Functional View

The Functional View of the IoT Reference Architecture defines the key functional components (FCs) and their roles in the system. It consists of several Functional Groups (FGs) that perform different tasks within an IoT system.

1. Device and Application Functional Group

- Devices include sensors, actuators, smartphones, and industrial machines.
- Applications include standalone applications (mobile/web) or enterprise systems.
- Key components: Sensing, Actuation, Tag, Processing, and Storage.

2. Communication Functional Group

- Ensures data transfer between devices and network infrastructure.
- Includes End-to-End Communication, Network Communication, and Hop-by-Hop Communication.
- Responsible for message routing, identifier translations, and secure transport of application layer messages.

3. IoT Service Functional Group

- Manages IoT services that interface with device resources.
- Provides sensor data, actuator controls, and service discovery mechanisms.
- Includes the IoT Service FC and the IoT Service Resolution FC.

4. Virtual Entity Functional Group

- Enables interaction between users and physical entities through virtual representations.
- Example: A user querying "What is the temperature in Conference Room Titan?" is mapped to the respective sensor service.

5. IoT Process Management Functional Group

- Integrates IoT services with business processes.

- Includes Process Modelling FC and Process Execution FC.

6. Service Organization Functional Group

- Handles service composition, orchestration, and choreography.

- Allows dynamic resolution of IoT services and automates service interactions.

7. Security Functional Group

- Ensures security and privacy of the IoT system.

- Components: Identity Management, Authentication, Authorization, Key Exchange, Trust & Reputation.

8. Management Functional Group

- Handles system-wide configuration, fault management, and performance monitoring.

- Includes Configuration, Fault, Member, State, and Reporting FCs.

Conclusion:

The Functional View defines how different components interact to provide IoT capabilities.

By organizing them into functional groups, the system ensures scalability, security, and interoperability.