IoT Physical Devices & Endpoints

IoT device

 A "Thing" in Internet of Things (IoT) can be any object that has a unique identifier and which can send/receive data (including user data) over a network (e.g., smart phone, smartTV, computer, refrigerator, car, etc.).

 IoT devices are connected to the Internet and send information about themselves or about their surroundings (e.g. information sensed by the connected sensors) over a network (to other devices or servers/storage) or allow actuation upon the physical entities/environment around them remotely. IoT Device Examples A home automation device that allows remotely monitoring the status of appliances and controlling the appliances.

 An industrial machine which sends information abouts its operation and health monitoring data to a server.

 A car which sends information about its location to a cloud-based service.

 A wireless-enabled wearable device that measures data about a person such as the number of steps walked and sends the data to a cloud-based service.

Basic Building Blocks of an IoT Device.

Sensing: Sensors can be either on-board the IoT device or attached to the device . IoT device can collect various types of information from the on board or attached sensors such as temperature, humidity, light intensity, etc

Actuation: IoT devices can have various types of actuators attached that allow taking actions upon the physical entities in the vicinity of the device. Example: A Relay switch connected to an IoT device can turn an appliance on/off based on the commands sent to the device.

Communication: Communication modules are responsible for sending collected data to other devices or cloud-based servers/storage and receiving data from other devices and commands from remote applications.

Analysis & Processing: Analysis and processing modules are responsible for making sense of the collected data Block Diagram of an IoT Device Expansions

- USB Host-Universal Serial Bus Host
- RJ 45/Ethernet- Component /Port
- CPU- Central Processing Unit
- GPU- Graphical Processor Unit
- HDMI-High-Definition Multimedia Interface Splitter
- RCA Video-Radio Corporation of America Community
- UART- Universal Asynchronous Receiver Transmitter
- SPI-Serial Peripheral Interface
- I2C-Inter Integrated Circuit bus
- CAN-Controller Area Network
- SD-Secondary Storage
- MMC-Multimedia Memory Cards.
- SDIO-Secure Digital Input Output
- NAND/ NOR- Logic Gates
- DDR1/DDR2/DDR3-Double Data Rate