

Askey 5G/Wi-Fi Private Network Solution Accelerates Enterprise's Digital Transformation

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Topics

- Why AI needs Private 5G to accelerate digital transformation
- Best practice projects on Private 5G/Wi-Fi networking
- Askey private 5G/Wi-Fi network solution



the iPhone moment of AI has started

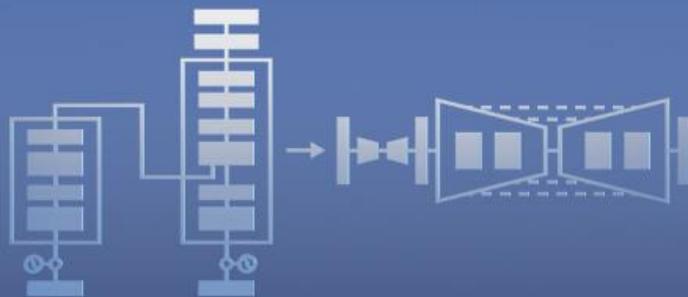
Y2023 GTC
tsy

Digital Transformation will trigger the iPhone moment of 5G Private Network

SUSTAINABILITY



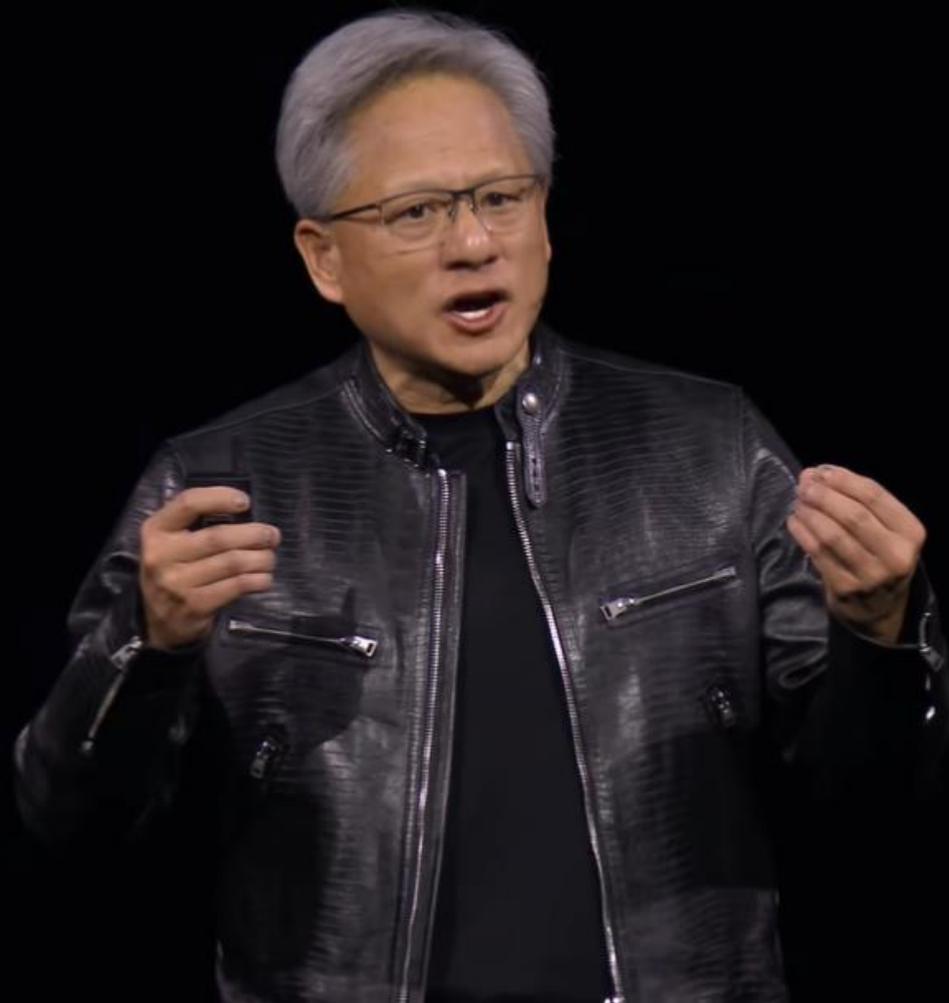
GENERATIVE AI



INDUSTRIAL DIGITALIZATION



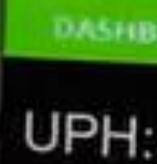
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digital twin idea is it is really spreading and it
it helps it helps companies build very complicated

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Digital Twins AI Factory



Omniverse Digital Twin

operations using live iot data from every machine on the production

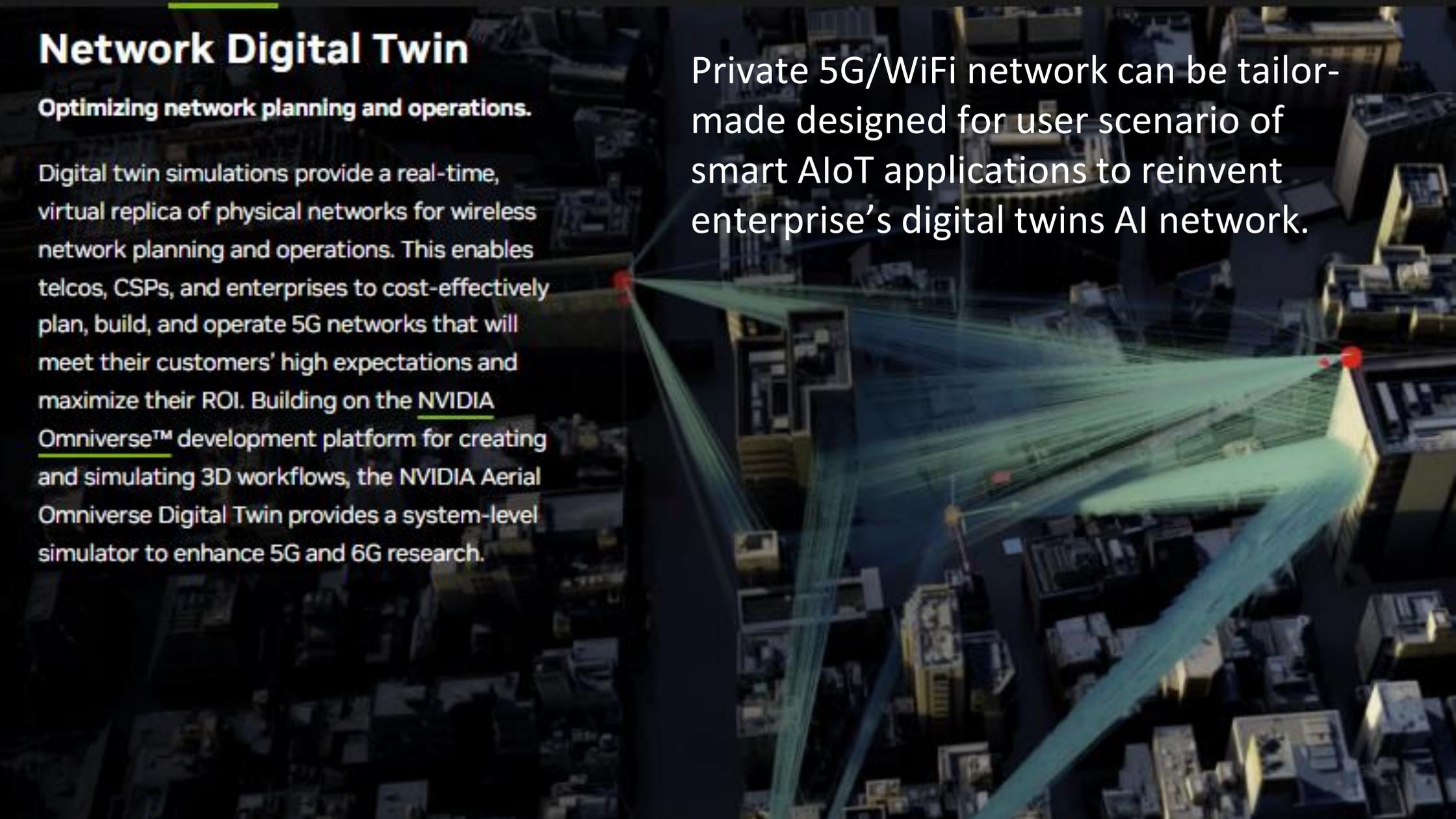
Y2024 GTC

Network Digital Twin

Optimizing network planning and operations.

Digital twin simulations provide a real-time, virtual replica of physical networks for wireless network planning and operations. This enables telcos, CSPs, and enterprises to cost-effectively plan, build, and operate 5G networks that will meet their customers' high expectations and maximize their ROI. Building on the NVIDIA Omniverse™ development platform for creating and simulating 3D workflows, the NVIDIA Aerial Omniverse Digital Twin provides a system-level simulator to enhance 5G and 6G research.

Private 5G/WiFi network can be tailor-made designed for user scenario of smart AIoT applications to reinvent enterprise's digital twins AI network.





Simulation

Digital Twin

Physical World

Emulation



Embedded Compute

The Embedded Compute Competency focuses on partners who deliver the power of modern AI for autonomous machines and other edge AI applications across all industries. Using the NVIDIA Jetson™ platform, these partners give customers the solutions and tools to quickly develop and deploy AI-powered robots, drones, intelligent video analytics (IVA) applications, and other energy-efficient autonomous machines that can perceive and understand the world.



Private Networking Networking

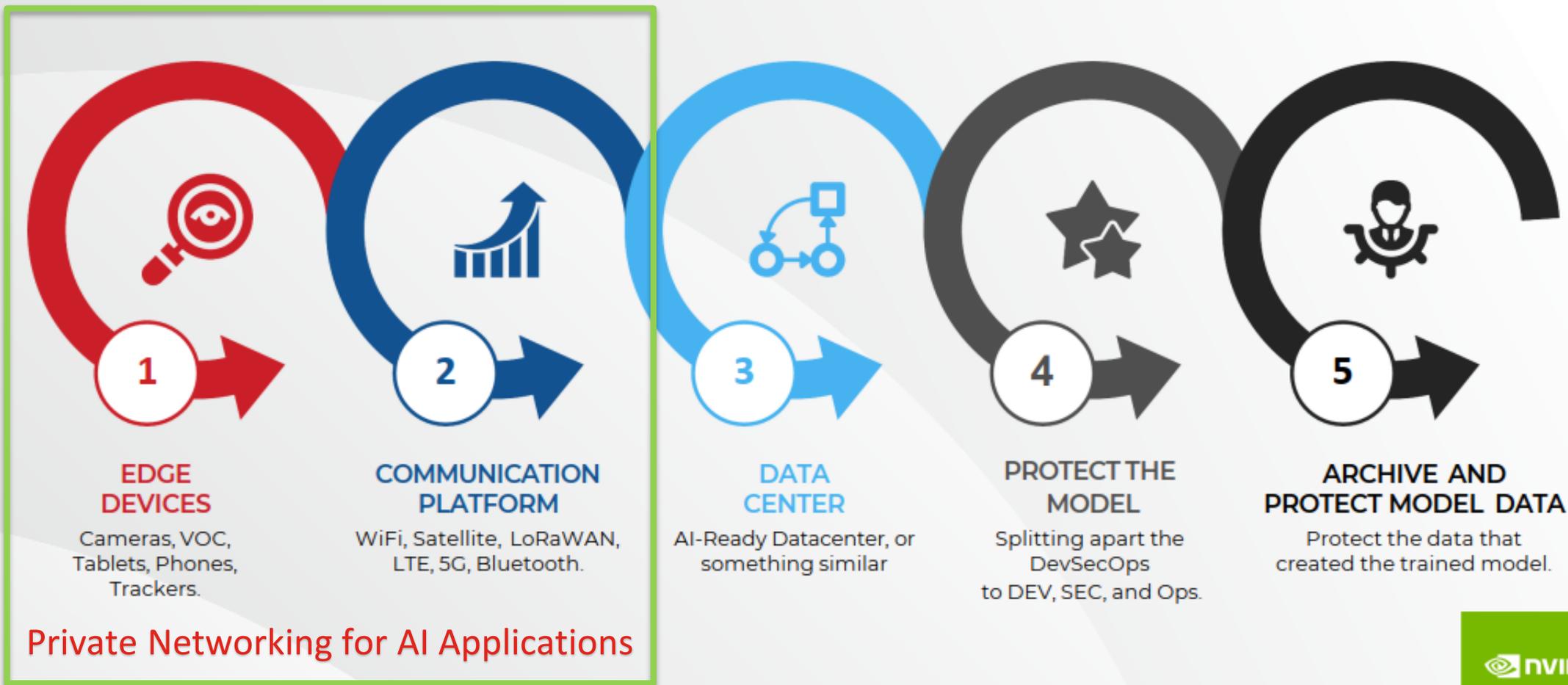
The Networking Competency focuses on partners who provide NVIDIA-accelerated networking solutions to enterprises, from mainstream data center servers to high-performance supercomputers. NVIDIA-accelerated networking solutions enable customers to build infrastructure that supports, develop-to-deploy implementations across all modern workloads and storage requirements, ushering in a new era of accelerated computing that maximizes AI return on investment.



NVIDIA AI

The NVIDIA AI Competency focuses on partners who provide customers with NVIDIA AI Enterprise software to accelerate data science and streamline development and deployment of production-ready generative AI, computer vision, speech AI, and more. With enterprise-grade NVIDIA AI, partners help customers reduce the cost and complexity of the AI lifecycle with cloud-native development tools, frameworks, pretrained models, reliable management and orchestration, and global enterprise support. NVIDIA AI-enabled solutions run across the cloud, data center, workstations, and edge.

Edge to Rest AI Workflow



Private Networking for AI Applications

Three Revolutions Happening – 5G + AIoT

IOT



IOT devices projected to grow to >150b by 2025, >1T by 2035.

5G



5G will deliver 1000X better bandwidth and 10X lower latency than 4G.

P5G

A Flexible and Scalable Network is Needed.

AI



By 2025, AI at the edge has a potential total economic impact of up to \$11T/year.



SW Defined



Open & Standards Based Solutions



VNF/CNF Based Deployments

Key Advantages for 5G Private Network Adoption

 <p>Improved Security</p>	 <p>High, Predictable QoS</p>	 <p>Lower Cost for Large Sites Than Wi-Fi</p>
Key Advantages		
 <p>Performance Levels Guaranteed by SLAs</p>	 <p>Improved Coverage and Stability</p>	 <p>Improved Handover</p>

CIO's Top Concern for 5G AIoT Applications



Source: Analysys Mason, 2022

Manufacturing's Challenges for Digital Transformation

Increasing energy and labor **cost**
(成本上昇)

Increasing consumer demand for **customized and personalized** products
(少量多樣與客製化需求)

Automate processes more, to gain efficiency
(自動化及生產效能提昇)

Maximize uptime to minimize business **interruption**
(設備稼動率提昇)

More **complex** operating and business models
(設備複雜度與日俱增)

Reduce carbon emissions and **energy** consumption
(節能減碳的要求)

TCO

Operations

User experience

Pay less

Easy to use and maintain

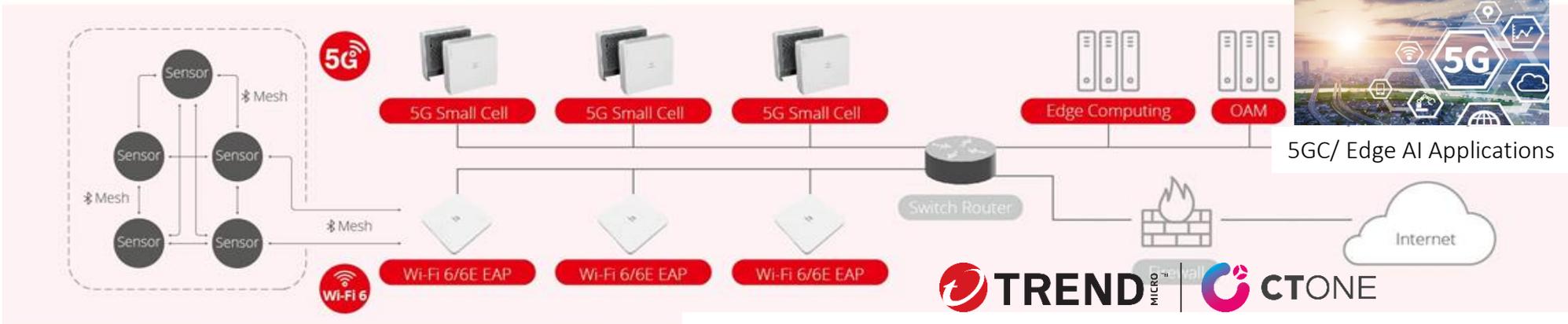
More autonomous

5G Private Network Solution For Smart Factory Projects

- For ASUS, Portwell, ADLink and Askey



Smart Factory Wireless Multi-access Network Solution



5G Key Features in Smart Manufacturing Applications:

- Mobility: **AGV/AMR/Drone**
- M2M Collaborations: Robotic **Automation**/Industrial Safety
- H2M Immersive Experience: **AR/VR/XR** Remote Operations



Collaboration



AGV/AMR



AOI



Smart Manufacturing Application @Askey 5G PN

AR Glasses in Factory

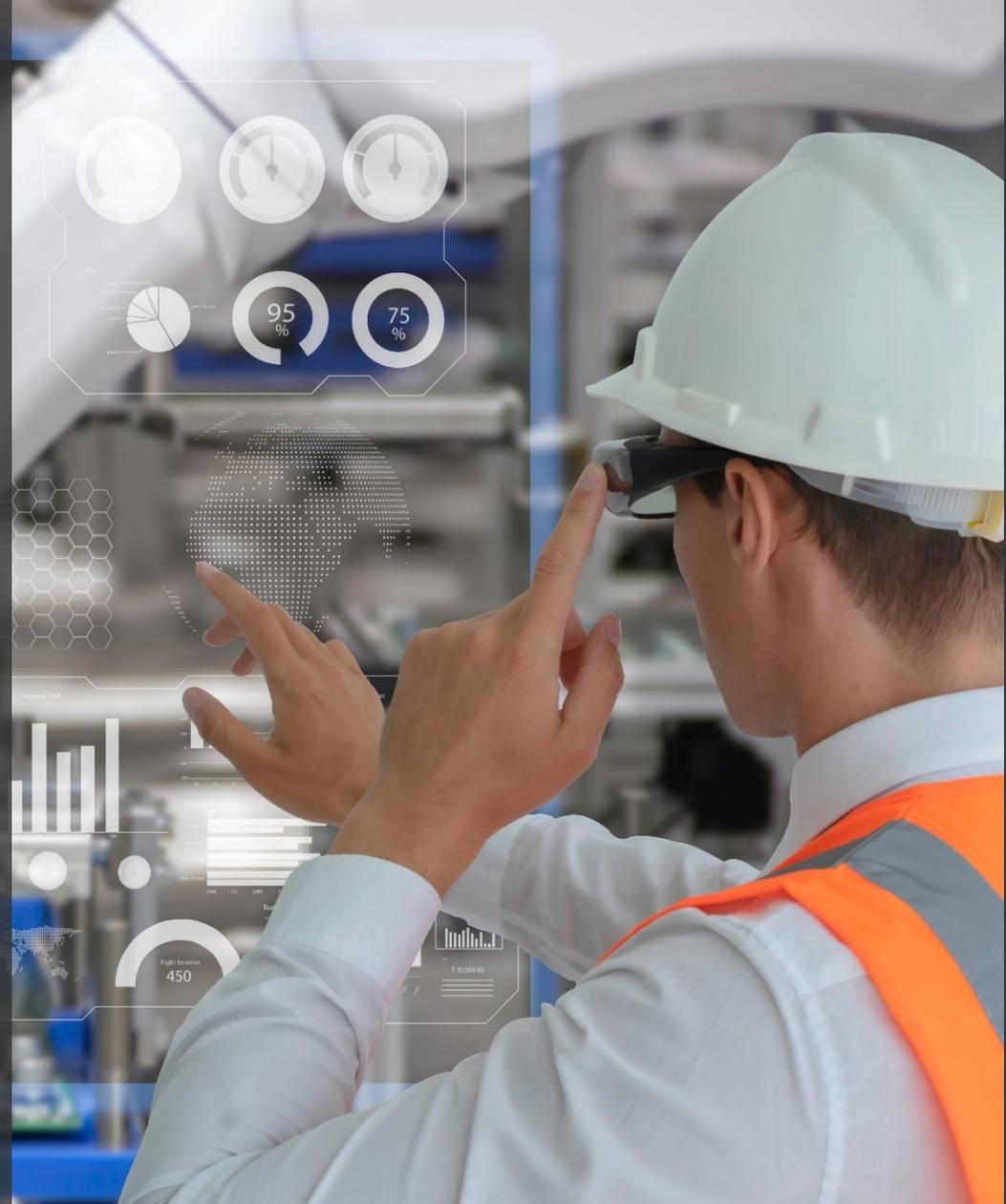
Mobile Situation Room
(Machine Parameter)

Co-operation
(Training · Maintenance · Check)



Mobile Situation Room
(Production Dashboard)

Incoming material check ·
Assembly line · outgoing shipment
confirmation



Smart Material Delivery System (AMR)

- ✓ End-to-end material delivery and retrieval solution with MES and i-Storage connected
- ✓ All events, tasks, and path traceability
- ✓ Effective support dynamic production line changeover with material kitting precision

Double Drum AMR

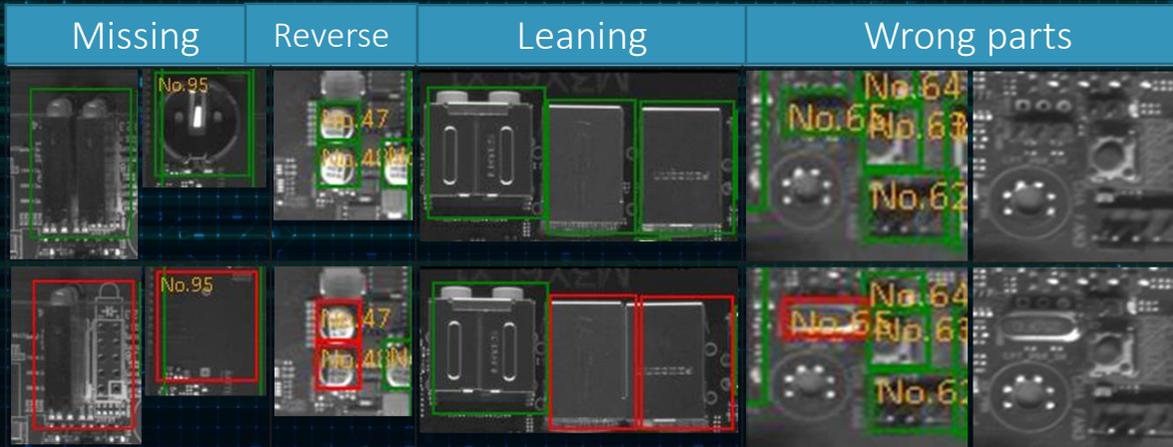


Jack-up AMR

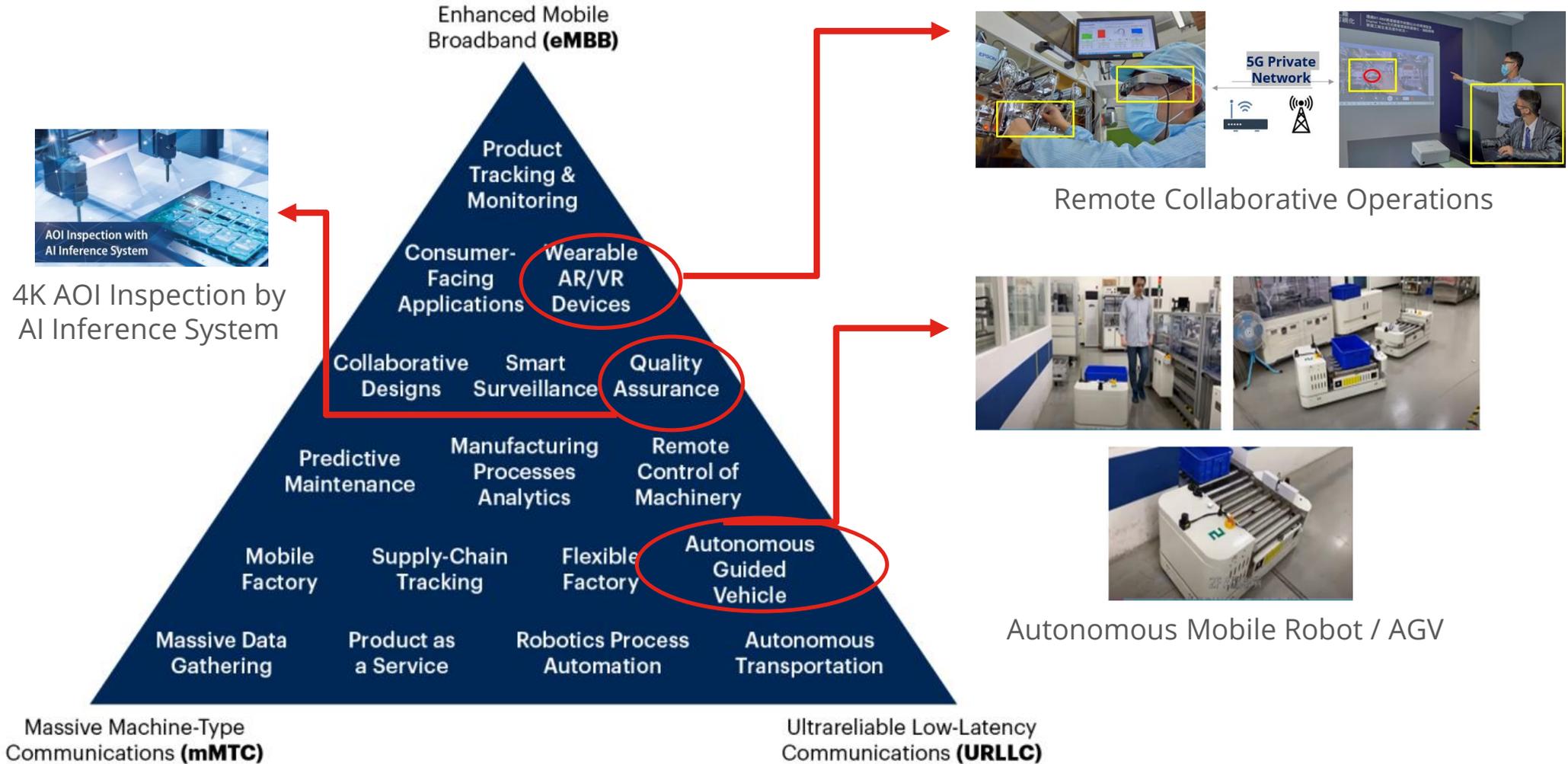


AI AOI for DIP Process

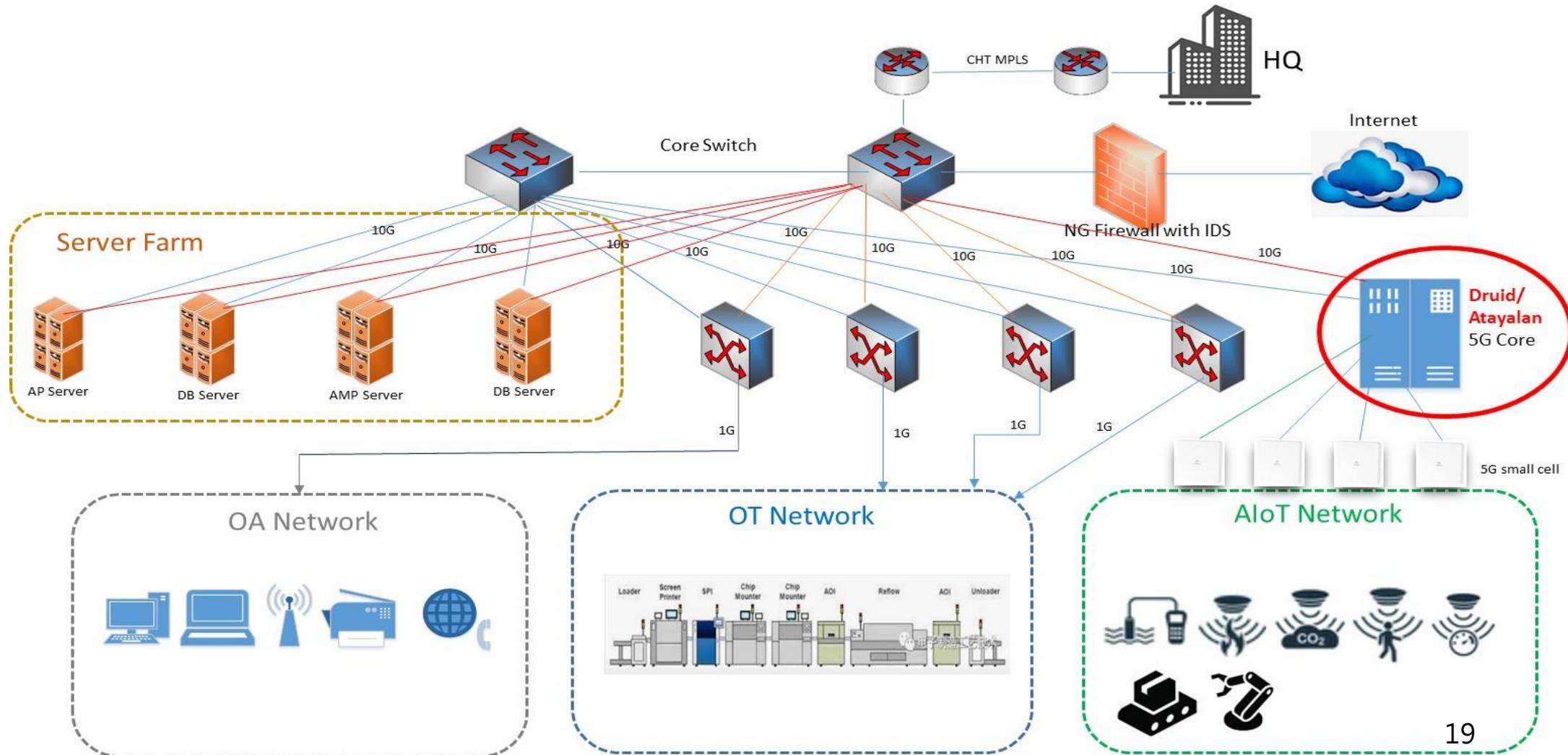
- ✓ Handful samples for AI modeling
- ✓ Automatic read serial number and other necessary machine readable information
- ✓ Design for before wave soldering, effectively re-work reduction
- ✓ Under MES management for production alignment and traceability



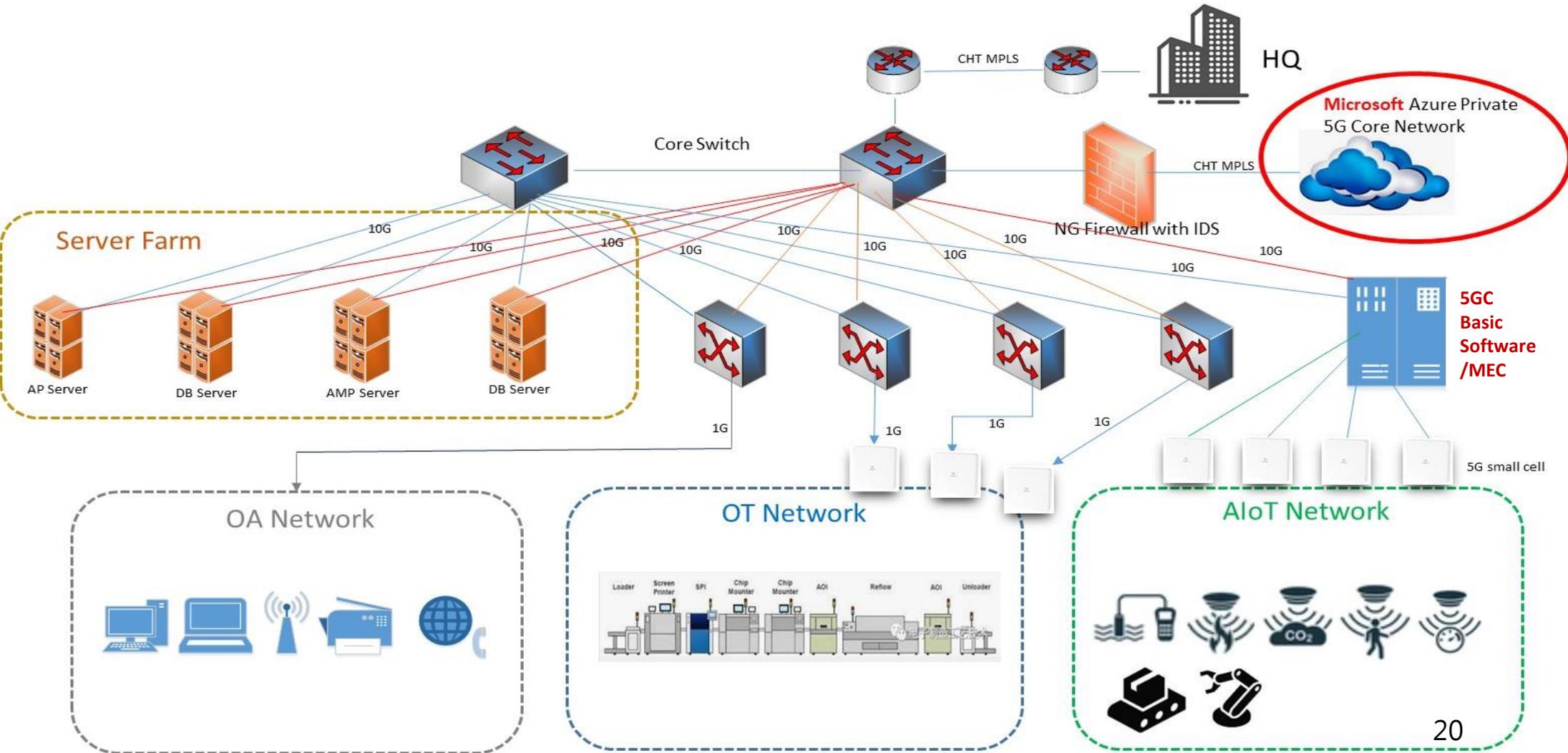
Askey 5G Smart Factory Plan – Phase 2 by 5G PN APPs



On-Premises Private Network Architecture



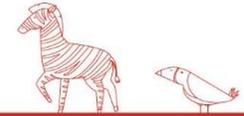
On-Cloud Private Network Architecture



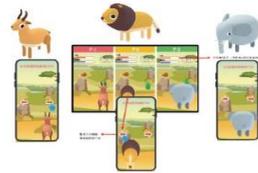
5G Smart Zoo Project @ Kaohsiung Shou Shan City Zoo



5G Interactive Technology Applications



- Wildlife Migration Battle Game
- Popularity Vote
- Animal Fruit Battle Game



Askey 5G Private Network is applied at Formosan Black Bear Corridor Site.

- 5G AR Puzzle
- Virtual Animal Tour
- Shoushan Zoo Tour
- Animal Coloring



- 5G Tutor 360° Livestream
- Take a Photo with Popular Animals by LBS AR

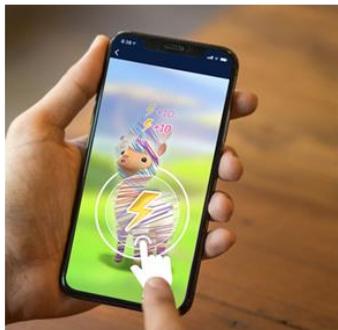


Smart Tourist APPs @ Kaohsiung Shou Shan City Zoo

1. Exclusive Animal Creation +NFT



2. AR Animal Voting



3. AR Animals Show



4. Cloud Battle Gaming



5. 5G Cloud Games



6. 5G Live KOL Teaching



7. Virtual Tour



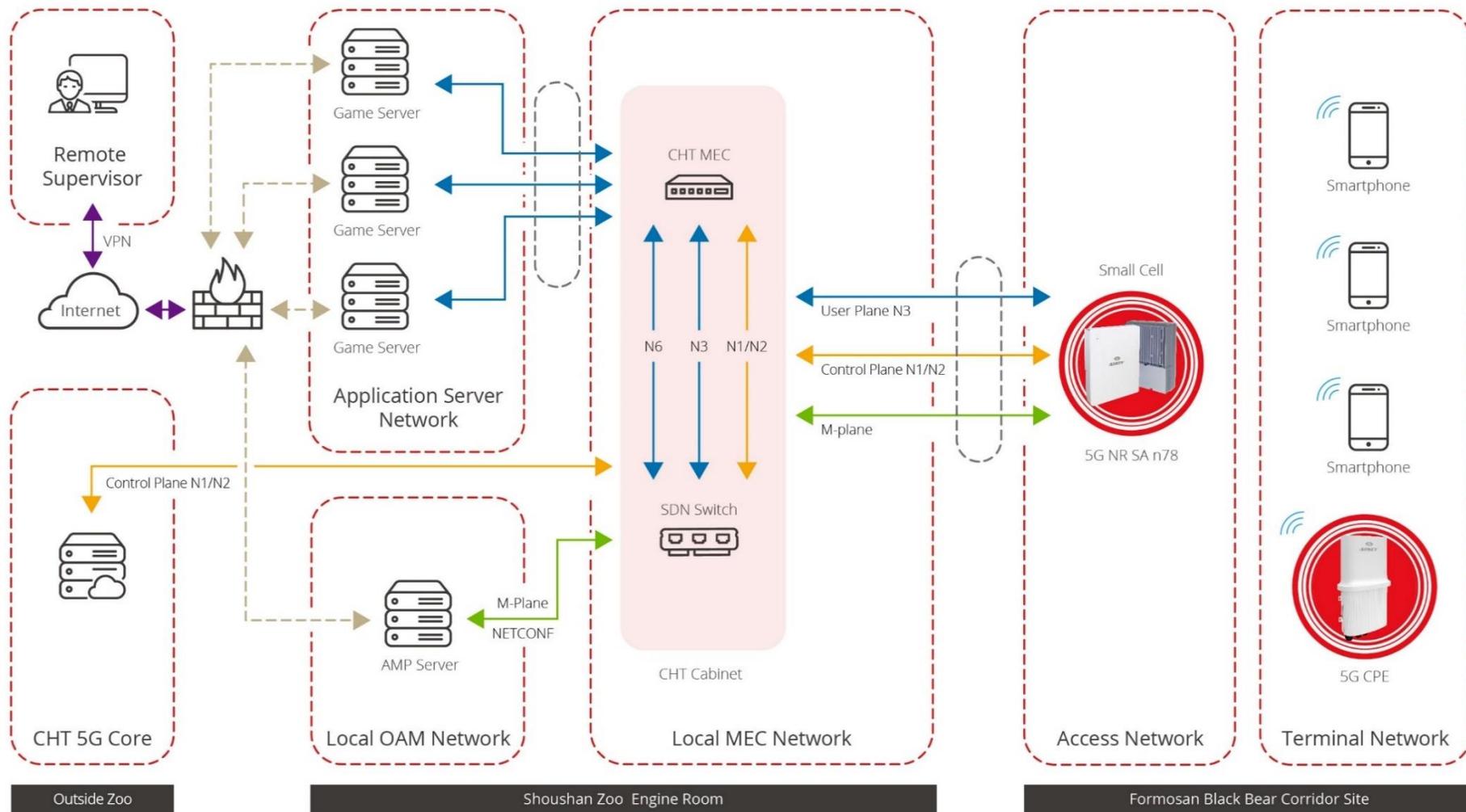
8. 5G AR Puzzle



9. AR Photo with Animals



5G PN Network Architecture @ Smart Zoo Project



Industrial IoT Applications



• AGV, AMR



• Robot Collaborations



• AR Remote Assistance

Smart Devices & Vehicles



• Immersive XR



• Drone



• Connected EV

Askey 5G Small Cell



DL (750Mbps)
UL (150Mbps)

- Indoor/Outdoor Type
- n77/n78/n48/n79
- R15 2x2 MIMO, 24/30dBm, 32UEs
- WebUI management functions

Cloud/On Premises 5GC



PoE/Optical Switch with PTP GM(1588 v2)

5G(NSA/SA) & IMS functions

Askey 5G Devices



5G/Wi-Fi CPE



5G Dongle



5G Outdoor Unit



Askey NMS Platform (AMP)

- Interface
 - > Restful API to Northbound
 - > TR069/Netconf to Southbound
- Support PM/FM/CM/SM/AM management functions to small cells and devices

Wi-Fi 6 Indoor EAP

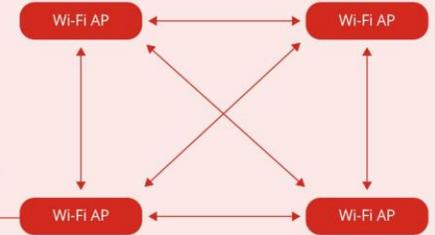


Wi-Fi 6 Outdoor EAP



AIoT Gateway

Wi-Fi Mesh Networking



Civil IoT Applications



Smart Agriculture



River Overflow Embankment Alert

Smart Home Applications



Home IoT



AR/VR

Enterprise Wireless Applications

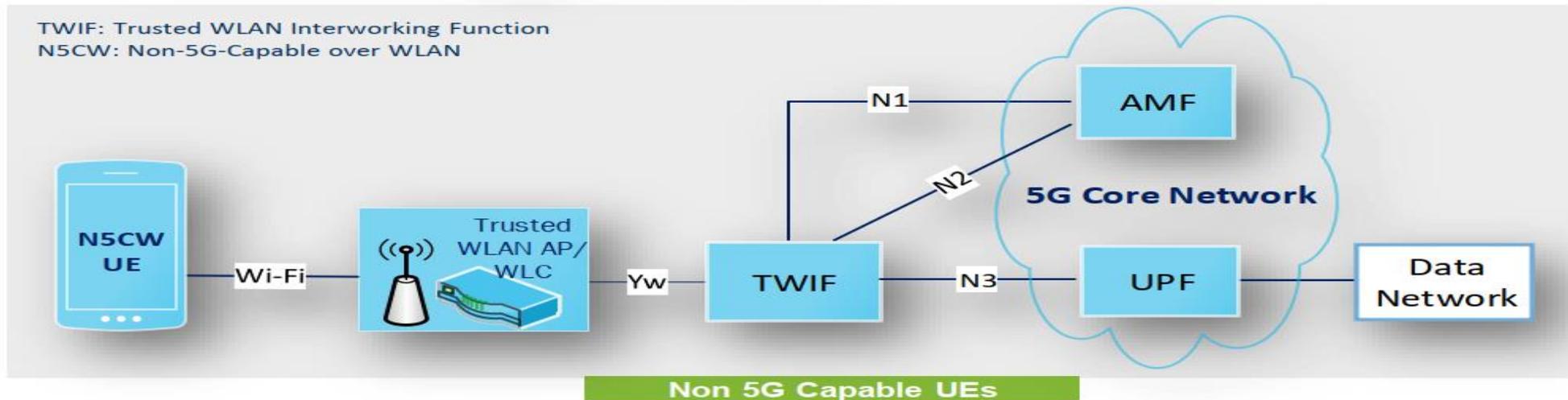
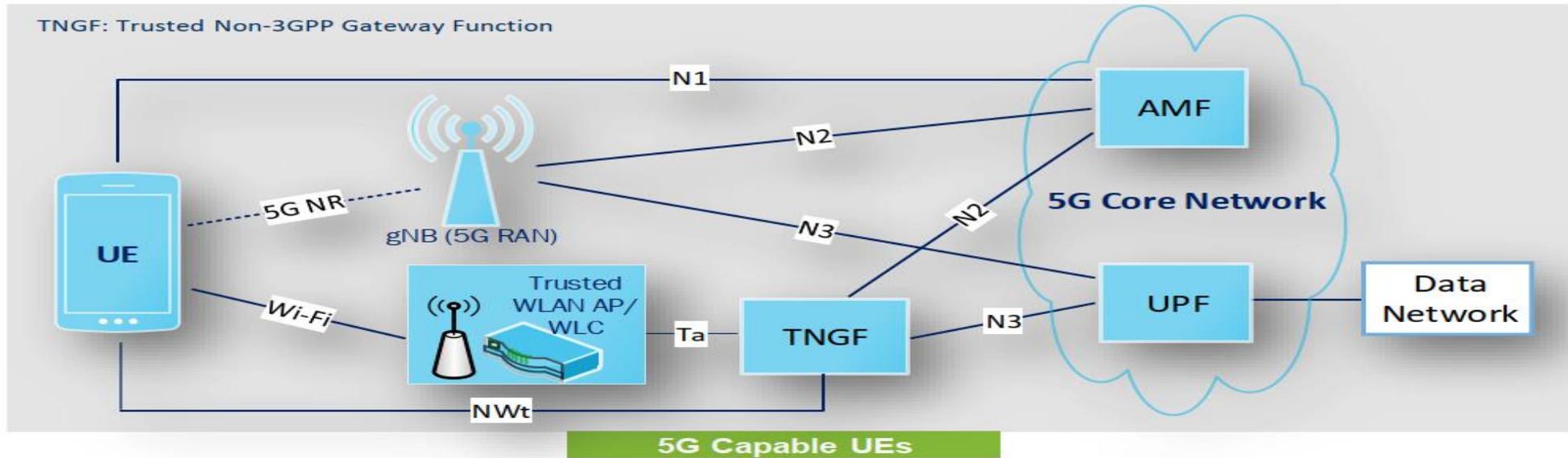


Outdoor Hotspots

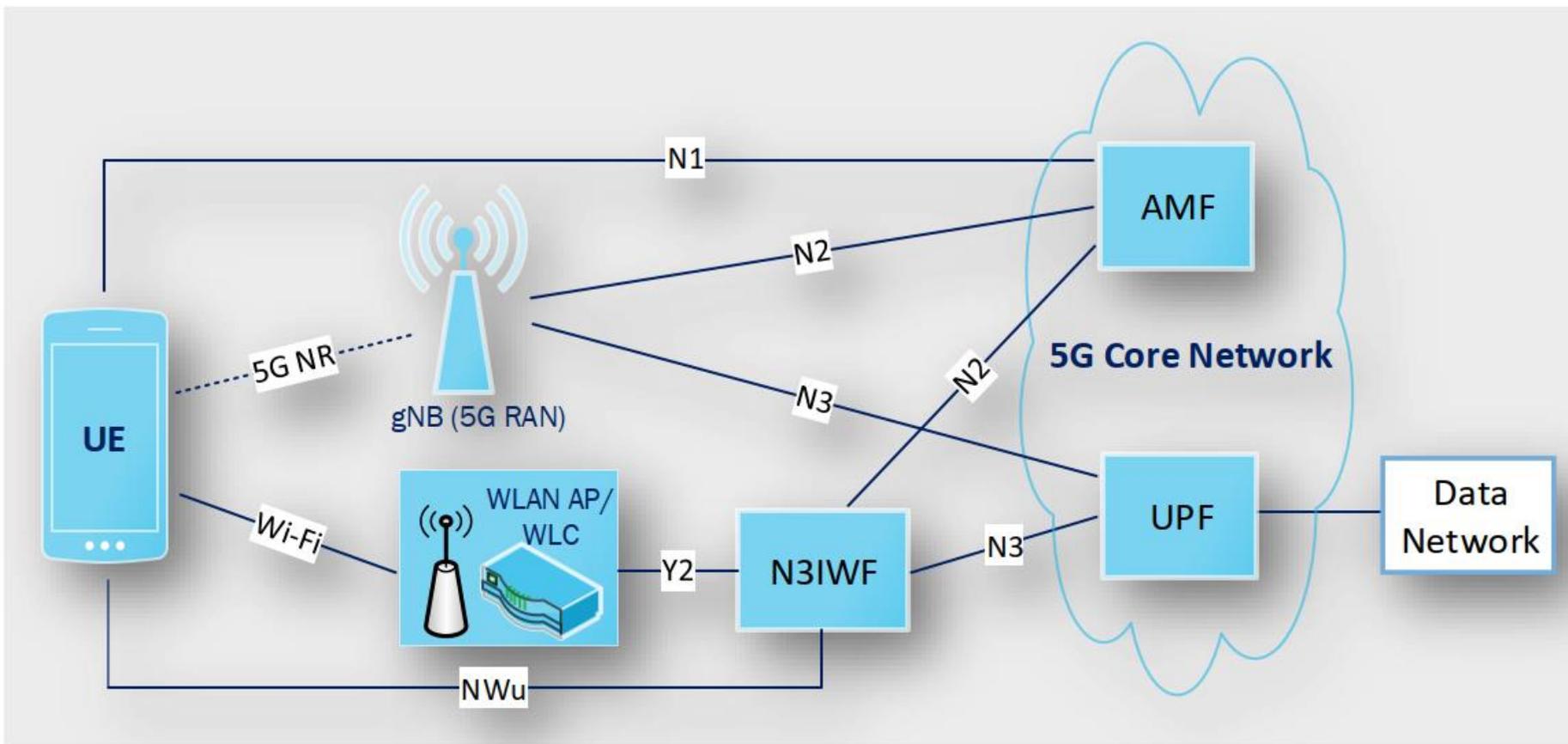


Smart Factory

5G/WiFi Convergence - Trusted WLAN Integration



5G/WiFi Convergence – Untrusted WLAN Integration



N3IWF: Non-3GPP Interworking Function
AMF: Access and Mobility Management Function
UPF: User Plane Function
NAS: Non-Access Stratum

5G Private Network Solution



ASUS Smart Factory



ADLINK Smart Factory



Sheh Fung Screw Smart Factory



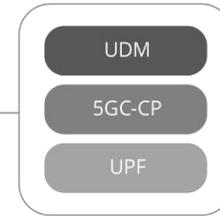
National Museum of Marine Science & Technology

NMS Platform (AMP)



- Interface
 - > Restful API to Northbound
 - > TR069/Netconf to Southbound
- Support PM/FM/CM/SM/AM management functions to small cells and devices

Cloud/On-Premises 5GC



Askey Cyber Security Solutions



5G (NSA/SA) ; IMS Functions

PoE/Optical Switch with PTP GM (1588 v2)

5G Indoor Small Cell



- n77/n78/n48/n79
- R15 2x2 MIMO, 24/37dBm, 32~64UEs
- WebUI management functions

5G Outdoor Small Cell



Askey Connectivity Devices



5G CPE



5G ODU



5G Dongle



5G Mobile Device



5G Camera

Enterprise Wireless Solution (EWS)

Enterprise AP

Wi-Fi 6/ Wi-Fi 6E/ Wi-Fi 7
for Office, Building, Mall

Built-in Controller,
Mesh, RRM, PoE



Office Area



Smart Factory

Branch/SMB Router

5G NR/LTE + Wi-Fi 6 for SMB, Retail Store, Restaurant

WAN Failover, VLAN,
Digital WorkSpace



Branch Router
with Wi-Fi 6



Wi-Fi 6/ Wi-Fi 7 AP

Outdoor Integrated AP

5G NR/LTE+Wi-Fi 6, Outdoor Environment

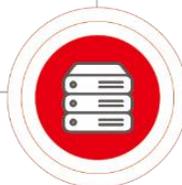
5G NR/Fiber/Eth. + Wi-Fi 6,
Mesh, IP67, PoE,
Wide Temp.,



Outdoor Hotspot



Outdoor Surveillance



AMP/EMP
Cloud Manager

5G NR/LTE

5G NR/LTE



LTE+Wi-Fi 6

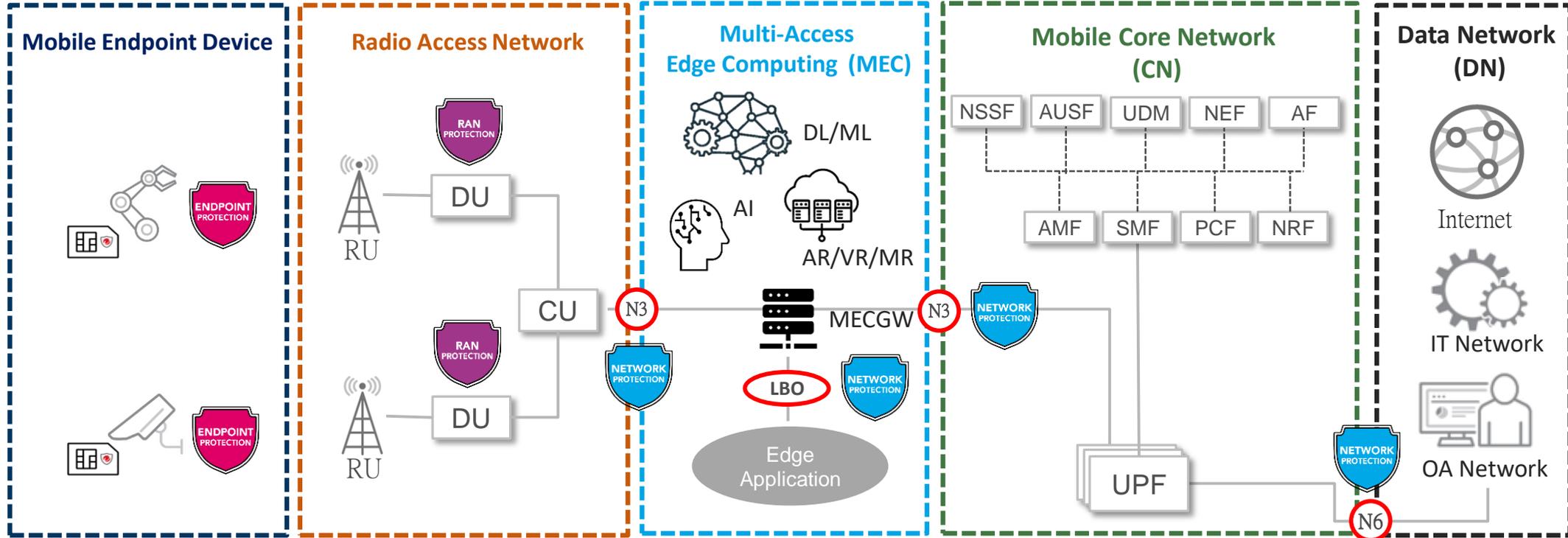


Wi-Fi



LTE/5G NR

Askey Cyber Security Solution – Partner with TrendMicro



Endpoint Protection

Mobile IoT/IIoT Endpoint Protection

Network Protection

Data Network and Edge Computing Protection

Worldwide Partners and Vertical Markets



Maritime



Warehouse



Factory



Defense



Campus



Hospital



Live Production



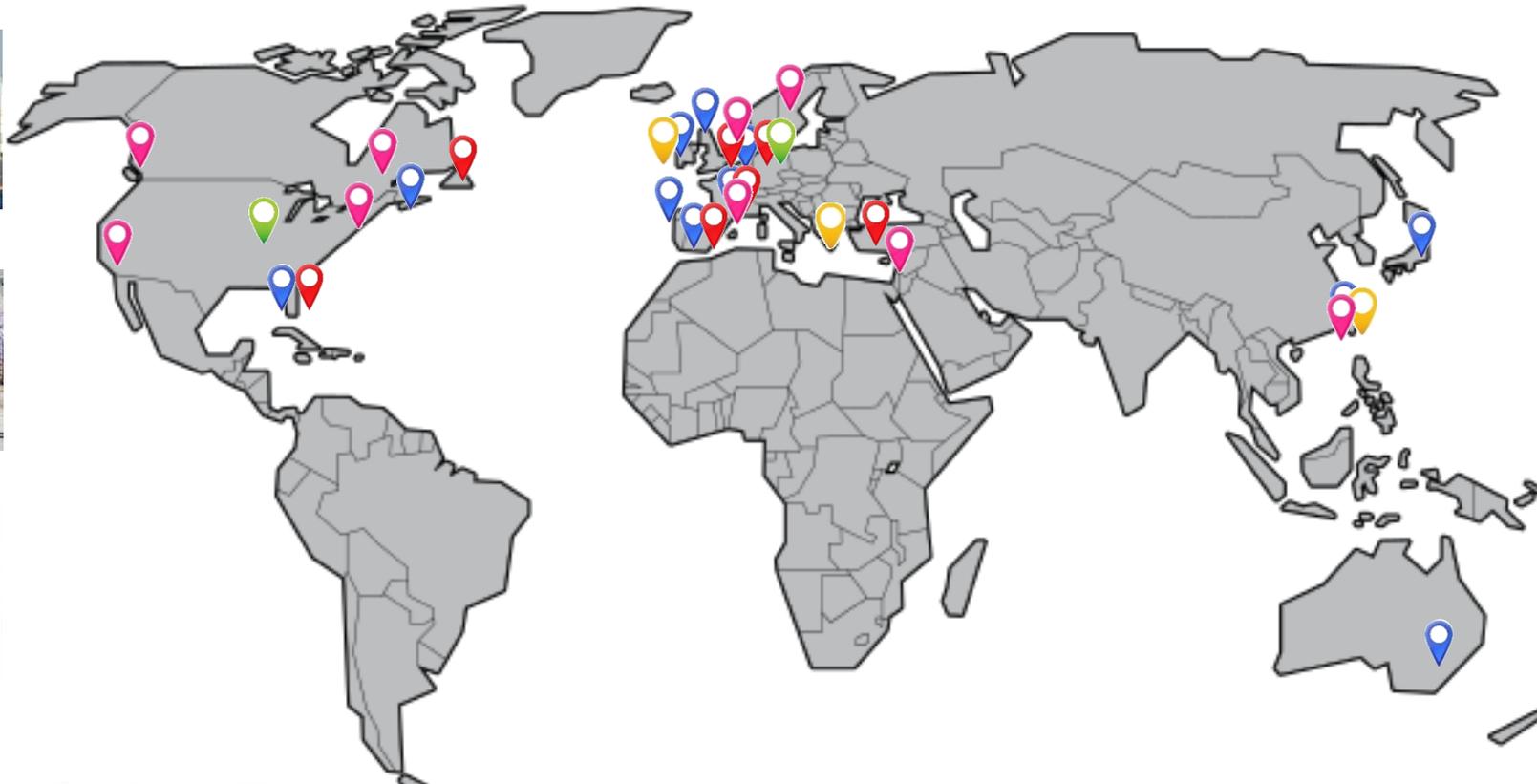
Zoo



Transportation



Arts Center



Search and Rescue



Oil & Gas Exploration



Mining

-  Telecom
-  System Integrator
-  Software Company
-  Core Company
-  Others

Key Take Away

- ✓ 5G/WiFi Private Network enables the infrastructure to adapt digital twin AI network
- ✓ Edge & Device Computing AI Apps running @ 5G.PN needs E2E CT & IT/OT Integration
- ✓ TCO, easy of operations and high security & reliability are key success factors of enterprise's 5G/WiFi private network

**Askey 5G PN Solution Can Help
you to Accelerate DX!**



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