



SNS COLLEGE OF ENGINEERING



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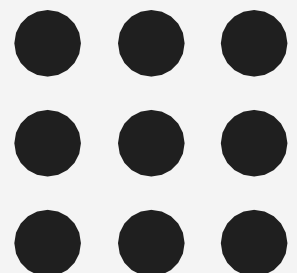
Department of Information Technology

Course Name – 19IT503 Internet of Things

III Year / V Semester

**Unit 2 – FUNDAMENTAL MECHANISMS & KEY
TECHNOLOGIES**

Topic 2- Structural Aspects of IoT





Structural aspects of IoT



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



Structural aspects of IoT

Environment Characteristics

- 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



Structural aspects of IoT

Traffic Characteristics

- 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;

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.



Structural aspects of IoT

Scalability

- 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.



Structural aspects of IoT

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