

CS849

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## Architectural Support for IOT applications

### Objectives

- To define Internet of Things
- To get a research perspective on current and future developments of Internet of things
- To provide an in-depth knowledge in ARM architecture for Internet of things
- To Provide knowledge on efficient Energy Utilisation

### UNIT I

Introduction to IoT: - Definition and Characteristics. Web of Things V/s Internet of Things: - Two pillars of the web, architecture standardization for WoT, Platform middleware for IoT. Unified multi-tier WoT architecture, WoT portals and Business Intelligence. M2M to IoT: M2M Communication. Trends in Information and Communication Technology, Implications for IoT, Barrier and Concern for IoT.

### UNIT II

IoT Architecture: Building architecture. Main design principles and needed capabilities, An IoT architectural overview. IoT Reference Model: IoT domain model, Information model, Functional model. Communication Model, Security Model. IoT Reference Architecture: Deployment and Operational view.

### UNIT III

General Concepts of the Architecture Reference Model (ARM):  
The Need for a Common Ground for the IoT: The History and Reasoning Behind the IoT-A Project.  
The IoT Architectural Reference Model as Enabler. IoT in Practice: Examples: IoT in Logistics and Health.

### UNIT IV

A Guidance to the Architecture Reference Model (ARM): Guidance to the ARM- A Process for Generating Concrete Architectures - IoT Reference Model -IoT Reference Architecture -The IoT ARM Reference Manual - Interactions - Toward a Concrete Architecture - ARM Testimonials

### UNIT V

Energy Utilisation for IOT: Battery Life Challenges in IoT Wireless Sensors Non volatile processor Architecture Exploration for energy harvesting applications - Electro mechanical devices for Ultra Low Power Electronics- IoT challenges and issues

### TEXT BOOKS:

1. Internet of Things: Converging Technologies for smart Environments and Integrated Ecosystems, Dr. Ovidiu Vermesan, Dr. Peter Friess, River Publication.
2. From Machine to Machine to the Internet of Things: Introduction to a new Age of Intelligence, Jan Hollar, Vlasios Tsiasis Mulligan, Stefan Avesand, Stamis Karnouskos, David Boyle, 1st Edition, Academic Press 2014.
3. Enabling things to talk, Designing IoT solutions with IoT Architectural Reference Model Alessandro Bassi, Martin Bauer, Martin Fielder, Thorsten Kramp, Springer, 2013

### REFERENCES:

1. The Internet of Things: An Overview, Understanding the issues and Challenges of More Connected World, Internet Society October 2015.
2. Designing the Internet of Things, Adrian McIwen, Hakim Cassimally.
3. Architecting the Internet of Things, Dieter Uckelmann, Mark Harrison, Florian Michahelles, Springer 2011.

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