

In the framework of

SESEI



CENELEC



In association with



Confederation of Indian Industry

3rd Indo-European Conference on Standards and Emerging Technology

26th April, 2018 – New Delhi



THE NEED FOR STANDARDIZED COMMON SERVICE LAYER IN SMART CITIES

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सी-डॉट
C-DOT

IOT/M2M APPLICATIONS IN SMART CITIES

Present landscape



Current IoT/M2M Solution Deployment Scenario

Pipe (vertical):
1 Application, 1 NW,
1 (or few) type of Device



Business Application

Business platform

Transport Network (mobile, fixed, Powerline ..)

Gateway

Local N/W

Device

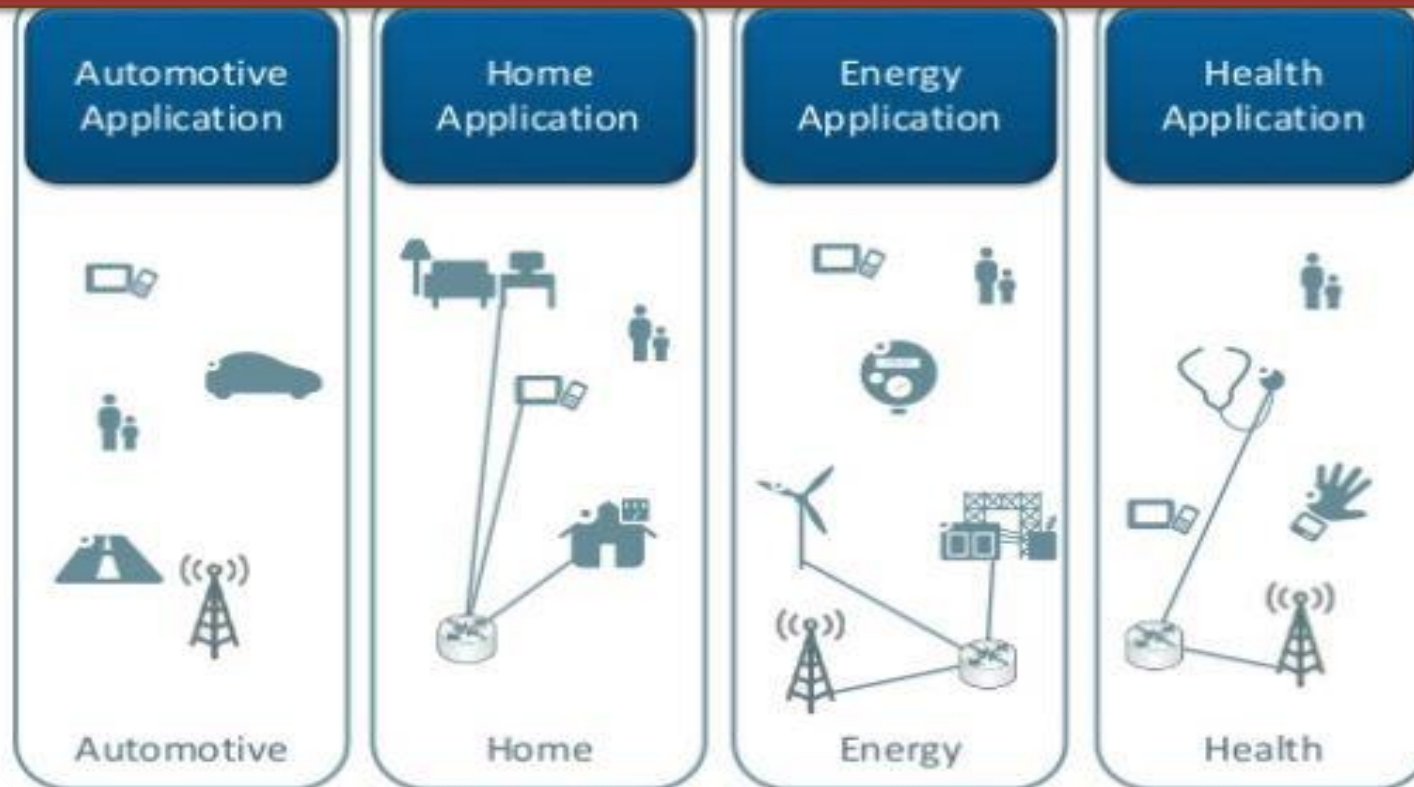
A Application Entity

A

Current Landscape of Smart City Applications

Management Layer

Management App



Other City Services and Departments

vertical Centric Siloed Ecosystem

IN ORDER TO SHARE DATA AMONG ALL THESE SILOED (PROPRIETARY) APPLICATIONS ANOTHER LAYER WOULD HAVE TO BE CREATED WHICH CAN EXTRACT DATA FROM THESE APPLICATIONS

The Challenges posed by this massive proliferation

- **Standardisation(or lack of it):** Due to non-standardised proprietary implementations the devices and applications do not interoperate; giving rise to higher TCO and preventing sharing of data amongst divergent applications
- **Security-** Device Security, Authentication, Communication Security, Data Integrity, Data Privacy, Lawful Interception
- **Inadequate Network Resources:** The networks of today are not designed to cater to the divergent kind of applications and the massive data volumes generated by such large number of devices
- **Device Ownership:** Ownership of the devices communicating, KYC
- **Spectrum Availability**
- **Addressability:** limited address space for mobile devices(10 digit, 13 digit or more..), IPv6?
- **Power Supply(long Battery life, energy harvesting..), Software Complexity, Semantics, Self-management And Self-healing of IoT/M2M devices and Regulatory Aspects (licensing, Service Provider Registration etc.)**

What is needed?

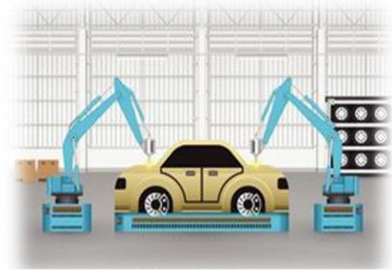
- Interoperability – applications, devices, networks, semantics (no vendor locking!)
- Data Sharing among Divergent Applications
- Security and Privacy
- Prevent deployment of unauthorized, unsolicited devices and applications
- Management interfaces and Dashboards
- Seamless integration of divergent applications
- Quick and Easy Development and rollout of new applications
- Promote Innovations

All the above can only be achieved if there is a **standardized** horizontal common service layer providing device, network and vertical agnostic pluggability.



Data Sharing Example

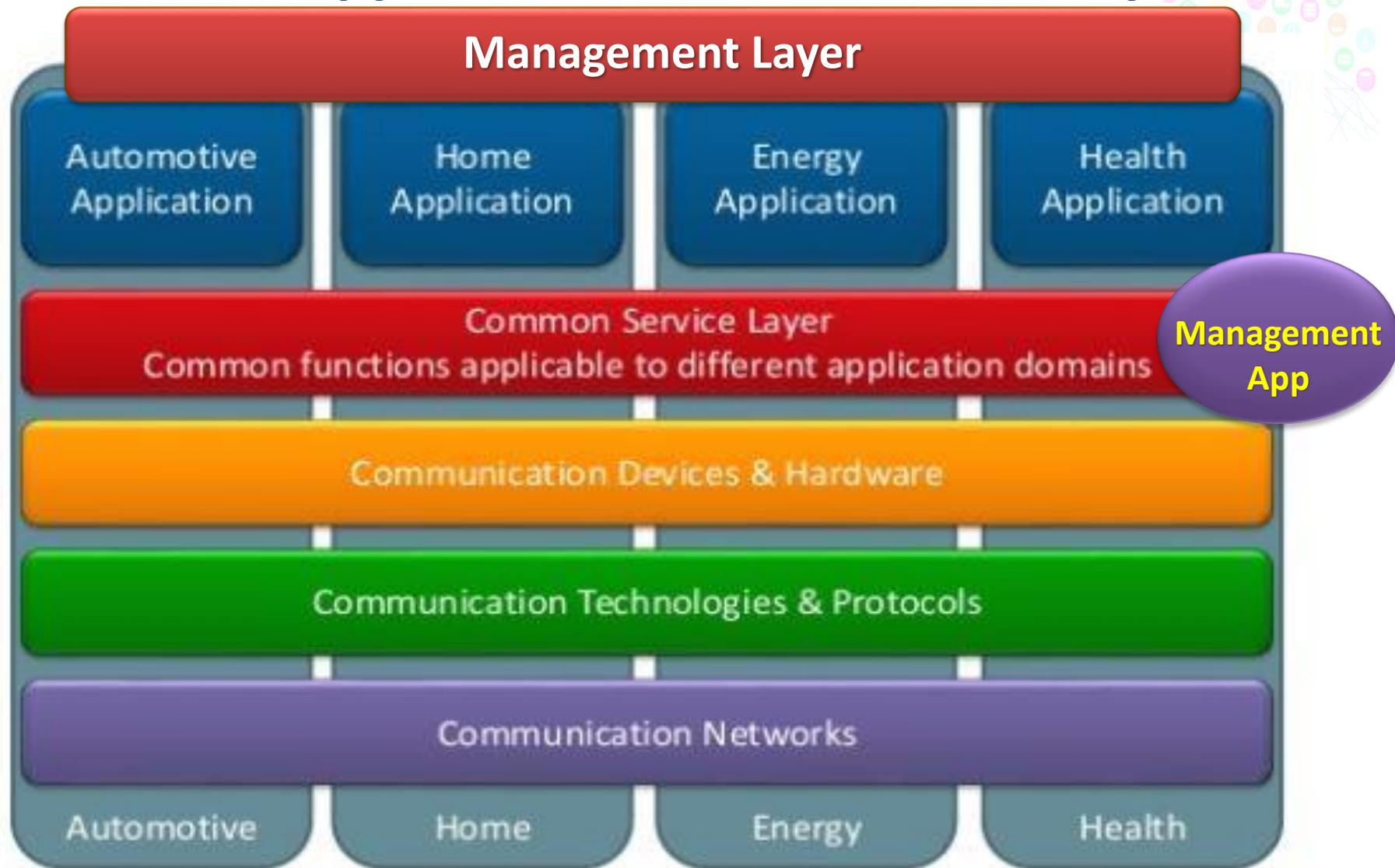
- Cars fitted with various sensors send information to the manufacturer
- The service provider servicing the car may also need access some to the sensor data
- The insurance company providing insurance for the car also needs information as to how the car is driven and based on this info charges the premium. The fraudulent insurance claims would also be minimised.
- The on-road assistance company would require the location information of the car to send appropriate assistance
- The traffic police would like to know accident information to be able to manage traffic.
- This information would be useful for the commuters to select alternate route



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Horizontal Approach-Common Service Layer



IOT/M2M APPLICATIONS IN SMART CITIES

The Common Service Layer



What is Common Service Layer?

Application Layer

Service Layer

Network Layer

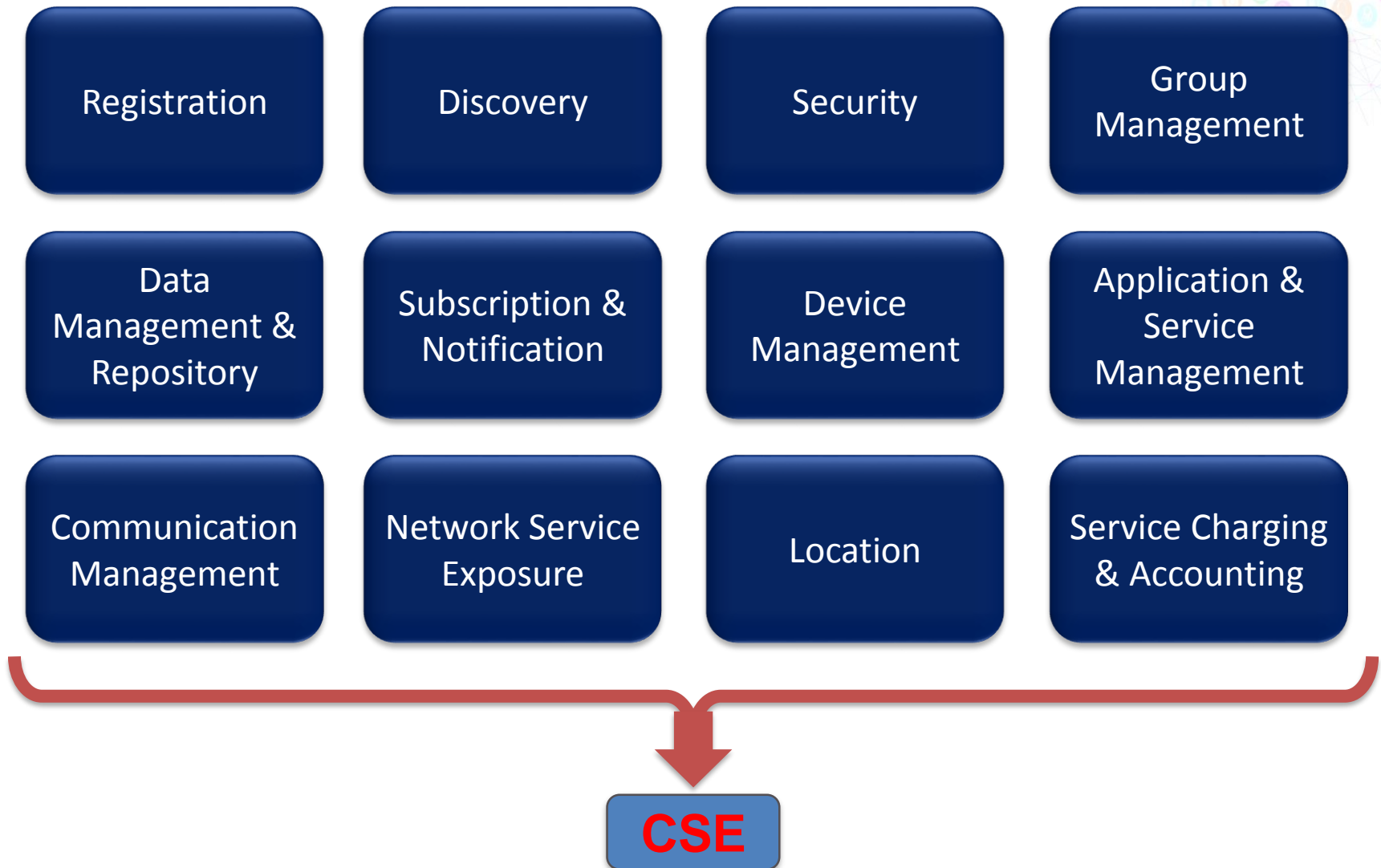
- ❖ It is a software/middleware layer
- ❖ It sits between applications and underlying communication networking HW/SW
- ❖ It typically rides on top of IP protocol stack
- ❖ It provides functions that applications across different industry segments commonly need
- ❖ It exposes common set of functions to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

It would enable the industry to develop Standard based Applications which would reduce the development, test and deployment lifecycles

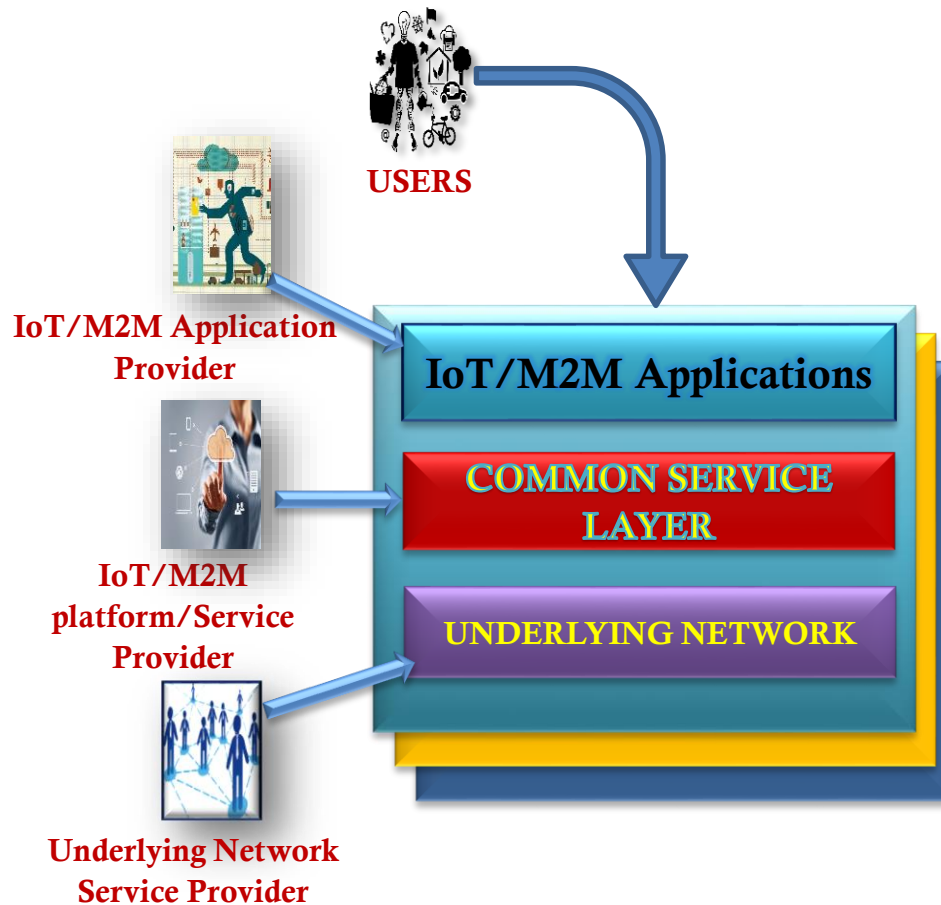
By deploying the Standards compliant Common Service Layer Platform, M2M Service Providers can offer wide range of services developed by the industry.

It can also play a pivotal role in the Smart City Projects by having this platform which would ease the development efforts of the application providers offering solutions for smart city project.

Common Service Functions



Functional Roles in the M2M/IoT Ecosystem



Functional Role Description

1. The **User** (individual or company) fulfils all of the following criteria:
 - a. Uses an M2M solution.
2. The **Application Service Provider** fulfils all of the following criteria:
 - a. Provides an M2M Application Service.
 - b. Operates M2M Applications.
3. The **M2M Service Provider** fulfils all of the following criteria:
 - a. Provides M2M Services to Application Service Providers.
 - b. Operates M2M Common Services.
4. The **Network Service Provider** fulfils all of the following criteria:
 - a. Provides Connectivity and related services for M2M Service Providers.
 - b. Operates an Underlying Network. Such an Underlying Network could e.g. be a telecom network.

Any of the above functional roles may coincide with any of the other roles. These functional roles do not imply business roles or architectural assumptions.

About oneM2M



- A global partnership among Standards Defining Organizations (SDOs) and Industry Associations like :

ARIB (Association of Radio Industries and Businesses, Japan),

ATIS (Advancing Transformation of the ICT Industry, America),

CCSA (China Communications Standards Association, China),

ETSI (European Telecommunications Standards Institute, Europe),

TIA (Telecommunication Industries Association, America),

TSDSI (Telecommunications Standards Development Society, India),

TTA (Telecommunications Technology Association, Korea), and

TTC (Telecommunications Technology Committee, Japan).

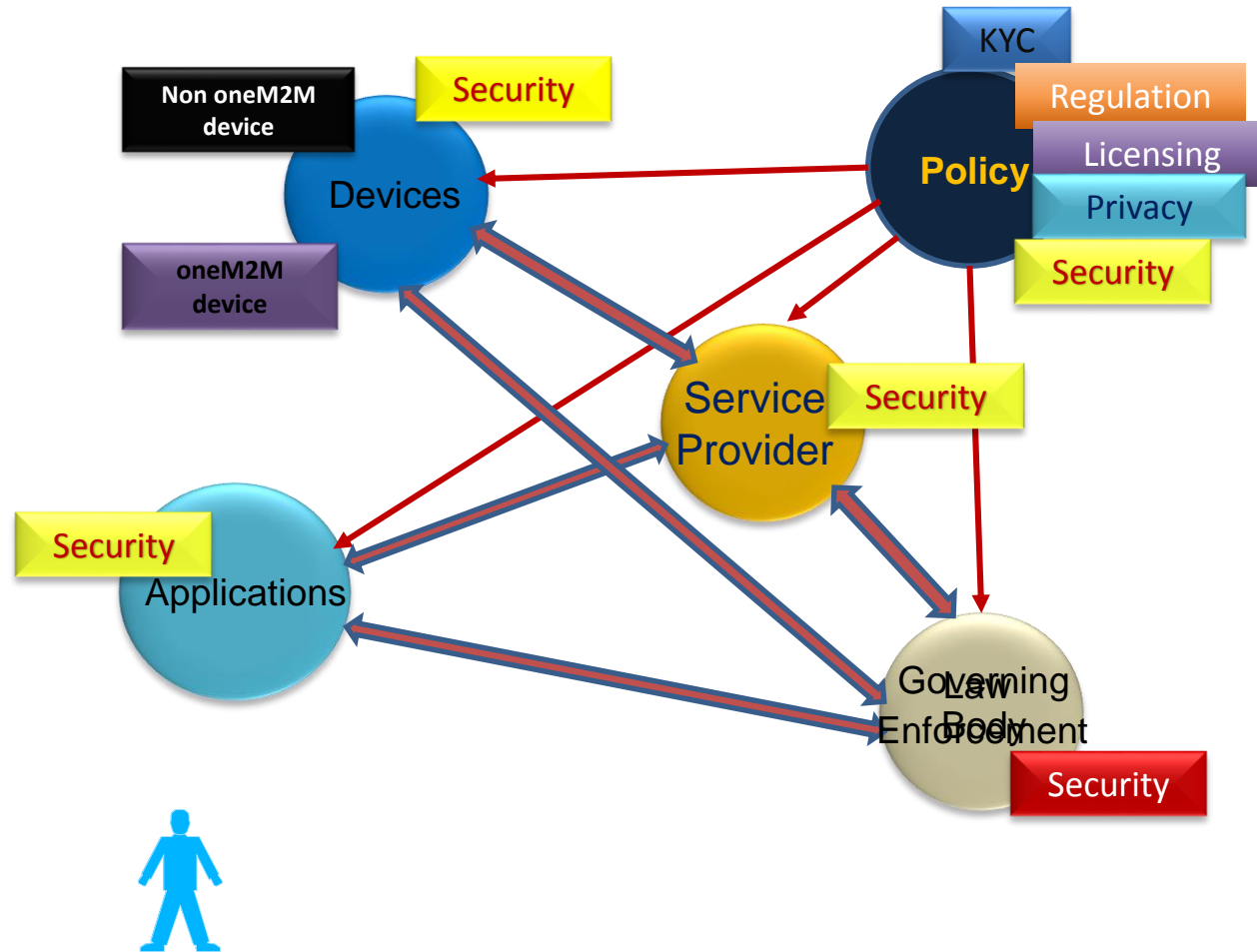
Additional partners contributing to the oneM2M work include:

the BBF (Broadband Forum), Continua, GlobalPlatform, HGI (Home Gateway Initiative), the New Generation M2M Consortium - Japan, and OMA (Open Mobile Alliance).

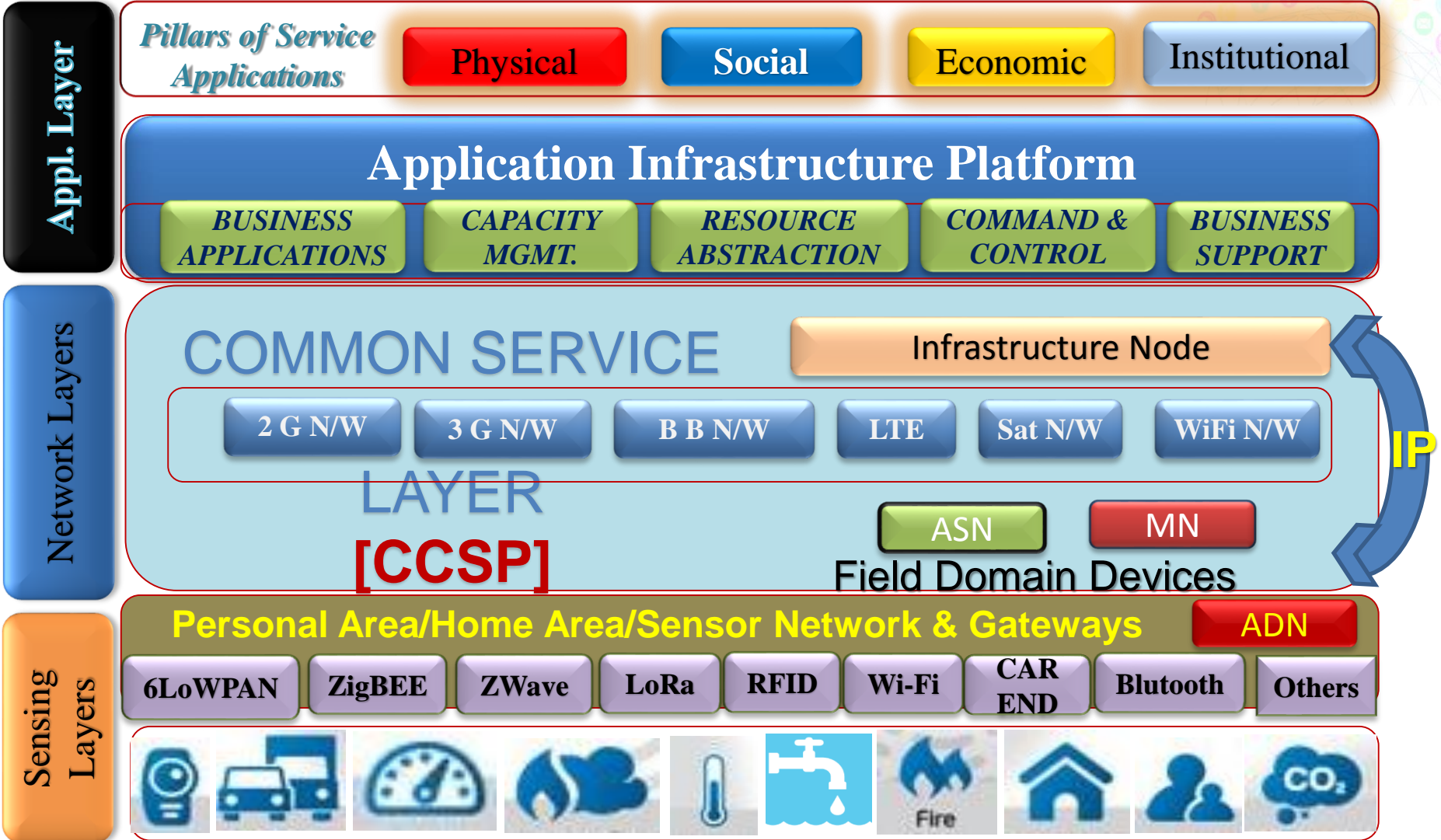
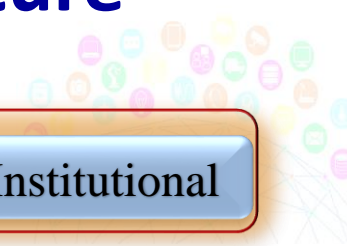
[C-DOT is also partner Type I (through TSDSI) contributing to the standards]

- In simple terms the main goal is to develop technical specifications for an M2M Service Layer which is a software platform which enables the M2M devices/applications communicate with each other in a secure and efficient manner

Actors in IoT/M2M Application Deployment



Standards' Compliant Smart City Architecture



Key Takeaways

For sustainable future proof Smart City ICT infrastructure, the following are essential:

1. The architecture shall be standardized and future proof
2. It shall promote interoperability (including semantic interoperability)
3. It shall be possible to share data across verticals
4. Only registered and authenticated devices and applications shall be permitted to communicate
5. Security shall be an integral component of the architecture

So, there is a pressing need to mandate a Standards Compliant “Common Service Layer” based architecture for Smart City ICT infrastructure.



THANKS