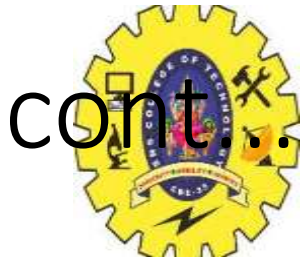




Structural Aspects of the IoT



- Structural Issue related to
- **☐ Environment Characteristics**
- **☐ Traffic Characteristics**
- **☐ Scalability**
- **☐ Interoperability**
- **☐ Security and Privacy**
- **☐ Open Architecture**



Environment Characteristics:

Most (but certainly not all) **IoT/machine-to-machine (M2M) nodes have design constraints:**

Low power (with the requirement that they will run potentially for years on batteries)

Low cost (total device cost in single-digit dollars or triple digit rupee)

Severely limited code and RAM space

Traffic Characteristics



- The **characteristics of IoT/M2M communication** is different from other types of networks or applications.
- For example, cellular mobile networks are designed for human communication and communication is connection centric.
- But **in IoT, M2M** the expectation is that there are many devices, there will be **long idle intervals, transmission entails small messages, there may be relaxed delay requirements, and device energy efficiency is paramount.**



Scalability



- When **contemplating expansion**, one wants to be able to build on previously deployed technology (systems, protocols), **without having to scrap the system and start from scratch.**
- The efficiency of a **larger system should be better than the efficiency of a smaller system.**
- This is what is meant by scalability.
- The goal is to **make sure that capabilities such as addressing, communication, and service discovery**, among others, are delivered efficiently in both small and large scale.

Interoperability



- Interoperability in the Internet of Things (IoT) is the **ability of different devices, systems, and platforms to work together within the same ecosystem**. It's a critical feature that unlocks the potential of the IoT paradigm.

Security and Privacy



- IoT relates to electric power distribution, goods distribution, transport and traffic management, e- health, and other key applications, as noted earlier. It is critical to maintain system-wide confidentiality, identity integrity, and trustworthiness.

Open Architecture



- The goal is to support a wide range of applications using a **common infrastructure, preferably based on a service-oriented architecture (SOA)** over an open service platform, and utilizing overlay networks (these being logical networks defined on top of a physical infrastructure)