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What exactly is the Internet of Things?

IoT is driven by a combination of:

1

THINGS

A collection of smart products, sensor-enabled devices, and other Things

2

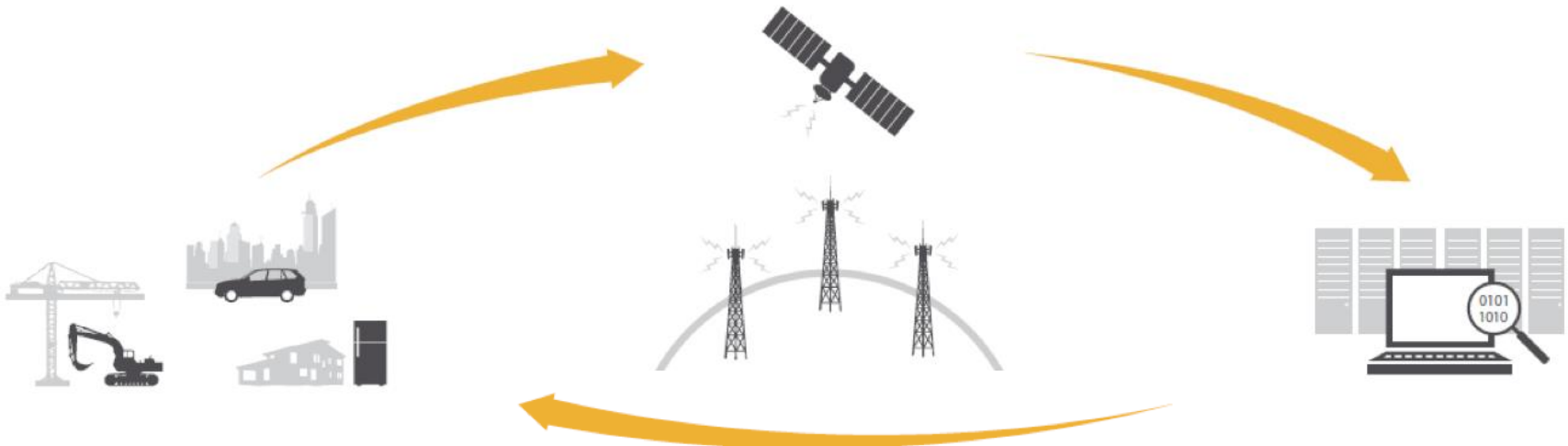
CONNECTIVITY

Smart Things are connected through and Internet-like communication infrastructure

3

BUSINESS & COMPUTING INFRASTRUCTURE

Connected to an infrastructure that includes people, business processes, and systems



2020 Forecast	North America	EMEA	LATAM	APAC	TOTAL
IT	\$1.60 T	\$1.40 T	\$0.30 T	\$1.70 T	\$5.00 T
IoT	\$0.44 T	\$0.36 T	\$0.02 T	\$0.86 T	\$1.68 T

Market Segmentation IOT

Smart Things:
wearables

Smart Home:
Thermostats, Water heaters, Alarm systems

Smart Transport:
driver less cars and trucks

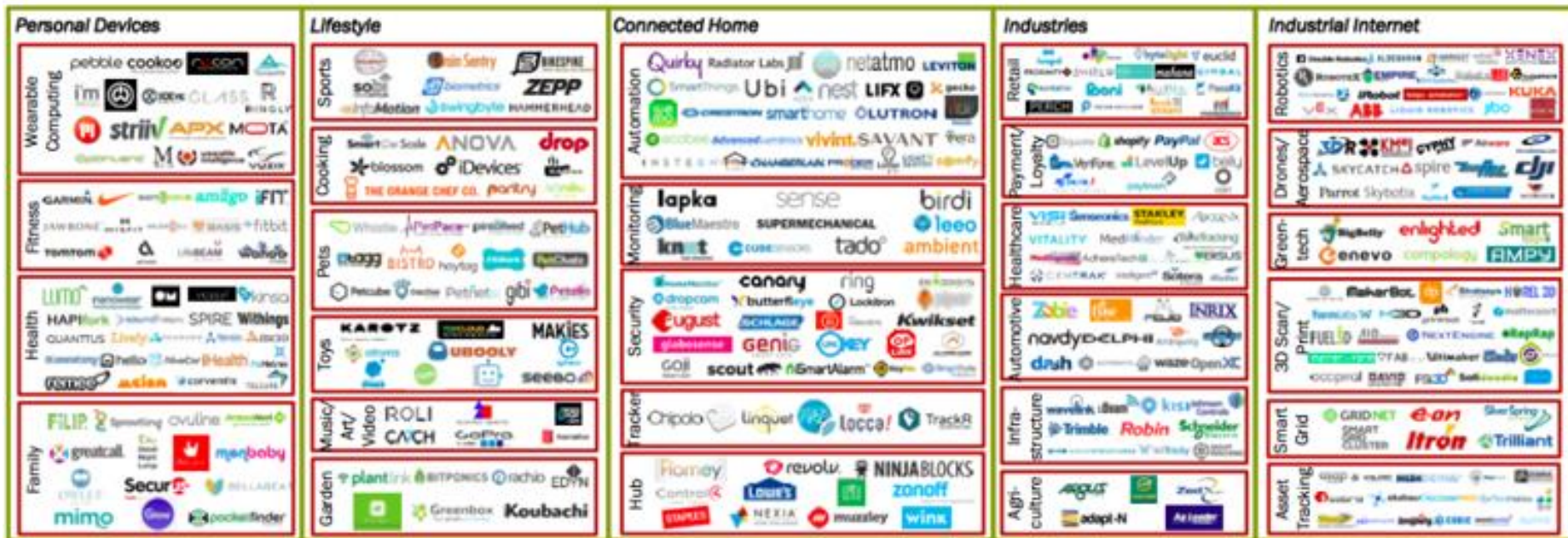
Smart Cities:
smart Street lights, Cameras, Waste Containers

Smart Industry:
Factory automation, motion control, Smart Meters



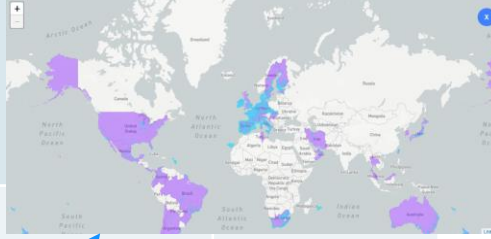


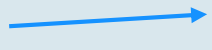
Intelligent device components

- Sensing and Actuating
Pressure, Temperature, Humidity, Light, Touch, etc.
- Connectivity:
Bluetooth Low Energy, NFC, Wifi, Lora, Sigfox, MQTT etc..
- Signal Conditioning and Protection:
Opmap
- Power and Energy Management:
Power Management IC's, Intelligent Power Switches



Overview IOT Connectivity Layers

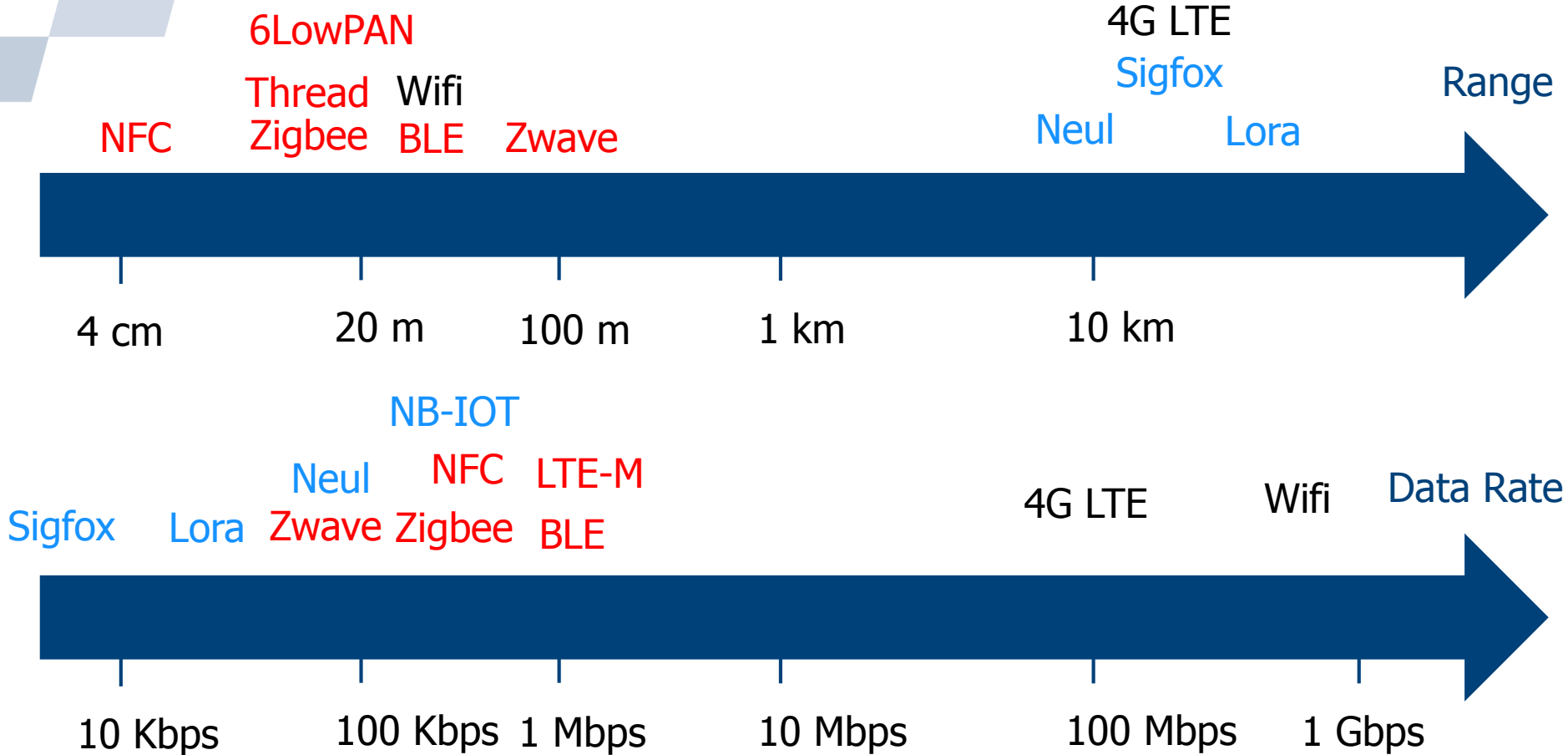
Layer	Standards			
Application	OMA-LWM2M, OMA-DM TR-069		Compatible with hue 	
Protocol	HTTP, MQTT, COAP, XMPP	Z wave	Zigbee Mi Wi Thread	Sigfox
Transport	TCP, UDP			
Network	IPv4, IPv6, 6LoWPAN			
Link/Physical	IEEE 802.3 (Eth) 802.11 (Wifi) IEEE 802.15.1 (BLE) Lora IEEE 802.15.4 (LR-WPAN)	ITU-T G.9959	IEEE 802.15.4 (LR-WPAN)	LTE-M NB-IOT



Overview IOT Connectivity

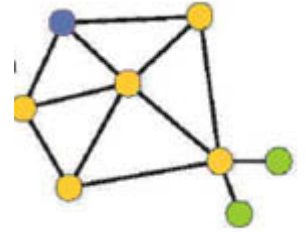
Low Rate Personal Area Network

Low Power Wide Area Network



IOT vs IT

- Lower use of system resources on the host
- Lower Data Rates
- Mesh topologies for Low range vs Star
- Very low latency required
- Lower power consumption - Sleep mode
- Sub GHz Frequency band used (Lora, Sigfox, Z wave)
- Larger number of systems need to be connected



IOT security challenges: Generic

- New attack vectors
- Lack of standards/proprietary protocols
- Physical access to the device
- Malware attacks
- Attacks in the RF spectrum
- The gateway will be a main target

IOT security challenges: Devices

- Single encryption key on all produced devices
- Default Passwords (that can't be changed)
- Manage security updates including patching:
roll out progressively
- Bluetooth pin
- Backdoors

Summary

- There is more to IOT than just IT.
- Use the communication protocol depending on your requirements (distance, data rate, power usage)
- Cybersecurity is a main challenge in adopting IOT.
- Focus on securing the complete end to end chain.