



ERICSSON

# IOT AND DISTRIBUTED CLOUD

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# ERICSSON



Founded in 1876, Ericsson is a Swedish multi-national provider of technologies and services to the world's operators.

# ERICSSON AT A GLANCE



## NETWORKS

One network for a million different needs

## IT

Transforms operators into digital enterprises

## MEDIA

Delight the TV consumer every day

## INDUSTRIES

Transforming industries and society

37,000

Patents

25,700

R&D Employees

36 B. SEK

In R&D

1 BILLION

Subscribers managed by us

2.5 BILLION

Subscribers supported by us

65,000

Services professionals

228 B. SEK

Net Sales

180

Countries with customers

118,000

Employees

# BEHIND THE NUMBERS



# 5TH

Largest Global Software company

# 5TH

Largest Global Services Company

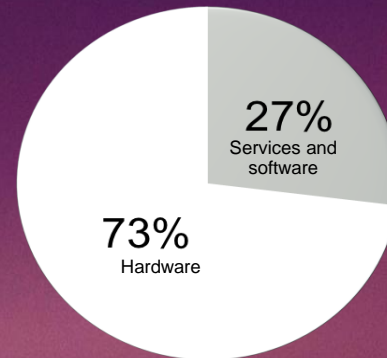
# #1

vendor to service providers

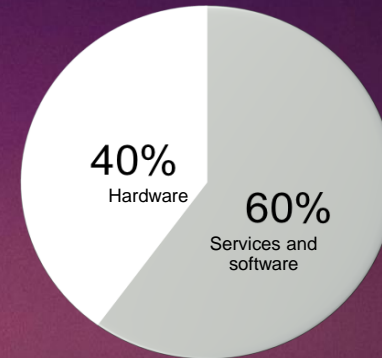
# 40%

Of Global Mobile Traffic

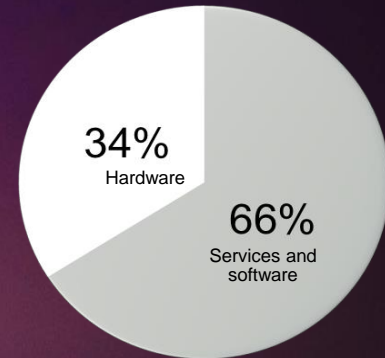
## Business Mix Changes



1999



2008



2014

# PACE OF CHANGE



	2014	2020
› Subscriptions (M)	7,100	9,200
› MBB (M)	2,900	7,700
› Smartphone subs (M)	2,600	6,100
› Pop coverage 3G (%)	~60	~90

1875

1975

2000

2020



100 years  
1B connected places



25 years  
5B connected people



15 years  
50B devices

# TELECOM WILL NEED TO DELIVER NEW SERVICES

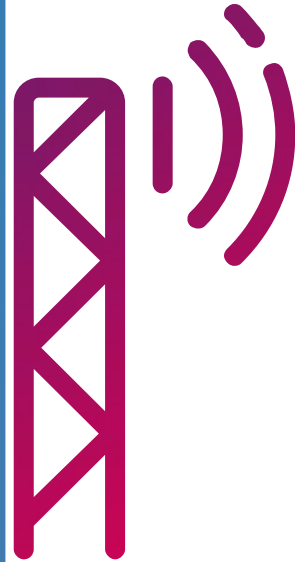


Hybrid

Public Cloud

Enterprise DC

Operator DC and CO



Access



Voice, Media, Messaging (Now)



Control Systems  
Data Collection (Emerging)

# EXAMPLES BEYOND TELECOM



HYDRO QUÉBEC  
ELEKTRILEVI  
SMART METERING



VOLVO CAR  
CONNECTED VEHICLE



MAERSK  
CONNECTED VESSEL

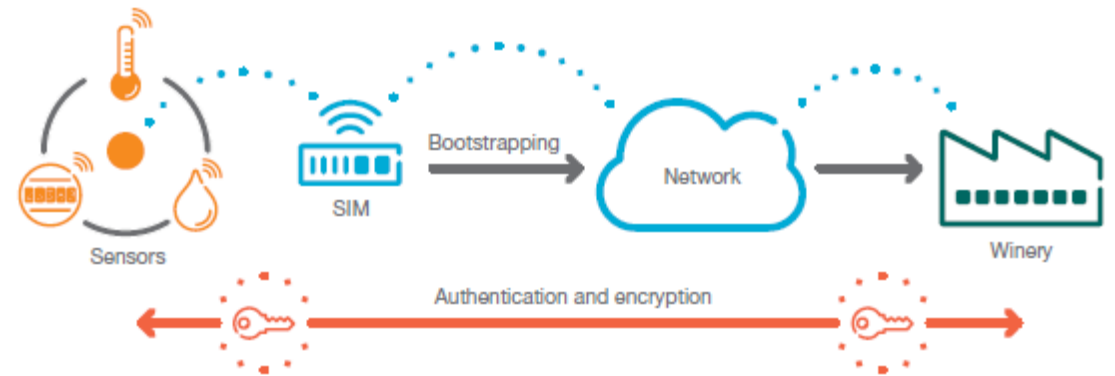


# SMART VINEYARDS



- Ericsson IoT Security Services, which are part of the Ericsson Device Connection Platform (DCP) providing SIM-based device authentication and secure, encrypted connectivity end-to-end.
- Combined with MyOmega's gateway and radio sensors and vineyard analytics platform
- Technology from Intel and connectivity provided by Telenor Conexion
- Allows the winemaker:
  - Improved output and optimized management of harvest
  - Improved wine quality
  - Remote monitoring of vineyard

- > Air humidity and temperature
- > Soil humidity and temperature
- > Solar intensity

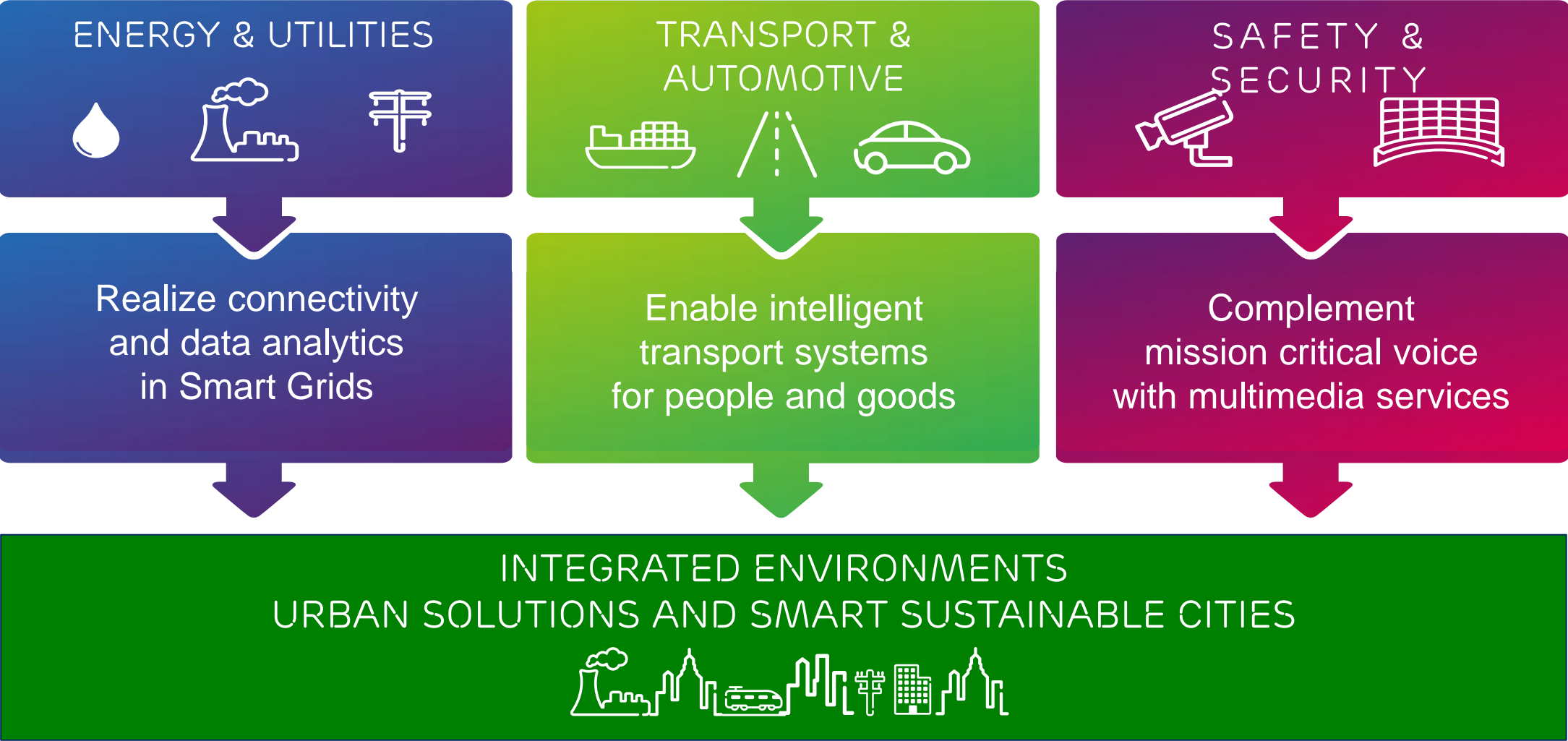


Moselle Valley, Germany





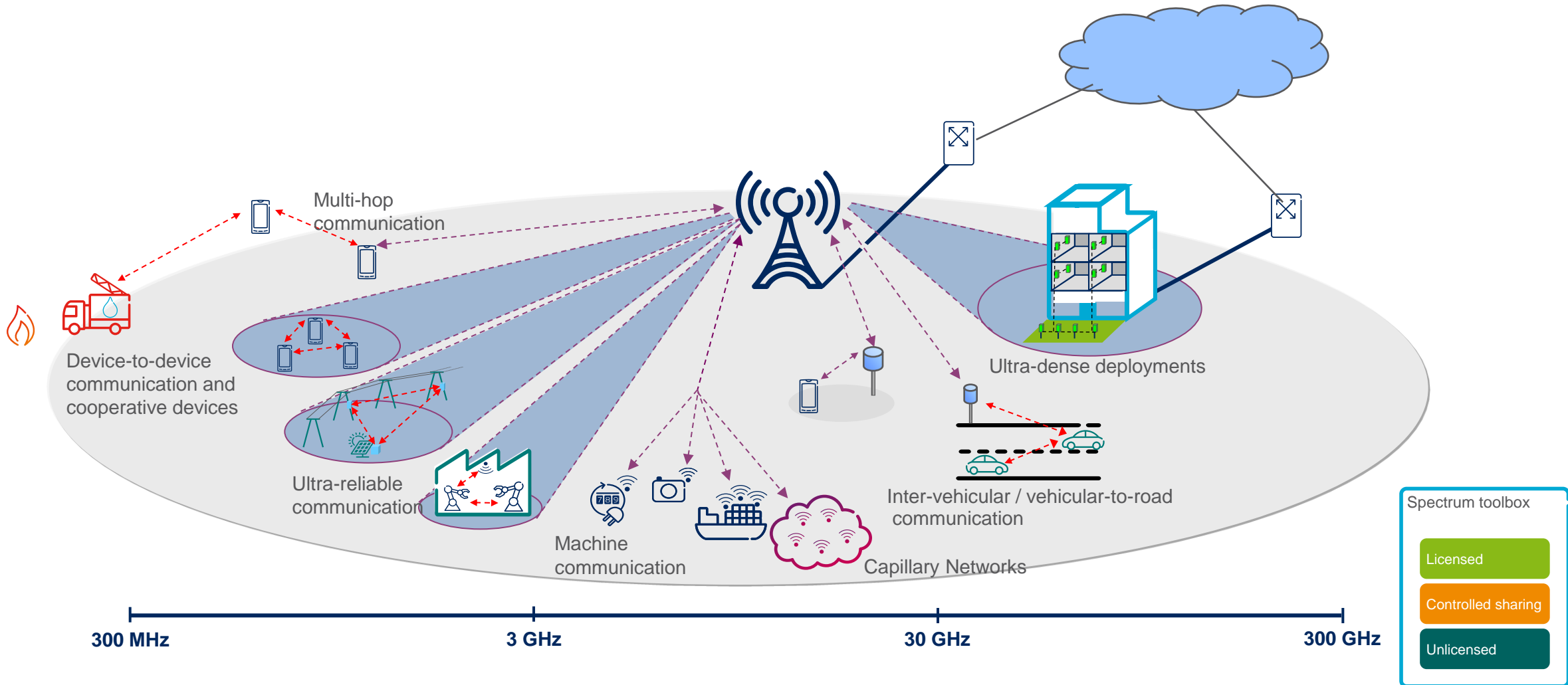
# OUR MAIN CURRENT INDUSTRY SEGMENTS



# EVOLUTION TOWARDS 2020



# 5G AND IOT





Use case	Most challenging requirements	Value	Cellular access technology
Cell automation	Latency Reliability	0.5ms 99.9999999	5G (uMTC <sup>1</sup> )
Automated guided vehicle	Mobility Reliability	10m/s 99.99999	LTE, 5G
Process automation	Reliability	99.9999999	LTE, 5G (mMTC, uMTC)
Logistics transportation tracking	Numb. devices <sup>2</sup> Coverage	100000/sqkm Global	LTE
Components tracking	Numb. devices <sup>2</sup> Mobility	1000000/sqkm Static	LTE
Remote assistance	Reliability	99.999%	5G (uMTC)
Augmented reality	Data rate	10Gbps	5G (xMBB)
Remote robot control	Reliability	99.999%	5G (uMTC)

<sup>1</sup>xMBB (Extreme Mobile Broadband), uMTC (Ultra-reliable Machine Type Communication) and mMTC (Massive MTC) are the main 5G services [1].

<sup>2</sup>The device density should be seen as indicative (and upper-bound), since it might vary enormously from one case to another. The ITU-R IMT-2020 recommendation was used as a reference; see ITU Radiocommunication Sector ITU-R, "Framework and overall objectives of the future development of IMT for 2020 and beyond," Recommendation ITU-R M.2083, September 2015.

Table 1: Requirements and access technology for Industrial IoT use cases.



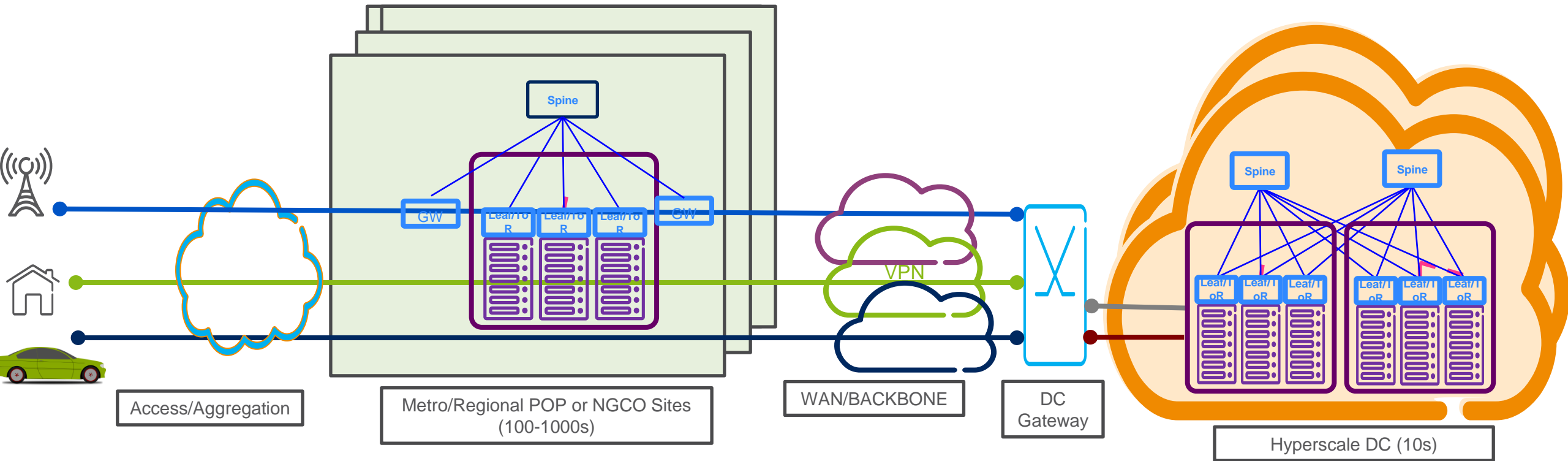
- ▶ **CELL AUTOMATION:** devices in an assembly line and control units communicate wirelessly with high enough reliability and low enough latency to enable flexible and highly efficient production.
- ▶ **AUTOMATED GUIDED VEHICLES:** unmanned vehicles autonomously move around safely and transfer goods in, for example, a factory or container harbor by communicating reliably with each other and a central controller.
- ▶ **PROCESS AUTOMATION:** a high number of low-maintenance sensors and actuators spread out over a wider area communicate wirelessly with observation and control units for industrial processes.
- ▶ **LOGISTICS TRANSPORT TRACKING:** the ability to track the flow of goods throughout a supply chain (from raw material to delivery).

- ▶ **COMPONENT STOCK TRACKING:** the ability to track components in stock (e.g. in a warehouse) through a very high number of low-cost, low-maintenance devices sporadically sending ID, sensor and location data to a central controller.
- ▶ **REMOTE ASSISTANCE:** an expert remotely supports an operator via high-definition, two-way augmented reality video using very high data rates and low latency.
- ▶ **AUGMENTED REALITY:** a live direct or indirect view of a physical, real-world environment whose elements are augmented by computer-generated sensory input such as sound, video and graphics.
- ▶ **REMOTE ROBOT CONTROL:** remote control of a robot in order to fulfill operations such as measurement, digging and manipulation of hazardous materials.

# CARRIERS HAVE AN "EDGE" OVER OTT PROVIDERS



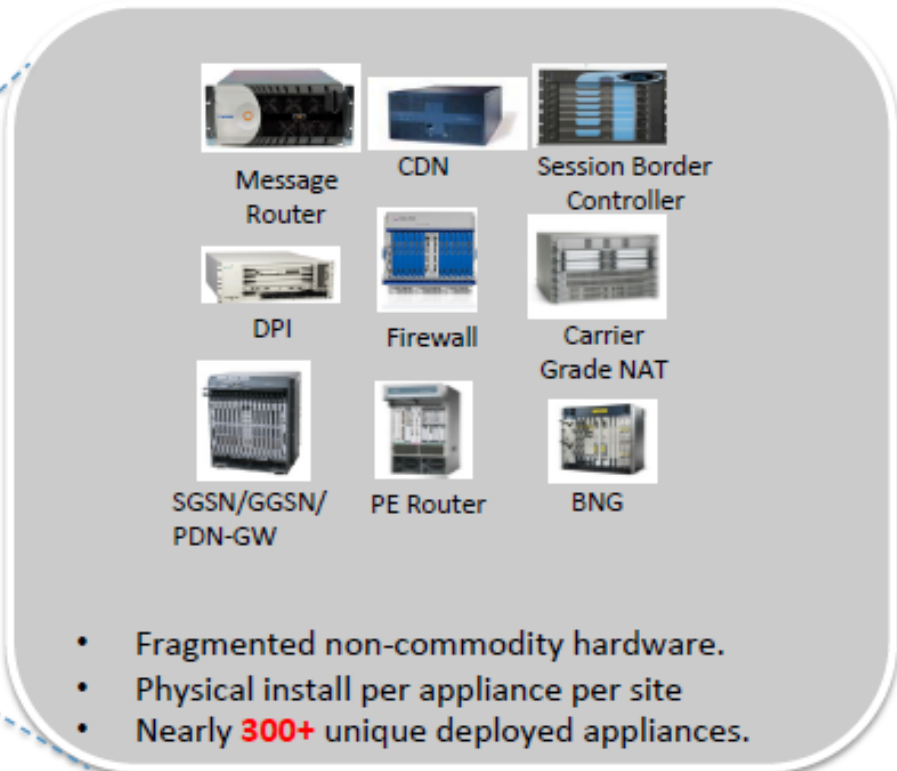
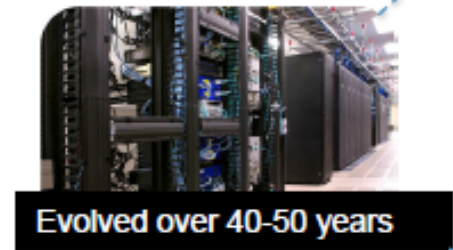
An Edge that can be used as a differentiator



# AT&T's viewpoint (ONOS 2015)

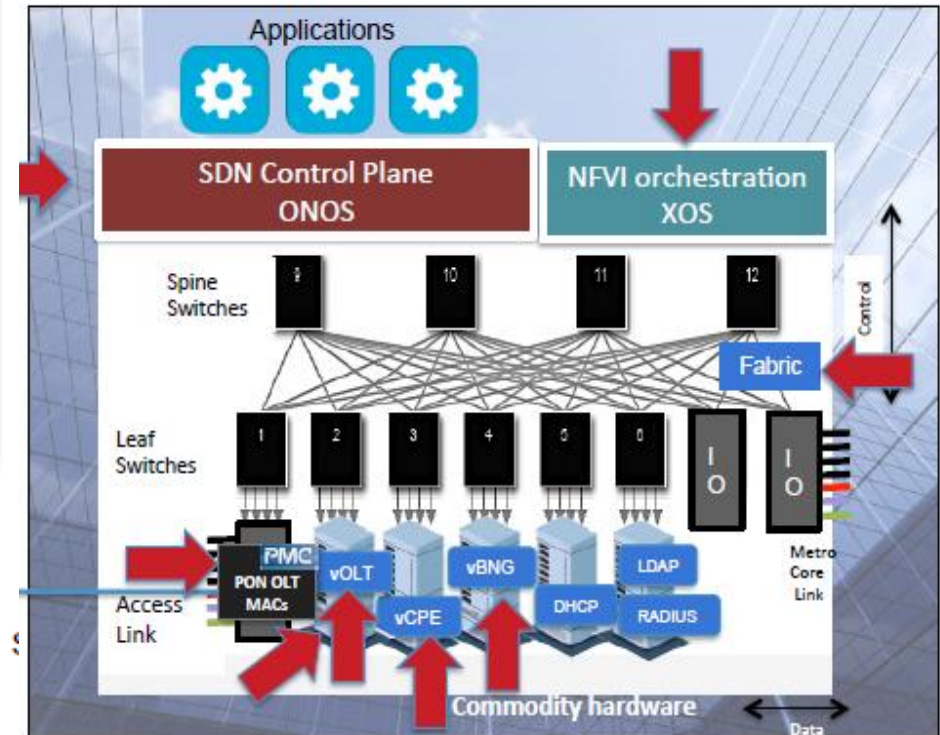


Today's Telco Central Offices (COs) are huge source of CAPEX/OPEX and their design/infrastructure is not geared for programmability, agility



What's needed? Common underlying infrastructure based on commodity hardware/whiteboxes and open platforms

## AT&T View of the Coord architecture



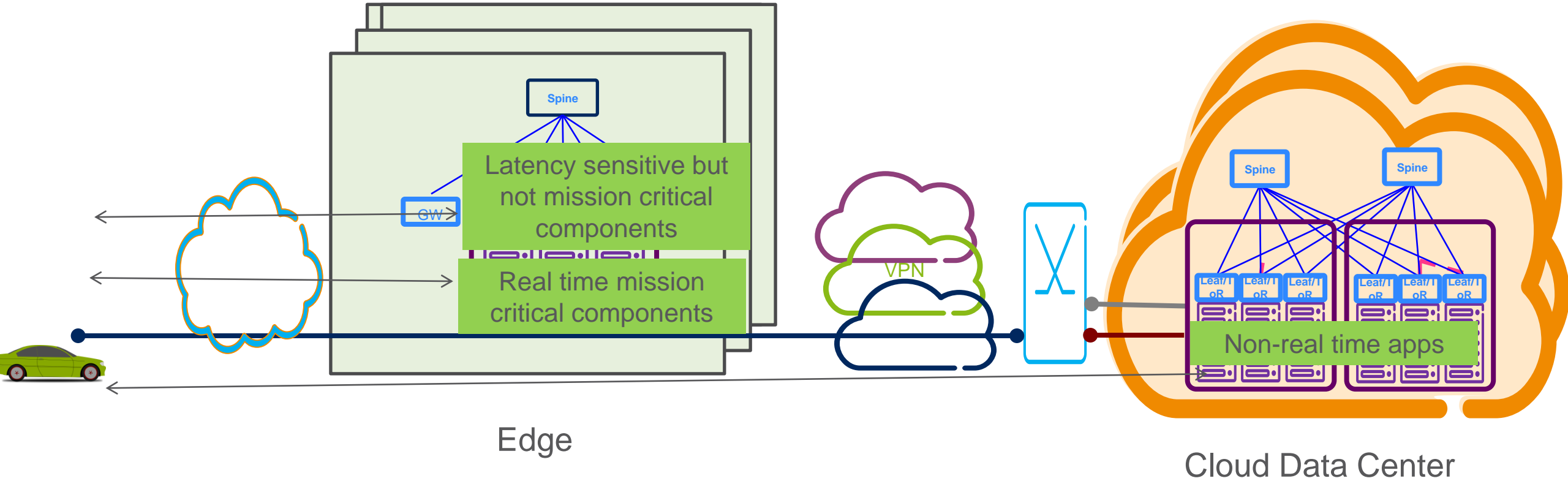
Central Office Re-architected as Datacenter

# DELIVERING A BETTER IOT



- Latency sensitive and subscriber aware IoT application/services
- Independent Control and Data Plane scaling/elasticity for IoT devices
- On demand, flexible SLA IoT gateways

Disaggregated distributed control plane





# SOME BENEFITS



## › Cost

- Capex benefits from a disaggregated software model
- Opex benefits from reduced time to deploy new services

## › Flexibility

- Accelerated deployment of new services. Customized by policy, subscriber

## › Media services

- Next generation CDN systems which use policy based service composition

## › Latency for IOT apps

- OTT service provider have to deal with 40-50ms as a baseline for e2e latency
- Many IOT applications have real-time response requirements

# CONCLUSIONS



- › The virtualization of function will dramatically shake up the vendor space
  - Established vendor categories will cease to exist causing dramatic shifts in business models and margin structures
  
- › Ericsson is well positioned to help on this journey
  - Many of the pieces need to deliver this distributed cloud and IOT enablement are already available from Ericsson
  - Ericsson will make some major announcements in MWC and later to embellish the portfolio



**ERICSSON**