SLICES

European Scientific Large-Scale Infrastructure for Computing/Communication Experimental Studies

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Aether community meeting

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6G Research Infrastructures?

Important stakeholders

ESFRI

MAKING SCIENCE HAPPEN
A new ambition for Research Infrastructures in the European Research Area

http://www.esfri.eu/

Research Infrastructures as a Scientific Instrument

From mid-Scale to Large-Scale funding

The European ESFRI framework

European Strategy Forum on Research Infrastructures
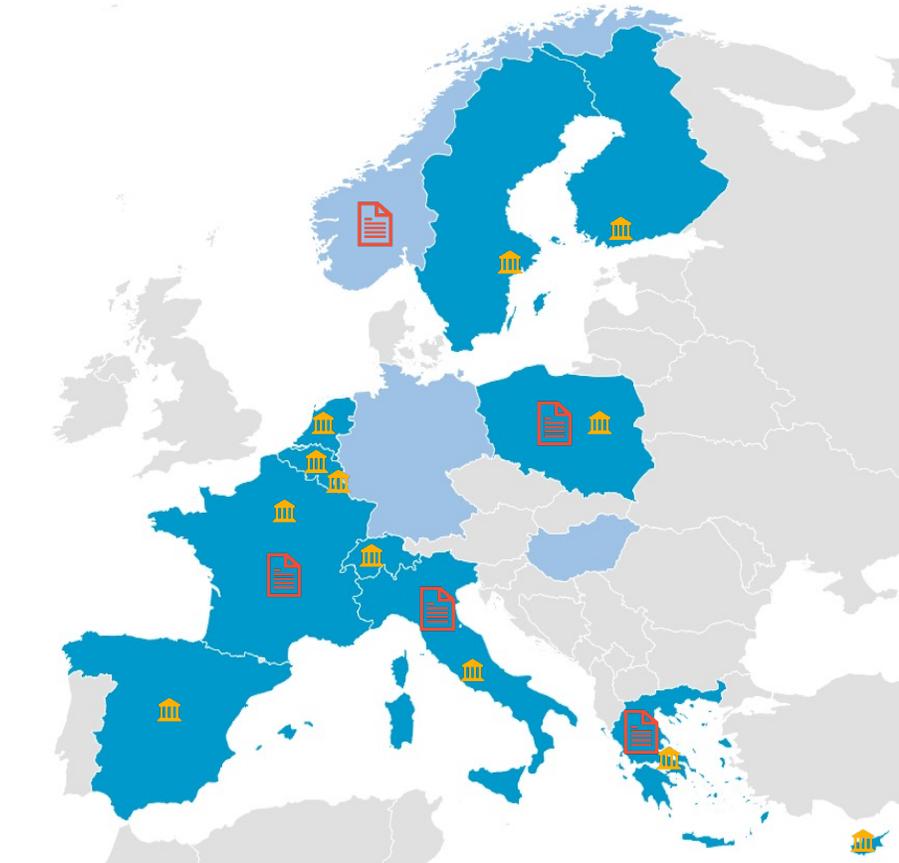
Supporting a scientific methodology

http://www.esfri.eu/

ESFRI

MAKING SCIENCE HAPPEN
A new ambition for Research Infrastructures in the European Research Area

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SLICES for research on Digital Infrastructures

Initiated in 2017, **25 partners** from 15 countries:

- **12 political support** from National Ministries 🏛

- included in **5 national roadmaps** 📄

> SLICES will enable **scientific excellence and breakthrough** and will **foster innovation in the ICT domain**, strengthening the **impact of European research**, while contributing to European agenda to address **societal challenges**, and in particular, the twin transition to a sustainable and digital economy.

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Current status of the partnership

"The Network is the Computer"
John Gage, Sun Microsystems, 1984

"We will think of a network as a programmable platform" …
"We will no longer think in terms of protocols. Instead, we will think in terms of software.
Nick McKeown, ONF Connect, 2020

"The network will be programmed by many and operated by a few ».
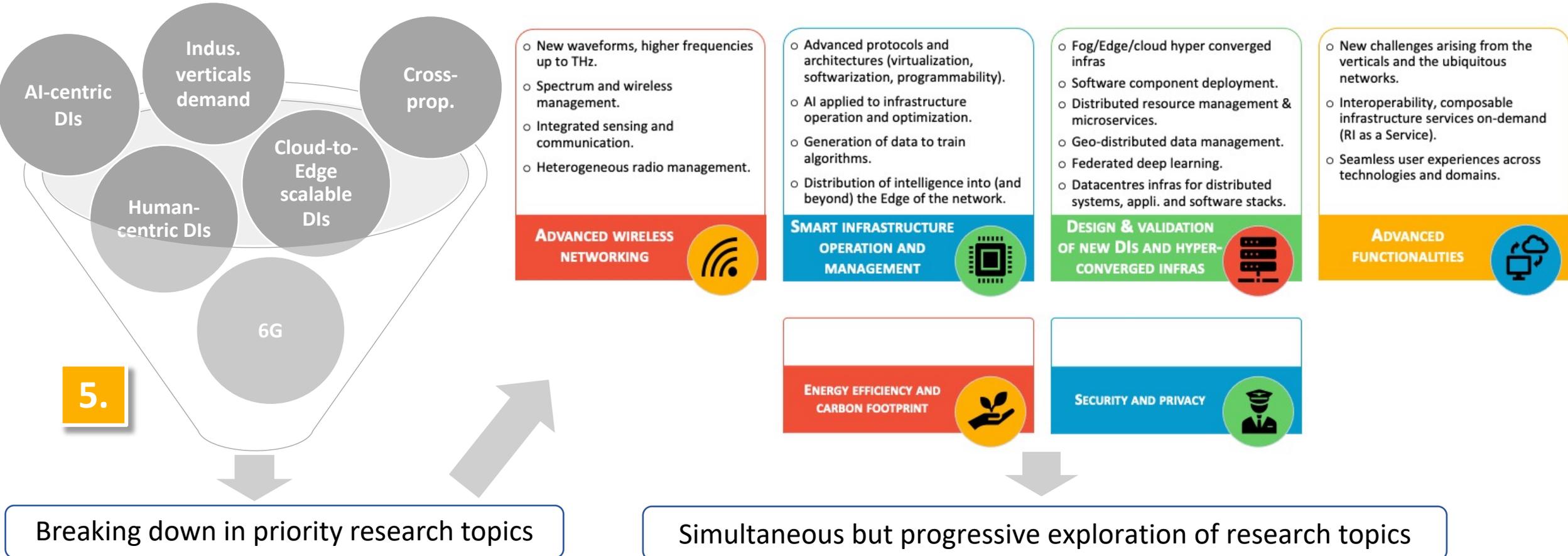*Nick McKeown, NetworkingChannel, March 2021*

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Fully Controllable, programmable Virtualized Digital Infrastructure Test Platform
Openness, International

Prioritisation of research topics

What's the methodology behind it?

5.

AI-centric DIs

Indus. verticals demand

Cross-prop.

Human-centric DIs

Cloud-to-Edge scalable DIs

6G

Breaking down in priority research topics

Simultaneous but progressive exploration of research topics

Advanced wireless networking
- New waveforms, higher frequencies up to THz.
- Spectrum and wireless management.
- Integrated sensing and communication.
- Heterogeneous radio management.

Smart infrastructure operation and management
- Advanced protocols and architectures (virtualization, softwarization, programmability).
- AI applied to infrastructure operation and optimization.
- Generation of data to train algorithms.
- Distribution of intelligence into (and beyond) the Edge of the network.

Design & validation of new DIs and hyper-converged infras
- Fog/Edge/cloud hyper converged infras
- Software component deployment.
- Distributed resource management & microservices.
- Geo-distributed data management.
- Federated deep learning.
- Datacentres infras for distributed systems, appli. and software stacks.

Advanced functionalities
- New challenges arising from the verticals and the ubiquitous networks.
- Interoperability, composable infrastructure services on-demand (RI as a Service).
- Seamless user experiences across technologies and domains.

Energy efficiency and carbon footprint
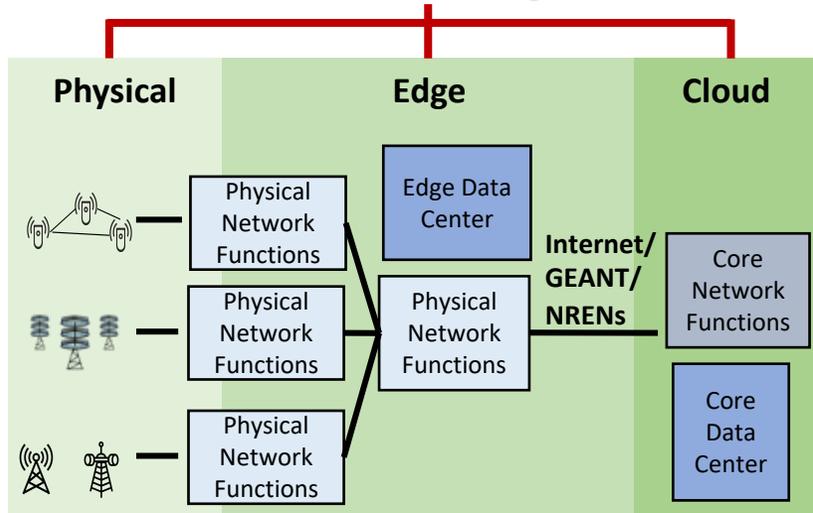
Security and privacy

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SLICES contribution to the development of the EOSC

slices RI ⟷ EUROPEAN OPEN SCIENCE CLOUD

Objectives: **federate existing research data infrastructures in Europe** and **realise a web of FAIR data** and **related services for science.**

#1 Enable experimentation at multiple network levels through **SLICES RI**

Physical	Edge	Cloud

- Physical Network Functions
- Edge Data Center
- Physical Network Functions
- Physical Network Functions
- Internet/ GEANT/ NRENs
- Core Network Functions
- Physical Network Functions
- Core Data Center

Allow experimentation with future/emerging digital, IT and network technologies (e.g., 6G, IoT, Edge, AI, hyper-converged infrastructure).

#2 EU-wide availability of **unique Software and App Repositories**

- ICT research-related services (e.g., testing new infrastructure and network solutions);
- Applications deployed within SLICES;
- Simulation tools;
- Data analysis tools.

Published in the EOSC Catalog and Marketplace and accessible with different access options.

open access	Orderable via provider channel	**EOSC-hub** Orderable via EOSC hub

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**#3** Interoperability with **Open and FAIR data**

- Producers of unique data;
- Maximize data reuse by adopting of FAIR data principles in Data Management and Governance;
- Processing of sensitive and personal information.

#4 Integration of the **SLICES communities to EOSC**

- SLICES community building
  - More than 120 participants to the 1st SLICES workshop;
  - Thousands of users of existing infrastructures.
- Training services

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SLICES timeline
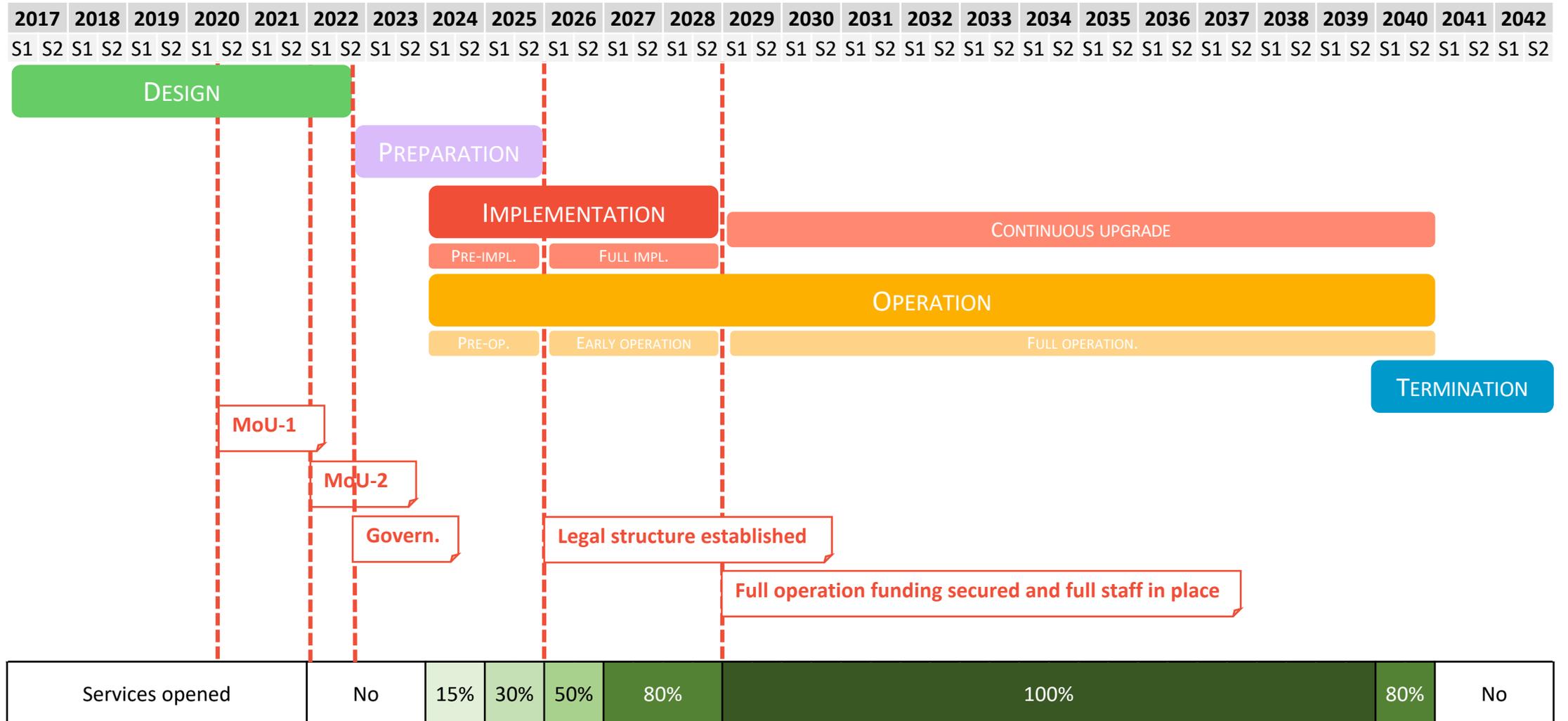
SLICES reference architecture

- Baseline software components that will form the backbone of SLICES

- We offer a large footprint for deploying and testing
  - OAI/Aether blueprints?
    - Aether Core + UPF, OAI disaggregated RANs
    - Support for SD-Fabric + UPF
    - Testing various O-RU, frequency bands (regulation)
  - Joint strategy regarding O-RAN?
  - Experimental plane
  - Portal and APIs

Thank you

www.slices-ri.eu

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