



# MICROCHIP



A Leading Provider of Microcontroller,  
Mixed-Signal, Analog & Flash-IP Solutions



## The Internet of Things - Mapping the Value beyond the Hype

Helsinki - 23rd May 2019

# Agenda

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- **The Hype and the Value**
- **The Importance of the Business Model**
- **The Demand for IoT Nodes**
- **Typical IoT/Cloud Connected Ecosystem**
- **Secure Cloud Connected IoT Sensor Node - A Modular Approach**
- **Secure Cloud Connected IoT Sensor Node - Demonstration**
- **Microchip/Cloud Partnerships**

# The Hype

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**Two phenomena have captured the public consciousness (globally) over the last 5 years!**

## **I.o.T**

**A technology trend that is set to affect the lives of billions and create a large economic impact**

**and**

## **G.o.T**

**A CGI laced fantasy drama that has captured the public imagination**

# Definition of I.o.T

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- **We define the Internet of Things as either:**

**Sensors and actuators connected by  
networks to computing systems**

**or**

**The network of connected “smart” devices  
that communicate seamlessly over the internet**

# Mapping the Value

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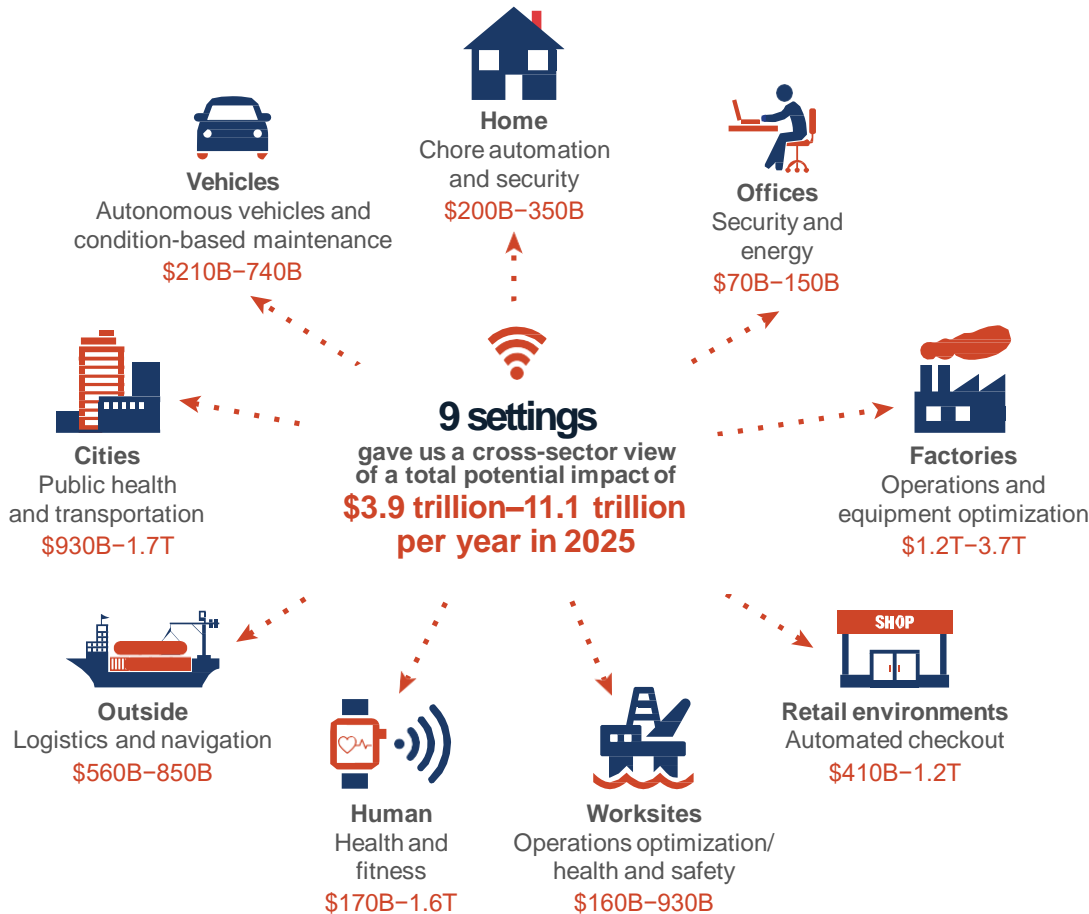
**The hype has been great - the value may be greater**

- **Research conducted by MGI\* since 2015 to determine the potential economic value impact from IoT in 2025.**
- **Analysed 13 sectors and focused on 9 settings.**
- **Total potential economic impact of \$3.9 trillion to \$11.1 trillion\*\* per year in 2025. The top end being equivalent to about 11% of the world economy in 2025.**

\* Mckinsey Global Institute

\*\* Potential value estimates are not equivalent to industry revenue or GDP

# Mapping the Value



## Types of opportunities



### Transform business processes

Predictive maintenance, better asset utilization, higher productivity

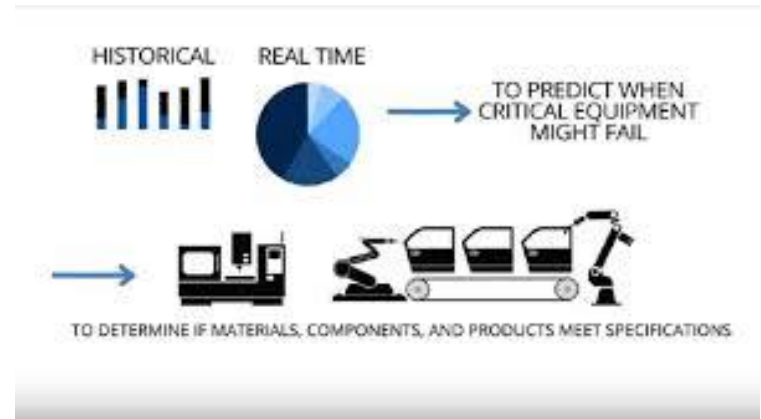


### Enable new business models

For example, remote monitoring enables anything-as-a-service

# Why IoT?

- **Improve functionality**
- **Remote control**
- **Reduce business cost**
- **Improve services**
- **Artificial Intelligence:**
  - Predictive maintenance
  - Adaptive controls
  - Advanced Human Interface (voice, image..)

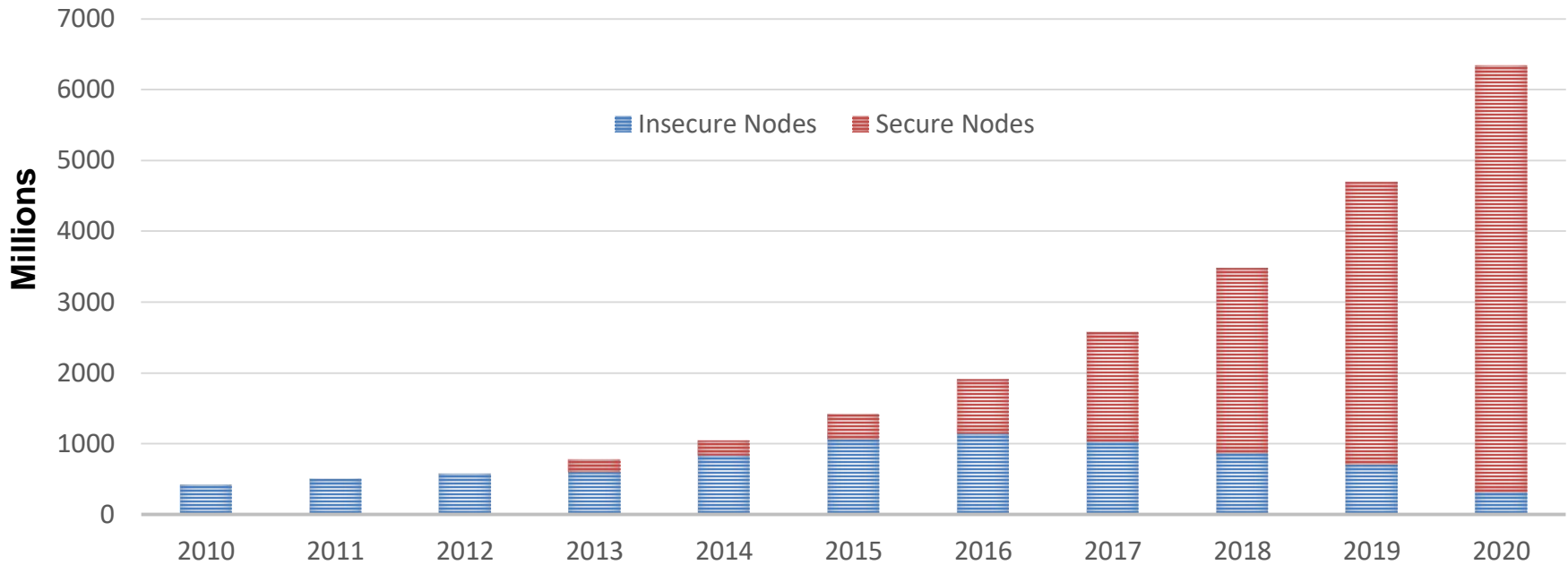


# The Importance of the Business Model





# Demand for IoT Sensor Nodes



**IOT NODE SHIPMENTS IN MILLIONS OF UNITS**

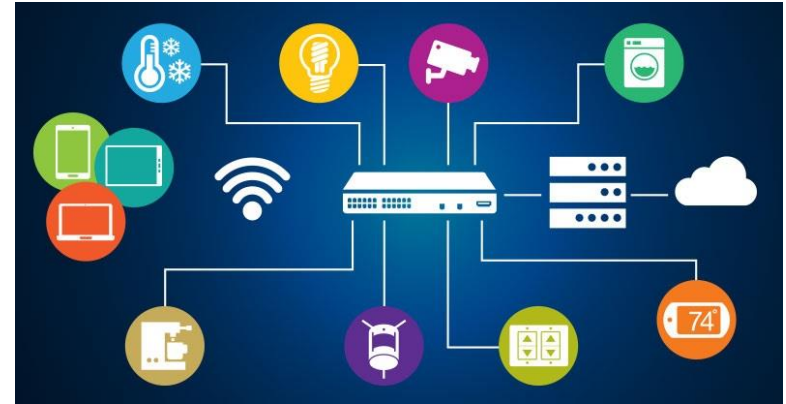
**Source: Cisco, Ericsson, Gartner, IDC, Harbor, ABI, IHS, Strategy Analytics, BI Intelligence**

**Demand for Secured IoT Nodes is increasing**

# IoT Markets & Applications

## Examples

- **Smart home**
  - Intelligent lighting
  - Smart appliances
  - Anti-theft systems
  - Climate control
  - Surveillance
  - Energy saving
  - Access control
  - Sprinkler systems



# IoT Markets & Applications

## Examples

- **Smart Cities**

- Air quality
- Traffic forecasts
- Transportation



- **Health**

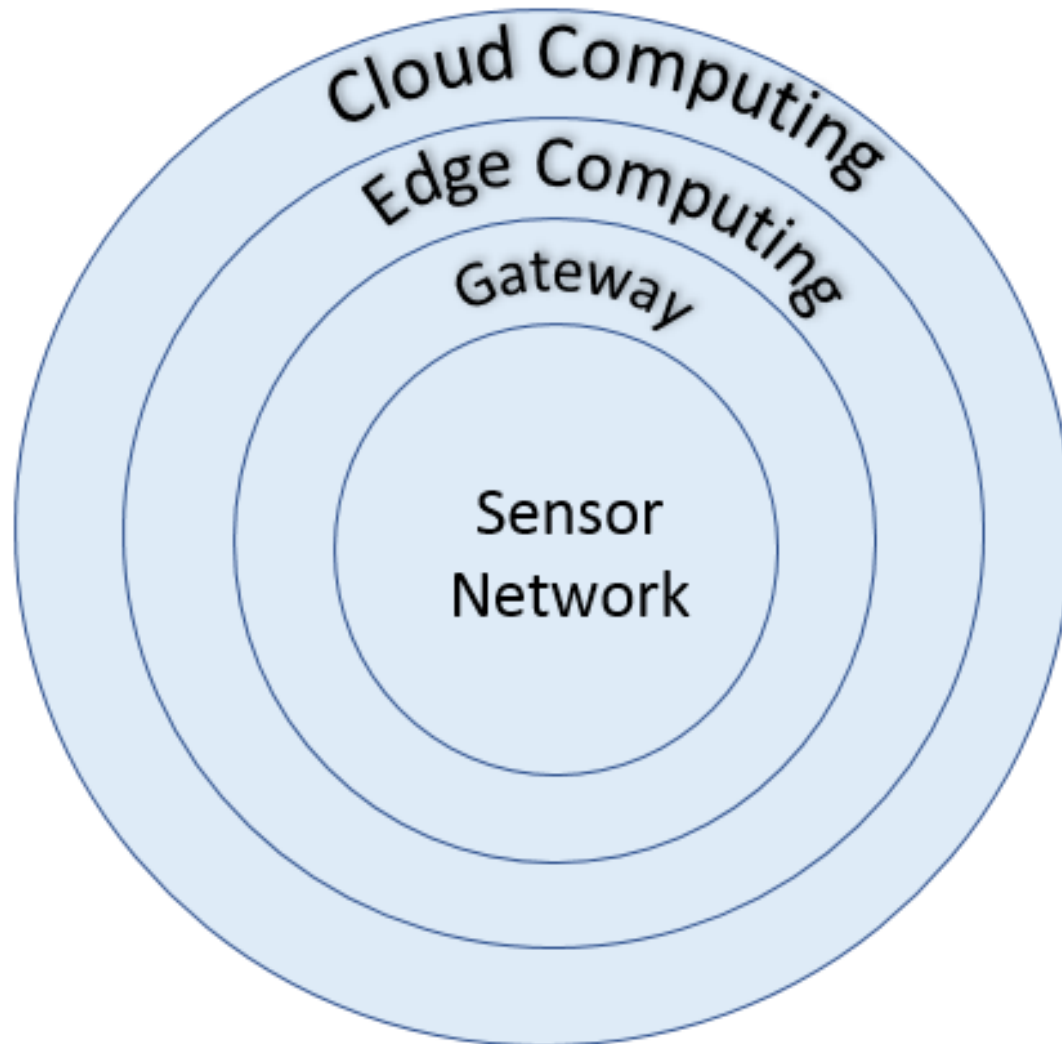
- Blood pressure
- Sport activities



- **Industry 4.0 Process Control Sensors**

- Level, Pressure, Temperature, Flow

# Typical Industrial IoT System



# Secure Cloud Connected Sensors

## A Modular Approach



Secure individual device authentication to Google Cloud

Secure  
**ECC608**

Key Storage  
Authentication  
Crypto



Right-sized processing units for smart sensors

Smart  
AVR & PIC  
MCU

MQTT  
JWT  
User App



Wi-Fi connectivity running TCP/IP and TLS to Google Cloud

Connected  
**WINC1510**

WiFi  
TCP/IP  
TLS

- **Effortless migration to the Cloud for:**
  - Embedded sensors
  - Actuators or mechatronic applications
- **Rapid and Easy Development**
  - No need to become a networking nor security guru
  - No security compromises
  - Modular approach reduces complexity
  - Modular approach enables scalability

# Cloud Partnerships

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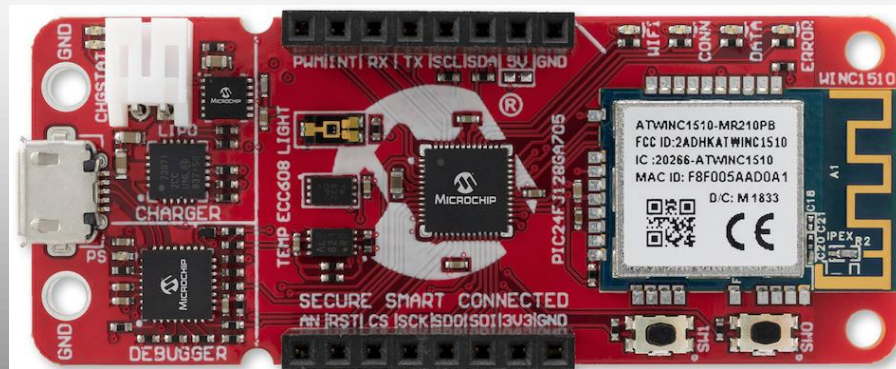
Google Cloud



# Demo

## PIC.IoT-WG

### Secure Cloud Connected IoT Sensor Node





# Easy as 1, 2, 3

At power up, the board follows a sequence that the user can monitor by observing the status of four LEDs:

- LED3 = *Wi-Fi* = BLUE: Indicates a successful connection to local Wi-Fi network
- LED2 = *CONN* = GREEN: Indicates a successful connection to the Google Cloud servers
- LED1 = *DATA* = YELLOW: Indicates a packet of sensor data has been successfully published to the Google Cloud MQTT servers
- LED0 = *ERROR* = RED: Indicates an Error occurred after the last step

