![intel Look Inside.™]

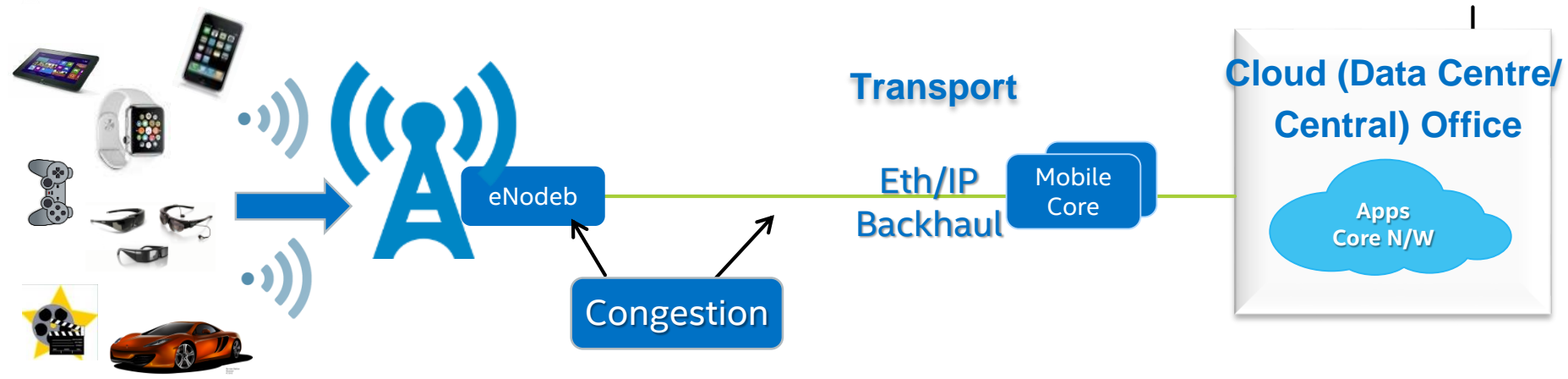# Mobile Edge & Interactive Cloud Computing

Network Platform Group
Comms Infrastructure Division
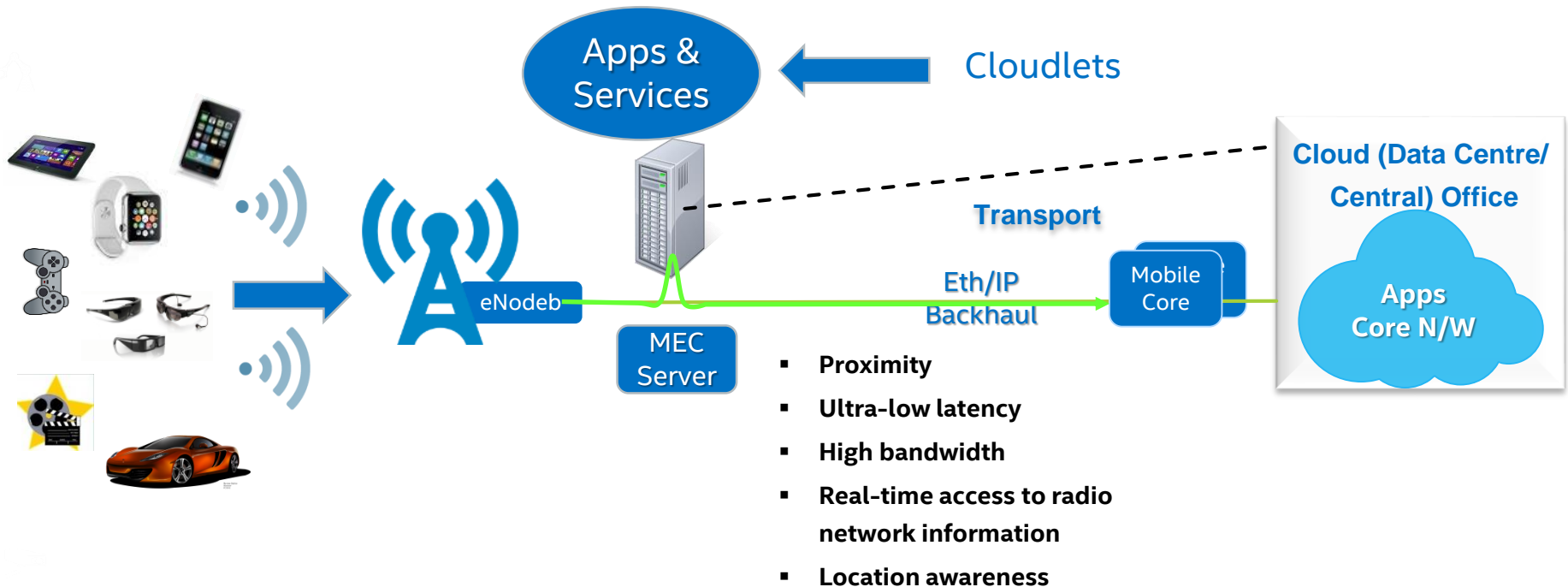
Mobile Networks

IOT Market expected to be 28.1 billion 'things' by 2020 according to IDC.

Businesses need competitive, scalable, secure connectivity that is agile and intelligent
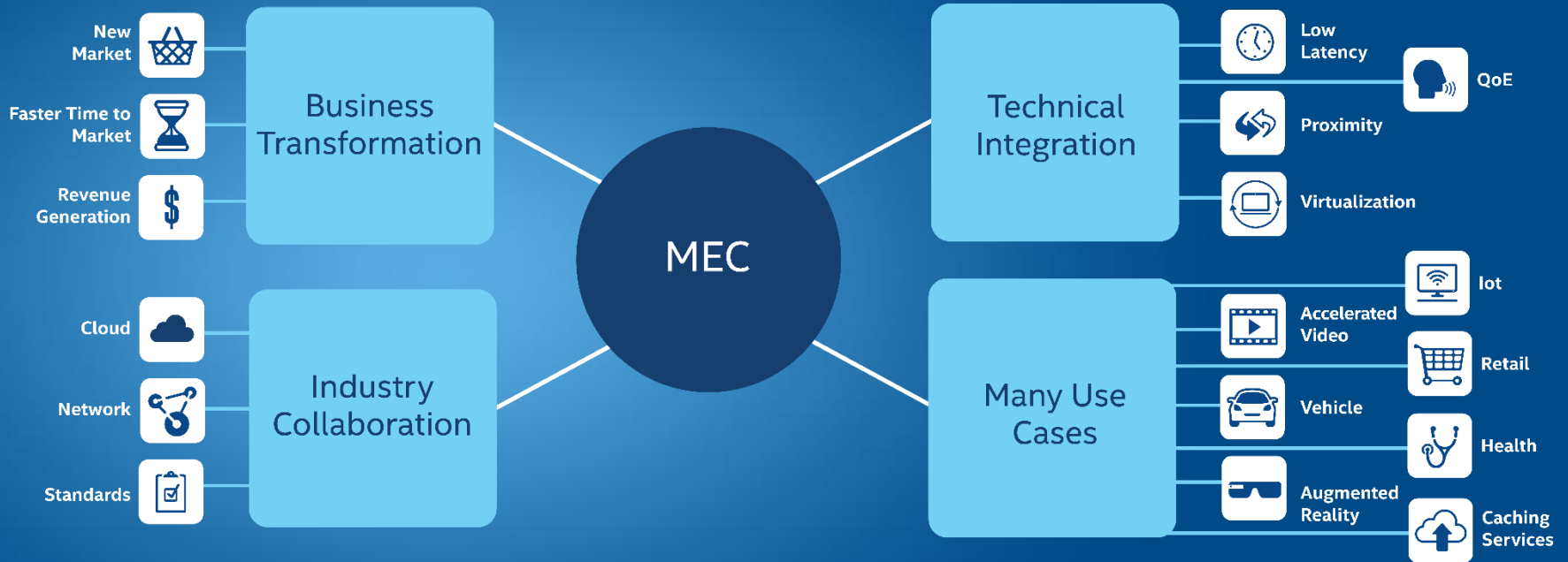
Transport

eNodeb

Eth/IP Backhaul

Mobile Core

Congestion

Cloud (Data Centre/ Central) Office

Apps Core N/W

Latency, Congestion, Capacity, All Call For Computes

ETSI Mobile-Edge Computing (MEC)

Apps & Services

Cloudlets

Cloud (Data Centre/ Central) Office

eNodeb

MEC Server

Transport

Eth/IP Backhaul

Mobile Core

Apps Core N/W

- **Proximity**
- **Ultra-low latency**
- **High bandwidth**
- **Real-time access to radio network information**
- **Location awareness**

MEC:
Unlocks the Wireless Access
Pillar for 5G, Small Cell Forum & CCSA Adopts

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MEC Market Drivers

New Market

Faster Time to Market

Revenue Generation

Business Transformation

Cloud

Network

Standards

Industry Collaboration

MEC

Technical Integration

Low Latency

Proximity

Virtualization

QoE

Many Use Cases

Accelerated Video

Vehicle

Augmented Reality

Iot

Retail

Health

Caching Services
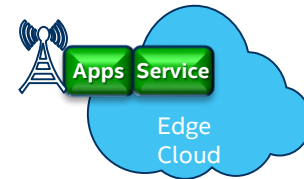
MEC Value Chain
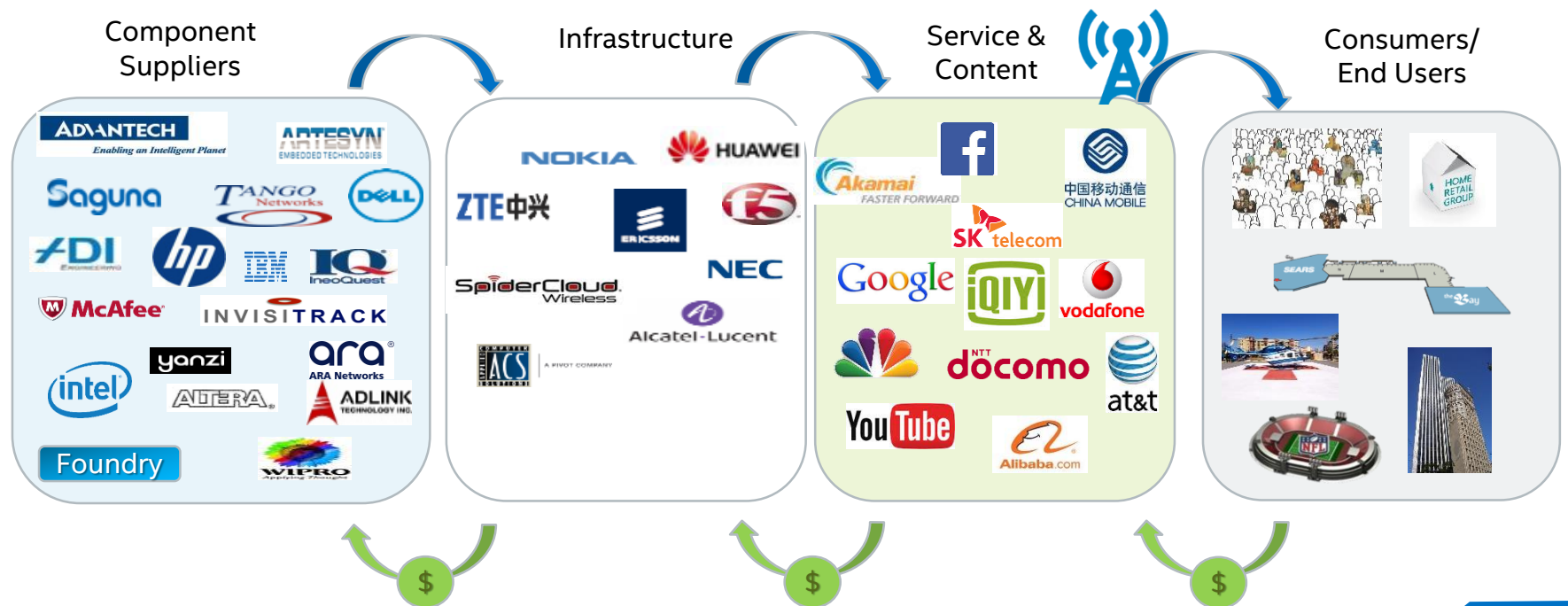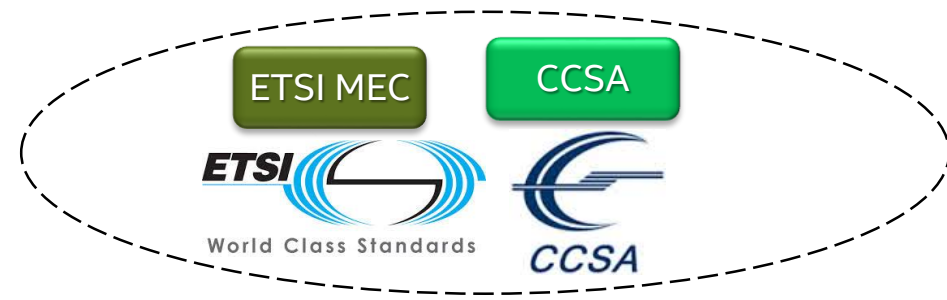
MEC Traction

- 5G pillar
- CCSA (China), Sm Cell, NFV
- Content Provider Interest Shanghai MWC, IDF, MEC World Congress, IWPC, …
- Huawei 'Open Mobile Foundry' (http://open-mbb.huawei.com)
- Nokia AirFrame
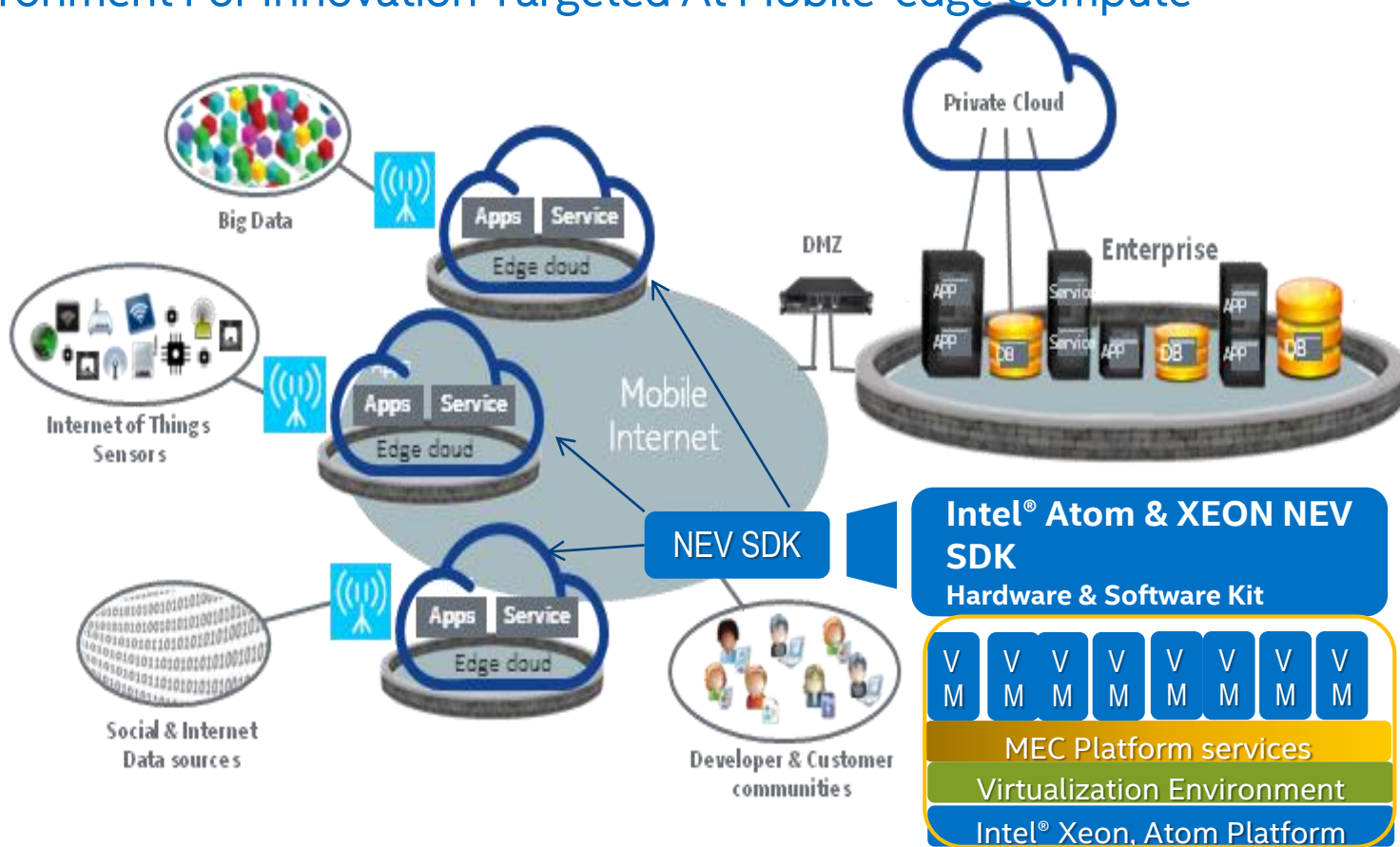- ACS Smart Perimeter

Industry Influence

- Proof of Concepts
- Field Trials
  - Tier1 Operators
- Investigating Smart City Implementation

Path to Deployment

(intel)

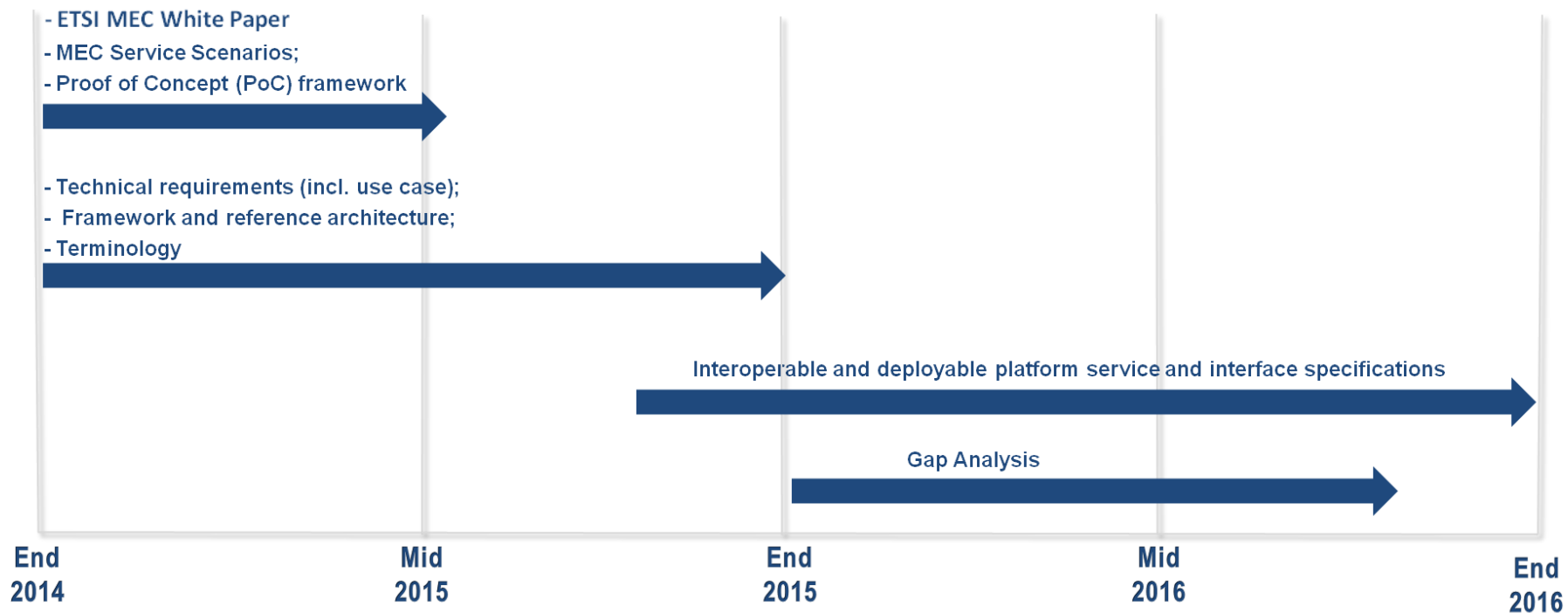# Intel® Network Edge Virtualization (NEV) SDK

An Environment For Innovation Targeted At Mobile-edge Compute

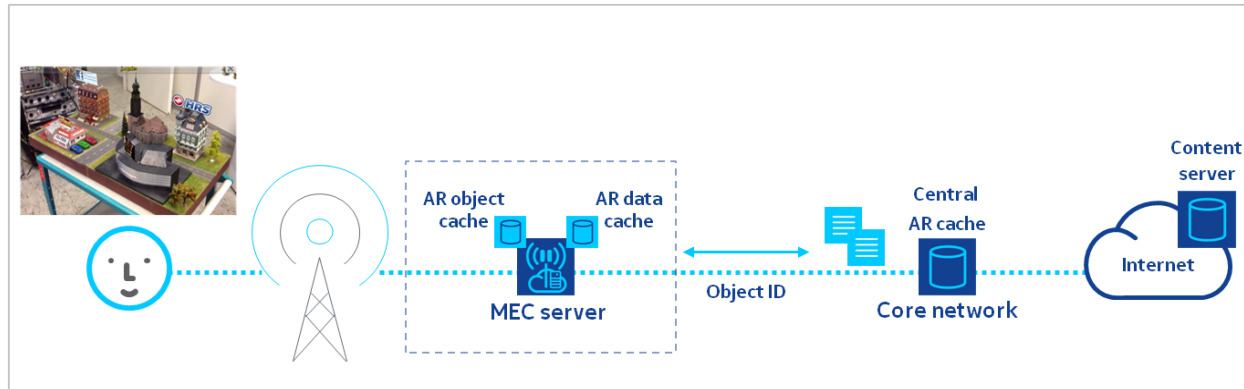NEV SDK enabling developers with a mobile edge environment

ETSI ISG MEC: Expected Deliverables
Lifetime spanning 24 months

- ETSI MEC White Paper
- MEC Service Scenarios;
- Proof of Concept (PoC) framework

- Technical requirements (incl. use case);
- Framework and reference architecture;
- Terminology

Interoperable and deployable platform service and interface specifications

Gap Analysis

| End 2014 | Mid 2015 | End 2015 | Mid 2016 | End 2016 |

Example MEC Service Scenarios

Doc #xxxxx

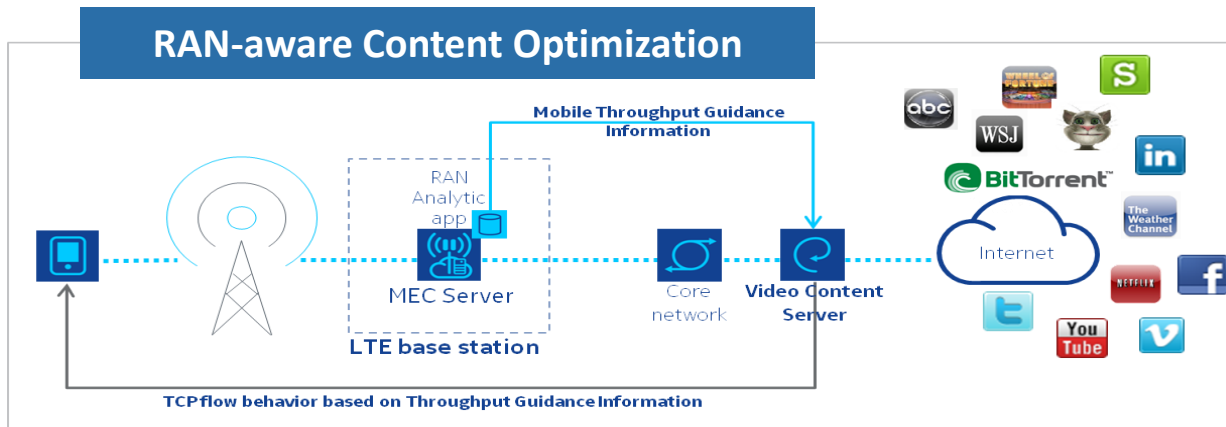# Augmented Reality Service Scenario Example

The MEC application analyses the output from a device's camera and the precise location

Objects viewed on the the device camera are overlaid with local augmented reality content

Network-performance Service Scenarios
Intelligent Video Acceleration

RAN-aware Content Optimization

Mobile Throughput Guidance Information

RAN Analytic app

MEC Server

LTE base station

Core network

Video Content Server

Internet

TCP flow behavior based on Throughput Guidance Information

A Radio Analytics application provides the video server with an indication on the throughput estimated to be available at the radio downlink interface

The information can be used to assist TCP congestion control decisions and ensure the application-level coding matches the estimated capacity at the radio downlink.

Enables improved video quality and throughput
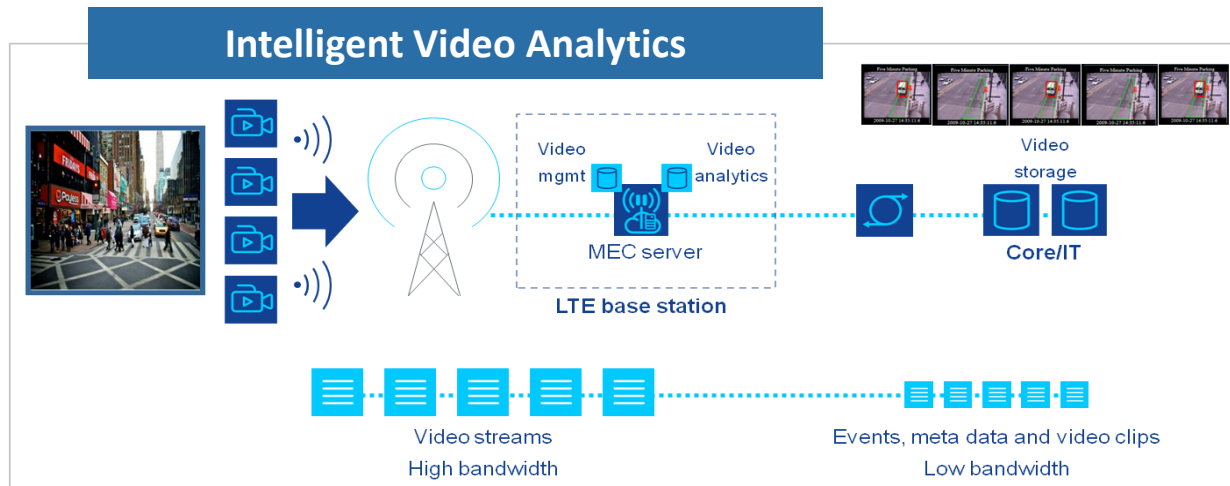
(intel)

Enterprise Service Scenarios
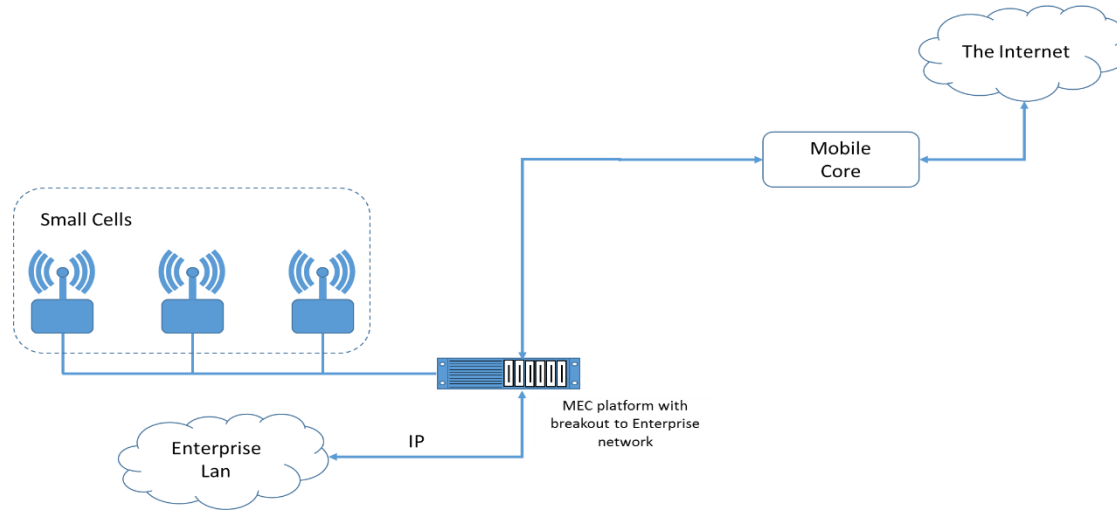
Classification of data services enables segregation and routing of traffic for different users

Ex: Retail can push personalized coupons to customers as they enter the store

IoT Service Scenarios
Video Analytics

Intelligent Video Analytics

Video mgmt · Video analytics

MEC server

LTE base station

Video storage

Core/IT

Video streams
High bandwidth

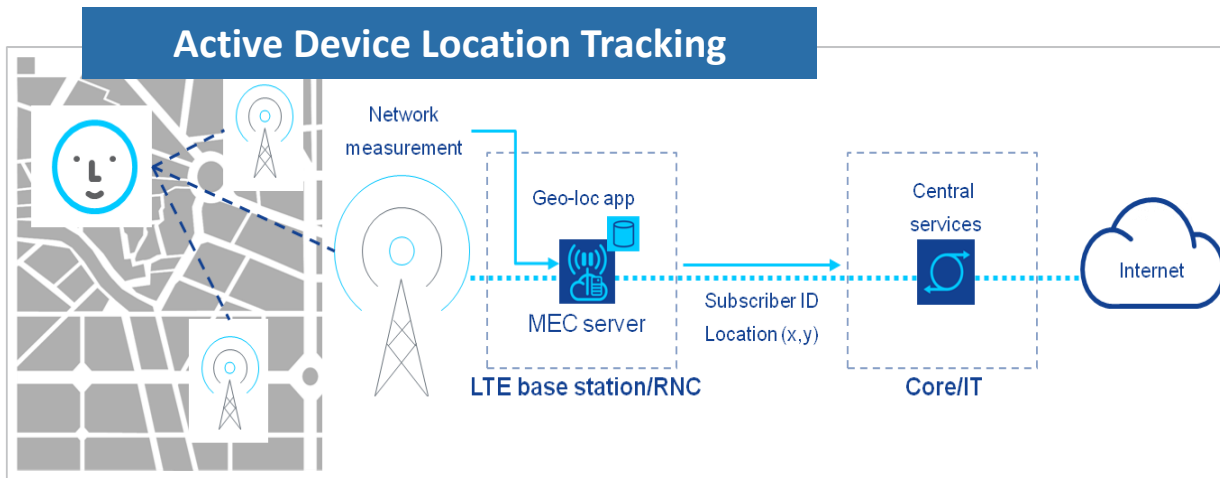Events, meta data and video clips
Low bandwidth

Live video stream analytics at the mobile edge

Events are triggered automatically (e.g. movement, missing objects, crowd, etc.); enables fast detection and action triggering

Optimizes backhaul and transport capacity

Applicable to public safety, smart cities...

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Location Based Services

Active Device Location Tracking

Network measurement

Geo-loc app

MEC server

LTE base station/RNC

Subscriber ID
Location (x,y)

Central services

Core/IT

Internet

Active device location is provided and not restricted to GPS availability due to standard MEC API's in real time

Helps to locate specific users and understand how the crowd is distributed

Applicable to Smart City, Stadium, Geo-Fencing, Retail, Public Safety and advertising

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Summary, Q & A

MEC is gaining traction in the industry

Opportunity for applications, your applications/cloudlets, to get deployed

Smart Campus and Innovation site with the NEV SDK is possible

Next Steps:

CMU Course : Applications for Cloudlets

Align Cloudlets with MEC APIs

Questions?

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