

Cognitive Networks 5G and Beyond

Presented by: **Mostafa Essa**

For: **ETSI Summit on Artificial Intelligence**

dd.mm.2019

Outline

5G towards Connected Machines IoT

IoT Challenges and Solutions

AI and ICT Story

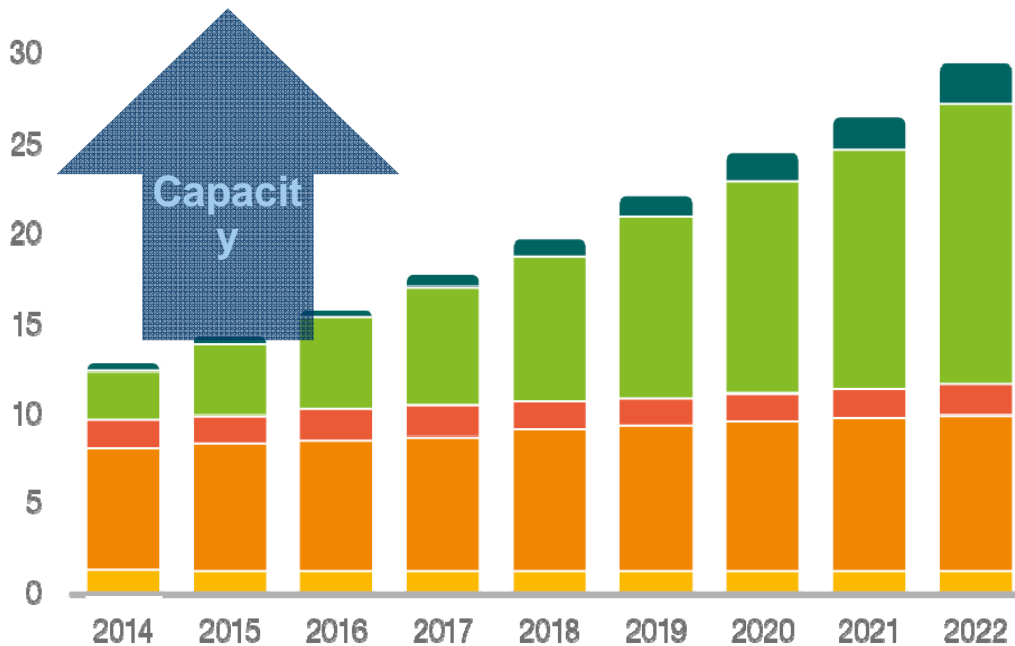
Radio Access Drones

Cognitive Het-Nets

New Vulnerabilities

5G towards Connected Machines IoT

Connected devices (billions)

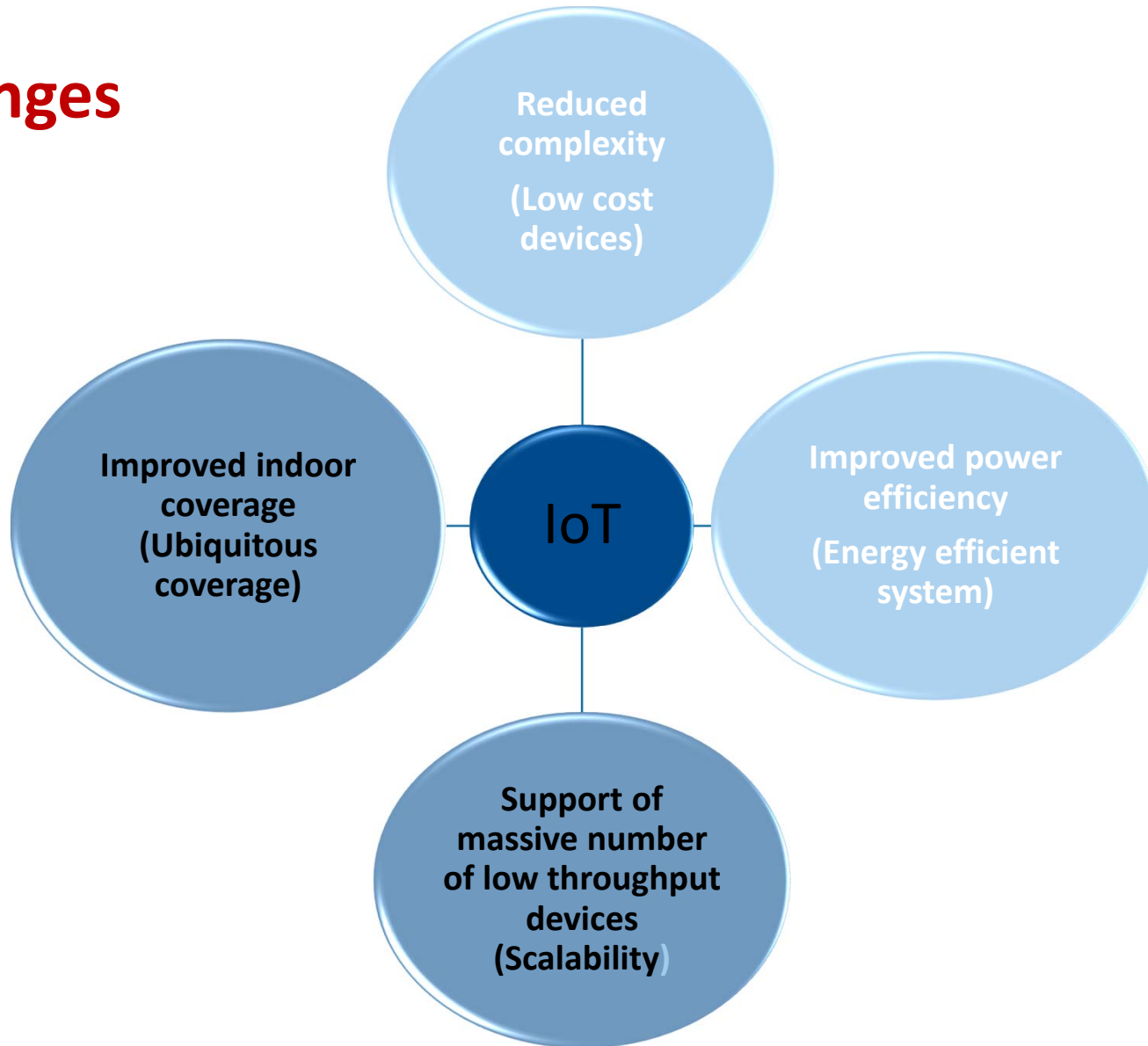
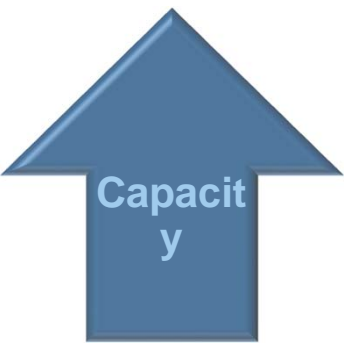


	2016	2022	CAGR
Wide-area IoT	0.4	2.1	30%
Short-range IoT	5.2	15.5	20%
PC/laptop/tablet	1.6	1.7	0%
Mobile phones	7.3	8.6	3%
Fixed phones	1.4	1.3	0%
	16 billion	29 billion	

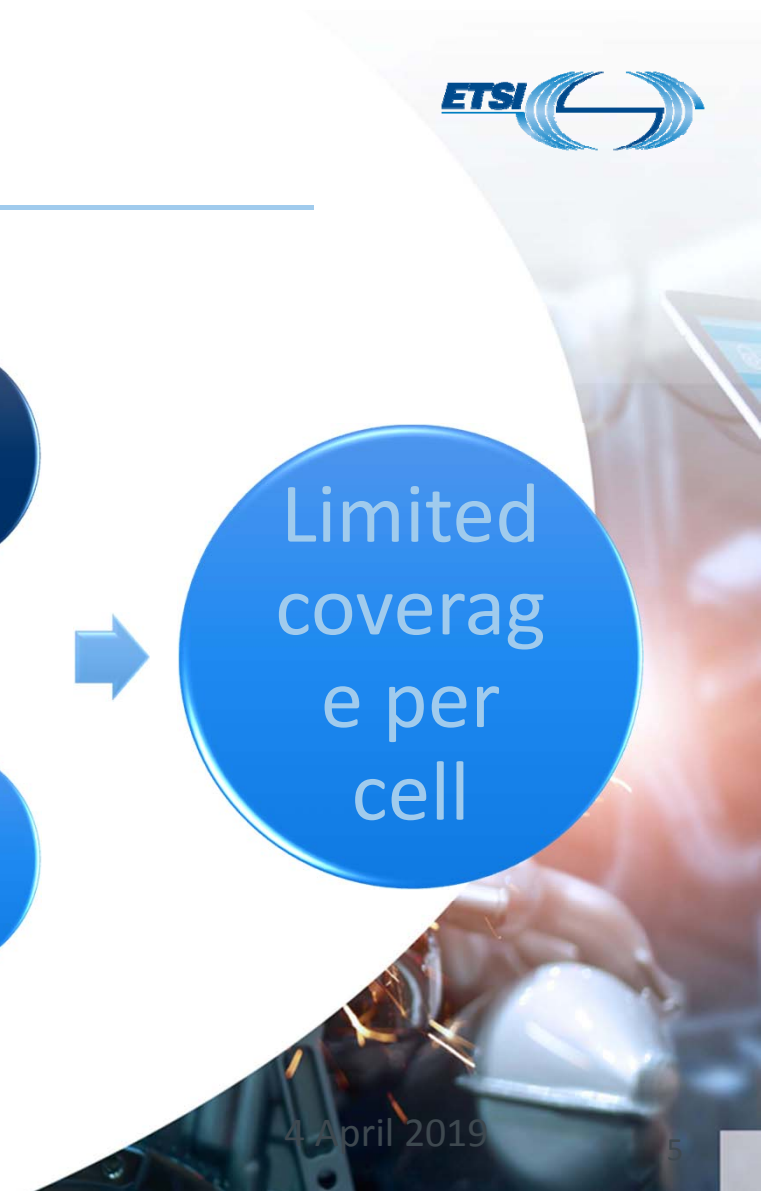
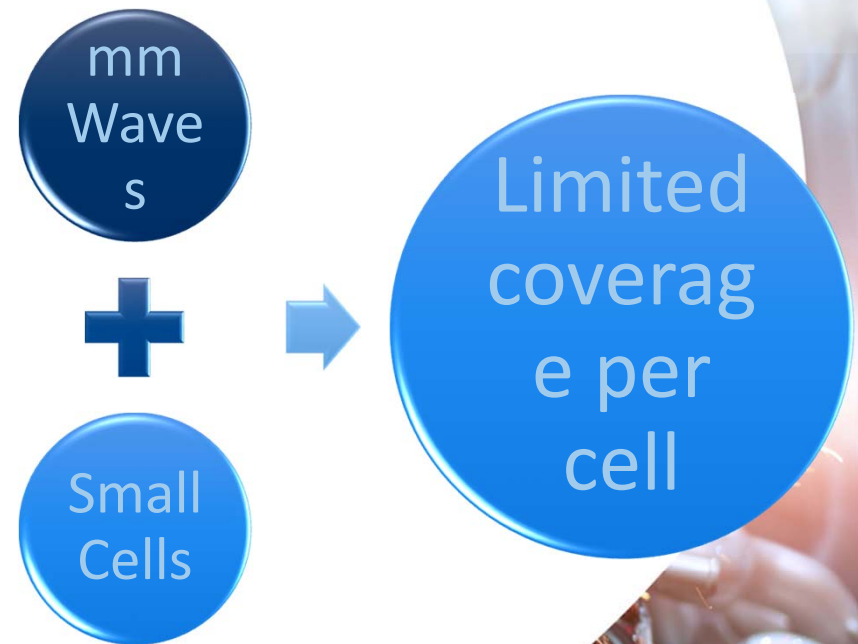
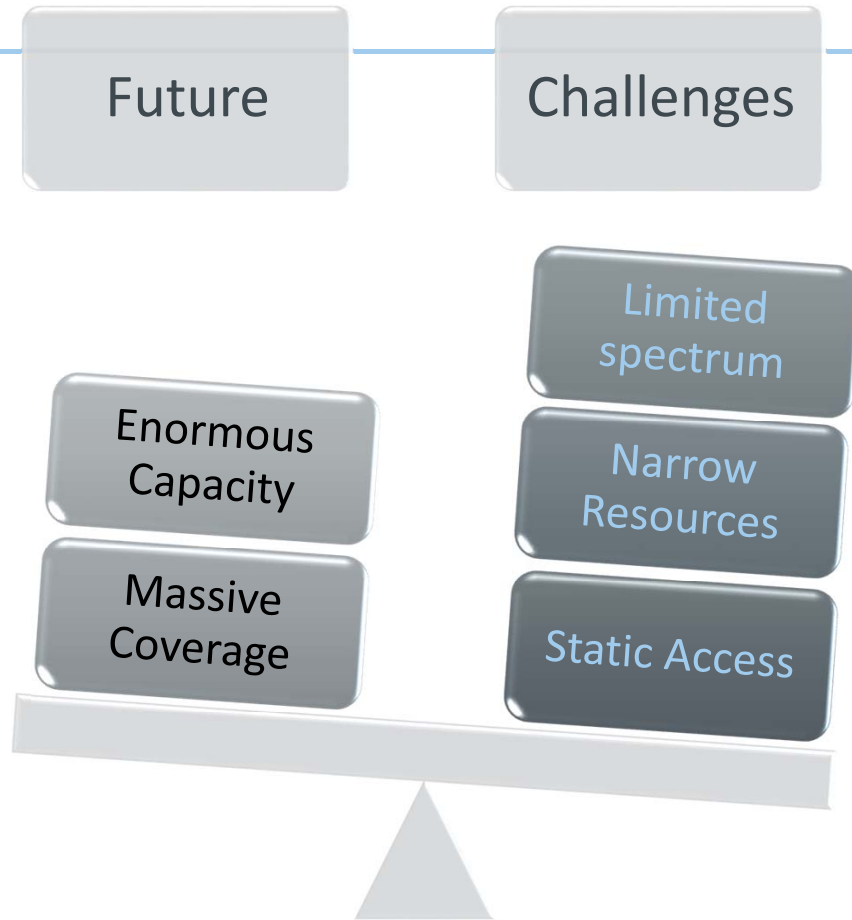
70% of wide-area IOT devices will use cellular technology in 2022

Source: Ericsson Mobility Report, June 2017

IoT Challenges



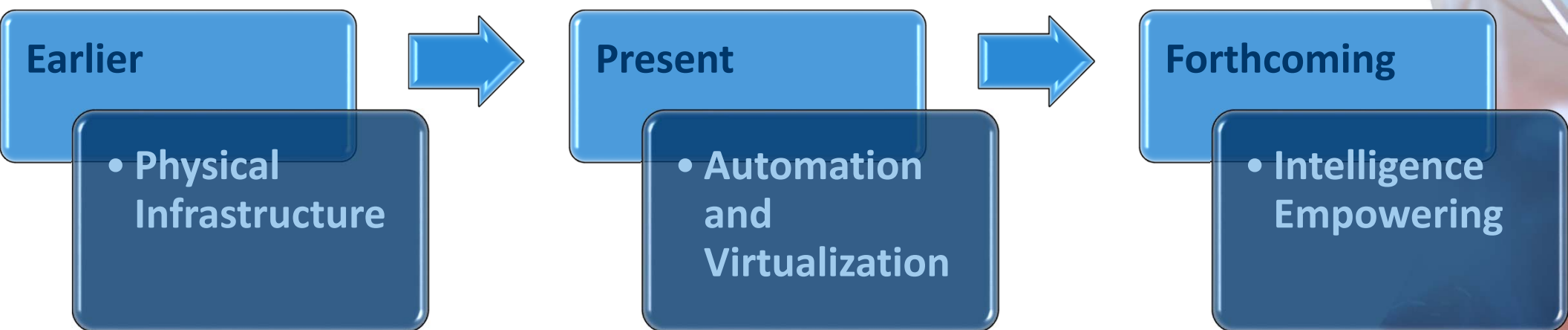
IoT Challenges and Solutions



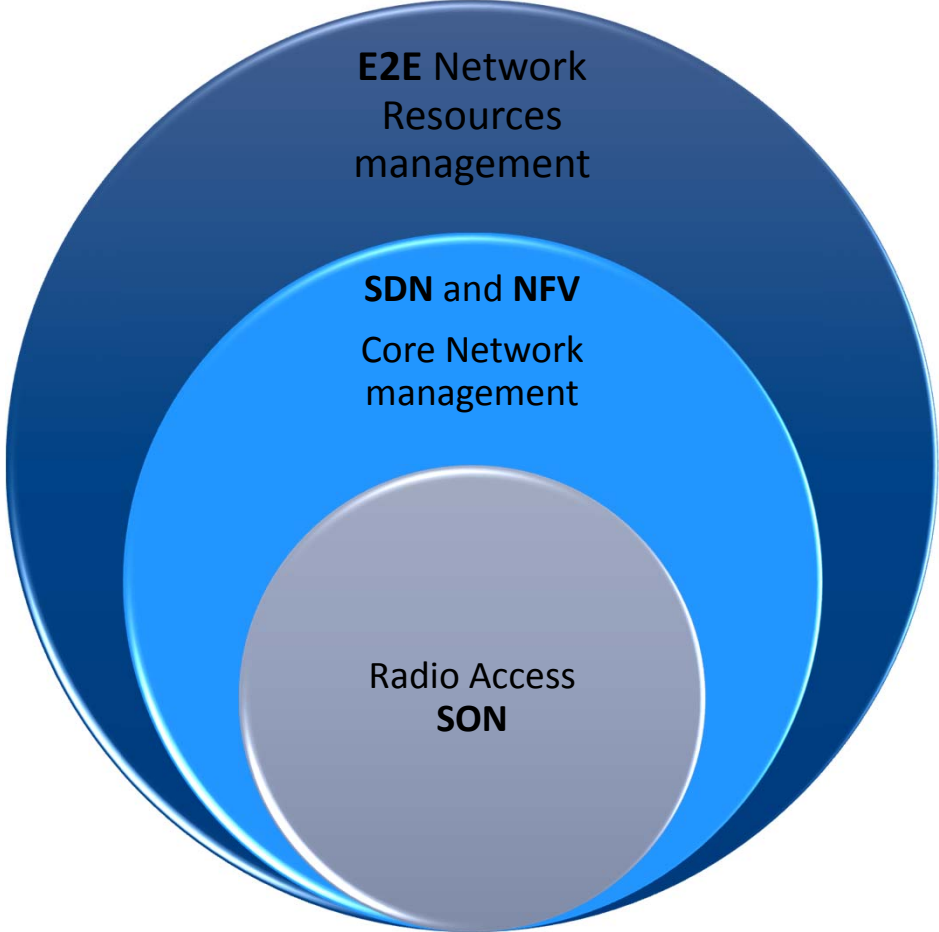


Artificial Intelligence is the Answer

Mobile Networks Evolution milestones



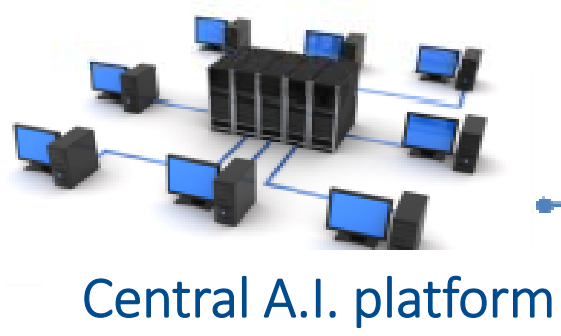
Intelligence Evolution Story



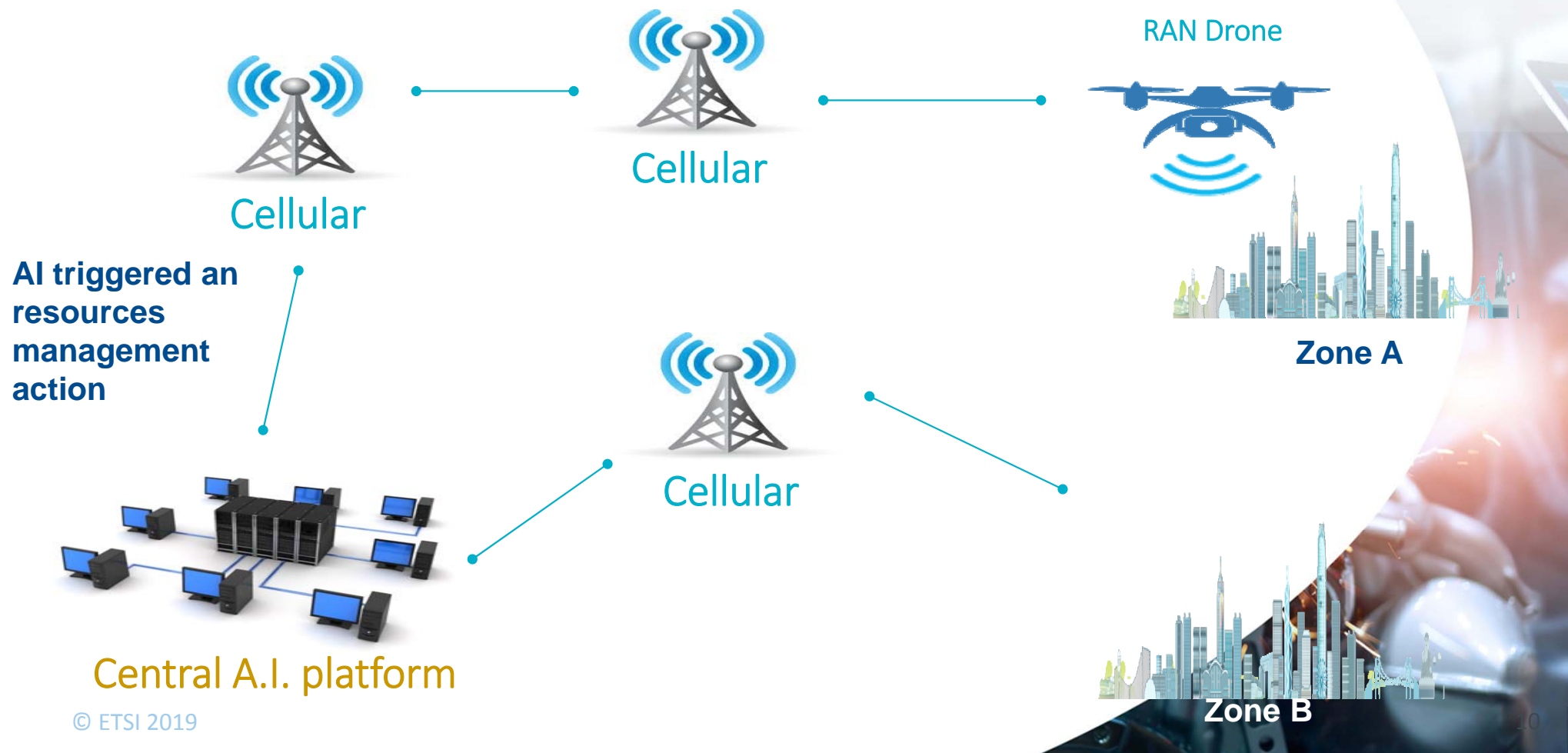
Cooperative RAN and Front Haul Drone Concept



A.I. controls fleet of RAN drones and Front Haul drones



Intelligent Networks Co. Mobile Broadband and Backhaul Concept



AI triggered an resources management action

Central A.I. platform

Vodafone Drones milestones

IOT Solution

Future proof for
RAN drones

Manned to AI
controlled drones

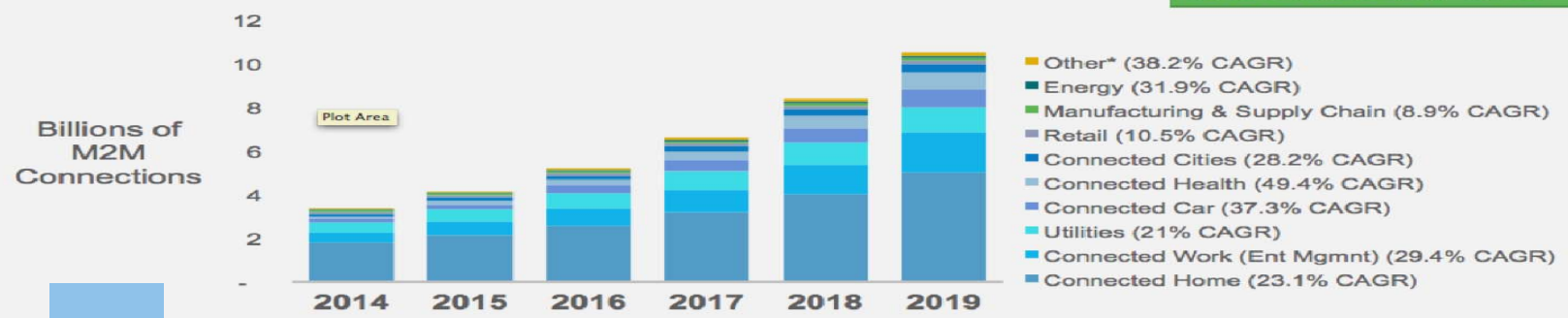


Extra Opportunity



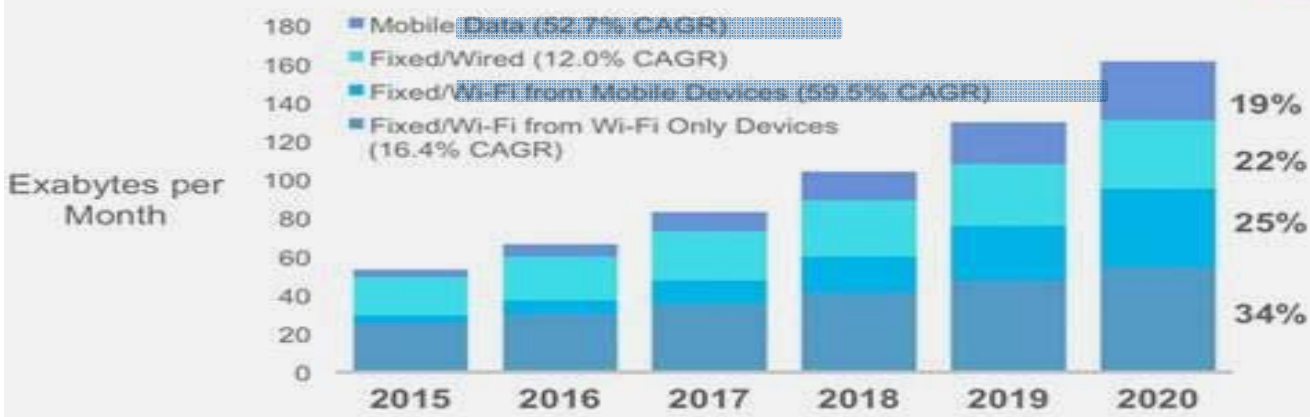
Global M2M Connections / IoE Growth By Vertical By 2019, Connected Home Largest, Connected Health Fastest Growth

26% CAGR 2014–2019

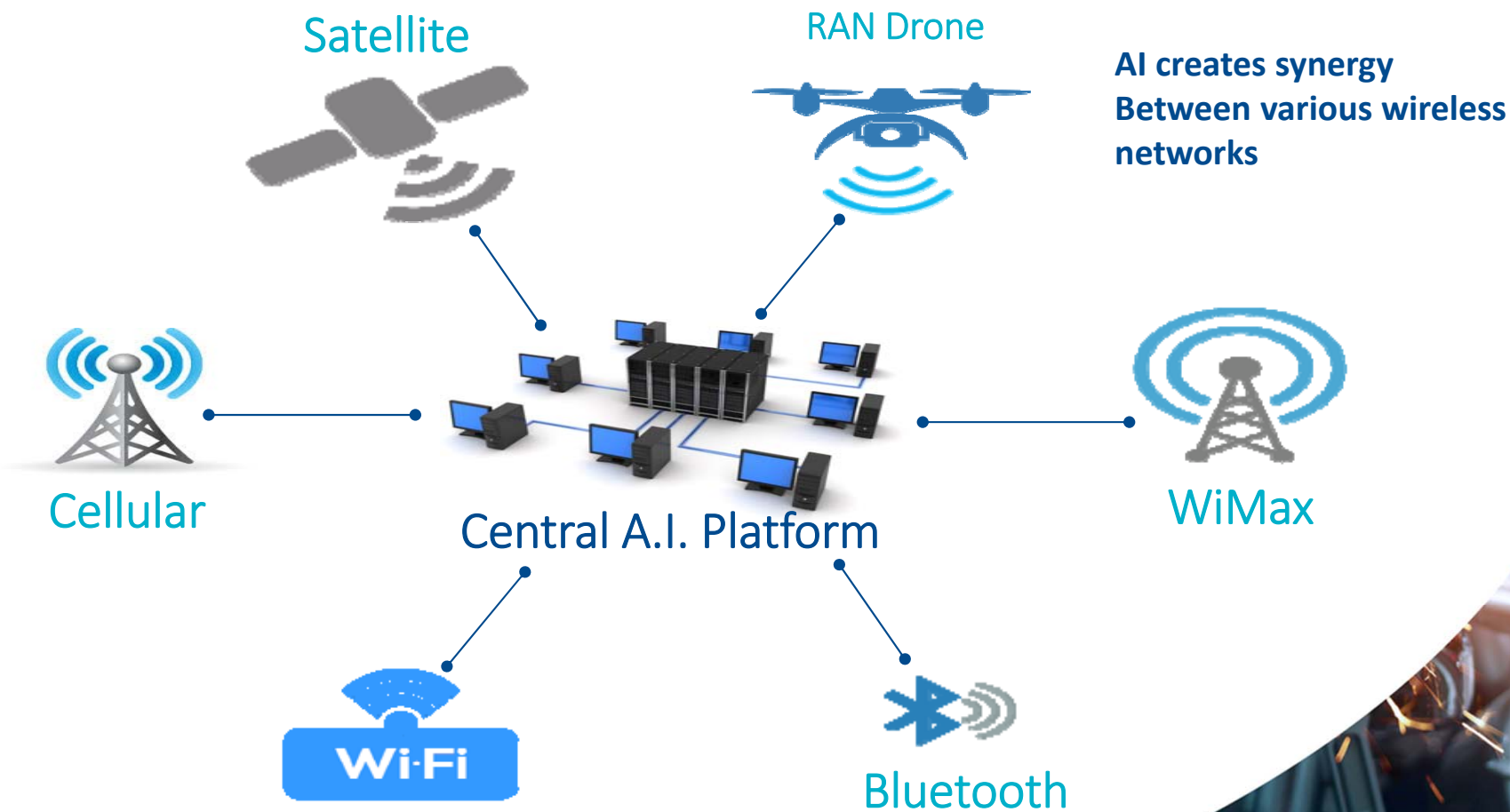


*Other includes Agriculture, Construction & Emergency Services
Source: Cisco VNI Global IP Traffic Forecast, 2014–2019

25% CAGR 2015–2020



Cognitive Heterogeneous Networks



New Vulnerabilities

Ease Accessible
Network Nodes

Hacked drones

Various Networks
Backdoors

AI is the Answer again



Q&A

