

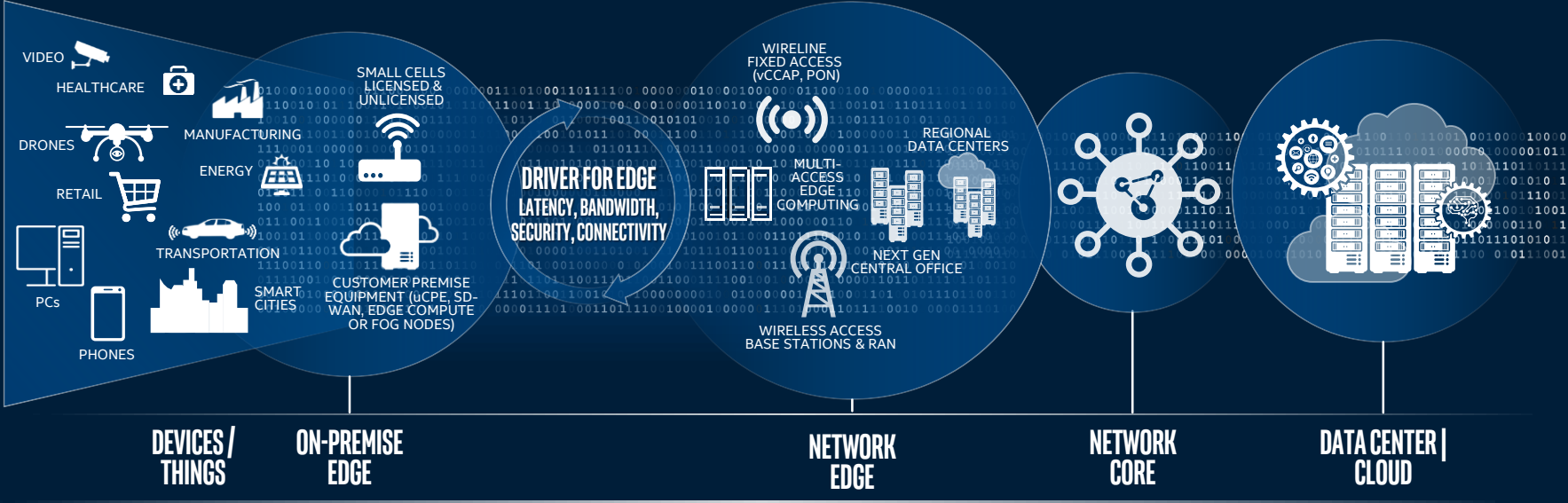


UNLEASHING THE VALUE OF 5G AND IOT

4th ITU Annual Forum on “IoT, Big Data, Smart Cities and Societies” for Arab region
Dubai, UAE, 28-29 August 2019

Ignacio Astilleros, Global Account Director Telecommunications,
Middle East, Turkey and Africa.

DISTRIBUTING CLOUD TECHNOLOGIES & ECONOMICS TO THE EDGE CLOUD



Latency expectation

Varies <1 ms

<5 ms

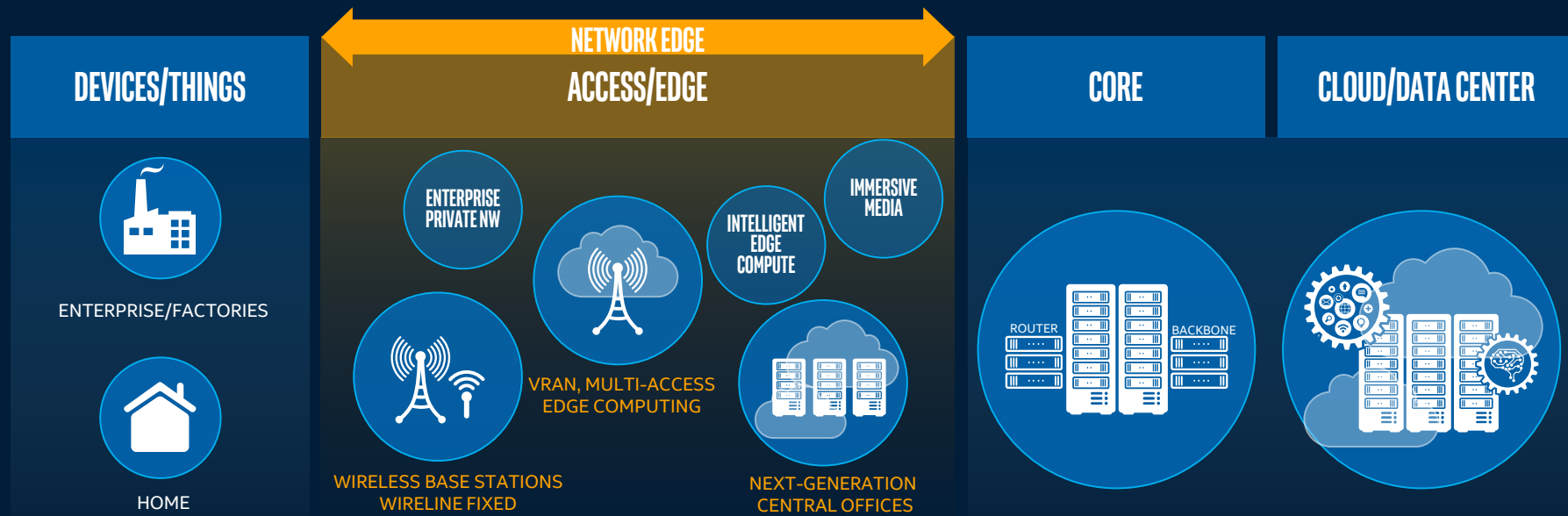
<10-40 ms

< 60 ms

~100 ms

MULTIPLE EDGE(S) & EDGE CLOUD LOCATIONS:
 PRIMARY FOCUS OF THIS DECK ON ON-PREMISE/ENTERPRISE EDGE & NETWORK EDGE
 NOT INCLUSIVE OF DEVICE EDGE & CLOUD EDGE

COMPUTE WORKLOAD PLACEMENT AT OPTIMAL LOCATION FOR RETURN



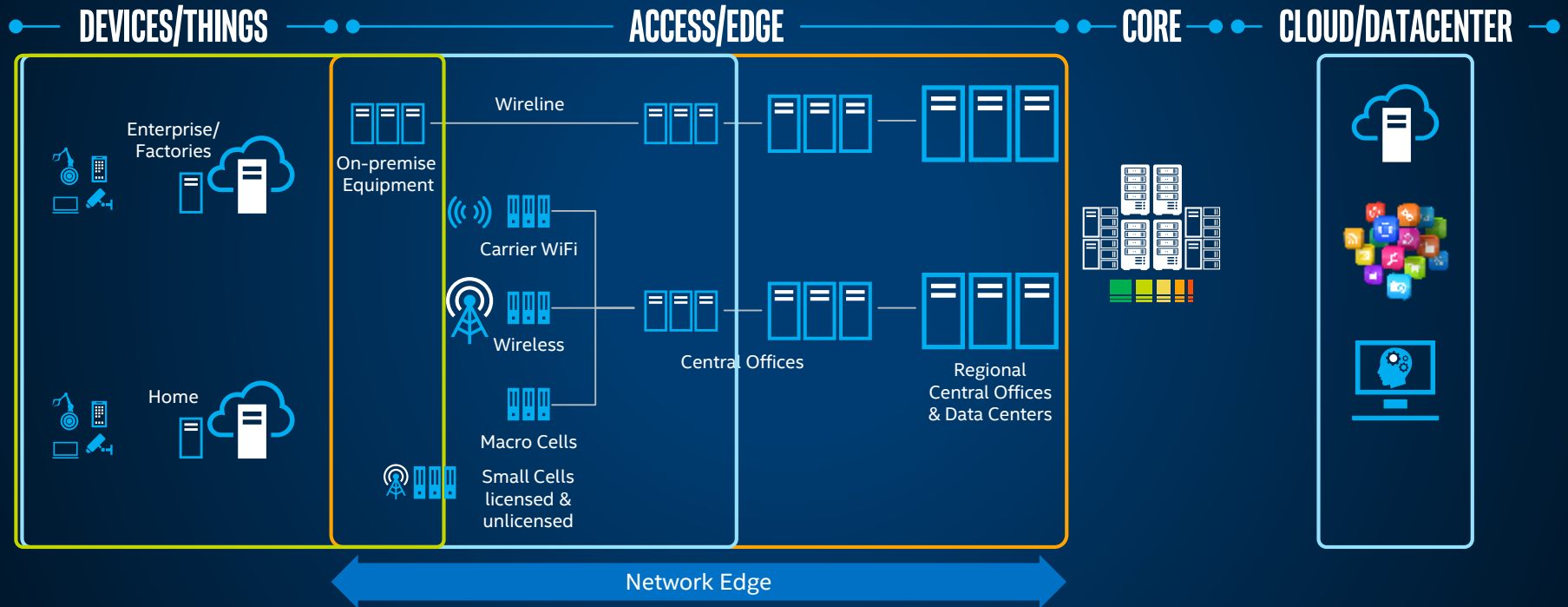
EDGE CLOUD SERVICES & APPLICATIONS CRITICAL TO DRIVE ROI ON EDGE INVESTMENT TO SERVICE PROVIDERS & ENTERPRISES

Where Is the Edge(s) Of The Future?

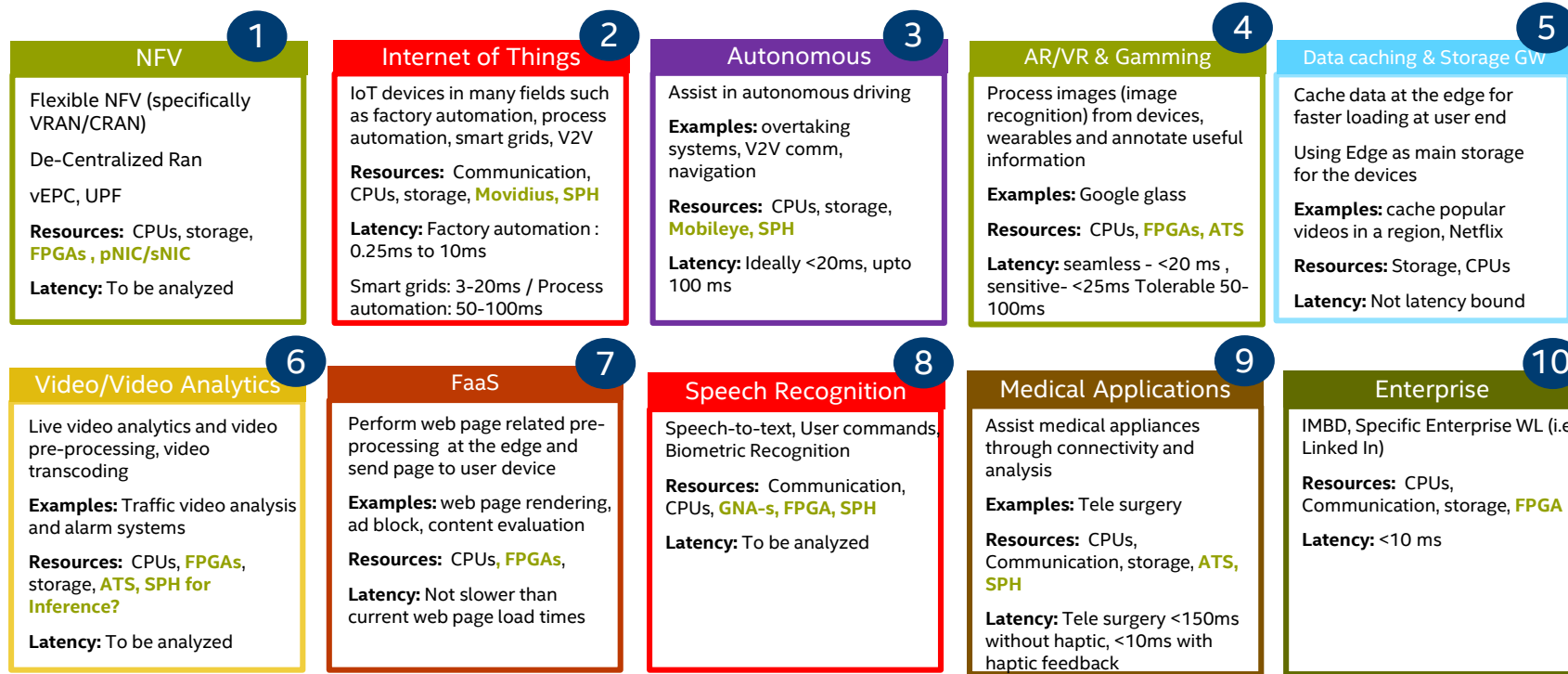
Enterprise View of Edge

Carrier's view of Edge



















Cloud's view of Edge



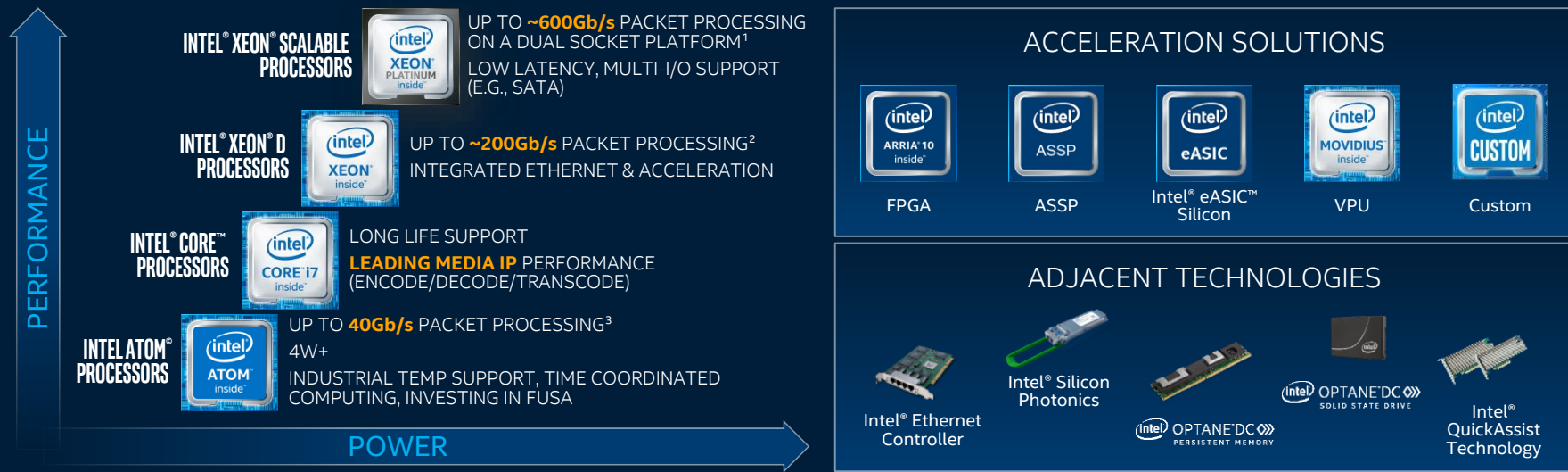
EDGE(S) SERVICES TAXONOMY – 2020/2025



EXAMPLE OF ISV SOLUTIONS FOR EDGE PROOF OF CONCEPTS

Edge Use-case Category	ISV / Workload	Edge Value Prop
Content Delivery Networks	 	<ol style="list-style-type: none"> 1. Save backhaul traffic 2. Use low latency + high BW for HQ content delivery
Video Analytics (Retail and Surveillance)	  	<ol style="list-style-type: none"> 1. Save backhaul traffic 2. Solution scaling
Smart Home / City	 	<ol style="list-style-type: none"> 1. Save backhaul traffic 2. Low latency connected components interaction
Speech Analytics		<ol style="list-style-type: none"> 1. Better user experience (latency) 2. Virtual assistant scaling
Healthcare	 	<ol style="list-style-type: none"> 1. Data sovereignty and reliability 2. Latency and user experience
Industry 4.0	 	<ol style="list-style-type: none"> 1. Compute at low latency 2. Faster analytics
Data Processing and Analytics	 	<ol style="list-style-type: none"> 1. Save backhaul traffic 2. Data processing and integration with other solutions
V2X and ADAS	 	<ol style="list-style-type: none"> 1. Latency critical applications 2. Save backhaul traffic by data filtering and preprocessing
AR/VR and Gaming	 	<ol style="list-style-type: none"> 1. Real time user-experience with low-cost edge devices 2. Integration with other use-cases such as speech analytics

HARDWARE: MOVE, STORE & PROCESS THE DATA



USE CONSISTENT, SCALABLE & HIGHLY PROGRAMMABLE ARCHITECTURE FROM EDGE TO DATA CENTER

1. Up To 586Gb/s Packet Processing on a dual socket Platform: Results based on internal Intel testing as of 8/2/2018. Intel(R) Xeon(R) Platinum 8160 CPU @ 2.10GHz (DP), 12x Intel® XXV710-DA4 PCI Express Gen Dual Port 25GbE Ethernet controller (4x25GbE/card). Benchmark: DPDK v17.11 L3fwd sample application (IPv4, LPM, 3750000 flows). Score: 586Gbits/s packet forwarding at 512B packet size.

2. Up to 191Gb/s Packet Processing: Results based on internal Intel testing as of 5/1/2018. Intel(R) Xeon(R) D-2187NT CPU @ 2.0GHz, 4x Intel® XXV710-DA2 PCI Express Gen Dual Port 25GbE Ethernet controller (2x25GbE/card). Benchmark: DPDK v17.11 L3fwd sample application (IPv4, LPM, 2048 flows). Score: 191Gbits/s packet forwarding at 512B packet size.

3. Up to 40Gb/s Packet Processing: Results based on internal Intel testing as of 8/14/2017. Intel(R) Atom(tm) Processor C3958 @2.0GHz, 2x Intel® X710-DA2 PCI Express Gen Dual Port 10GbE Ethernet controller (2x10GbE/card). Benchmark: DPDK v17.02 L3fwd sample application (IPv4, LPM, 1024 flows). Score: 40Gbits/s packet forwarding at 512B packet size.

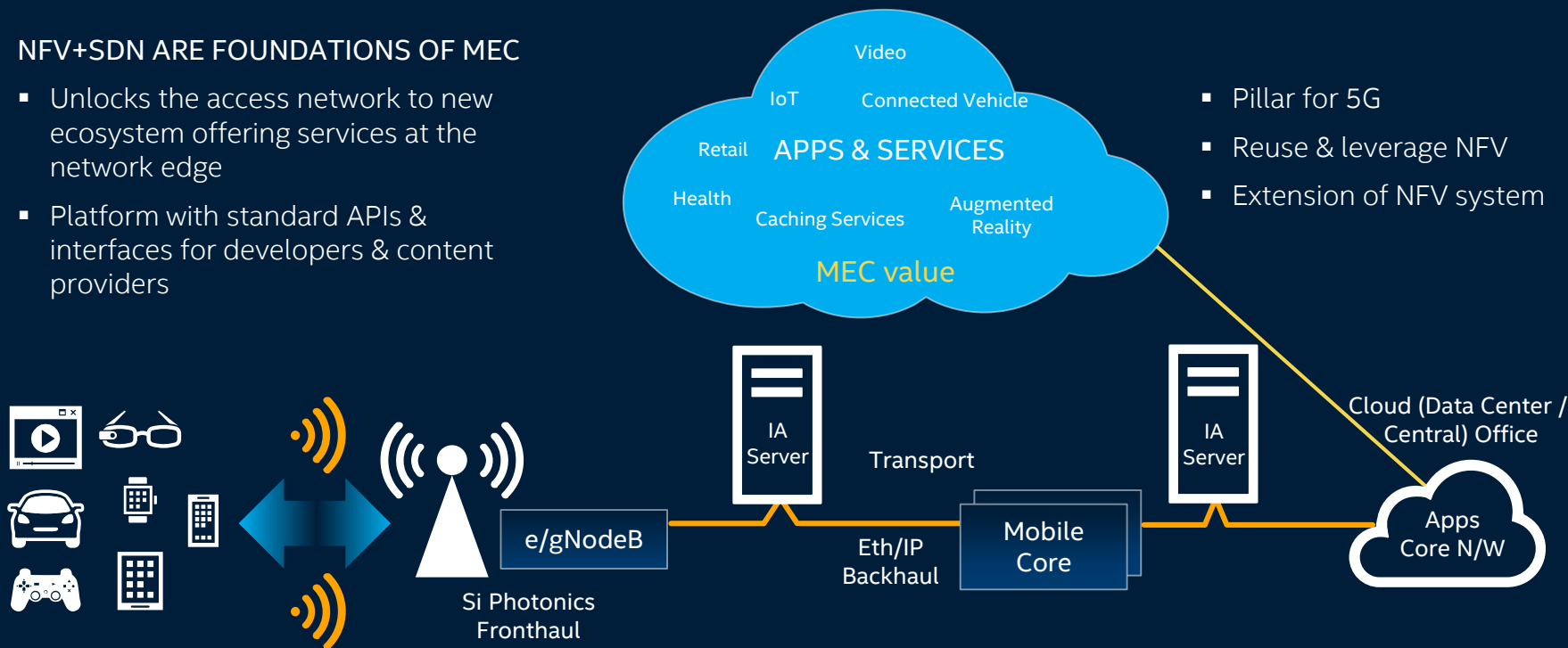
Disclaimer: Performance results may not reflect all publicly available security updates. See configuration disclosure for details. No product can be absolutely secure. Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit <http://www.intel.com/performance>.

MULTI ACCESS EDGE COMPUTE (MEC)

NFV+SDN ARE FOUNDATIONS OF MEC

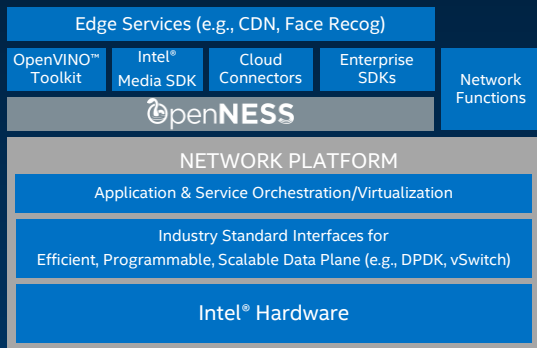
- Unlocks the access network to new ecosystem offering services at the network edge
- Platform with standard APIs & interfaces for developers & content providers

- Pillar for 5G
- Reuse & leverage NFV
- Extension of NFV system



EDGE SERVICES: ENABLING ECOSYSTEM & DEVELOPERS

EDGE SERVICES REFERENCE SOFTWARE



- 1 Make it easy for developers to create applications & services by abstracting the complexity of the network

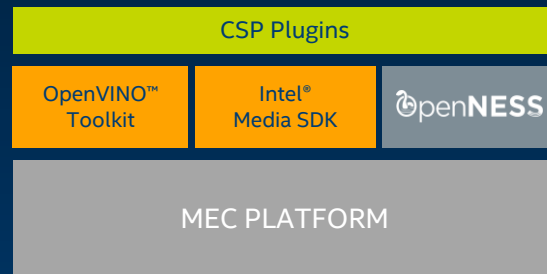
MULTI LOCATION EDGE REFERENCE ARCHITECTURE



- 2 Enable convergence of application workloads (media, AI/analytics, networking)

DEVELOPER KITS

(Amazon*, Azure*, etc.)



- 3 Enable a diverse ecosystem (CoSP, CSP & Enterprises) on Intel® platforms

ADDRESS NEW SERVICES & APPLICATIONS IN TOP VERTICALS – MEDIA, INDUSTRIAL, RETAIL, SMART CITY & OTHERS

*Other names and brands may be claimed as the property of others.

PARTNERSHIPS: WINNING 5G WITH THE ECOSYSTEM

INVEST

OPEN SOURCE AND STANDARDS

TELECOM INFRA PROJECT

INDUSTRY COLLABORATION

INTEL® NETWORK BUILDERS & INTEL® DEVELOPER ZONE

350+ Members

35+ Comms SPs

100+ POCs/Trials/Deployments Based on Member Solutions

13,000+ Developer's Trained worldwide

12,000+ Network Builder University Program Members

50+ Network Edge Ecosystem Program Members

251,480+ IDZ page views

intel select solution

NFVI NETWORK FUNCTIONS VIRTUALIZATION INFRASTRUCTURE

Intel® Select Solutions for Visual Cloud available Q2'19

USE INDUSTRY LEADING ECOSYSTEM PROGRAMS TO DRIVE EDGE TRANSFORMATION & ENABLE DEVELOPERS

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