

S1-241055

vivo



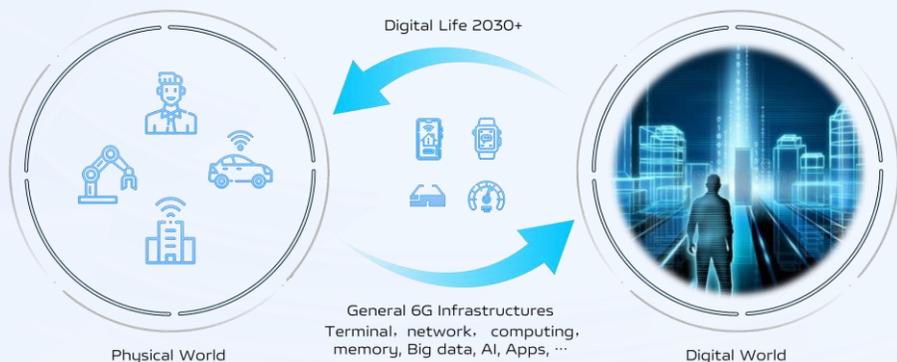
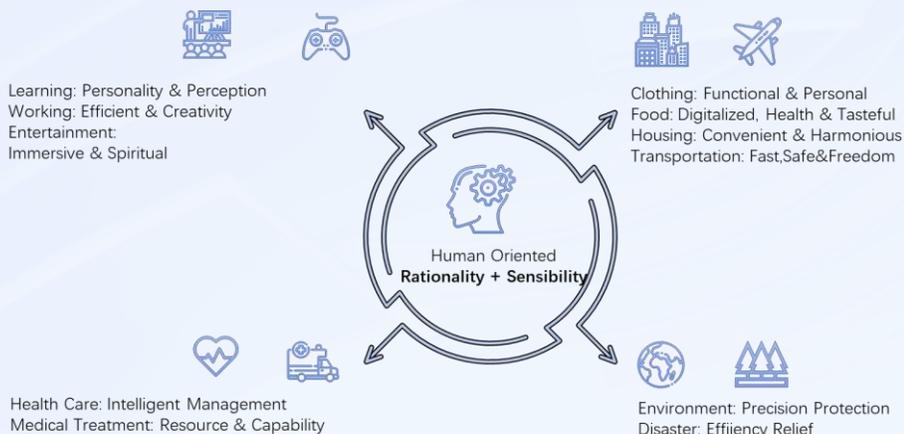
vivo views on 6G use cases and SA1 study

202405

6G

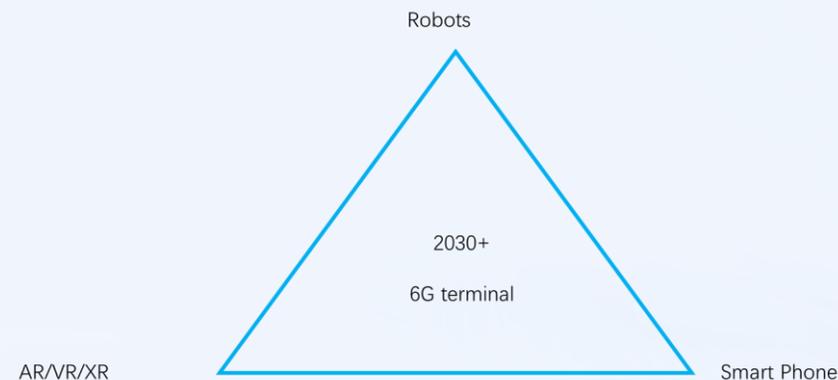
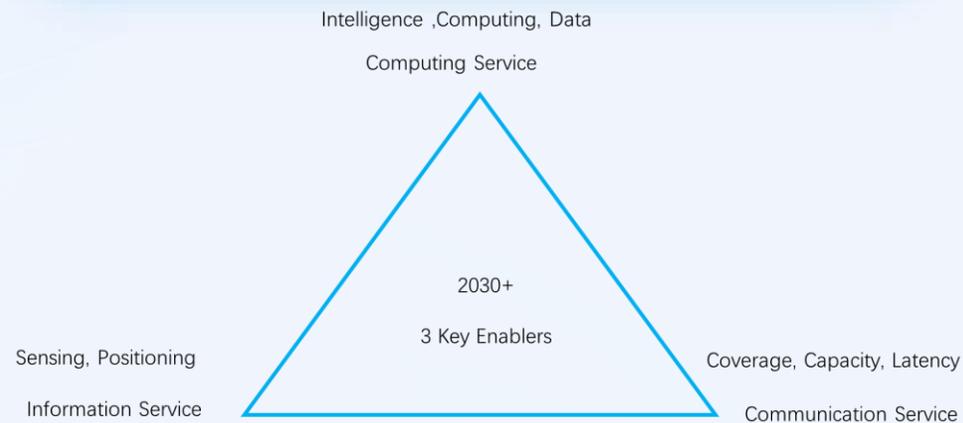
Digital Life in 2030+ and 6G vision

Digital Life in 2030+



Freely connected physical-digital integrated world

6G Vision - New Services and Devices



New devices - major 6G driving force

6G Key enablers

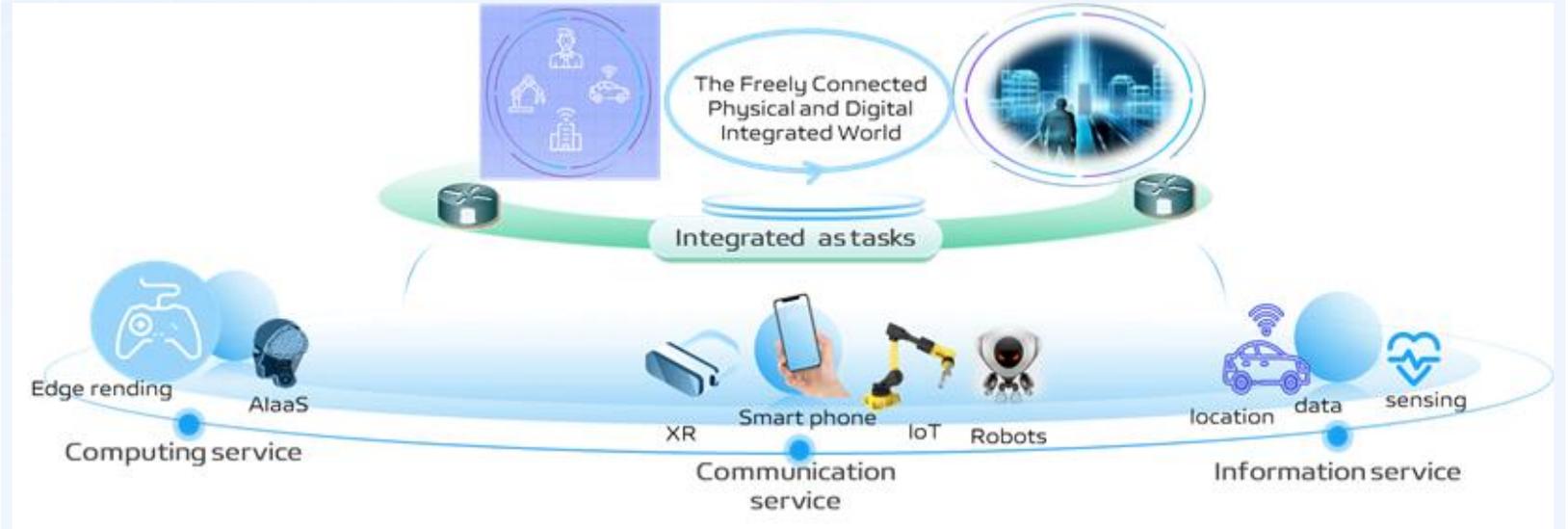
Pain points of 5G

High power consumption for NW and UE

Inconsistent user experience

Complex and high cost UE design

New services and various device type driven



6G key enablers to address 5G pain points and to meet new services/devices requirements



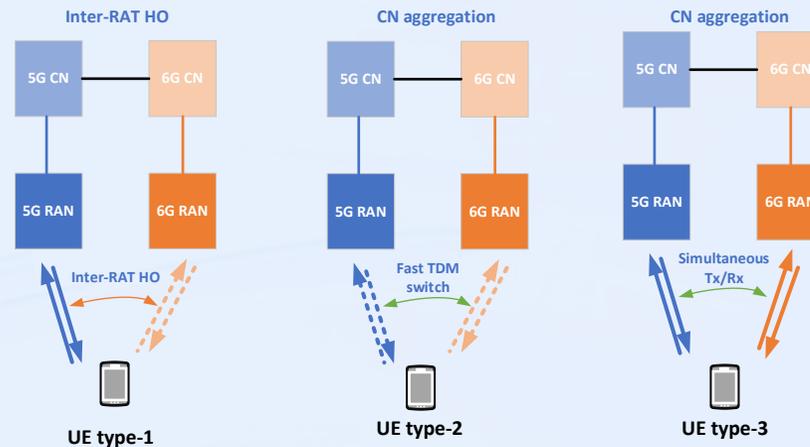
Device diversity in 6G

- Various devices form factors and complexity/cost shall be considered in 6G
- UE types for 5G-6G Interworking
 - Different UE types/capabilities shall be considered for 5G-6G interworking from beginning
 - UE type-1: UE keeps single connection (either 5G or 6G)
 - Basic UE type in 6G.
 - Not support: Simultaneous Rx or Tx between 5G and 6G at the same time, or dynamic TDM switching.
 - 5G-6G inter-RAT handover is supported for service continuity
 - 6G-6G CA is optional supported
 - UE type-2: UE keeps dual connection (both 5G and 6G), but with Rx and/or Tx TDM switch between 5G and 6G
 - More advanced UE type and optional. UE hardware requirement similar as "DSDA-like" feature in existing products.
 - Simultaneous Rx or Tx between 5G and 6G at the same time is not supported, but dynamic TDM switching is supported.
 - CN aggregation can be considered.
 - UE type-3: UE keeps dual connection (both 5G and 6G), and simultaneous Rx and Tx for 5G and 6G, with full capability
 - Most advanced UE type and optional. UE hardware requirement similar as "Full concurrency DSDA" feature in existing products
 - Simultaneous Rx or Tx between 5G and 6G at the same time is supported
 - CN aggregation can be considered.
 - Non-standalone 6G operation, if also to be considered, shall assume above Type-2 as the basic UE capability

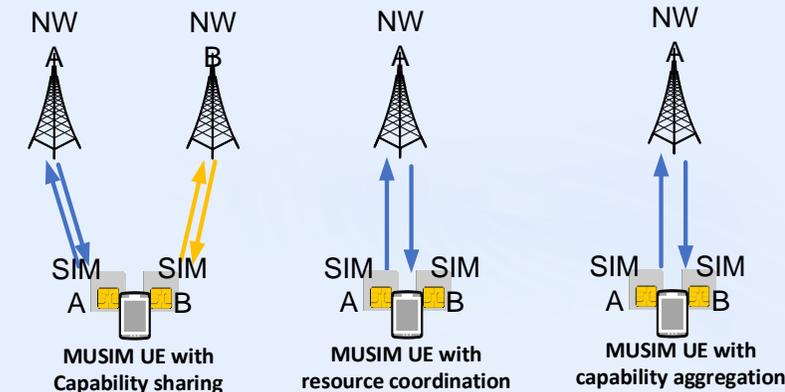
- UE types for 6G MUSIM
 - MUSIM UE with UE capability sharing between SIMs
 - MUSIM UE without UE capability sharing between SIMs
 - MUSIM UE with UE capability aggregation among SIMs



Device in various form factors



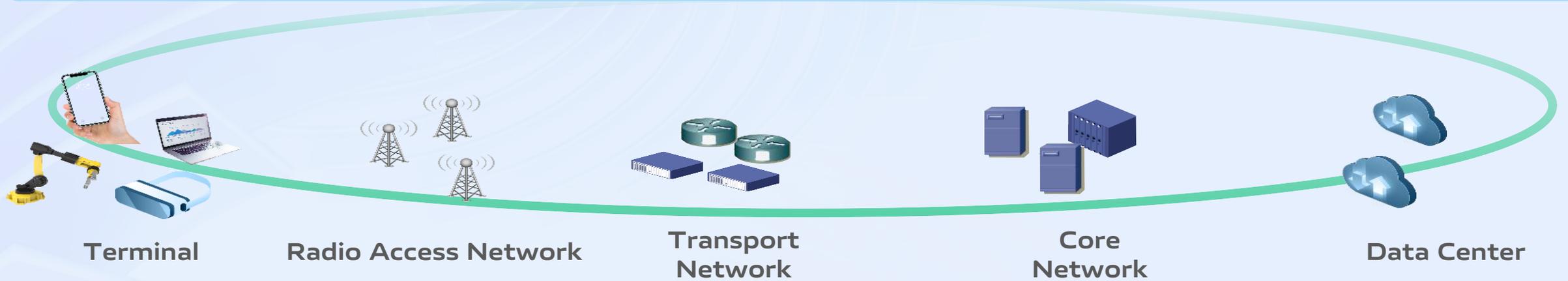
UE types for 5G-6G Interworking



UE types for MUSIM

Energy Efficiency

Energy efficiency should be optimized for different services (low/medium/high data rates, with/without low-latency target), and different traffic loads (empty/low/medium/etc.), different RRC states from day 1.



End to End Energy efficiency

EE as a Service

- Energy efficiency (EE) as a service
 - Service Consumer (Network, User, 3rd party/AF)
 - Extension of Policy/QoS to include energy efficiency
- Energy efficiency KPI (UE and NW side)
 - Accurate evaluation methodologies
 - Relative metrics for UE at multi-level sleep states
 - NW energy consumption at UE granularity

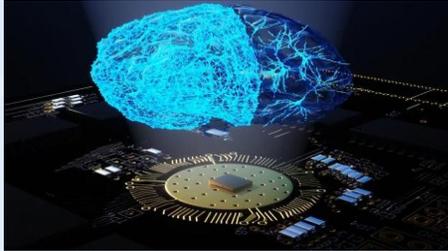
Technology for E2E EE

- NW and UE collaboration for joint energy saving
- Existing 5G energy saving features could be leveraged
 - R18/R19 LP-WUS/WUR
 - R18/19 NW energy saving in RAN and SA
- LP-WUS/WUR for network energy saving
 - Sparse periodical SSB
 - On-demand SSB

Computing & Intelligence



XR rendering



Large model



Robot



Auto driving



Digital human

Computing & Intelligence

Service needs:

- Quick and accurate response;
- Large communication and computing resource needed;

Various interests:

- UE: limitation of power, computing and AI capability;
- NW: profit from new business
- 3rd party: better service with low cost

Different business models:

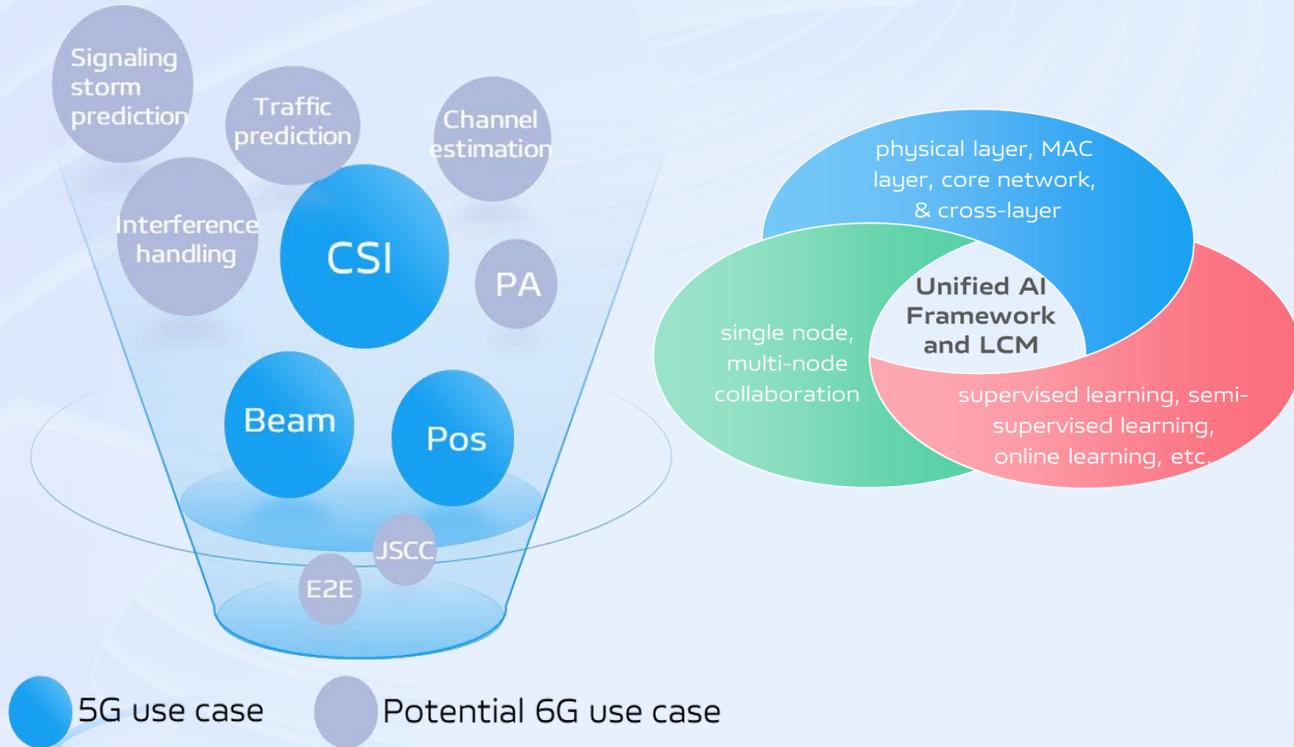
- Service anchor at 3rd AF
- Service anchor at 3rd AF, AF offload part of task to 6G
- Service anchor at 6G

Key enabler technologies:

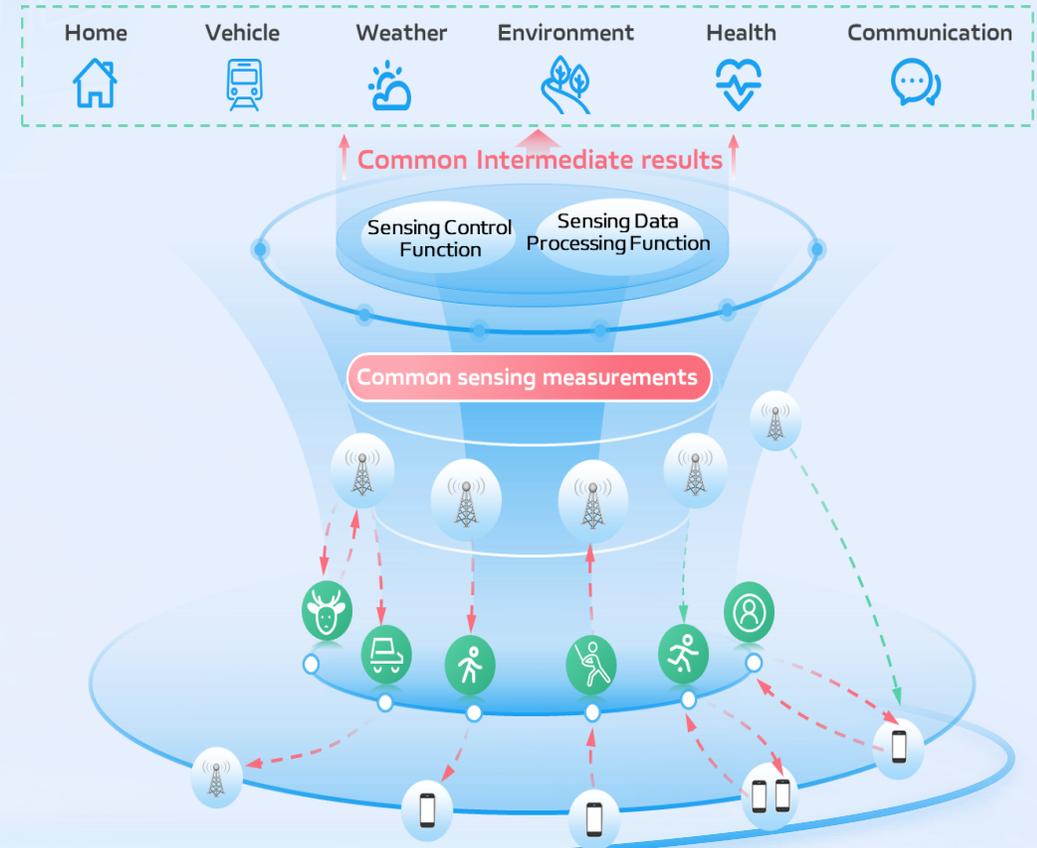
- coordination of communication and computing
- Policy and QoS mechanism for integrated service;
- Computing related information exposure and exchange

Sensing & AI for network

AI for Network



Sensing



Data Service

Unified data service framework, e.g., data plane, supporting data collection, management and sharing for network and applications including AI and sensing

Unified TN and NTN

6G terminals natively support GEO narrow-band access, e.g., IoT NTN

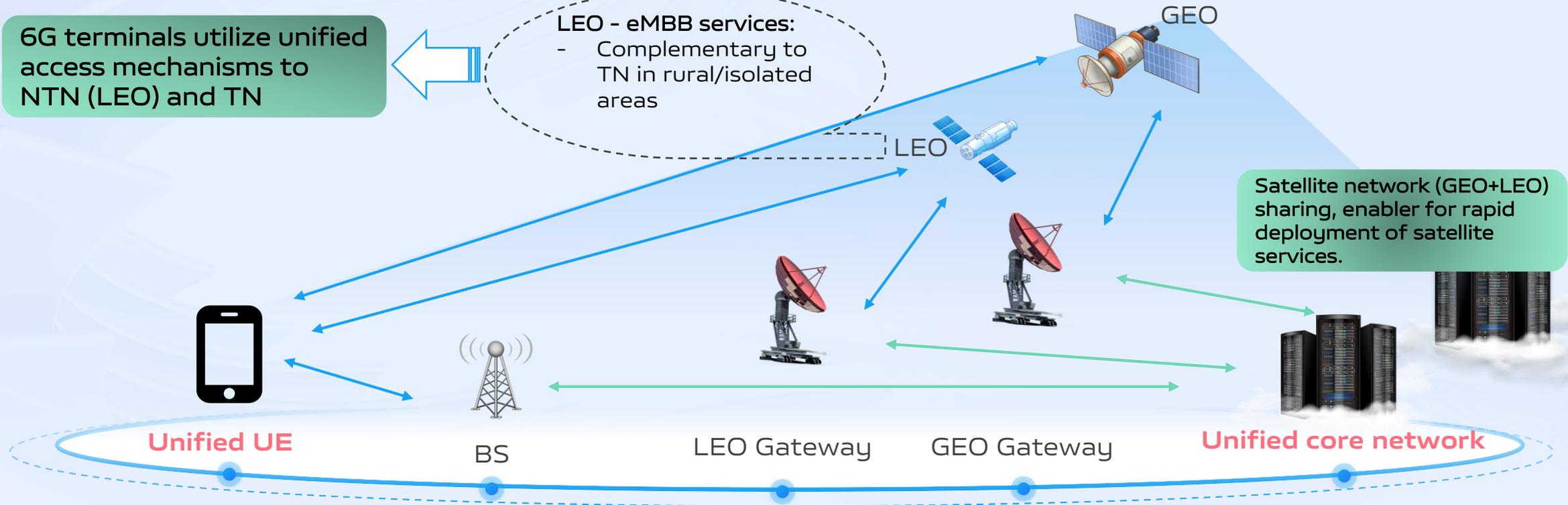
GEO - low data rate services:

- SMS, MIoT type service
- Global voice call service, anytime/anywhere

6G terminals utilize unified access mechanisms to NTN (LEO) and TN

LEO - eMBB services:

- Complementary to TN in rural/isolated areas



Suggestion on SA1 study on 6G use cases

6G single umbrella SI (approved at Sep 2024)

Building Block phase (Starts from Q1 or Q2 2025)

Communication service

- Immersive
- Metaverse
- Device diversity
- AI for network

Computing service

- Network for AI
- Coordination of communication and computing

Information service

- Data service
- Sensing
- Positioning

Ubiquitous connectivity

- GEO narrow-band call
- NTN and TN
- ...

Vertical Service

- Ambient IoT
- ...

Cost & Energy efficiency

- Energy efficiency as a service
- E2E energy efficiency
- Network automation

Intermediate SA1 Output

- High level requirement
- General principle



THANKS

The background features a light blue gradient with abstract, 3D-rendered blue geometric shapes. These shapes consist of multiple overlapping, curved, and layered bands that create a sense of depth and movement, resembling a stylized spiral or a series of stacked, curved planes.