

Internet of Things: Introductions

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What is Internet of Things (IoT)?

The **Internet of Things** (IoT, sometimes **Internet** of Everything) is the network of physical objects or "**things**" embedded with electronics, software, sensors, and connectivity to enable objects to exchange data with the manufacturer, operator and/or other connected devices based on the infrastructure of International ...



[Internet of Things - Wikipedia, the free encyclopedia](https://en.wikipedia.org/wiki/Internet_of_Things)
https://en.wikipedia.org/wiki/Internet_of_Things Wikipedia ▾

- Very broad idea, a general catch-all term capturing a lot of different technologies.
- Things = Physical objects. This can be anything.
- They are assumed to be made 'smart.'
 - How? Add sensor/actuator and embedded processor.

Example



Regular light bulb

No sensing or control other than a manual switch



'Smart' light bulb

Can have sensor to sense light output, faults, temperature
Can have actuator to control light output, switch on/off
Can have a rudimentary processing ability (via a micro-controller)
Can have wireless connectivity

What is Internet of Things? (contd)

- Connect these smart thing into a network.
 - Via a wireless network.
 - Either a private custom network, or to the global Internet.
- This vision enables serious applications.
 - Imagine, every physical object is sensor/actuator enabled.
 - And, connected to Internet.
 - We can know the `status' of everything, where they are located and to some extent `control' them.

Many Names But Same Concept

- **M2M (Machine to Machine)**
 - A term originated by Telcos.
 - Mostly telemetry type applications (e.g., smart electricity meters)
- **Cyber-physical Systems (CPS)**
 - Mostly concerned with scientific applications (e.g., micro-climate monitoring)
- **Sensor/actuator Networks**
 - Mostly academic research types focusing on core technologies.

Current Market

- Health
 - such as fitness tracking, aging in place.
- Various smart home applications
 - Sense/control doors, switches, lights, thermostat, moisture, occupancy, baby monitoring, appliances.
- Smart grid
- Building/environment monitoring
 - Structural integrity, HVAC, pollution, disaster warning, intrusion.
- Overall nascent market and limited real applications.
 - Think of Internet in the 90s.
 - However, basic ideas are well understood.
 - However the future potential is huge.

Industry Forecasts

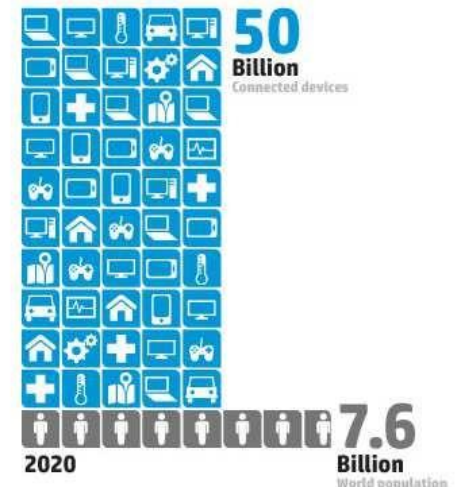
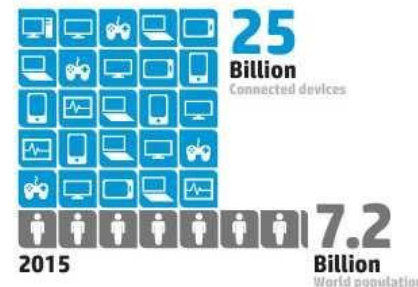
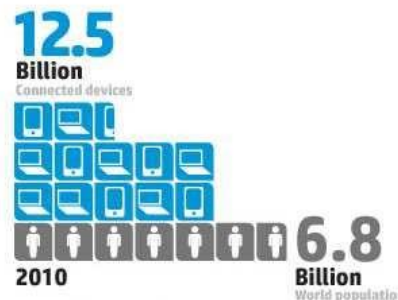
THE INTERNET OF EVERYTHING IS HERE.
As the Internet evolves, so will we.

37 billion new things will be connected by 2020.

The Internet of Things will experience a continued growth spurt into the next decade
The number of connected devices will double every five years, making the world's population growth seem glacial in comparison

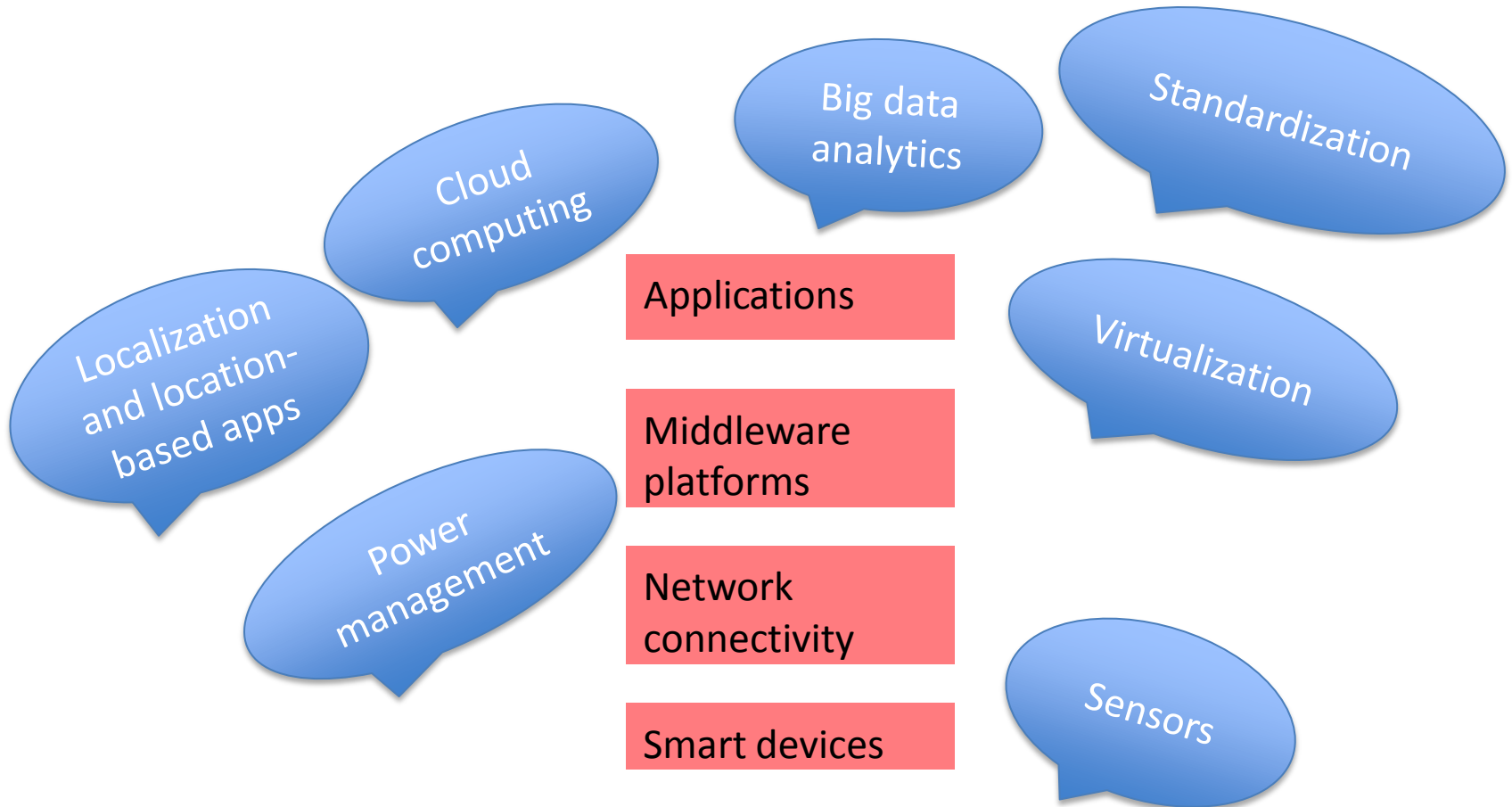
#IoE #TomorrowStartsHere

Cisco: 37-50 billion connected devices by 2020

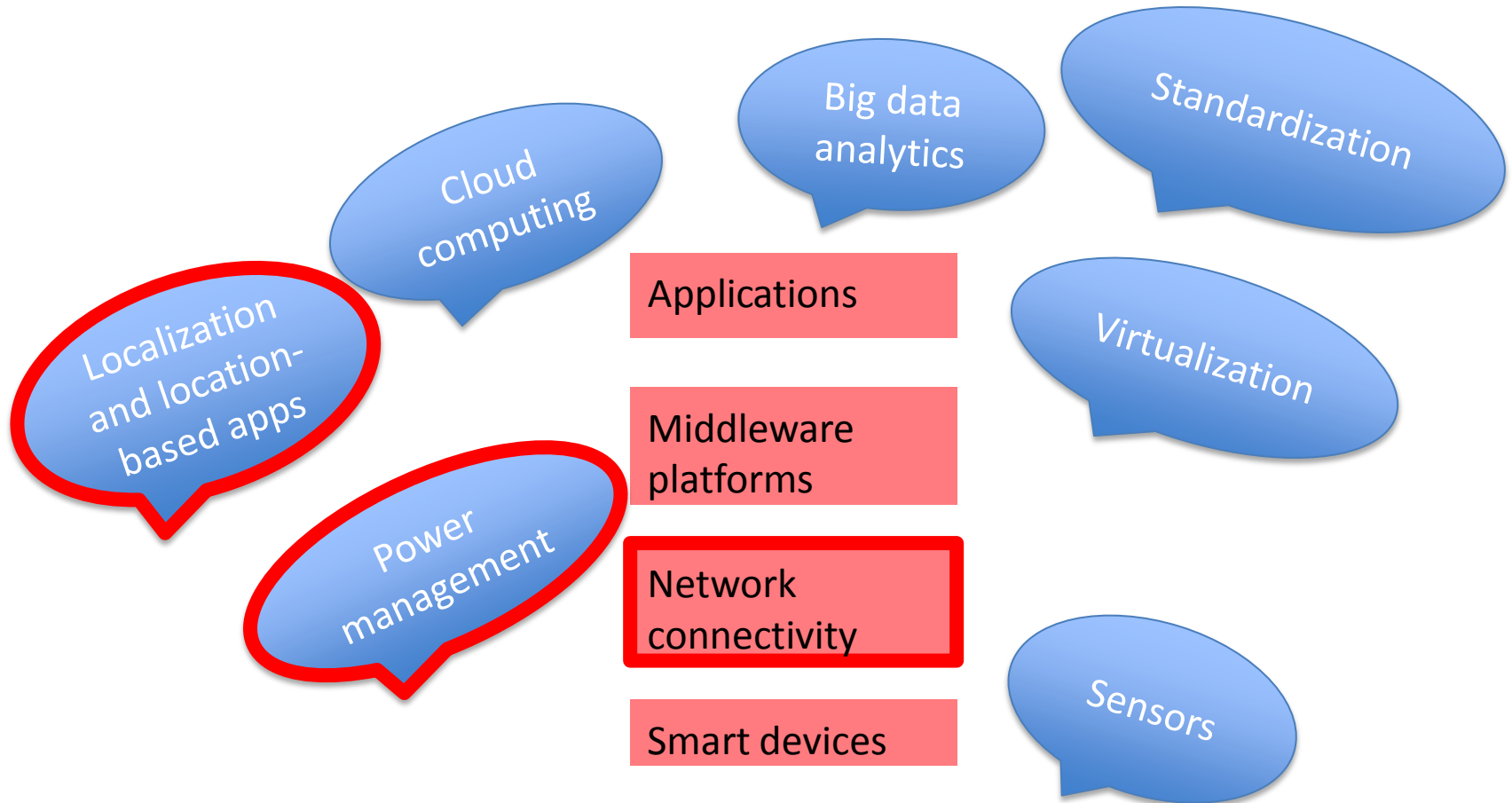


Source: Cisco, "Internet of Things", July 2011

Technical Challenges



Lecture Contents



Lecture Contents

