

IoT – a network or a service?

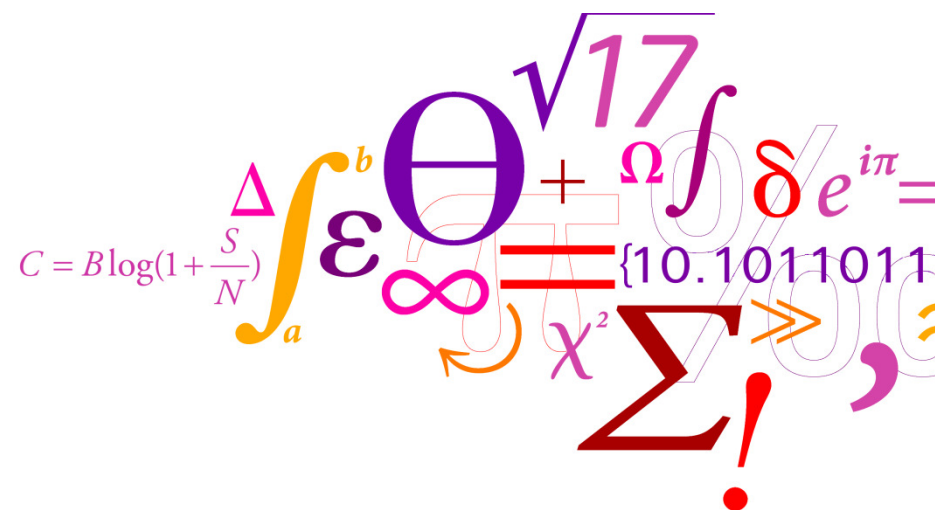
COPENHAGEN 30/9/2015

Lars Dittmann, DTU

Head of network technologies and service platforms

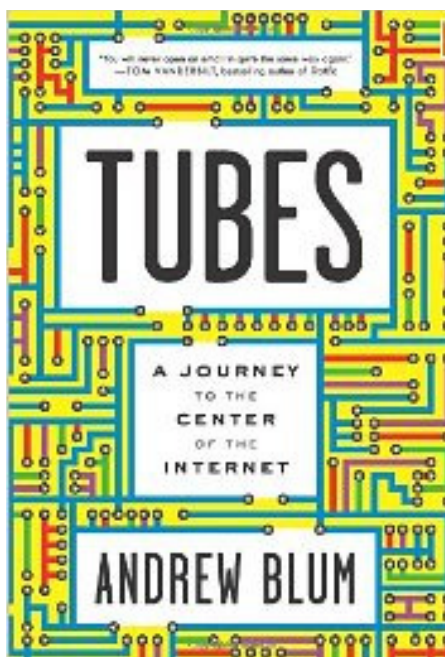
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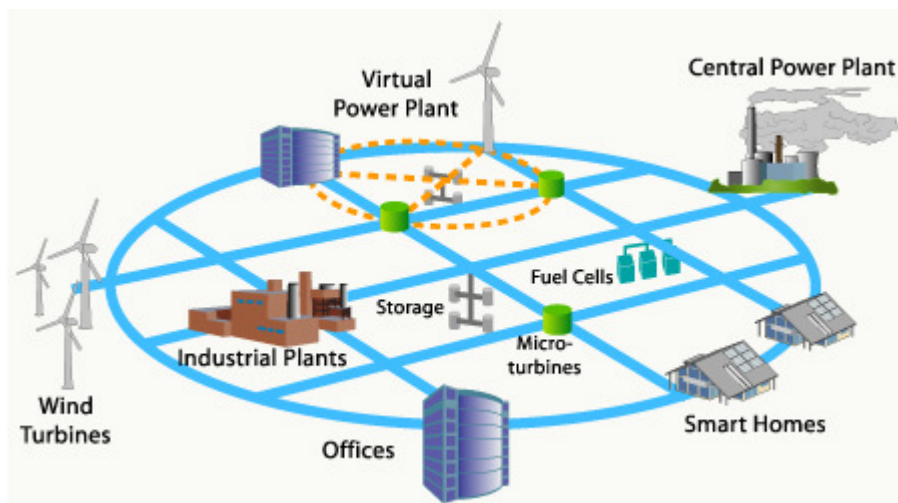
Objective

- Internet of Things – new services on the existing infrastructure or a new infrastructure as well?
- IoT – challenge: volume or type of application?

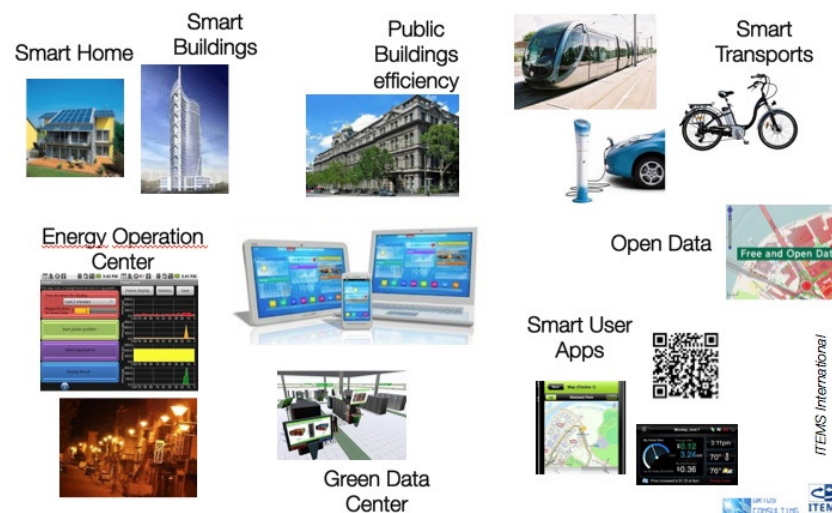


Smart Grid, Smart Cities, Smart “everything”.... what do we need?

- General communication systems for M2M application.
- Infrastructure with high resilience and fault recovery.
- Integrated solution – not dedicated solutions (exploiting virtualization).



Source : www.gridwise.org



Development of communication networks a.k.a. "the Internet"

- 1st phase: We connect buildings



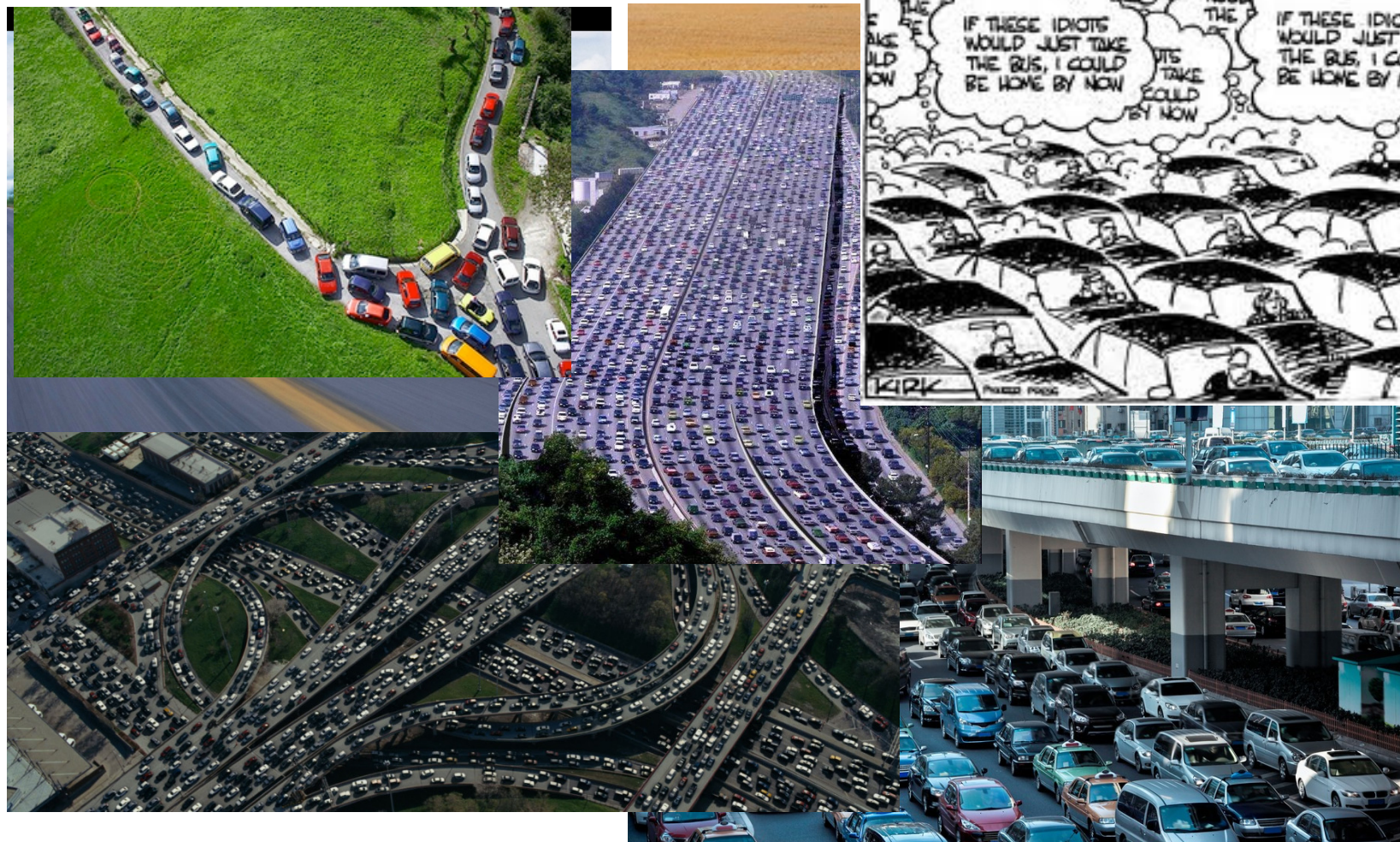
- 2nd phase: We connect people



- 3rd phase: We connect things



Goal for the Internet development – faster and more energy efficient



Improved reach

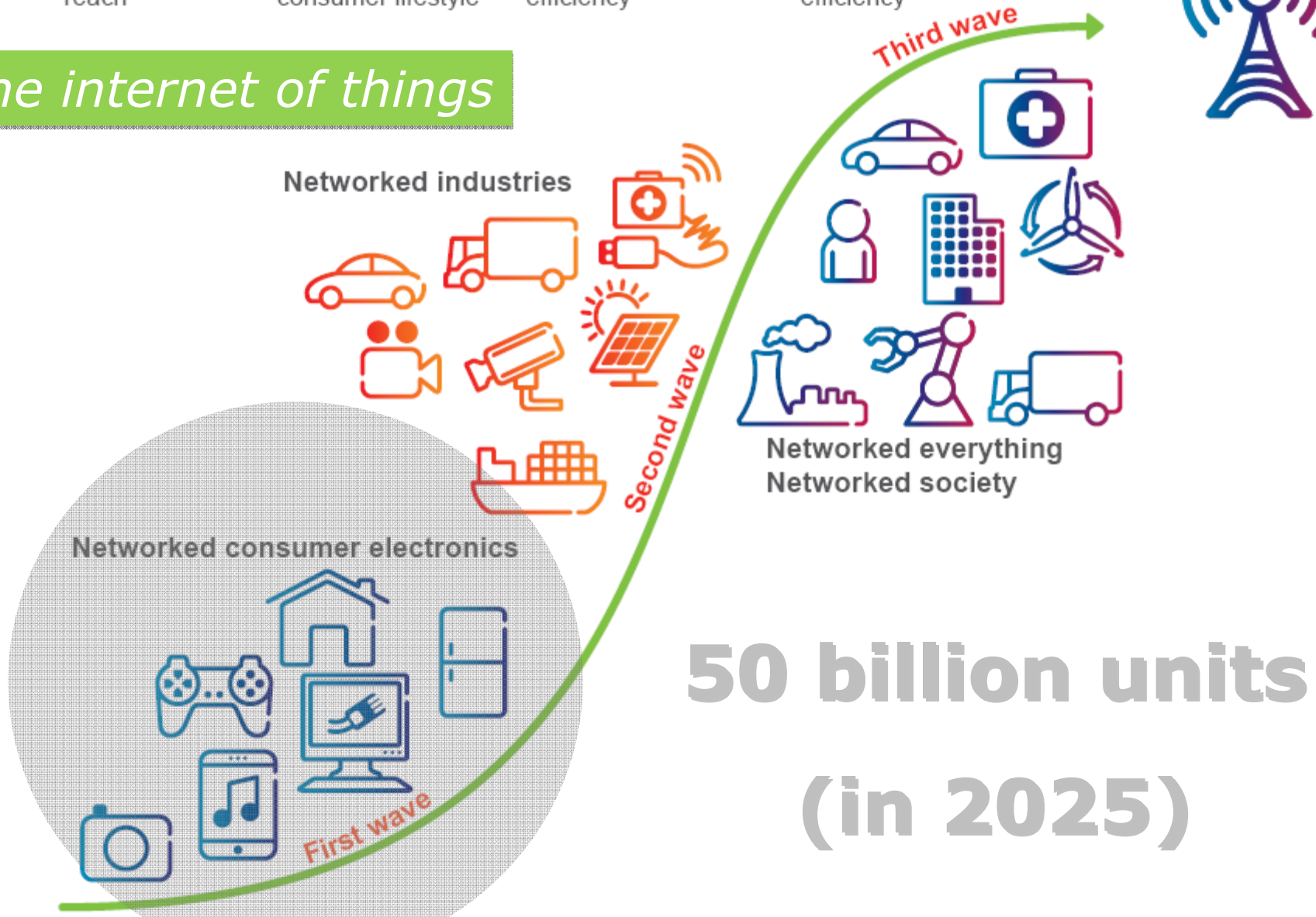
Improved value – consumer lifestyle

Improved process efficiency

Improved human efficiency



the internet of things

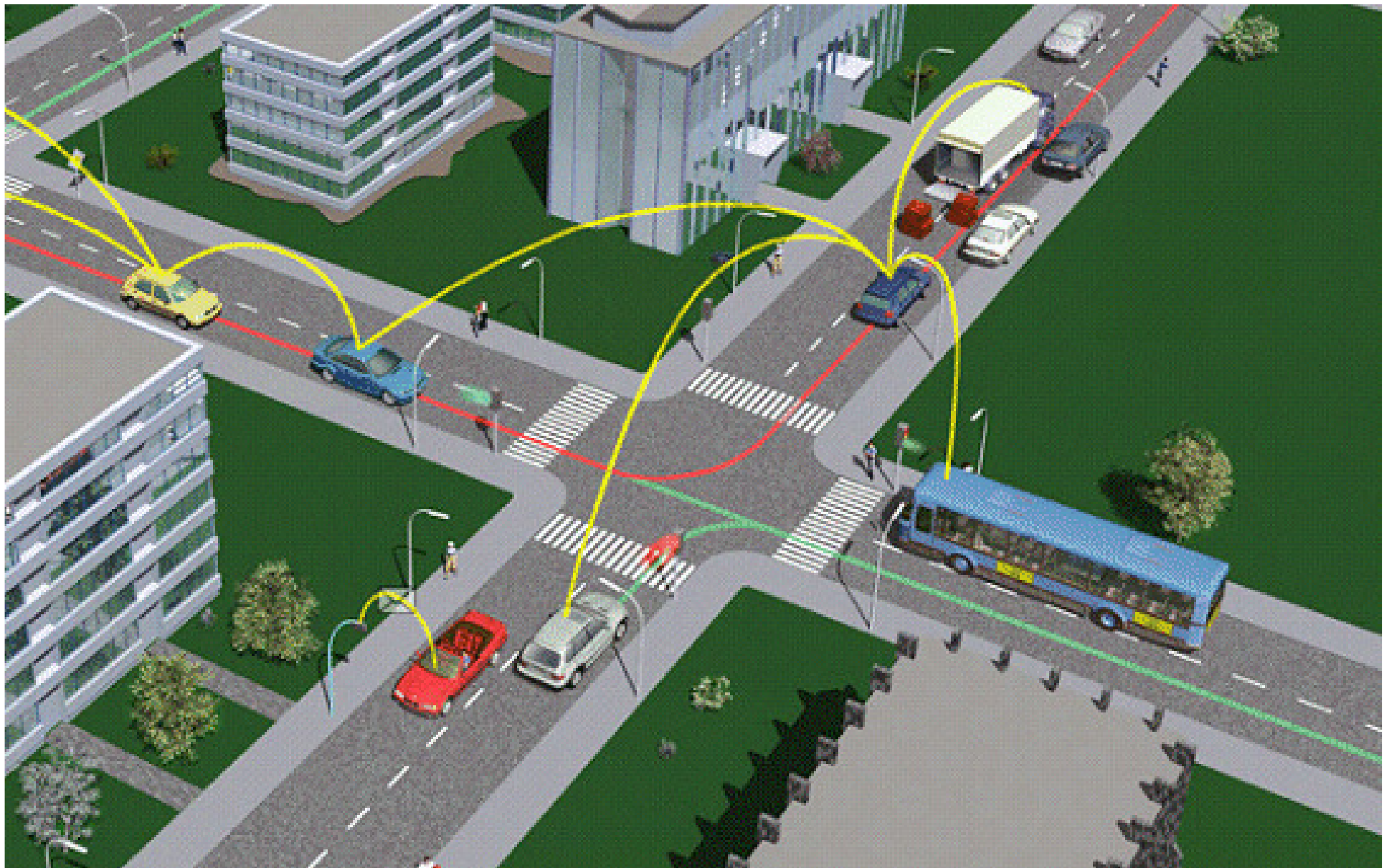


50 billion units (in 2025)

HOW DO WE GET ALL THESE DEVICES CONNECTED?



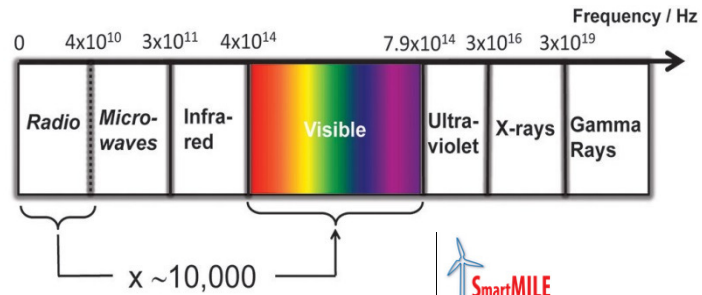
Opportunistic communication



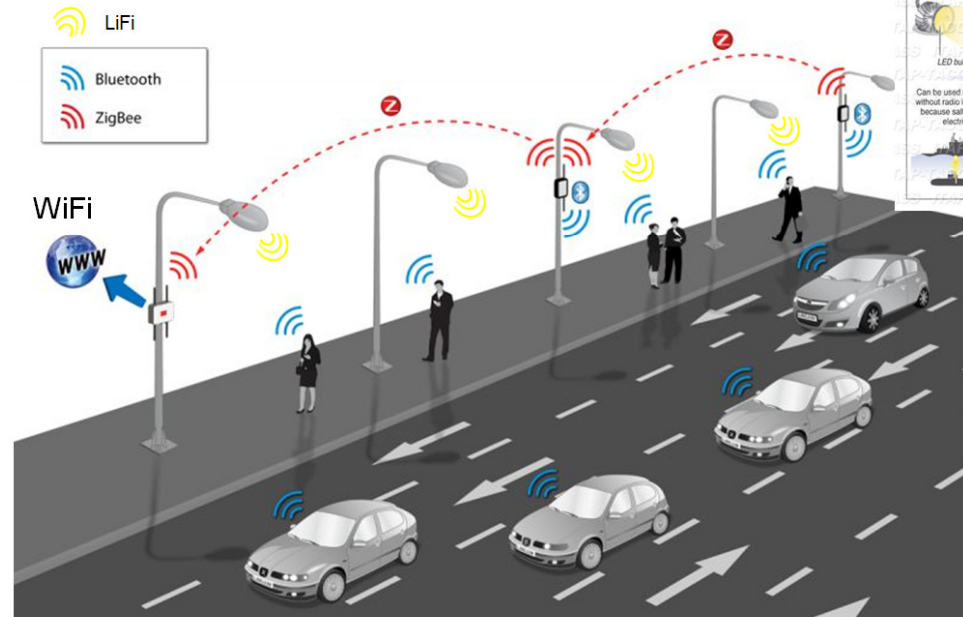
Lightpoles or Internet access points?



LiFi visible light communication



SMART URBAN COMMUNICATION NETWORK



Topics



DATA TRANSMISSION USING LIGHT

Harald Haas, professor at the University of Edinburgh gave a debut demonstration of a Li-Fi prototype for data transmission using light at the TEDGlobal conference in Edinburgh

HOW IT WORKS

High-speed flickering of light-emitting diodes (LEDs) that is imperceptible to the human eye can be registered by special equipment

The technology is aimed at creating new communication channels with the use of existing equipment

LED bulb Light receiver

ADVANTAGES

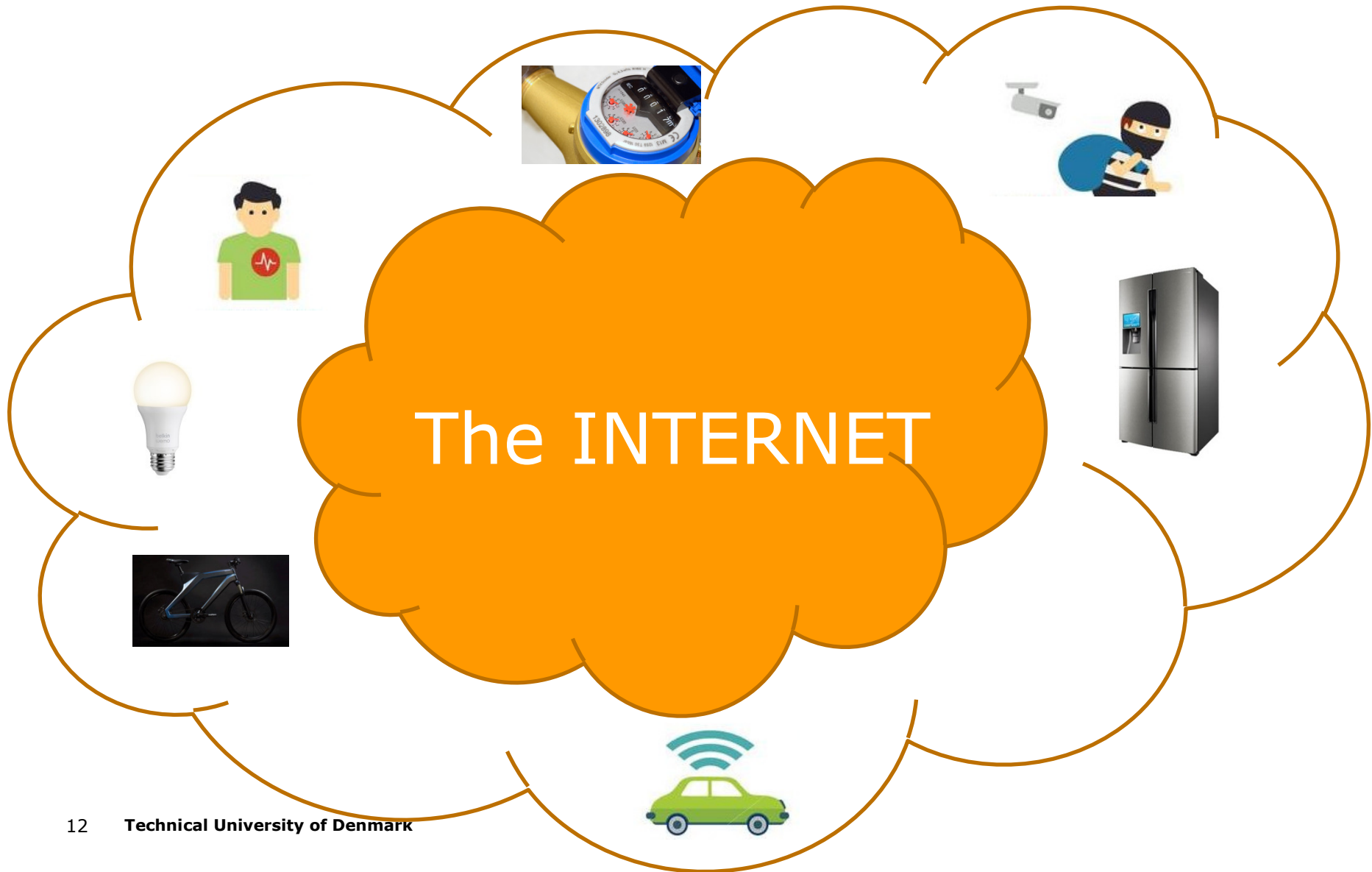
- Can be used underwater without radio interference because salt conducts electricity
- Transmission can be blocked by walls, so there is less risk for data leaking
- Can be safely used on planes because it does not interfere with radio equipment

Source: nytimes.com

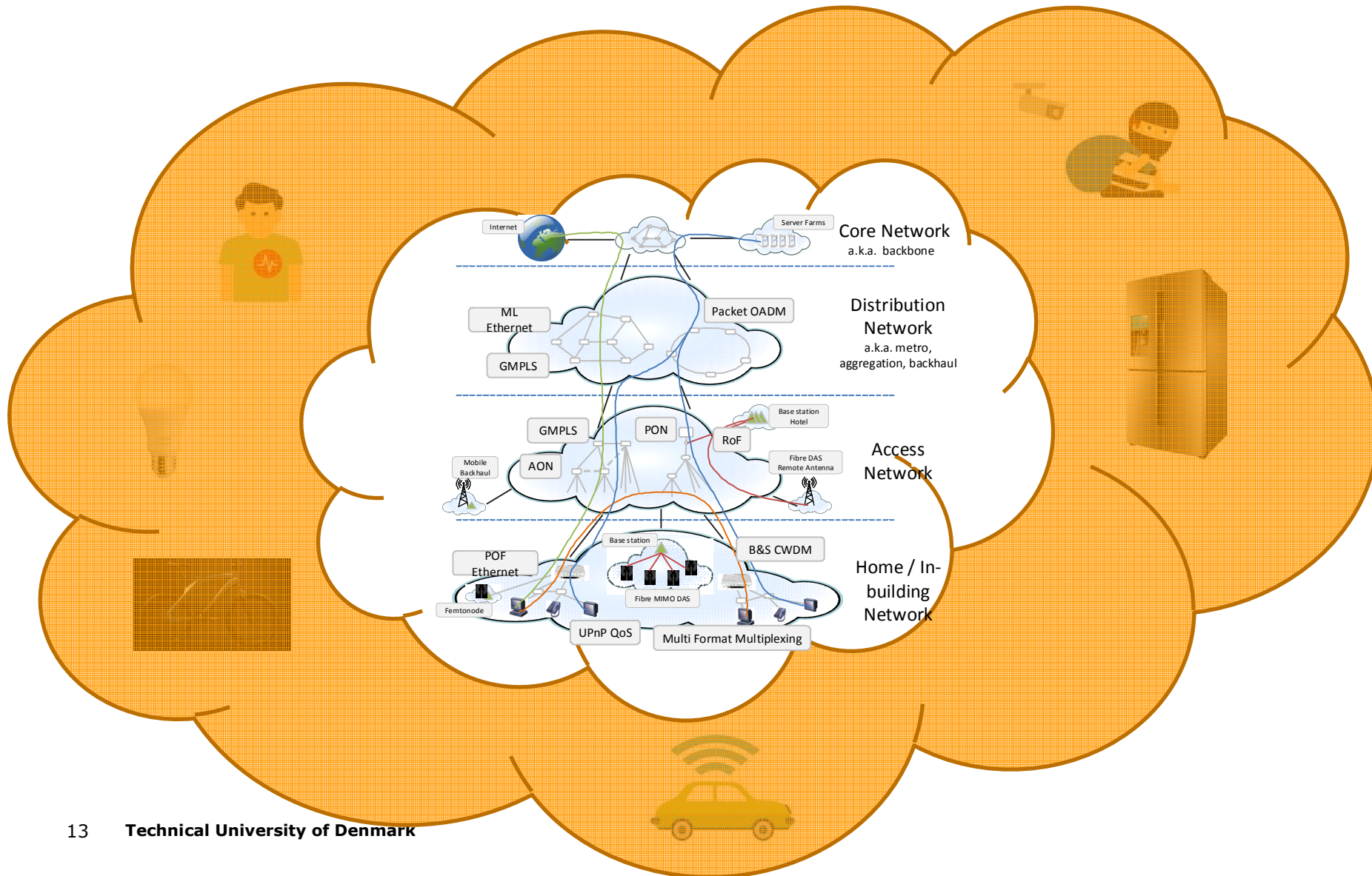
Selfdriving car or mobile datacenter?



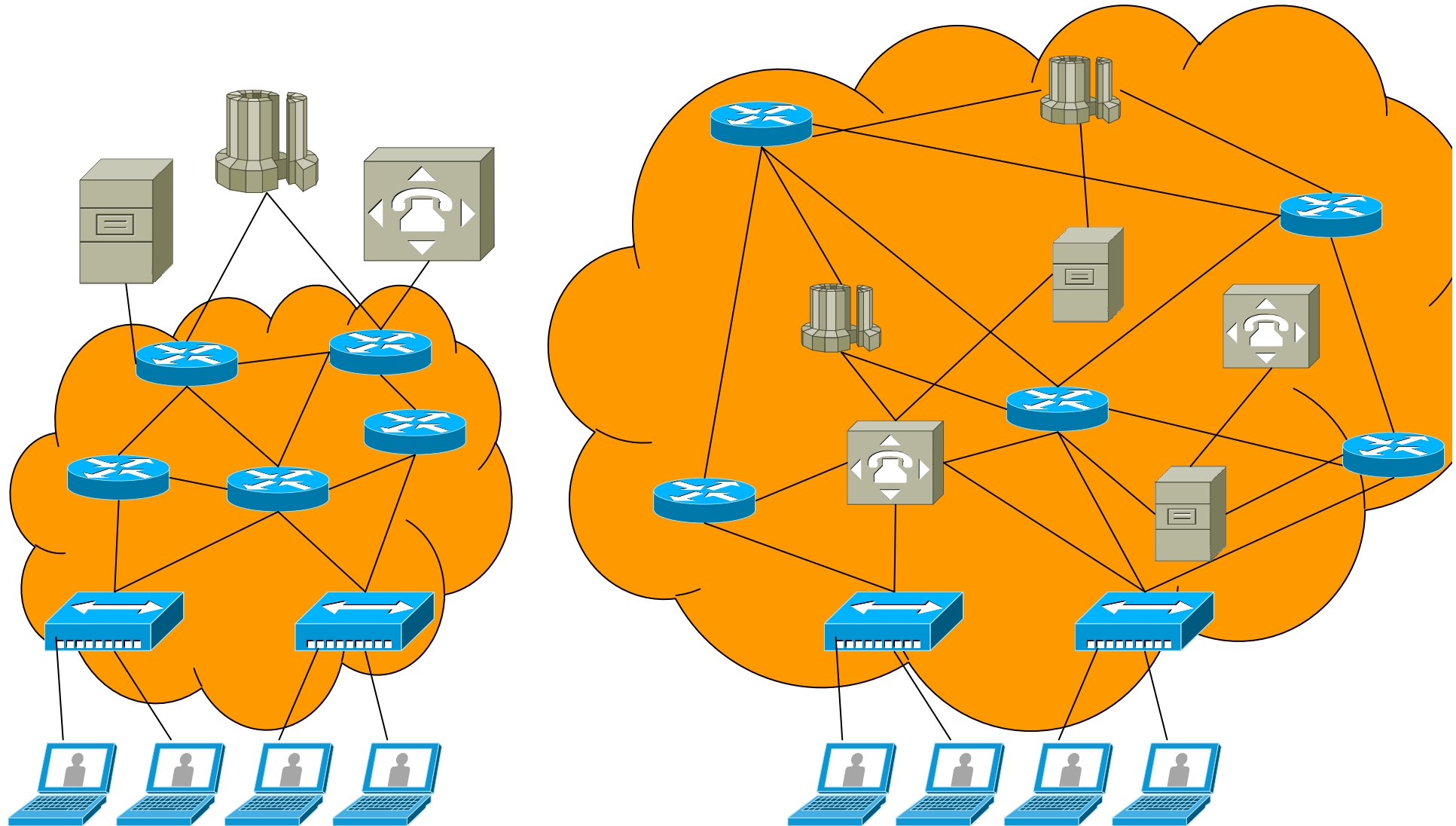
The Internet of Things (IoT) *"from the outside"*



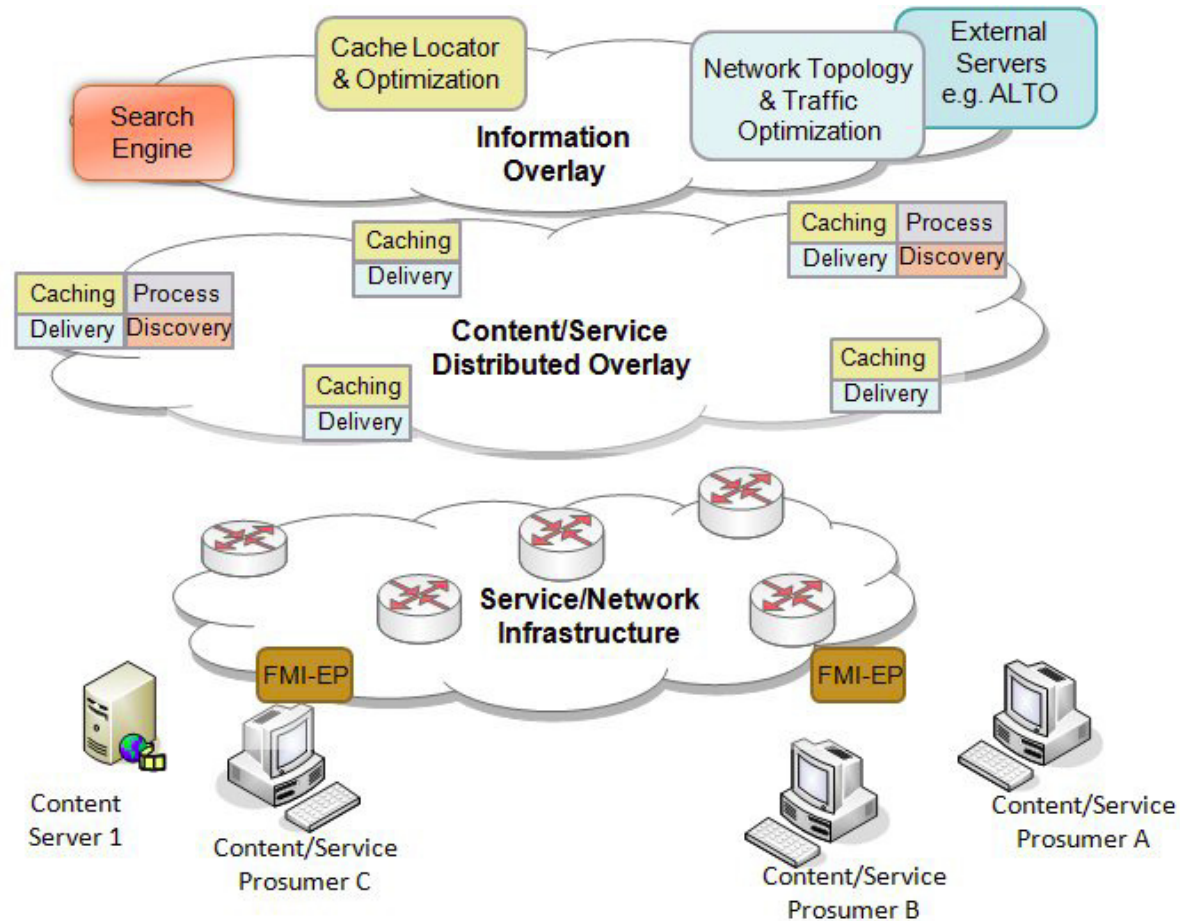
The Internet of Things (IoT) "from the inside"



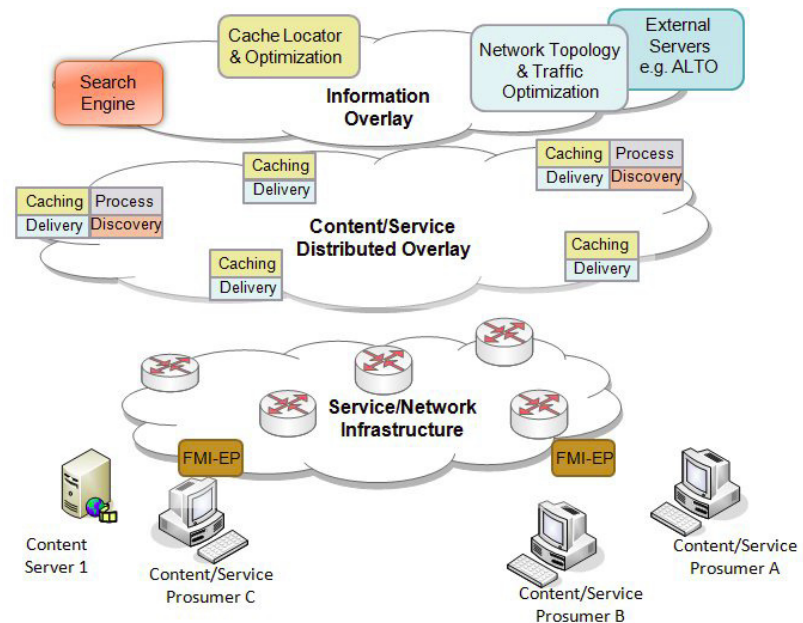
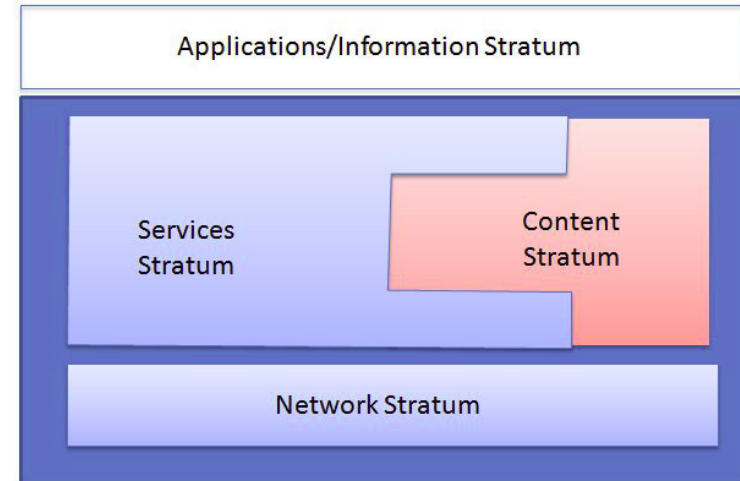
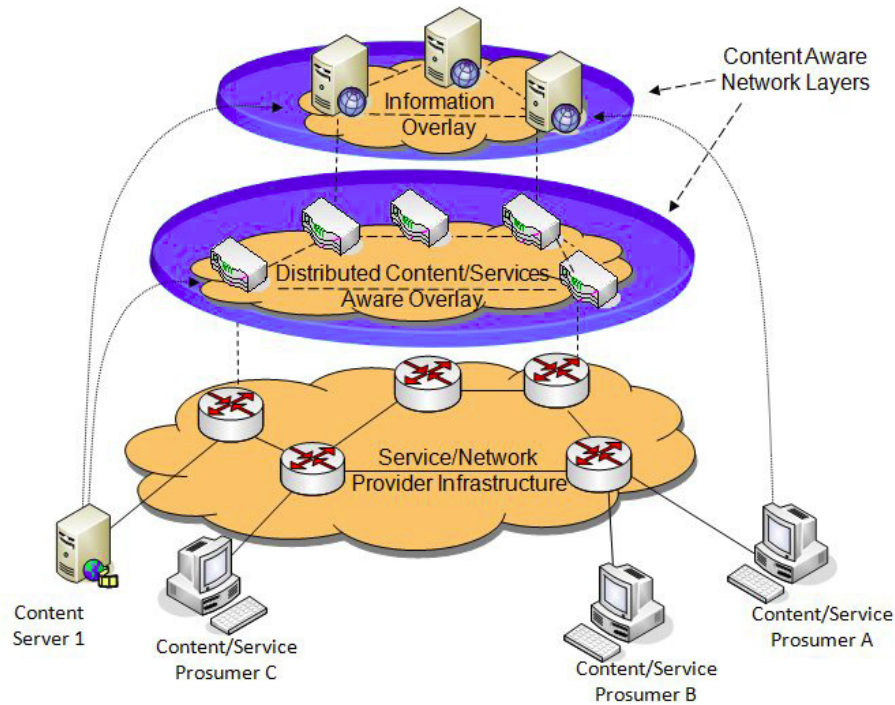
Network and services becoming more integrated



Stratified future internet – and that only a fraction of it all

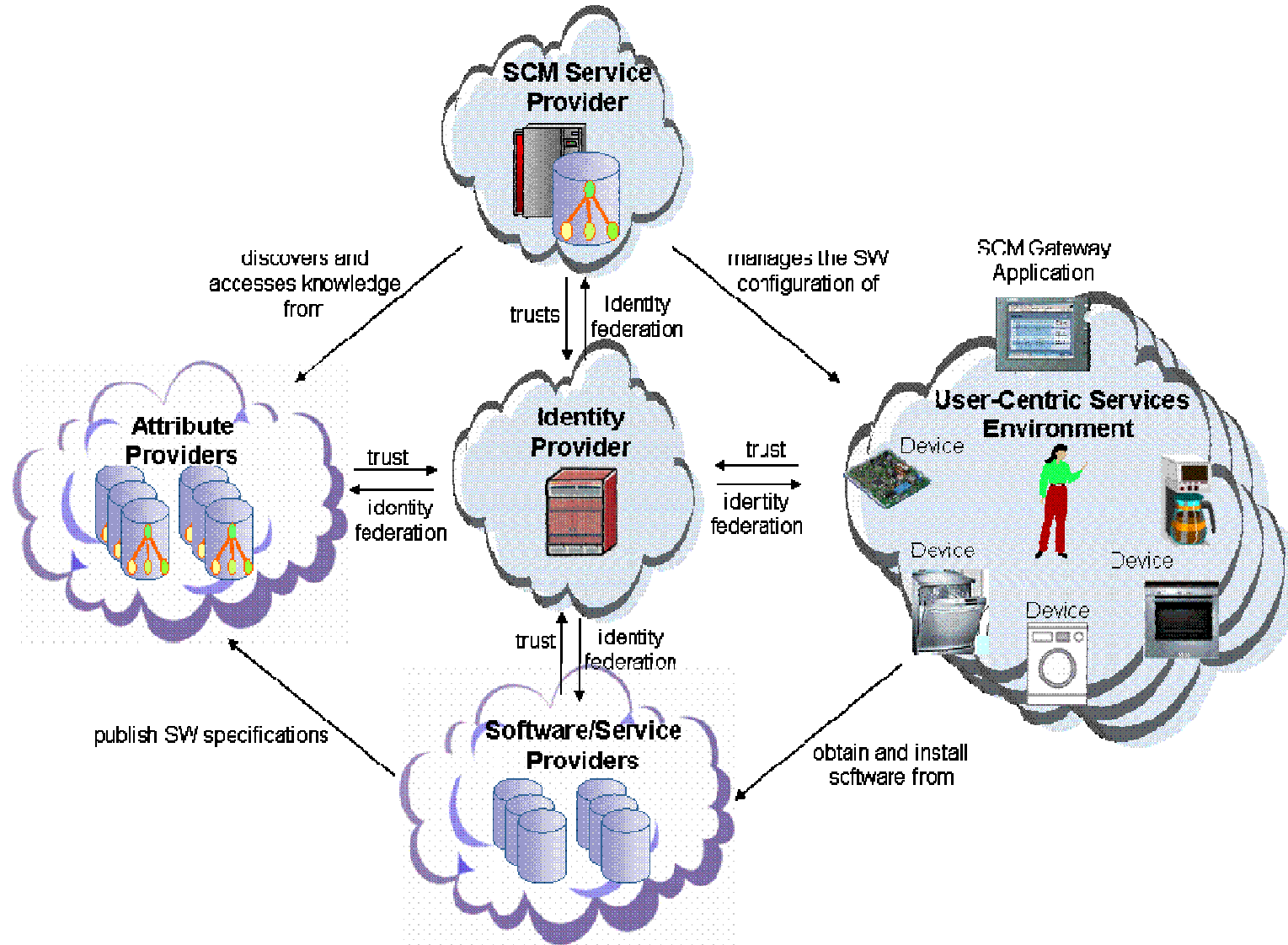


Stratified Future Internet architecture



Future Internet

- "new applications and easier use"



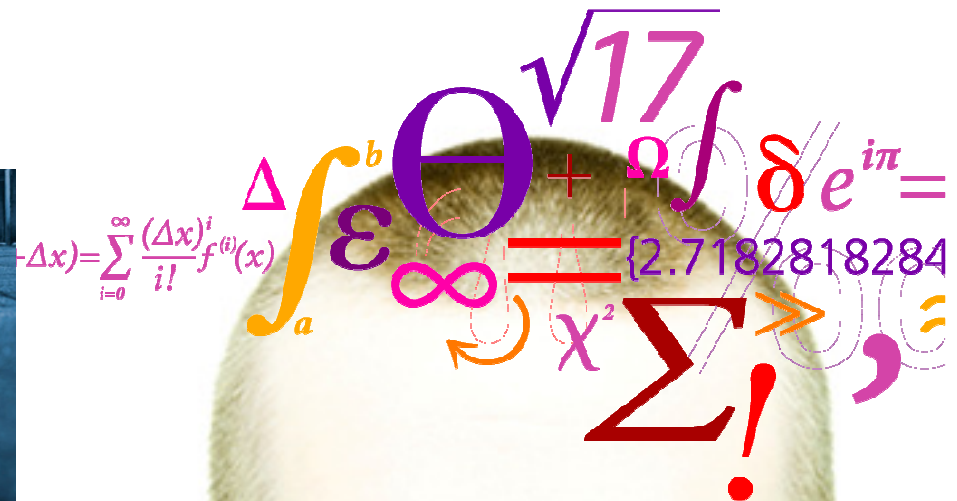
Conclusion



- Current internet is primarily an entertainment platform – suited for some gadgets, but not critical IoT applications.
- IoT will require much higher availability and security to become useful for critical applications in e.g. healthcare and other similar areas.
- IoT is not so much about high bandwidth/capacity as now – the quality of the Internet of Things will have to be measured differently than today.
- Services and infrastructure needs to more tightly integrated.
- Network elements will become service elements (e.g. basestations and accesspoint will also become a part of data and processing services)
- Generic platforms (open?) are essential.
- Trusted service management a must!!

Thank you

Please visit



Smart Urban Services - SUS

<http://www.lightinglab.dk/UK/DOLL-news/News/?id=689>