



The Pan-European 6G federated infrastructure flagship project

'SUstainable federationN of Research Infrastructures for Scaling-up Experimentation in 6G'

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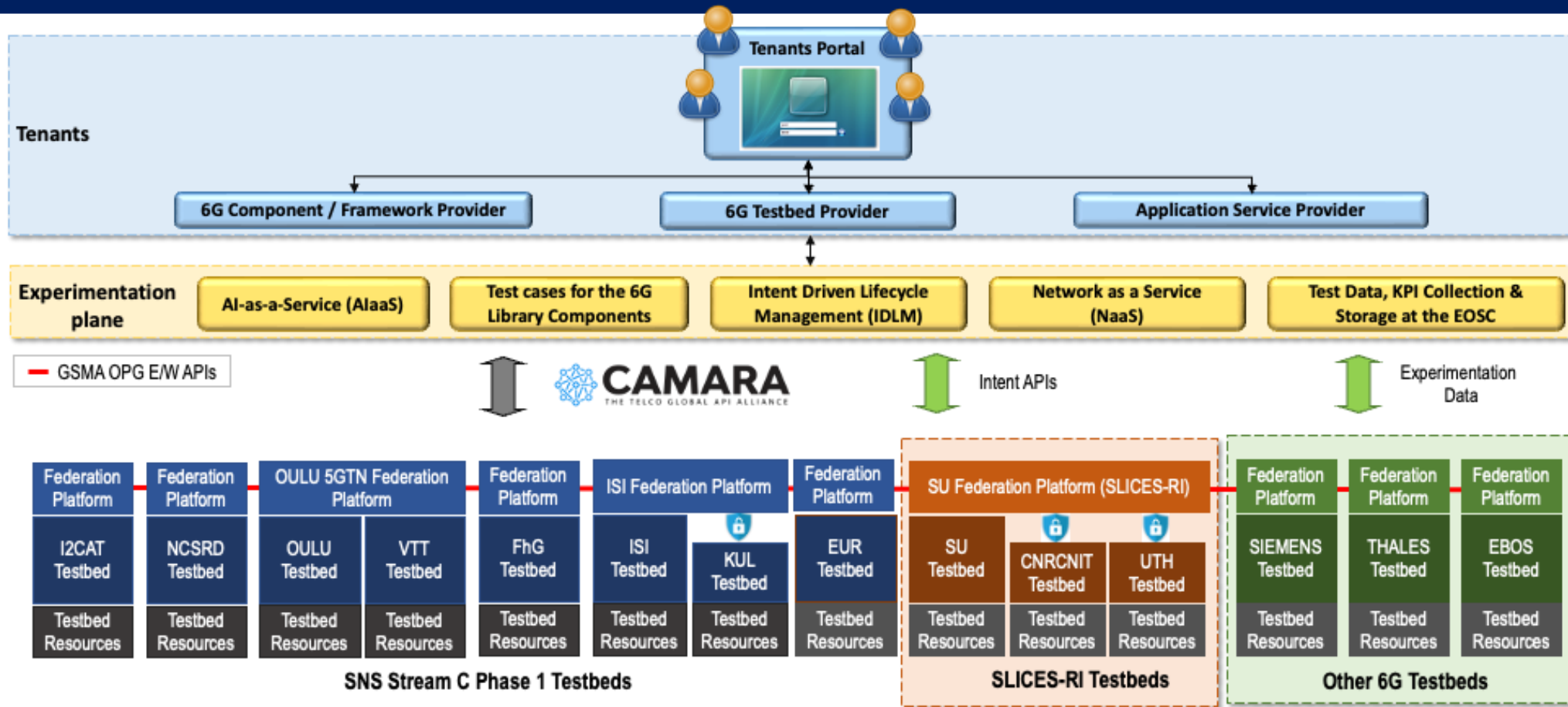


**Pan-European
Federation of 6G
infrastructures, that
provides access to a
comprehensive library
of 6G enablers during
the SNS program**

Key participants from:
Stream C Phase-1
Other SNS Phase-1
National 6G initiatives
SLICES-RI



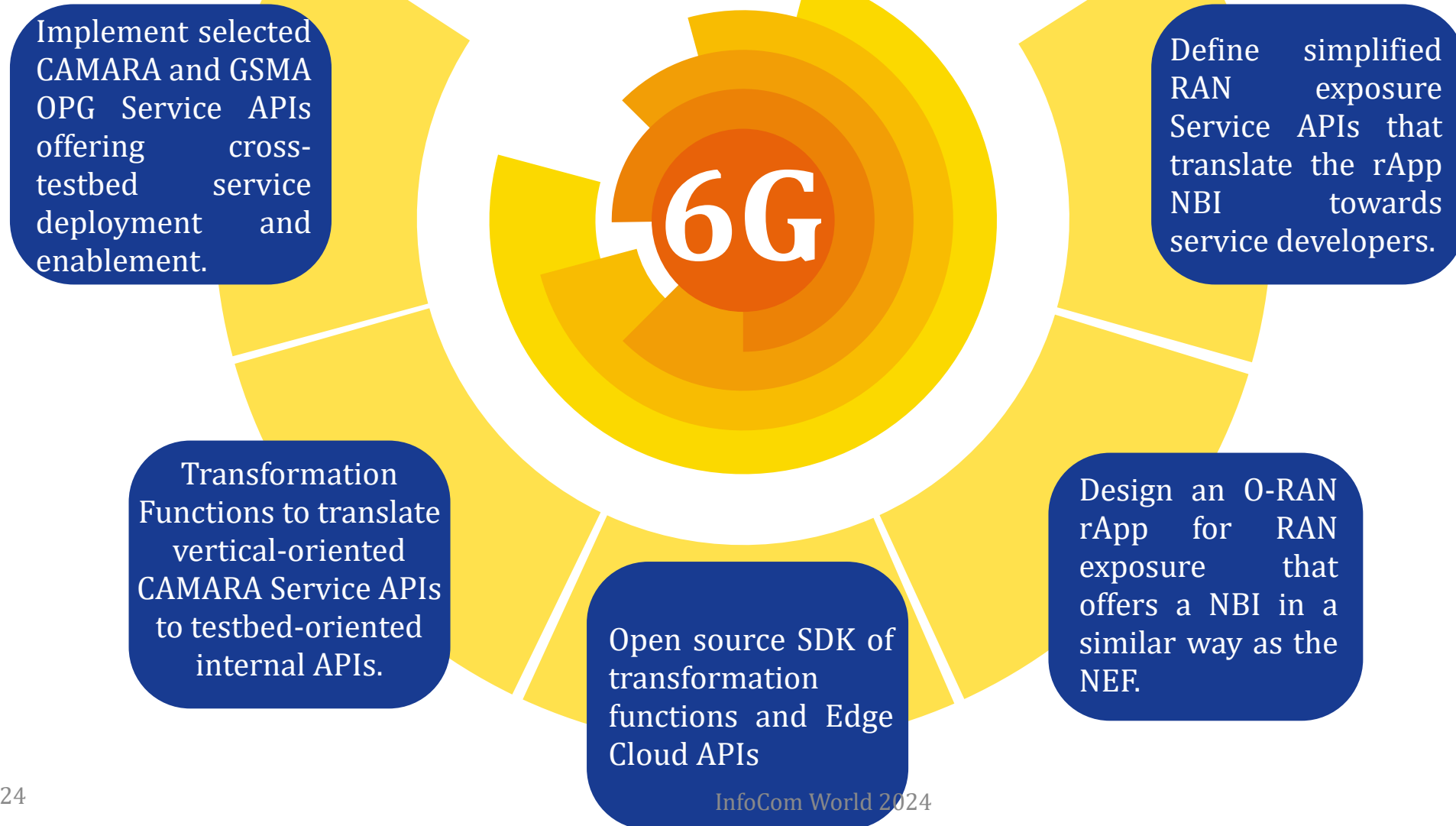
SUNRISE-6G Architecture



Implement CAMARA Service APIs & GSMA Operator Platform Group for portability (and replicability) of applications and services across different federated facilities.

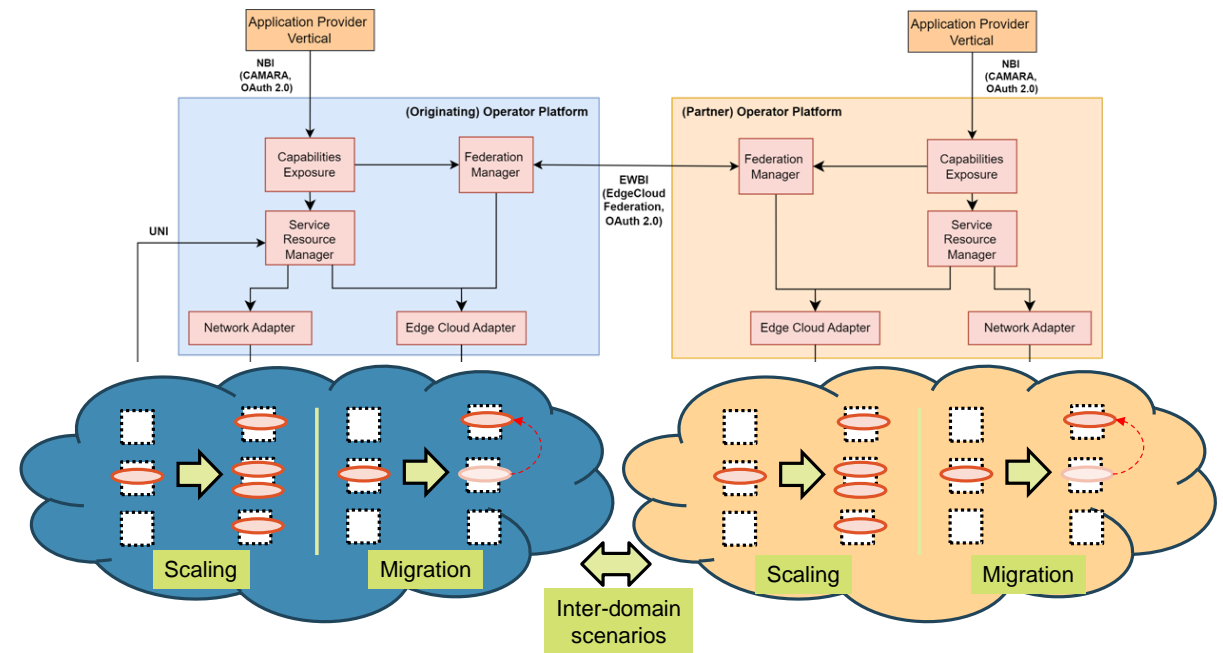
Expose in Testing-as-a-Service manner all project testbeds as a sustainable Facility

❖ 3GPP compliant Federation Framework

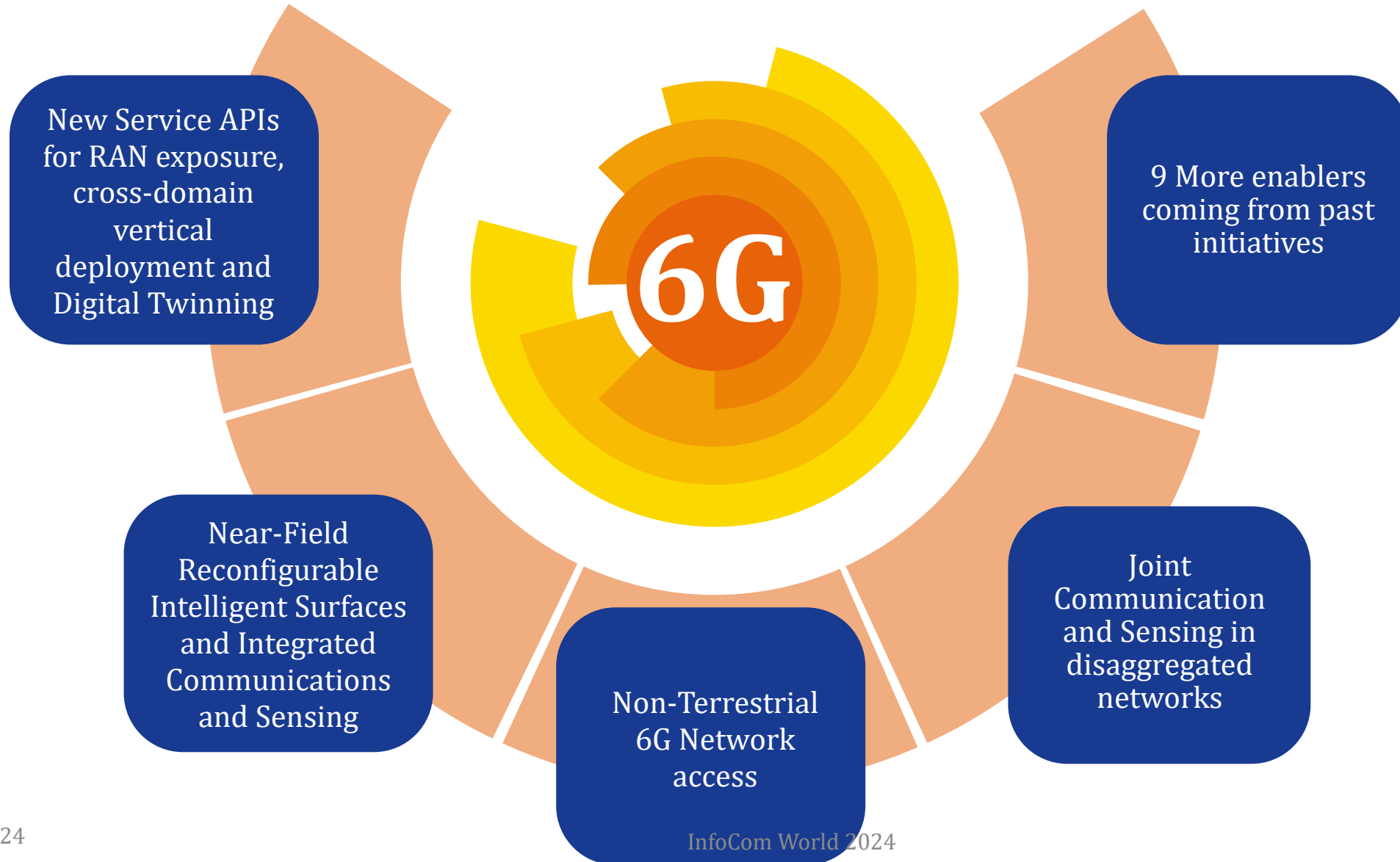


SUNRISE-6G will harmonize and deliver an Open Federation Framework to implement the emerging federation standards and offer extensions that fill the gaps to support a 3GPP compliant pan-european 6G experimentation infrastructure

SUNRISE-6G aims to allow CAMARA-compliant verticals to be deployed unchanged at any federated testbed and in the future to large-scale trial sites that support Camara Service APIs



6G Library for Experimenters



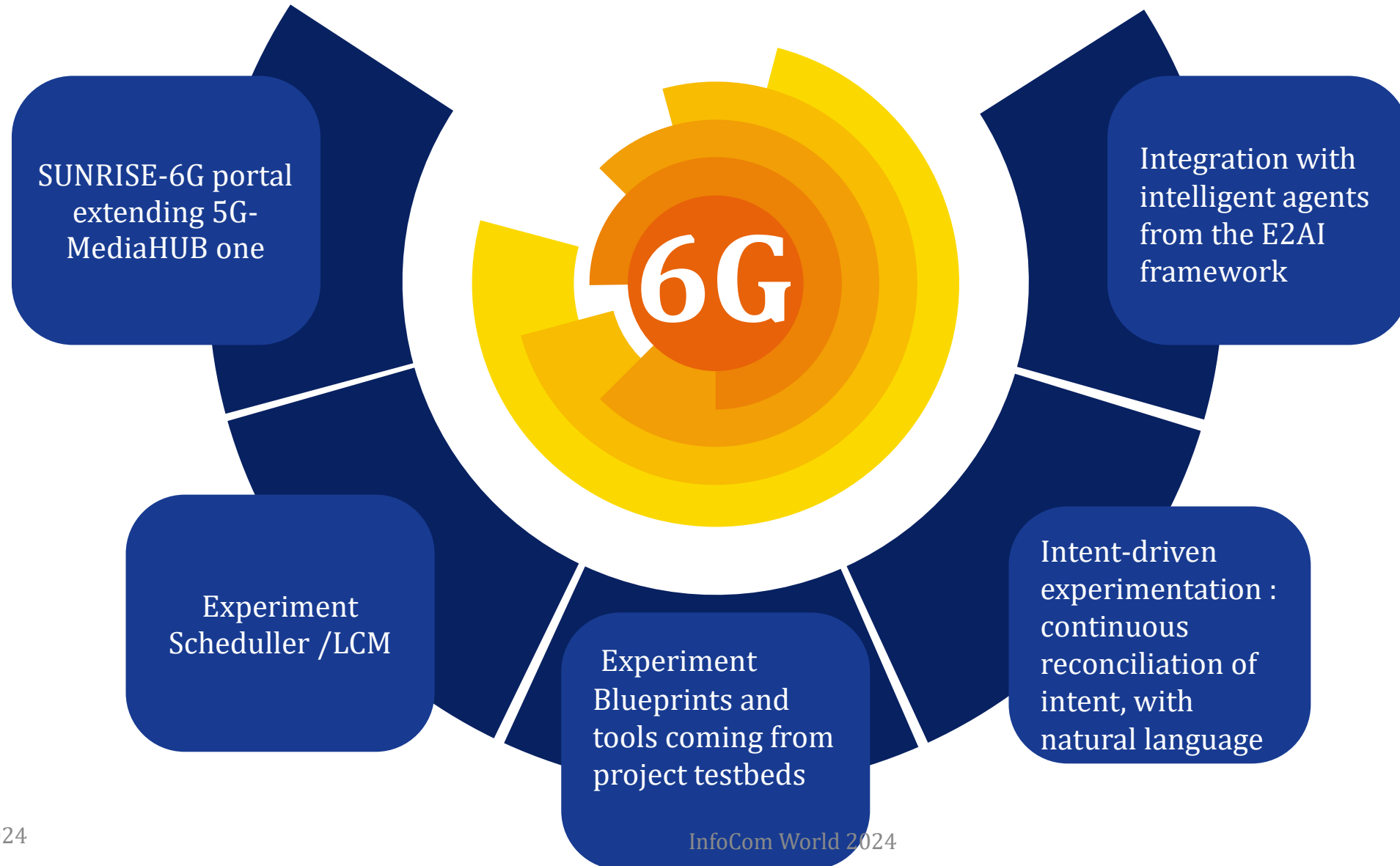
- O-RAN enabled Network Digital Twin solution
- Near Field communication prototyping in a mmW RIS platform
- JCAS prototype and validation environment
- NTN-terrestrial MPTCP proxy and Digital Twins Emulator
- NTN Edge Cloud System Emulator
- Energy Framework
- Open RAN Compliant CFmMIMO and prototype xApps
- OpenMAEP - E2E testing tool for measurements via android phones
- AI-Driven Compute Continuum
- AI-driven cyberattack mitigation framework based on Ensemble Learning

Deliver a comprehensive and mature library of 6G enablers

- Several 6G enablers are already in development in SNS Phase 1 projects.
- Current efforts lack maturity (target TRL 3-4) and provision for external access

SUNRISE-6G will increase the maturity of existing 6G enablers from Phase 1 projects and deliver new ones, that were identified as missing pieces from the Facility. These will be offered to experimenters as a cohesive 6G Library

- ❖ **6G enablers linked with experiments**
- ❖ **Assured access by external experimenters**
- ❖ **6G enablers from all Phase-1 Stream-C projects & RIGOUROUS and ADROIT6G Stream-B projects**



Intent-Driven Experimentation

- TaaS is a concept popularized from 5G-PPP program; on-demand execution of test cases
- High barrier of entry for new testbeds; integration of (typically unique) APIs with the Experiment Scheduler
- High barrier for experimentation; requires users to learn a new (typically imperative) DSL

Pursue sustainable TaaS via reusable experimentation blueprints (e.g., from SLICES-RI, 5GMediaHUB) while adopting a declarative paradigm (IDLM) consistent with the “Network-of-Networks” federation.

❖ **Intent reconciliation paradigm**

❖ **Natural Language / Chat interface**

UC Title & Stakeholders	Objectives	UC KPIs
UC1: Federated Metaverse (I2CAT)	Realistic multiuser holographic comm platform to enable cross-domain Metaverse-like services <ul style="list-style-type: none"> • Showcase the Open Federation framework(including E/W and CAMARA APIs) in a cross-domain Metaverse scenario • Validate the Cognitive Compute Continuum enabler 	KPI-1: ≥ 2 transversal VNFs to be dynamically orchestrated over federated cloud continuum KPI-2: End-to-end delay reduction up to x10 from local edge to far edge/cloud resources KPI-3: Up to 30% of processing offloaded and up to 50% bandwidth saved for end clients
UC2: Collaborative Robots for Mining (LTU, OULOU)	Inspection missions of a mining infrastructure, by multiple autonomous vehicles in a collaborative approach <ul style="list-style-type: none"> • Validate the tinyML capabilities of the E2EAI framework • Showcase the federation of external Private networks under the umbrella of SUNRISE-6G 	KPI-1: Dynamic allocation of computational resources for AI in the Edge, while keeping the real time bounds of 10Hz KPI-2: Model training time reduction via E2EAI capabilities (50%)
UC3: Federated NTN (INFO, LTU)	Execution of diverse NTN scenarios <ul style="list-style-type: none"> • PoC1: mobility scenarios with multiple static and mobile heterogeneous compute nodes in a federated NTN system • PoC2: NTN emulation on scenarios testing multi-connectivity and inter-PLMN handover scenarios 	KPI-1: Increase at least 30% in the downloading throughput level in comparison to the single access; KPI-2: Service continuation during inter-PLMN NTN-TN hand-over with measured service interruption $< 50\text{ms}$



Thank you for your attention!



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