



IRIS²

A catalyst for 5G NTN and the European technological sovereignty

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Flavien RONTEIX

Project Officer – Secure Connectivity and Radio Spectrum
European Commission – Joint Research Centre



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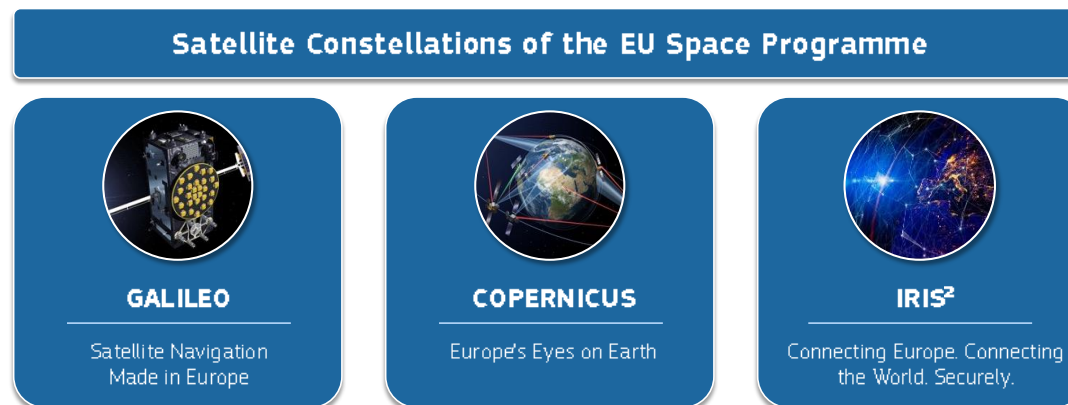
- Introduction to the IRIS² programme
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- Conclusion

Introduction to the IRIS² programme

Introduction

A new EU space flagship programme

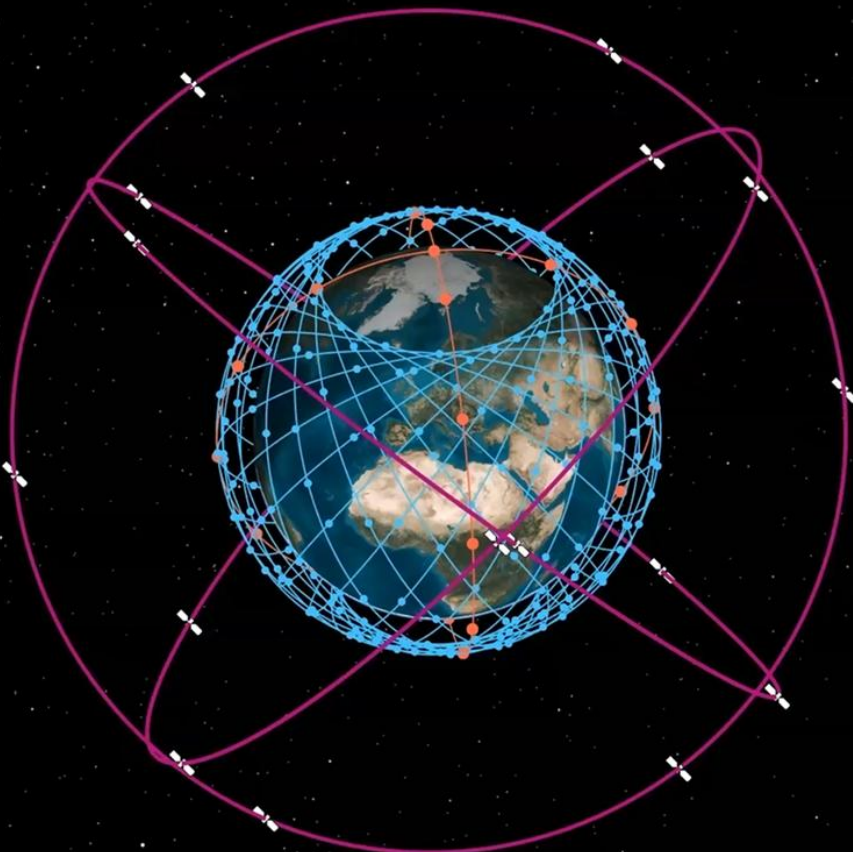
- **IRIS²** (Infrastructure for Resilience, Interconnectivity and Security by Satellite) is the **new flagship space programme of the European Union**



- Implemented as a **Public-Private Partnership**
 - Public sector : the **European Commission**, the **European Space Agency** (ESA) and the **EUSPA**
 - Private sector : concession agreement signed with the **SpaceRise** consortium the 16.12.2024
- **Use cases and service portfolio**
 - 1/ Robust Worldwide Low-Latency
 - 2/ Robust Space Data Relay
 - 3/ Assured Worldwide Low-Latency
 - 4/ Assured Worldwide Narrowband
 - Commercial satellite services

Introduction

The IRIS² vision



Multidomain telecom and data network backbone

LEO and MEO, low latency, high throughput
Combined with GOVSATCOM (GEO) and Low-LEO for future services

Security by design

State-of-the-art cryptographic mechanisms, cyber- and RF-threats resilient,
assets located in EU, security accreditation
Future Quantum Key Distribution service

Open standards and interoperability

Regenerative mode: **built-in 5G NTN** in space, ground and user segments
Transparent mode: support of sovereign waveforms and user terminals

Innovative

System must integrate innovative/disruptive technologies and services,
participation of SMEs, New Space actors

Environmental and space sustainability

GHG minimisation and offset, space debris mitigation, anti-collision,
prevention of illumination pollution

GEO: Geostationary Earth Orbit
GHG: Greenhouse Gas
GOVSATCOM: Governmental Satellite Communications

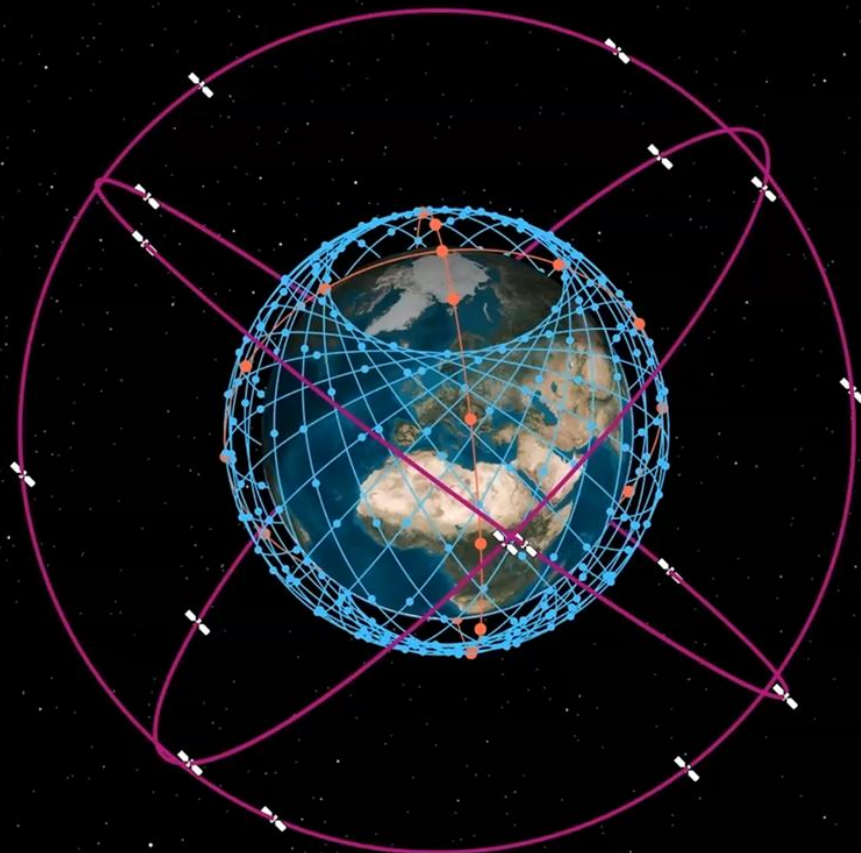
LEO: Low Earth Orbit
MEO: Medium Earth Orbit
NTN: Non-Terrestrial Networks

RF: Radio Frequency
SME: Small and Medium Enterprise

Introduction

The IRIS² system

* First launches planned for Q3'2029
and full operational capability by 2032



18 MEO satellites @ 8060 km (Ka-Mil, Ka bands)

330 (264+66¹) High-LEO satellites @ 1220 km (Ka-Mil, Ku bands)

24 polar High-LEO² satellites @ 1230 km (Ka-Mil)

10+10 Low-LEO³ satellites @ ≤ 750 km (S-band)

5 Hard-Gov EU gateway sites and 3 EU Ground Control Centres

Notes:

(1) Ka-Mil only

(2) Option

(3) Ongoing EC and ESA RFPs for NB-IoT service and D2D demonstration missions

Introduction

IRIS² industrial setup



SpaceRISE

**Infrastructure
Architect
Member**



Subcontracted activities (Core Team)



Suppliers

60+ already identified in 12 European countries (e.g. software, filters, propulsion, etc.)

The 5G NTN for IRIS²

5G NTN in the IRIS² system

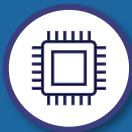
Use of 3GPP standards across all mission segments

IRIS² is the first publicly announced multi-orbit satellite constellation built on 3GPP NTN standards

- **Space segment:**
 - 5G NR NTN FR2 regenerative payload for governmental and commercial services in High-LEO and MEO
 - 5G NR NTN FR1 and NB-IoT NTN regenerative payload for Low-LEO
- **Ground segment:**
 - Sovereign 5G Core Network
- **User segment:**
 - 5G NR NTN FR2 VSAT terminals for High-LEO and MEO
 - 5G NR NTN FR1 handheld and NB-IoT NTN devices
- **Other 5G features:**
 - UE-Sat-UE communication (i.e., direct user-to-user), GNSS-resilient operations

5G NTN in the IRIS² system

Benefits of adopting 3GPP open standards



Technological benefits

- Integrated **Quality-of-Service** (QoS) architecture
- **Flexible resource management** (e.g., dynamic time-frequency resource allocation)
- Built-in 3GPP **security** and **authentication** mechanisms
- **Interworking** with other **3GPP core networks** (e.g., national 3GPP broadband mission-critical communications systems)

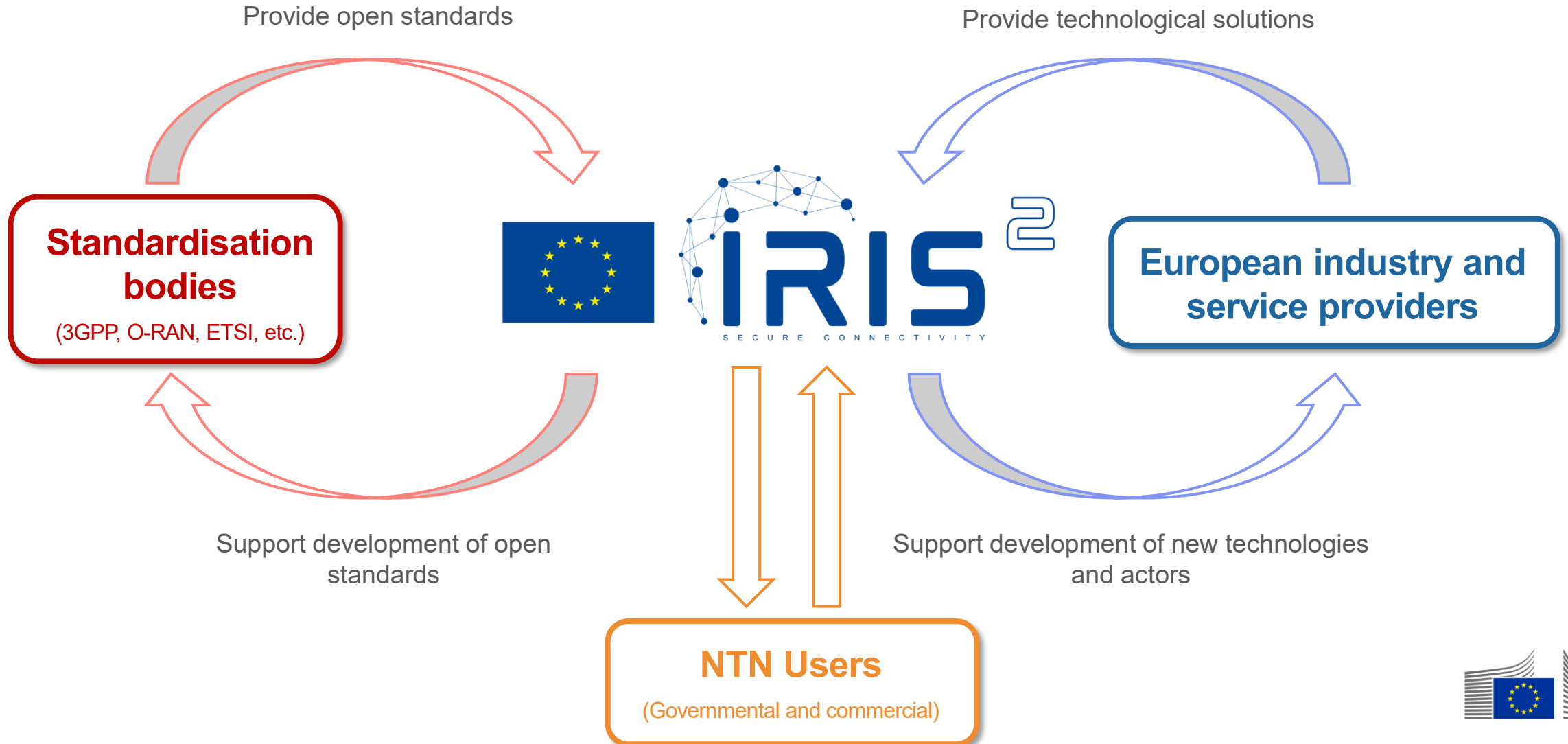


Commercial benefits

- **Mature** and **open** standards ecosystem with a **clear evolution path**
- 3GPP standards enable **vendor interoperability** and **economies of scale**
- **Lower entry barriers** for **new SATCOM actors** (space, ground and user segments)
- Synergies with **key verticals** (e.g., automotive, railway, etc.)

5G NTN in the IRIS² system

IRIS² contributions to 5G NTN technology



Conclusions

Conclusion

Three key takeaways

- **IRIS² is the new flagship constellation of the EU Space Programme:**
 - A strategic asset for the security of the EU and its Member States
 - Strong support from ESA in full cooperation with the European Commission and EU Member States
- **An integrated and interoperable system for secure and reliable communications:**
 - High-LEO and MEO for broadband secure and low-latency communications
 - Combined with GOVSATCOM (GEO) and Low-LEO for Direct-to-Device and NB-IoT services
- **An innovative and forward-looking technology approach:**
 - Use of 5G NTN standards in the space, ground and user segments
 - Participation of European space industry, SMEs, start-ups and New Space actors

IRIS² is a unique opportunity to support the development of NTN via open standardisation, sovereign industry and innovative services

Thank you



Flavien.ronteix-jacquet@ec.europa.eu

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Backup



Introduction

IRIS² legal basis and implementation timeline

Legal basis:

- [Regulation \(EU\) 2023/588](#) (“the IRIS² regulation”) → entry into force in **March 2023**
- Implemented as a Public-Private Partnership

IRIS² implementation timeframe:

- Signature of Concession Agreement with SpaceRISE: **December 2024**
- Project kick-off: **January 2025**
- Rendez-Vous 1 (RDV1) milestone completion: **August 2026**
- Initial services by **2030**, Full Operational Capability by **2032**

Introduction

Use cases and service portfolio



- Hard-Gov services
- Light-Gov services
- Commercial services

Introduction

IRIS² public sector setup



- The **European Commission** has the **overall responsibility** for the **implementation** of the **Union Secure Connectivity Programme – IRIS²**



- The **European Space Agency (ESA)** is the **Qualification and Validation Authority** of the **IRIS² governmental infrastructure**



- The **European Union Agency for the Space Programme (EUSPA)** is responsible for **security accreditation** and the **provision of governmental services**