cell & sat

# *Implementing Cellular & Satellite convergence*




**2026**

# Cell & Sat

> Systems engineering company
  - Established in 2005
  - Located in Paris, France

> Mission :
  - Provide expertise at the cross-road of Cellular & Satellite
  - Focus on alleviating the digital divide in Emerging markets
  - Prepare the convergence of terrestrial and satellite networks

> Business positioning :
  - Consulting activities
    - *Assignments with cellular and satellite operators, regulators*
  - Technical innovations
    - *System specifications, patents, optimization software*

www.cell-sat.com

# Some of our references

> Technology evaluations
- Comparison of satellite networking solutions
- Evaluation of fixed and mobile wireless technologies
- Design of stratospheric cellular systems

> Business strategy and Marketing
- Market assessment
- Definition of service/product offering
- Business planning

> Cellular & Satellite operations
- Technical audit of mobile operator
- Satellite network engineering

> Specifications and product developments
- Cellular backhaul optimisation software
- Definition and validation of cellular + satellite rural solutions

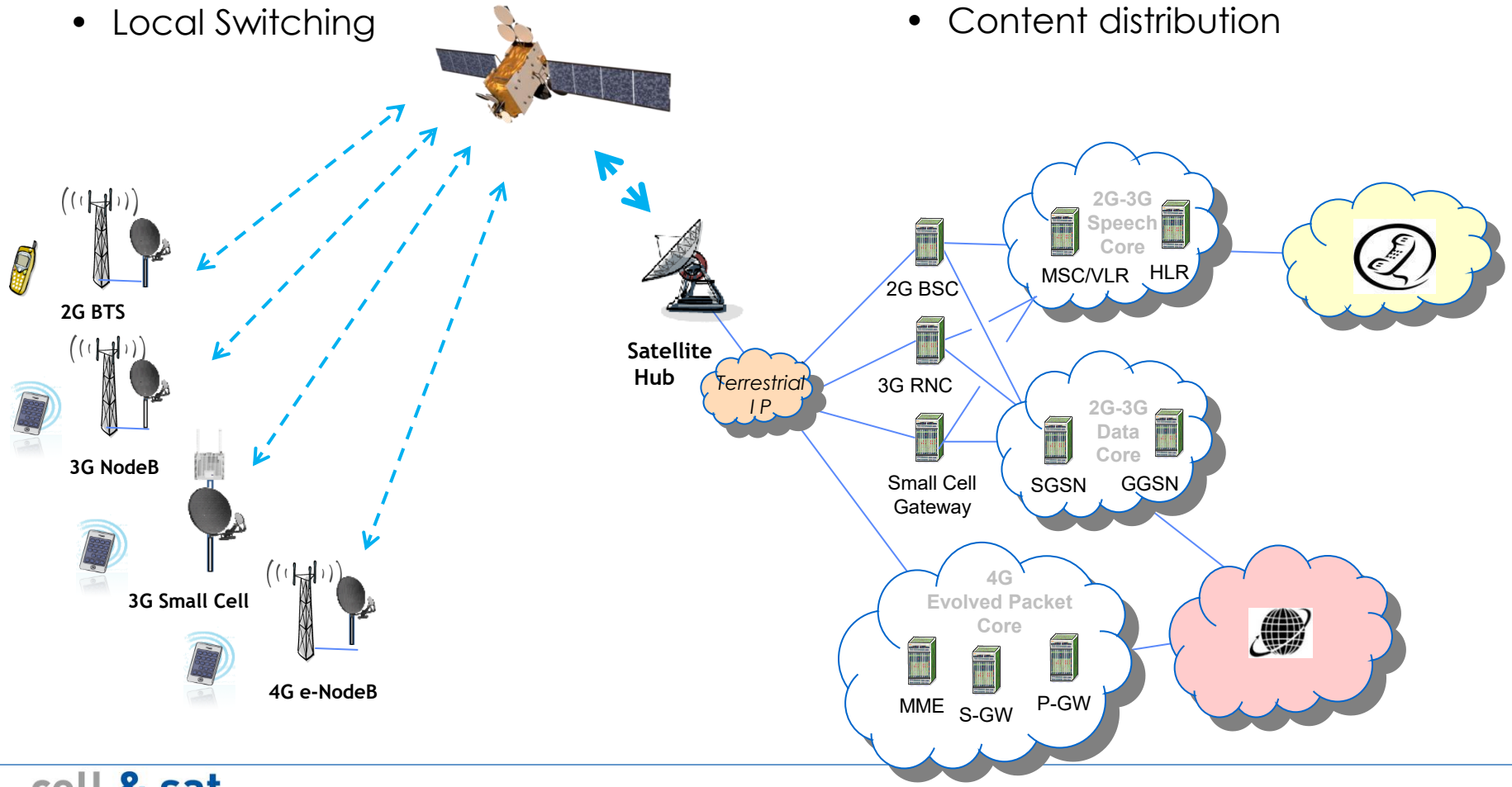
# Cell & Sat experts

| | | | |
|---|---|---|---|
| > Cellular & Satellite | **Didier Verhulst**<br>France Telecom R&D<br>Alcatel Mobile<br>Alcatel Space | **Jean-Marc Hanriot**<br>Alcatel Mobile<br>Alcatel Mob. Broadcast<br>Alcatel-Lucent Services | **Patrick Forgnone**<br>Alcatel Mobile<br>Alcatel Space-Thales<br>Metracom |
| > Cellular (5G)HAPS | **Luc Dartois**<br>Alcatel Mobile<br>Nokia Bell Labs | **Yoann Lefebvre**<br>Alsatis | **Bruno Ridard**<br>Alcatel<br>Thales |
| > Satellite backhaul<br>Rural cellular | **Semir Hassanaly**<br>Memotec<br>iDirect | **Yves Hupé**<br>Alcatel<br>Memotec | **Maxime Dumas**<br>Nuran<br>Parallel Wireless |
| > 3GPP standard<br>Non-Terrestrial Net. | **Keith Edwards**<br>Nortel Networks<br>3GPP Consultants | **Julius Robson**<br>Nortel Networks<br>3GPP Consultants | **René Faurie**<br>Nortel Networks<br>3GPP Consultants |
| > Regulation, networks,<br>Training | **Vincent Roger Machart**<br>Setics<br>Cogicom | | |

# Our expertise : satellite backhaul optimization

> We developed solutions to optimize backhaul for speech and data

- Silence detection & compression
- Local Switching
- Compression, acceleration
- Content distribution



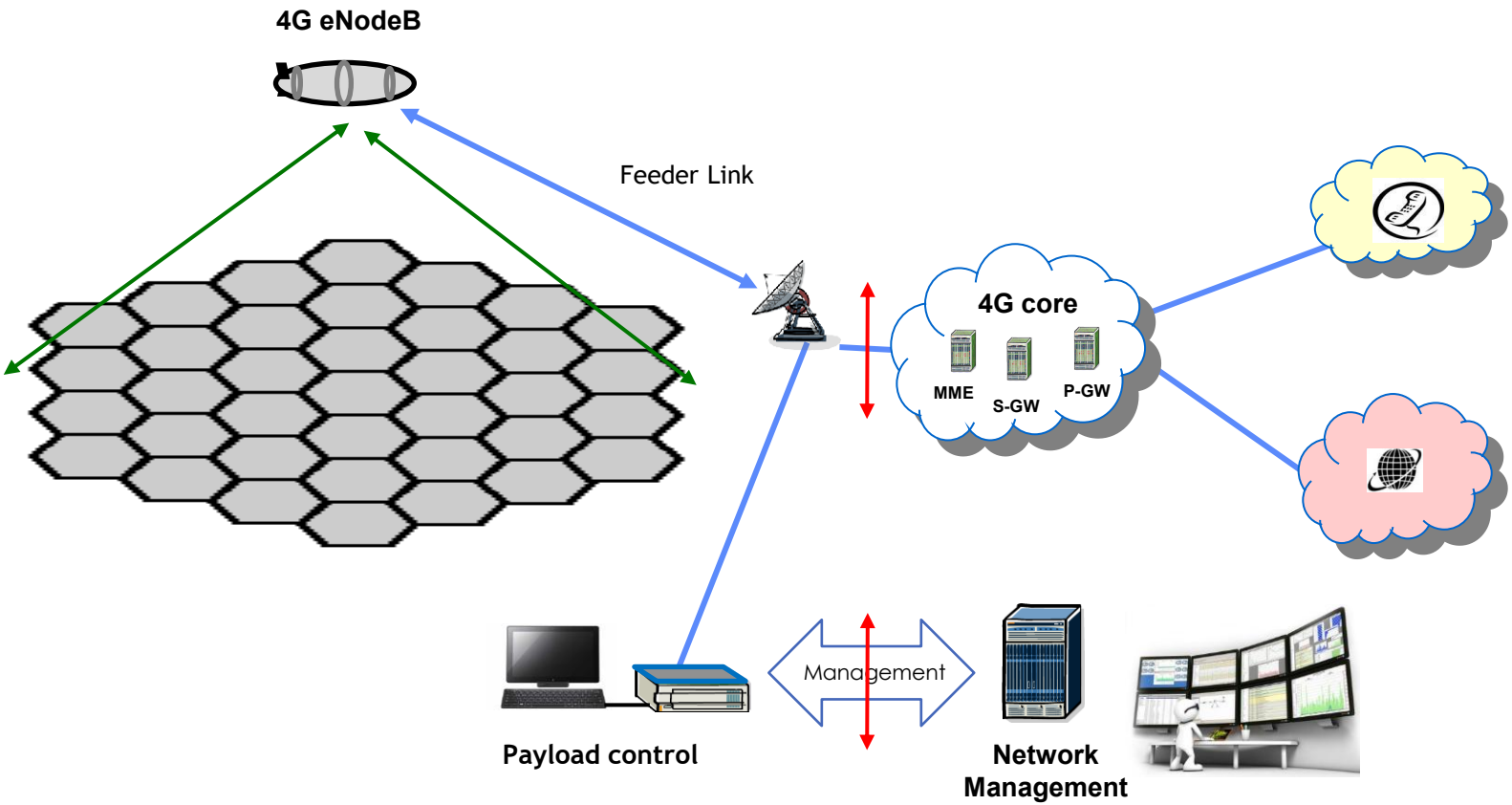
# Our expertise: Rural site optimization

> We evaluated rural base station design & supported their deployment

2G/3G/4G
small cell
+ satellite
+ solar energy

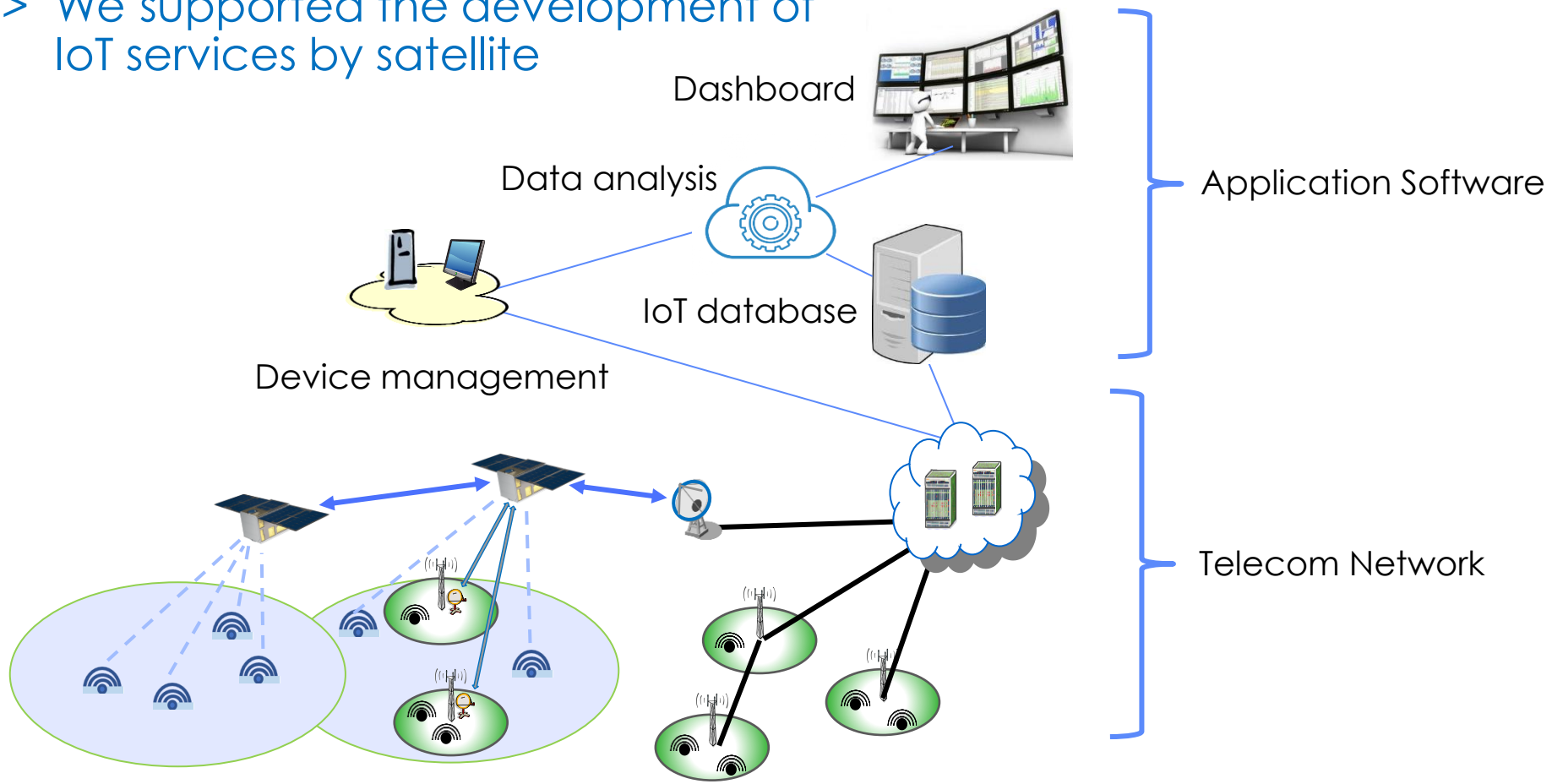
# Our expertise : Cellular HAPS design

> We defined the architecture of a high-capacity 4G stratospheric payload and performed in-flight validation



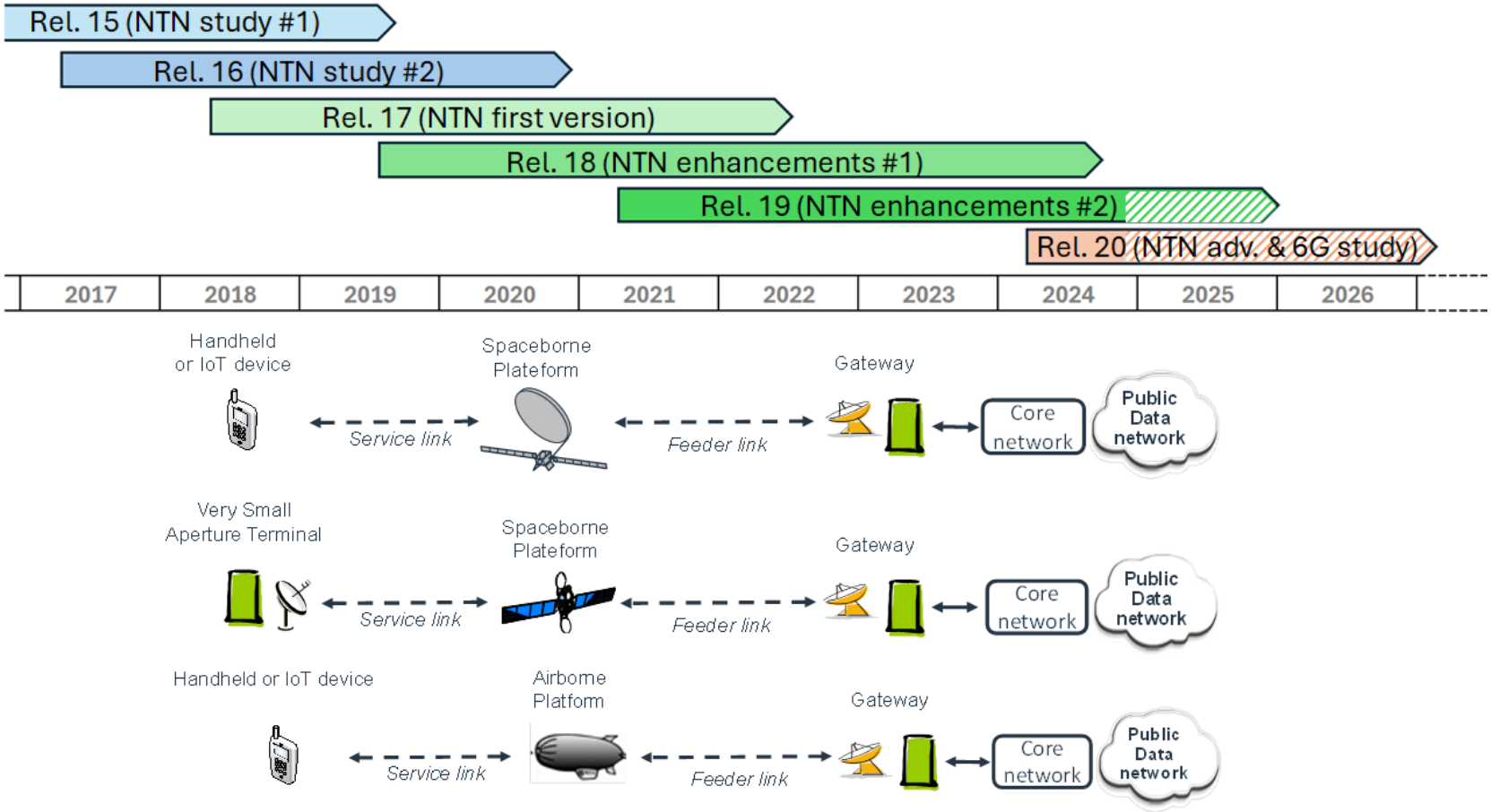
# Our expertise: Satellite IoT

> We supported the development of IoT services by satellite



# Our expertise: 3GPP 5G NTN standardization

> Starting with Release 17, we contribute to the definition of 3GPP 5G "Non-Terrestrial Network" standard for IoT and broadband services.



# Consulting services for Telecom Operators

- We support Telecommunication Operators in their short/medium term deployments using space solutions

**Technical**

- Performance Analysis
- Optimization Systems
- Specifications, choice of suppliers (satellite, ground system)
- Impact of standards (cellular, satellite, etc.)

**Economic**

- Business models
- Competitiveness analysis,
- Choice of satellite operators
- Integration with terrestrial networks
- Integrated Rural Solutions (Cellular + Satellite + Solar)

**Regulatory**

- Frequency Management
- Regulatory constraints (lawful interception, etc.)

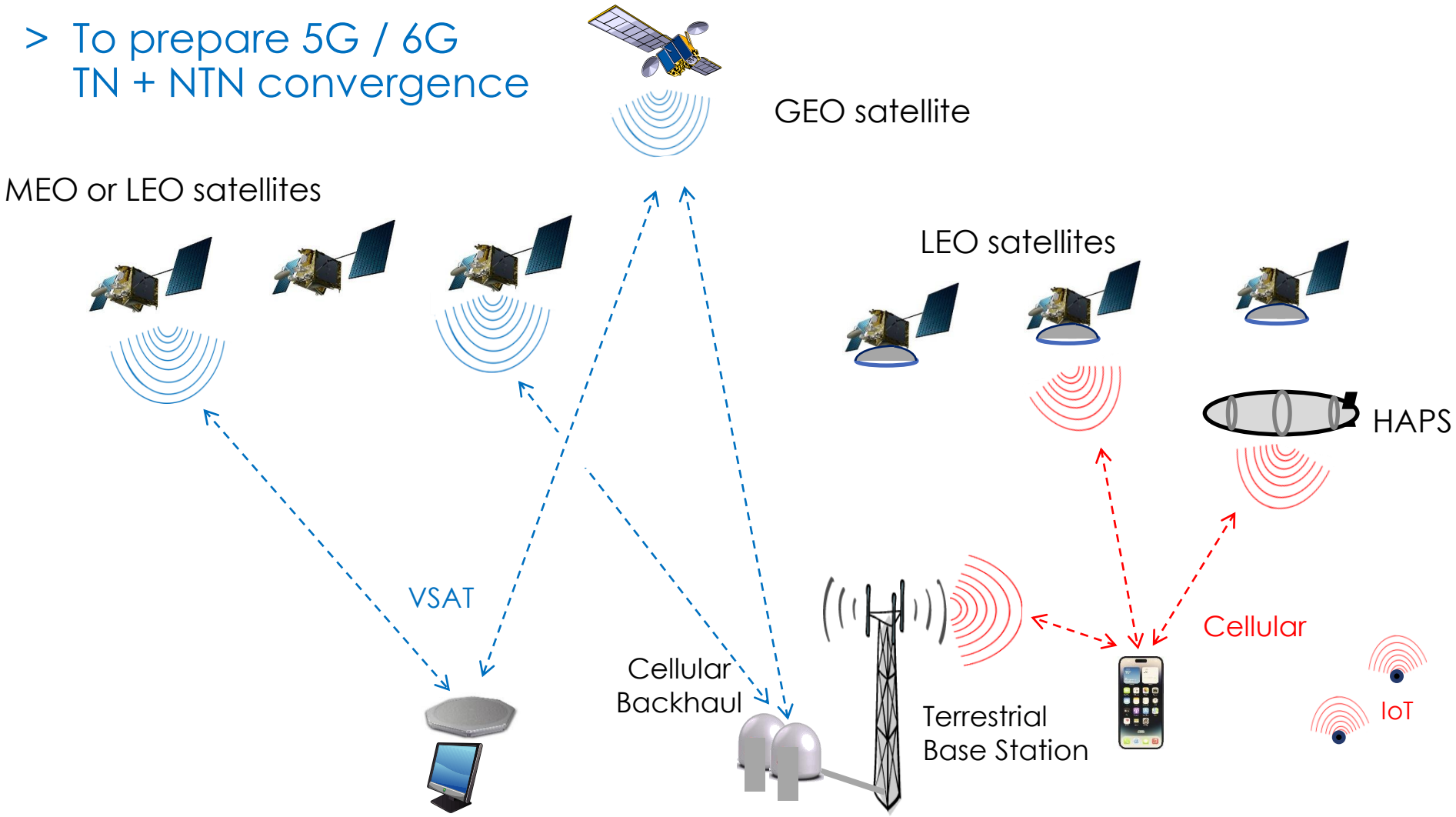
**Operational**

- Plant optimization
- Operation & Maintenance Procedures and Platforms

… and contribute to their long-term terrestrial + satellite convergence strategy.

# Our vision: full Cellular + Satellite integration

> To prepare 5G / 6G
> TN + NTN convergence



# Our short / medium term goals

- To promote the development of efficient telecommunication services combining terrestrial and space-based components
  - To provide truly universal access to the Internet
- To contribute to the design of innovative cellular & satellite systems:
  - Offering flexible and secure broadband Internet access services
  - With wide coverage and affordable costs
  - And adopting sustainable development principles

  with the following architectural choices :
  - Implementing the new 3GPP 5G/6G NTN standards
  - With a multi-layer approach : GEO/MEO/LEO satellites, HAPS, Terrestrial
  - & optimized number of satellites: environment friendly, cost & energy efficient.
- To support the European industry in the “New Space” environment
  - Contribute to the IRIS$^2$ developments of reliable, secure, and autonomous satellite communication capabilities for the European Union.