one M2M
The IoT Standard

tsdsi
India's Telecom SDO
Telecommunications Standards Development Society, India

STAKEHOLDERS DAY CONFERENCE
NEW DELHI, INDIA

12 February 2025

9:30 AM to 6:00 PM IST

Research & Innovation Park,
IIT Delhi, New Delhi and online

India Perspective

IoT/M2M Deployment Scenarios & Possibilities in context of oneM2M

12 February 2025

Advancing oneM2M Adoption - Challenges & Growth prospects

by

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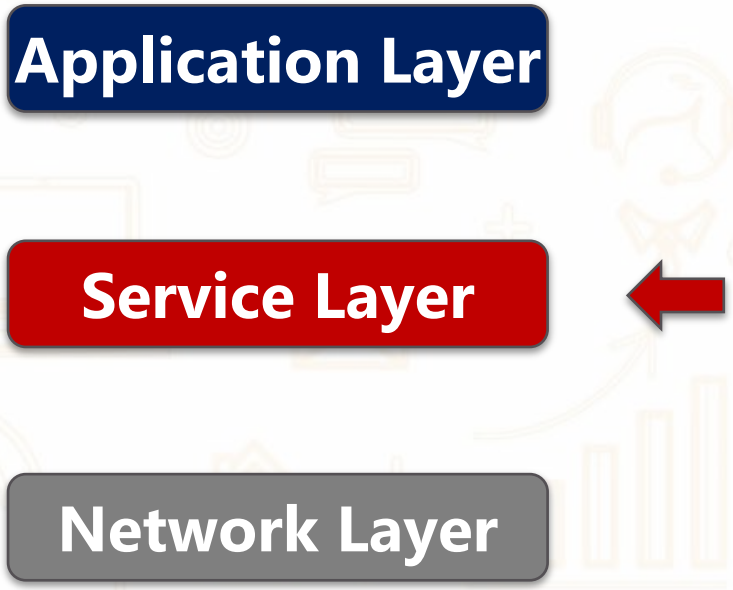
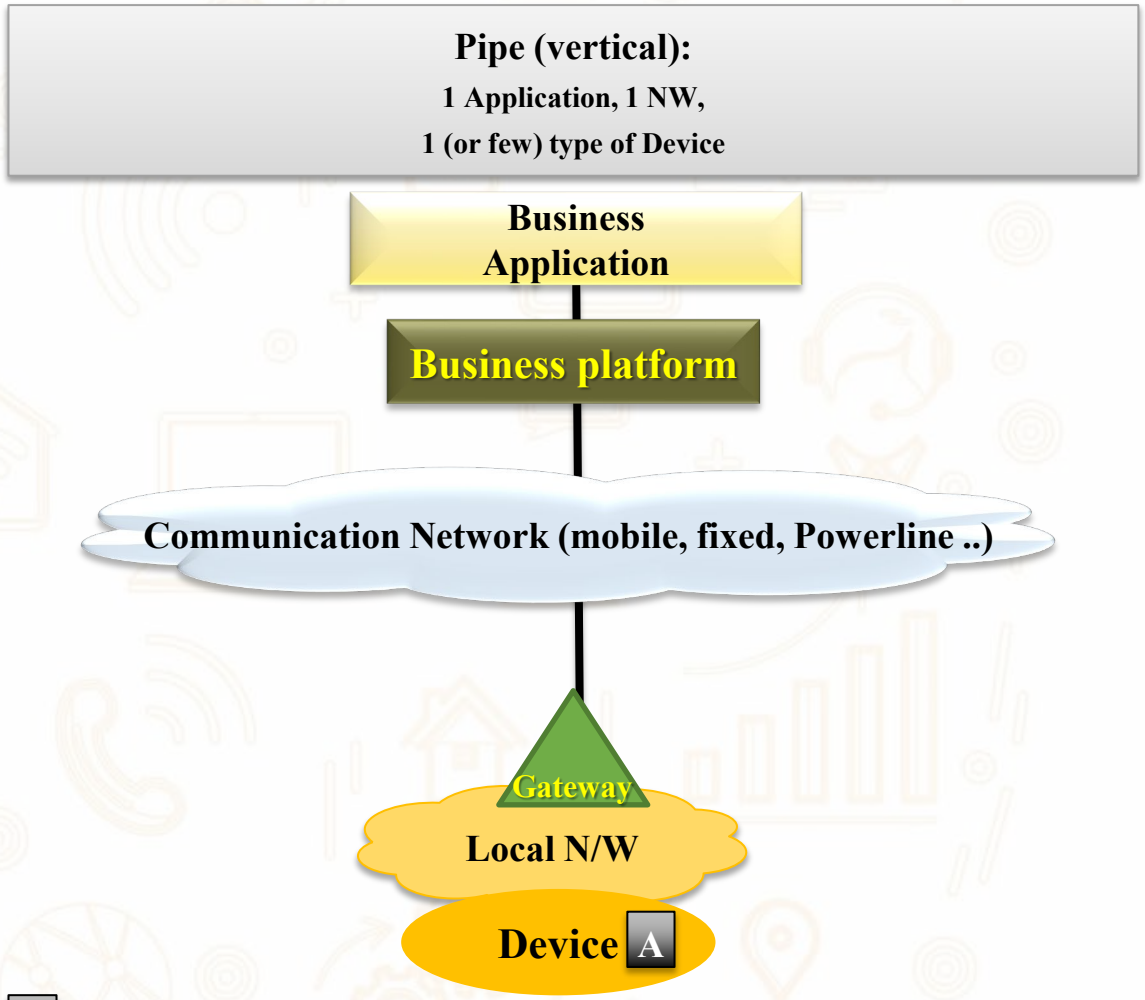
What is oneM2M?



- It is a software/middleware layer
- It sits between applications and underlying communication networking HW/SW
- It hides complexity of NW usage from apps
- It typically rides on top of IP protocol stack
- It exposes common set of functions to applications via developer friendly APIs
- It is integrated into devices/gateways/servers and allows distributed intelligence
- It stores and shares data
- It supports access control
- It notifies applications about events

Present IoT/M2M Deployment Architecture



Issues with siloed deployment:

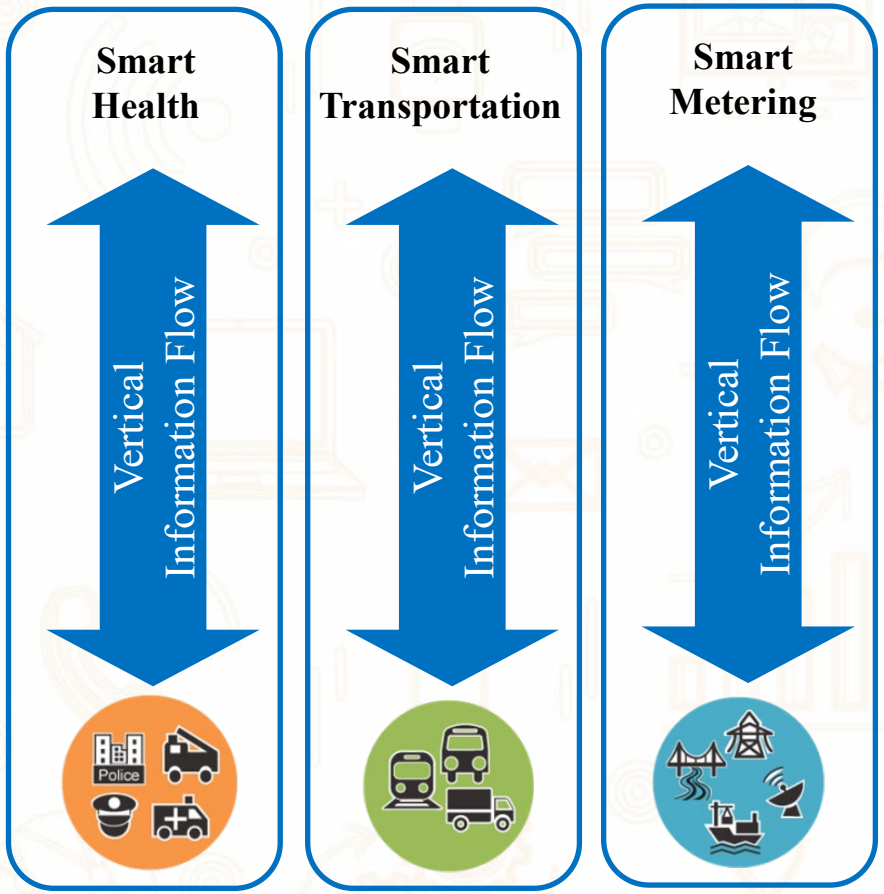
1. Interoperability: Devices and applications do not interoperate; giving rise to higher TCO.

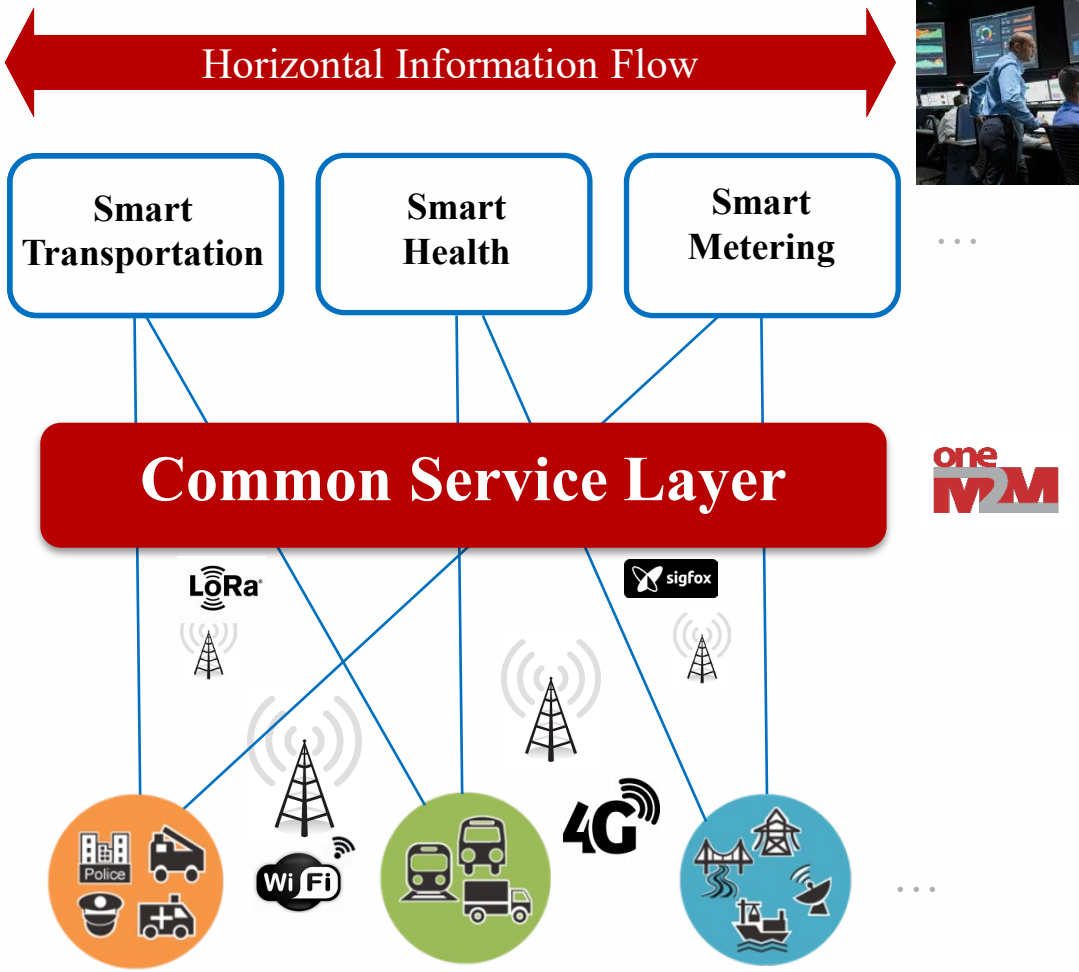
2. Data Sharing: Sharing of data amongst divergent applications very difficult and controlled by the Application Provider(s).

3. Vendor Lock-In: All the applications are deployed and controlled by a single vendor. Scaling and onboarding of new applications becomes challenging.

4. Security: Device Security, Communication Security, Data Integrity, Data Privacy, are not completely guaranteed.

oneM2M Breaks Down the Silos





oneM2M Feature Summary by Release

Rel-1 Features

- Registration
- Discovery
- Security
- Group Mgmt.
- Data Mgmt. & Repository
- Subscription & Notification
- Device Management
- Communication Mgmt.
- Service Charging
- Network Service Exposure
- App & Service Mgmt.
- HTTP/CoAP/MQTT Bindings

Rel-2 Features

- Time Series Data
- Flexible resources that can be customized by app developers
- Semantics Description & Discovery
- Security Enhancements
  - Dynamic Authorization
  - Content Security
  - E2E Security
- WebSocket Binding
- Ontology for Home Area Information Model
- oneM2M App-ID Registry
- oneM2M Interworking
  - LWM2M
  - AllJoyn
  - 3GPP Triggering

Rel-3 Features

- Semantic Querying/Mashups
- 3GPP SCEF Interworking
  - Non-IP Data Delivery,
  - UE Reachability Monitoring
  - Device Triggering
  - Etc.
- Transaction Management
- Service Layer Routing
- Common oneM2M Interworking Framework
  - OCF, OPC UA, OSGi, Modbus
- oneM2M Conformance Tests and Profiles
- Security Enhancements
  - Distributed Authorization, etc.
- Ontology-based Interworking

Rel-4 Features

- Fog/Edge Computing
  - Service Provisioning
  - Service Pooling, etc.
- 3GPP Interworking
  - Session QoS
  - V2X
  - NIDD Enhancements
  - Charging
- Vehicular Centric Features
  - Mobility, low latency, …
- Semantic Reasoning & Ontology Mapping
- Service/User Subscription
- Security Enhancements
  - User/Data Privacy, etc.
- W3C WoT Interworking
- SDT4.0 and the information models for multiple domains
- Streamlining oneM2M protocol
- oneM2M Conformance Tests

oneM2M: User's Perspective

- Enhanced Security & User Safety
- Privacy Protection & Personal Data Management
- Cross Domain Device Interoperability
- Improved User Experience

TEC and oneM2M Adoption

- TEC adopted **oneM2M Release 2 and Release 3** specifications as National Standards in 2020 and 2022 respectively.
- The important benefits of implementing oneM2M standards based solution includes interoperability of device & application; authentication & authorization of devices; and Data security & Privacy. These specifications will enable the development of standardized IoT ecosystem in the country including smart cities.
- These TEC national standards have been referred by BIS in its standard on IoT Reference Architecture - IS 18004 (Part 1) and MoHUA in its Smart City RFP.
- C-DOT developed oneM2M Rel 3 based platform (CCSP) and opened it for hosting of applications by various Start ups, innovators and industries.
- CDAC developed oneM2M Rel 2 based platform and providing services.
- IIIT Hyderabad is having oneM2M Rel 2 based Smart City living lab for R&D and created Smart campus network.

Awareness Initiatives

- TEC always puts forward the idea of using oneM2M standards to deploy M2M/IoT solutions through workshops and webinars.
- From time to time TEC has been writing to various Ministries/ departments/ organizations to mandate compliance with oneM2M standards through RFPs/ guidelines.
- TEC has been promoting deployment of oneM2M Standards among various industry stakeholders like start-ups and SMEs through forums like India Mobile Congress.
- C-DOT has established a Centre of Innovation to collaborate with start-ups and SMEs on developing smart solutions based on oneM2M standards. The center helps applicants test their IoT/M2M solutions on the C-DoT Common Service Platform (CCSP) before deployment.
- oneM2M standards Rel. 2 has been transposed into ITU-T Y.4500 series.

Testing and Certification Scenario

- **oneM2M Deployment Status**: Implemented in India and Korea, but not yet widely adopted globally.
- **Testing & Certification Ecosystem**: GCF RTOs - 3 and ACEs - 1
- **Certification Trends**: As per GCF data, only 39 products certified under oneM2M certification since 2017, including only 2 products in 2024.
- **Testing & Tool Support**: No tool supplier available for implementing Release 3 test suite, GCF currently certifies only oneM2M Release 2 test suites.
- **Accreditation Initiatives**: TEC initiated discussions with GCF to establish RTOs/ ACEs in India and exploring ways to move forward with oversight of TEC.

oneM2M Adoption – Growth Prospects

- **Establish Testing & Certification Ecosystem**: GCF to consider nominating TEC as the authorized testing and certification body for oneM2M in India. TEC can then be authorized to accredit testing labs/RTOs/ACEs, to provide certification support for oneM2M solutions.

- **Mandate oneM2M standard :** Regulatory framework to mandate oneM2M standard for IoT deployments and cover IoT solutions under mandatory testing and certification. Further, C-DoT Common Service Platform (CCSP) will be expanded to facilitate the testing needs of start-ups, innovators, SMEs, and others for their IoT/M2M solutions.

- **Capacity Building & Awareness**: TEC in collaboration with TSDSI can organize training programs, workshops, and seminars to raise awareness and build technical expertise, ensuring successful oneM2M deployments and integration.

- **Promote Regional Collaboration**: TEC can lead by facilitating partnerships between SAARC nations and oneM2M standards bodies, encouraging joint testing and certification initiatives to drive adoption across the region.

Thank You

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