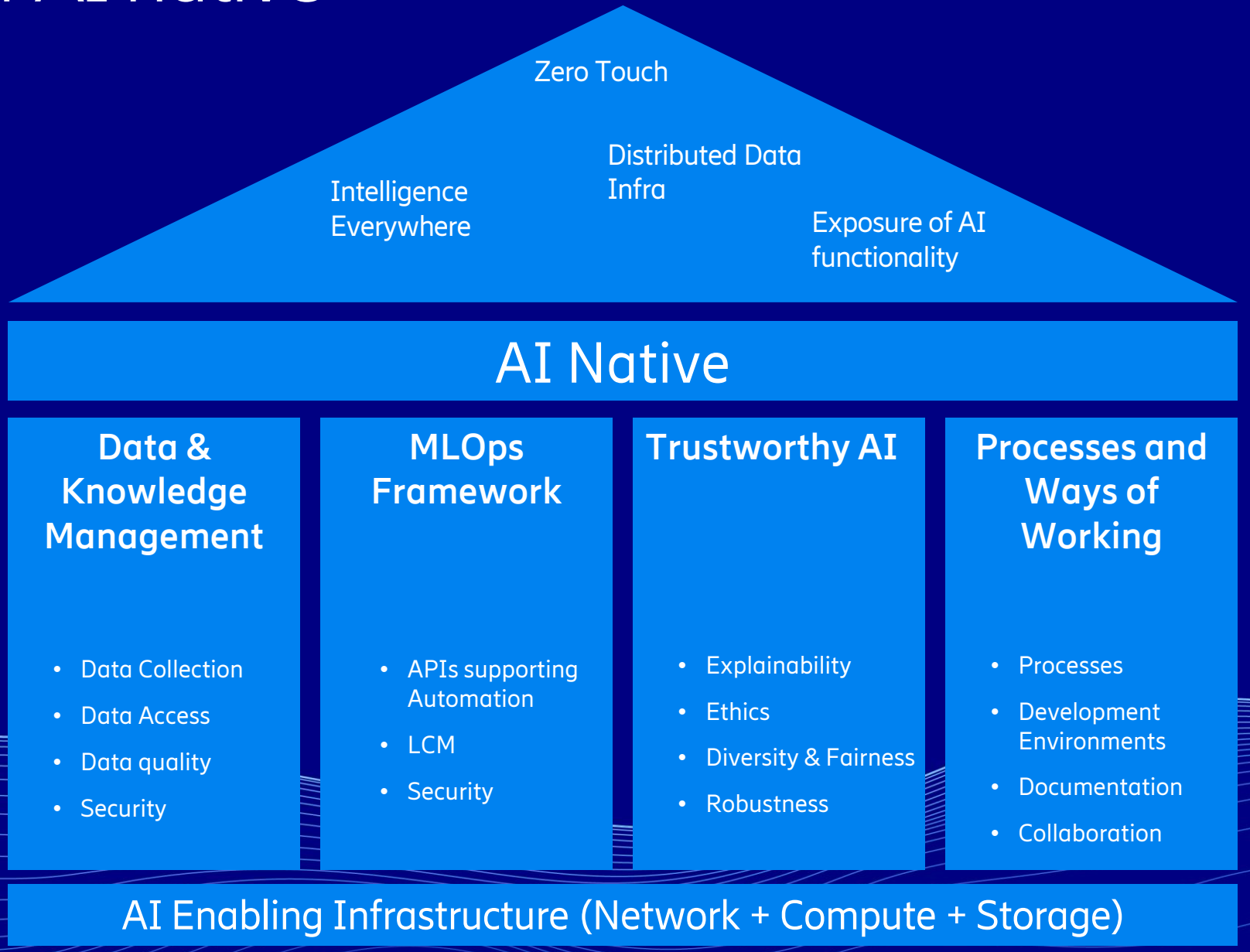
AI native
AI in 6G

Benedek Kovács, PhD

Expert, Edge Computing, Ericsson

AI native: AI native systems are designed, implemented and operated by using AI technology.

Pillars of AI native



Examples of AI for Software

Testing

Can we teach LLMs to to generate test cases (J-CAT)?

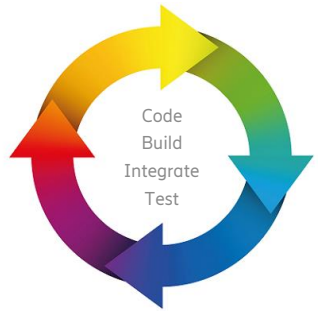
Code comprehension

Can we train LLMs to help developers understand our complex internal source code?

API synthesis

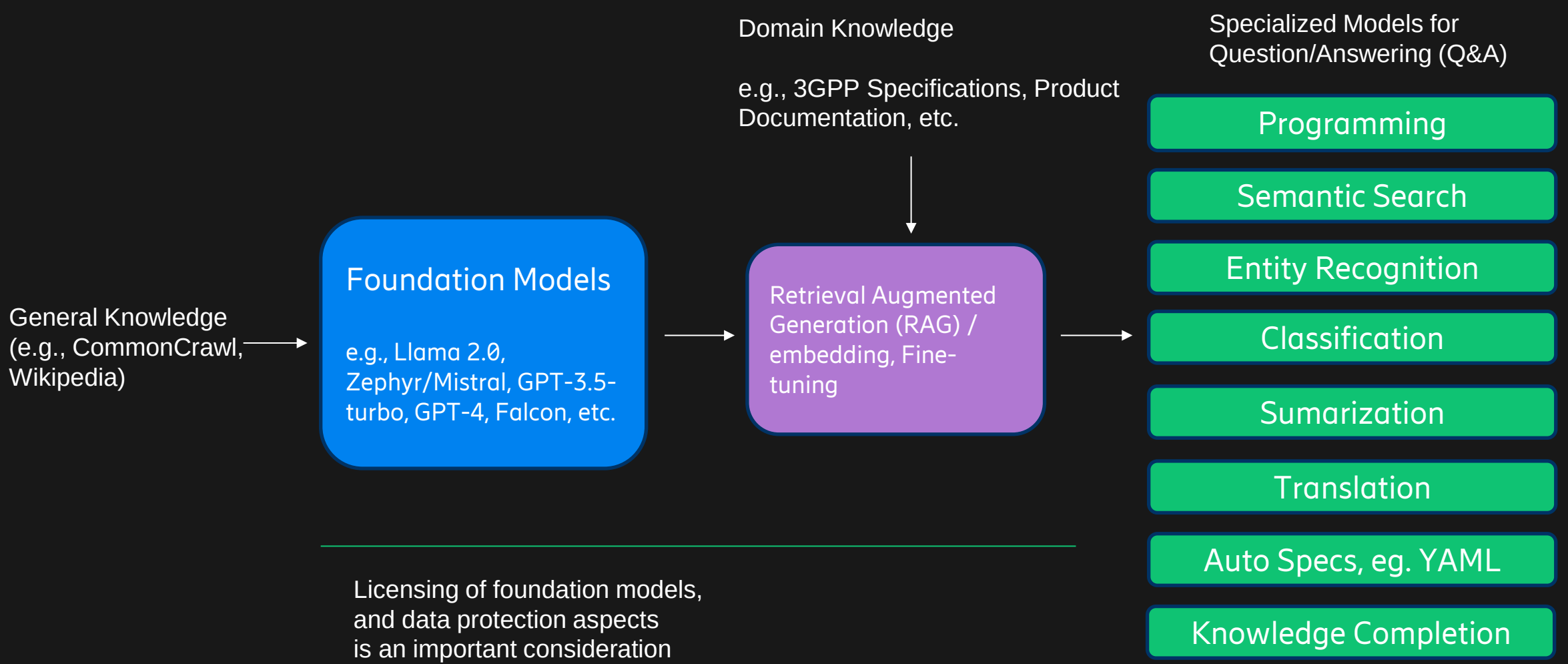
Can we teach LLMs to use the APIs of our network functions?

CI troubleshooting



Can we learn patterns from complex CI logs to consistently detect anomalies and pin-point root causes?

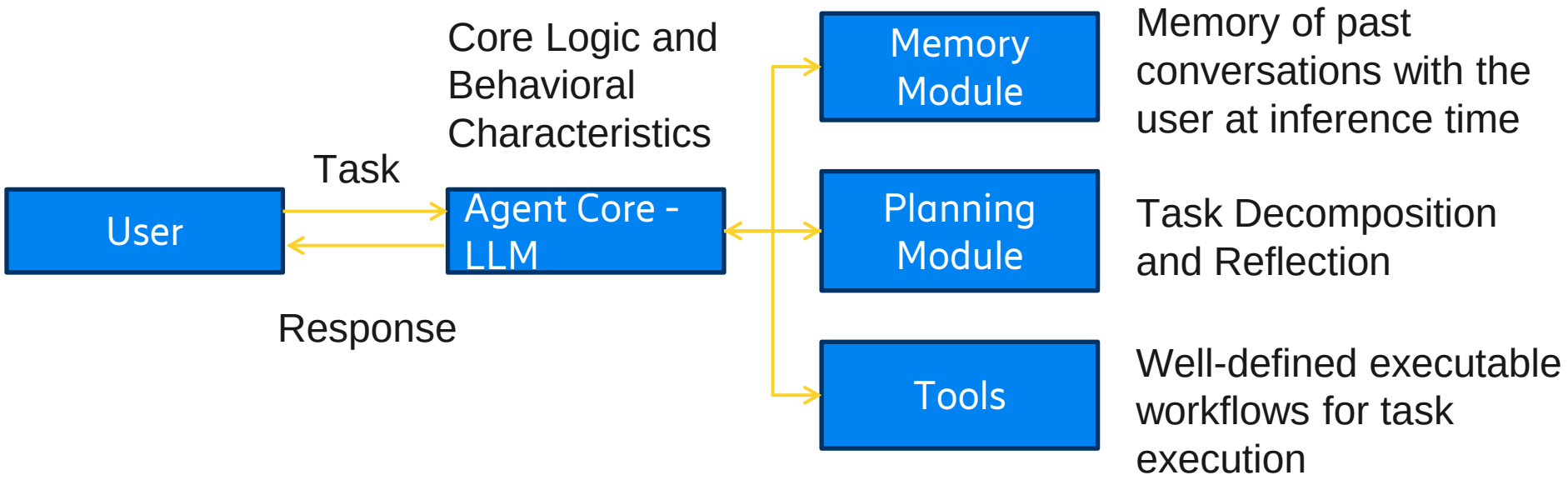
Chatbots using Large Language Models (LLMs)



LLM Agents

While LLMs are good performers in simple tasks (e.g., QA, code-generation) they cannot complete more sophisticated tasks on their own (e.g., process automation).

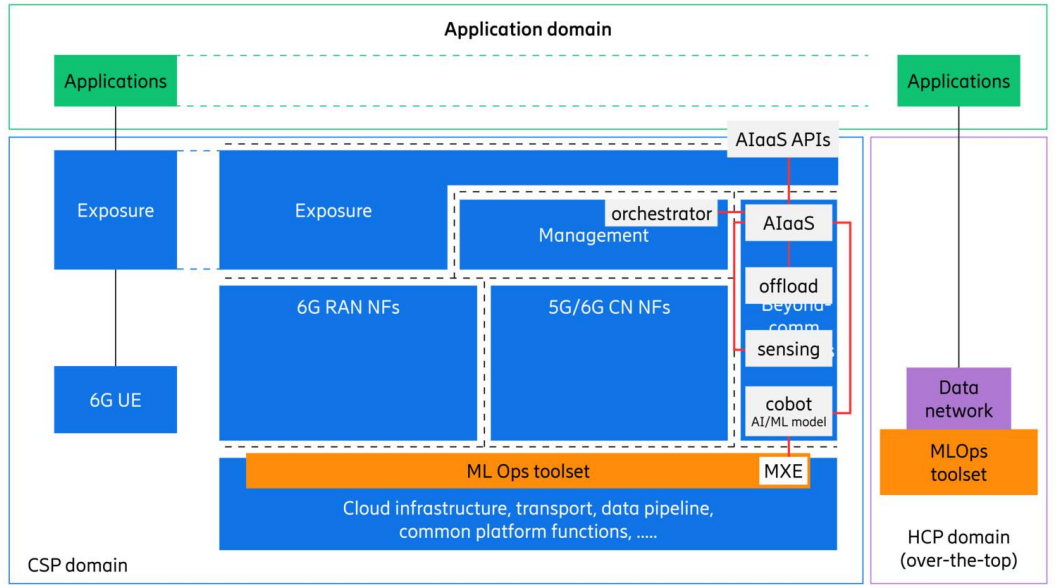
LLM Agents attempt to address these concerns. There is no standard definition for LLM agent but multiple sources seem to indicate a system that given a user task or problem, can use an LLM to reason on the problem, create a plan to solve the problem and execute the plan using a set of tools.

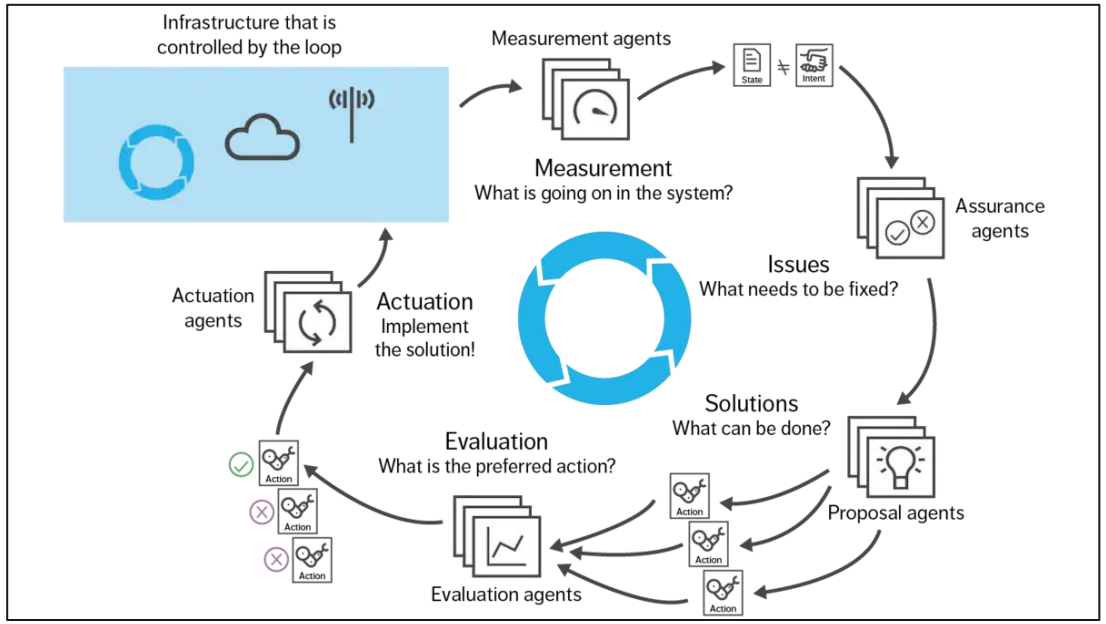


Sources: [1] [2] [3]

An AI native example Cognitive Network

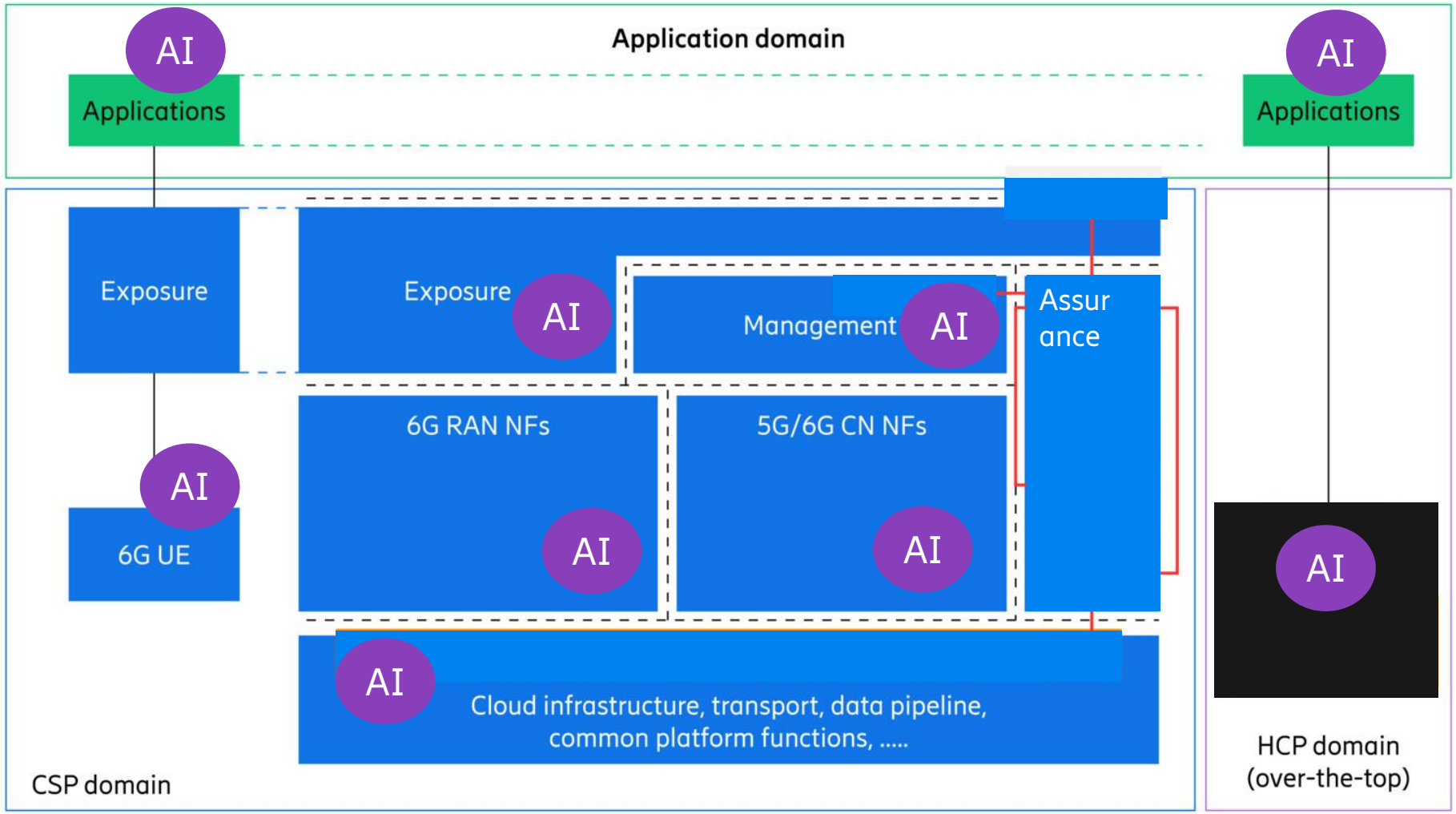
- A **cognitive network** is an AI-native implementation of an autonomous network.
- An **autonomous network** is a network with self-* capabilities
  self-configuration, self-healing, self-optimization, self-protection





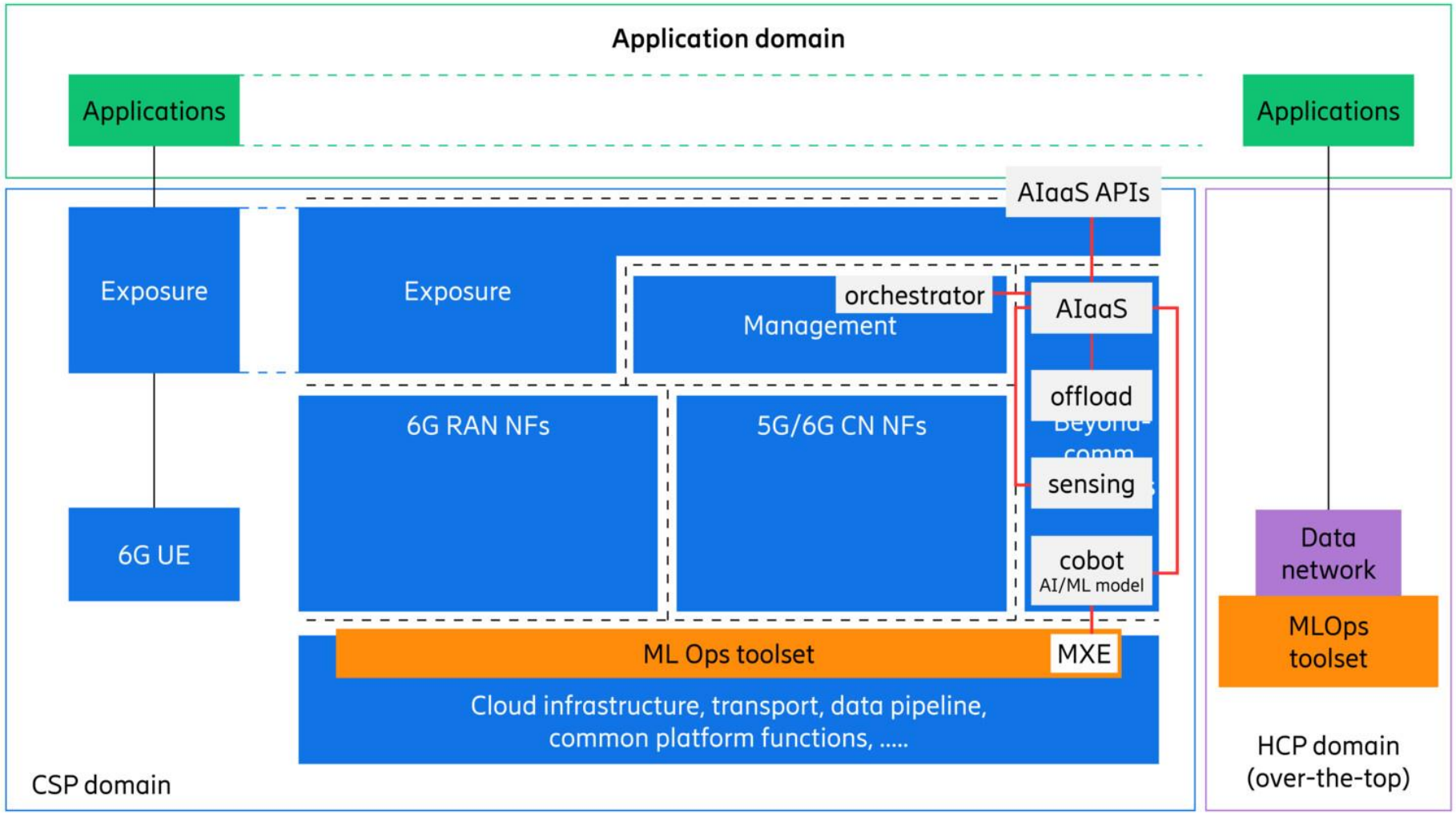
- Network management
- Smart algorithms and
- AI powered network functions
- AI for data analytics and assurance
- …
- **<u>AI (agent) is more than a software component…</u>**

AI



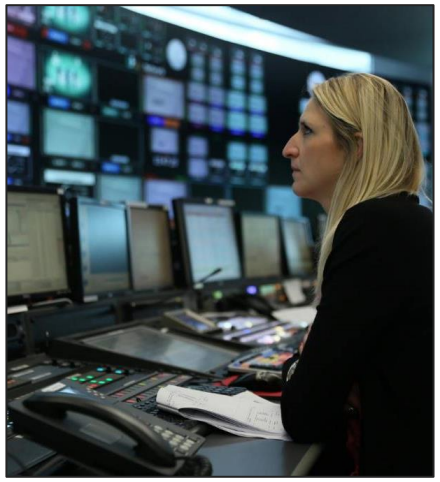
Trustworthiness is a prerequisite for people and societies to develop, deploy and use AI systems.

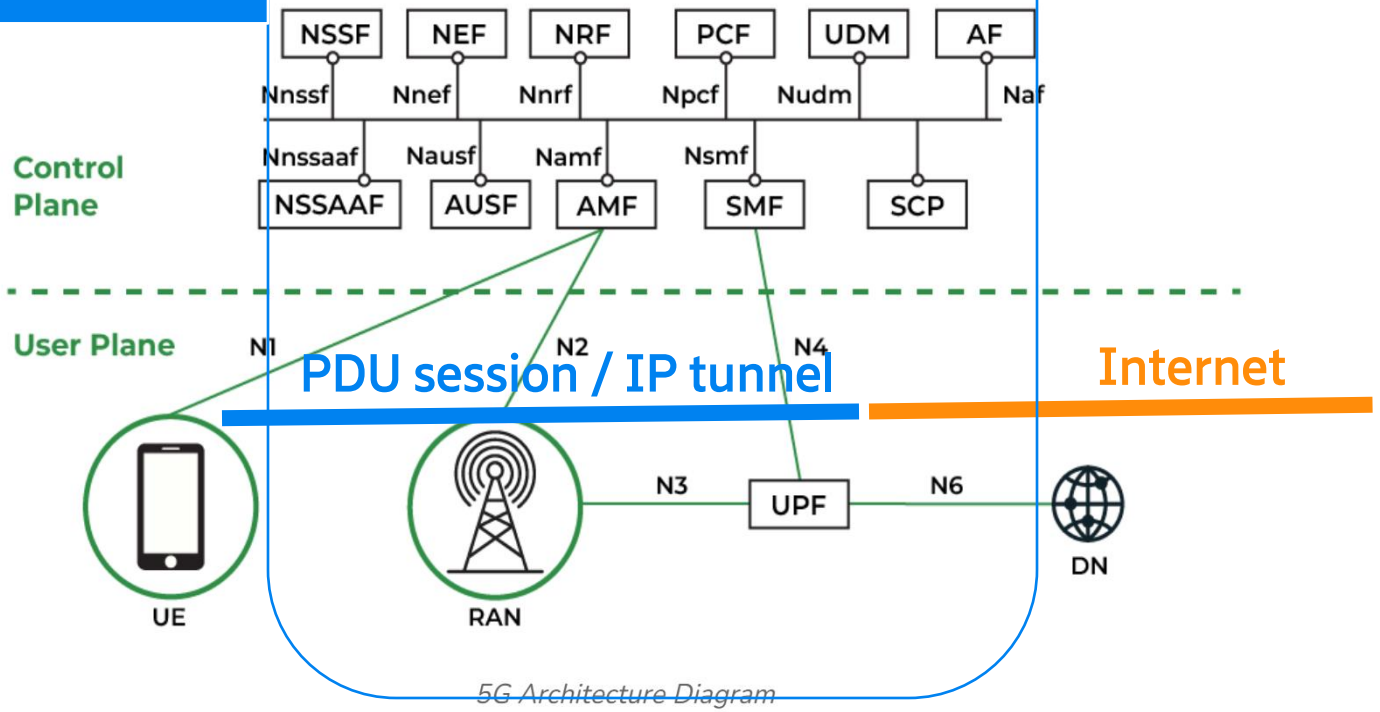
- MLOps refers to the processes and functionalities for building, deploying, operationalizing, and observing ML-based systems.



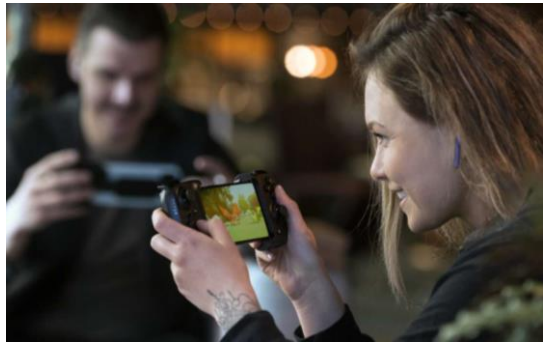
Network data

Use AI to build and operate networks in a smarter way

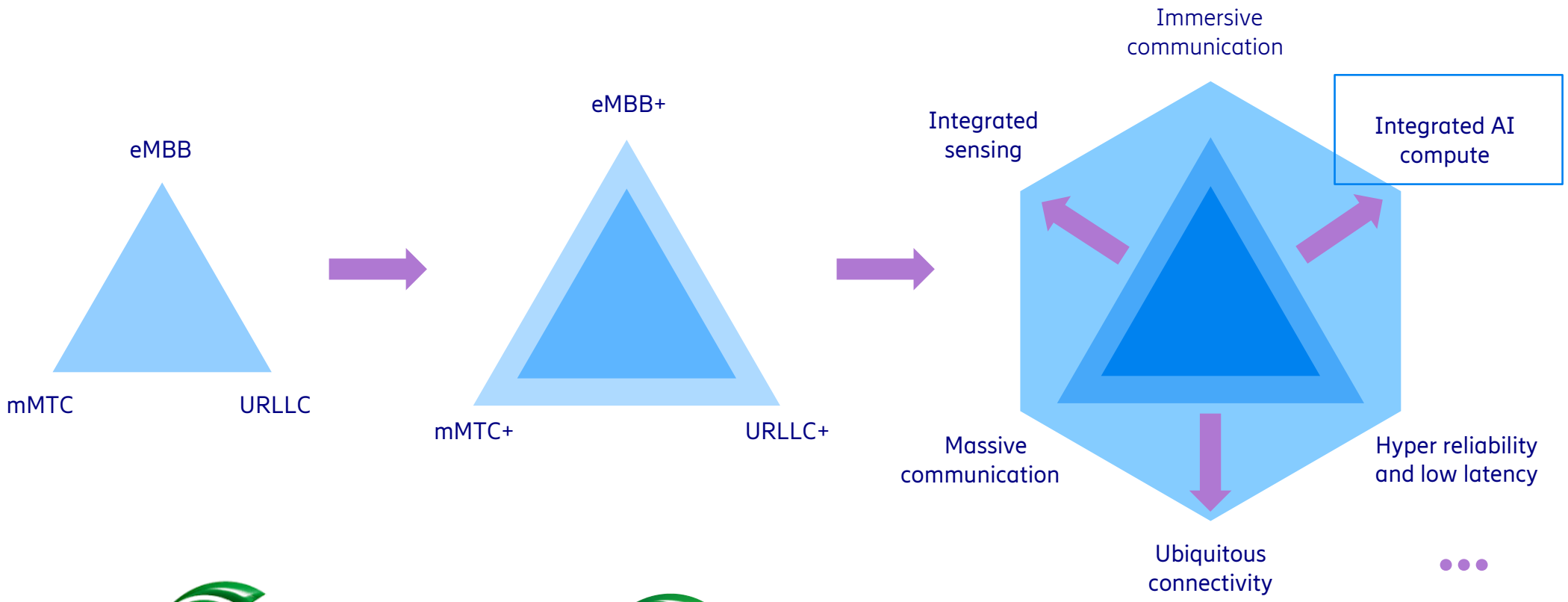




5G Architecture Diagram



AI native systems can reduce TCO,
can make networks more effective and also
more flexible for new use cases

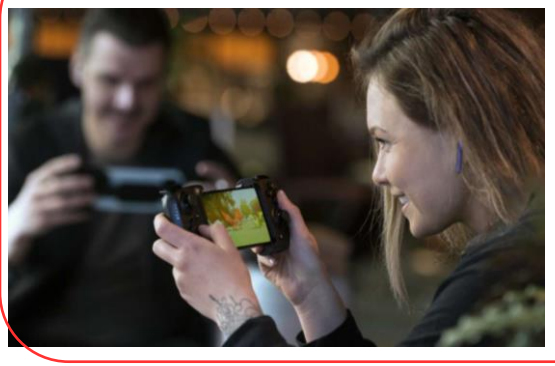

eMBB
mMTC
URLLC
eMBB+
mMTC+
URLLC+
Immersive communication
Integrated sensing
Integrated AI compute
Massive communication
Hyper reliability and low latency
Ubiquitous connectivity
5G
5G ADVANCED
6G

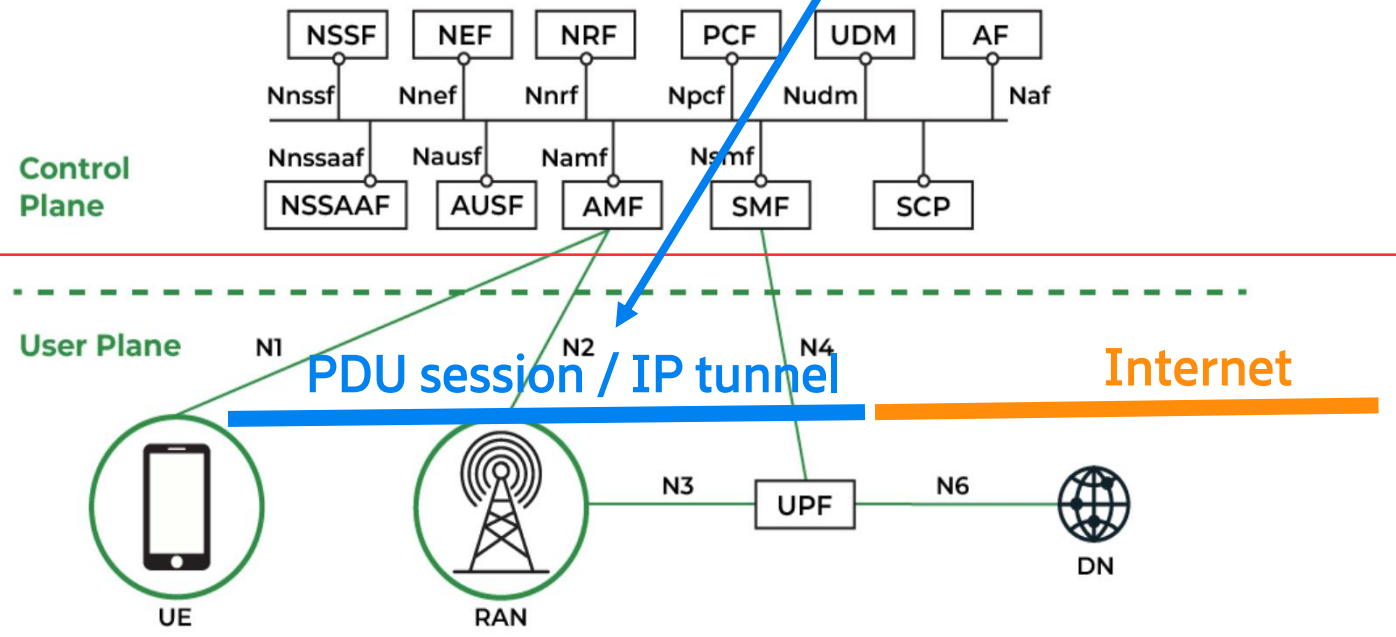
How do I make money on 6G with AI?

Build network for new, AI "native" use cases

Create a differentiated connectivity with right assurance features

User Data produced and consumed by mobile applications

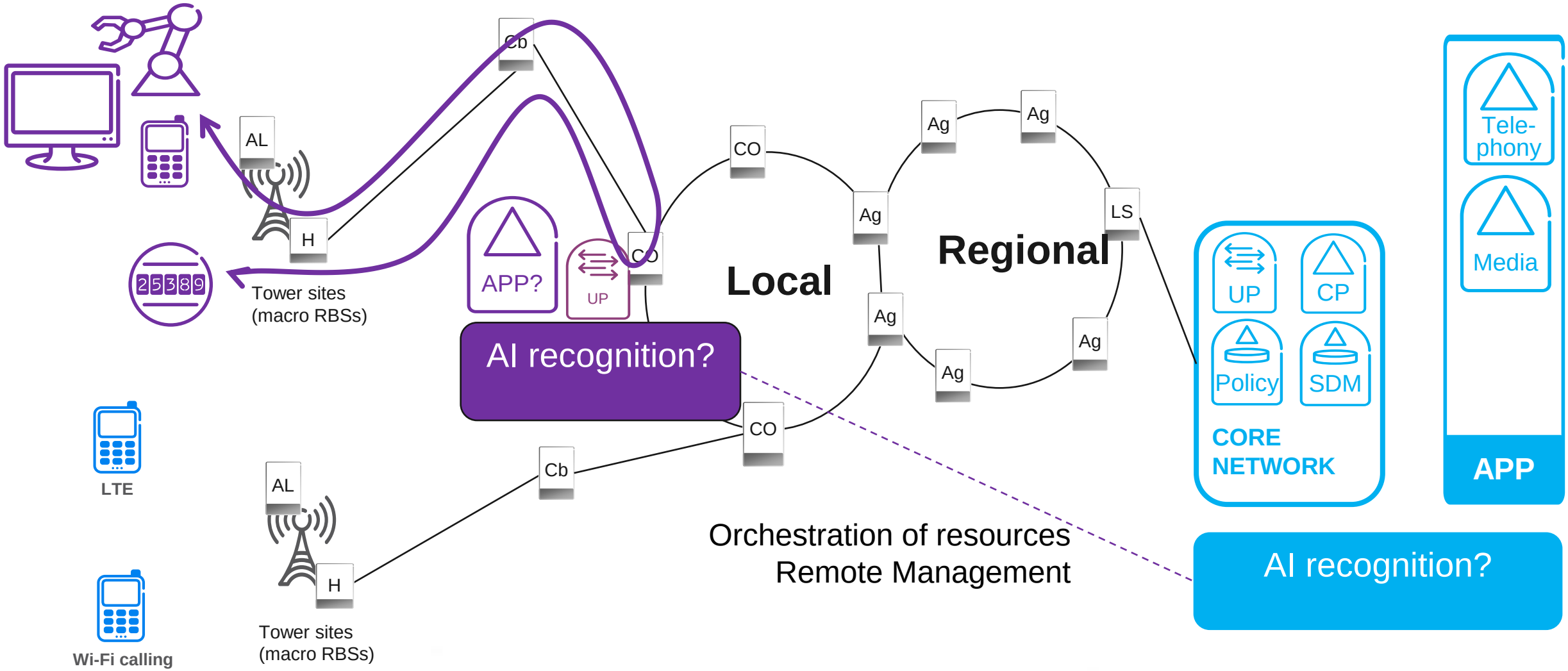




Userd data is stored and processed by the application provider

5G Architecture Diagram

The compute offload (and edge computing) problem

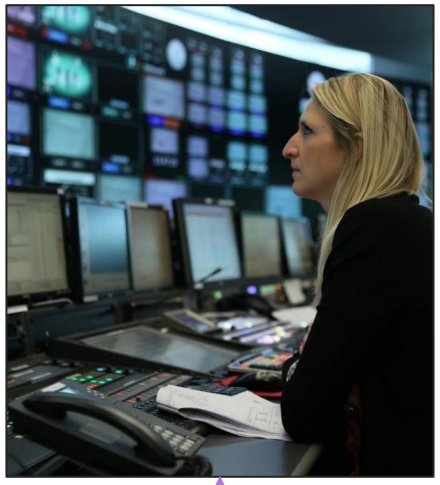


The data ownership problem

GDPR?

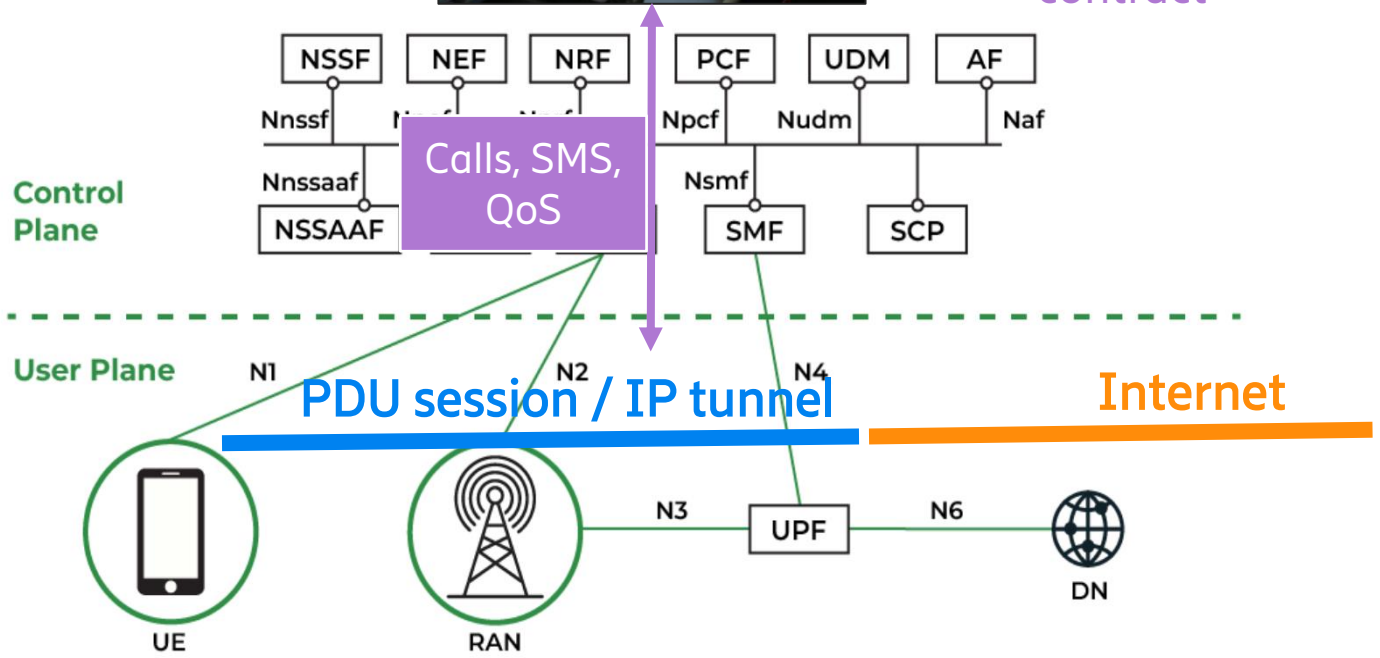
Consent?

Current: Exposure



- Exposes data on business contract
- Influences network configuration

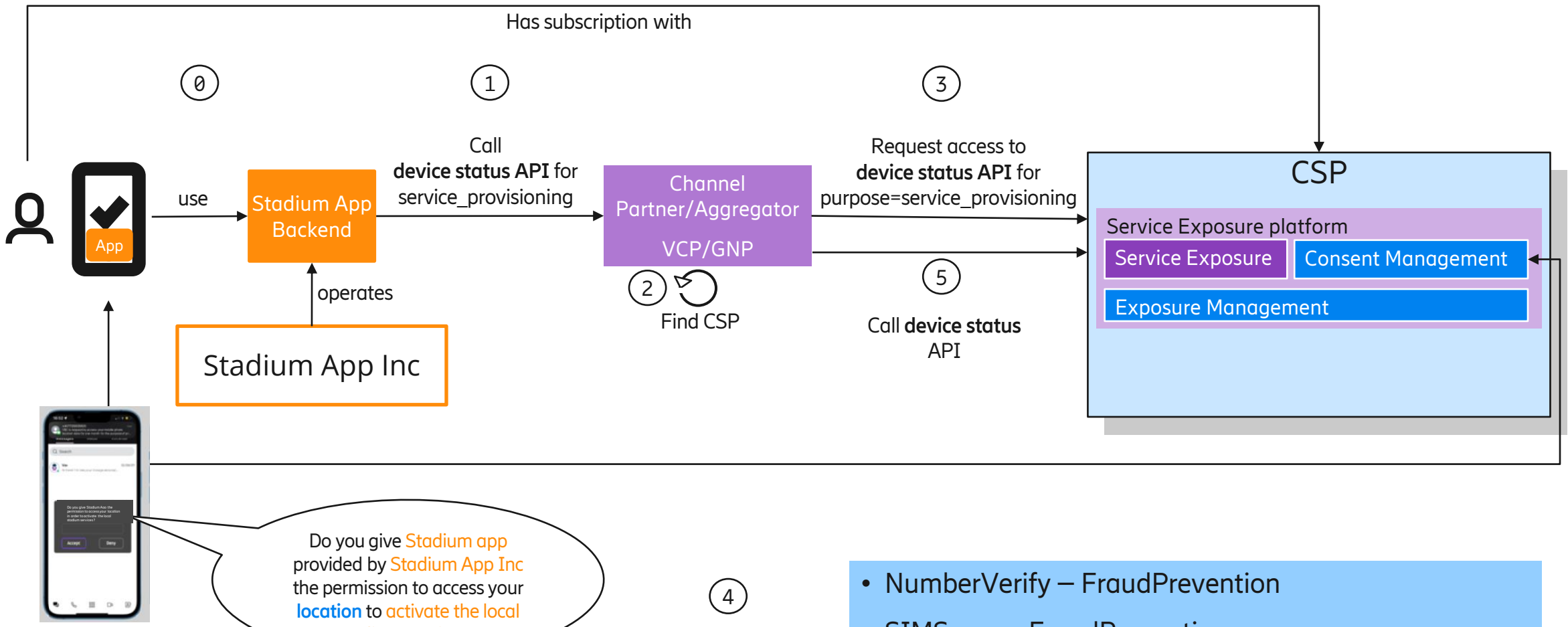
Application



Application

5G Architecture Diagram

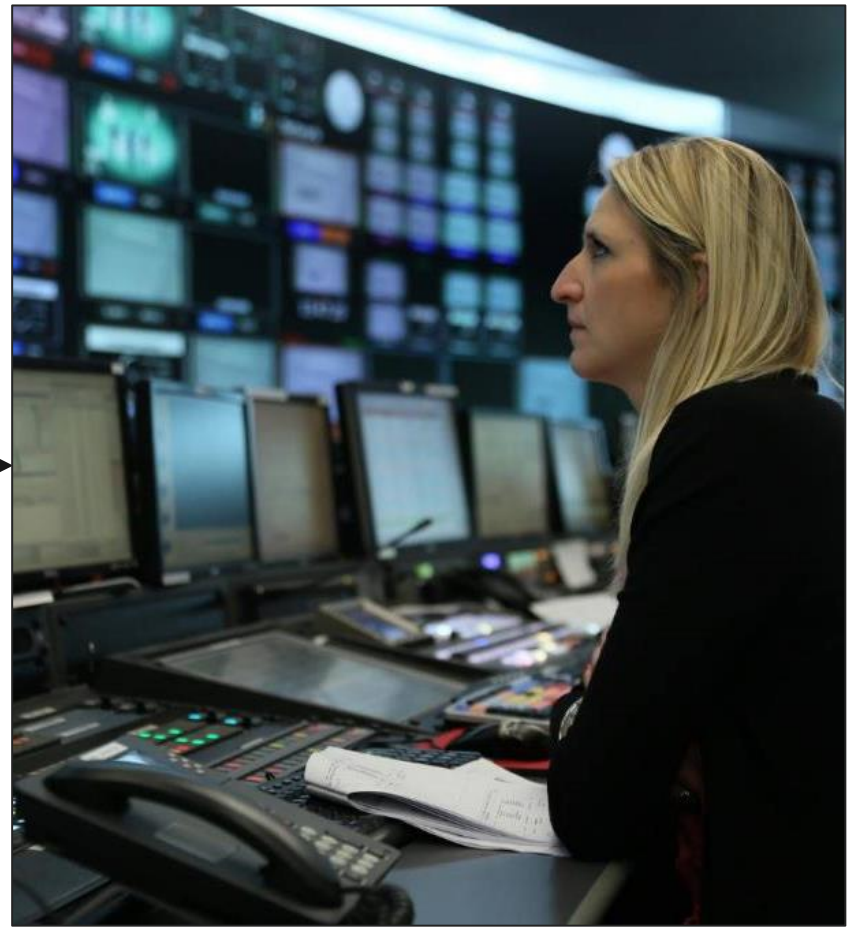
NW API Invocation - TODAY



- NumberVerify – FraudPrevention
- SIMSwap - FraudPrevention
- Device Status – FraudPrevention, ServiceProvisioning, …

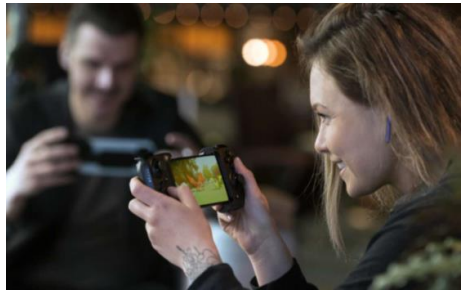
Key aspects of exposure

- Security by design (SIM-based, trusted, authenticated)
- Works Globally
- Provides network quality
- Enables new business models



From Communication APIs to Network APIs




Communications APIs

- Messaging
- Voice
- Video

Network APIs

- Authentication
- QoS
- Location

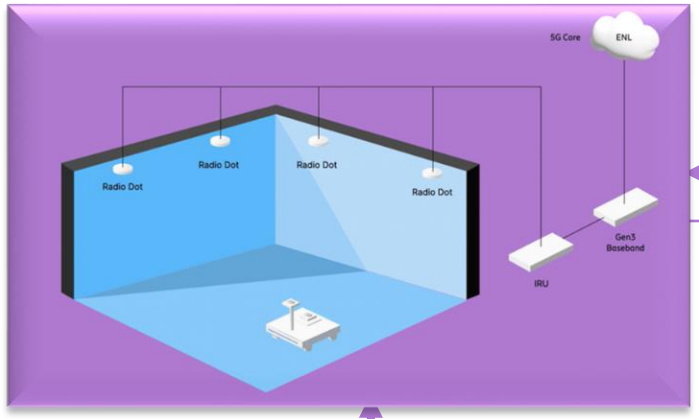
Global network platform

APIs empower developers, simplify application creation, and optimize performance

- High speed & Low latency
- Reliability
- Wireless edge solutions
- Security
- Network slicing

Worldwide 4G and 5G networks

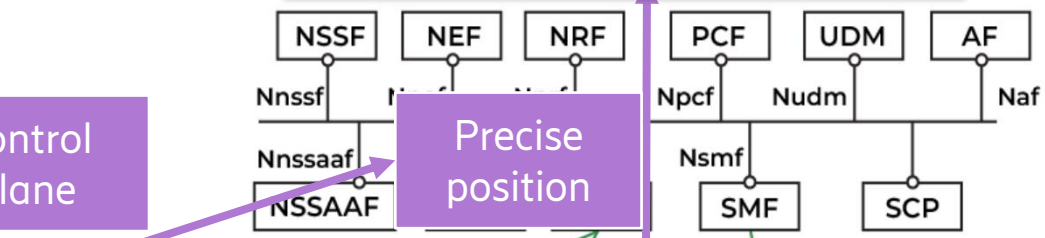
Exposure of precise location / position



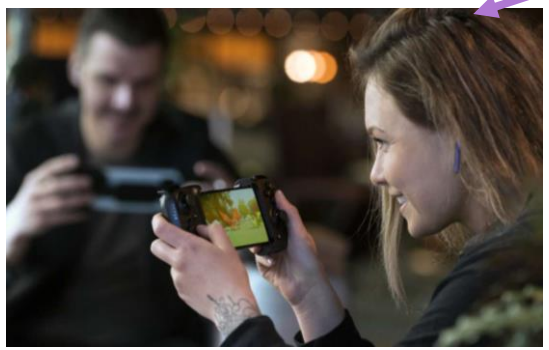
- Exposes data on business contract
- Influences network configuration

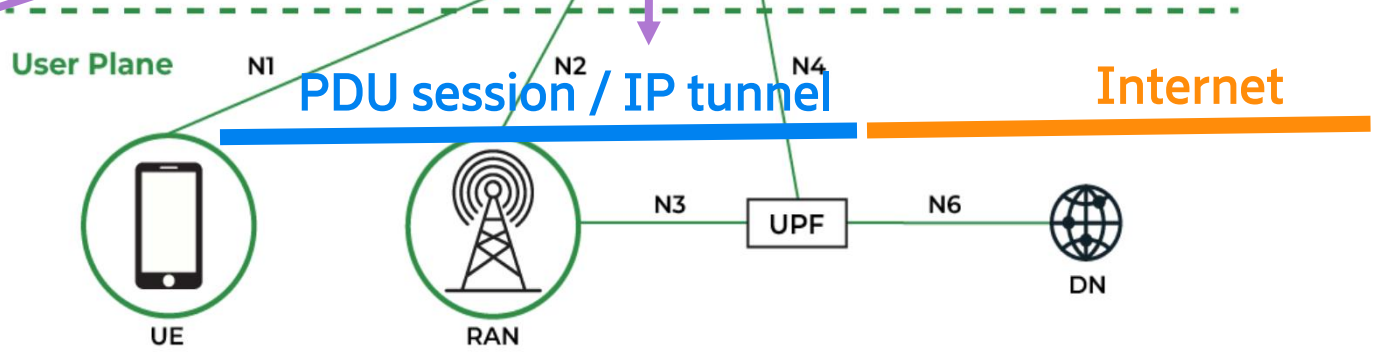
Control plane

Precise position



Application





5G Architecture Diagram

AI native

AI native: AI native systems are designed, implemented and operated by using AI technology.

AI native network require uniform, trusted AI framework

AI native built network will help reducing the TCO while making the network more flexible for new use case implementations

AI in 6G

AI will be a native part of 6G

AI can enable new use cases where operators can make money on differentiated connectivity via exposure

Making money on AI infrastructure and services is uncertain