

De impact van Internet of Things en Edge Computing

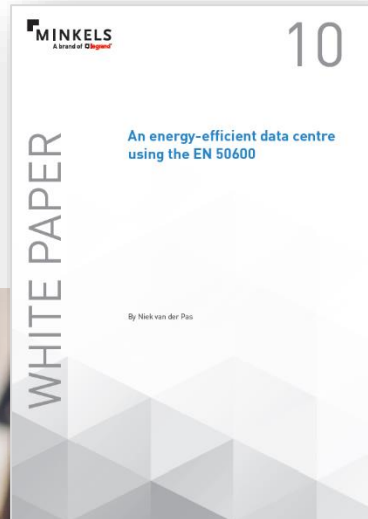
Legrand Data Center Solutions, Niek van der Pas

LEGRAND – THE GLOBAL SPECIALIST IN ELECTRICAL AND DIGITAL BUILDING INFRASTRUCTURE

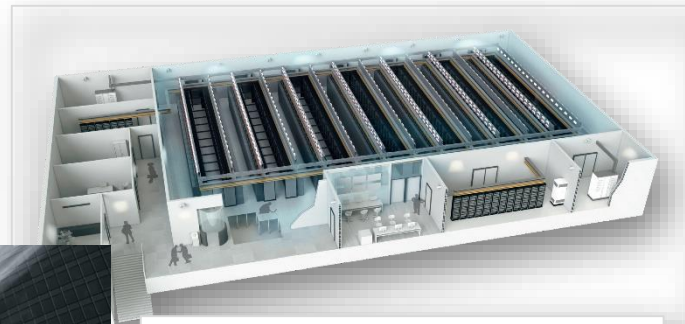
2017 RESULTS

- Turnover: €5,5 bn (+10%)
- Present in over 180 countries
- >37.000 employees
- Benelux: Veghel, Boxtel, Schiedam, Weert, Diegem, Wijgmaal

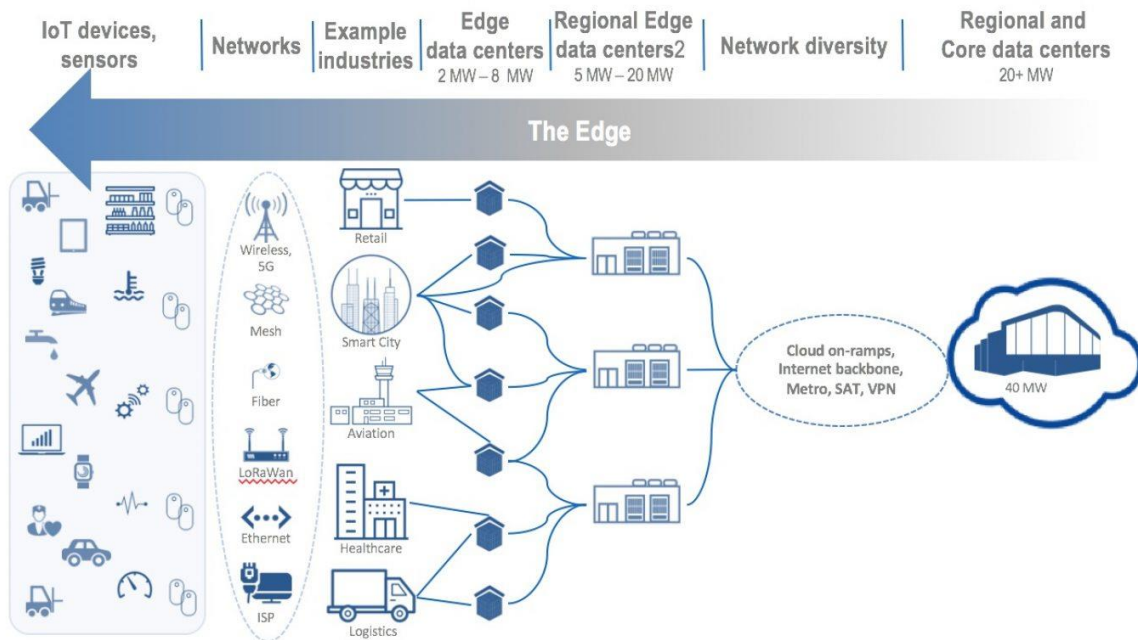
- Sharing knowledge
- White Papers
- Active participation in standards committees



Agenda



The Edge

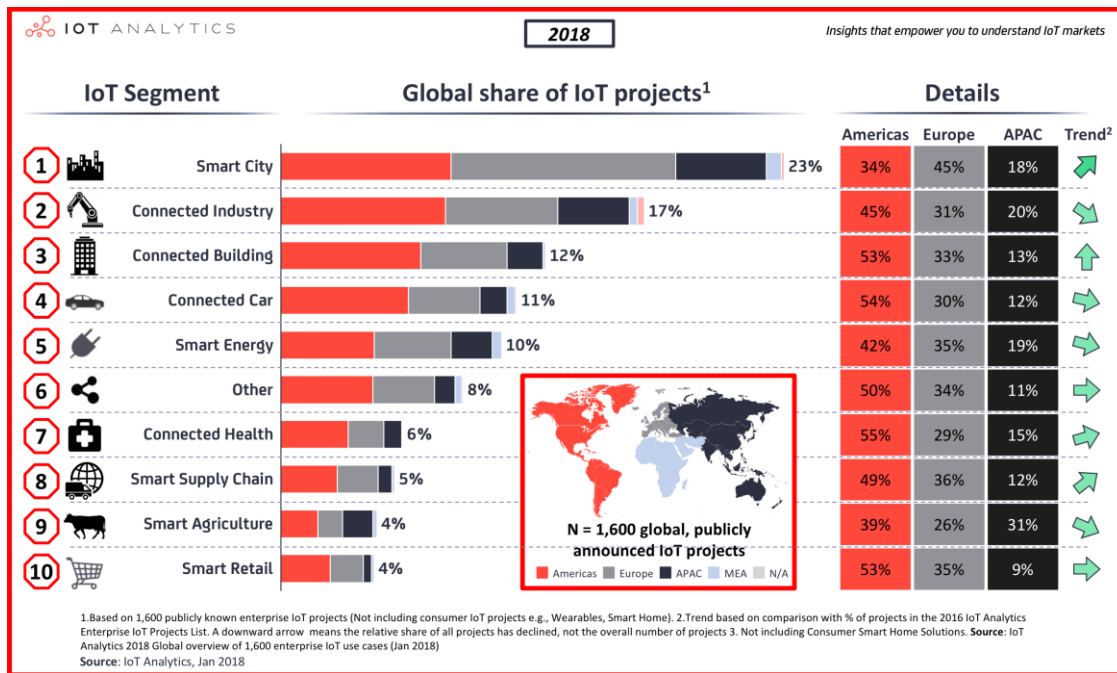


complete happiness
edge¹ /edʒ/ *n* **1** the part or place where something **ends** or begins or that is farthest from its centre: *Don't go too near the edge of the cliff.* | *She stood by the water's edge.* | *If you don't want it, leave it on the edge of your plate.* | *Can you stand a coin up on its edge?* | (fig.) *He felt he was on the edge of madness.* **2** the thin sharp cutting part of a blade, tool, etc.: *This knife has a very sharp edge.* **3** have the edge on/over to be (slightly) better than or have a (slight) advantage over: *She has the edge on the other students because she spent a year in England.* **4** on edge nervous; *EDGY: I'm sorry if I was rude to you – I'm a bit on edge at the moment.* **5** take the edge off to lessen the force of: *That'll take the edge off your hunger.* **6** -edged /edʒd/ having an edge or edges of the stated type or number: *a sharp-edged blade* | *a two-edged sword* —see also CUTTING EDGE, DOUBLE-EDGED

Source: Longman Dictionary

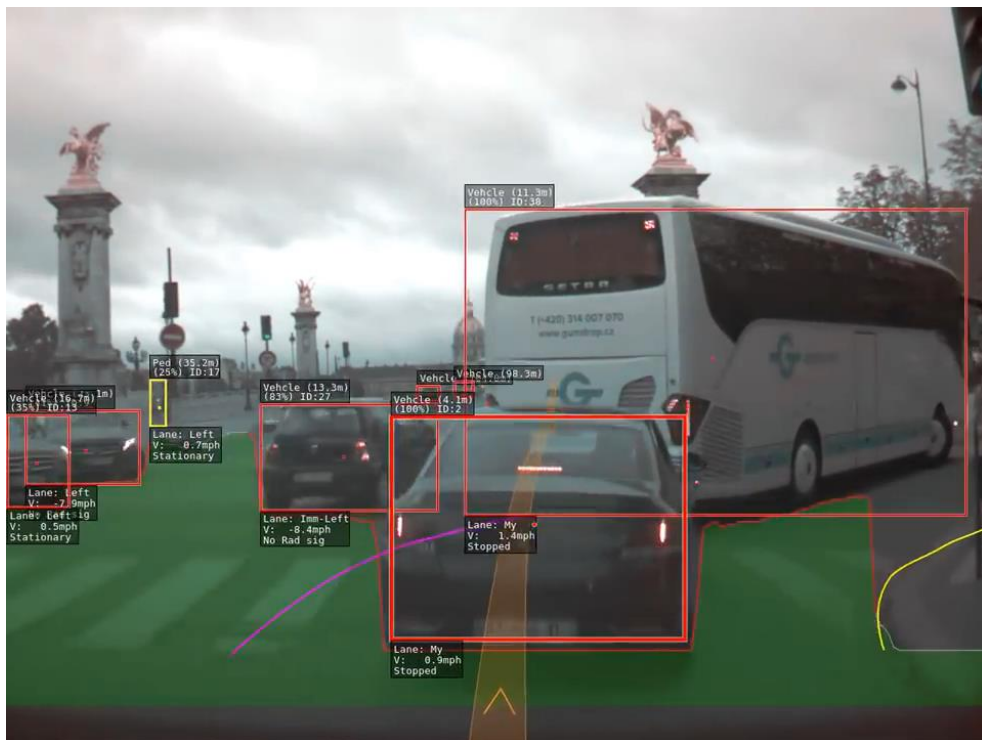
Source: Futurion

Wat stuurt de Edge



Source: IOT Analytics

Zelfrijdende auto's



Source: [Youtube](#)

The 5 levels of driving automation

For on-road vehicles

Human driver Automated system

		Steering and acceleration/deceleration	Monitoring of driving environment	Fallback when automation fails	Automated system is in control
Human driver monitors the road	0 NO AUTOMATION				N/A
	1 DRIVER ASSISTANCE				SOME DRIVING MODES
	2 PARTIAL AUTOMATION				SOME DRIVING MODES
Automated driving system monitors the road	3 CONDITIONAL AUTOMATION				SOME DRIVING MODES
	4 HIGH AUTOMATION				SOME DRIVING MODES
	5 FULL AUTOMATION				

Source: SAE International

Vox

Zelfrijdende auto's Tijdspad



1939	Vision GM	1966
2018	Level 2 Driver assistance	
2021-25	Level 4 No driver	
2025	Level 5 Full Autonomous	

Source: [Norman Bel Geddes, Futurama at the 1939 New York World's Fair 14:27-15:08](#)

Zelfrijdende auto's Voorwaarden

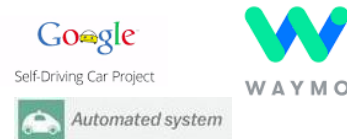
Mobileye layers:

- harvesting agents (any camera-equipped vehicle), 10KB/km
- map aggregating server (cloud)
- map-consuming agents (autonomous vehicle)
- Data sharing i.e. Mobileye REM™

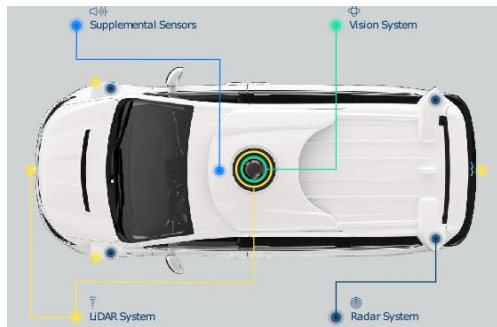


Waymo: Level 4

- Perception
- Behavior Prediction
- Planner



We also consider the security of our wireless communication. Our vehicles **do not rely on a constant connection** to operate safely. vehicle movements and the onboard 3D maps **are shielded from**, and inaccessible from, the vehicle's **wireless connections** and systems.



Source: Waymo

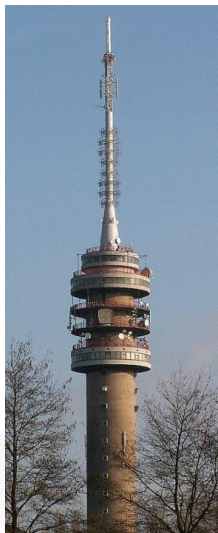
5G Landbouw



Source: channelconnect.nl

Het Edge Landschap

- Het netwerk
 - Telco aanbieders
 - Vast: ADSL, Coax, Glas
 - Mobile: 3G, 4G
 - Lokale netwerken
 - Glas
 - Fixed wireless

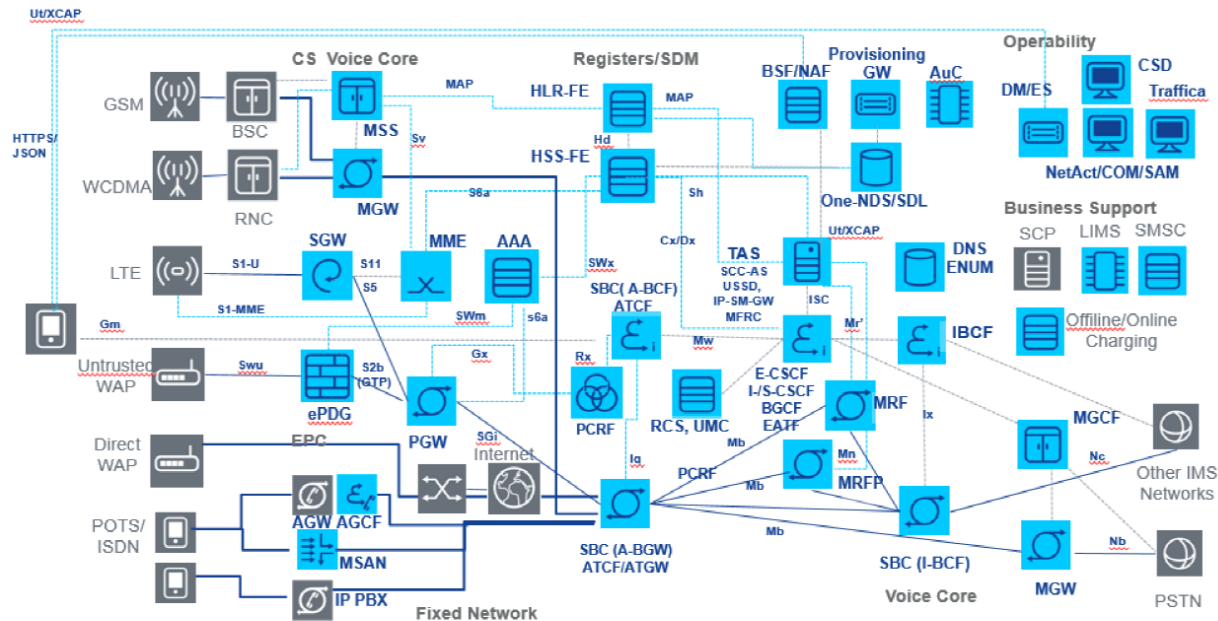


Bron: Westo

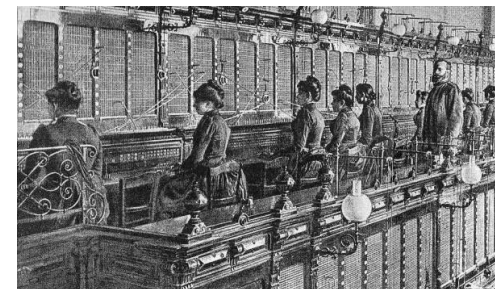


Bron: Engie

CORD Central Office Re-architected as a Data Center



- 4G 80% binnen
- Wij zijn 93% binnen
- 5G 2020



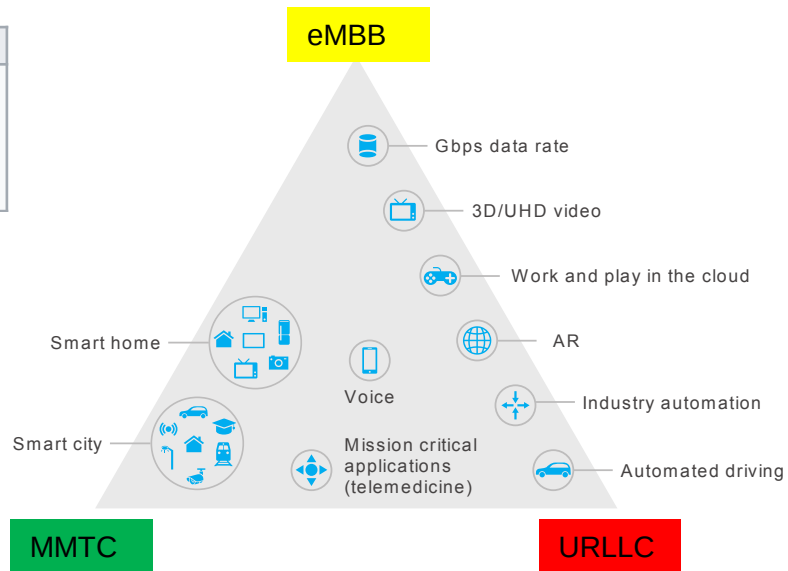
Source: Nokia

Network functions today run on purpose built bare metal hardware → huge effort to operate and maintain networks where almost every box runs on a different platform.

CORD Central Office Re-architected as a Data Center

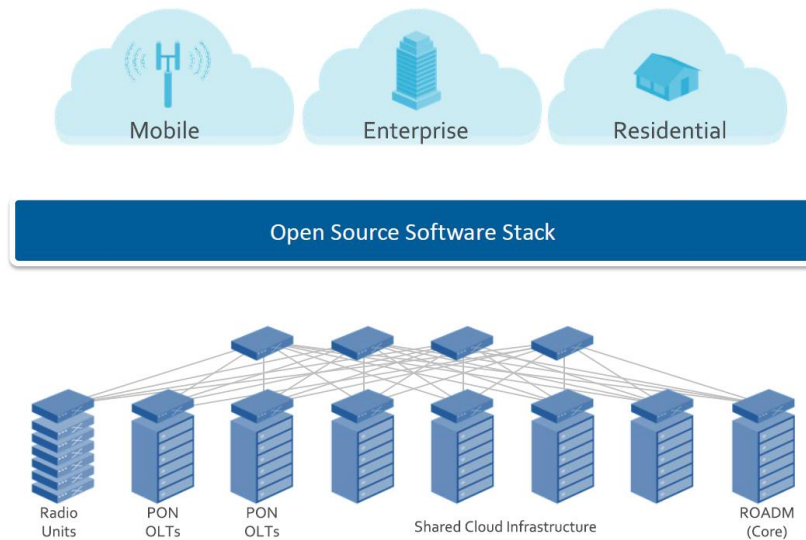
- IMT 5G 2020

Capability	Description	5G target	Usage scenario
Peak data rate	Maximum achievable data rate	20 Gbit/s	enhanced Mobile Broad Band
User experienced data rate	Achievable data rate across coverage area	1 Gbit/s	



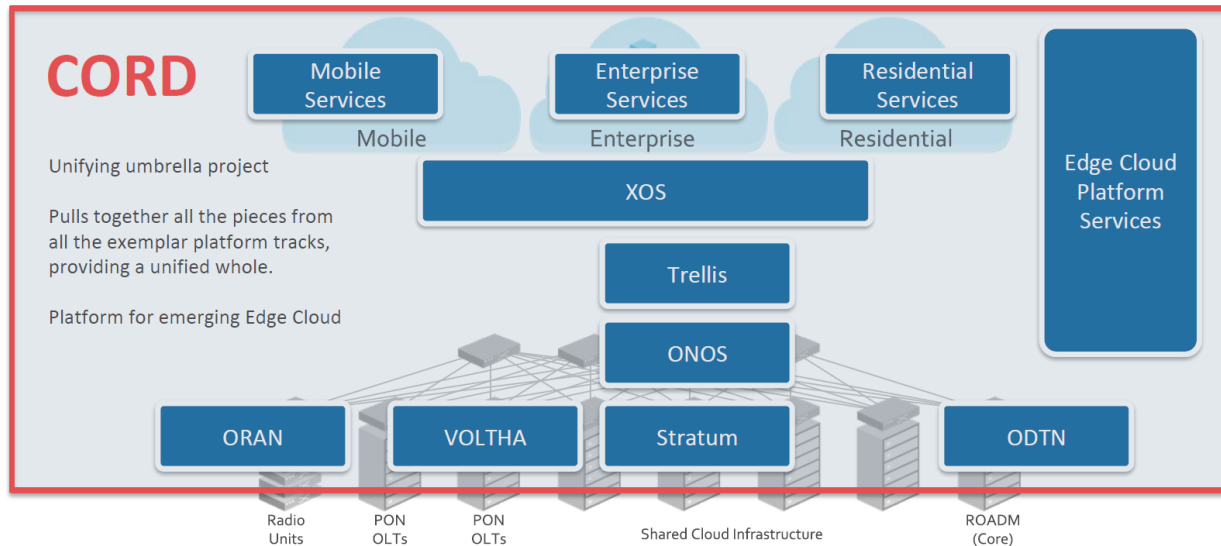
Source: Huawei, Indoor 5G network WP

CORD Central Office Re-architected as a Data Center



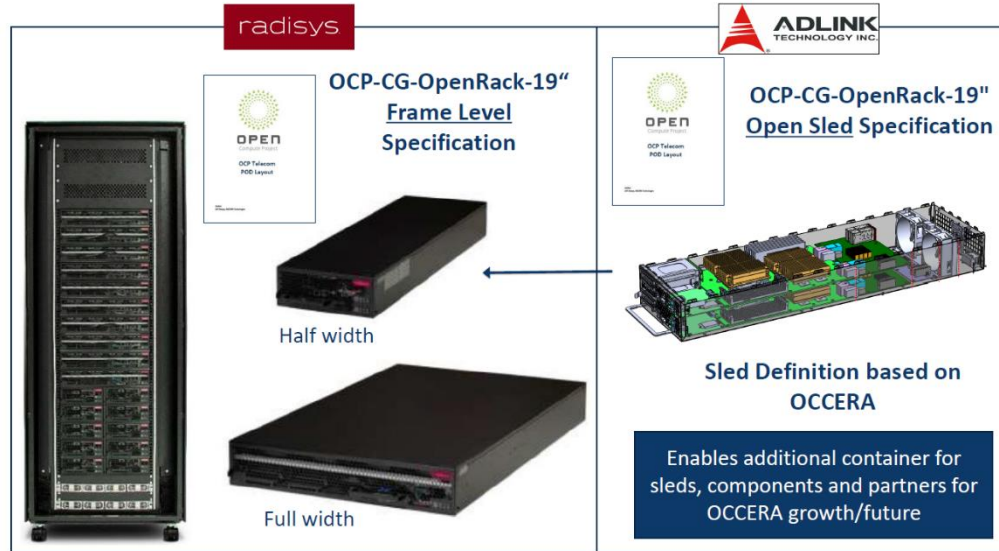
Source: Open Network Foundation

CORD Central Office Re-architected as a Data Center



Source: Open Network Foundation

CORD Central Office Re-architected as a Data Center

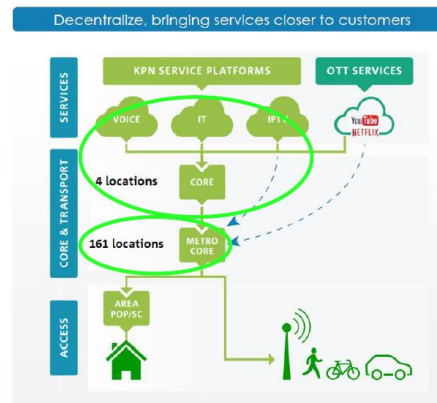


Source: Open Compute Project

WHERE is KPN considering to use OCP ?

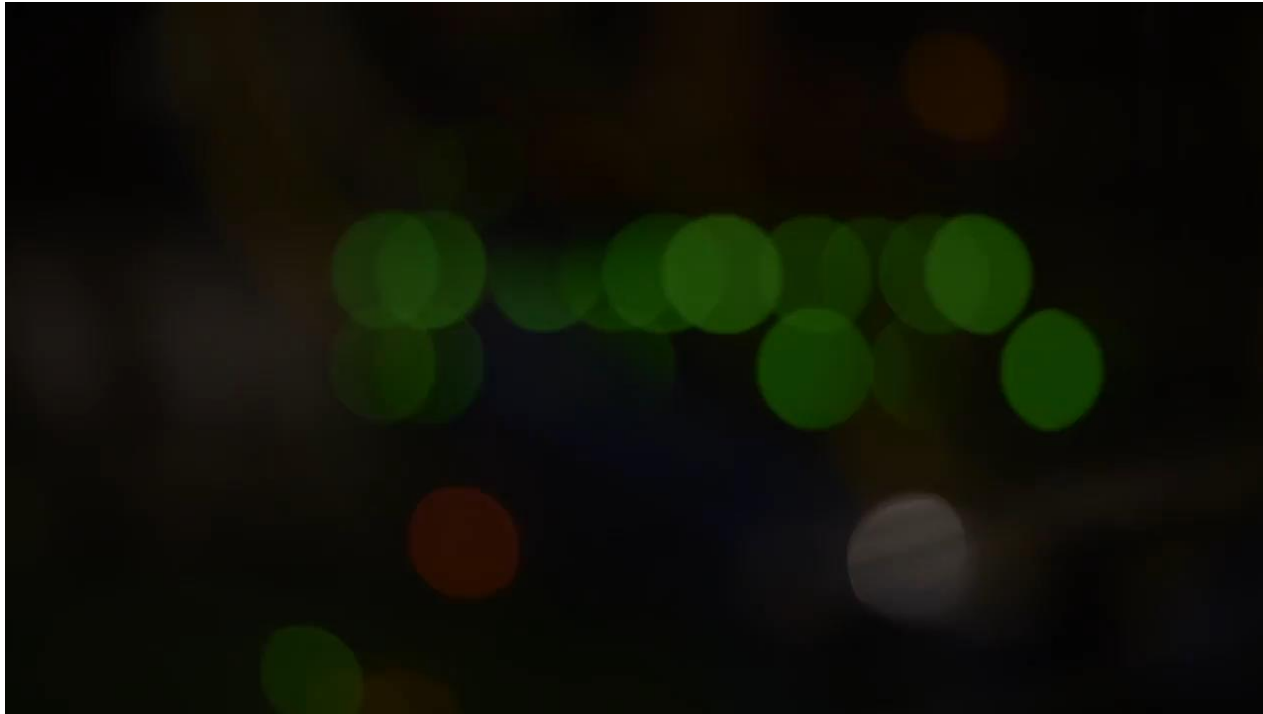


- Central Telco DC (4):
 - Starting with a few, will increase over time
- Metro Core (161):
 - CORD based
 - Just a few racks @ each site
 - Servers:
 - Controller layer for our programmable whitebox switches
 - KPN Edge Network services



Source: KPN OCP presentatie Amsterdam 01-10-2018

IOT en Hotels



[Legrand](https://www.legrand.com)

Legrand IOT

INTEGRATION OF NFC TECHNOLOGY

FACILITATING INSTALLATION AND MAINTENANCE



CHIME

BEING INFORMED REMOTELY



HOME AUTOMATION

CONNECTING EXISTING HOMES
AND REMOTELY CONTROLLING
LIGHTING AND ROLLER BLINDS

ASSISTED LIVING

PROVIDING SAFETY FOR
PEOPLE WITH DIMINISHED
INDEPENDENCE



PDU (POWER DISTRIBUTION UNITS)

POWERING AND MONITORING
ACTIVITY IN DATA CENTERS

UPS

BEING INFORMED OF THE STATUS
OF THE EMERGENCY SYSTEM,
AVOIDING OPERATING LOSSES



ENERGY MANAGEMENT



A LABEL FOR ALL LEGRAND CONNECTED DEVICES

As well as a development program, Eliot is also a label. From September 2015, Legrand connected devices will be marked with the program logo for easy identification.

PROTECTION

AVOIDING INCIDENTS
LINKED TO UNEXPECTED
POWER CUTS



SURVEILLANCE CAMERAS

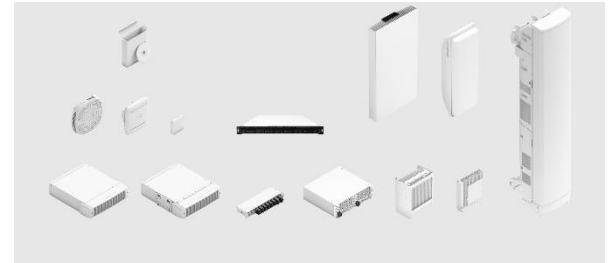
EASILY IMPLEMENTING REMOTE
SURVEILLANCE AND RECEIVING
REAL-TIME ALERTS



The Edge



Source: Verizon

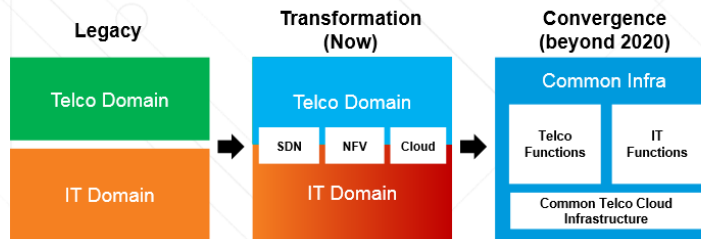
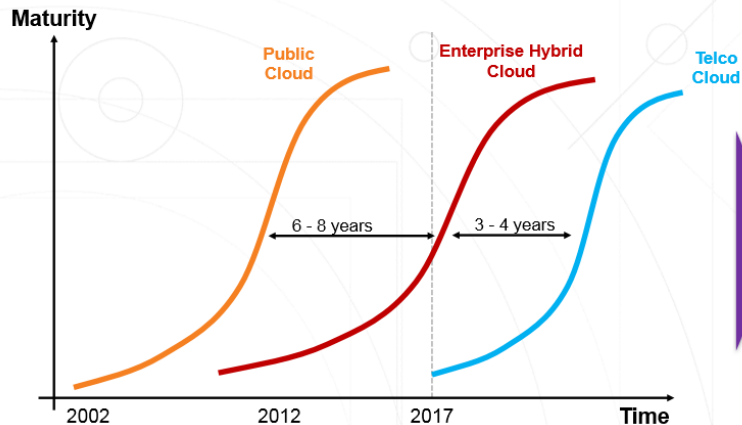


Source: Nokia

Wanneer

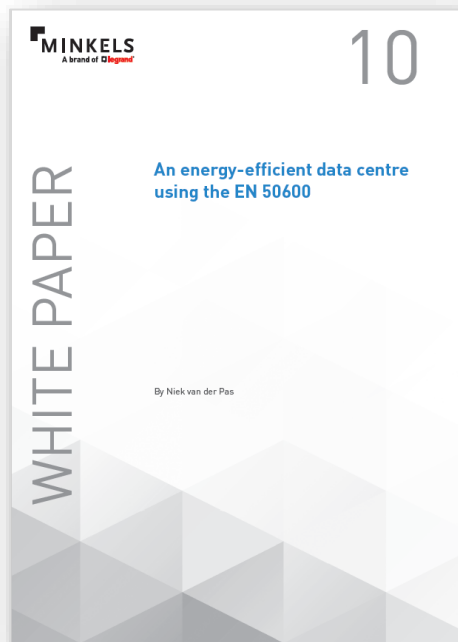
Two Distinct Growth Markets for next 2-3 years

Infrastructure For Enterprise IT and Telco will converge longer term

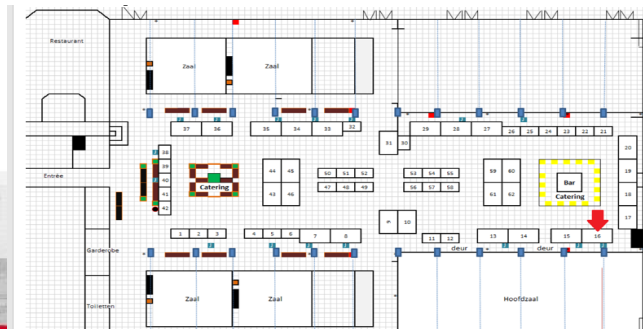


flex

Om 12:30 Stand 16



- **12.30 en 13.30 – Vragenuur op de stand:**
- Mark Acton zal op stand 16 een vragenuurtje houden over de EN 50600. Niek en Mark zullen dit na afloop van hun presentatie ook nog benadrukken.
- De bezoekers die een visitekaartje overhandigen ontvangen na afloop per mail de nieuwe Whitepaper 'An energy-efficient data centre using EN 50600'.



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