THE NETWORKED SOCIETY

ERICSSON

CHALLENGES AND OPPORTUNITIES

Ulf Wahlberg
VP Industry and Research Relations
Ericsson

NETWORKED SOCIETY
THE 5TH TECHNOLOGY REVOLUTION

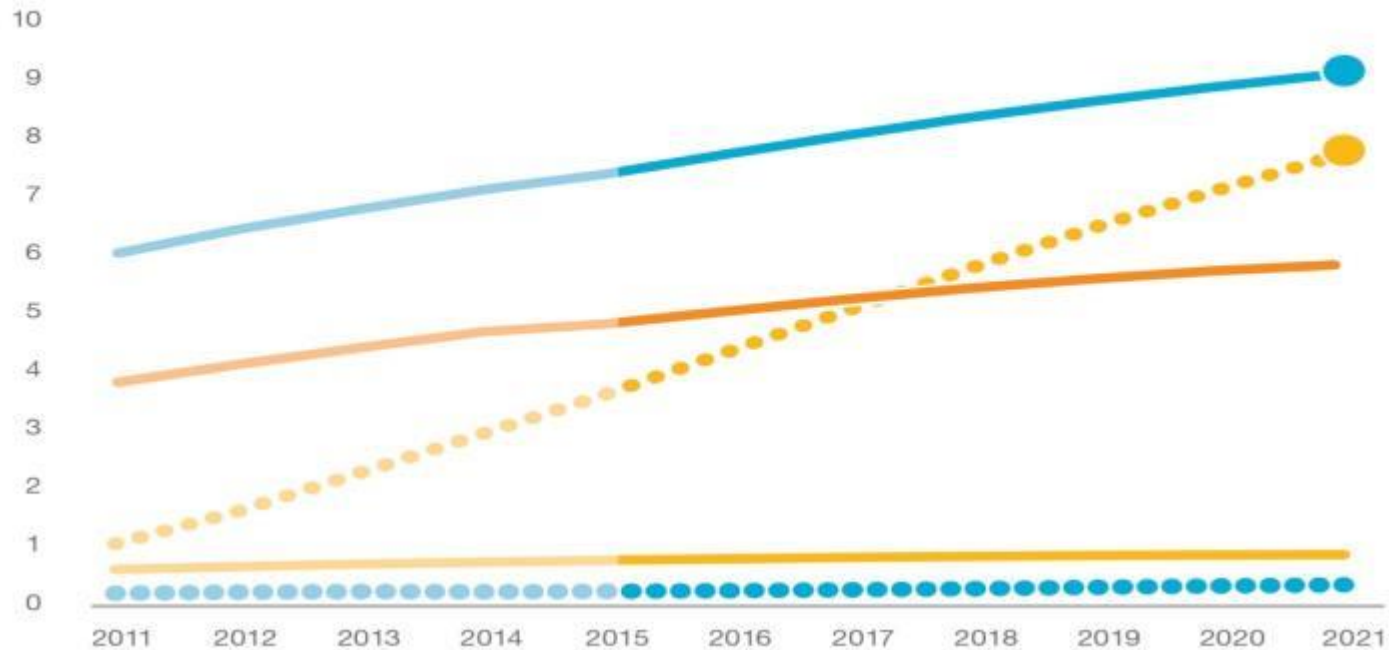INSTALLATION

DEPLOYMENT

MOBILITY

BROADBAND

CLOUD

85% OF MOBILE SUBSCRIPTIONS WILL BE FOR MOBILE BROADBAND IN 2021

Subscriptions/lines, subscribers (billion)

By the end of 2021:
- 9.1 billion mobile subscriptions
- 85% of mobile subscriptions will be for mobile broadband
- 150 million 5G-subscriptions

What is a 5G subscription?
A 5G subscription requires a device capable of supporting LTE Evolved or NX, connected to a 5G-enabled network, supporting new use cases.

Legend:
- Mobile subscriptions
- Mobile broadband subscriptions
- Mobile subscribers
- Fixed broadband subscriptions
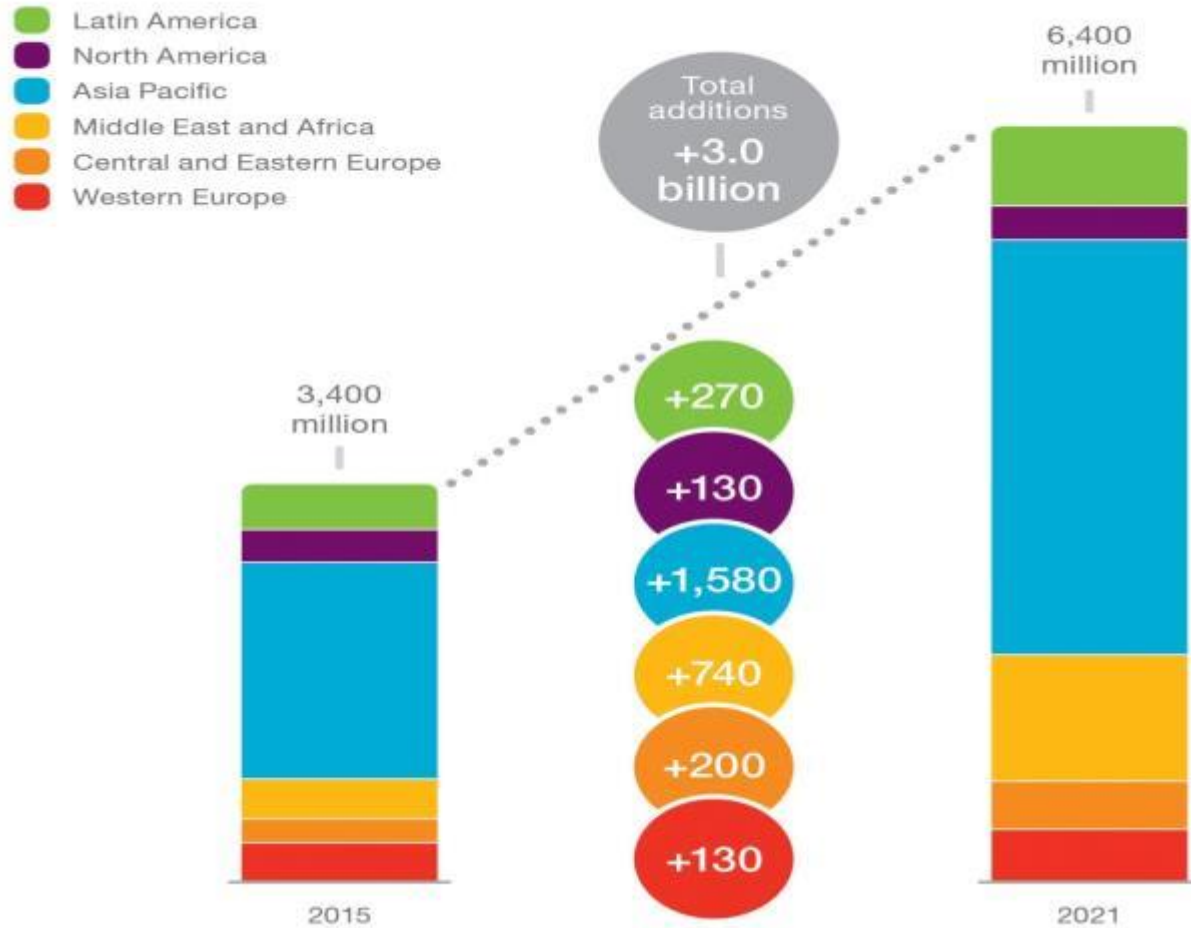- Mobile PCs, tablets and mobile router subscriptions

SMARTPHONE SUBSCRIPTIONS SET TO ALMOST DOUBLE BY 2021

Smartphone subscriptions per region 2015–2021

- Latin America
- North America
- Asia Pacific
- Middle East and Africa
- Central and Eastern Europe
- Western Europe

Total additions
+3.0 billion

6,400 million

3,400 million

+270
+130
+1,580
+740
+200
+130

2015

2021

Smartphone subscriptions in the Middle East and Africa region will grow more than 200% between 2015-2021

CONNECTED DEVICES

Connected devices
In our forecast a connected device is a physical object that has an IP stack, enabling two-way communication over a network interface.

› Anticipating the effects of increased industry focus, 3GPP standardization of LTE-based Narrowband-IoT technology and other enhancements – e.g. in provisioning, device management, service enablement – the number of cellular connected devices is expected to grow

› In total, around 28 billion connected devices are expected by 2021, of which more than 15 billion will be connected M2M and consumer electronics devices.

› 1.5 billion M2M and consumer electronic devices with cellular subscriptions by 2021
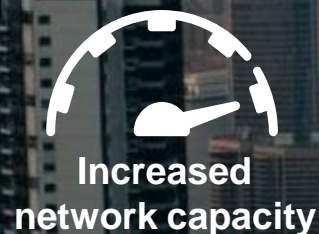
Connected devices (billions)

	15 billion	28 billion
M2M: non-cellular	2.6	10.7
M2M and consumer electronics; cellular	0.4	1.5
Consumer electronics; non-cellular	1.6	3.1
PC/laptop/tablet	2.4	2.8
Mobile phones	7.1	8.7
Fixed phones	1.3	1.4

	2015	2021

EVERYTHING THAT CAN BENEFIT FROM BEING CONNECTED WILL BE CONNECTED

ROBOTS

DEVICES

MACHINES & VEHICLES

EMBEDDED

NEW OPPORTUNITIES
– NEW CHALLENGES

Open and capable devices
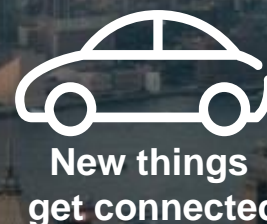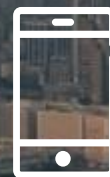
Enhanced focus on Security & Privacy

Increased network capacity

New things get connected

Sustainable

An IP based unified global network

More services get networked

Secure

More cloud storage & services

More decisions based on real-time data

More commerce & financial transactions

WIRELESS ACCESS GENERATIONS

The foundation of mobile telephony

Mobile telephony for everyone

The foundation of mobile broadband

The evolution of mobile broadband

Non-limiting access; anywhere, anytime, anyone, anything

1G
AMPS TACS NMT

2G
GSM D-AMPS PDC IS-95

3G
WCDMA/HSPA cdma2000

4G
LTE

5G

~1980

~1990

~2000

~2010

~2020

SECURITY DRIVERS FOR 2G, 3G, 4G

One basic service to protect
- Connectivity, in particular voice

Security needed for trust and business
- User privacy: user data encryption, basic identity protection
- Reliable charging: strong authentication

Slight changes in threats over time
- Mainly incremental improvements in new generations

Has worked very well
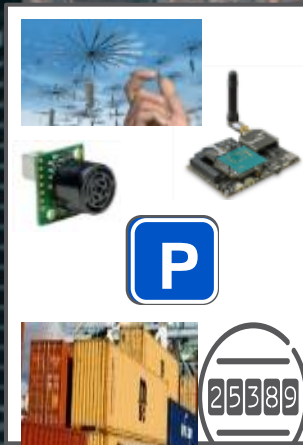- Some "legacy" crypto problems in 2G, but largely a success

5G – BEYOND MOBIL BROADBAND

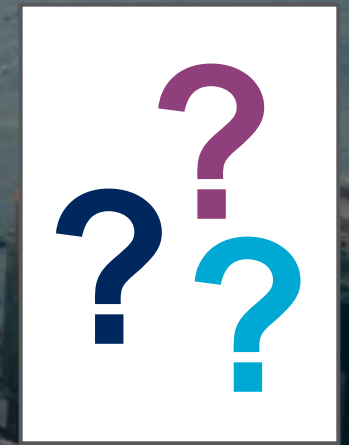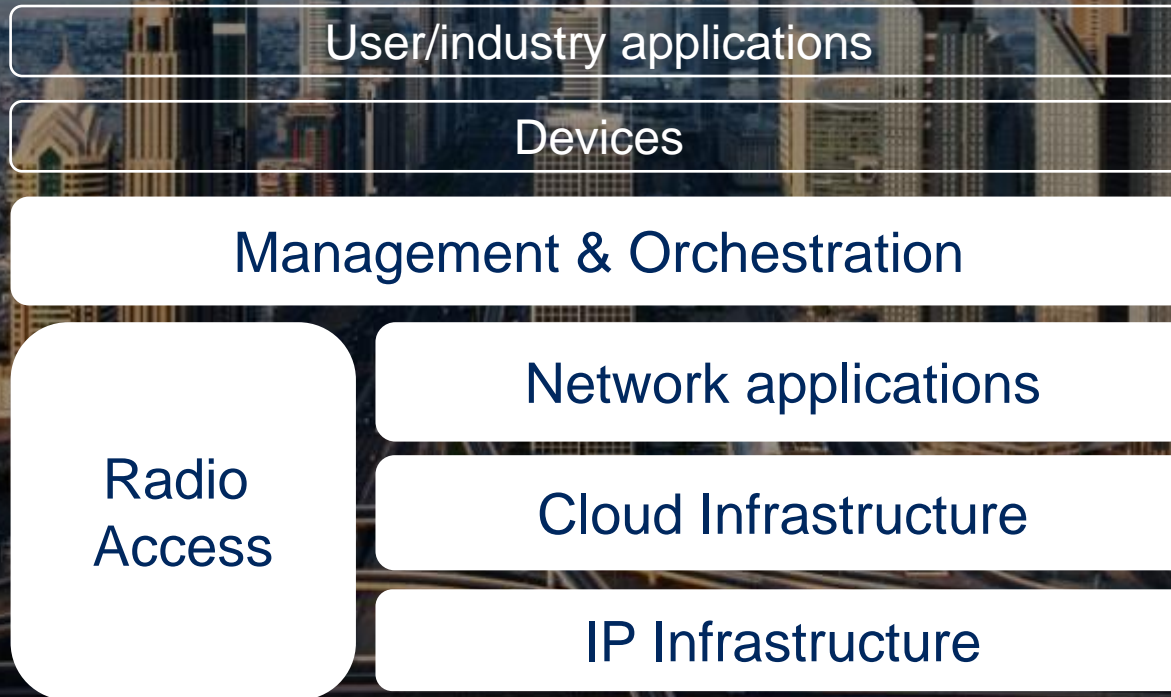| Broadband experience everywhere anytime | Mass market personalized media and gaming | Meters and sensors, "Massive MTC" | Remote controlled machines | Smart Transport Infrastructure and vehicles | Human machine interaction | And much more |

Multiple use-cases supported by a common network platform

5G NETWORK EVOLUTION TO MEET EXPECTATIONS

User/industry applications

Devices

Management & Orchestration

Radio Access

Network applications

Cloud Infrastructure

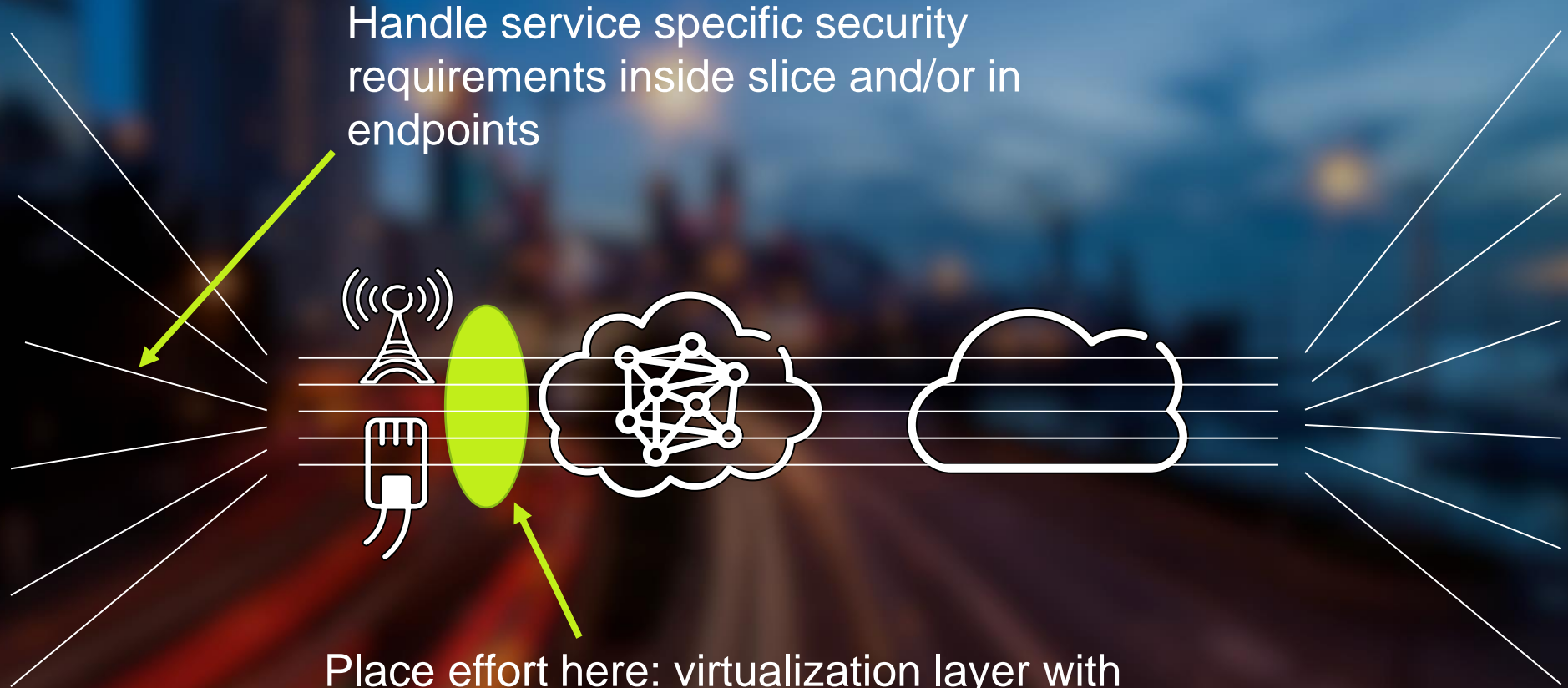IP Infrastructure

Sustainability

Security

Scope for 5G

ONE NETWORK – MULTIPLE INDUSTRIES

A common network platform with Dynamic and Secure Network Slices

ONE NETWORK – MULTIPLE INDUSTRIES

Handle service specific security requirements inside slice and/or in endpoints

Place effort here: virtualization layer with strong assurance on security/isolation

5G: PUSHING THE ENVELOPE

1000X
Mobile Data Volumes

5X
Lower Latency

10X
Battery Life

10-100X
End-user Data Rates

10-100X
Connected Devices

Critical Communications

<5ms e2e delay
99.999% transmission reliability
500Kmph relative velocity

Extreme availability

Intelligent Transport Systems

Massive Communications

>10yrs battery lifetime
>80% cost reduction
20dB better coverage

Scalability and flexibility

Connected Sensors

Source: METIS

MACHINE TYPE COMMUNICATION

Massive MTC

Low cost
Low energy
Small data volumes
Massive numbers
Long ranges

Critical MTC

Ultra reliable
Very low latency
Very high availability
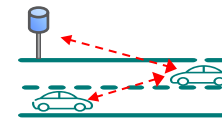
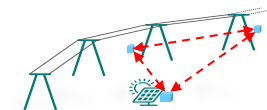Sensors, actuators   Smart buildings   Capillary networks
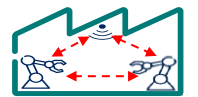
Traffic safety & control   Smart grid   Industrial applications

WHAT DEFINES 5G SECURITY?

NEW BUSINESS & TRUST MODELS

NEW SERVICE DELIVERY MODELS

INCREASED PRIVACY CONCERNS

EVOLVED THREAT LANDSCAPE

5G SECURITY IS NOT ABOUT "BIT-RATES" ETC, IT'S A NEW GAME!

SECURITY FOCUS AREAS FOR THE ICT INDUSTRY

Keep unwanted traffic at bay

Secure software practices

Building trust in clouds

Security assurance
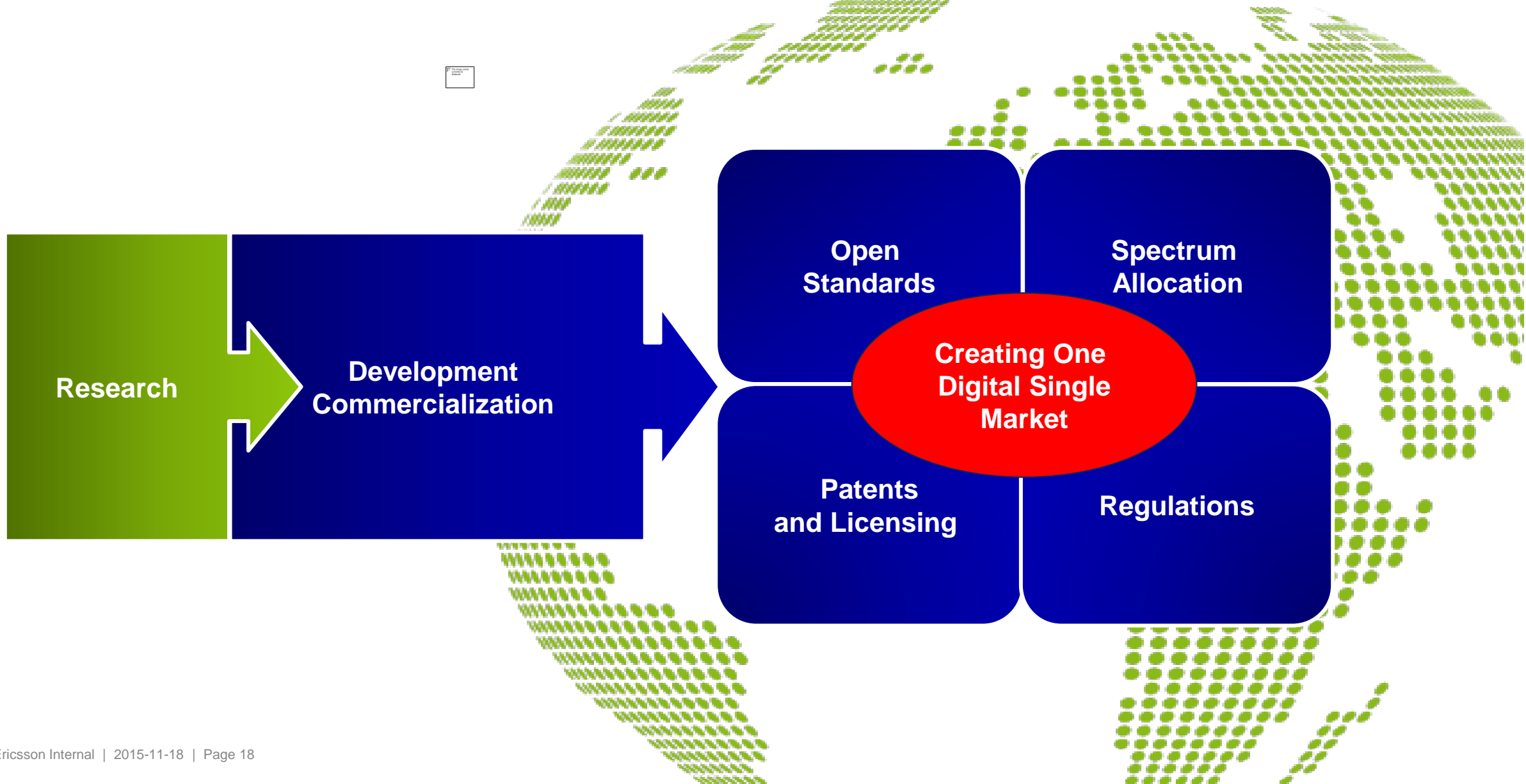
Secure virtualization

Security for big data

Device and platform security

Identity management

TOWARDS ONE DIGITAL SINGLE MARKET ENABLING INNOVATIVE SERVICES AND PRODUCTS

Research

Development Commercialization

Open Standards

Spectrum Allocation

Patents and Licensing

Regulations

Creating One Digital Single Market

ERICSSON