Introduction to IOT

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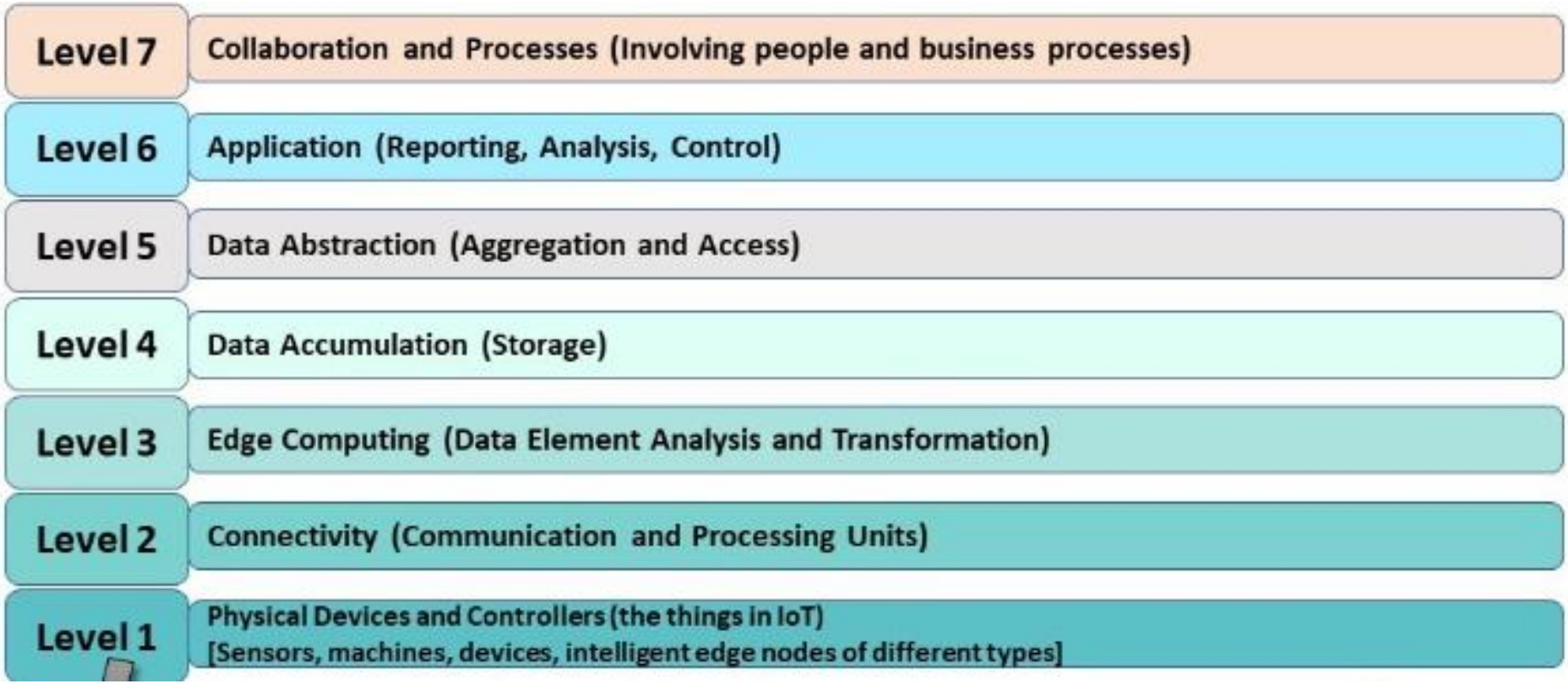
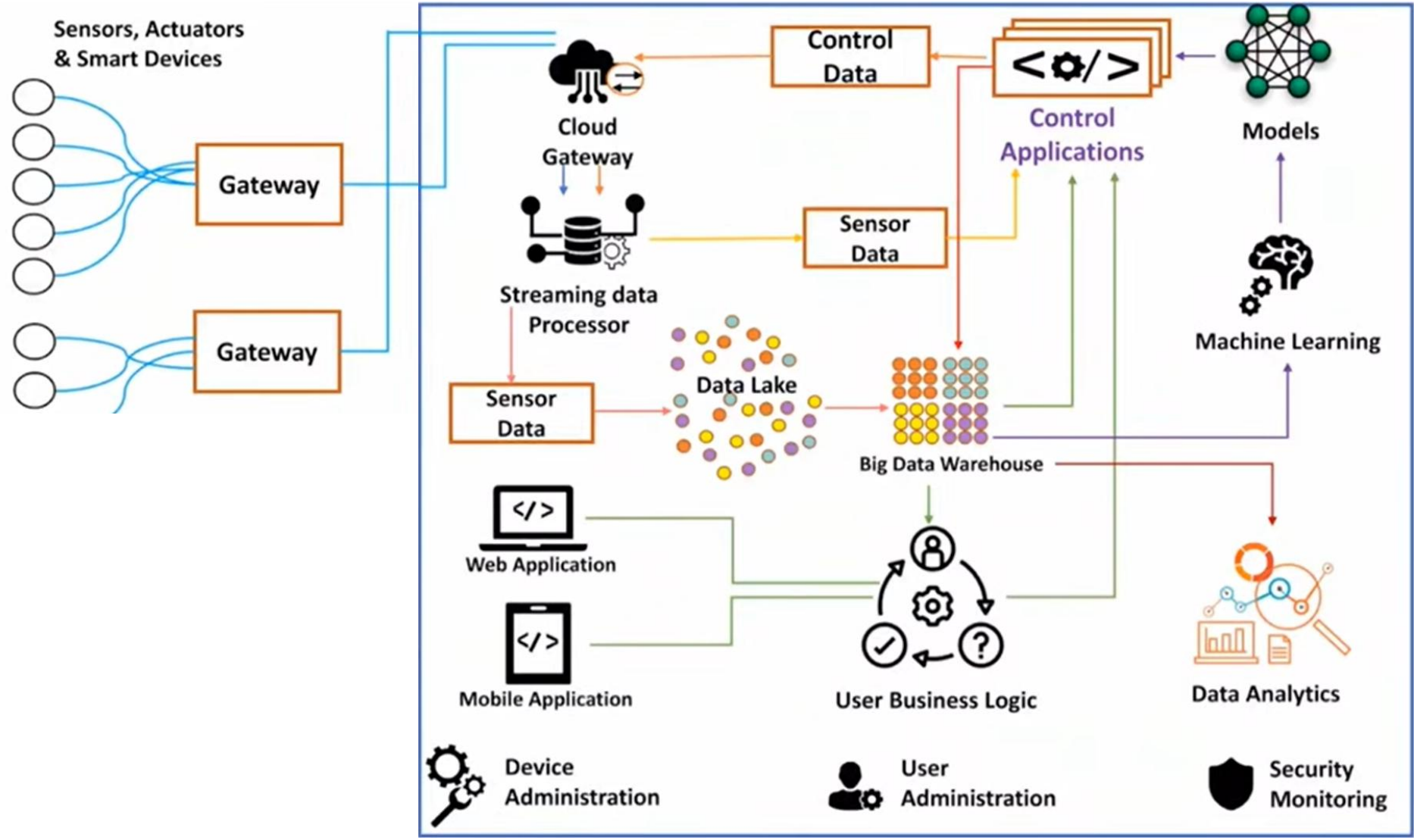
Fundamentals of IoT Reference Model

- An IoT system has multiple levels, each level explains distinct functionalities and Components of the IoT network. These levels include different physical devices, connectivity protocols, data processing, applications, etc.
- These levels are also known as tiers. Tiers mean the hierarchical structure of the IoT network. Each tier has specific roles and responsibilities.
- Several reference architectures are expected to co-exist in the IoT domain. There can be many reference architectures of IoT systems for different applications. These reference architectures provide guidelines, best practices, and common patterns for designing and implementing IoT solutions.
- A model enables the conceptualization of a framework.
- A reference model can be used to depict building blocks, successive interactions, and integration of various IoT components.
- We will understand IoT Architecture with CISCO's seven levels reference model.

IoT Reference Model by CISCO



End-to-End IoT Architecture



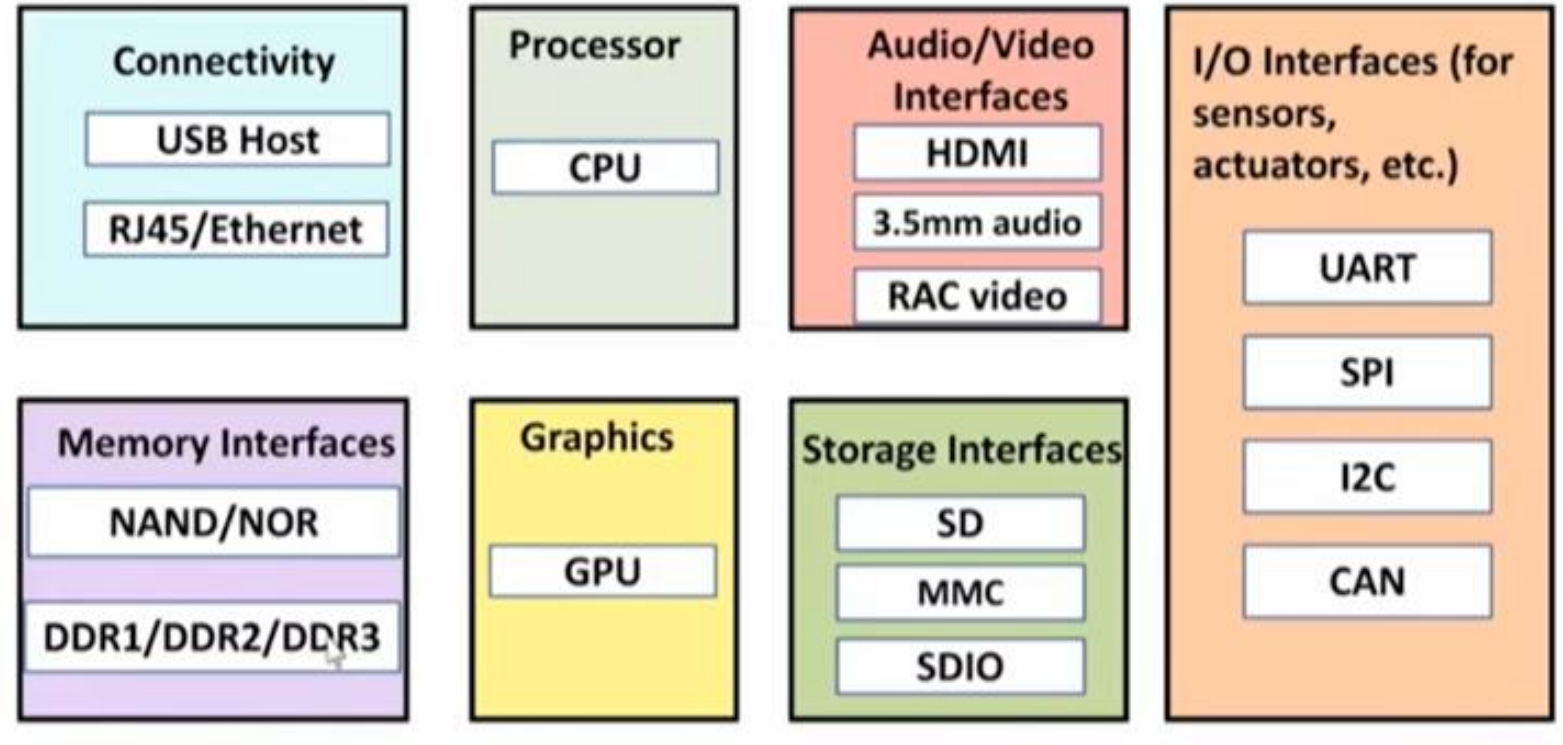
Physical Design of IoT

- Physical design is more than creating products. It includes Things/Devices and protocols.
- Node Devices perform remote sensing, actuating, and monitoring work. The protocols are used to establish communication between the Node devices and servers.
- It is about forming an overall intelligent system.
- In physical design, one understands the most effective method of storing and accessing the objects.

❑ "Things" in IoT

- Things in IoT pertain to devices that are used for Actuating, Monitoring, and Remote sensing capabilities. It is used for the following functions:
  - Collect data. {Sense Physical Data}
  - Exchange data. {Things to IoT Cloud}
  - Perform Tasks based on Program/Algorithms. {Actuator}

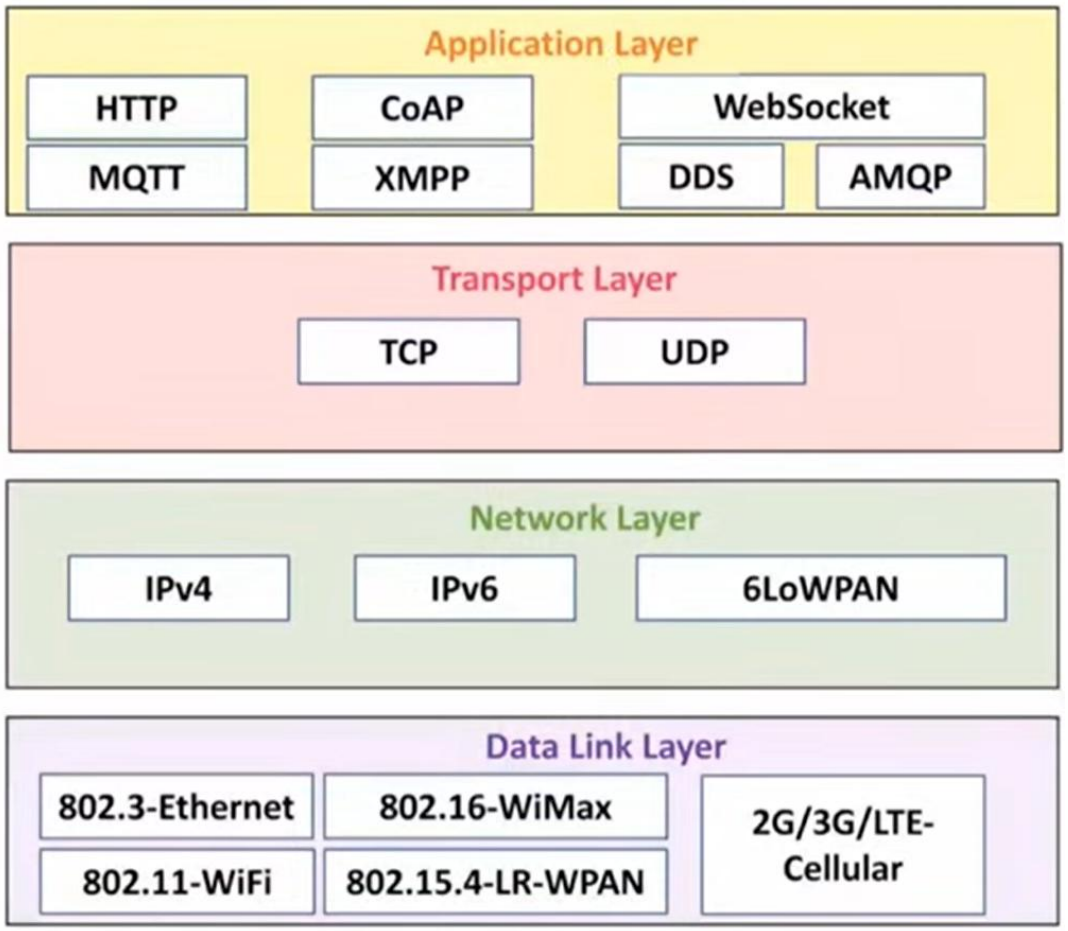
Generic Block Diagram of IoT devices



IoT Protocol Brief Overview

- IoT Protocols provide the Foundation of IoT systems. It facilitates network connectivity and establishes communication between devices and applications.
- IoT Protocols Allow devices to exchange data over the network.
- IoT Protocol defines the following essential aspects:
  - The data exchange formats
  - Data encoding
  - Addressing schemes for devices
  - Routing of packets from source to destination.
- IoT protocol also provides data transmission with the following functionalities:
  - Sequence control
  - Flow control
  - Retransmission of lost packets.

IoT Protocols for Internet Communication



Thank You