

# **5G Architecture and Implementation Panel Discussion**

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# The Big Picture – A Growing ICT Industry

## Mobility

- 1G → 2G → 3G → 4G → 5G
- 11b → 11g → 11n → 11ac & 11ad → 11ax & NG60

## Computing

- Mainframe → PC → Smartphone → Wearable → Sensor

## Internet

- Email → Web → Search → Social Network → Cloud Computing & IoT

## Content

- Voice → Video → HD/UHD → 360° Video → Virtual Reality → ...

## Big Data

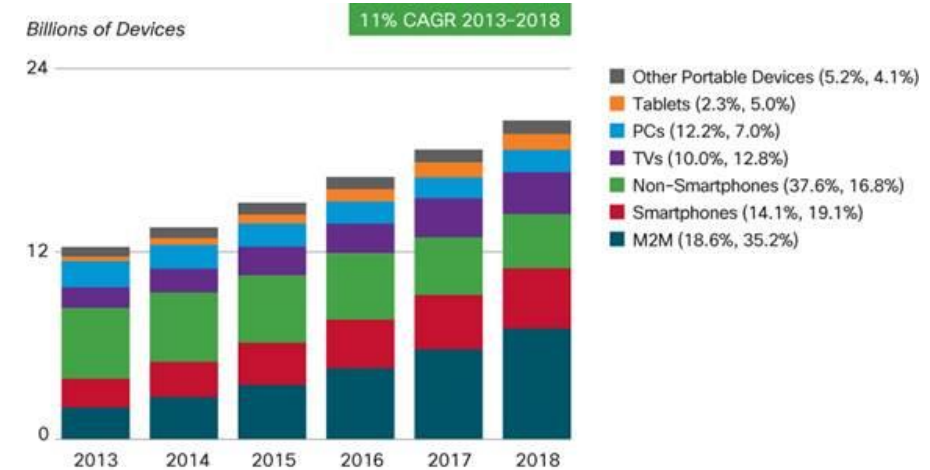
- Big data analytics, Deep Learning, ...

## The Rise of Machines

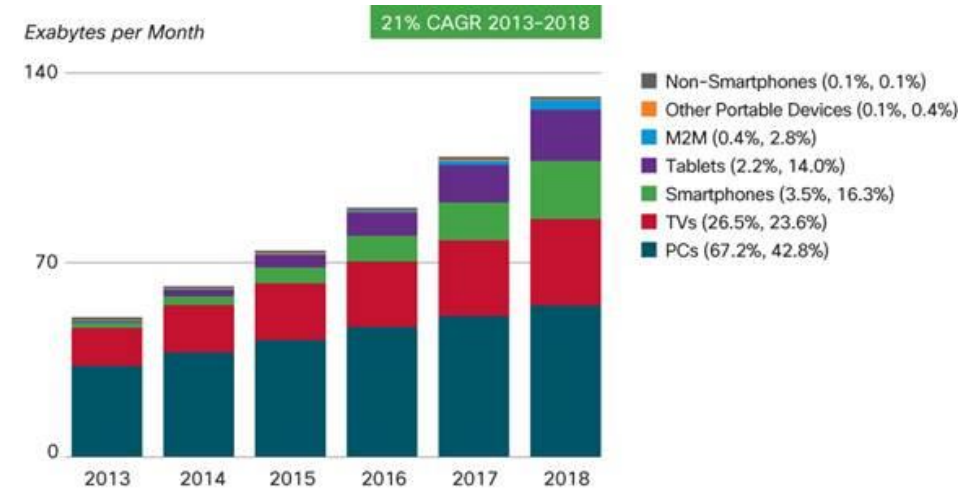
- Remotely controlled and self-operating cars, drones, robots, ...

## Applications and Services

- Think of anything? There is an app for that (If not, somebody will make one)
- Everything is possible (although not everything will be successful)



Source: Cisco VNI, 2014  
The percentages in parentheses next to the legend denote the device share for the years 2013 and 2018, respectively.



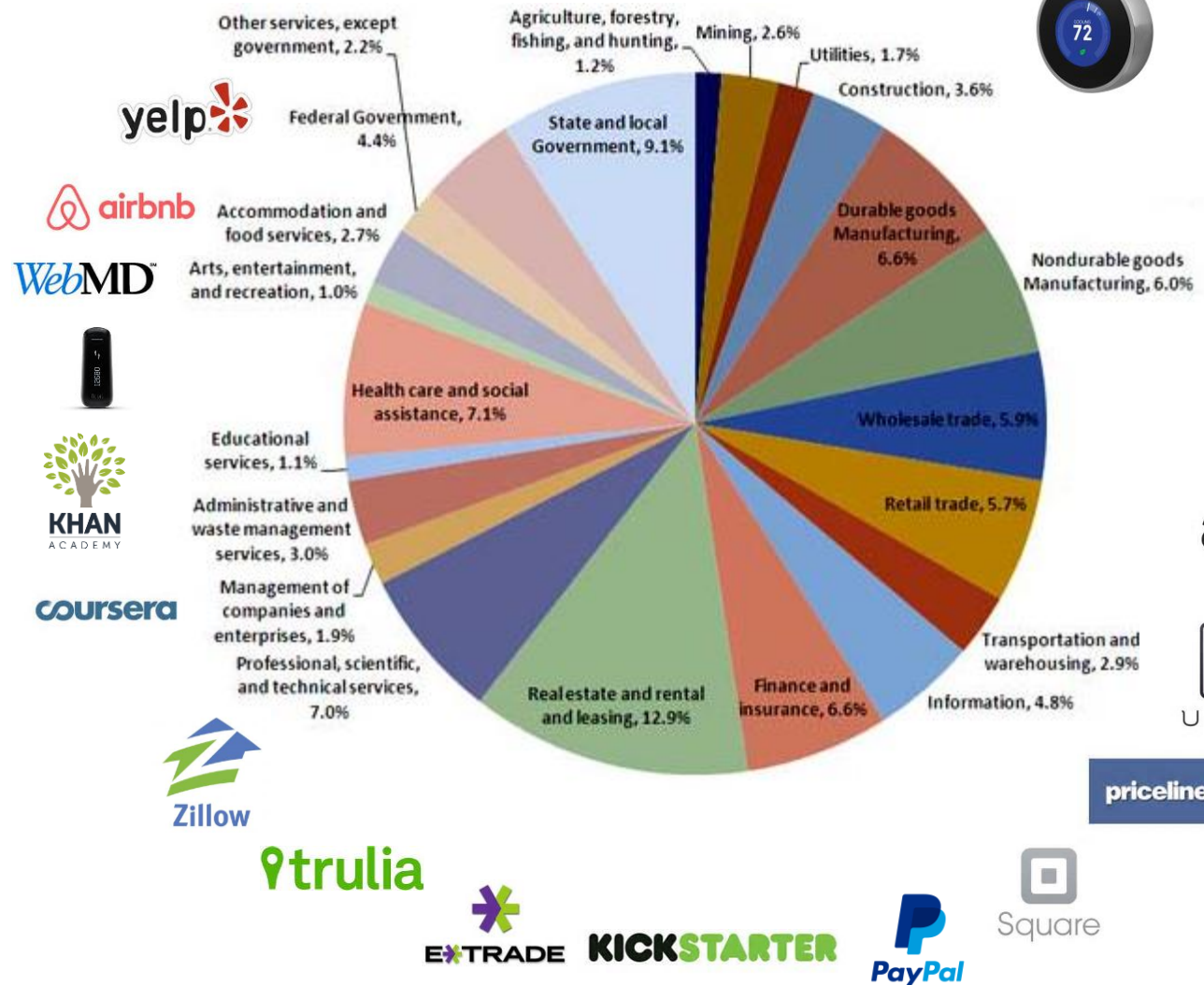
Source: Cisco VNI, 2014  
The percentages in parentheses next to the legend denote the device traffic shares for the years 2013 and 2018, respectively.

# The Bigger Picture - A Connected World

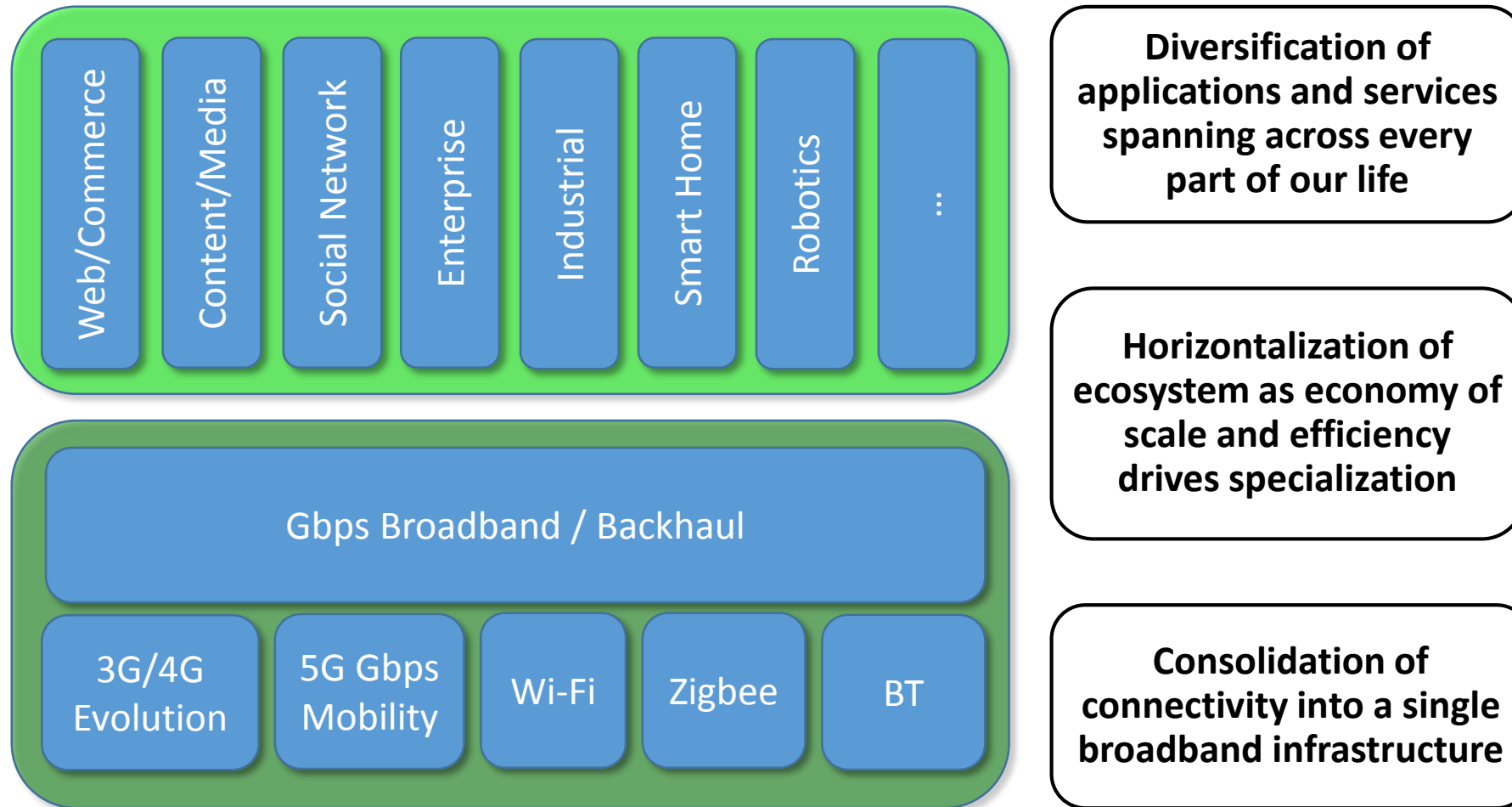
## A rising tide lifts all boats

- ICT accounts for 4.8% of U.S. GDP (2012)
- ICT contributes to
  - 60% of U.S. total factor productivity growth in 1996 - 2007
  - Virtually all growth in labor productivity in U.S. in 1995 – 2002

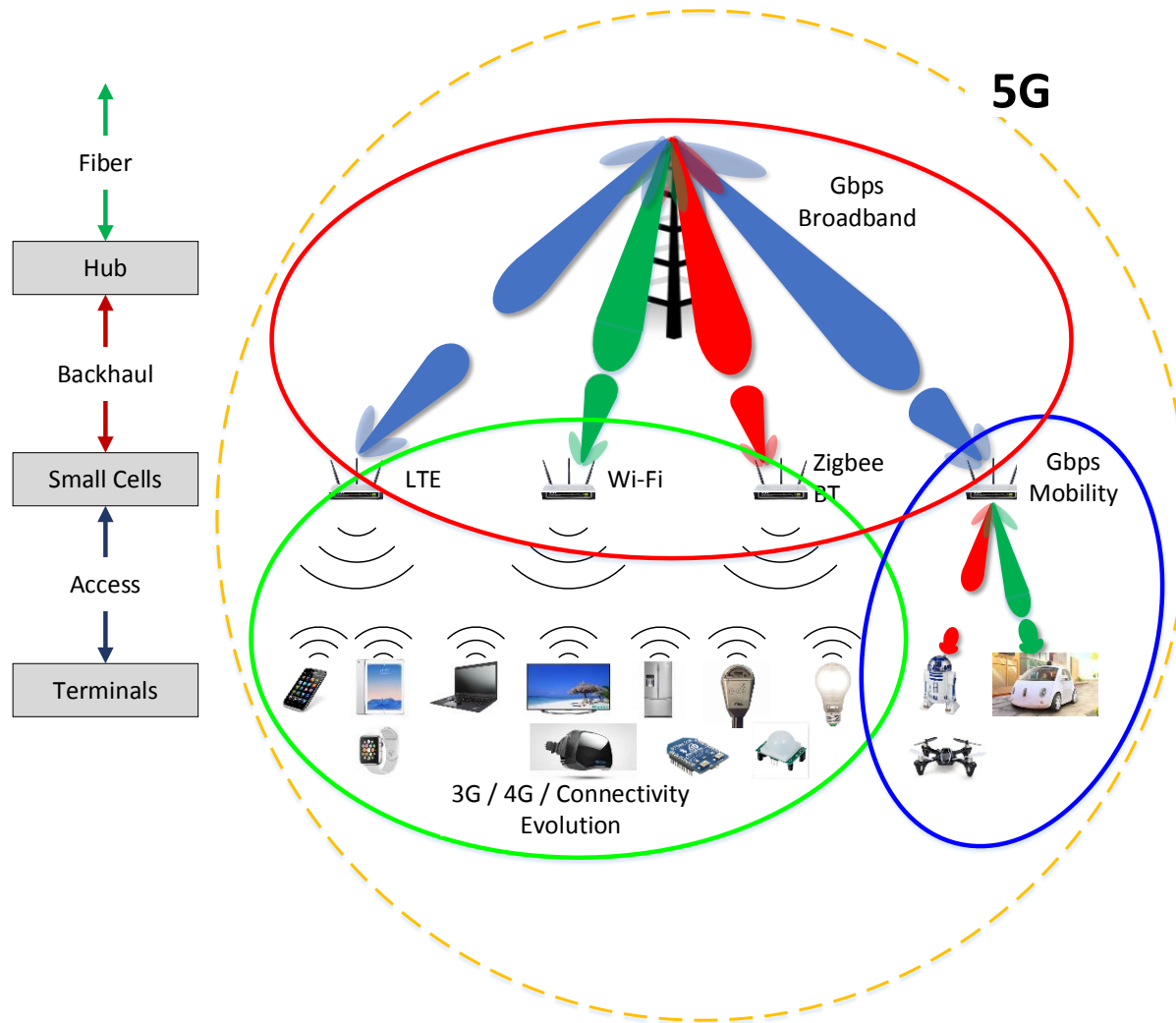
The world, the economy, and our lives are being digitized, connected, and mobilized



# A Digitized, Connected, and Mobilized World



# 5G Broadband Infrastructure

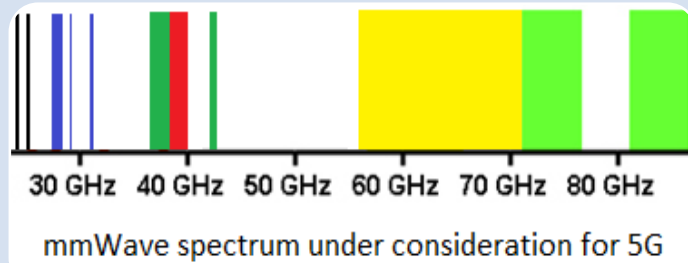


Gbps Broadband  
(& Backhaul)

Gbps Mobility

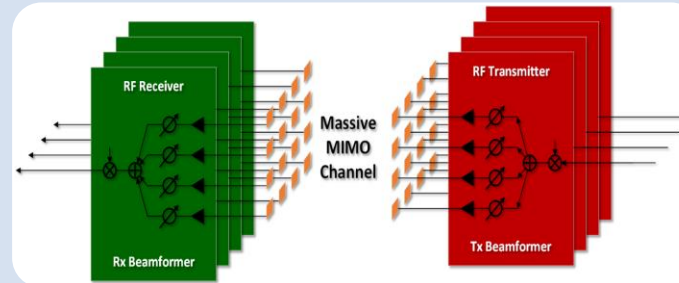
Multi-Radio Access  
Technology Integration

# 5G Key Technologies



Millimeter  
Wave

More  
Spectrum



Massive  
MIMO

Better  
Spectral Efficiency



Small  
Cells

Higher  
Frequency Reuse

**Strong Value Proposition and Great Synergy in Gbps Broadband and Gbps Mobility**

# Network Transformation towards 5G

Multi-RAT integration to expand support for new applications & services

MMW Gbps Broadband to facilitate massive cell densification

MMW Gbps Mobility to strengthen value proposition and foster killer applications

