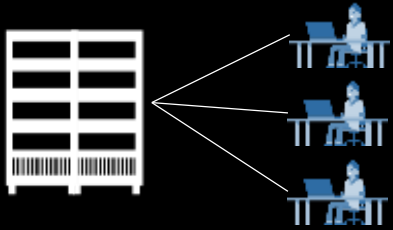


# Windows 10 at the Core of IoT

A piece of Pi with Windows 10 on top



# The four computing eras



1960s

Mainframe era

one computer – thousands of users



1980s

PC era

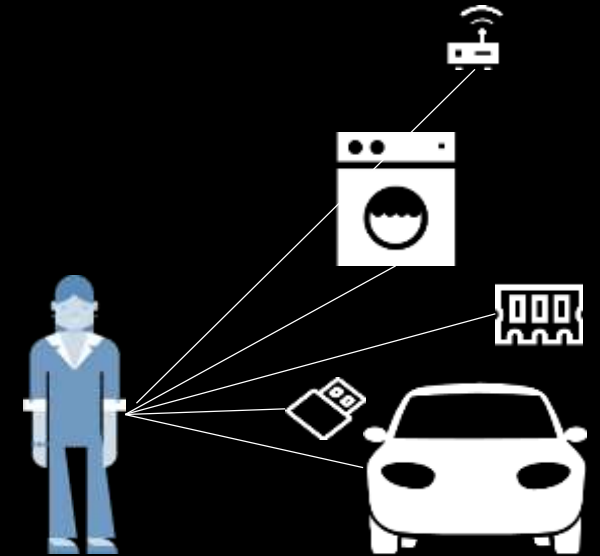
one computer – one user



2000s

Mobility era

several computers – one user



2020s

Ubiquity era

many computers – one user

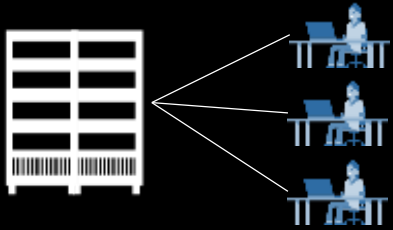


EV-P H.S. FR.





# The four computing eras



1960s

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1980s

PC era

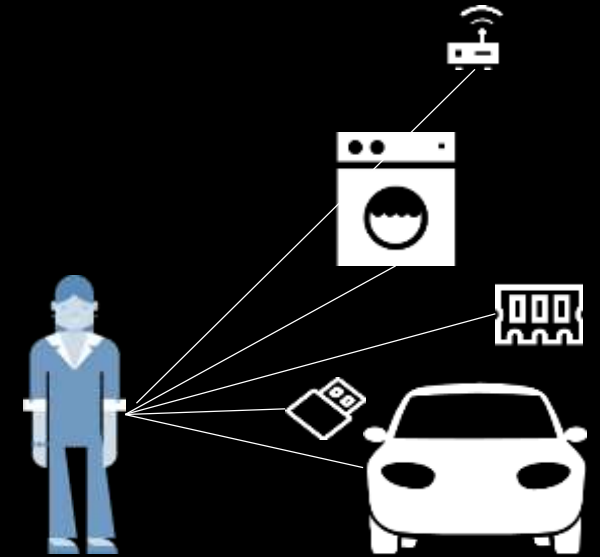
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Mobility era

several computers – one user



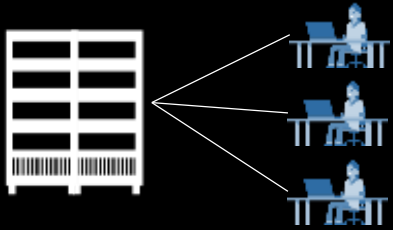
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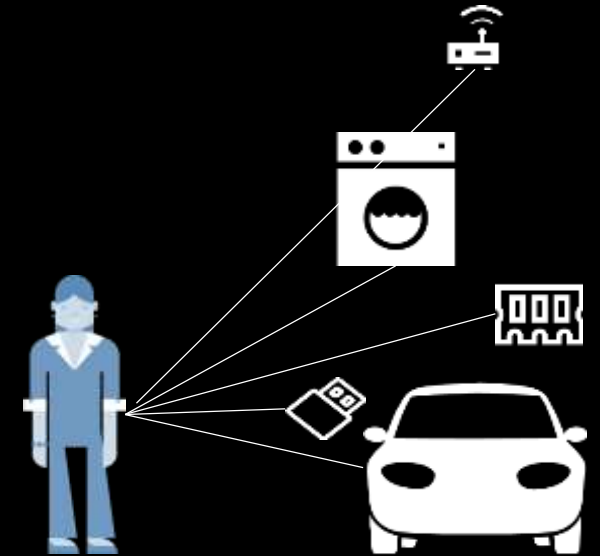
one computer – one user



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Medication adherence



Health monitoring



Pet tracking



Behavior modification



Object tracking



Child and elder monitoring



Sports and fitness



Smart lighting



Indoor navigation



Beacons and proximity



Trip tracking and car health



HOME

COMMUTE



WORKPLACE

COMMUTE



HOME



Smart appliances



Food and nutrition tracking



Identity



Office equipment



Smart vending machines



Bike ride stats and protection



Sleep tracking



Air conditioning and temperature control



Environmental sensors



Information capture



Control



Home security



Home automation



Leak detection



Garden, lawn and plant care



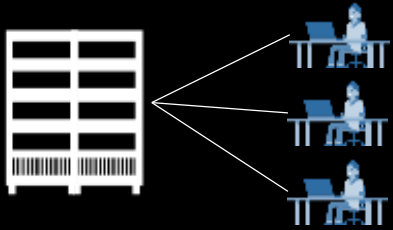
New devices and sensors



Entertainment systems



# The four computing eras



1960s

**Mainframe era**

one computer – thousands of users



1980s

**PC era**

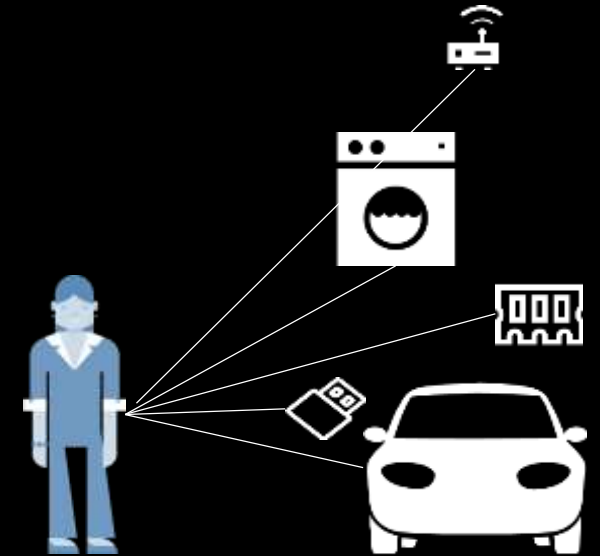
one computer – one user



2000s

**Mobility era**

several computers – one user



2020s

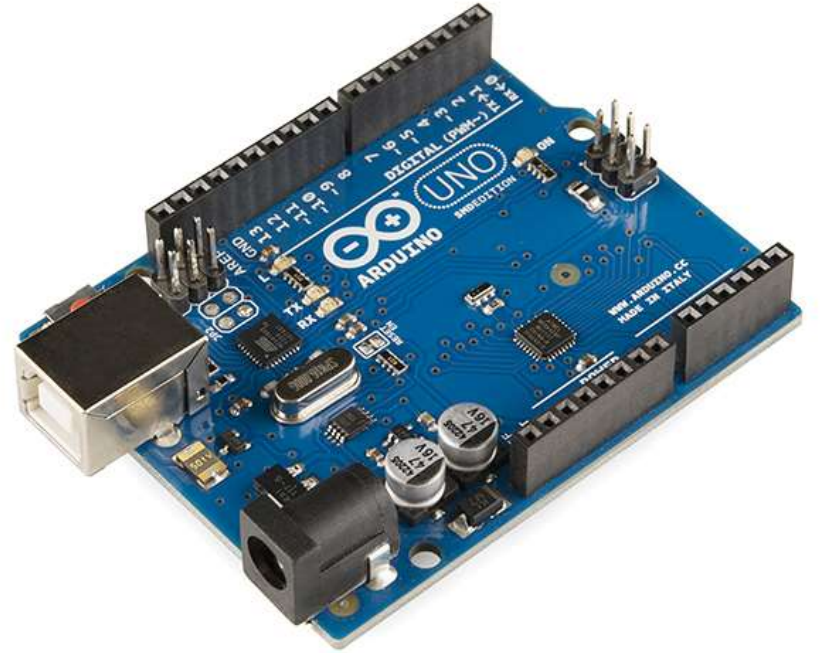
**Ubiquity era**

many computers – one user

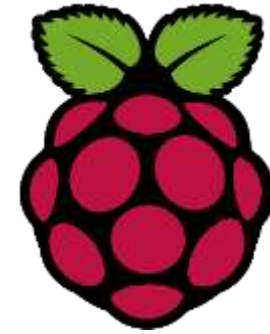
# Raspberry Pi



# Arduino



# The Raspberry Pi



Rpi 1 Model A (2012)









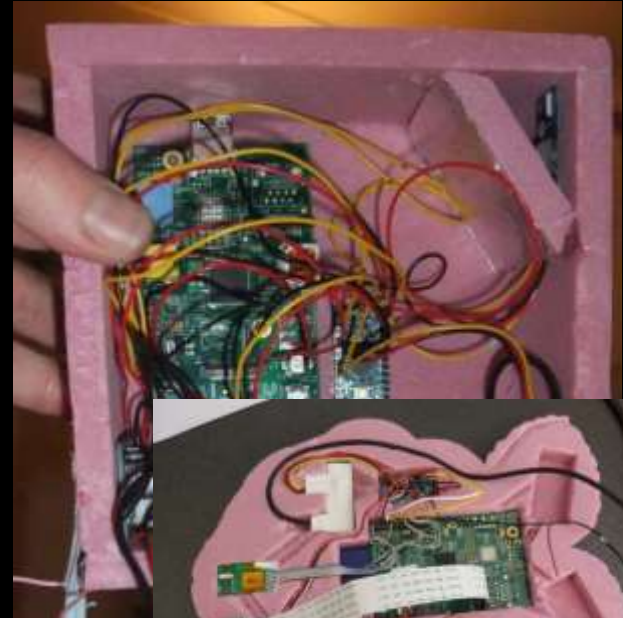
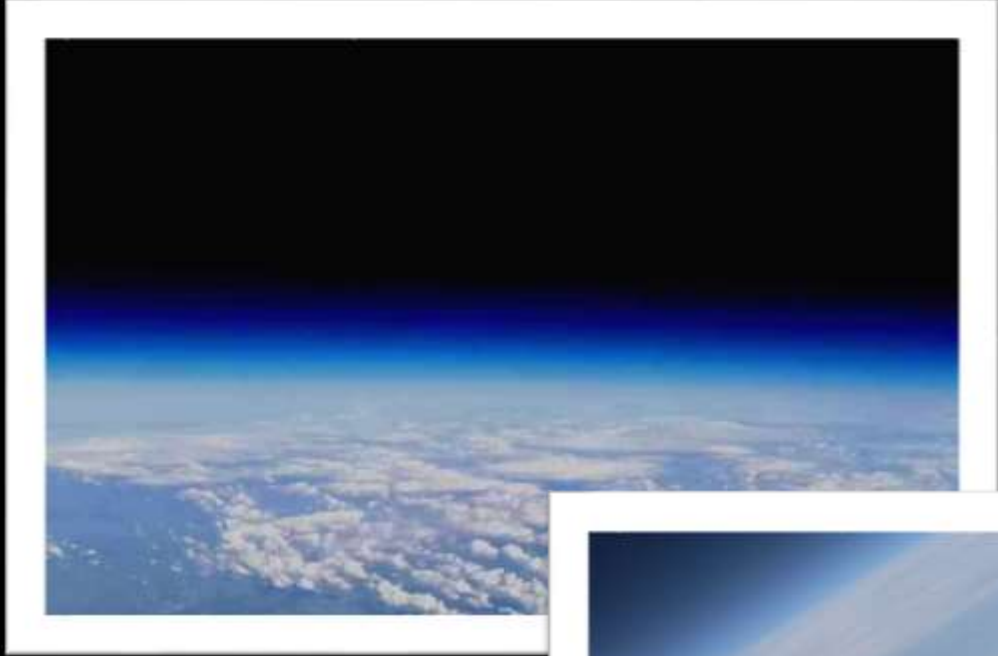




# PI IN THE GROUND



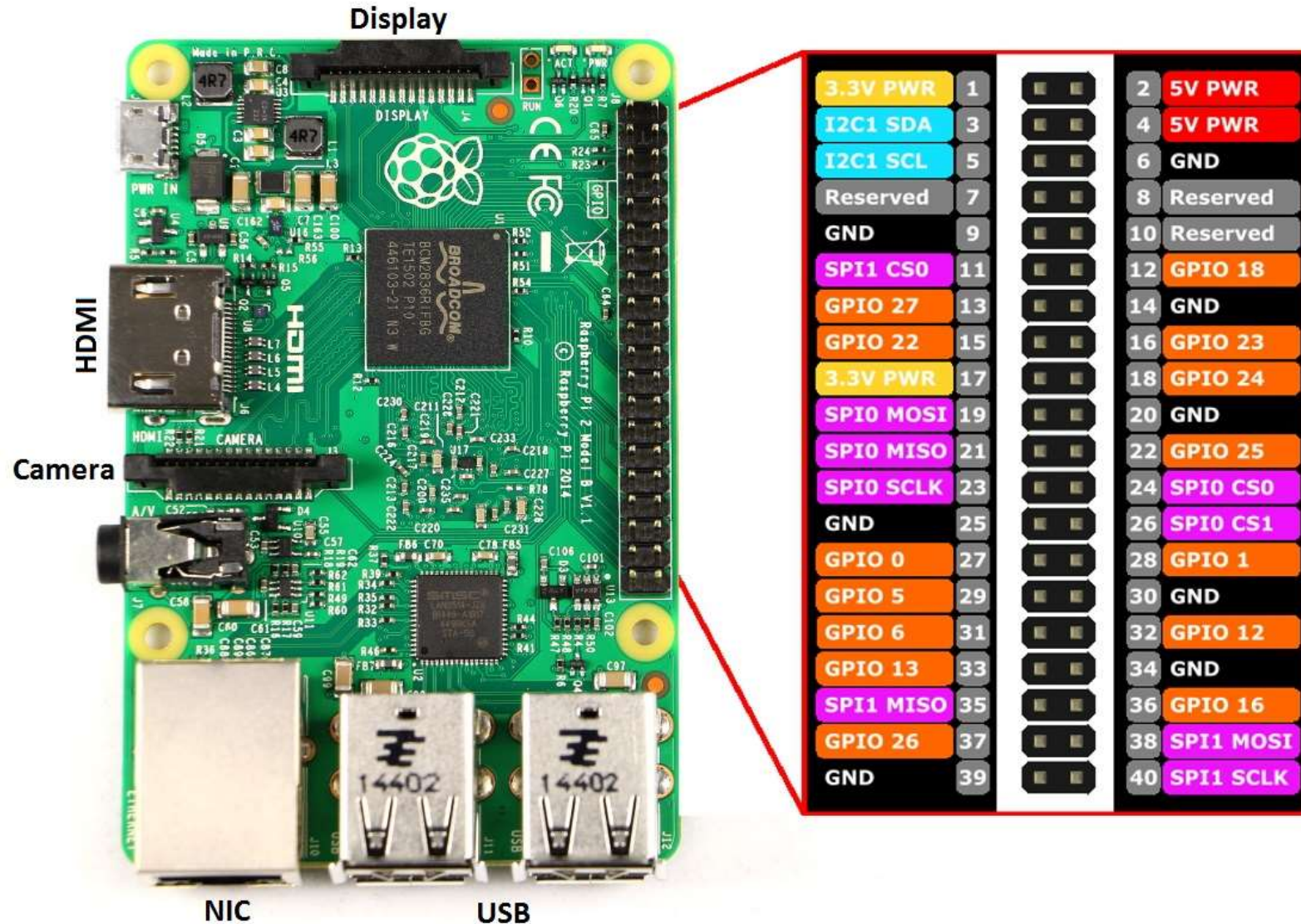
# PI IN THE SKY



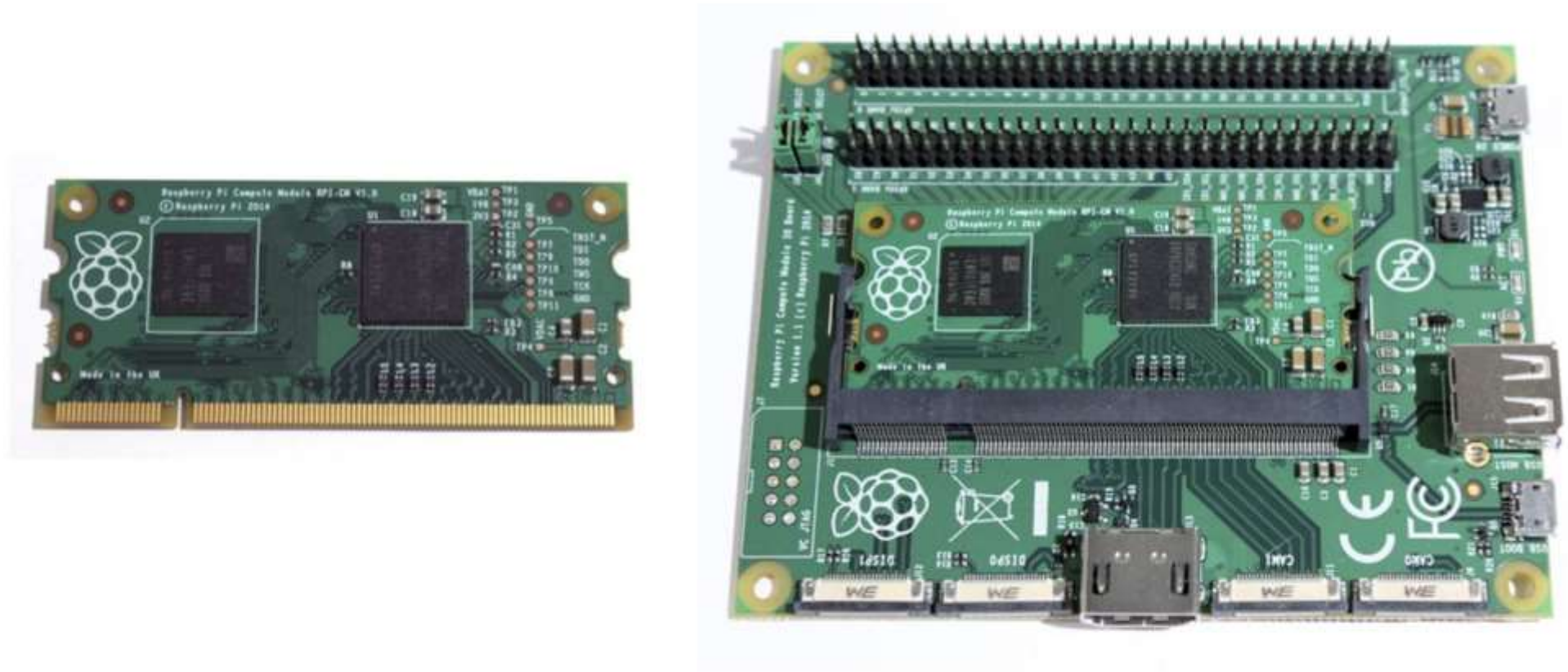




# Raspberry Pi 2



# Raspberry Pi Compute Module for the pro's





Raspberry Zero

A tweaked Pi 1 for 5 freakin \$







**Raspberry Pi 3**  
Model B



- Broadcom BCM2837
- ARM Cortex 1.2GHz
- GPU Broadcom VideoCore IV
- 1GB RAM
- Ethernet, BT 4.1/LE, WiFi
- 40-Pin header
- HDMI, 4xUSB 2.0
- Serial: Camera, Display

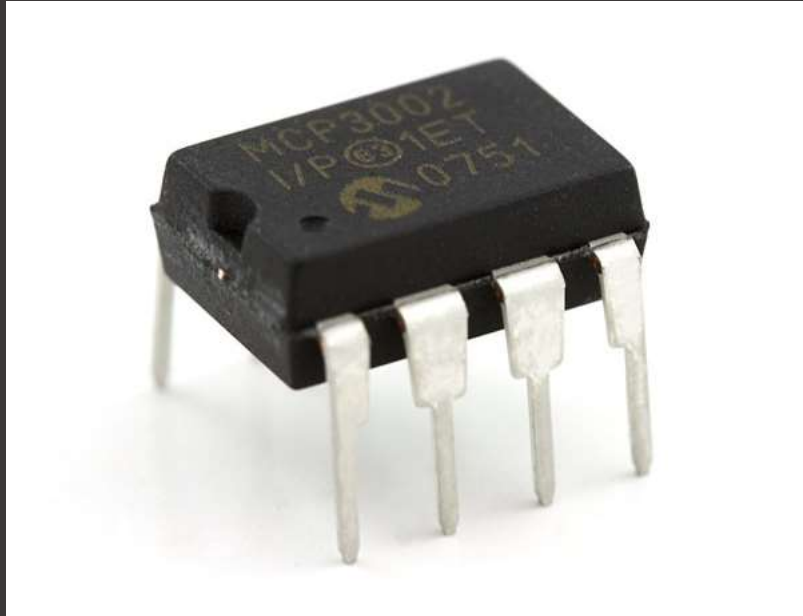


# Raspberry Pi 3 GPIO Header

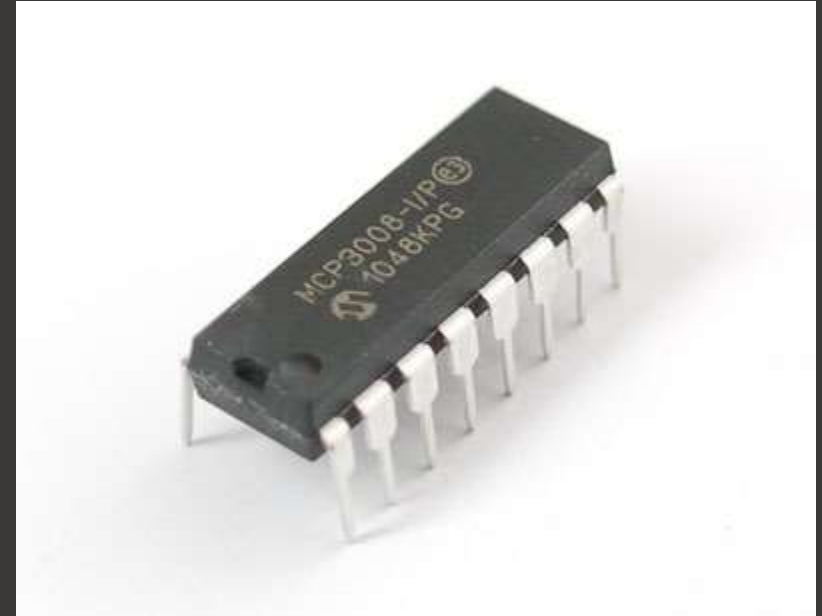


Pin#	NAME		NAME	Pin#
01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I <sup>2</sup> C)		DC Power 5v	04
05	GPIO03 (SCL1 , I <sup>2</sup> C)		Ground	06
07	GPIO04 (GPIO_GCLK)		(TXD0) GPIO14	08
09	Ground		(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I <sup>2</sup> C ID EEPROM)		(I <sup>2</sup> C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40

# Analog/Digital Converter (ADC)

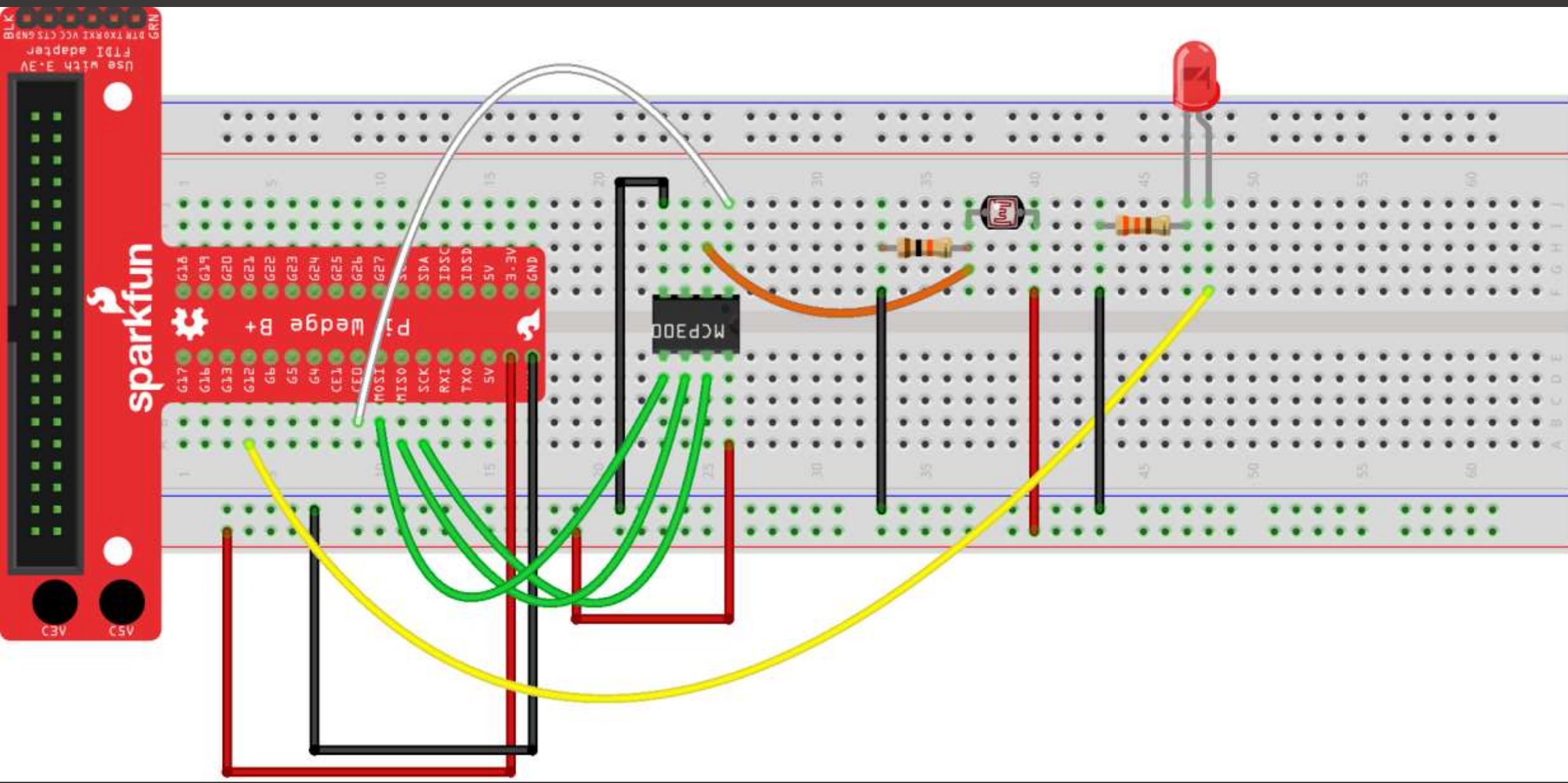


MCP3002: dual-channel, 10-bit

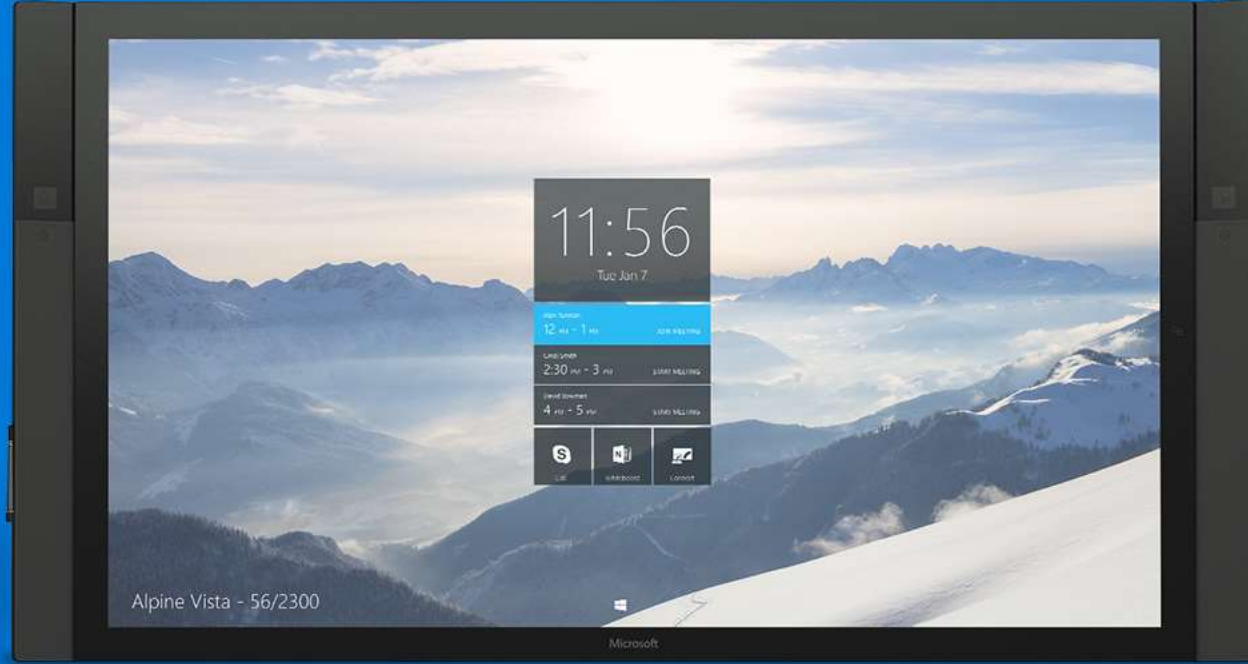


MCP3008: 8-channel, 10-bit





Microsoft's role for devices and their  
'makers'?



# Windows 10



## Windows 10 IoT Enterprise

UWP + Classic desktop apps + Protection + Manageability

## Window 10 IoT Mobile

Mobile devices + Peripherals + Multi-user profiles

## Windows 10 IoT Core

UWP + Headless + I/O



## Windows 10 IoT Enterprise

Rich apps, performance

## Window 10 IoT Mobile

Mobile scenario's

## Windows 10 IoT Core

Low cost, low power

Free when using online auto updates from Microsoft

## Windows 10 IoT Enterprise

Rich apps, performance

## Window 10 IoT Mobile

Mobile scenario's

## Windows 10 IoT Core Pro

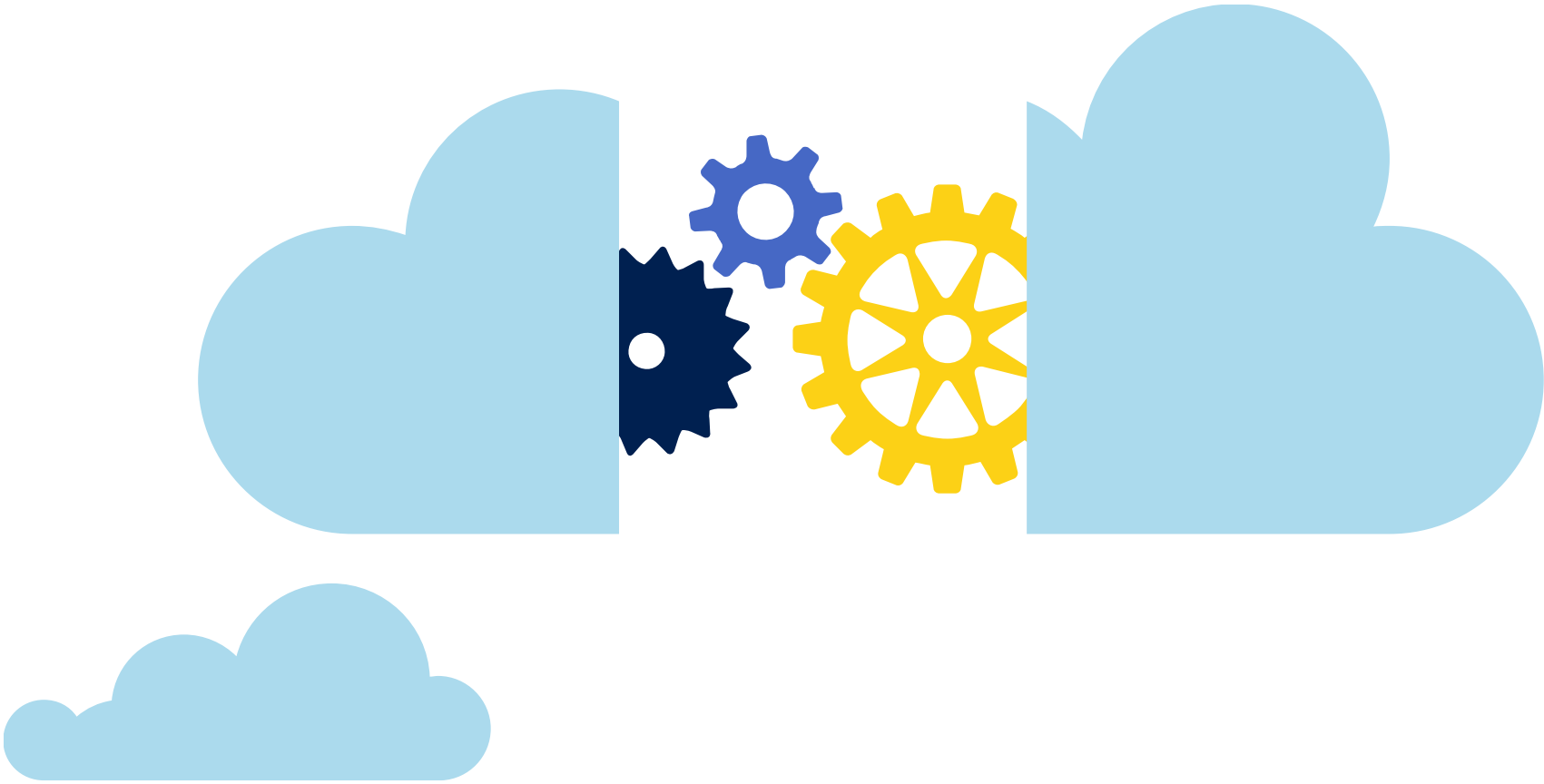
OEM Exclusive SKU, deferred or custom updates

A top-down view of various electronic components and tools arranged on a dark surface. In the center is a white breadboard with a small black component and a red LED. To the left is a blue Intel Galileo board and a green Arduino Uno board. Below the Arduino is a black reel of wire. In the bottom center is a red digital multimeter with black and red test leads. To the right is a red soldering iron stand with a silver soldering iron. Various jumper wires, a pair of blue-handled pliers, and a screwdriver are also visible.

# Windows 10 IoT Core



# Windows 10 IoT Core Demos

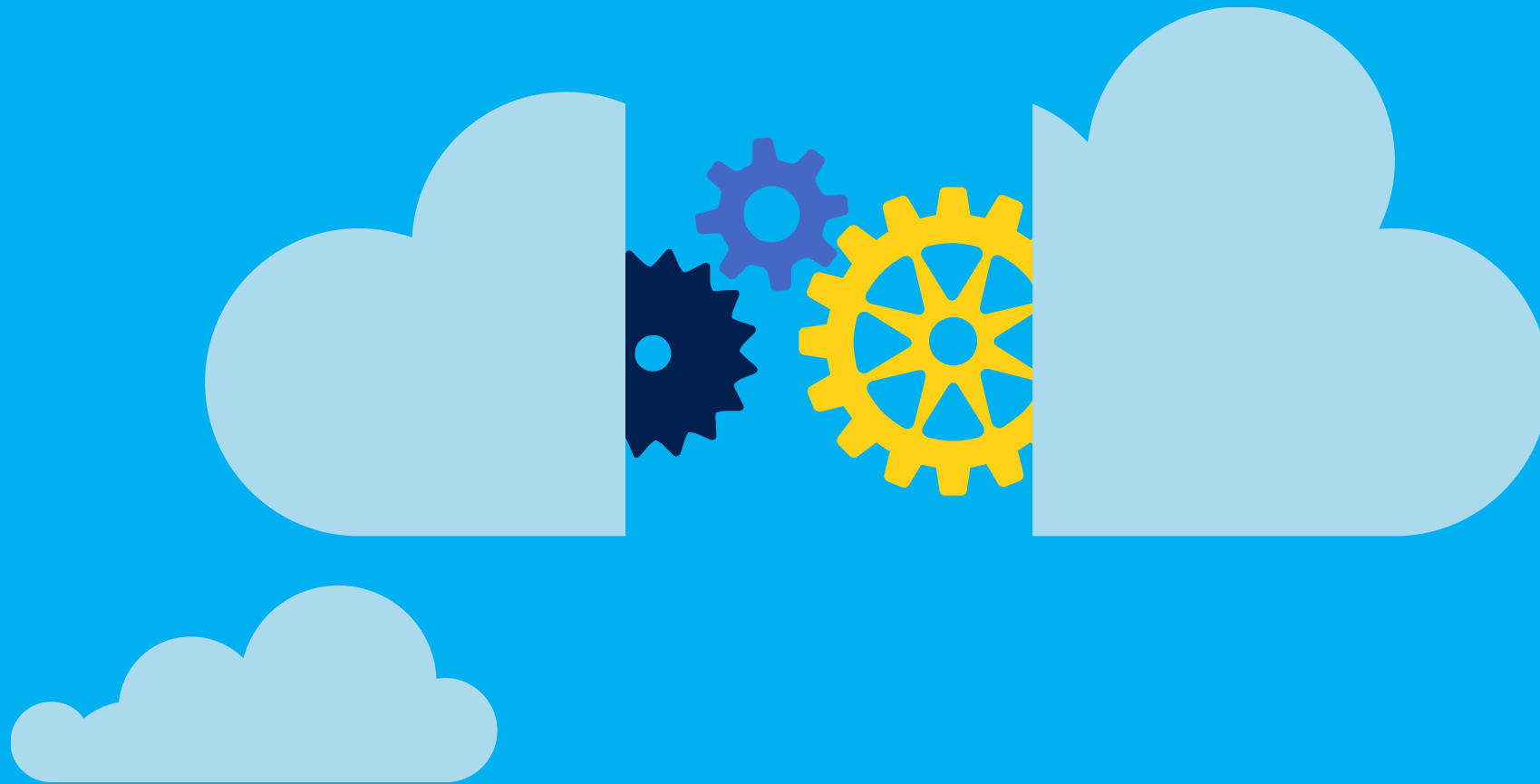


# The Azure Periodic Table

Explore the power and possibilities of Azure

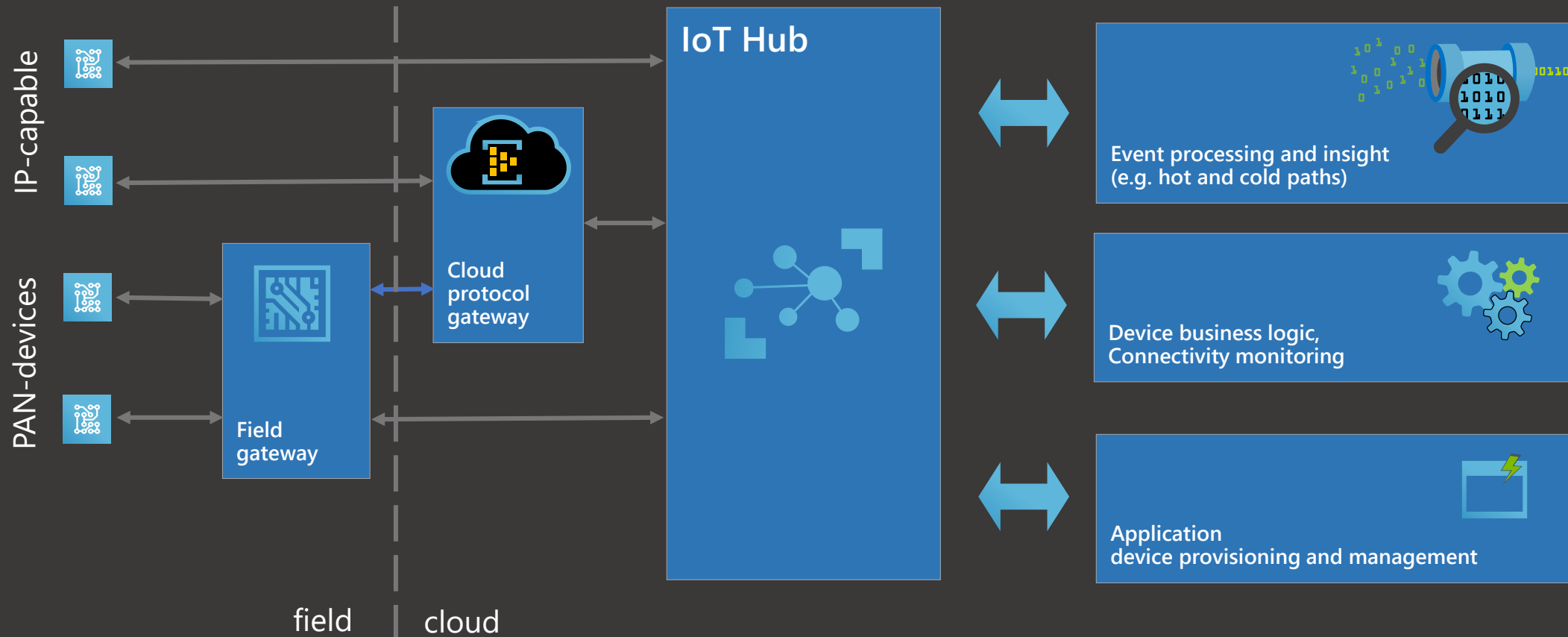
 DATA FACTORY									 TRAFFIC MANAGER
 STREAM ANALYTICS	 EVENT HUBS				 SQL DATABASE	 SQL DATA WAREHOUSE	 DOCUMENTDB	 AZURE SEARCH	 EXPRESSROUTE
 MACHINE LEARNING	 HDINSIGHT	 VIRTUAL MACHINES	 CLOUD SERVICES	 BATCH	 REMOTEAPP	 STORAGE	 STORSIMPLE	 AZURE REDIS CACHE	 VIRTUAL NETWORK
 AZURE AD	 MULTI-FACTOR	 BACKUP	 SITE RECOVERY	 SERVICE BUS	 BIZTALK SERVICES	 SCHEDULER	 AUTOMATION	 OPERATIONAL INSIGHTS	 DNS
 WEB APPS	 MOBILE APPS	 NOTIFICATION HUBS	 API MANAGEMENT	 MOBILE ENGAGEMENT	 APP SERVICES	 API APPS	 LOGIC APPS	 KEY VAULT	 APPLICATION GATEWAY
 VISUAL STUDIO	 APPLICATION INSIGHTS	 MEDIA SERVICES	 MEDIA INDEXER	 MEDIA ENCODING	 MEDIA PROTECTION	 MEDIA PLAYER	 MEDIA STREAMING	 CDN	 VPN GATEWAY

# Demo

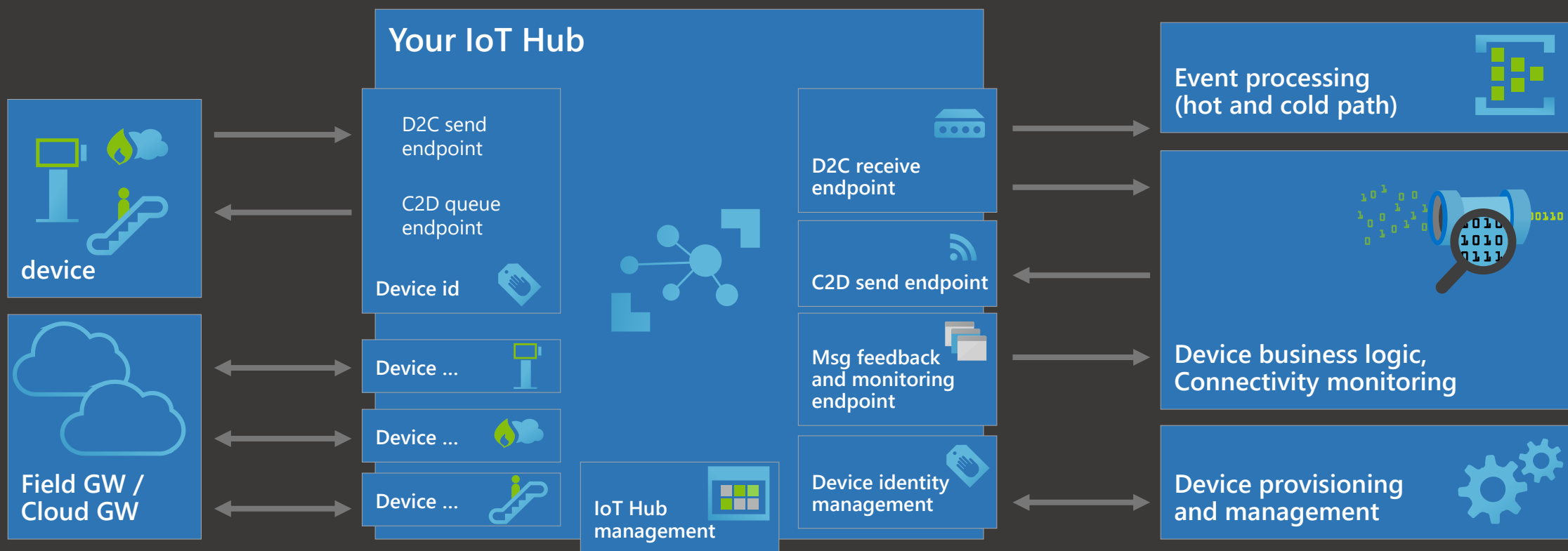




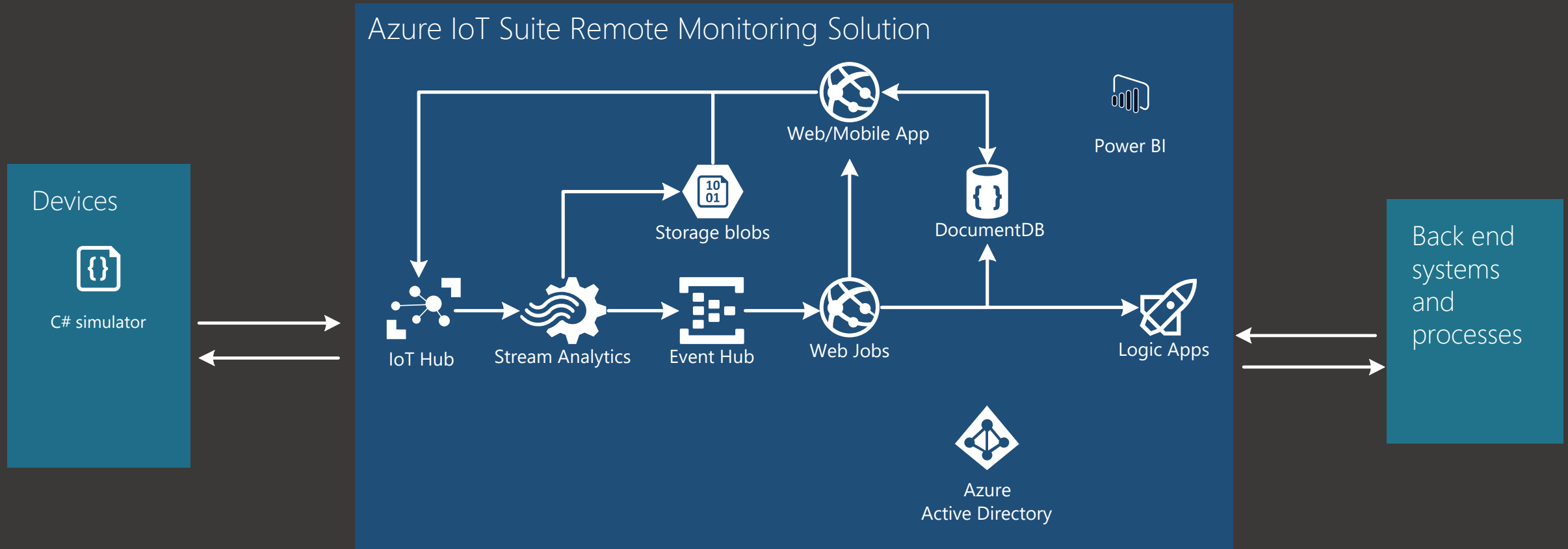
# Connect your devices to Azure



# IoT Hub endpoints



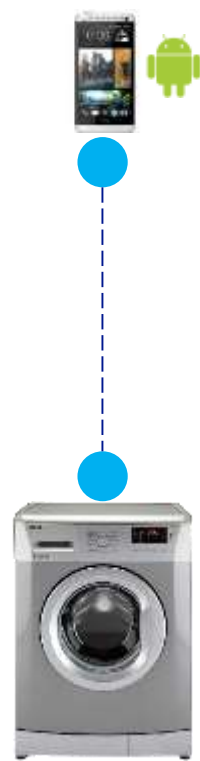
# Microsoft Azure IoT Suite Remote monitoring





# IoT Barrier: Proprietary Solutions

IHV Transport



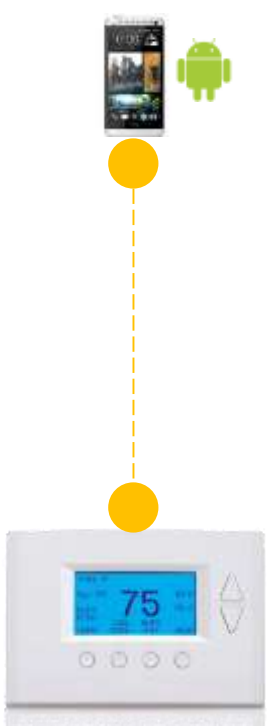
ISV Schema



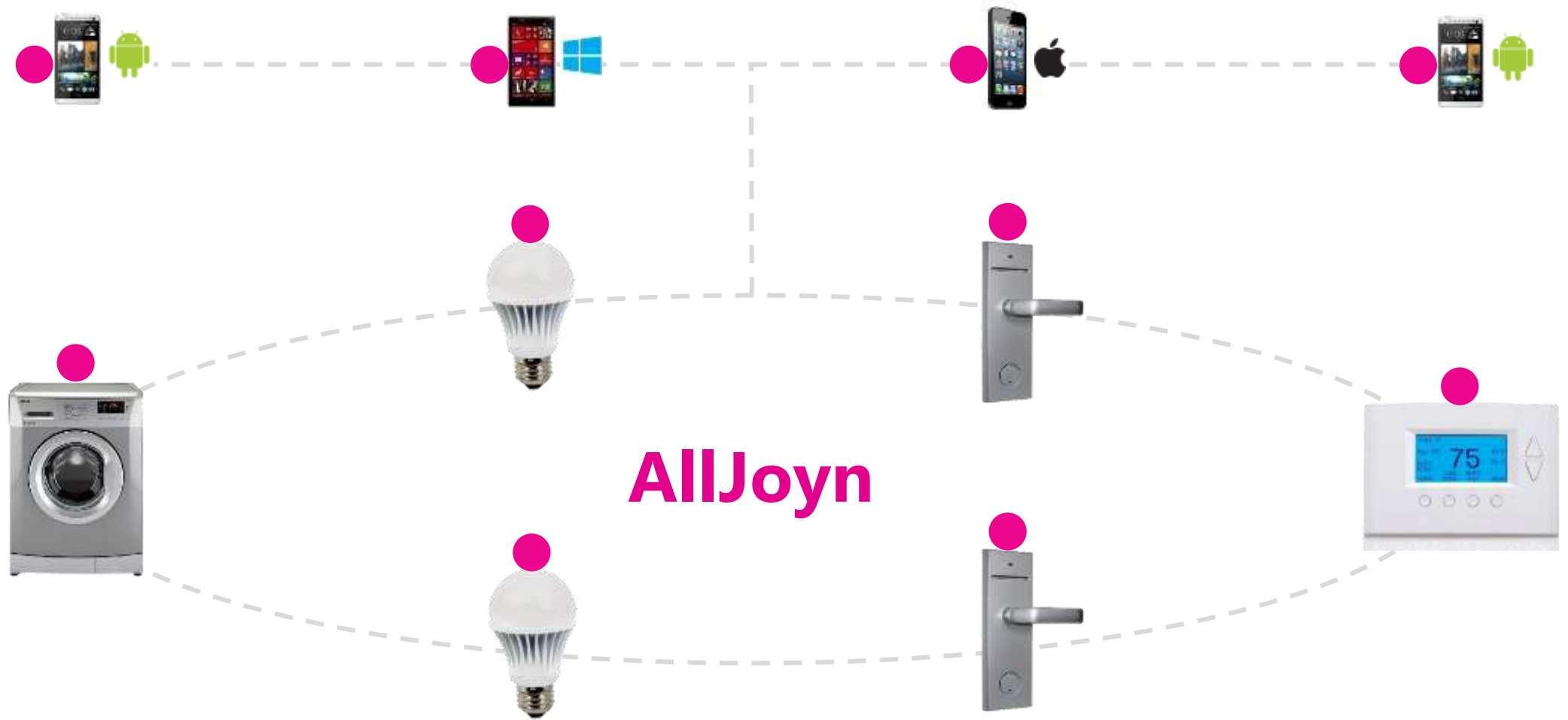
OS API



Closed System



# AllJoyn Enables IoT Device Interoperability



Freebee!!

Pi Magazine #43

<http://aka.ms/pimag>





Vragen?



One more thing.....

