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Your NFVI Partner for the New IP Infrastructure

Webinar: Flying into Edge Cloud

Paul Stevens

Telecom Sector Marketing Director, Advantech Networks & Communications Group

Eric van Vliet

Platform Application Engineer, NFV Remote Evaluation Service Labs, Advantech NCG

Today's Presenters

Paul Stevens
Marketing Director,
Advantech
Networks &
Communications Group

Paul Stevens is Telecom Sector Marketing Director at Advantech Networks & Communications Group. Paul has focused on technology marketing roles since he joined Advantech in 2002. Prior to that he was European Marketing Manager at Motorola. Paul's focus today is on enabling the NFV Ecosystem at Advantech. He is based in France.

Eric van Vliet
Platform Application Engineer,
NFV Remote Evaluation Service Labs,
Advantech
Network & Communications Group

Eric van Vliet is Platform AE at Advantech Networks & Communications Group. Eric has a technical background in embedded systems and networking equipment and works closely with customers on new product design-ins. His expertise covers bladed technologies as well as Carrier Grade Servers and Network Appliances. His current focus is to help ecosystem partners and customers accelerate their NFV development using Advantech's Remote Evaluation Service in addition to active participation in industry PoCs and plugtests. Eric is UK-based

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Agenda

- What is Edge Computing?
- Why Edge Cloud? Key Drivers
- MEC and the Road to 5G
- PoCs & Use Cases
- Private LTE, Private Cloud
- Edge Cloud Enablers

What is Edge Computing?

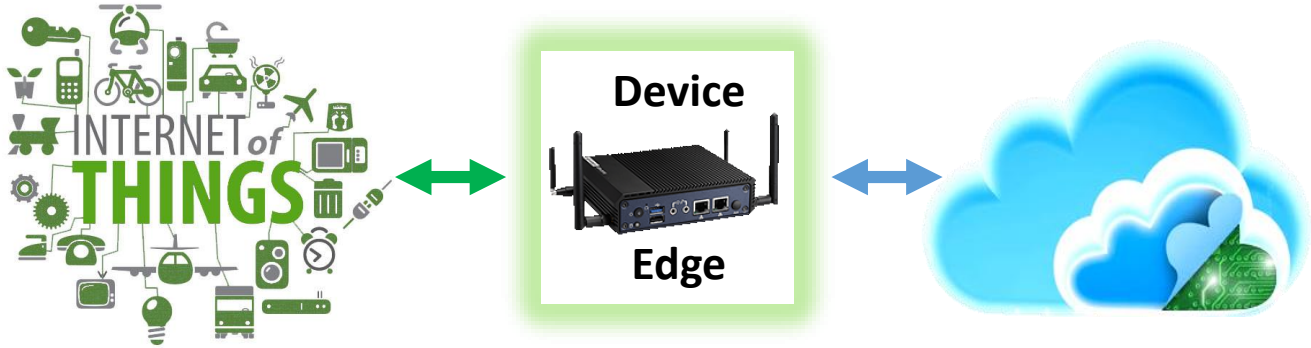
A way to streamline the flow of traffic from IoT devices and provide real-time local data analysis

Network World

Where critical data processing occurs at data source rather than centralized cloud. Certain data processing tasks are best performed 'at source' than in the cloud. OAS

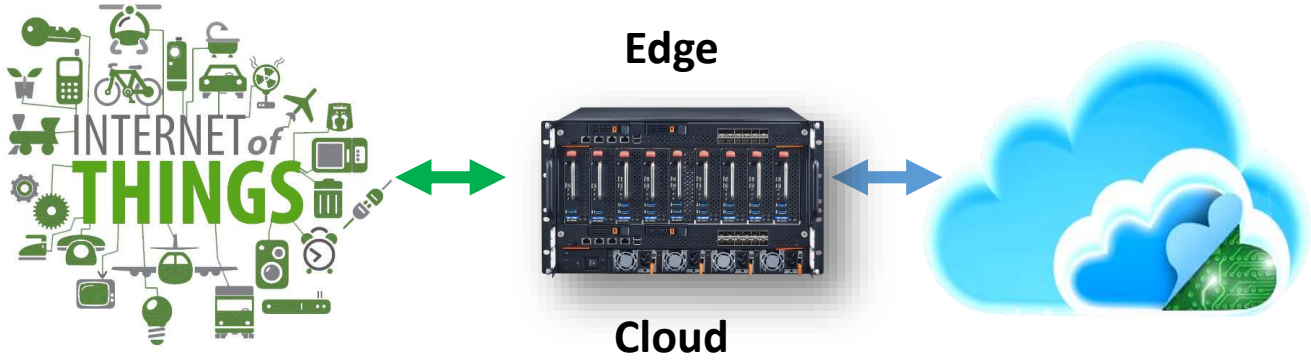
The processing, storage and network optimization at the edge of both fixed and mobile networks, independent of the access technology. MEC implementations can play a role in optimizing the utilization of access resources. Senza Fili

IoT, Device Edge & Cloud Edge



Device Edge

Edge computing apps run in existing environments. A local IoT Gateway offers capabilities similar to public cloud. Customers typically own the hardware running the edge software.

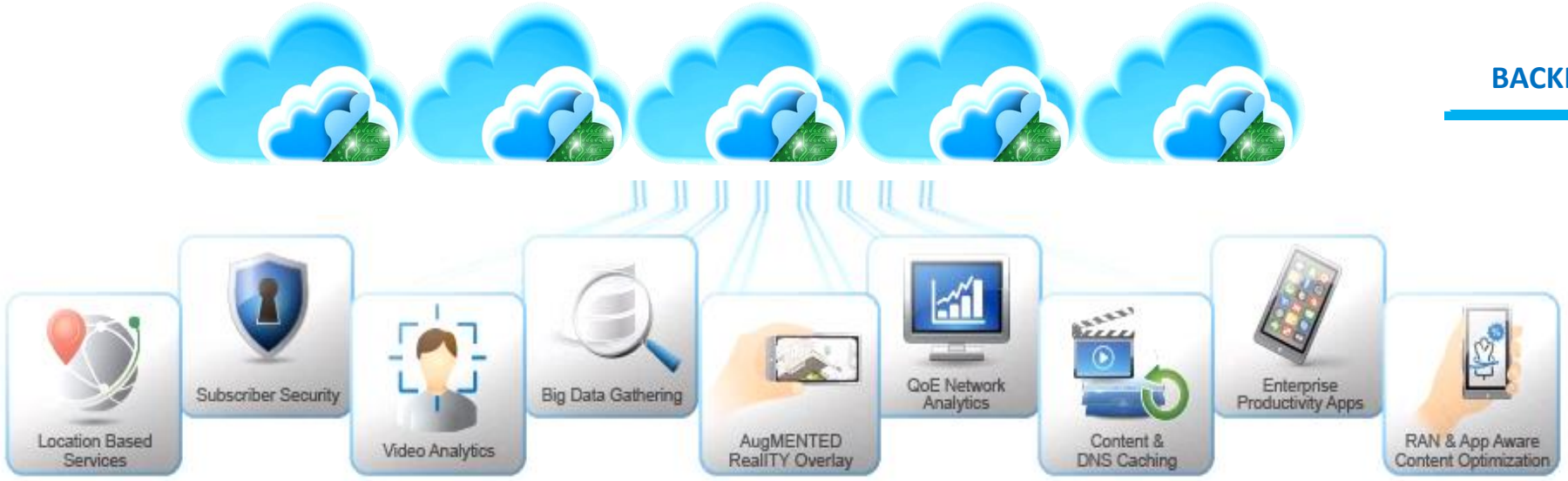


Edge Cloud

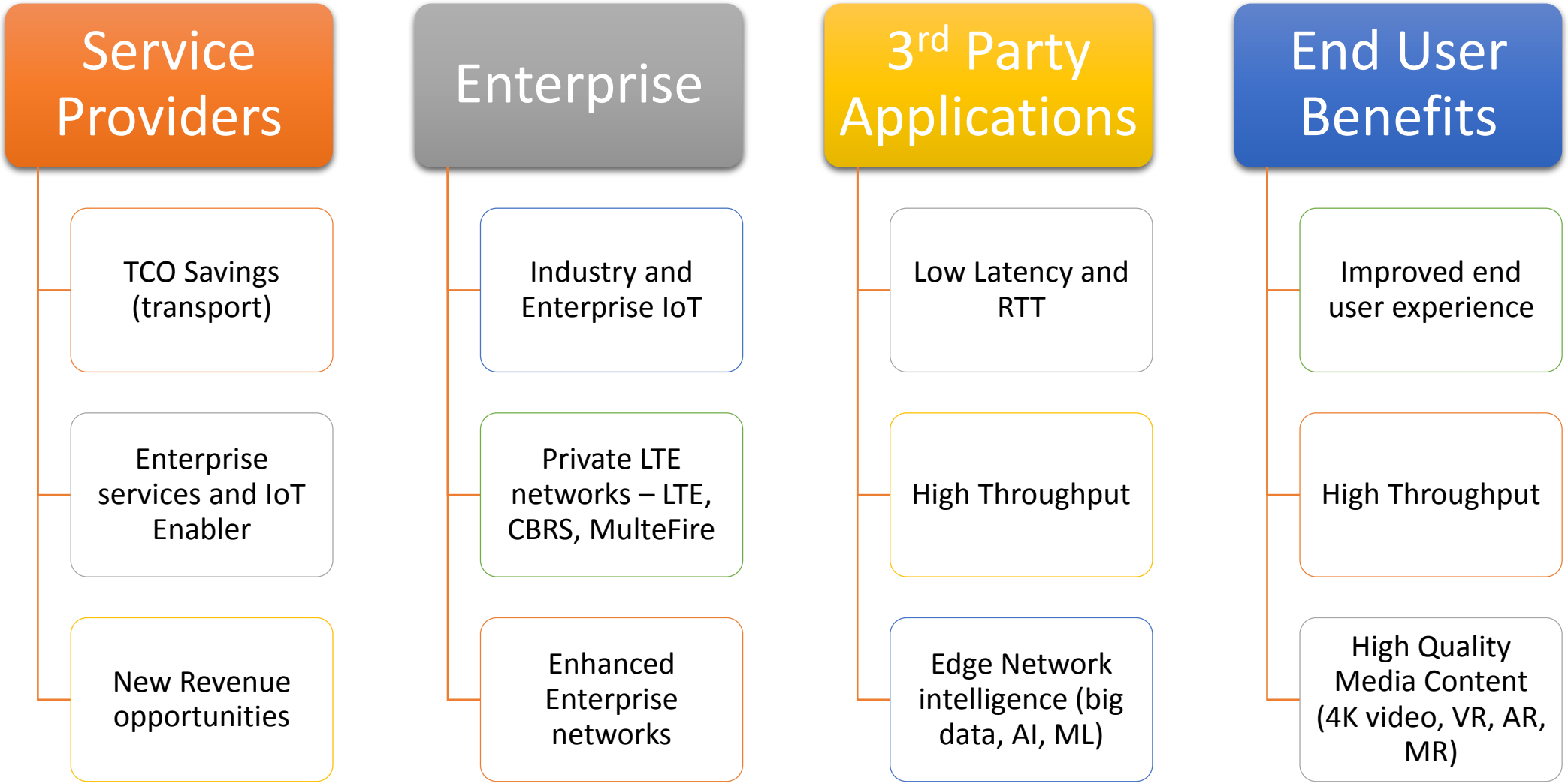
An extension of the public cloud, include compute, storage and network services. Can also be Private Cloud.

Why Edge Cloud

- ✓ **Low latency:** For critical communications and subscriber experience
- ✓ **Higher Throughput:** Cloud content caching & local content
- ✓ **Context information:** Throughput guidance for optimal QoE /individual needs
- ✓ **On premises:** Local breakout to enterprise networks (Private, Private LTE, Small Cells)
- ✓ **Better Security:** Protects core network with applications at the edge
- ✓ **Proximity:** Edge processing reduces latency & relieves backhaul
- ✓ **Location awareness:** Unique interactive Augmented Reality experience



Drivers for Edge Computing



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Domain Specific Market

Industry 4.0 Solutions


iFactory


Robotics


Equipment

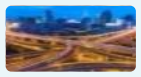

Warehouse

Smart City Solutions


Retail


Transaction


Building


Traffic


Fleet


Railway

IIoT Solutions


Environment


Agriculture


Power & Energy


Oil & Gas

Solution Ready Platform (SRP)


Connected Equipment

IT&OT Convergence


Asset Tracking


IP Surveillance


Environment Monitoring


Equipment Monitoring


Predictive Maintenance


Vehicle Connectivity


Secured & Resilient Network

MEC Services

Public Network

Edge Cloud

Network Edge


Cellular Router


SmartSwarm Gateway


Industrial LAN Router


Telematics


Wzzard LRP (LoRa)


Wzzard Mesh (Dust Networks)

Network Infrastructure


MiniMc Fiber Converter


Fiber Access Platform


Industrial Ethernet Switch


PoE Switch

IXM Switch

Industrial Protocol Switch

EN50155 Switch

IEC-61850 Switch

DNV Switch

WiFi AP

Industrial Connectivity

Industrial Protocol Gateway

Serial–Ethernet Converter

USB Converter

USB Hub/Extender

Serial Connectivity

Surge Protector

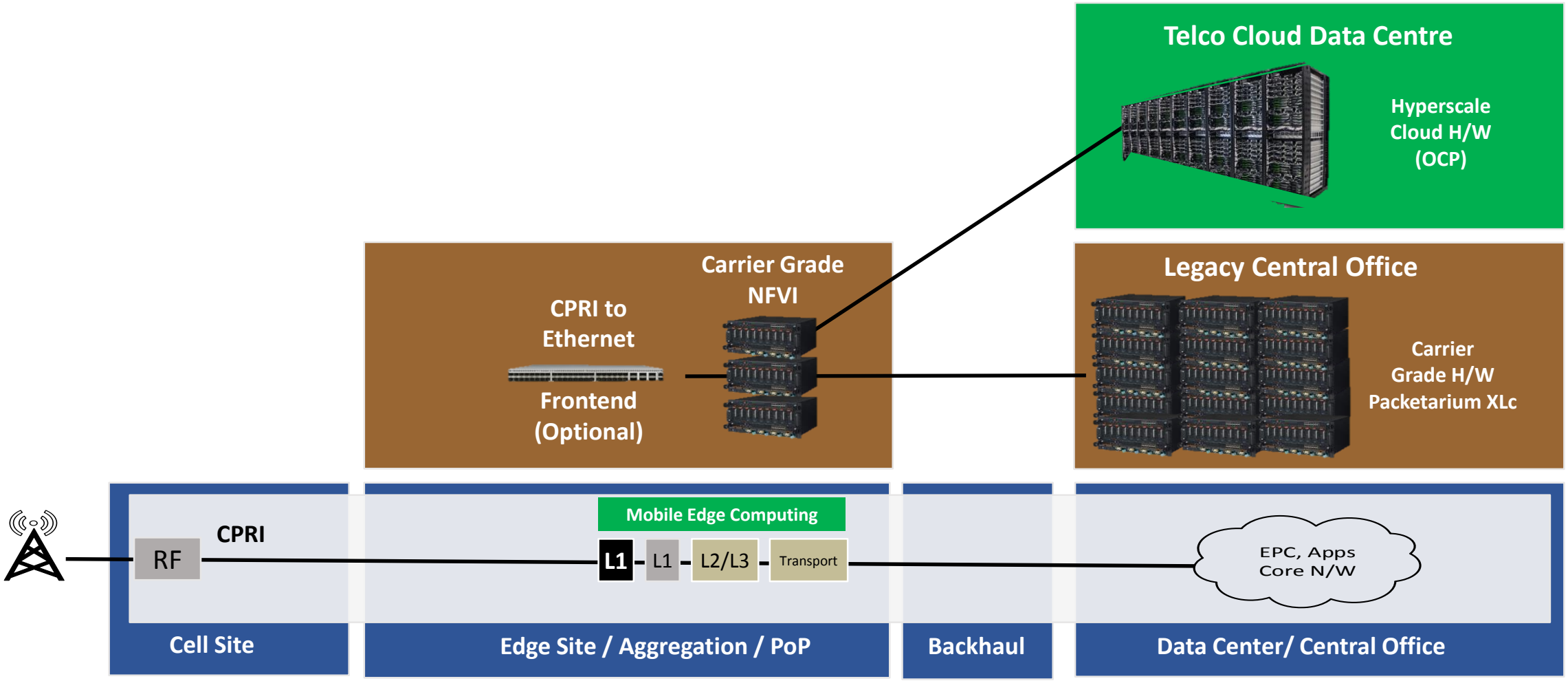
Isolator

WIFI Client

Devices

Edge Cloud Enablers from Advantech

Moving Compute to The Edge – The Road to 5G



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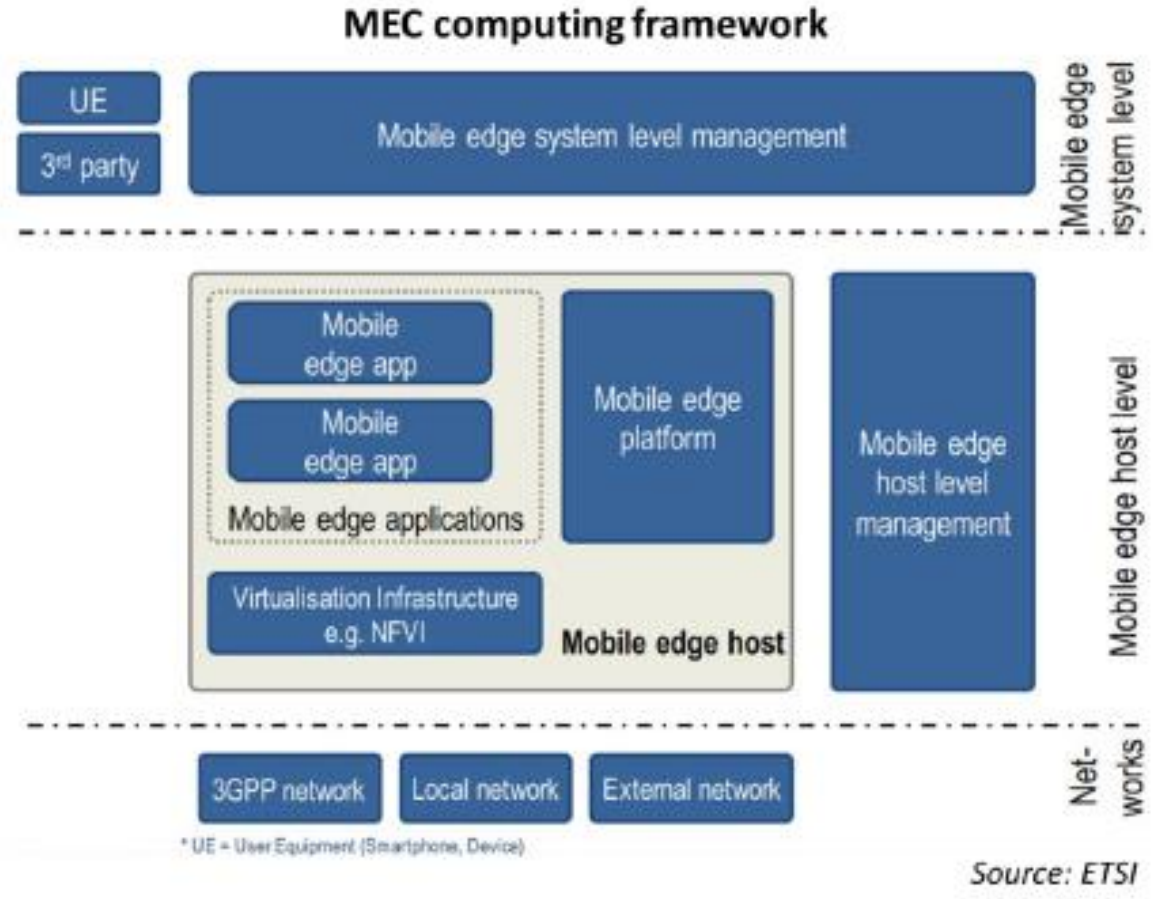
MEC Framework



Source: ETSI

MEC services for network optimization
Radio network information service (RNIS) ▪ Up-to-date radio network conditions ▪ Measurements and statistical information related to the user plane ▪ Information about the UEs served by the radio node(s) associated with the host (e.g., UE context and radio access bearers) ▪ Changes in UE information
Location information service ▪ Location information: cell ID, geolocation, etc. ▪ Location of specific or all UEs served by the radio nodes associated with the ME host ▪ Location of a category of UEs (optional) ▪ Location of all radio nodes associated with ME host
Bandwidth manager service ▪ Allocation of bandwidth to ME applications ▪ Prioritization of certain traffic routed to ME applications

Source: ETSI

MEC Wiki – Ongoing PoCs

Source: https://mecwiki.etsi.org

PoC 1 Video User Experience Optimization via MEC - A Service Aware RAN PoC

- Intel - China Mobile - iQiYi

PoC 2 Edge Video Orchestration and Video Clip Replay via MEC

- Nokia - EE - Smart Mobile Labs

PoC 3 Radio aware video optimization in a fully virtualized network

- Telecom Italia - Intel UK Corporation - Eurecom - Politecnico di Torino

PoC 4 FLIPS – Flexible IP-based Services

- InterDigital - Bristol is Open - Intracom - CVTC - Essex University

PoC 5 Enterprise Services

- Saguna - Adva Optical Networking - Bezeq International

PoC 6 Healthcare – Dynamic Hospital User, IoT and Alert Status management

- Quortus Ltd - Argela - Turk Telecom

PoC 7 Multi-Service MEC Platform for Advanced Service Delivery

- Brocade - Gigaspaces - Advantech - Saguna - Vasona - Vodafone

PoC 8 Video Analytics

- Nokia - Vodafone Hutchison Australia - SeeTec

PoC 9 MEC platform to enable low-latency Industrial IoT

- Vasona Networks - RIFT.io - Xaptum - Oberthur Technologies - Intel Corporation - Vodafone

PoC 10 Service-Aware MEC Platform to Enable Bandwidth Management of RAN

- Industry Technology Research Institute - Linker Network - FarEasTone

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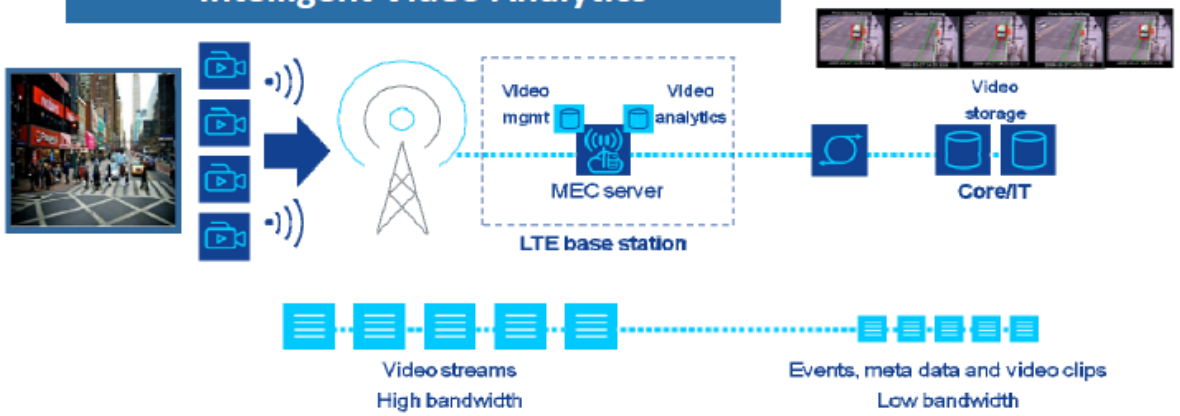
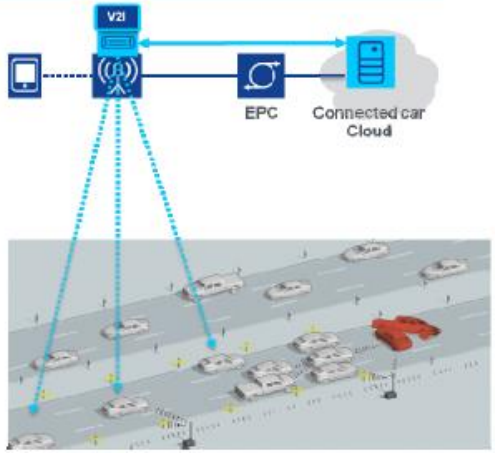
Service Aware use Cases

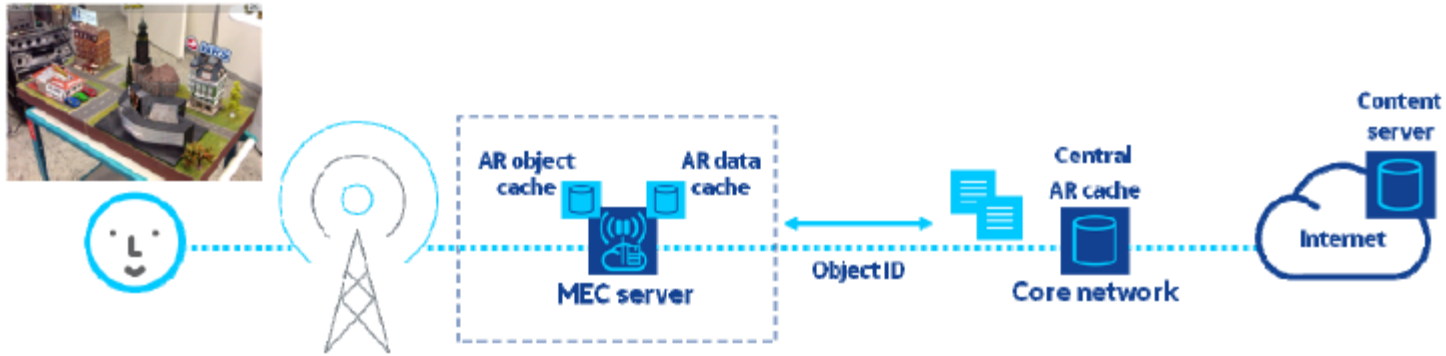
Intelligent Video Analytics



Vehicle-to-infrastructure

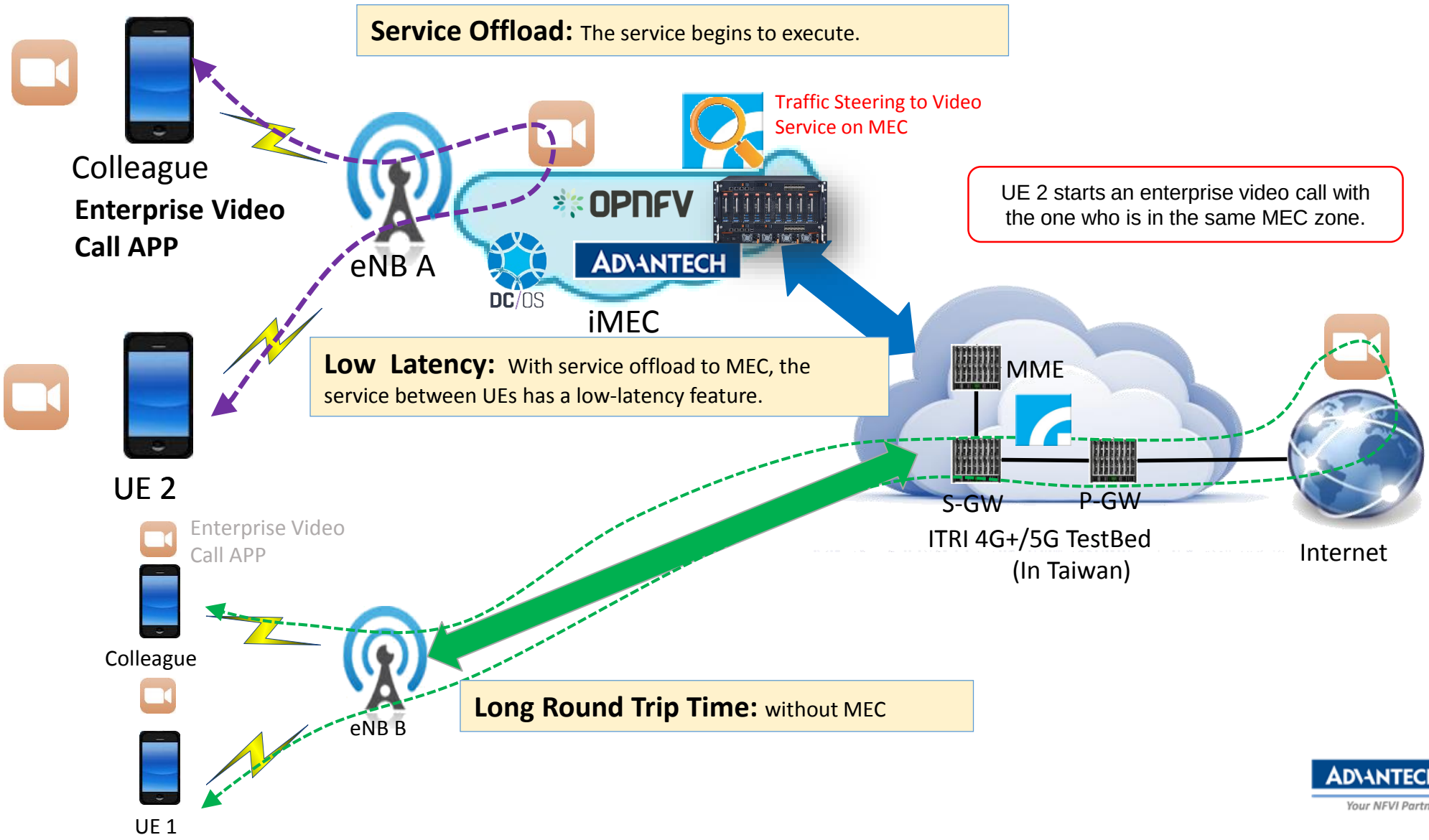


High bandwidth low latency content delivery



ETSI PoC 10: ITRI – Service Offload

工業技術研究院
Industrial Technology Research Institute



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ETSI PoC 10: ITRI – Bandwidth Management

工業技術研究院
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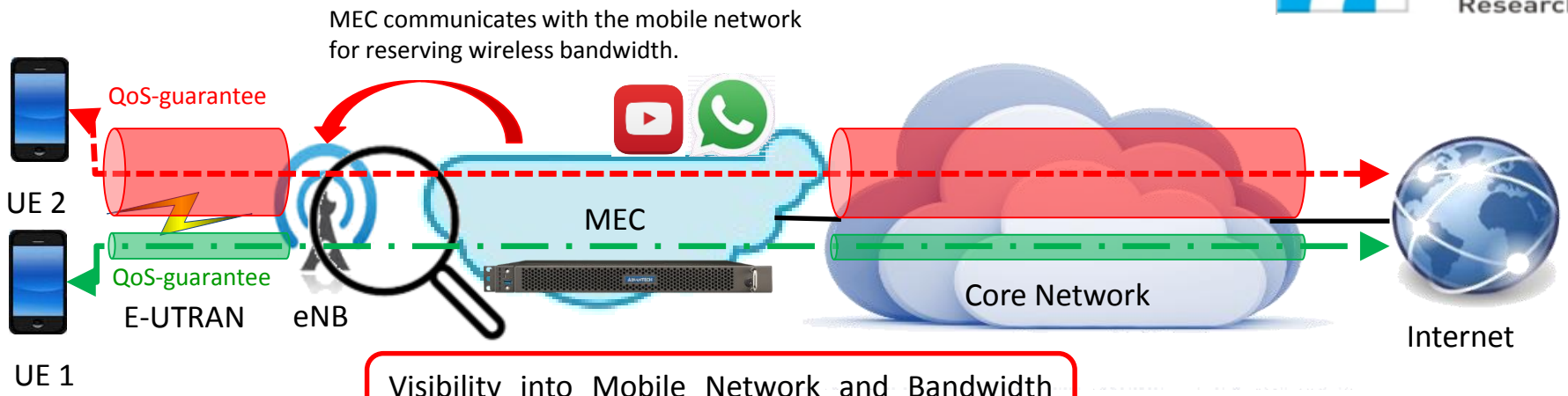

Visibility into Mobile Network and Bandwidth Management with the MEC Platform.

Problem

When a UE requests a service APP via a mobile network, the mobile network does not have the ability to identify the type of the service, nor allocate a feasible setting of the E-UTRAN[1] bearer for this service in advance.

QoS-Guarantee

The MEC platform identifies the service request from UEs. If the service APP has been deployed on the platform, the MEC platform redirects the service request to itself and transfers the parameters for bandwidth management to mobile network.

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Private Cloud & Private LTE Networks

Primary deployment reasons

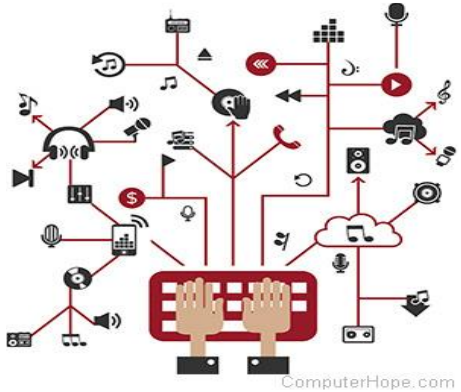
Coverage

Guarantee facility or location coverage. Most necessary where public networks do not exist or are not robust (in remote areas, e.g., mines or agricultural lands), but can often also apply to indoor and campus locations (e.g., factories, warehouses, power plants, etc.)

Capacity

No contention with other network users, enterprises can make full and exclusive use of available capacity. They can configure uplink and downlink, set usage policy and engineer the RAN according to their specific capacity demands.

Control



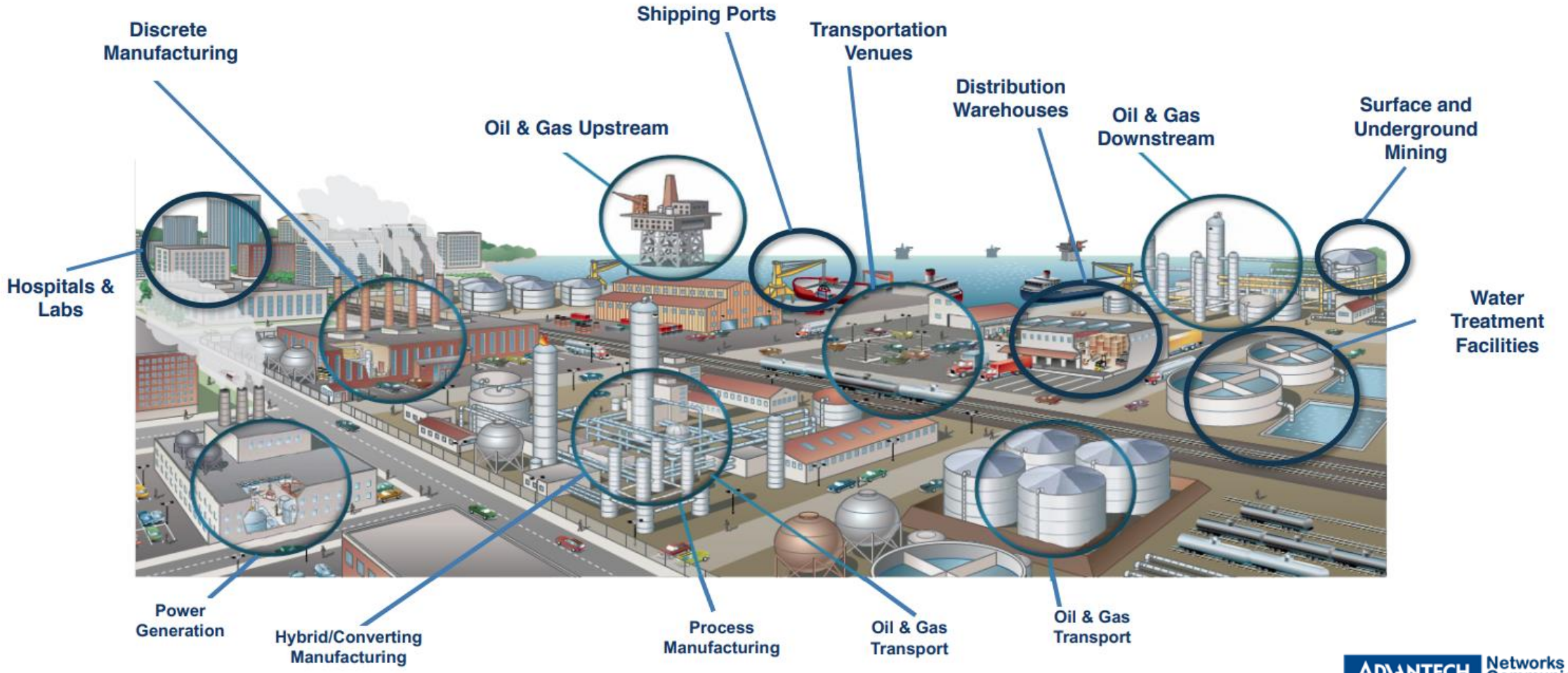
Private operators can determine which users connect, how resources are utilized and how traffic is prioritized. LTE radio can be customized to optimize reliability and latency in challenging physical environments (warehouse or oil/gas facility with lots of metal). Impossible on the public network.

Security

Control your own security so sensitive information doesn't leave the premises – essential to many connected businesses.

Private LTE Network Potential

31B$ in 2022 across a wide range of industries



Source: Harbor Research

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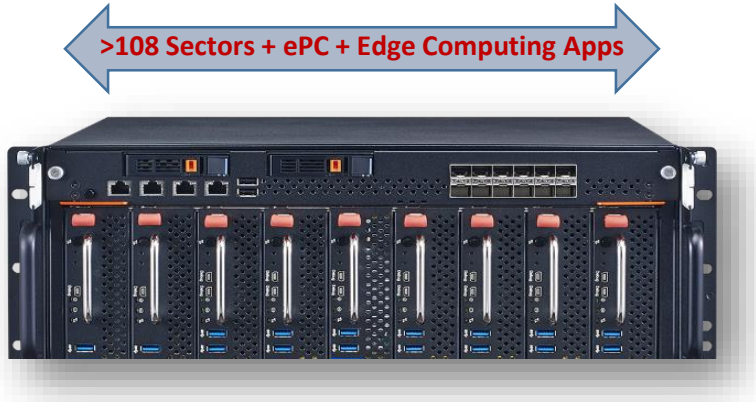
MWC17 PoC 3GPP Demo

3GPP Standard Implementation - Amarisoft LTE

- AW2S Ethernet RRH
  - MIMO 2x2 20MHz TDD Band 40
- Advantech Packetarium XLc
  - 2 x Intel® Xeon® Processor D-1587 per blade (2 x 16 cores)
- Amarisoft LTE 100 (3GPP rel 13 ready)
- Fully functional LTE RAN in a box

Amarisoft eNodeB: PHY/L1/L2/L3 Processing



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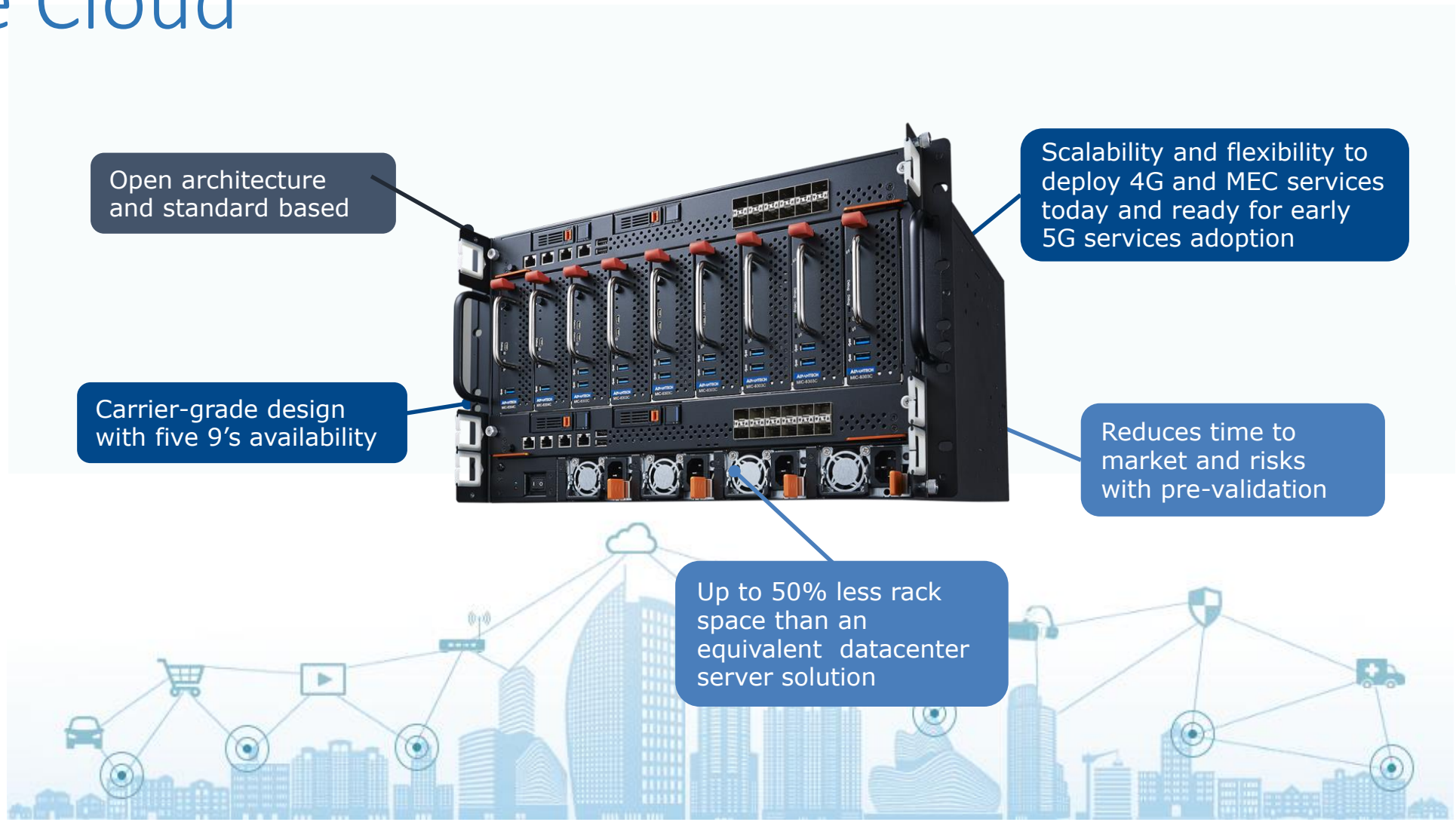
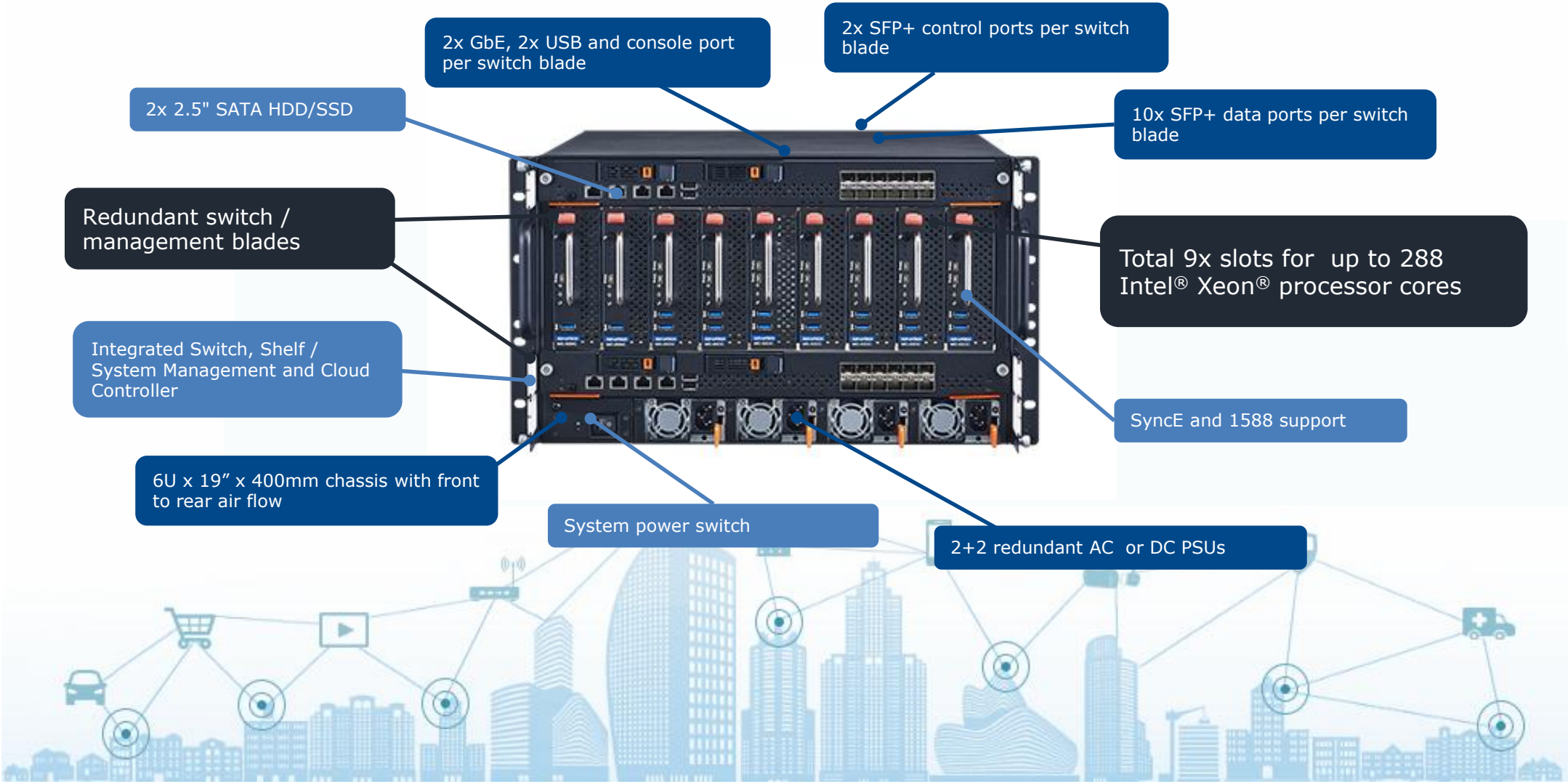
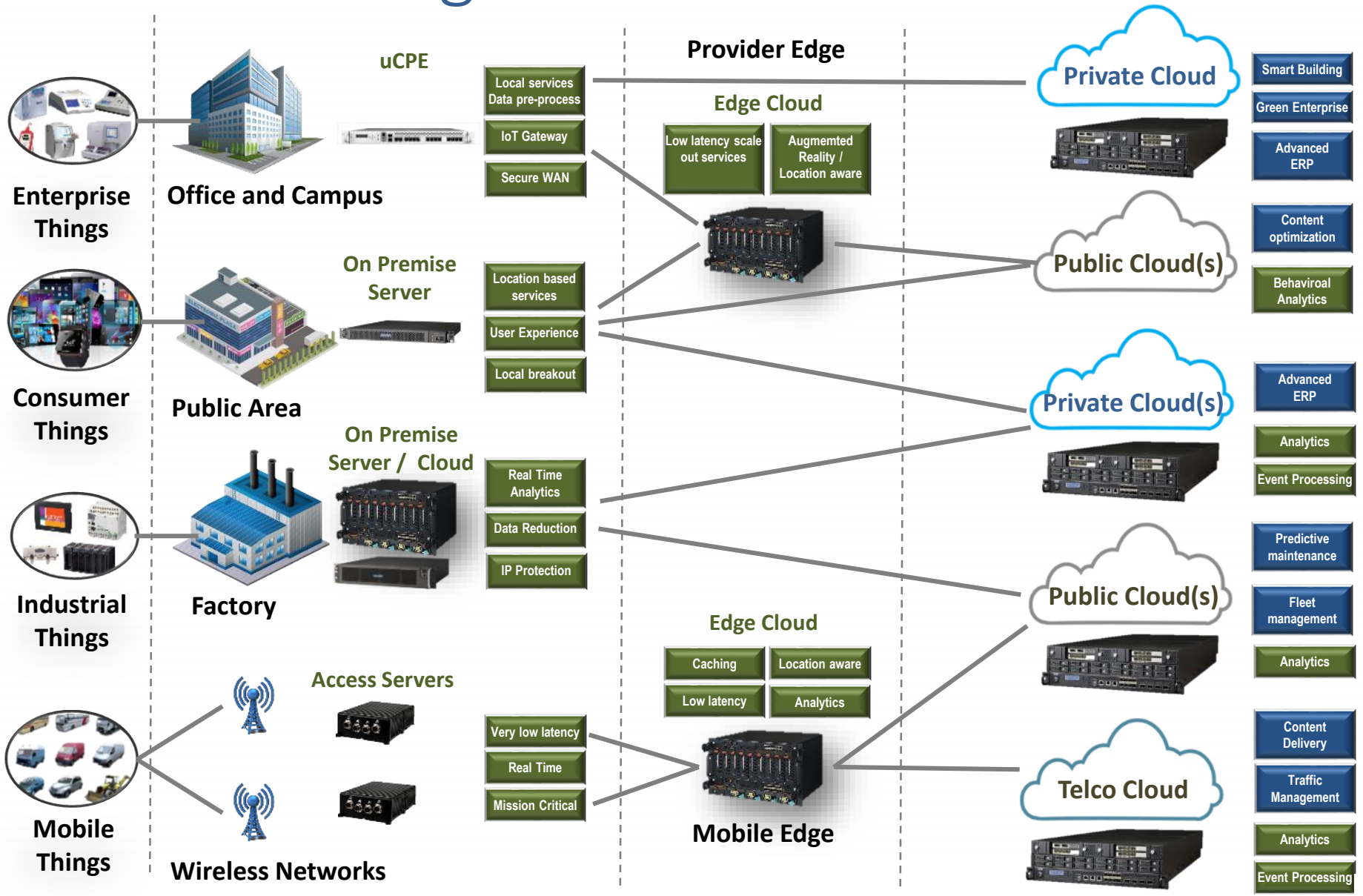
Packetarium XLc - Carrier Grade Scale-out for Edge Cloud



High Density – Microdatacenter for Edge Cloud



Advantech - Edge Cloud Enablers



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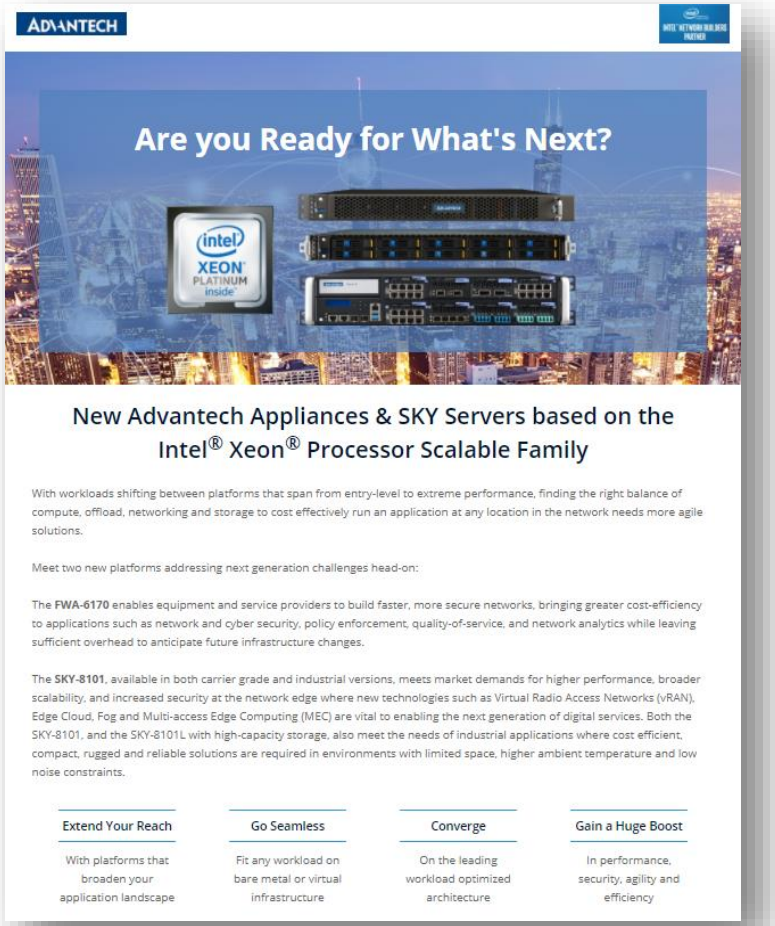
TIME FOR QUESTIONS
12
1
2
3
4

Useful links



http://www.advantech.com/nc/spotlight/Intel-Xeon-Scalable-Family/

http://www.advantech.com/nc/newsletter/NCG/NFV/

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