Koninklijk Instituut Van Ingenieurs

Engineering Society

Komende thema avonden

Midden november / Den Haag	– Communicatie in en tussen voertuigen
23 november / Utrecht	– URSI bijeenkomst
Midden December	– Gezondheid en communicatie

2017 ideeen:
Data Center optimalisatie
Blockchain
ESTEC
Drones
Vederprijs
Ontwikkelingen in Antenne techniek of Short range radio: NFC & RFID
Software Defined Radio at Fontys (nav NERG donatie)

8 november / Den Haag	– “IPv6 is er nu, kan IPv4 al uit?” door Stipv6

IoT en LoRa

Agenda:

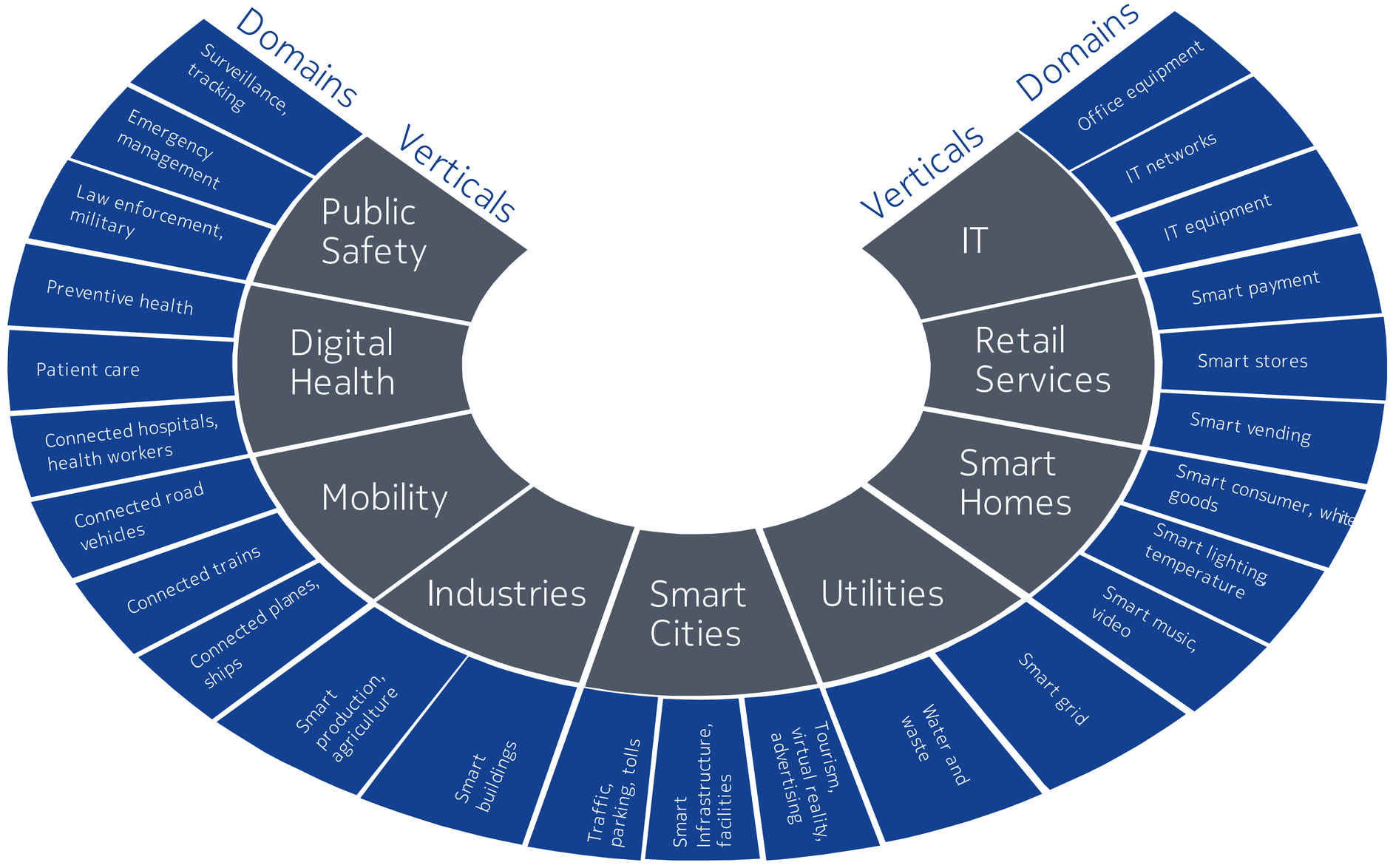
- 17:30 – 18:30 Inloop, koffie, en broodjes
- 18:30 – 18:45 Introductie IoT – Anne van Otterlo, KIVI TC
- 18:45 – 19:30 LoRa, wat is het, hoe werkt het, wat kun je er mee
  Pieter van Nieuwaal en Dirk Gooris, IoT pioniers
- 19:30 – 20:15 Innovatieve IoT diensten over het KPN LoRa netwerk
  Jasper Kuin, KPN Manager New Business Development
- 20:15 – 20:30 Discussie
- 20:30 – 21:30 Demo’s en borrel

IoT: definition

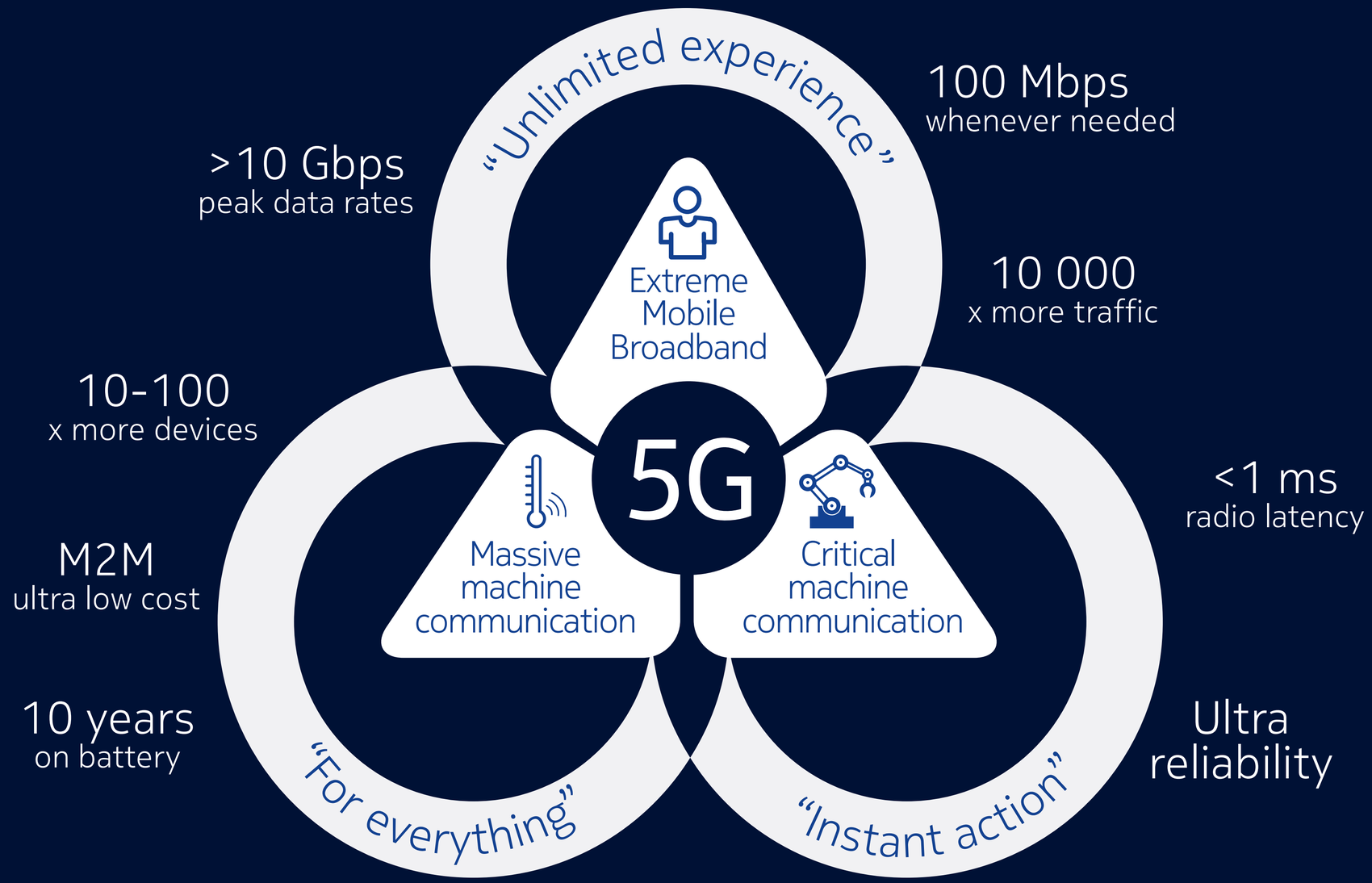
Wikipedia:
The **internet of things** (IoT) is the internetworking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

Google:
noun: **Internet of things**
a proposed development of the Internet in which everyday objects have network connectivity, allowing them to send and receive data.
"if one thing can prevent the Internet of things from transforming the way we live and work, it will be a breakdown in security"

The IoT has a transformational impact on (almost) all sectors



5G will change the world



IoT value predictions vary significantly by source

Revenue is reported in billions while global economic impact measured in trillions

Revenue Potential

2018: ABI Research predicts worldwide IoT potential to be revenue **$149Bn**

2019: Business Insider predicts the total software and services market will be **$600Bn**

2020: IC Insights estimates the IoT in manufacturing market to be worth **$13.5Bn**

2021: Intel has sized the building automation systems market to be **$101Bn**

Economic Impact

2018: Microsoft sales expenditure for IoT in manufacturing is set to grow to **$913Bn**

2019: IDC Research estimates the worldwide spending on IoT will reach **$1.3Tr**

2022: Cisco predicts the IoT market will be **$14.4Tr** in total, with **$1.95Tr** from smart factories

2025: McKinsey estimates the economic impact of IoT to be between **$3.9Tr** to **$11.1Tr**

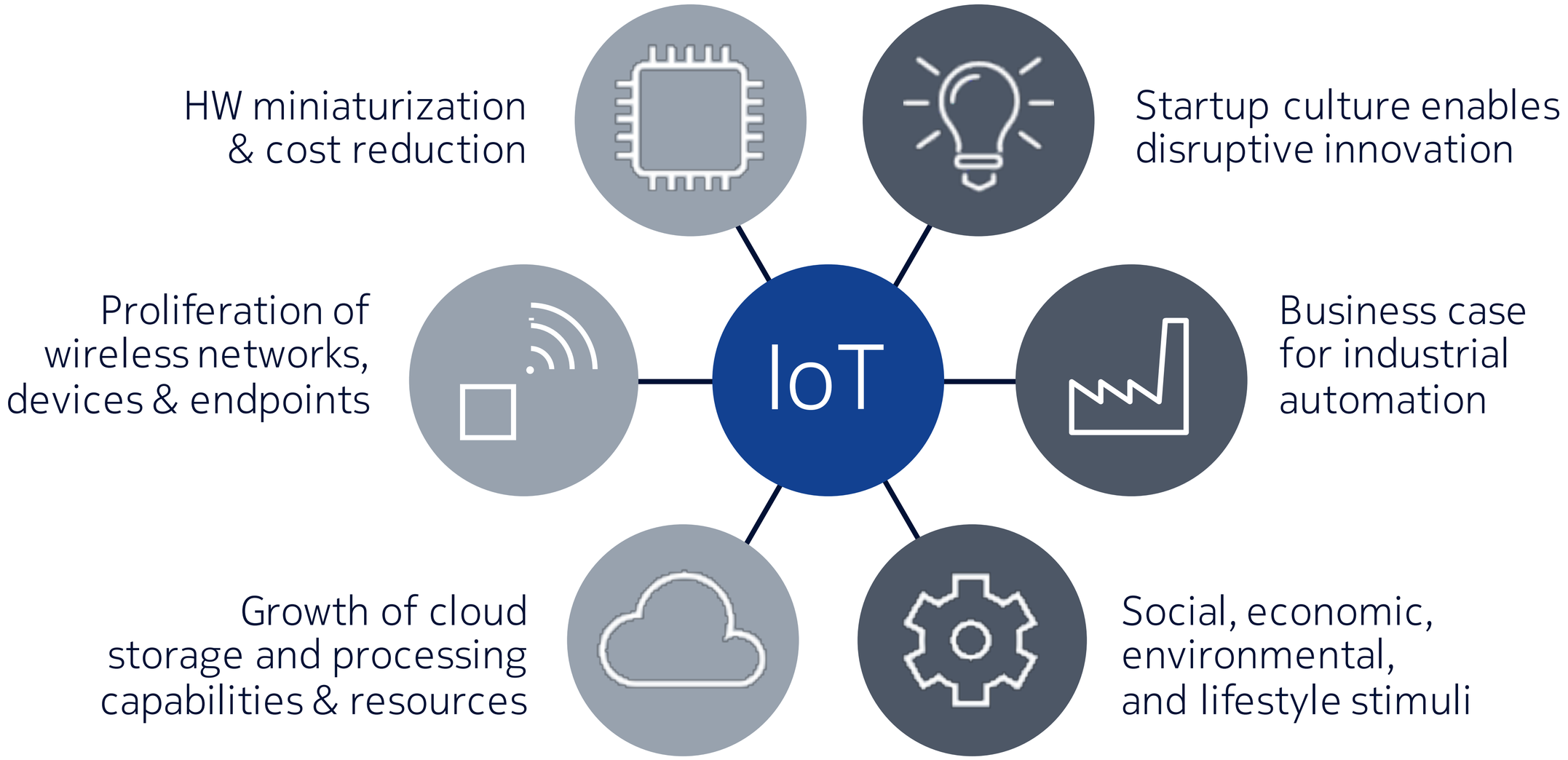
Number of Connected Devices

2019: IC Insights predicts the number of new IoT connections will reach **3.1Bn** a year

2020: IDC predicts the number of IoT units will reach **28.1Bn,** with a growth rate of **17.5%**

2020: The World Economic Forum projects the number of connected devices will hit **50.1Bn**

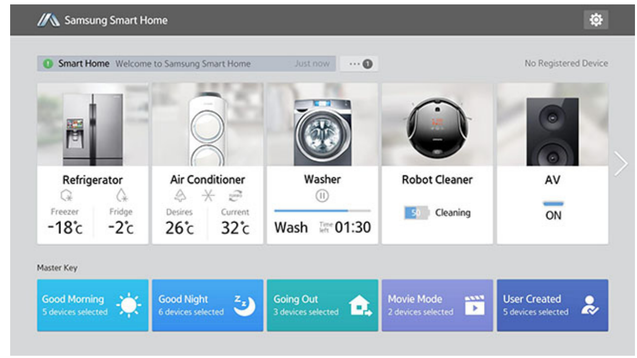
Why now?


HW miniaturization & cost reduction
Startup culture enables disruptive innovation
Proliferation of wireless networks, devices & endpoints
IoT
Business case for industrial automation
Growth of cloud storage and processing capabilities & resources
Social, economic, environmental, and lifestyle stimuli

What technology to connect devices, sensors and everyday objects?

- Body Area Networks: medical sensors
  - Bluetooth, NFC, …

- In home: smart-fridge, thermostat, lamps, anything that changes
  - Ethernet, PLC, Bluetooth, WiFi, Zigbee, Zwave, …



- In building: industrial processes
  - Ethernet, WiFi, 5G, …

- Wide area: logistics, agriculture, …
  - GSM, LoRa, SigFox, NB-IoT, LTE-M, 5G, ...

today’s focus