DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECE308 – WIRELESS TECHNOLOGIES FOR IOT

III ECE / VI SEMESTER

UNIT 1 – OVERVIEW OF INTERNET OF THINGS

TOPIC 8 – Data enrichment, Data consolidation and Device management at IoT/M2M Gateway,
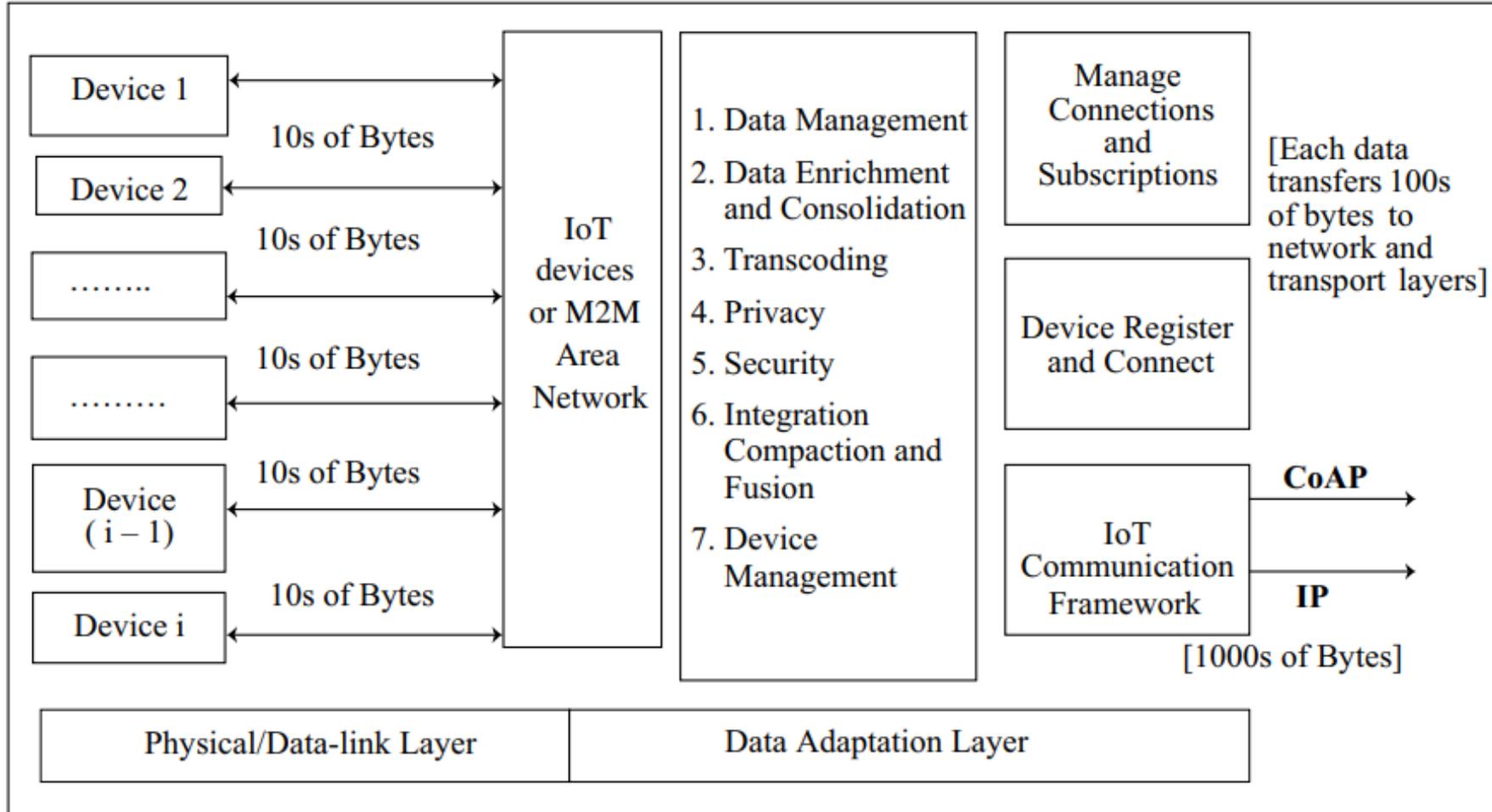
Device and Gateway capabilities

- A gateway at a data-adaptation layer has several functions.
  - Data privacy, data security, data enrichment, data consolidation, transformation and device management.
- The gateway includes two functions viz.
  - data management and consolidation, and
  - connected device management.

Framework for data enrichment and consolidation

Data Management and Consolidation Gateway Functions

- Transcoding

- Privacy, security

- Integration

- Compaction and fusion

Transcoding

- Adaptation
- Conversions, and changes
- Using software which renders the web responses and messages
- Required in the IoT device acceptable Formats and representations

Data Privacy

•Examples: Patient medical data, data for a company supplies from and to different locations, and changes in inventories.

Privacy and protection from consciously or unconsciously transferring to untrustworthy destination using the Internet

Privacy Model

Depends on following components:

 (i) Device and Applications Identities management

 (ii) Authentication

 (iii) Authorization

 (iv) Trust and

 (v) Reputation

Data Security sub-layer for confidentiality and authorization

- A standard algorithm AES (Advanced Encryption Algorithm based on symmetric 128-bit block data encryption) CCM mode (Counter with CBC MAC)

• CBC stands for cryptographic block cipher with a block length of 128 bits.

• CCM is method which provisions for the authenticated encryption algorithm for confidentiality and authentication.

Data Gathering

- Data gathering means data acquisition from the device(s)

- Four modes of data gathering are:

  (i) Polling means data sought from a device by addressing the device

  (ii) Event based

  (iii) Scheduled interval

  (iv) Continuous monitoring

Data Enrichment

- Adding value
- Security and
- Usability of the data

Data Dissemination: Prior Actions

- (i) Aggregation of joining together present and previously received data.

- (ii) Compaction making information short without changing the meaning or context

- (iii) Fusion means formatting the information received in parts through various data frames and several types of data (or data from several sources),

Energy Dissipation due to Data Dissipation

- Higher the data rate, the greater will be the energy consumed

- Higher is the radio frequency used,the greater will be the energy consumed

- Energy efficient computations by using concepts of data aggregation, compaction and fusion