

M2M to the IoT

M2M system

- Each machine in embeds a smart device
- Device senses the data or status of the machine
- Performs the computation and communication functions

M2M system

- A device communicates via wired or wireless systems
- Protocols: 6LowPAN, LWM2M, MQTT, XMPP
- Each device assigned 48-bits Ipv6 addresses.

Machine-to-Machine (M2M) to IoT

- Technology closely relates to IoT which use smart devices to collect data that is transmitted via the Internet to other devices.

Machine-to-machine (M2M) to IoT

- Close differences lies in M2M uses for device to device communication also for coordinated monitoring and control purposes

M2M Application Areas

- Connected Cars for Safety and Infotainment
- Remote Monitoring
- ATMs/Point of Sales Terminal Connected for centralized Security
- Remote Monitoring, Trucks Fleet Management

M2M Communication Framework

- DeviceHive
- Enables connecting devices to the IoTs
- Web-based management software that creates security rules based networks and monitors devices

M2M Architecture

Three domains

- M2M Device domain,
- M2M network
- M2M Application domain

M2MM Application Domain

Integration, Collaboration and M2M Application Services

Application (Reporting, Analysis, control)

Network Domain

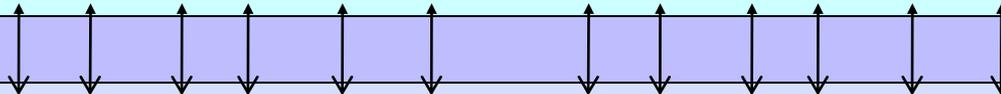
M2M server, device identity, device and device-network management, Data Analysis, Abstraction, Accumulation, and Management, uni-cast and multicast message delivery and core functionalities for monitoring.

Connectivity (Communication and Processing Units)

M2M Devices Domain Communication

Gateway

Connectivity Interface (Communication and Processing Units) and Edge Computing (data element analysis and transformation)



Physical devices and Controllers (the things in IoT) [Sensors, machines, devices, Intelligent Edge nodes of Different Types]

Layer 3: M2M device communication domain

- **M2M Devices Domain Communication**
- Gateway
- Physical devices and Controllers (the things in IoT) [Sensors, machines, devices, Intelligent Edge nodes of Different Types]

Layer 2: Network Domain

- M2M server, device identity, device and device-network management, Data Analysis, Abstraction, Accumulation, and Management
- uni-cast and multicast message delivery
- Core functionalities for monitoring

.....Layer 2: Network Domain

- Connectivity (Communication and Processing Units)

Layer 1: M2M Application Domain

- Integration, Collaboration and M2M Application Services
- Application (Reporting, Analysis, control)

M2M Protocols

- Eclipse M2M Industry Working Group Various projects
- Koneki
- Eclipse SCADA for open standards for communication protocols, tools, and frameworks

M2M Protocols

- ITU-T Focus Group M2M (global standardization initiative for a common M2M service layer
- Weightless (wireless communications) Group for standards and using wireless spaces for M2M

M2M Usages

- Coordinated movement of tools, robots, drones
- Refinery operations, sequential control at each stage during manufacturing
- Manufacturing of food packets
- Assembly in assembly lines and
- Tracking of failures along the railway tracks.

IIoT usages

- Manufacturing at multiple locations, railways, mining, agriculture, oil and gas, utilities, transportation, logistics and healthcare services along usages of the Internet, and
- Usages of software for analytics, machine learning, and knowledge discovery in these areas

Summary

We learnt

- (i) M2M devices Network connect to Internet Also
- (ii) Close differences lies in M2M uses for device to device communication also for coordinate monitoring plus control purposes

Summary

We learnt

- (iii) IoT usages of remote computers, systems, servers connected through Internet protocols, and
- (iv) Three Layer Architecture: Devices Communication Domain, Network domain and Application Domain

Summary

We learnt

(v) M2M Devices and Network Tools
and

(vi) M2M usages examples

(vii) IIoT usages examples

End of Lesson 5 on M2M to the IoT