

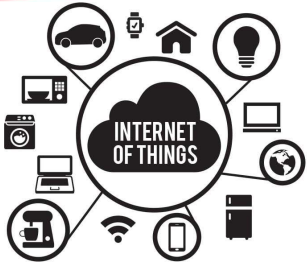


SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution



Department of Information Technology



19ITT30 - INTERNET OF THINGS

III B.Tech. IT/ V SEMESTER

UNIT II : FUNDAMENTAL MECHANISMS & KEY TECHNOLOGIES

Topic 2 : Environment Characteristics- Traffic Characteristics-Scalability- Interoperability-Security and privacy

Identification of IoT Objects and Services- Structural aspects of IoT-Environment Characteristics- Traffic Characteristics-Scalability-Interoperability-Security and privacy -Key IoT Technologies : Device Intelligence - Communication Capabilities - Mobility Support - Device Power -Sensor Technology -RFID Technology - Satellite Technology - IoT Enabling Technologies- WSN, Cloud Computing, BigdataAnalytics, communication protocols, embedded systems



Recap

There are various types of identifiers with different purposes and practicality

- Globally unique identifiers are highly desirable.
- Identification codes can be classified as
 - Object IDs (OIDs)
 - Communication IDs

Structural aspects of IoT

- Environment Characteristics
- Traffic Characteristics
- Scalability
- Interoperability
- Security and privacy





Environment Characteristics ^{4/10}

- IoT M2M nodes have noteworthy 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)
- Significantly more devices than in a LAN environment
- Severely limited code and RAM space (e.g., generally desirable to fit the required code—MAC, IP, and anything else needed to execute the embedded application—in, for example, 32K of flash memory, using 8-bit microprocessors)
- Unobtrusive but very different user interface for configuration (e.g., using gestures or interactions involving the physical world) •
- Requirement for simple wireless communication technology. In particular, the IEEE 802.15.4 standard is very promising for the lower (physical and link) layers



Traffic Characteristics

5/10

IoT / M2M communication is different from other networks.

- For example, Cellular mobile networks are designed for human communication. Communication is connection centric;
- It entails interactive communication between humans (voice, video), or data communication involving humans
- (web browsing, file downloads, and so on).
- It is optimized for traffic characteristics of human-based communication and applications.
- Communication takes place with a certain length (sessions) and data volume;



Traffic Characteristics ^{6/10}

M2M

- In 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 ^{7/10}

- IoT applications may start out covering a small geographic area or a small community of users.
- But it is desirable they may be expanded in future
- In case of expansion, we able to build on previously deployed technology (systems, protocols), without having to scrap the system and start from scratch.
- Also, the efficiency of a larger system should be better than the efficiency of a smaller system.
- The goal is to make sure that capabilities such as addressing, communication, and service discovery, are delivered efficiently in both small and large scale.
- There is a need for enough name space to support increasing populations of devices and new applications.

Interoperability

- Because of the plethora of applications, technology suppliers, and stakeholders, It is desirable to develop and/or re-use a core set of common standards.
- To the degree possible, existing standards may prove advantageous to a rapid and cost-effective deployment of the technology.
- Product and service interoperability is of interest.



Security and Privacy

- Protocol Security is important
- Almost invariably a protocol spec will have many pages of data format and operation procedures and only a short paragraph or two on security considerations.
- It is critical to maintain system-wide confidentiality, identity integrity, and trustworthiness



Thank You!