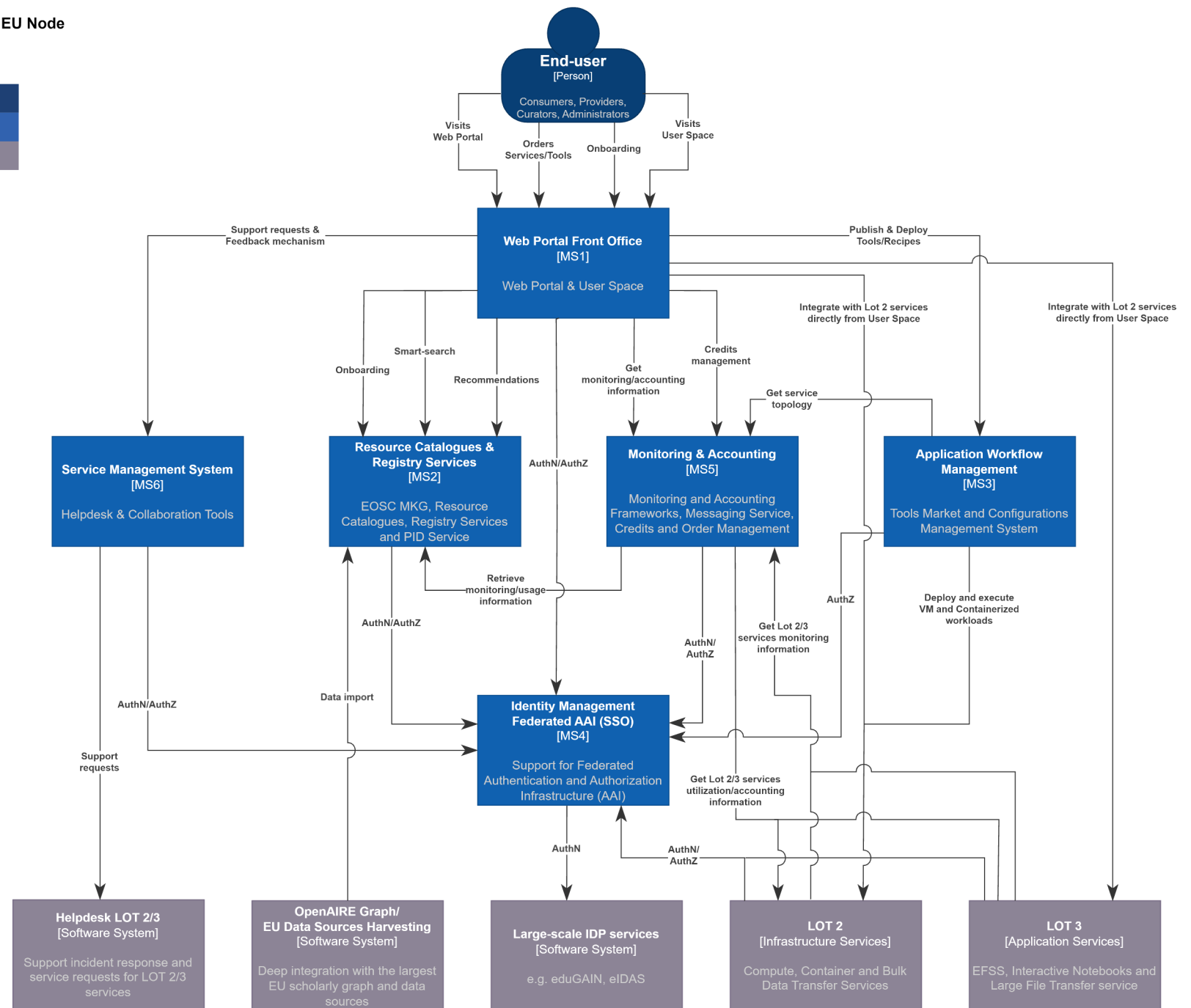
- **The first node of the EOSC Federation** provisioned from the **EC** (Lots 1/2/3) as the Service Business owner (DG CONNECT)
 - EOSC EU Node is an **EC service** and hence must abide to EC operational policies (quality, security, content); expands across all operational processes
 - Specified, provisioned, and operated leveraging **experience** and **output** gained from EOSC-related projects under a **pragmatic, focused, and quality-assured** perspective
 - **Blueprint for other EOSC Nodes**; architecture and open-source software
 - **Offers federating** capabilities and **SaaS** offerings to Nodes (optional; lower the entry barrier/costs)
- Serves **researchers & groups** (across disciplines, under-served, 'last resort), **Service Providers** (discover, access, order), **RIs** (compute/storage resources), Nodes (enrol), **citizen scientists** (discover RO)
- **Focal point** of the EOSC Federation, but it is only **one** EOSC Node

EOSC EU Node Architecture Overview

[System Landscape] EU Node Conceptual view

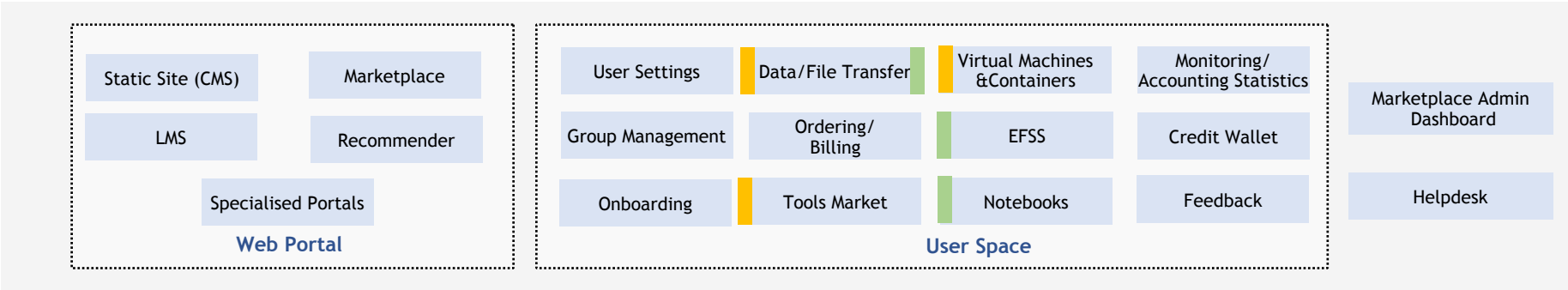
Legend

Person
Lot-1 Managed Service
External Software System



EOSC EU Node Conceptual Overview

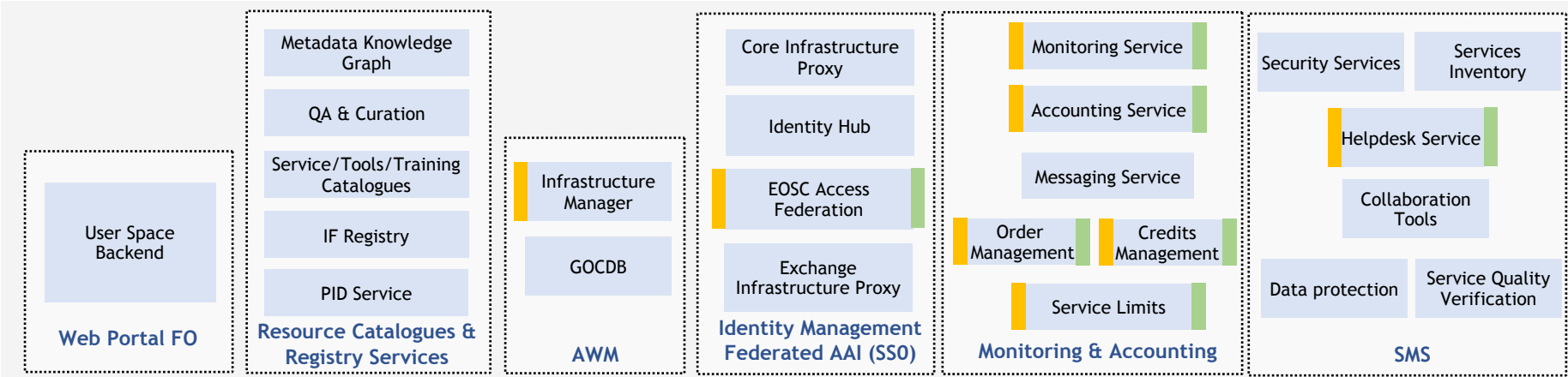
Web Portal FO



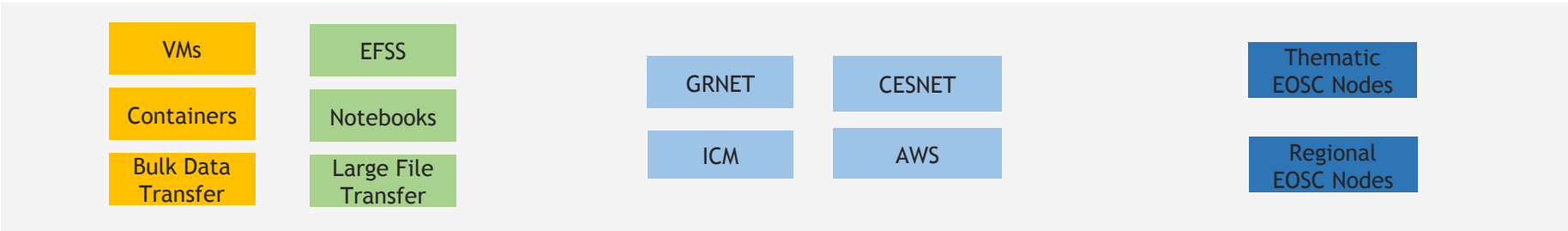
Platform Middleware



Managed Services Backend



Infrastructure



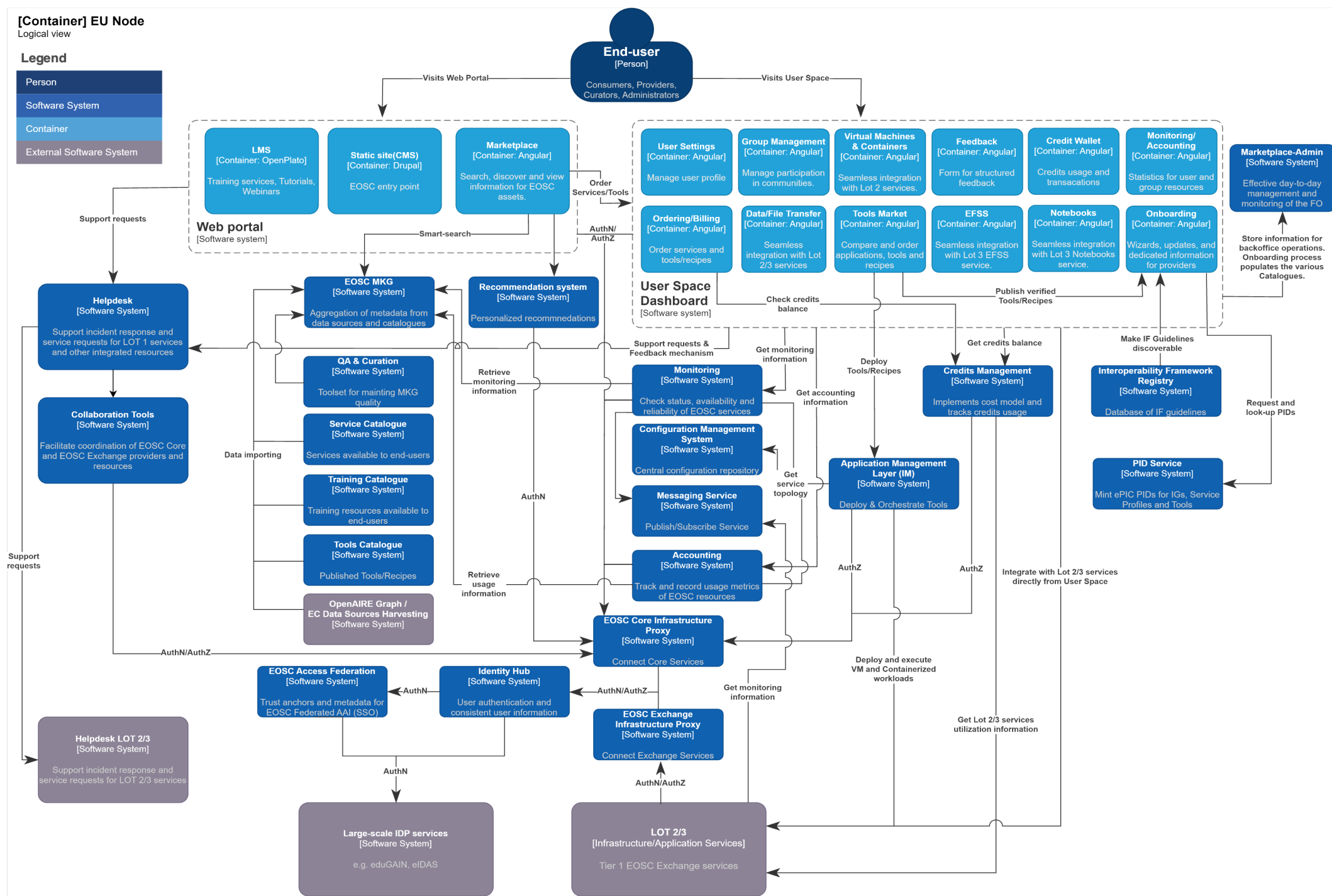
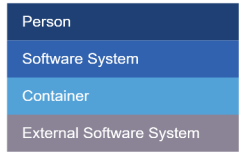
LEGEND

- Light Blue Box: Lot 1 Component
- Blue Box: Lot 1 Infrastructure
- Yellow Box: Lot 2 Infrastructure services
- Green Box: Lot 3 Application Services
- Dark Blue Box: Other Nodes
- Yellow Vertical Bar: Integration with Lot 2 services
- Green Vertical Bar: Integration with Lot 3 services

[Container] EU Node

Logical view

Legend



New concepts and differences (1/3)

- **Terms: Contributors, Enrolment, Onboarding, ...**
- **EOSC Metadata Knowledge Graph (EOSC MKG): OpenAIRE + EC Data Sources** (CORDIS, European Open Data Portal, Open Research Europe, Software Heritage) + **EOSC Data Sources** (migration & new policies)
- **Quality Assurance** (manual, semi-automated, automated) and enforcement is everywhere (safeguard EC standing; RoP)
- **Onboarding a multi-step** process (QA-focused) with **offboarding** also supported and enforced
 - Onboard a **Contributor** (representative, organization, etc.); access to Contributor Space
 - Onboard a **Data source** (end-point, technical conformance, etc.); harvest and add in MKG
 - Onboard a **Service** (end-point/catalogue, technical conformance, curation, AUP/AP, etc.); harvest and add in MKG
 - **Offboard** any of the above when QA is not adequate (e.g., spam, systematic errors)

New concepts and differences (2/3)

- **Exchange Services** in the EOOSC EU Node
 - **Guaranteed services** by the EC (**Lots 2/3**); available to all users (see quota/credits next) and fully integrated in the Front Office (User Space)
 - **Discoverable** services offered by Contributors; **out-link** to Service Provider, no technical requirements (facilitate discovery and inclusion, lower entry barrier for Contributors)
 - **Orderable services** offered by Contributors (and other Nodes); **conform** to IF/guidelines and EC policies (higher entry barrier for Contributors; will come post-launch)
- **Credits Management** for Exchange Services
 - A user **claims** an amount of credits upon entry to the EOOSC EU Node; able to consume them for Services (periodically replenished; requests for additional credits supported)
 - Rolled-out and integrated for **Guaranteed EC Services** (Lots 2/3); support fair and effective demand management; iterative evolution of cost/pricing model and inform sizing
 - To be **selectively** tested and offered for Orderable services in the future

New concepts and differences (3/3)

- The EOSC EU Node is **not** the EOSC Future Marketplace; **takeover** already completed
- **Technologies**, solutions, operations (and people) are similar but **not the same**; remove technical debt and streamline; some key differences:
 - **Front Office & User Space**: entirely **new software**; integrates and exposes **all** underlying functionalities of the EOSC EU Node (micro-services; BPMN)
 - **Knowledge Graph & catalogues**: different KG engine, KG order of magnitude larger, homogenized catalogues, onboarding/offboarding policies, QA processes (manual, automated)
 - **AAI/SSO**: GEANT federated AAI
 - **Tools**: find, share, create, and run TOSCA templates (ready to use)
 - **Onboarding**: entirely new software (integrated in FO) and business flows
 - **SLA provisioned services** (not best-effort)

Services to Researchers & Communities/RIs

- **Discover Research Output (MKG)**

- Search, Recommend, Learn, Favorites/Collections (publications, data, software, services, tools)

- **Use EC Exchange Services**

- All users can claim access to free quota per service (also time-limited) by the EOSC EU Node (base tier; possibly additional if available/needed on a per case basis)
- Specific user groups/organizations/communities may request additional compute and storage resources (e.g., an RI for deploying a specific service)
- Utilization is monitored and assessed by the EC; effectively manage demand, reposition services/quota and ensure user satisfaction (e.g., from service to service, within a service)

- **User Space (aka Dashboard)**

- Personal settings and preferences, link accounts, manage favorites/collections; Groups and group management; Claim, request, and manage credits/quota (EC Services); Notifications & messaging

User Space (sneak-peak)

The screenshot displays the user space interface for an EOOSC EU Node account. The left sidebar contains navigation options: Overview (selected), Notifications (99+), Tools Hub, and a list of services (File Sync & Share, Interactive Notebooks, Cloud Container Platform, Virtual Machines, Large File Transfer, Bulk Data Transfer). Below these are general settings like Groups (7), Requests & Orders (7), Credits, and Favourites (3).

The main content area is titled "Hello Researcher Name" and provides an overview of the account. It features a "Services" section with six cards:

- File Sync & Share:** 22 GB / 50 GB used. View Service >
- Interactive Notebooks:** 87 / 450 credits used. Refreshes in: 12 days. View Service >
- Cloud Container Platform:** 87 / 450 credits used. Refreshes in: 12 days. View Service >
- Virtual Machines:** 87 / 450 credits used. Refreshes in: 12 days. View Service >
- Large File Transfer:** 2 active links. View Service >
- Bulk Data Transfer:** 2 active links. View Service >

Below the services is a "New in Tools Hub" section with a "View all Tools" link. It lists two templates:

- web-app-stack.yaml:** Template for a web application stack, including web servers, databases, etc. Upvote 32. Author: Author name. Public.
- db-cluster-template.yaml:** Template for a database cluster setup. Upvote 32.

Services to Contributors

- **Onboard a Contributor and its Services or enroll a Node**
 - EOSC EU Node supports technical integration, operational harmonization, assessment of established criteria (baseline contractual services)
 - A Service Provider can **join** the EOSC EU Node (discoverable, orderable), **another** EOSC Node (onboarding), or **become** a Node (enrolment)
- **Re-Onboarding** to the EOSC EU Node (migration for EOSC Future Providers)
 - Consent collected from most (contact Helpdesk if not provided)
 - Onboarding team invites to register as Contributors in the User Space (review, edit, validate)
 - Onboarding team invites to review & revise Contributor Services (new policies); evaluation follows (QA requirements), and Service is discoverable (orderable later)
- Other types of contributions and content are **curated** by the EOSC EU Node (training material, IF)

Federating capabilities and SaaS

	EOSC EU Node	Offer “as a Service”	Federating capability
Web portal	ec.europa.eu	n/a	n/a
AAI	IdP, Single-Sign-On, Federated login	Hosted infrastructure proxy	AAI federation, core proxy
Catalogues	Catalogues, KG	Hosted catalogues, KG filtering	Actual catalogue of the federated entities
AWM	Orchestration	n/a	Recipes execution
Monitoring/Accounting	For the node and SPs	Separate instance with probes to install	Monitoring information exchanged for accounting mostly
Helpdesk/SMS	Level 1,2,3	Level 1 plus dispatch	Automatic distribution of tickets from single user interface

Context of services

DATA-CENTRIC CLOUD SERVICES:

- **EOSC-EXCHANGE: LOT3**

DATA-CENTRIC USER-FACING SERVICES:

- EFSS: Sync & Share
- DATA SCIENCE: Notebooks
- LARGE DATA Transfer

- **EOSC-EXCHANGE: LOT2**

INFRASTRUCTURE AND PLATFORM SERVICES

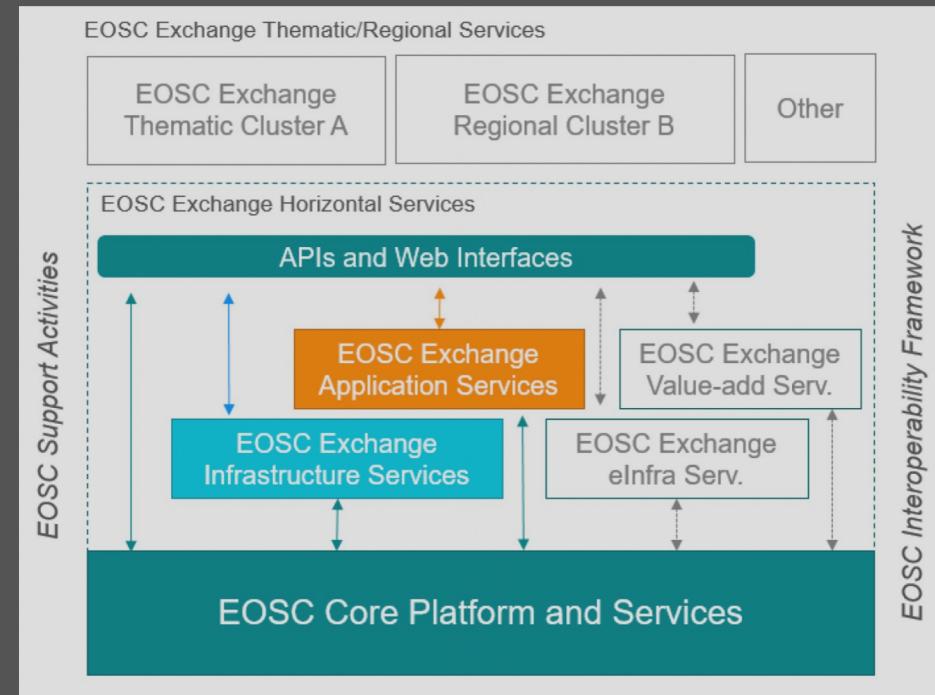
- CLOUD/VMs
- CONTAINER PLATFORM
- BULK DATA TRANSFER

- **EOSC-CORE: LOT1**

USER-ACCESS, SERVICE MGMT AND OPERATIONS

- SERVICES FOR FEDERATED EOSC CORE SERVICES:
- REDESIGNED USER PORTAL

EOSC EU NODE – LOT2 AND LOT3



LOT2/3

Project SPECIFCS

MODEL AND REQUIREMENTS

- **THE BAR WAS SET VERY HIGH:**
 - **TECHNICAL EXCELENCE**
 - **ECONOMIC ACTIVITY**
 - **SERVICES MGMT PROCEDURES**
 - **CERTIFICATION**
 - **SECURITY**

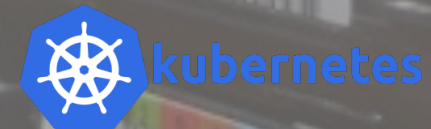
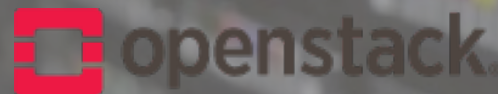
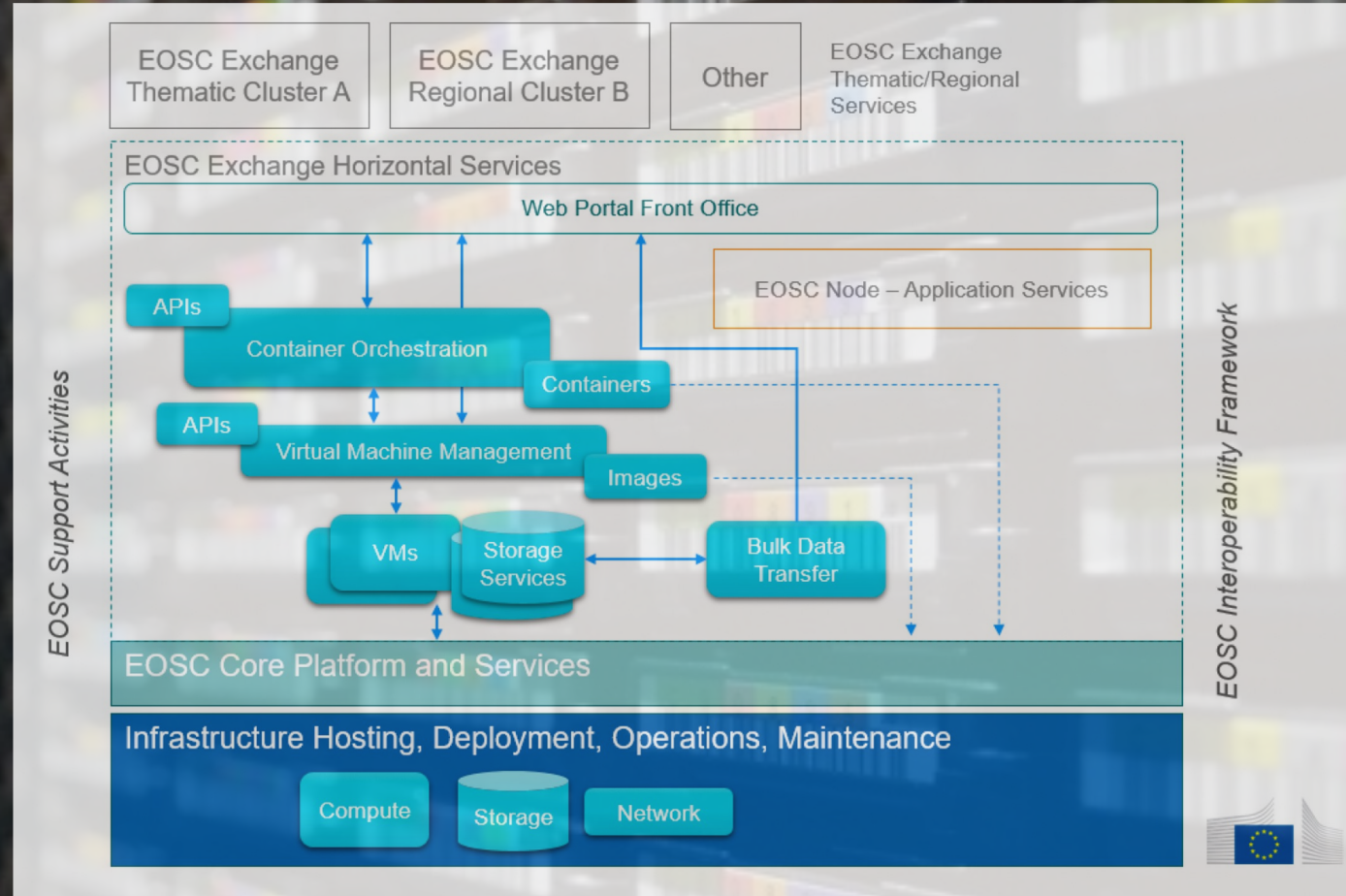


SCOPE

LOT#2:

- OPEN SOURCE & INDUSTRY STANDARDS COMPONENTS ENCOURAGED:
- SOLUTIONS:
 - **INFRASTRUCTURE: IaaS:**
OpenStack-based cloud
 - **PLATFORM: PaaS:**
Kubernetes / OKD
 - **BULK DATA TRANSFER:**
FTS and others
 - => in their 'vanilla' versions with minimum possible integration/dev. work (TRL 9)

WHAT'S INSIDE (LOT #2)

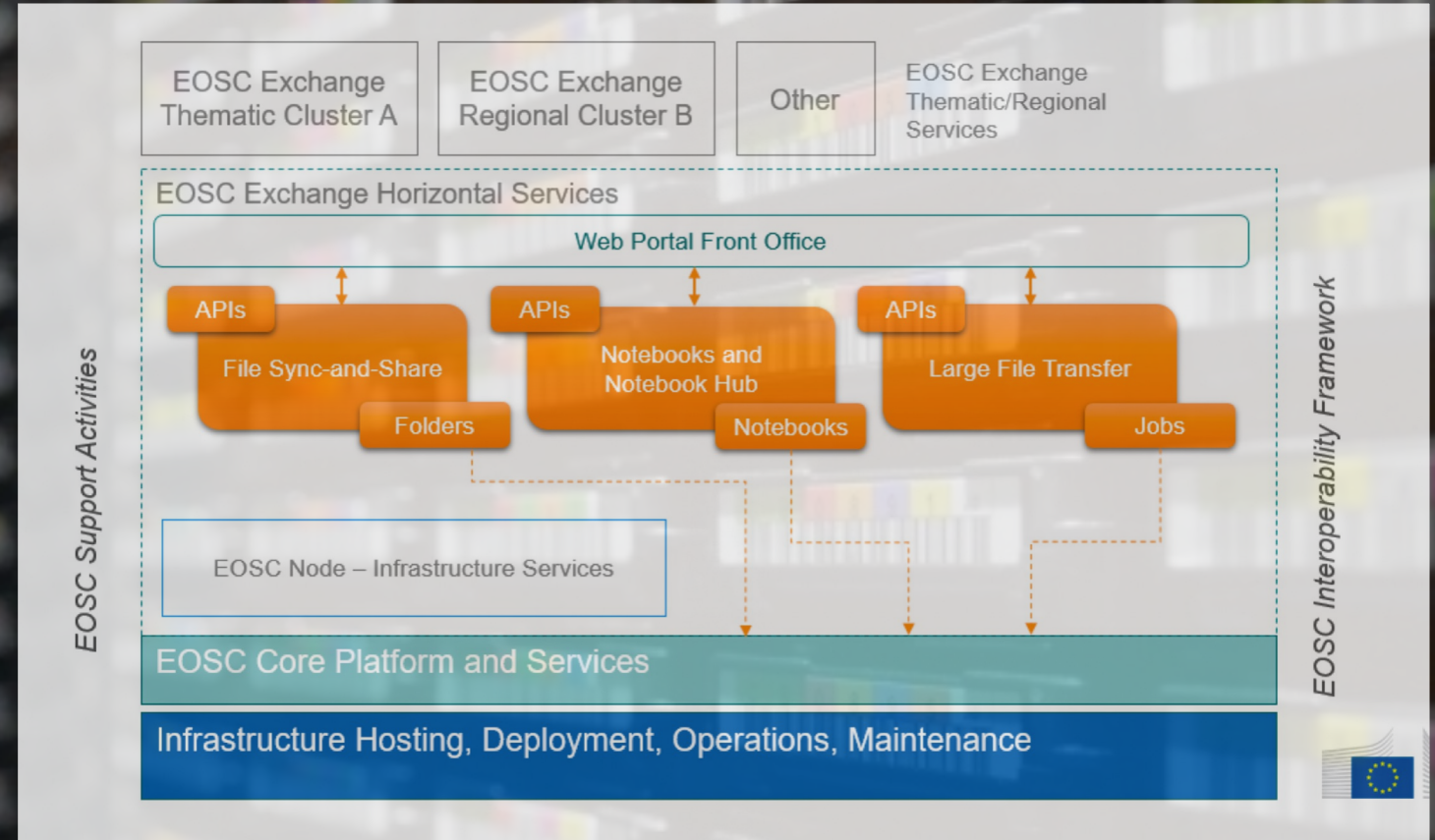


SCOPE

WHAT'S INSIDE (LOT #3)

LOT#3

- AGAIN: OPEN SOURCE & INDUSTRY STANDARDS ENCOURAGED:
- DATA-CENTRIC SERVICES
 - **EFSS/SYNC & SHARE:** OWNCLLOUD
 - **DATA SCIENCE:** JUPYTER NOTEBOOKS
 - **FILE TRANSFER:** FILE SENDER
- 'USUAL SUSPECTS' WE WORK WITH
- COMPANIES AND DEVELOPERS ON-BOARDED TO THE BIDDING GROUP
- **IMPORTANT TO NOTE:**
 - LOT#3 APPLICATION-LEVEL MORE R&E-SPECIFIC REQS & ADDED VALUES SCORED (E.G. SCIENCE MESH COMPLIANCE)
 - OPTION TO USE COMPUTE INFRASTRUCTURE FROM LOT#2

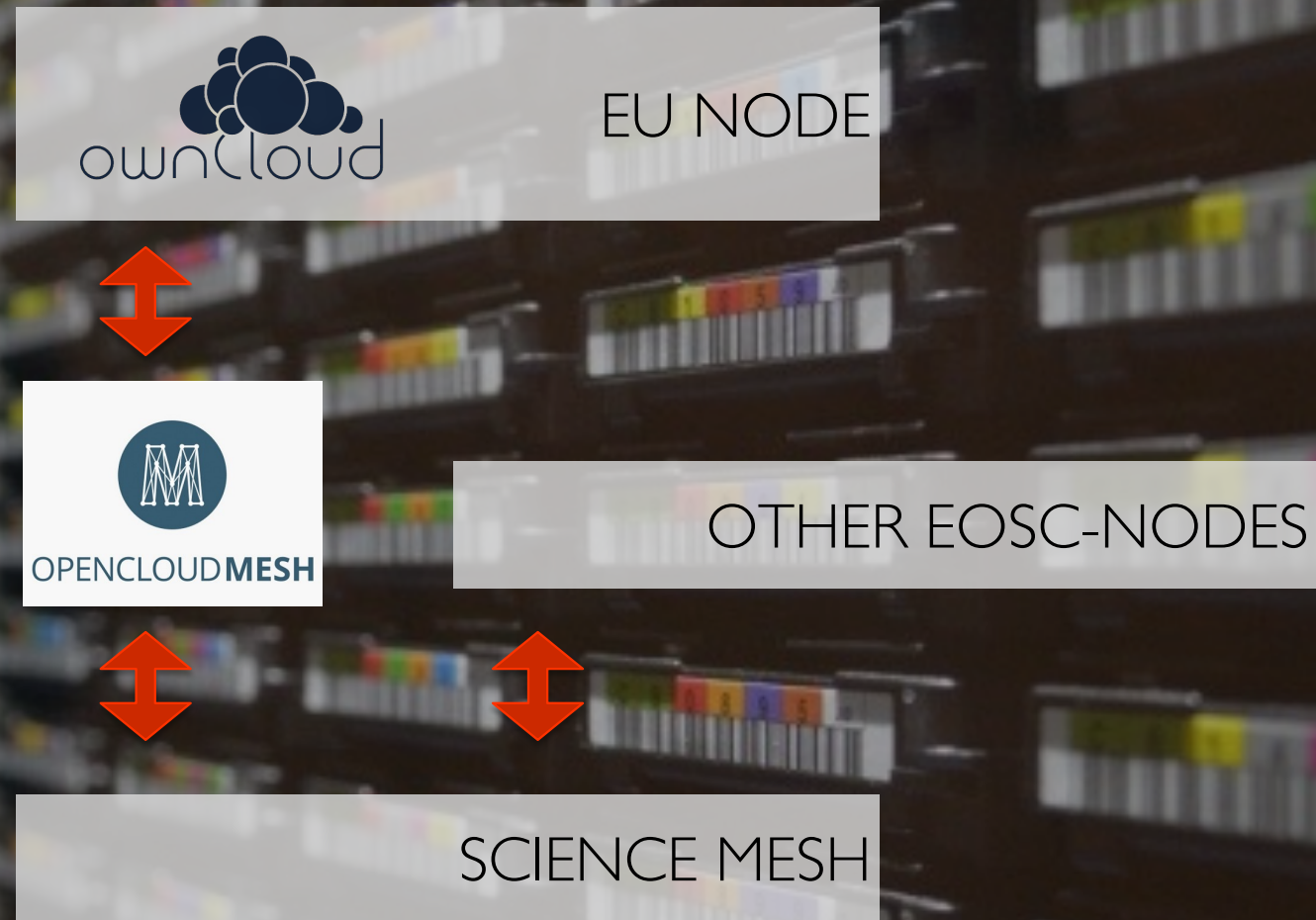


FOCUS ON

LOT #3 SCIENCE MESH COMPLIANCE

LOT#3:

- LOT #3'S FILE SYNC & SHARE SOLUTION HAS TO BE **SCIENCMESH-COMPLIANT** MEANS: PROTOCOLS, PROCEDURES, ARCHITECTURE
- THE OFFERED SOLUTION:
 - IS **OWNCLOUD OCIS** THAT SUPPORTS CS3APIs and OCM
 - **OCM** IS THE BASIC **BUILDING BLOCK** FOR CROSS-SITE DATA ACCESS AND STORAGE
 - EOSC EU NODE MUST BE **ABLE TO JOIN** SCIENCMESH



FOCUS ON

LOT#3 INTEGRATIONS:

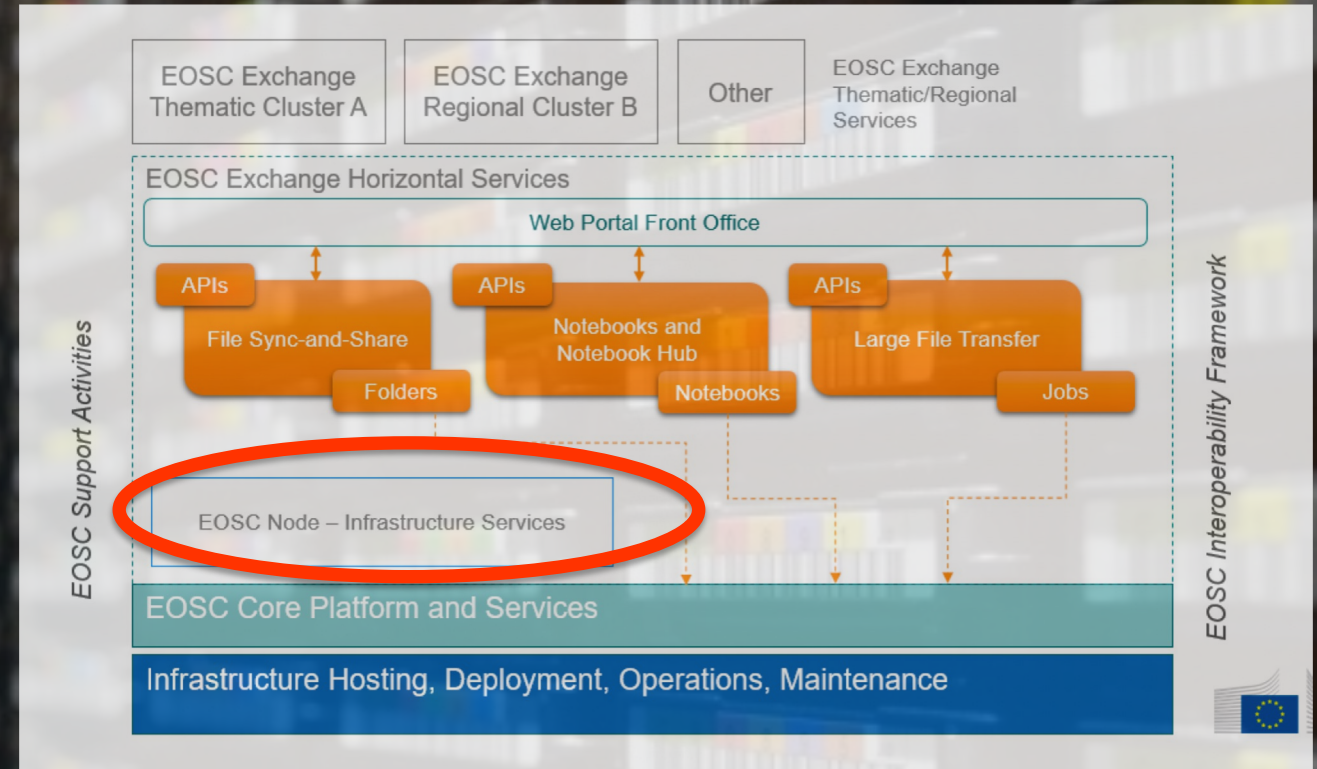
- **VERTICAL (OPTIONAL)**

- USE COMPUTE INFRASTRUCTURE FROM LOT#2 TO IMPLEMENT FILE STORAGE AND DATA SCIENCE IN EVEN LARGER SCALE

- **HORIZONTAL (ENVISIONED):**

- JUPYTER NOTEBOOK SERVICES MAY STORE USERS' DATA IN EFSS
- FILE TRANSFER MAY BE INTEGRATED INTO JUPYTERS AND/OR EFSS
- DATA DEPOSIT MAY BE PERFORMED DIRECTLY: EFSS TO REPOSITORIES

OTHER INTEGRATIONS



jupyter



File Sender

SUMMARY

- **EOSC EU NODE - PROVIDES DATA-CENTRIC CLOUD SERVICES**
 - FILE SYNC & SHARE
 - JUPYTER NOTEBOOKS
 - DATA TRANSFER
 - INFRASTRUCTURE BACK-END
 - OTHER SERVICES IN LOT#1 INCLUDING PID SERVICES AND FEDERATED AAI
- **INTEROPERABILITY AND DATA FAIR'NESS IS PART OF THE GAME:**
 - **INDUSTRY STANDARD COMPONENTS**
 - **STANDARD APIs FOR:**
 - DATA ACCESS
 - RESOURCES/SERVICES PROVISIONING
 - AAI
 - **SCIENCMESH COMPLIANCE**
 - **INTEGRATIONS TO SUPPORT FAIR**

TAKE AWAYS



DISCUSSION

OVERALL OBSERVATION:

- AS A COLLECTIVE OF NRENS & COMPANIES

WE CAN DO EVERYTHING:

- LIGHTING UP FIBRES IN NETWORK,
- OPERATE AND SECURE IT (NOC, SOC)
- BUILD & OPERATE DATACENTERS
- RUN CLOUD SERVICES (VMs, K8S),
- PROVIDE PaaS COMPONENTS
- DEVELOP & INTEGRATE APPLICATIONS

BASED ON THE OBSERVATION:

- NRNES AND COMPANIES FROM PL, SE, DK, NAMELY: PSNC, NORDUNET, SAFESPRING GOT TOGETHER AND OFFERED CLOUD / CONTAINER INFRASTRUCTURE (LOT2)
- ++ OTHER PARTNERS: OWNCLOUD, CESNET/EGI, SIKT WE APPROACHED THE APPLICATION-LEVEL SERVICES (LOT3)

COLLABORATION



Thank you