

Connectivity for industries

Private networks 4G/5G



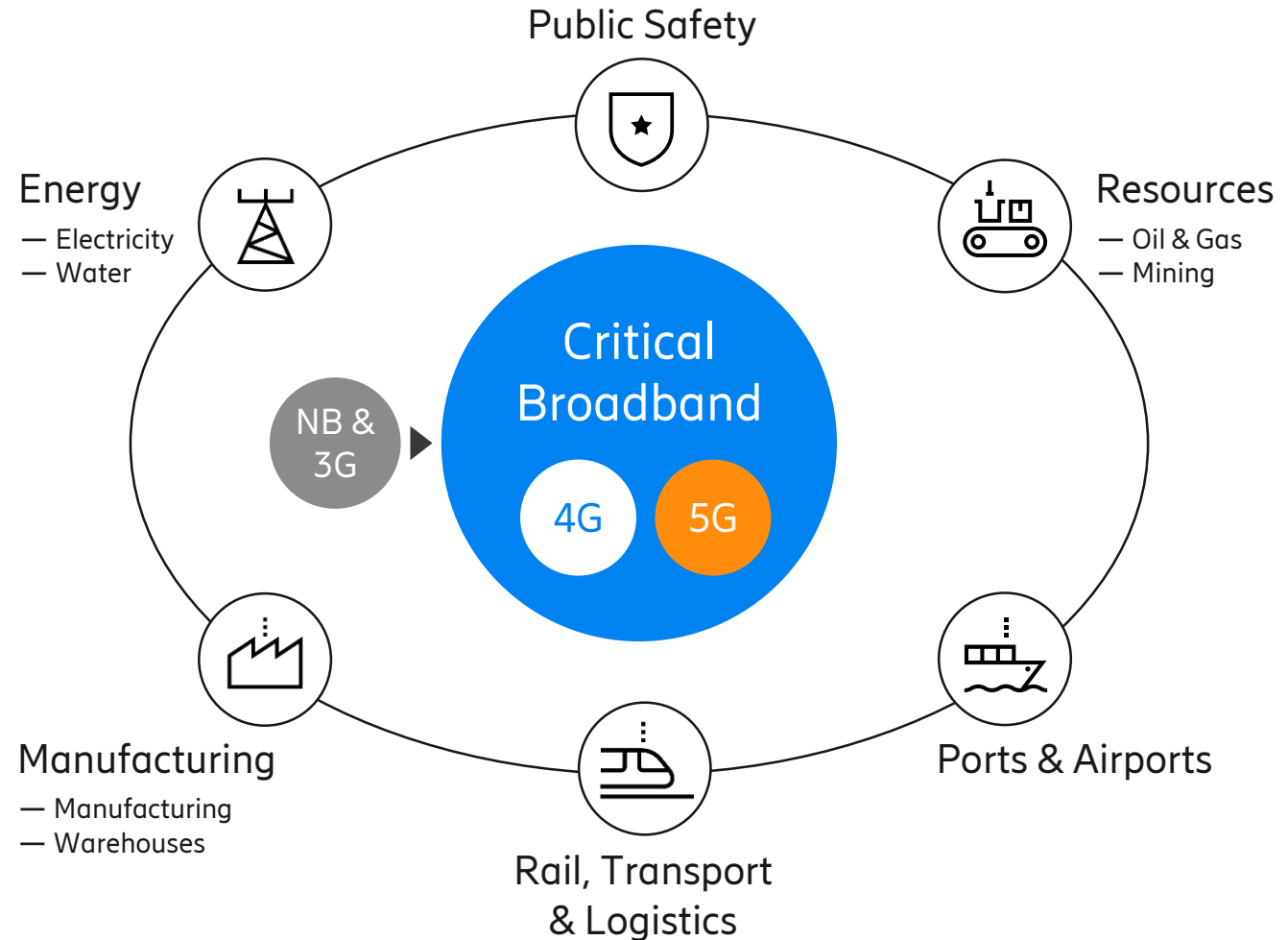
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Business Development Director
Mission Critical
and Private Networks

13-Nov-2019

Critical industries require critical broadband



It's no longer a question of 'if' critical broadband services are needed, but rather 'when' and 'how'



Why industries and governments invest in private networks?



What are the pains?

that generate market drivers

End of life existing infrastructure or high operational cost



Communication Modernization

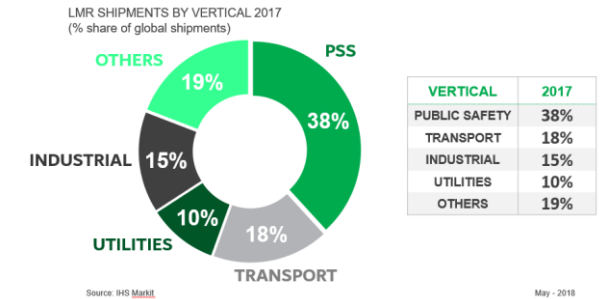
Use cases that

- increase operational efficiencies
- increase in productivity
- generate new revenues

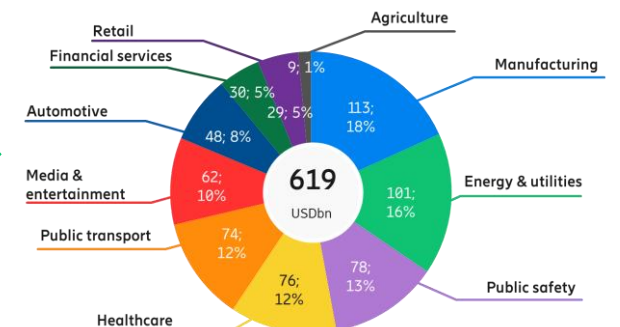


Industry Digitalization

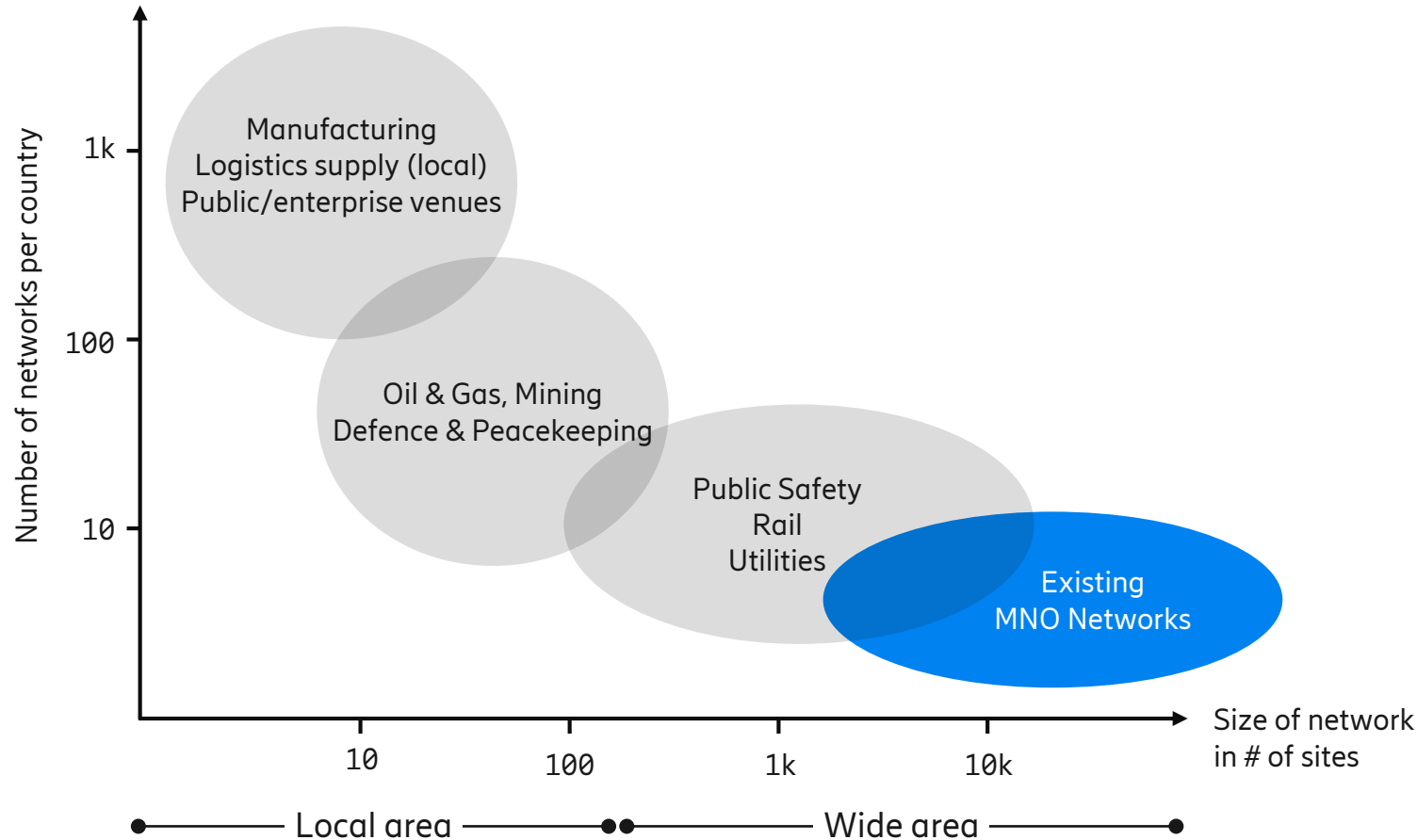
Existing 8.9 BUSD (2017) PMR business



New business for industries



Private Networks - designed to meet business and mission critical requirements



Common customers needs

- High availability and resiliency
- Low latency, high throughput
- High security for sensitive data
- Advanced QoS features
- Additional coverage and/or capacity
- Additional services, such as MCPTT

Cellular IoT evolution and segments



Commercial – Growth

Early pilots & standardization

Massive
IoT

Broadband
IoT

Critical
IoT

Industrial Automation
IoT

One network – multiple use cases and industries

1370

Smart
Metering



Asset
management



Fleet
Management



Drones/UAV



VR/AR



Automotive
C-ITS



Traffic Safety
& Control



Smart Grid
Automation



Collaborative
robotics



Advanced
Automation
& Control

Low cost devices, low energy
Small data volumes
Massive numbers
NB-IoT + Cat-M1 (4G and 5G)

High throughput
Low latency
Large data volume
4G + 5G

Ultra reliability
Ultra low latency
Very high availability
5G (advanced)

Industrial protocols
Time Sensitive Networks
Precise indoor positioning
5G (advanced+)

Industries adapt own standards for digitalisation, 3GPP aligned

Industry standardization

Many industries are aligning themselves around common standards to encourage a faster adoption of technology at scale

Manufacturers prepare for 5G



Drone Traffic Mgmt (UTM)

NASA/FAA, and EU EASA, each evaluate a regulatory system for drones beyond line-of-sight (BVLOS). 3GPP work item

Industrial Automation

Nov 2018, OPC UA to converge industrial networks for ethernet TSN. 3GPP adds 5G wireless



Automotive

Forum for auto players and network providers, EU and US revisit the V2X spectrum policy

Live Broadcast

EBU working group on 5G in Content Production (5GCP), while 3GPP studies the requirements of Audio and Video Production



Value that service providers bring



Scale

- Existing assets and operational capabilities, including Managed Services
- Boost the ecosystem



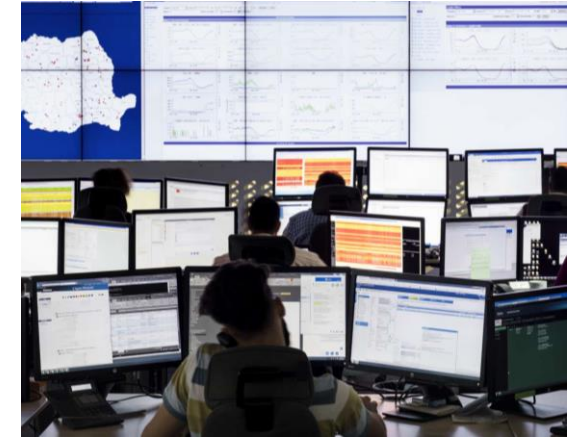
Coverage

- Extensive roaming and mobility services
- Spectrum aggregation



Evolution

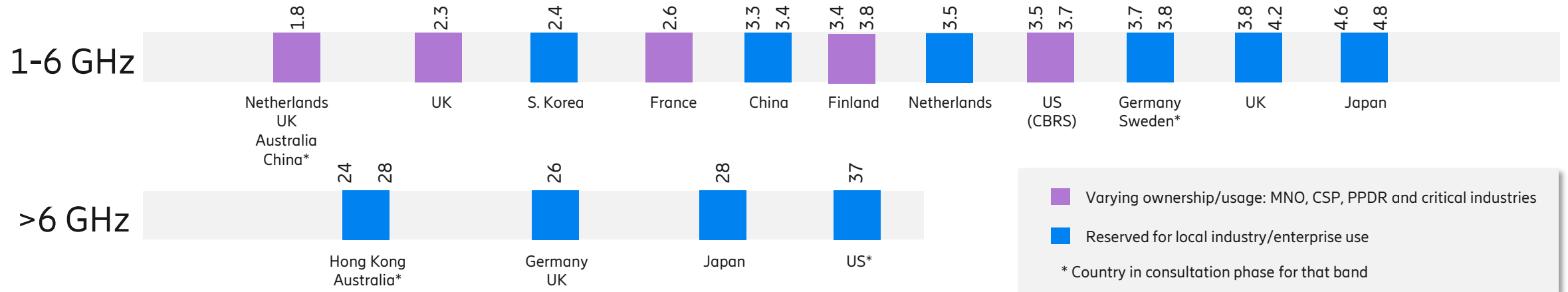
- Access to continuous 3GPP innovations and enhancements.
- Enabling journey to 5G



Value Added Services

- Enrich existing offering by bundling with IoT, cloud, edge and enterprise services

Locally licensed broadband spectrum trends



SPECTRUM ALLOCATION BY COUNTRY



3.5-3.7 GHz (inc. CBRS)
37 GHz in consultation



3.7-3.8 GHz



1.8 & 2.3 GHz* re-licensing
3.8-4.2 GHz
26 GHz



2.6 GHz



2.6 GHz NSA f/c 2020
4.6-4.8 & 28-29 GHz f/c 2020



3.7-3.8 GHz in consultation f/c 2020



3.4-3.8 GHz sub-licensing



24-28 GHz
1.8 GHz (China only) in consultation



1.8 GHz
24-27 GHz in consultation





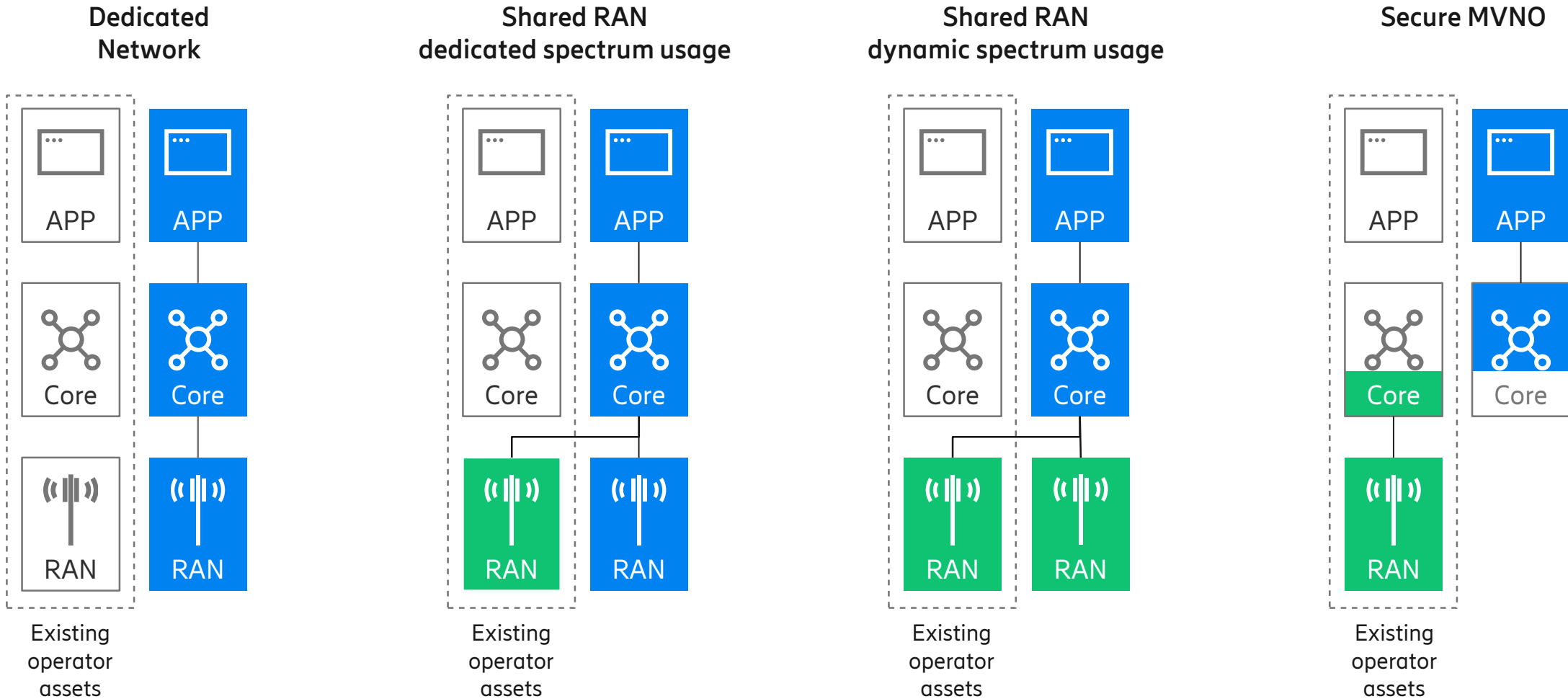
2.4 GHz



1.8 GHz
3.5 GHz
26 GHz in consultation

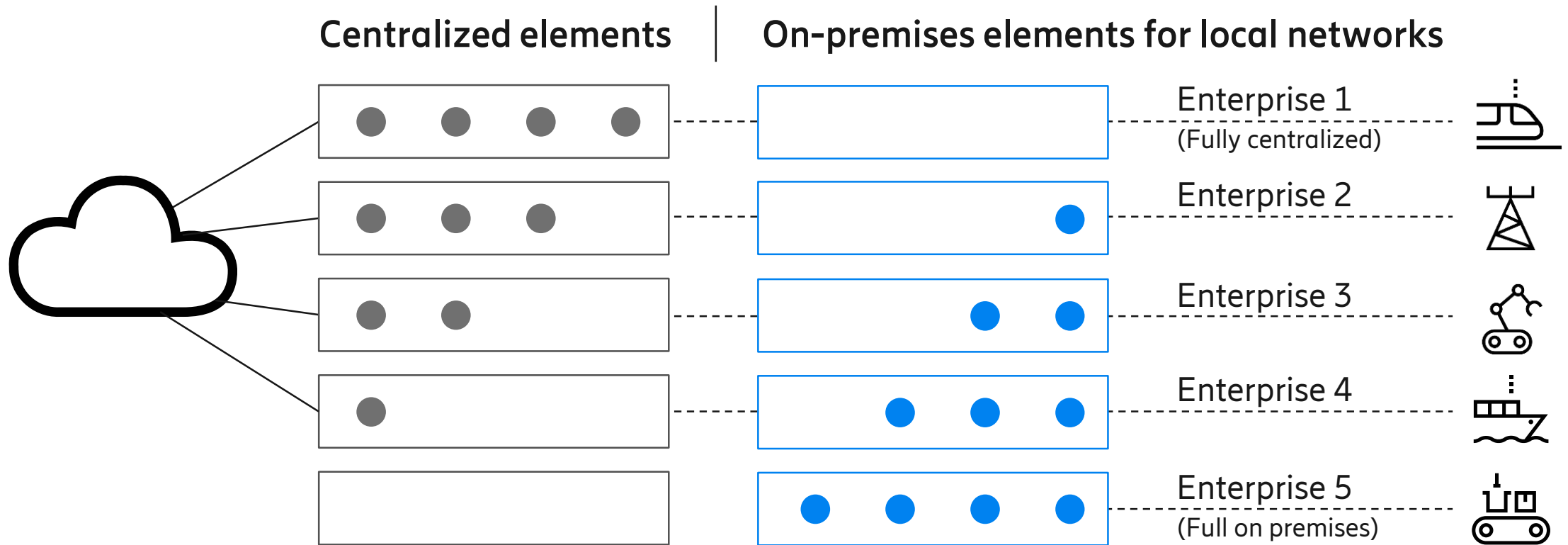
Nationwide networks: Leveraging existing RAN coverage

-  Dedicated private assets
-  Shared assets



Local private networks

– Flexible deployments for business scalability



Private LTE – Air France

The Challenge

Private LTE trial at Charles De Gaulle Airport, Paris at Air France terminals and hangars. to replace traditional radio communications such as TETRA and Wi-Fi for Gate-link connectivity, video Surveillance, MCPTT & AF apps

“The need for an efficient and adapted network is a very strong constraint in our businesses. Previous technologies can no longer support new needs created or desired by staff and materials. We needed a secure and solid infrastructure capable of supporting the digital transformation of all Air France's critical operations on the Roissy and Orly hubs.”

Christian Regnier

Head of Communications Solutions Air France & Secretary
AGURRE



The Solution

LTE radio sites connected to a virtualized EPC. Local breakout to Air France's professional applications

Many use cases

- **Private Mobile Radio (PMR)**
- **Multimedia communications between ground staff and control towers.**
- **Operational communications/IoT with emergency vehicles and AGVs**
- **On taxiway, downloading telemetry data while aircraft is landing.**
- **Video surveillance / security**



Partners

- Air France
- Airbus Industry
- Airport of Paris / HubOne



<https://www.ericsson.com/en/networks/offerings/mission-critical-private-networks>