UK SPACE AGENCY

# Satellite Connectivity at the UK Space Agency – New Directions in Direct to Device and Non-Terrestrial Networks

Henny Sands and Tatum Burgess
Telecommunications Team
Investment Directorate

# Agenda

- Opening Remarks by Tech UK
- Introduction
- Sector Trends  - New Opportunities in Satellite Connectivity
- Overview of ARTES
- Overview of Connectivity in Low Earth Orbit Programme
- Overview of Pilot Procurement Programme
- Questions

# Opening Remarks

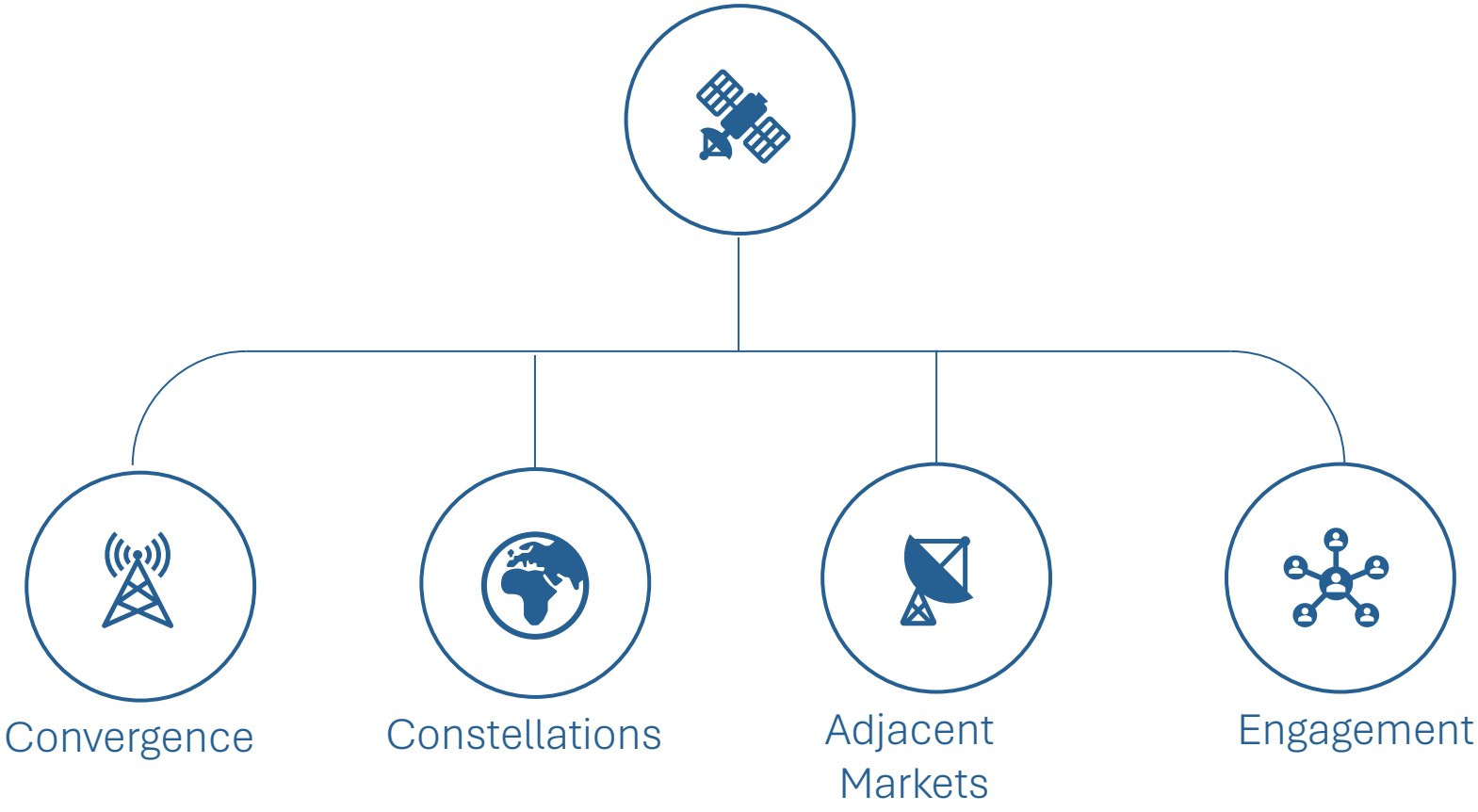
# Introduction

# Sector Trends

# UK Space Agency Priorities

- Data for citizens
  - Creating unique data and services to citizens and businesses
- Economic growth
  - Space investments return nearly 10:1 in a global economy worth c.£490bn by 2030.
- Global influence
  - Partnering on new missions and setting standards
- Threat protection
  - Space is part of the UK's CNI

# Satellite Communications



# Outlook and opportunities

## Disrupted

Single systems

Rise of constellation market
+Replacabilty
+Accessibility
+High-volume

Changing role of Geo

## Disruption

Multiple systems

+Convergence
+Technology change
+Consumer demand
Market consolidation

Changing role for SatCom

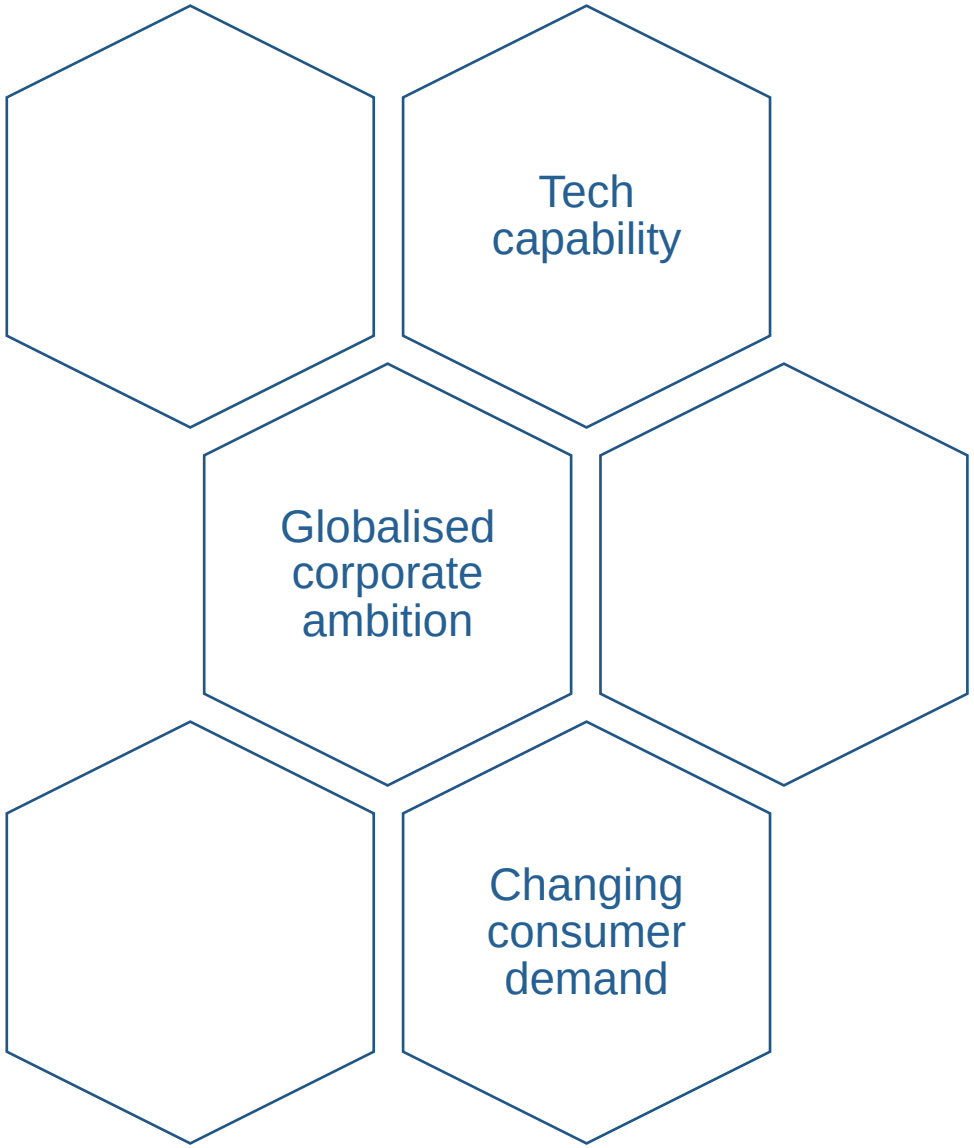
## Disrupting

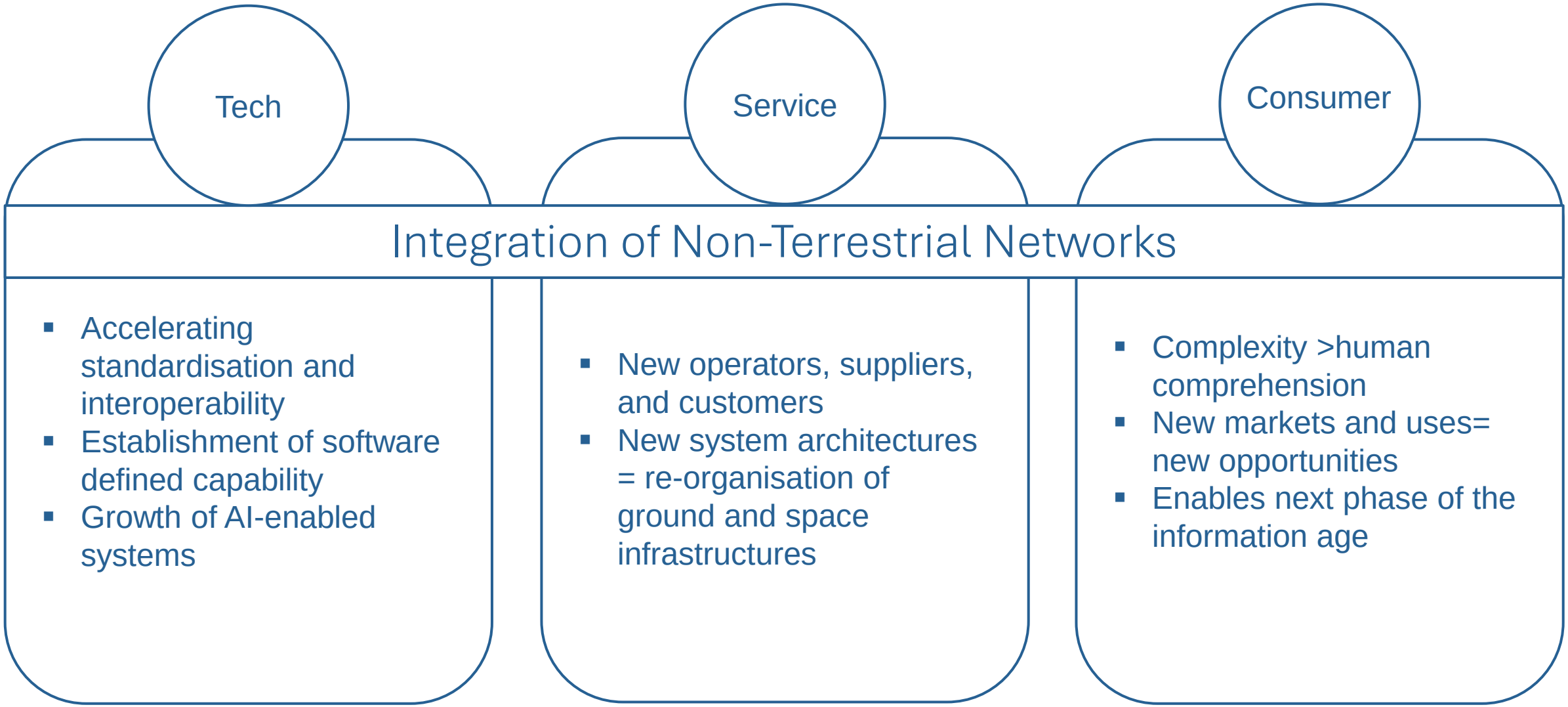
Network of networks

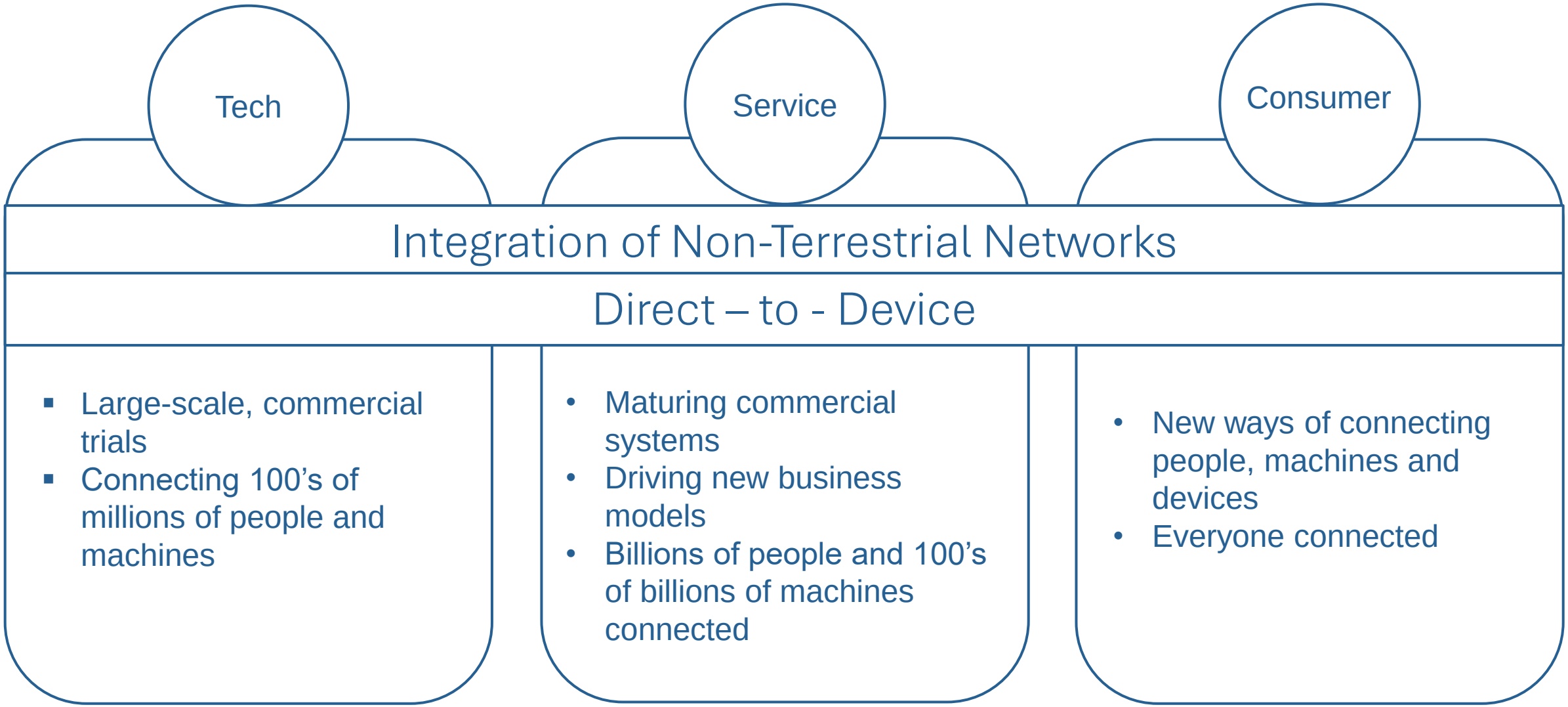
Ubiquitous connectivity
Rise of e2e infrastructures
Transition to optical

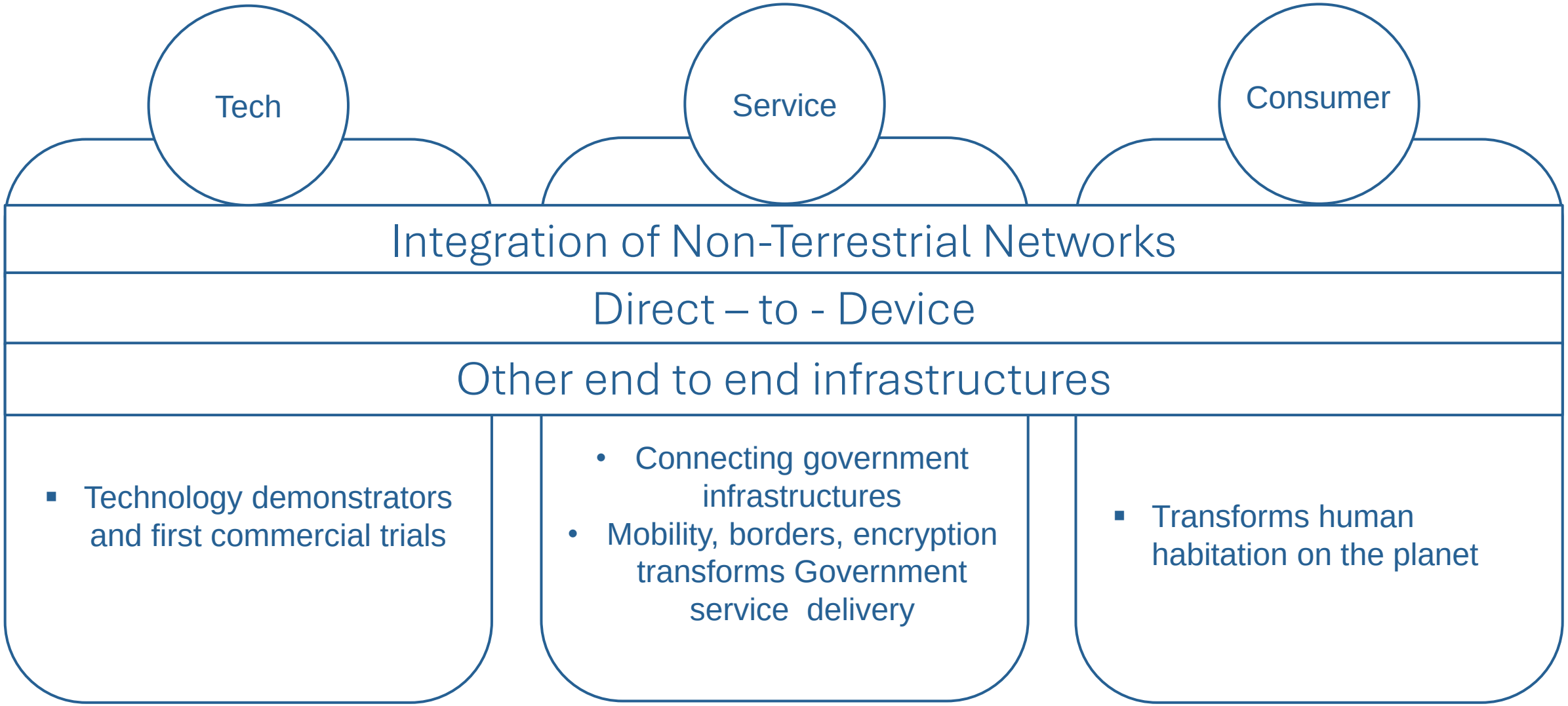
Complexity

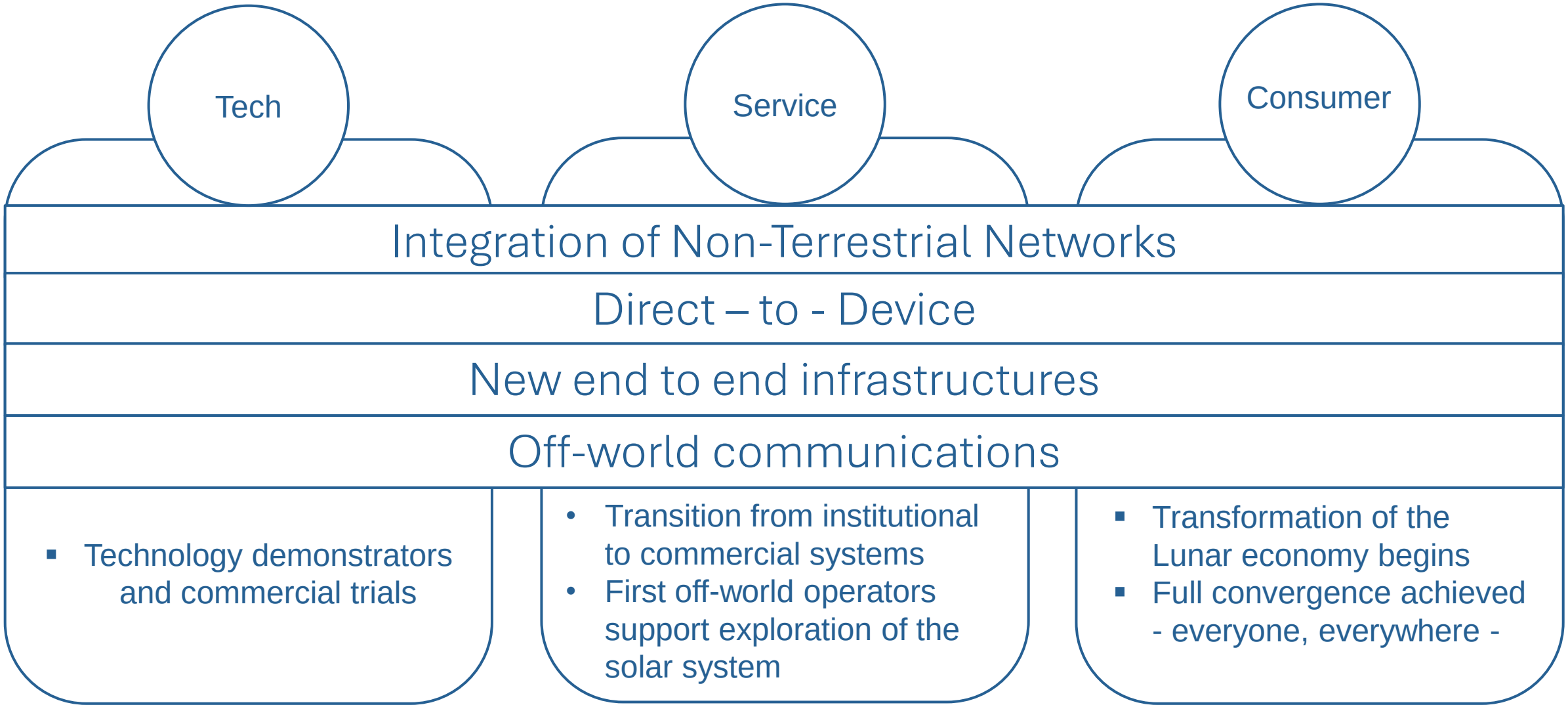
# What’s driving the change

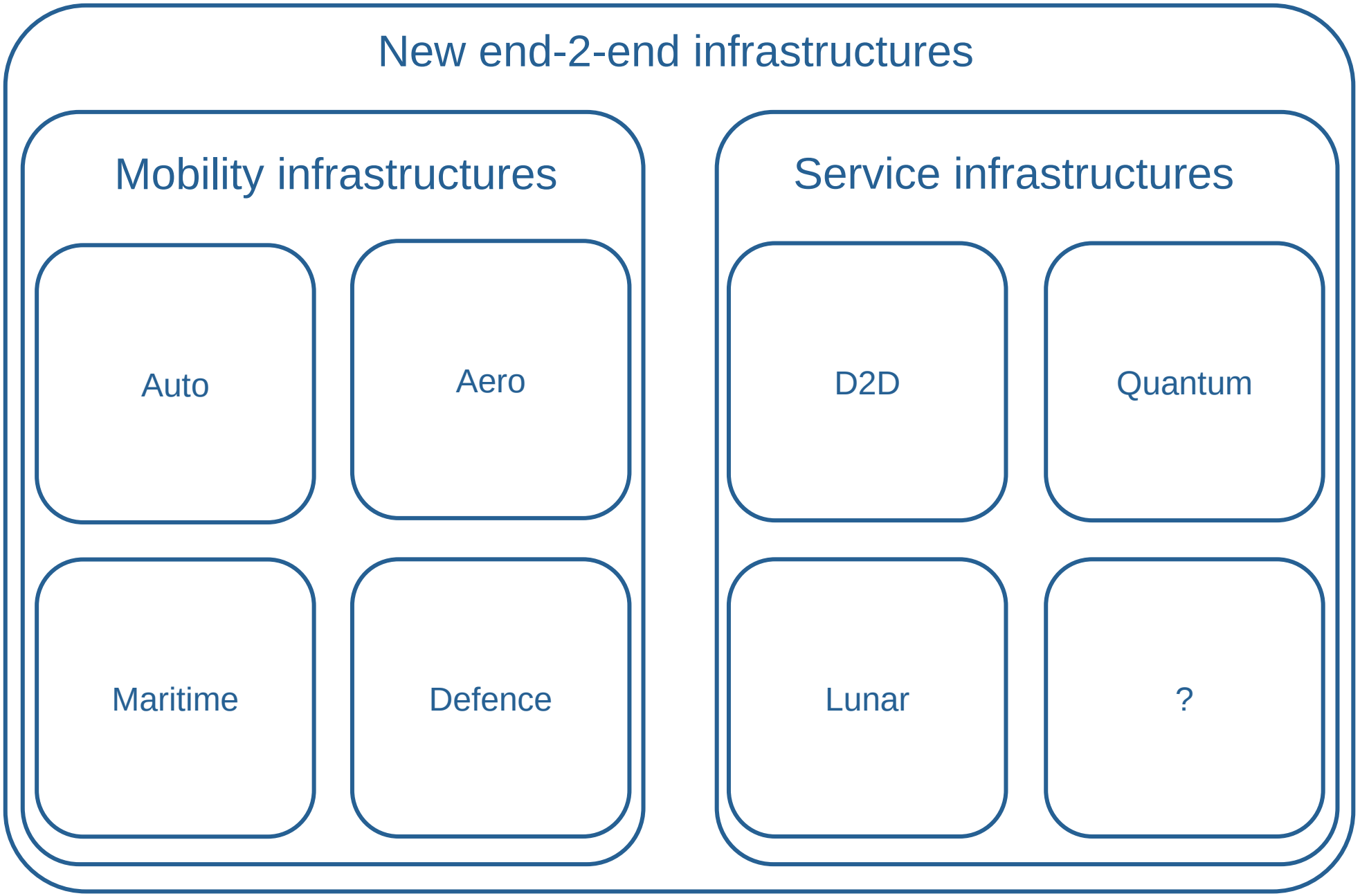


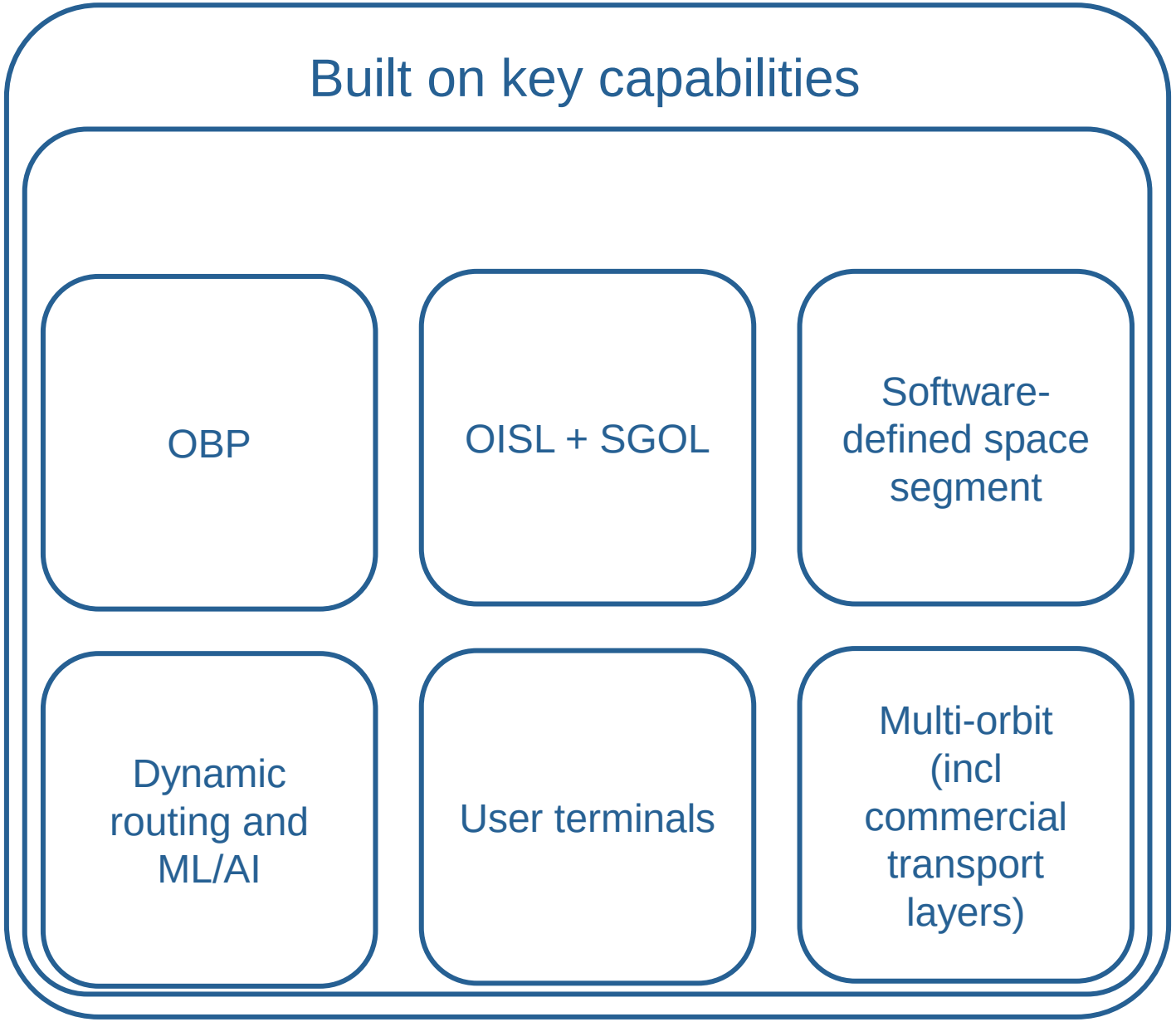

Tech
Service
Consumer
Integration of Non-Terrestrial Networks
Accelerating standardisation and interoperability
Establishment of software defined capability
Growth of AI-enabled systems
New operators, suppliers, and customers
New system architectures = re-organisation of ground and space infrastructures
Complexity >human comprehension
New markets and uses= new opportunities
Enables next phase of the information age

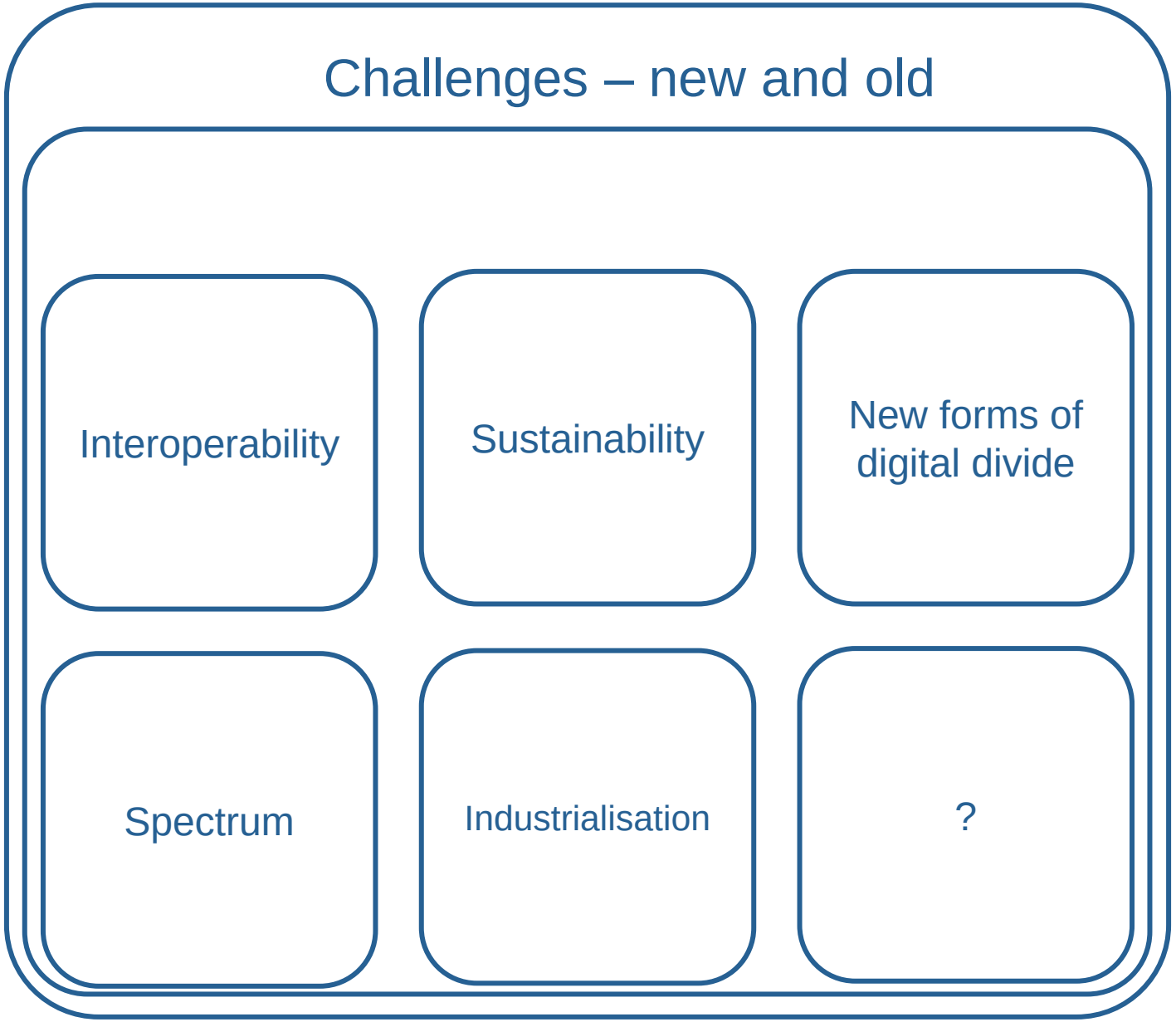

Tech
Service
Consumer
Integration of Non-Terrestrial Networks
Direct – to - Device
Large-scale, commercial trials
Connecting 100’s of millions of people and machines
Maturing commercial systems
Driving new business models
Billions of people and 100’s of billions of machines connected
New ways of connecting people, machines and devices
Everyone connected


Tech
Service
Consumer
Integration of Non-Terrestrial Networks
Direct – to - Device
Other end to end infrastructures
Technology demonstrators and first commercial trials
Connecting government infrastructures
Mobility, borders, encryption transforms Government service delivery
Transforms human habitation on the planet


Tech
Service
Consumer
Integration of Non-Terrestrial Networks
Direct – to - Device
New end to end infrastructures
Off-world communications
Technology demonstrators and commercial trials
Transition from institutional to commercial systems
First off-world operators support exploration of the solar system
Transformation of the Lunar economy begins
Full convergence achieved - everyone, everywhere -


New end-2-end infrastructures
Mobility infrastructures
Auto
Aero
Maritime
Defence
Service infrastructures
D2D
Quantum
Lunar
?

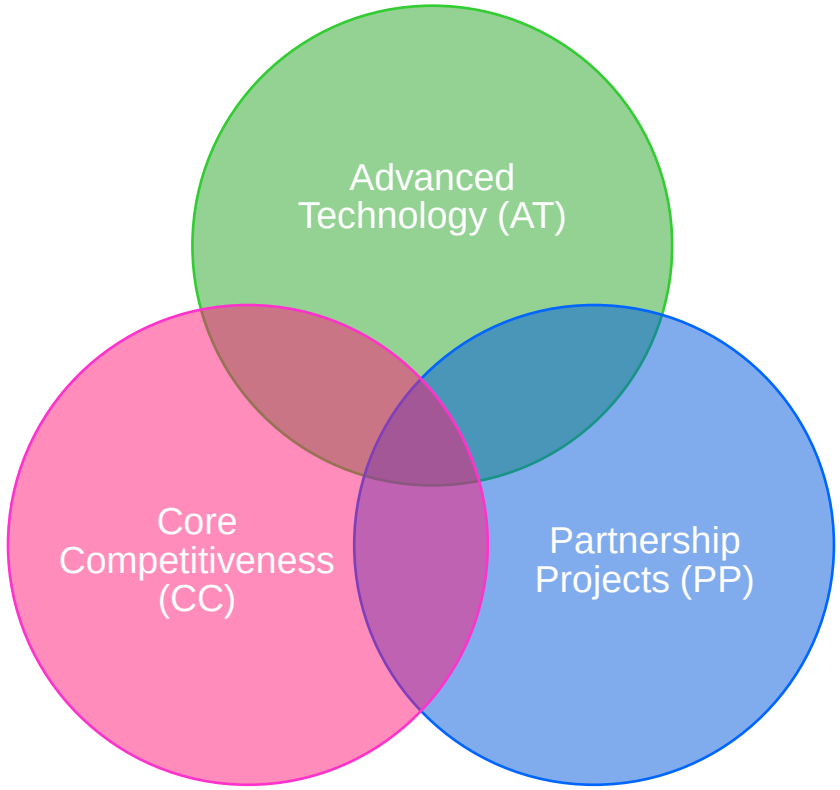

Built on key capabilities
OBP
OISL + SGOL
Software-defined space segment
Dynamic routing and ML/AI
User terminals
Multi-orbit (incl commercial transport layers)


Challenges – new and old
Interoperability
Sustainability
New forms of digital divide
Spectrum
Industrialisation
?

# Programme Overview: ARTES

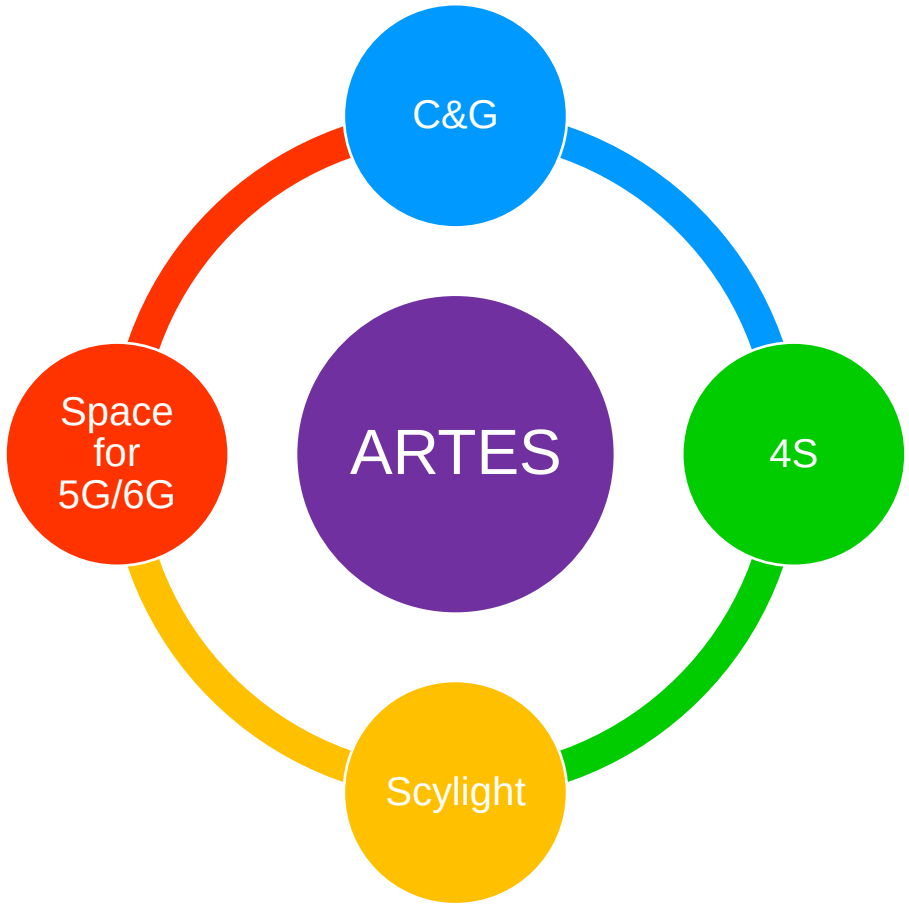
# ARTES

- ARTES = Advanced Research in Telecommunications Systems
- R&D programme aimed at developing the use of space in Europe across a range of sectors and industries
- Three main elements: Advanced Technology (AT), Core Competitiveness (CC), and Partnership Projects (PP)



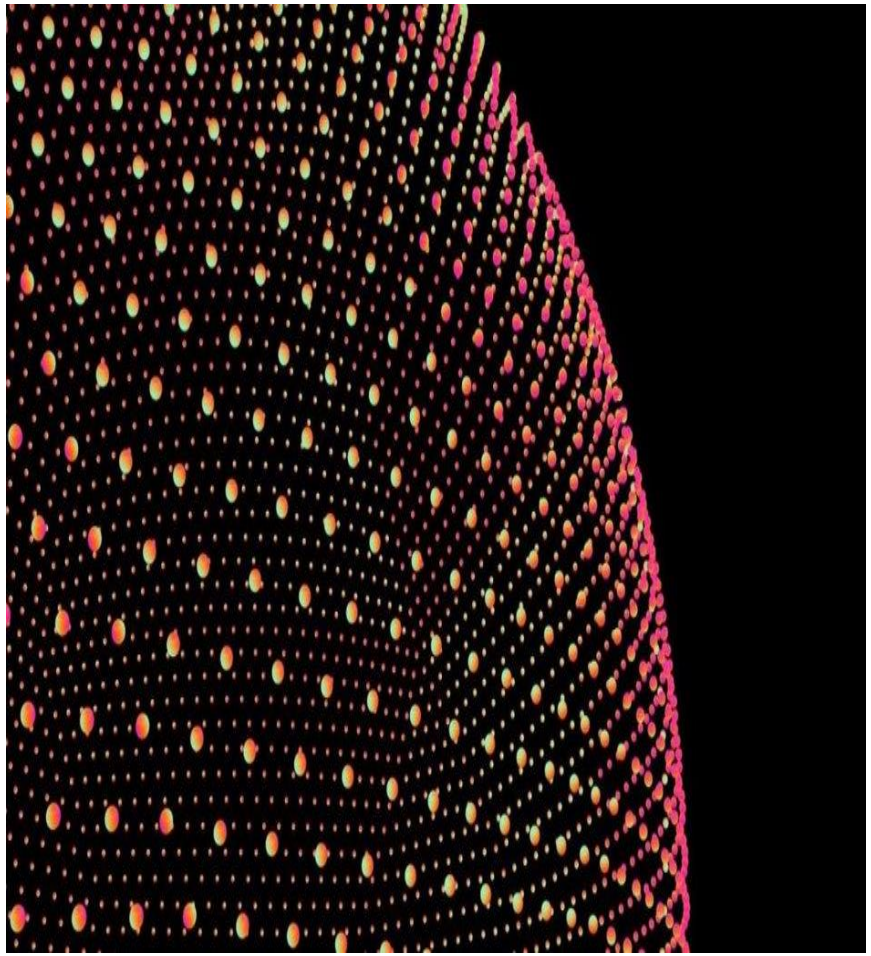
# ARTES Programme Lines

- Generic Programme Line: Competitiveness & Growth (C&G)
- Strategic Programme Lines: 4S, Scylight and Space for 5G/6G



# Programme Overview:
# Connectivity in Low Earth Orbit

# C-LEO



- Designed to fund next generation of satellite communications development and boost UK's leadership in ever-growing global satellite market.
- Building on existing heritage in satellite design and manufacture, and support UK-based suppliers in developing the technologies needed to build the next generation of LEO satcom satellites.
- Key Technology areas: on-board (regenerative) processing, active antennas, optical inter-satellite links, networking and routing, and user terminals

# Programme Overview:
# Pilot Procurement Programme

# Pilot Procurement Programme

BT Madley Communications Site, UK

GHY-6 Antennae, Helston, UK

- Ambition to grow the UK ground segment as a resilient capability to support civil and defence applications.
- ‘Ground segment as a service’ is a necessary commercial driver for the growing lunar economy.
- Government acting as a procurer of services rather than as a grant provider.
- Contract Award Goonhilly Earth Station Ltd

# Questions