

# SLICE-RI for Digital Infrastructure Technologies Experimentation: Building Infrastructure and Starting Communities

Yuri Demchenko, Paola Grosso, Cees de Laat, Wouter Los (University of Amsterdam)

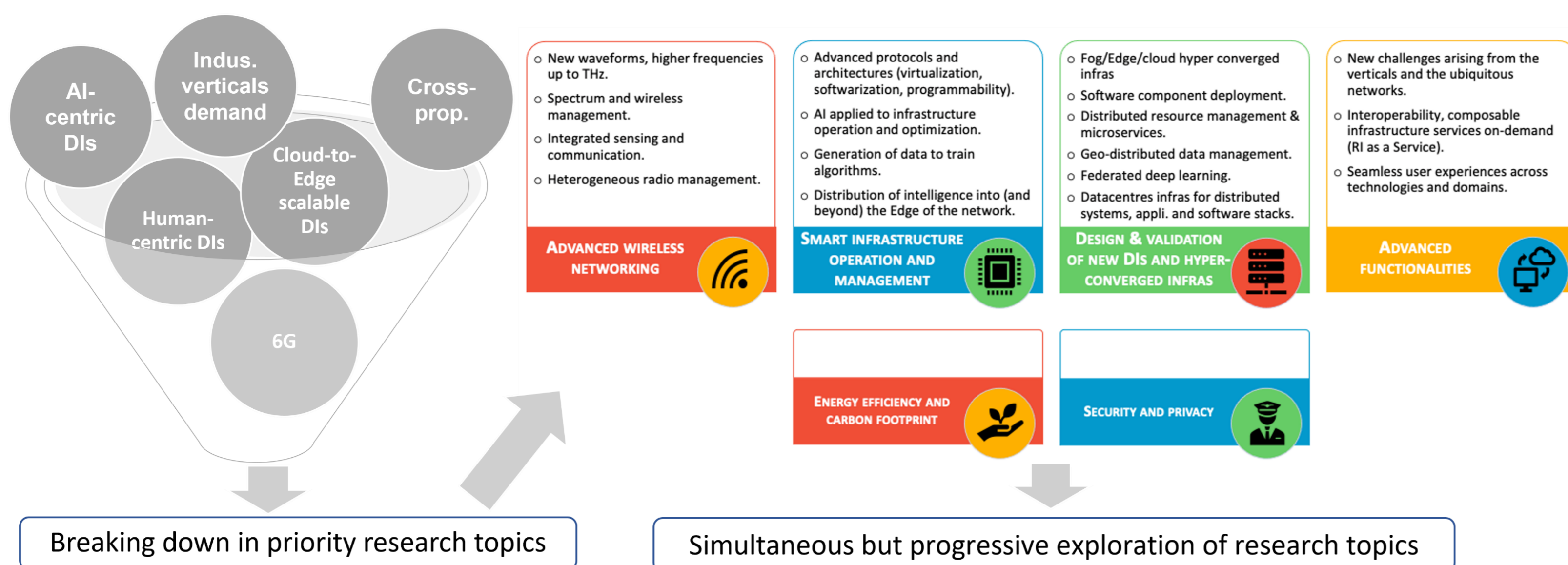
## SLICES-RI is an ESFRI Roadmap 2021 Project and Initiative

- SLICES is a flexible platform designed to support large-scale, experimental research focused on networking protocols, radio technologies, services, data collection, parallel and distributed computing and in particular cloud and edge-based computing architectures and services.
- SLICES consortium gathers partners from 15 European countries
- SLICES will provide advanced services via RI centres and nodes to enable experiments on novel Digital Infrastructure (DI) solutions and applications
- SLICES covers all ESFRI Digital Infrastructures domains: Computing, Digital, Data, Network

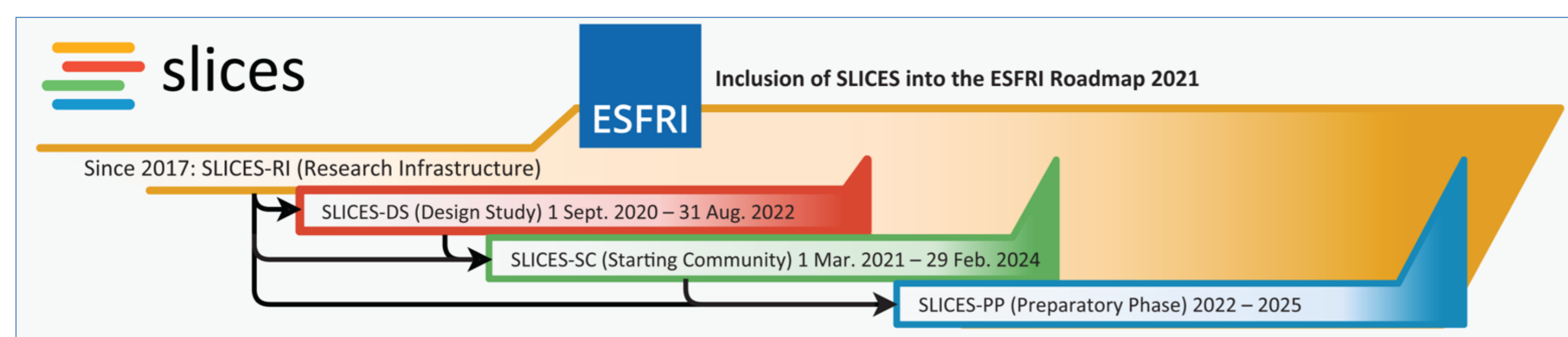
## SLICES-NL Research Topics

- Cloud, IoT and Network Infrastructure research
  - Architecture and design patterns of the future RI Platform as a Service (PRIaaS) for Experimental Research Automation
  - Large scale experimentation on distributed hybrid cloud infrastructure involving public cloud providers
  - Decentralised network/compute optimisation in multi cloud/edge/fog environments
  - High performance and optical networking
  - 5G+ Radio Access and Mobile Networks
- Long Term Research Infrastructure sustainability and energy consumption monitoring and optimization
- Data Infrastructure
  - Trusted data exchange with policy/rules enforcement, preserving data sovereignty and protecting data privacy
  - Data management and quality assurance aspects in Industry 4.0 and Digital Twins applications
- New security and compliance models for Complex Cyber Infrastructures
- Trustable and explainable Internet based on open networking technologies
- AI technologies exploitation, ethical awareness & use for good
- Quantum networks and Quantum Computing
- Support of education on key technologies of the future data centric and cloud enabled infrastructures

## Prioritisation of the SLICES Research Areas



## SLICES-RI Development Timeline



## SLICES-NL Timeline

**May 2023 (Date tbd): Technical SLICES-NL Workshop**

Goal: Inventory NL experimental facilities, identification needs for common infrastructure for experimental research sharing, reproducibility and FAIR compliance.

**June-July 2023 - SLICES-RI Roadshow in Netherlands**

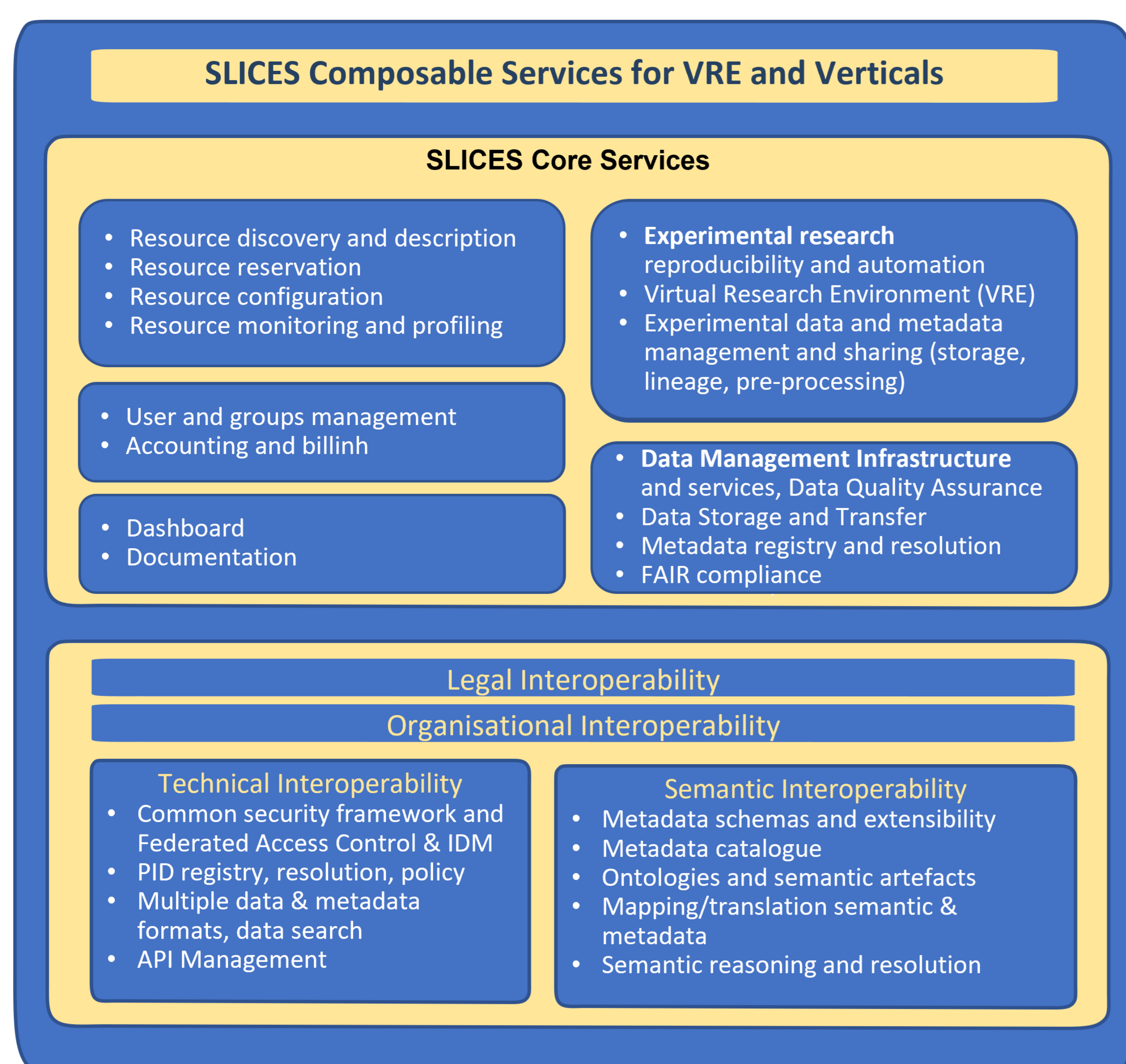
Goal: Meeting SLICES-RI and SLICES-NL communities

**August 2023 (preliminary) – NWO Large Infrastructure Call published**

**September 2023 – Launch event for SLICES-NL community initiative**

**Sept 2023 – Feb 2024 – SLICES-NL proposal preparation and consortium building**

## SLICES Interoperability Framework



## Focus on Interoperability and Integration with EOSC

- Minimum viable infrastructure/service model for SLICES regional nodes and centers
- Integration with the EOSC, external and domain specific RIs, and public clouds
- API design approach to effectively manage and publish SLICES-RI resources and services
- Data Management & Governance: Adoption and compliance with FAIR data principle
  - Metadata for the resource and experimental facilities description
  - Metadata for sharing and publication of data produced by SLICES
  - FAIR Digital Object and PID infrastructure
  - Semantic Research Object (RO)
- Interoperability
  - **Technical \* Semantic (metadata) \* Organisational \* Legal**

## References

SLICES-RI, SLICES-PP - <https://slices-ri.eu/>

ESFRI Roadmap 2021 - <https://www.esfri.eu/esfri-roadmap-2021>

Serge Fdida, et al, SLICES, a scientific instrument for the networking community, Computer Communications, 2022, ISSN 0140-3664, <https://doi.org/10.1016/j.comcom.2022.07.019>

Yuri Demchenko, Sebastian Gallenmüller; Serge Fdida; et al. Experimental Research Reproducibility and Experiment Workflow Management, proc. 2023 15th International Conference on COMMunication Systems & NETWORKS (COMSNETS) [online] <https://ieeexplore.ieee.org/document/10041378>

Contact: Yuri Demchenko [y.demchenko@uva.nl](mailto:y.demchenko@uva.nl), Paola Grosso [P.Grosso@uva.nl](mailto:P.Grosso@uva.nl)

