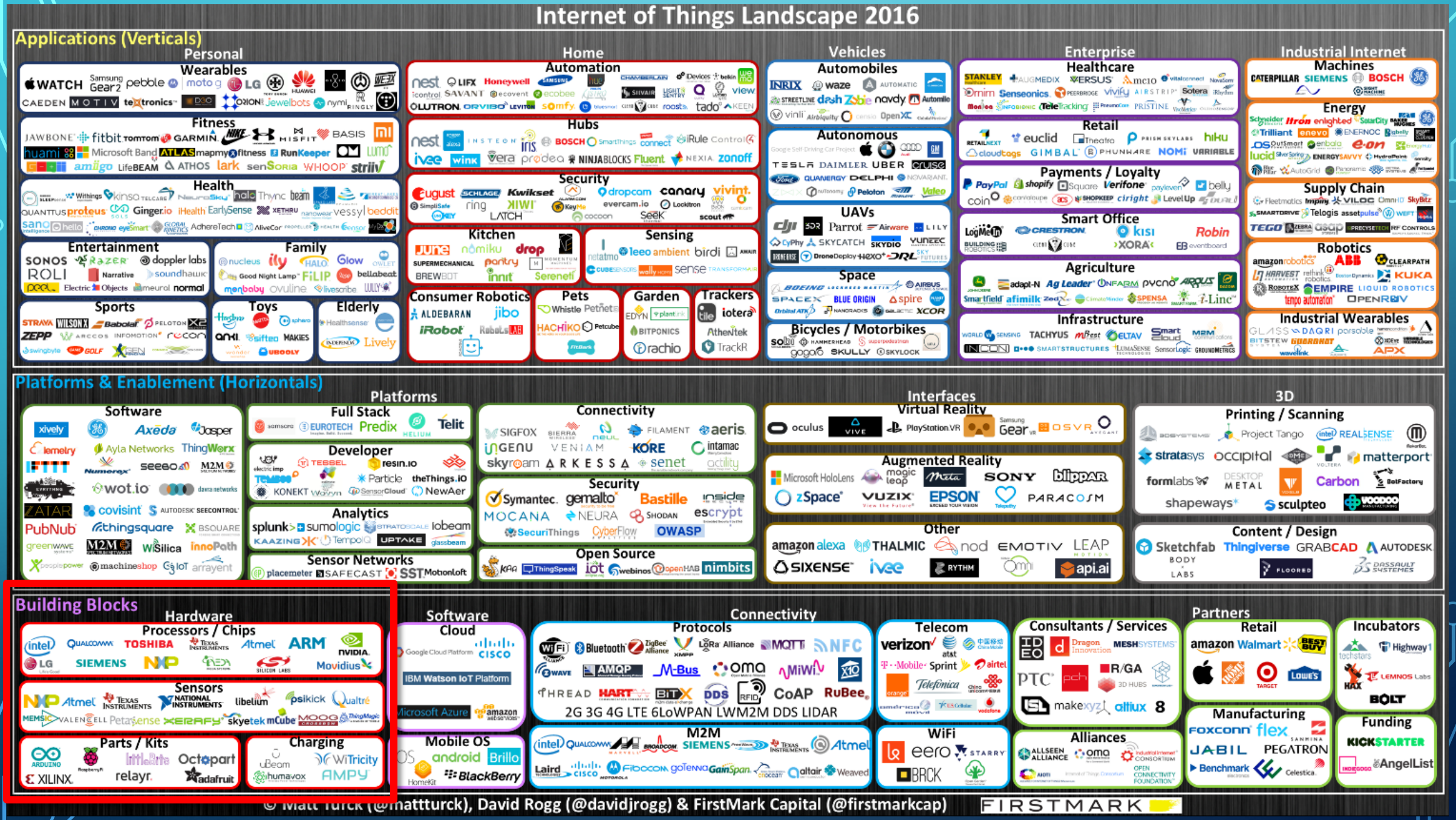
IoT Lab

Paul Langdon

Saturn 2016


Internet of Things Landscape 2016
Applications (Verticals)
Personal
Wearables
Fitness
Health
Entertainment
Family
Sports
Toys
Elderly
Home
Automation
Hubs
Security
Kitchen
Sensing
Consumer Robotics
Pets
Garden
Trackers
Vehicles
Automobiles
Autonomous
UAVs
Space
Bicycles / Motorbikes
Enterprise
Healthcare
Retail
Payments / Loyalty
Smart Office
Agriculture
Infrastructure
Industrial Internet
Machines
Energy
Supply Chain
Robotics
Industrial Wearables
Platforms & Enablement (Horizontals)
Platforms
Software
Full Stack
Developer
Analytics
Sensor Networks
Connectivity
Security
Open Source
Interfaces
Virtual Reality
Augmented Reality
Other
3D
Printing / Scanning
Content / Design
Building Blocks
Hardware
Processors / Chips
Sensors
Parts / Kits
Charging
Software
Cloud
Mobile OS
Connectivity
Protocols
2G 3G 4G LTE 6LoWPAN LWM2M DDS LIDAR
M2M
Telecom
WiFi
Partners
Consultants / Services
Alliances
Retail
Manufacturing
Incubators
Funding
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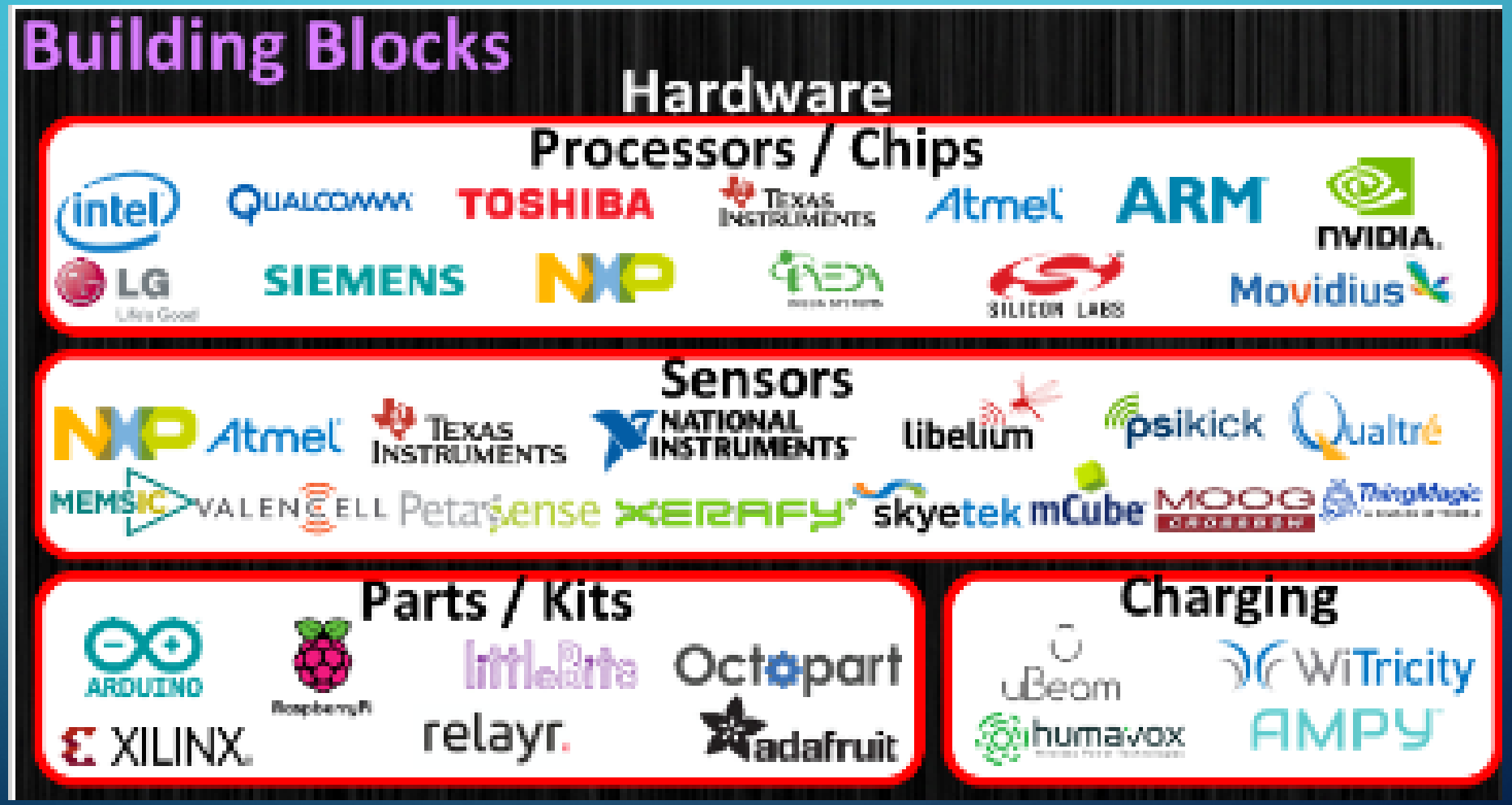
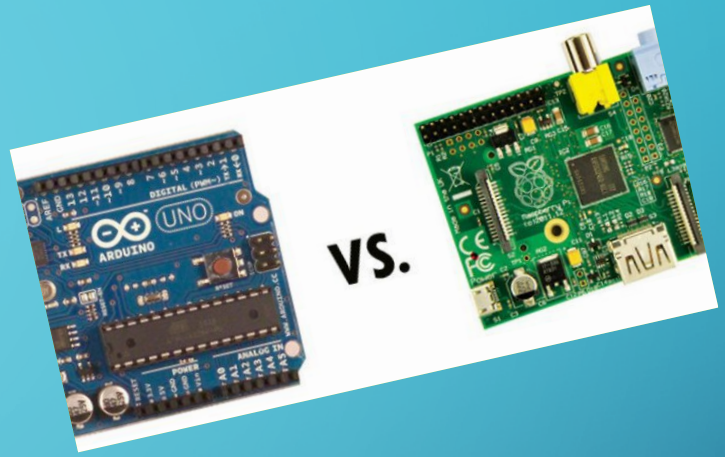
HARDWARE


Building Blocks
Hardware
Processors / Chips
intel
QUALCOMM
TOSHIBA
Texas Instruments
Atmel
ARM
NVIDIA
LG
SIEMENS
NXP
SILICON LABS
Movidius
Sensors
NXP
Atmel
Texas Instruments
National Instruments
libelium
psikick
Qualtré
MEMSIC
VALENCELL
PetaSense
XERAFY
skyetek
mCube
MOOG
ThingMagic
Parts / Kits
ARDUINO
RaspberryPi
littleBits
Octopart
XILINX
relayr.
adafruit
Charging
uBeam
WiTricity
humavox
AMPY

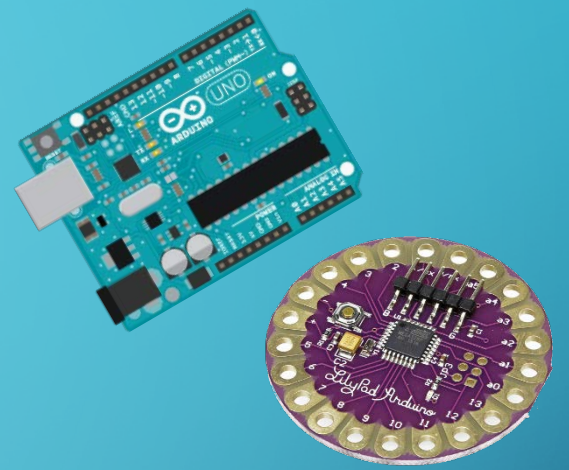
Hardware Types



- Microcontroller (MCU)
  - Arduino, ESP8266, Particle
- Single Board Computer (SBC)
  - Intel Edison, Raspberry Pi, C.H.I.P.

Excellent Guide: http://makezine.com/comparison/boards/

Microcontrollers



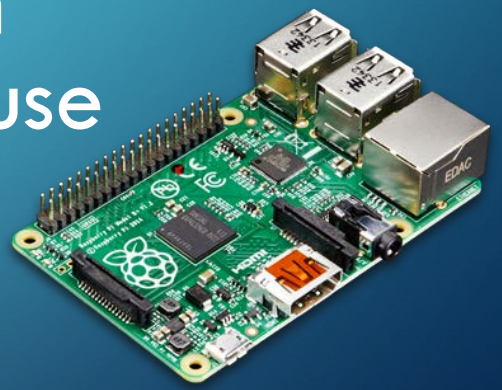
A microcontroller is a simple computer that can run one program at a time, over and over again.

Best used for simple repetitive tasks: opening and closing a garage door, reading the outside temperature and reporting it to Twitter, driving a simple robot, wearables.

Development Environments/Language: Arduino, JavaScript, Python, LUA, .Net Micro

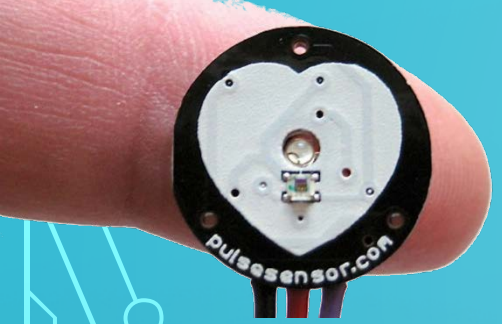
Single Board Computers

A general-purpose computer, usually with a Linux operating system, and the ability to run multiple programs. It is more complicated to use than a microcontroller.

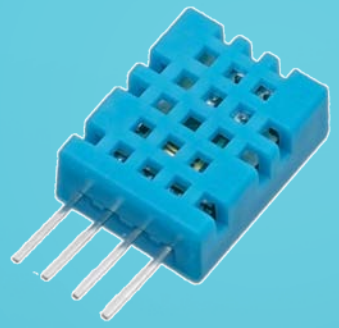


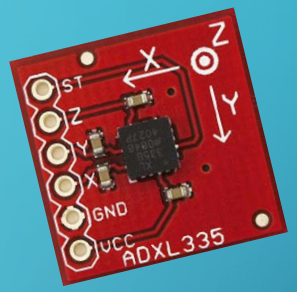
Best used when you need a full-fledged computer: driving a more complicated robot, performing multiple tasks, doing intense calculations, storing or processing data.

Development Environments/Language: Linux, C, Python, Java, JavaScript, Android, …

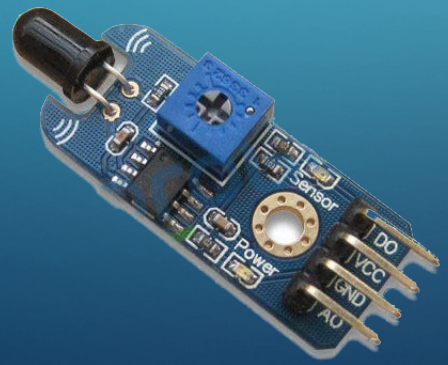


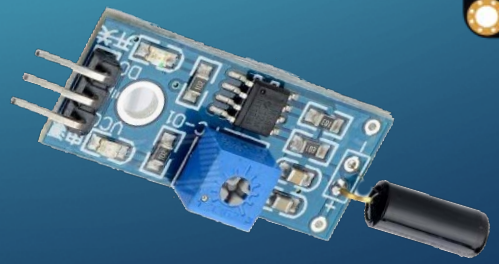
SENSORS

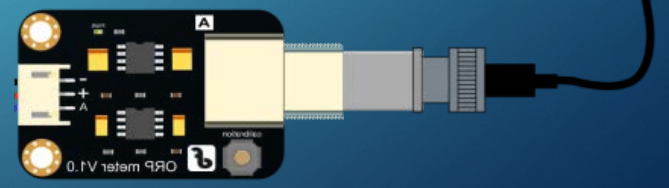




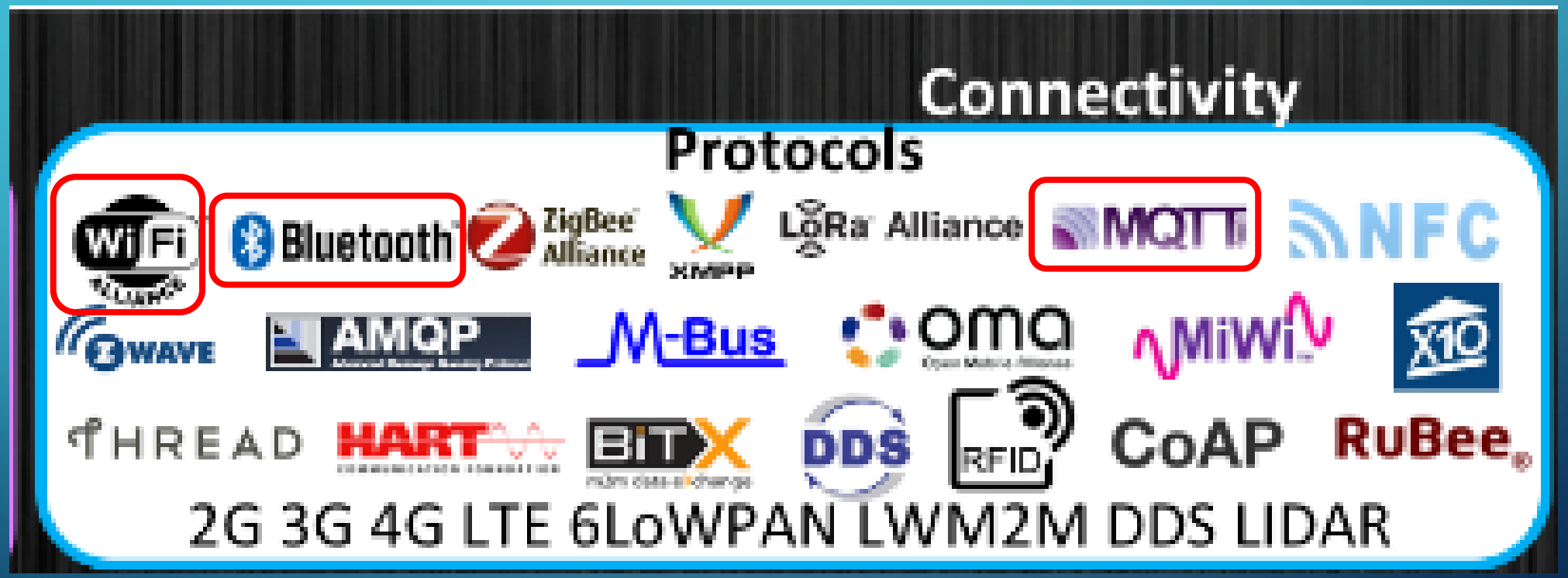
A device that detects to some type of input from the physical environment. The specific input could be light, heat, motion, moisture, pressure, or any one of a great number of other environmental phenomena.







CONNECTIVITY



Today's Toolbox

A little bit of everything

SBCs: Intel Edison, Raspberry Pi, Samsung Artik, Beagle Bone, Onion Omega, C.H.I.P

MCUs: Arduinos (Uno, Nano, MKR1000), ESP8266, Particle, LinkIt One

Sensors: light, sound, vibration, temperature, gas, motion, GPS, humidity & more…

On To The Labs

- Multiple workstations for each example, you can work alone or with a partner.
- Instructions for each lab is at the workstation.

Please

- Ask Questions
- Share