



Emerging LP-WAN Technologies

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IOT Definition

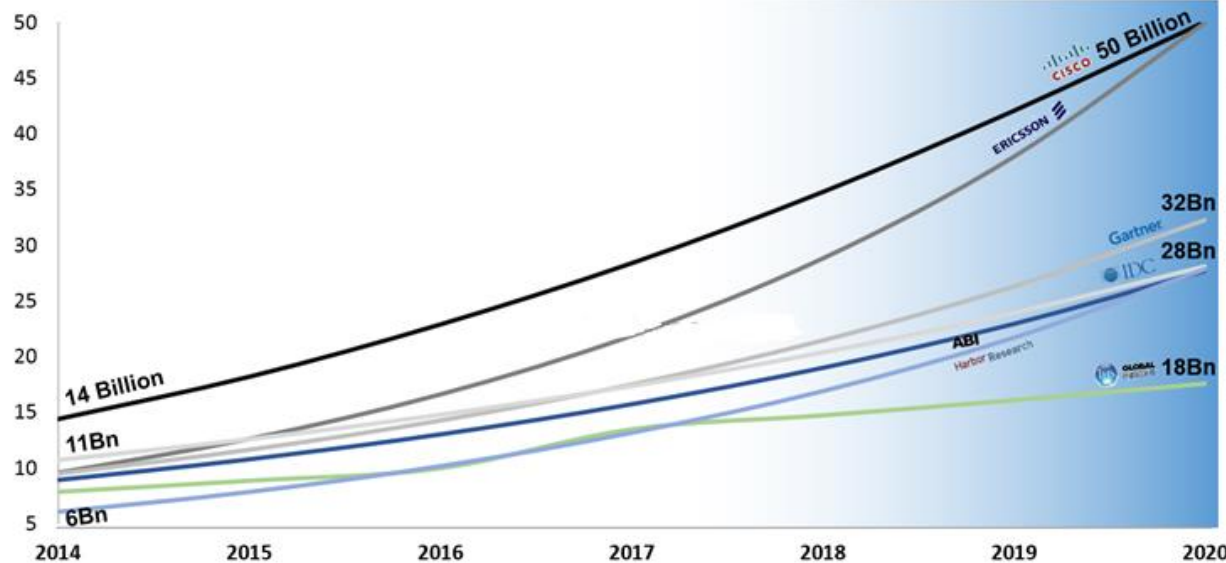
“Physical objects containing embedded Internet Protocol (IP) communications technology that can be overserved or controlled via a network”

Broad Range of IOT Estimates

IoT Analytics - Quantifying the connected world

Global IoT/IoE device forecasts

of worldwide connected devices² (in Billion)



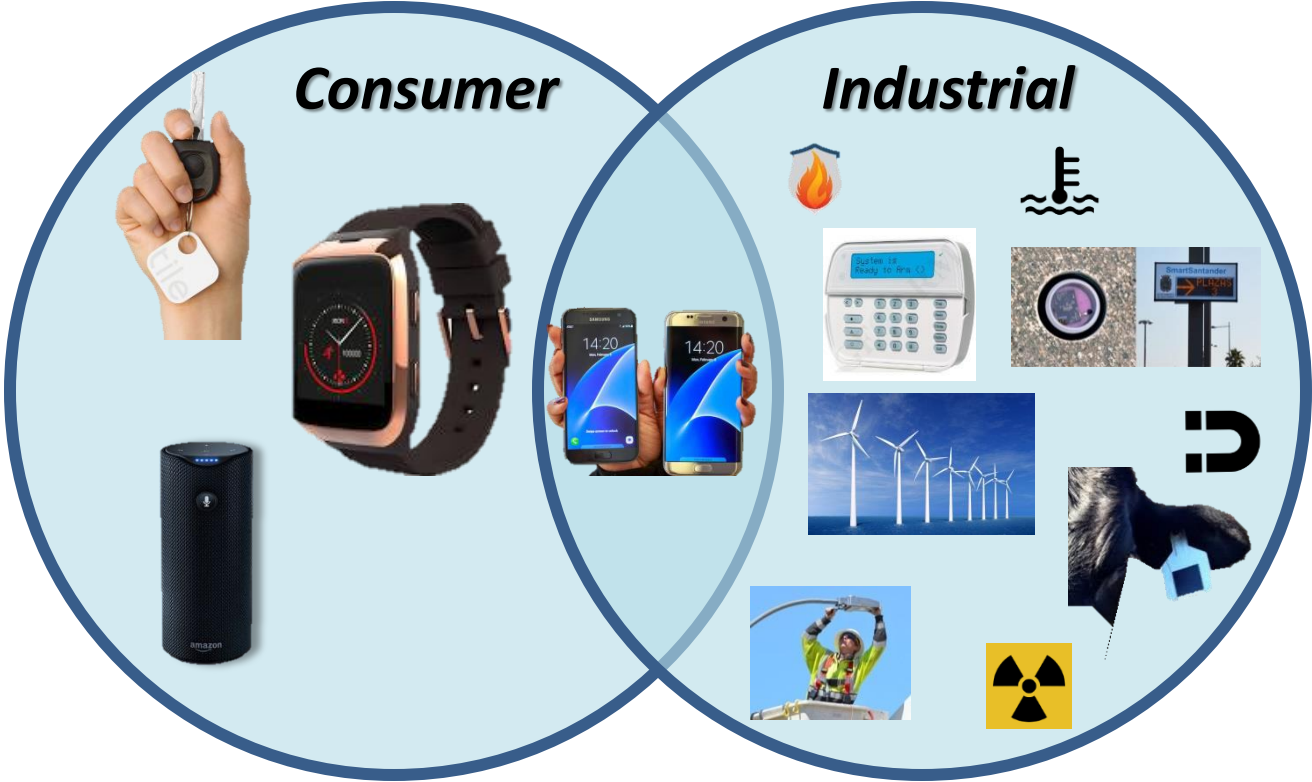
Source	Date	CAGR ¹ 2014-'20
CISCO	2013	23%
ERICSSON	2010	-
Gartner	2013	23%
IDC	2014	17%
Harbor Research	2014	29%
ABI research	2014	21%
GLOBAL INSIGHT	2014	14%

Note: Some forecasts only for specific years, in that case all other years in between are extrapolated based on the corresponding growth rate; Ericsson does not specify today's number of connected devices – therefore: Average of all other studies assumed as starting point in 2014

1. CAGR = Compound annual growth rate 2. Connected devices includes all autonomous connected things (every forecaster has own definition) - does NOT include computers, mobile devices, tablets

Sources: Cisco, Ericsson, ABI Research, Gartner, IHS, IDC, Harbor Research, IoT-Analytics.com

IOT Segments



Connected Devices are Exploding

The three entities using IoT ecosystems include **businesses, governments** and **consumers**.



Consumers



5B Devices Installed
By 2020



\$900B Invested (2015-2020)



\$400B ROI (2015-2025)



Governments



7.7B Devices Installed
By 2020



\$2.1T Invested (2015-2020)



\$4.7T ROI (2015-2025)



Businesses



11.2B Devices Installed
By 2020



\$3T Invested (2015-2020)



\$7.6T ROI (2015-2025)

Source: BI Intelligence, The IoT Ecosystem, October 2015

Trillions of Dollars Will Be Invested, Billions of Devices Will Be Connected

IoT Wireless Connectivity

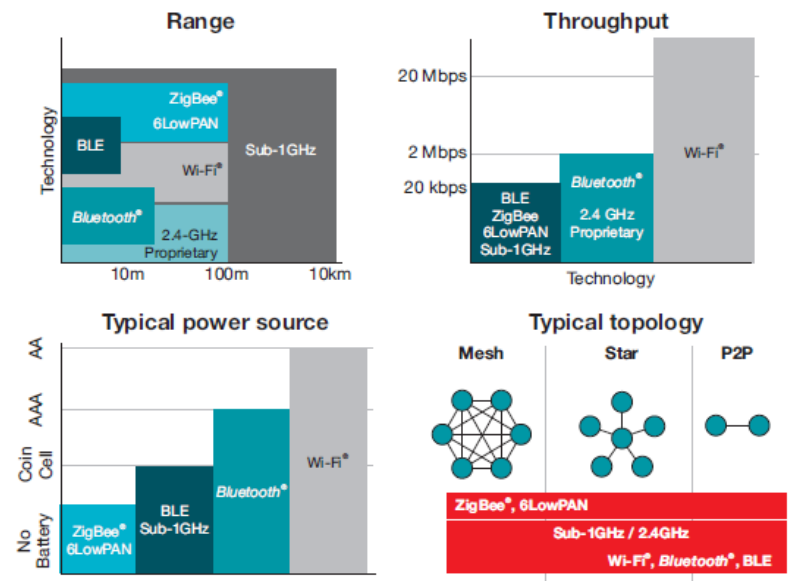
Multiple Standards

Different Ranges and Applications for Different Networks



Source: Texas Instruments, Wireless Connectivity for the IoT, June 2014

“Which Wireless Technology is Best For the Application?”



Developers Currently Focusing on Over 13 IoT Connectivity Protocols

LP-WAN

Where does it Fit in the Wireless World?

Short



Short

Range
(LAN)



Range
(LAN)

Long

Range
(WAN)



Long

Range
(WAN)

LP-WAN = Huge Coverage per Gateway

LoRa Example

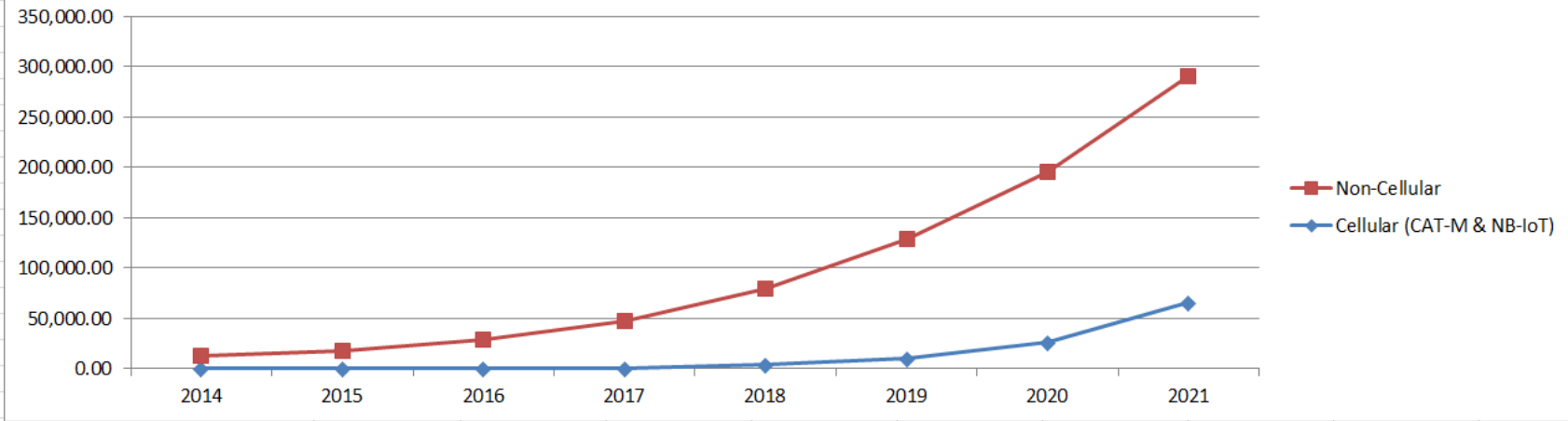
- Single Gateway Coverage
- >30miles (50km) from San Jose to San Bruno



Slide courtesy of Semtech

LP-WAN launches ahead of CAT-1, CAT-M

Chart 1
LPWA Connections by Technology
World Market, Forecast: 2014 to 2021



Source: ABI Research

LP-WAN

Many Smart City IOT Applications



Thank you!