WORKSHOP WITH IEEE P2413

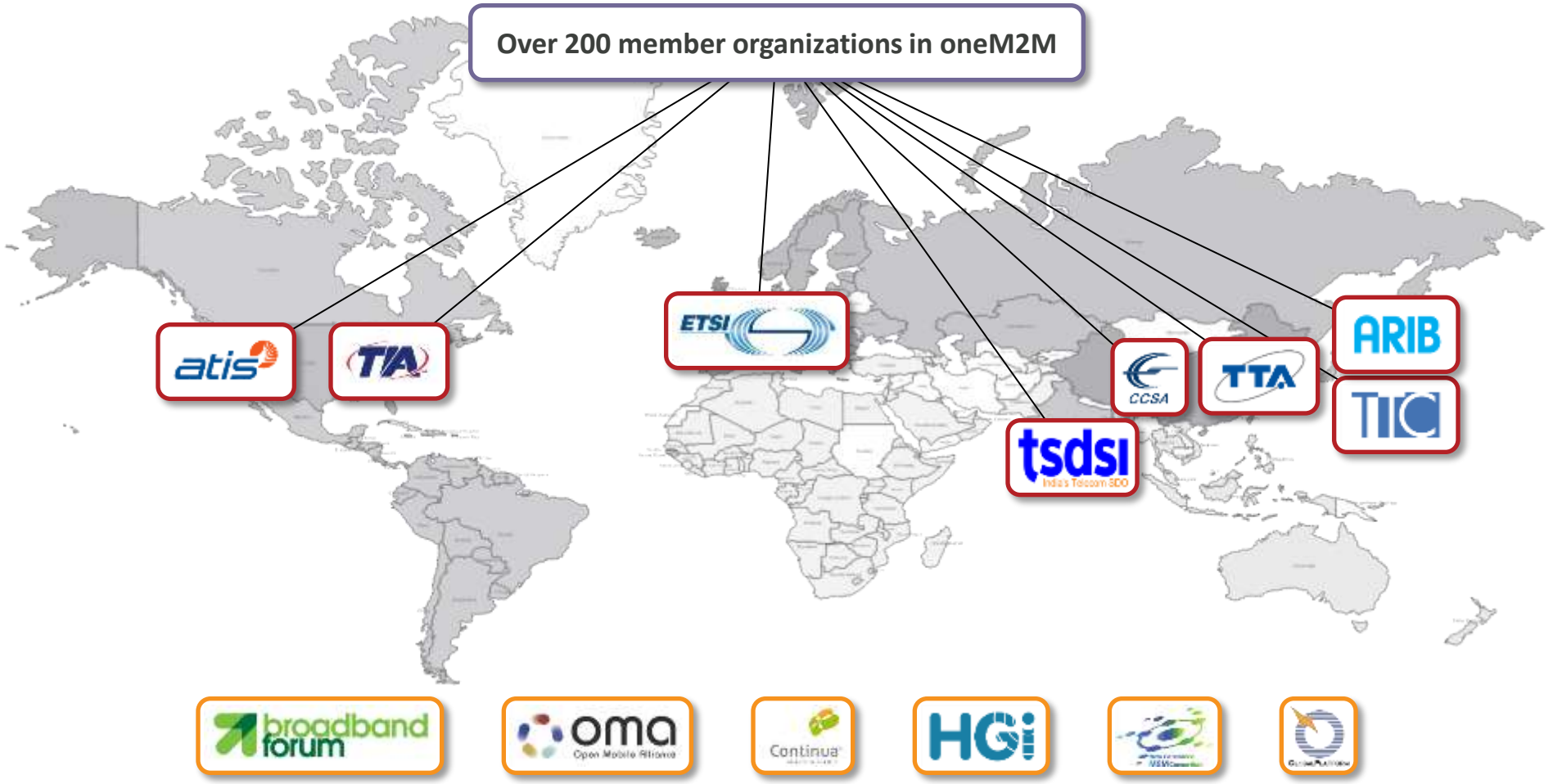
oneM2M

www.oneM2M.org

Proposed Agenda

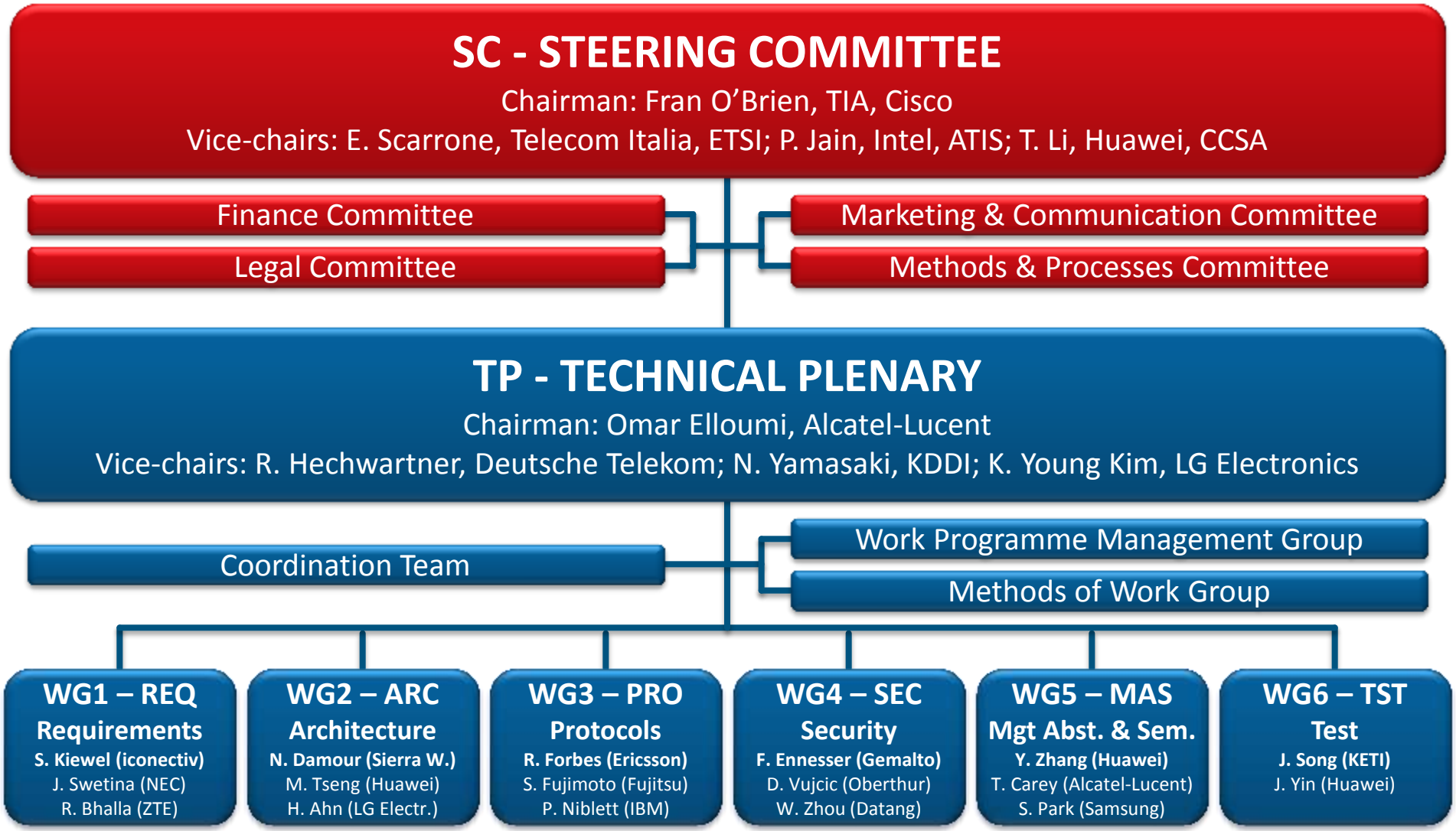
- Presentation of oneM2M's Work
  - Overview of oneM2M and current specification (Release 1)
  - Presentation of oneM2M Release 2 Work
  - Focus on Home Domain Enablement Domain
  - Focus on Industrial Domain Enablement Domain
  - Questions and Answers
- Presentation of IEEE P2413's Work
- Discussions on potential collaboration
  - Mutual ideas about potential collaboration
  - Brainstorming and roundtable discussion
  - Conclusion and next steps

oneM2M Partnership Project



Some of the 200+ members

oneM2M – Organization



Purpose, Work & Deliverables

Purpose

To specify and promote an

M2M Common Service Layer

Work

Six physical 1-week meetings per year with ~100 attendees

About 4/5 conference calls per week between the meetings

200+ documents produced and discussed at each meeting

3800 docs in 2013 4400 docs in 2014

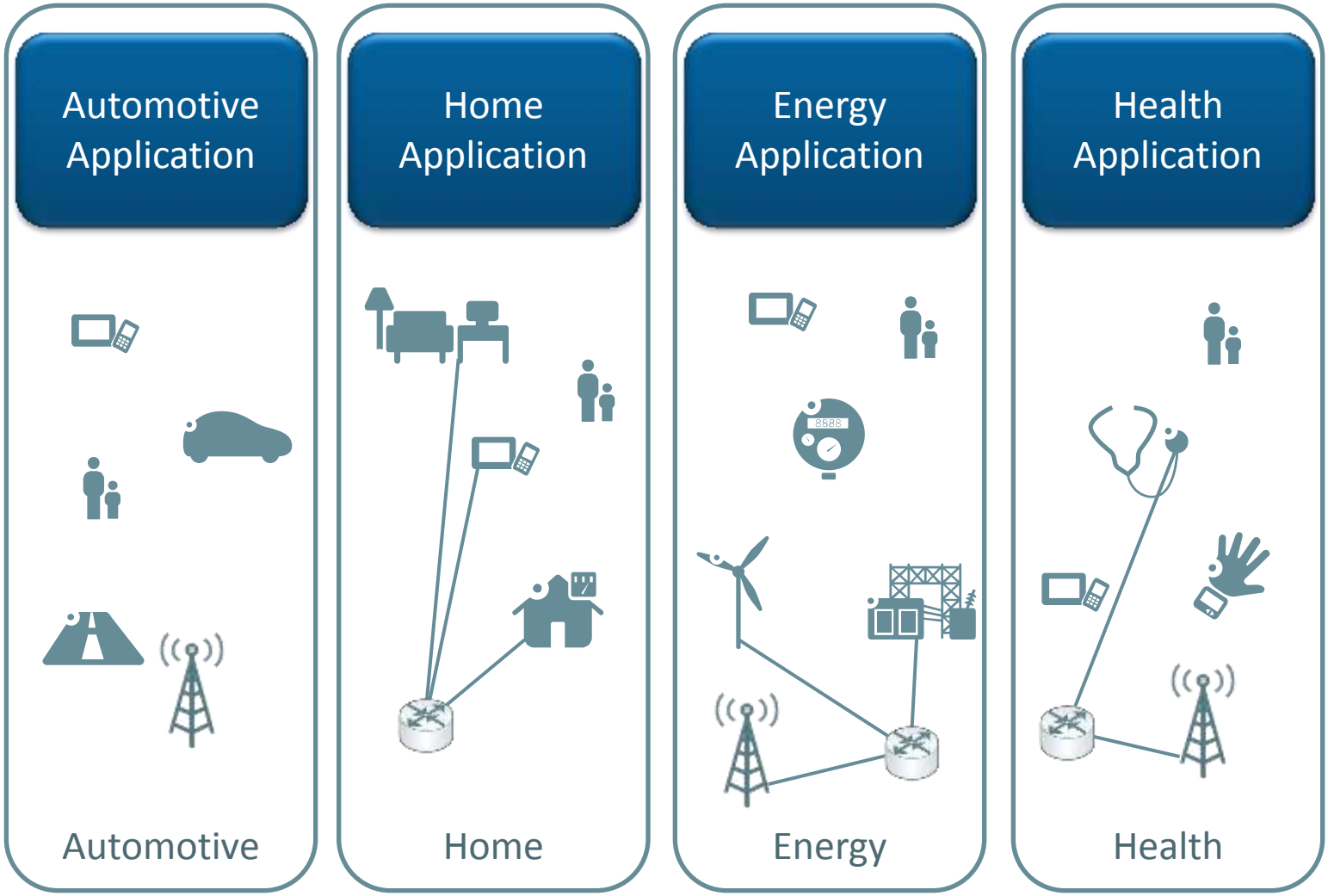
Deliverables

Technical Reports and Technical Specifications

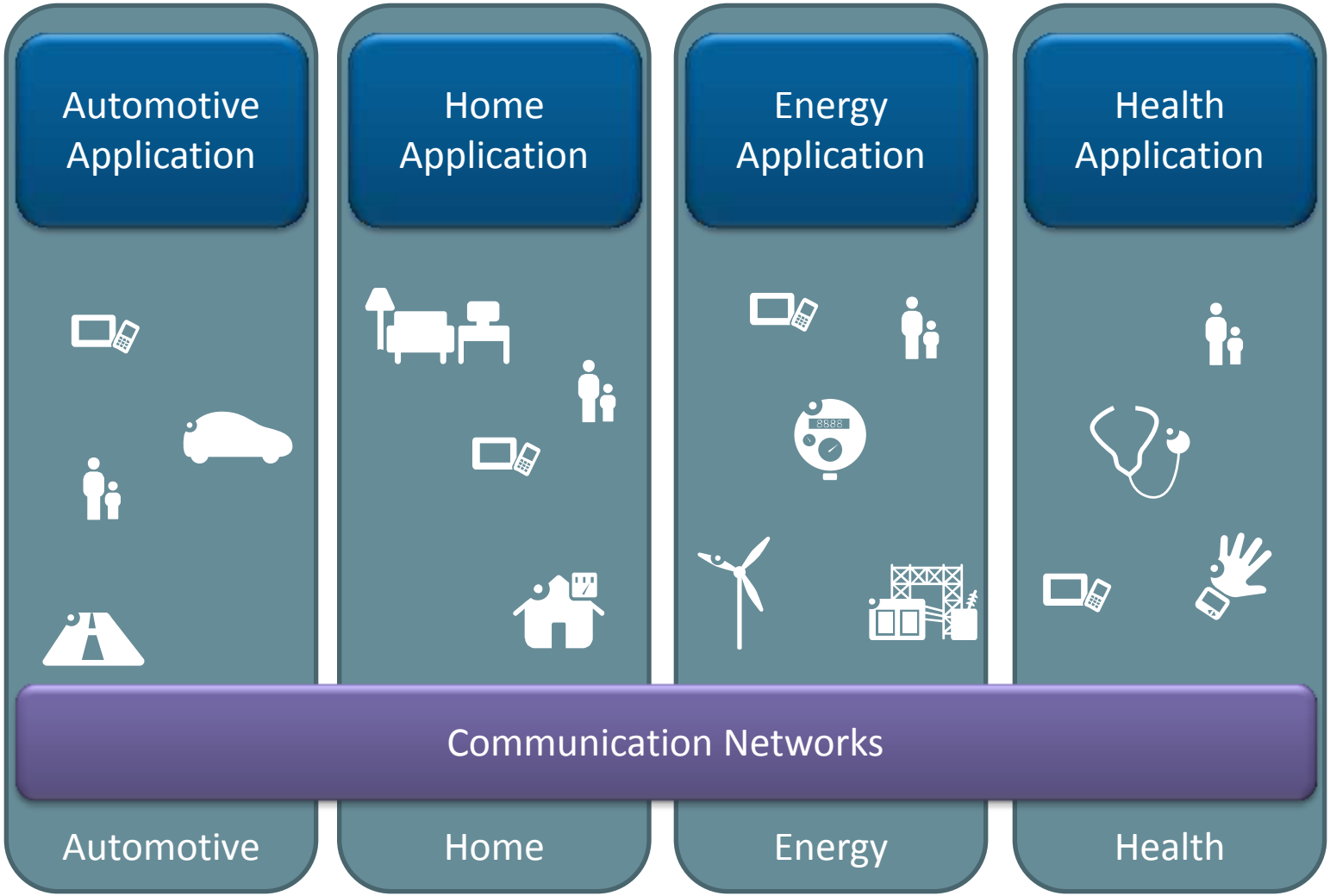
Collaborative Mindset

- Core mindset within oneM2M
  - Partnership Project from the start
  - Strong focus on reusing existing technologies wherever possible
  - Strong consideration for user industries
- Concrete and nascent collaborations
  - Personal Connected Health Alliance – Continua
  - Home Gateway Initiative
  - AllSeen Alliance
  - Open Interconnect Consortium
  - European Smart Metering Industry Group
  - Industrial Internet Consortium
  - IEEE P2413

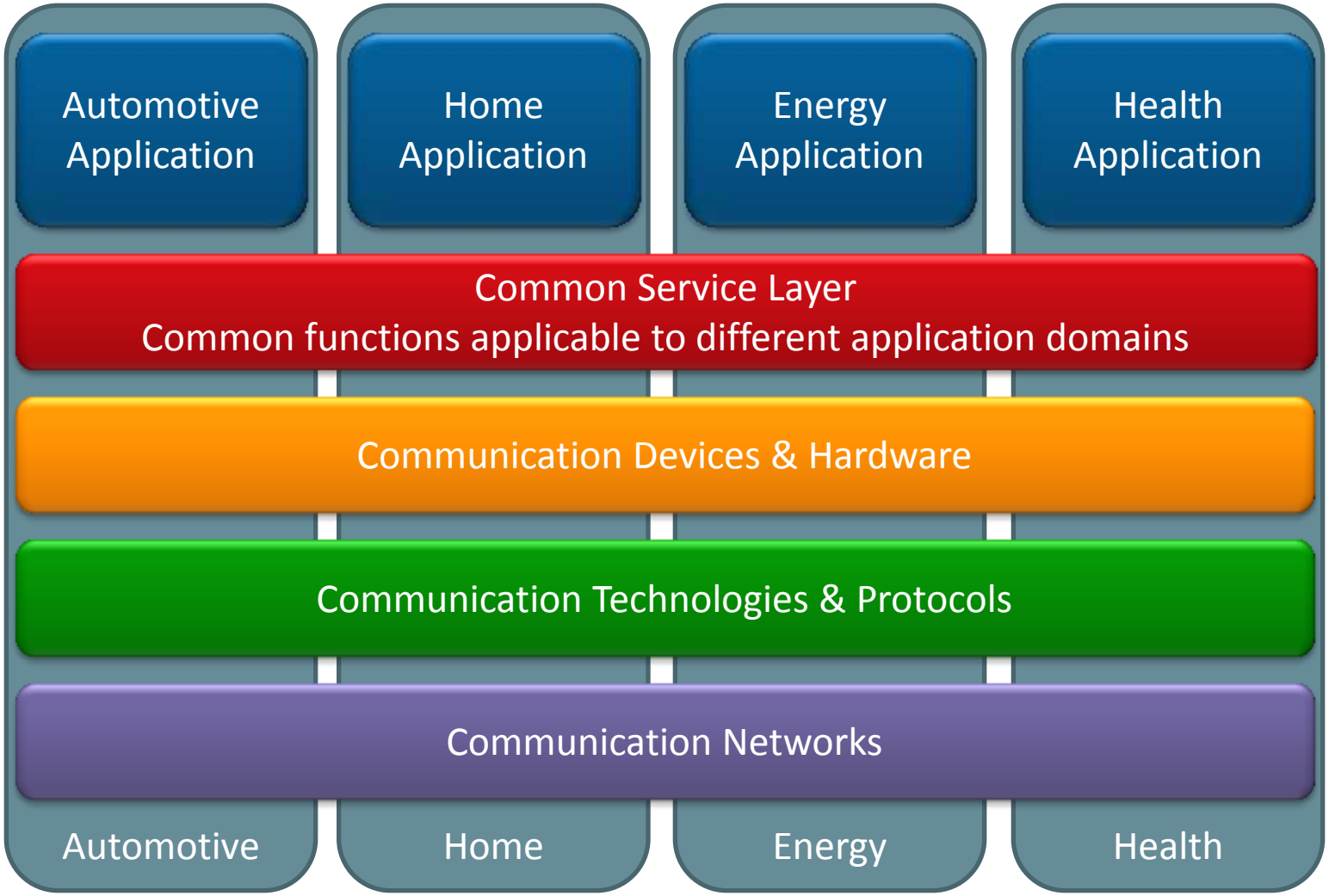
The Common Service Layer



The Common Service Layer

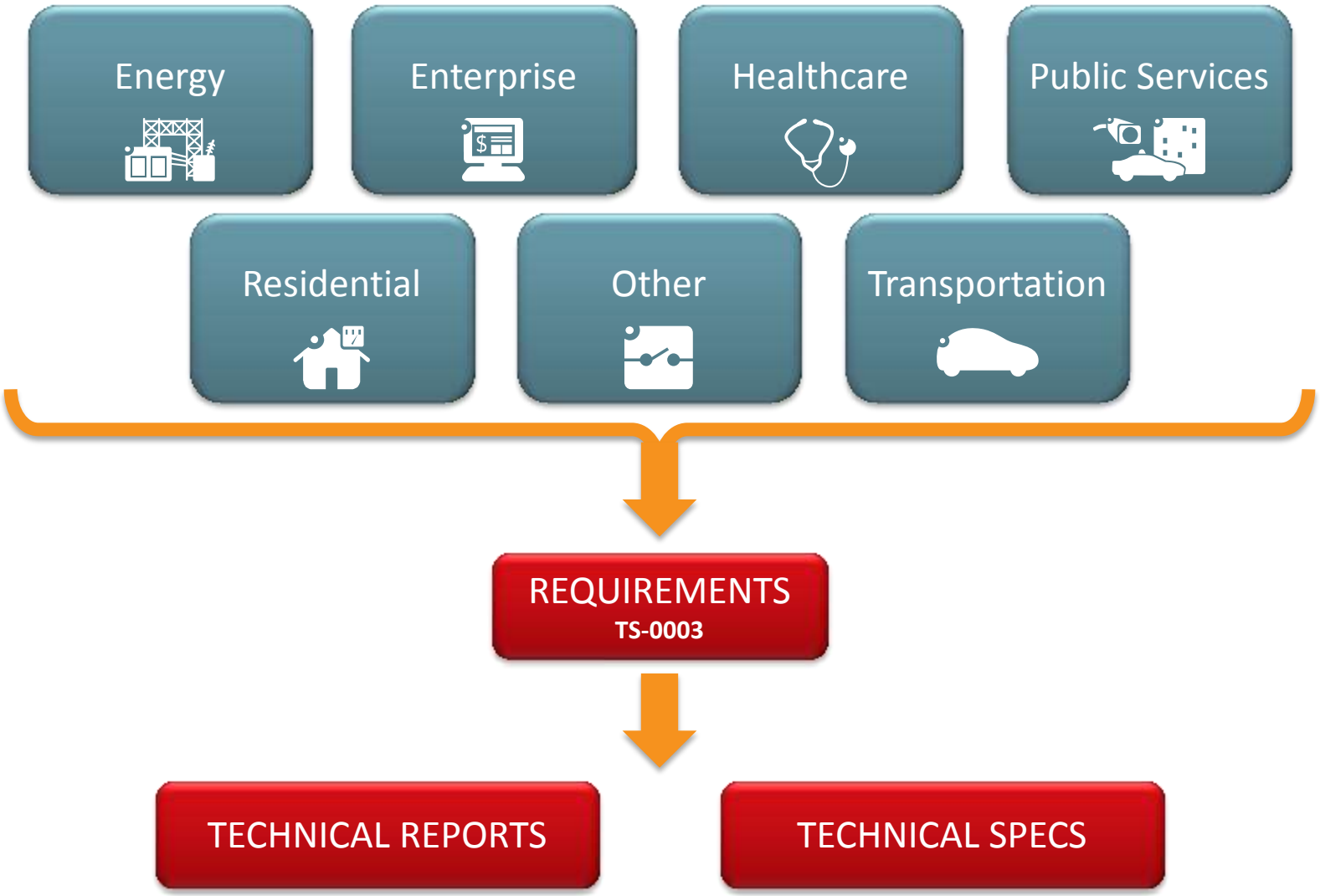


The Common Service Layer



Common Service Functions

Work Process



Technical Reports

Architecture Analysis 1
TR-0002
(WI-0002)

Use Cases
TR-0001
(WI-0001)

Architecture Analysis 2
TR-0003
(WI-0002)

Protocol Analysis
TR-0009
(WI-0008)

Study of Mgt Capab. Enablnt
TR-0006
(WI-0004)

Abstraction & Semantics
TR-0007
(WI-0005)

Security Analysis
TR-0008
(WI-0007)

Roles & Focus Areas
TR-0005
(WI-0003)

Use Cases v2
TR-0011
(WI-0014)

E2E Security & Group Authent.
TR-0012
(WI-0011)

Technical Specifications

Requirements
TS-0002
(WI-0001)

Functional Architecture
TS-0001
(WI-0002)

Definitions & Acronyms
TS-0011
(WI-0003)

Service Layer Core Protocols
TS-0004
(WI-0009)

HTTP Protocol Binding
TS-0009
(WI-0013)

CoAP Protocol Binding
TS-0008
(WI-0012)

Management Enablᵉⁿᵗ - OMA
TS-0005
(WI-0010)

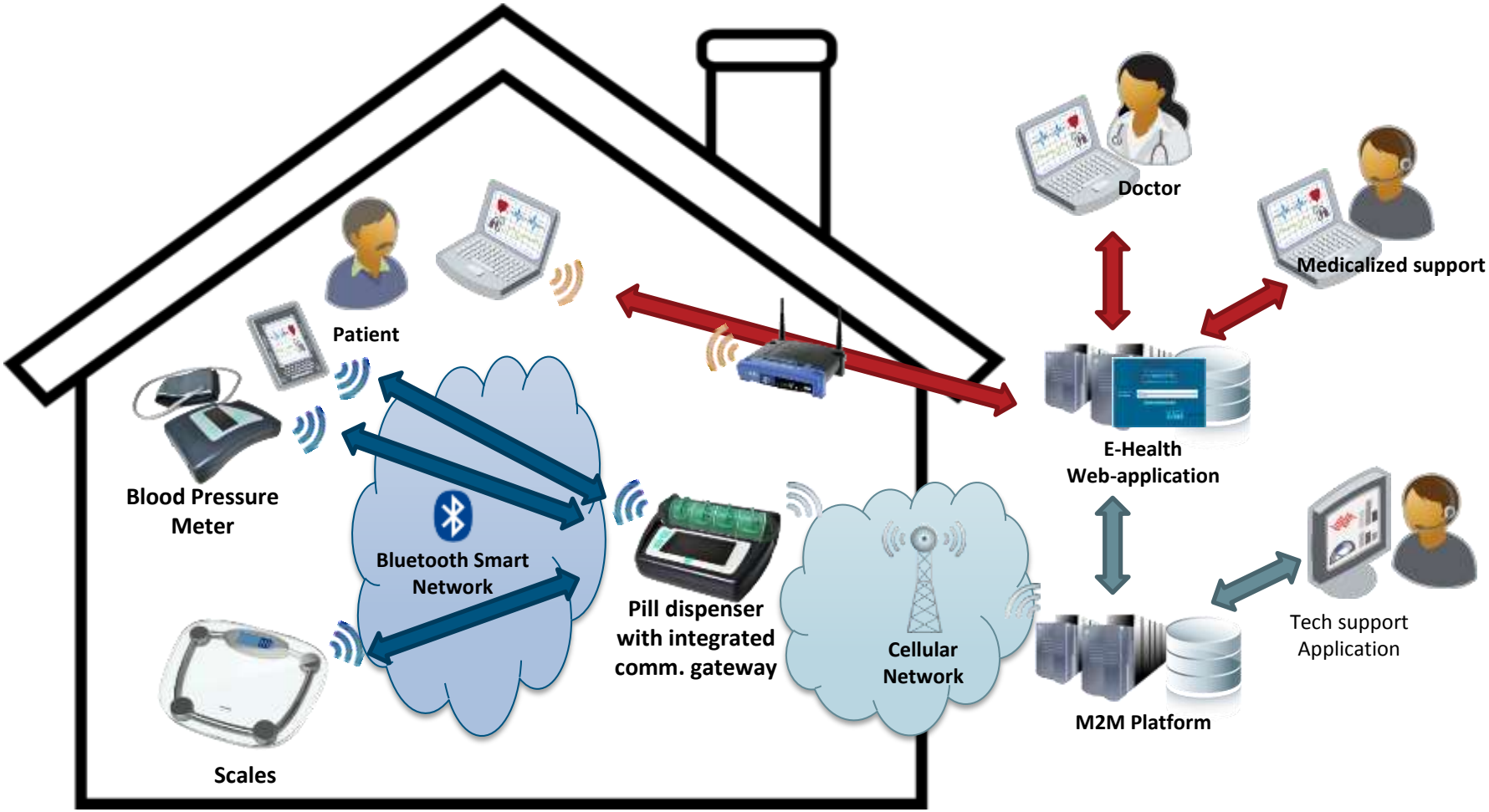
Management Enablᵉⁿᵗ - BBF
TS-0006
(WI-0010)

MQTT Protocol Binding
TS-0010
(WI-0014)

Security Solutions
TS-0003
(WI-0007)

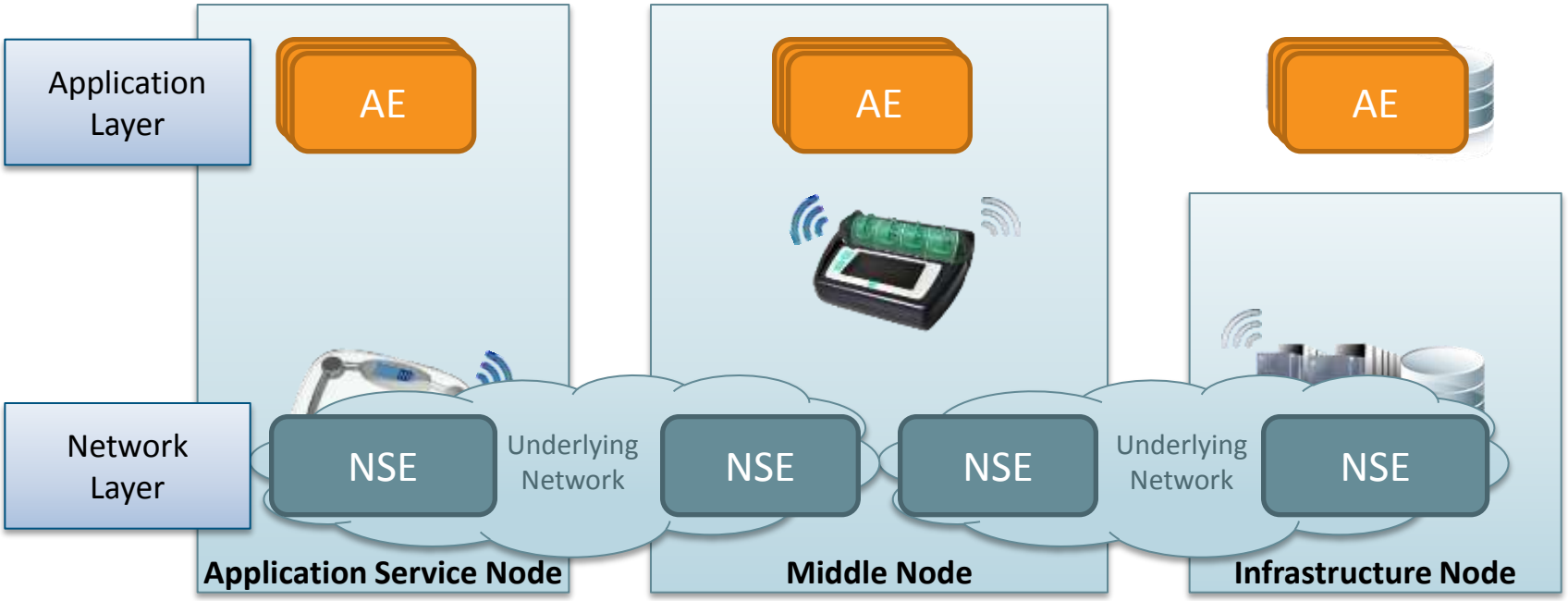
Service Components
TS-0007
(WI-0011)

Example Scenario – E-Health



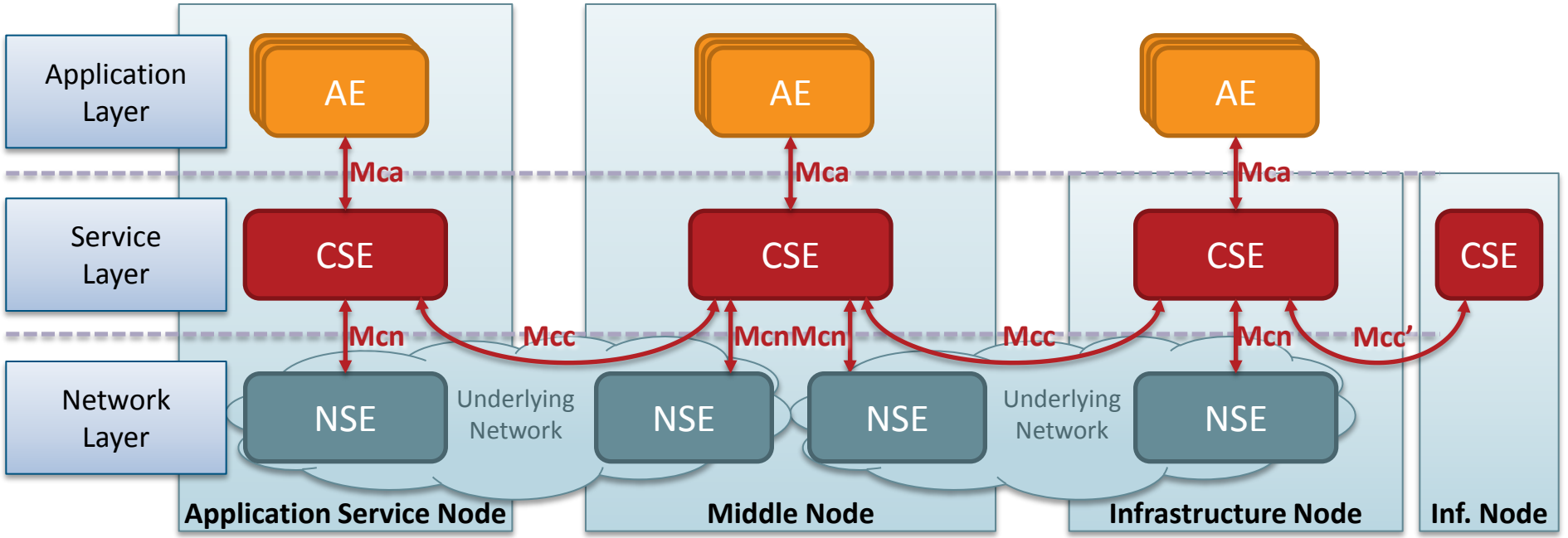
Architecture

Application Entity	Provides application logic for the end-to-end M2M solutions
Network Services Entity	Provides services to the CSEs besides the pure data transport
Node	Logical equivalent of a physical (or possibly virtualized, especially on the server side) device



Architecture

Reference Point	One or more interfaces - Mca, Mcn, Mcc and Mcc' (between 2 service providers)
Common Services Entity	Provides the set of "service functions" that are common to the M2M environments
Application Entity	Provides application logic for the end-to-end M2M solutions
Network Services Entity	Provides services to the CSEs besides the pure data transport
Node	Logical equivalent of a physical (or possibly virtualized, especially on the server side) device



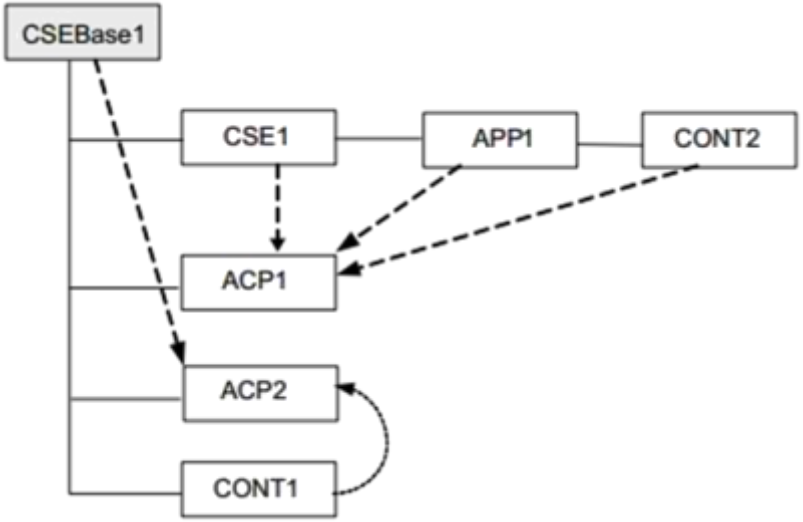
Information Modelling

Resource-based information model

Uniform Resource Identifiers

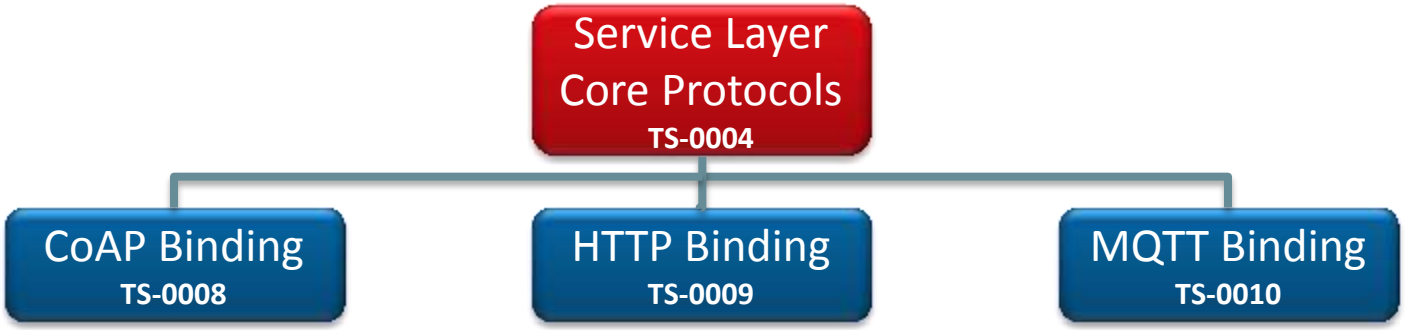
Create, Read, Update and Delete

Tree-like structure and with links



Communication Protocols

Reuse IP-based existing protocols



XML or JSON Content serialization

HTTP Example

REQUEST

```
GET http://provider.net/home/temperature HTTP/1.1
Host: provider.net
From: //provider.net/CSE-1234/WeatherApp42
X-M2M-RI: 56398096
Accept: application/onem2m-resource+json
```

RESPONSE

```
HTTP/1.1 200 OK
X-M2M-RI: 56398096
Content-Type: application/onem2m-resource+json
Content-Length: 107
{"typeOfContent":"application/json",
"encoding":1,
"content": "{'timestamp':1413405177000,'value':25.32}"
}
```

Security

Reuse existing mechanisms

Enrolment

Provisioning/Configuration of the M2M System (Devices, Applications…)

Secure communications

Protocols (TLS/DTLS), credentials and authentication (PSK/PKI/MAF)

Access Control

Defined in accessControlPolicy resources
Which SUBJECT can perform which ACTIONS
on which OBJECT under which CIRCUMSTANCES

oneM2M Work Programme

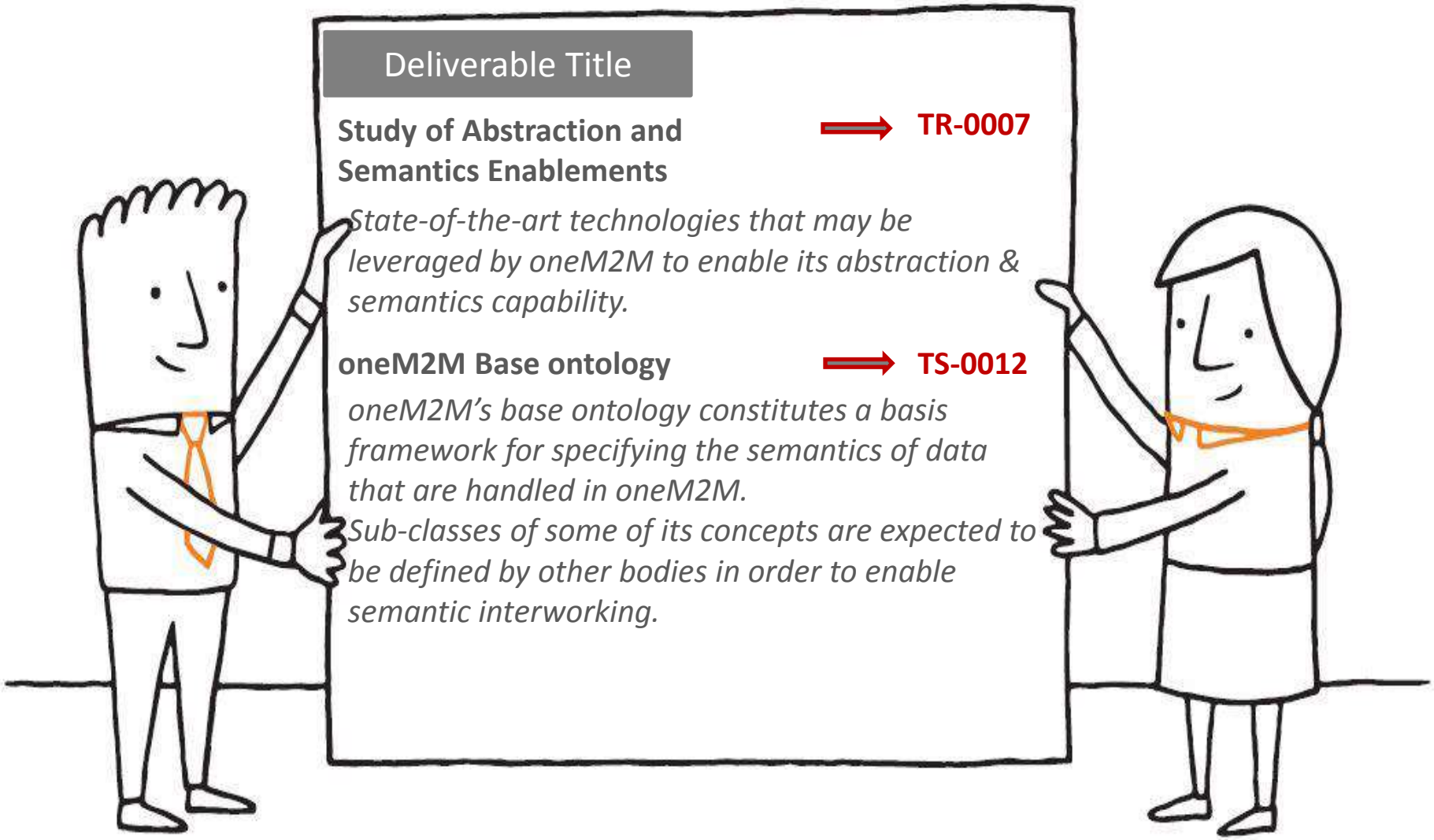
Release 1 (closed Jan. 2015)

- WI-01 - Requirements
- WI-02 - Architecture
- WI-03 - Vocabulary
- WI-04 - Study of Managt Capability
- **WI-05 - Abstraction & Semantics**
- WI-06 - Device/GW Classification
- WI-07 - Security
- WI-08 - Protocol Analysis
- WI-09 - Protocols
- WI-10 - Management Enablement
- WI-11 - Service Components Arch.
- WI-12 - RESTful COAP Protocol
- WI-13 - RESTful HTTP Protocol
- WI-14 - MQTT Protocol

Release 2 (target 2016 ?)

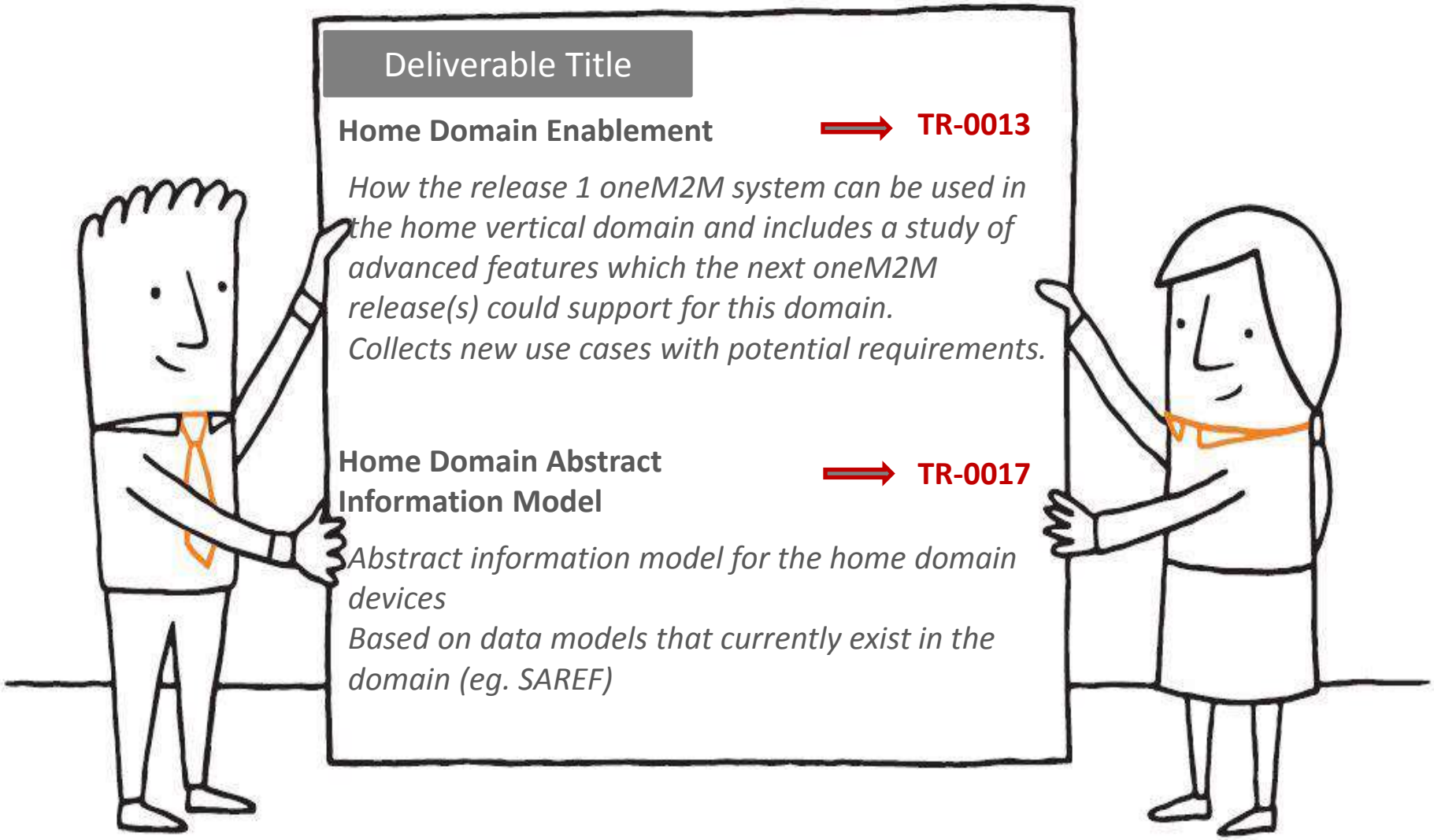
- WI-15 - Use Cases v2
- WI-16 - E2E Security & Groups
- **WI-17 - Home Domain Enablement**
- WI-18 - oneM2M & AllJoyn Interwrkg
- WI-19 - Dynamic Authorization
- WI-20 - Service Layer API
- WI-21 - Secure Environment Abstr.
- WI-22 - Interoperability Testing
- WI-23 - Author. Arch. & Access Ctrl
- WI-24 - LWM2M Interworking
- WI-25 - Area Ntwks Gen. Interwrkg
- WI-26 - Efficient Communications
- WI-27 - Testing Framework
- **WI-28 - Industrial Domain Enablnt**

Semantics Work



Slide material courtesy of Orange

Home Domain



Slide material courtesy of Orange

Industrial Domain

In the past years, the appearance of automation improve the efficiency for manufacturing industry , but in recent years even in the future, the development for automation in manufacturing industry also encounters several difficulties, the industry need to be updated.

Efficiency

- **Energy efficiency** : Manufacturers need to improve energy efficiency and manufacture more products with less energy.
- **Time efficiency:** The manufacture process is more and more complex but the product cycle is shorter and shorter.

Flexibility

- **Customer :** The future manufacture requirements would be diversification but small quantity, customer can purchase customized goods according to their preference, thus the product line must be more and more flexible
- **SCM:** The supply chain has to grantee the products delivered to customer in time, and the product line must run smoothly

Labor

- **Aging:** The problem for aging population in developed countries is more and more serious, especially in Japan, this need the aged people to have a certain ability to do some work in the future manufacture
- **Structural labor :** Many developing country are facing structure labor shortage problem, especially in China, this need the experienced labor to do more than now and need unexperienced labor to do some work that they can do.

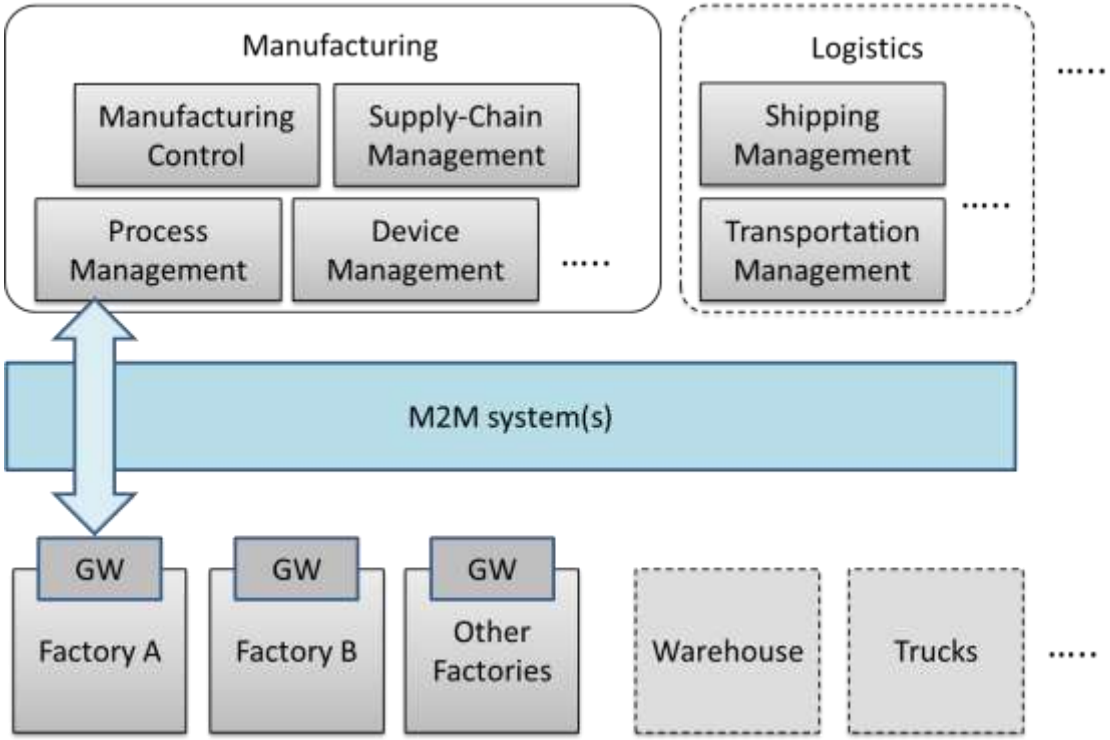
From IHS report

Slide material courtesy of Hitachi

Industrial Domain Prospect

Update traditional manufacturing system by introducing M2M technologies:

- Improving the performance of productivity, quality, delivery, cost reduction and security
- New opportunities to cooperate with other domains for mass production
- New architecture for next generation industry

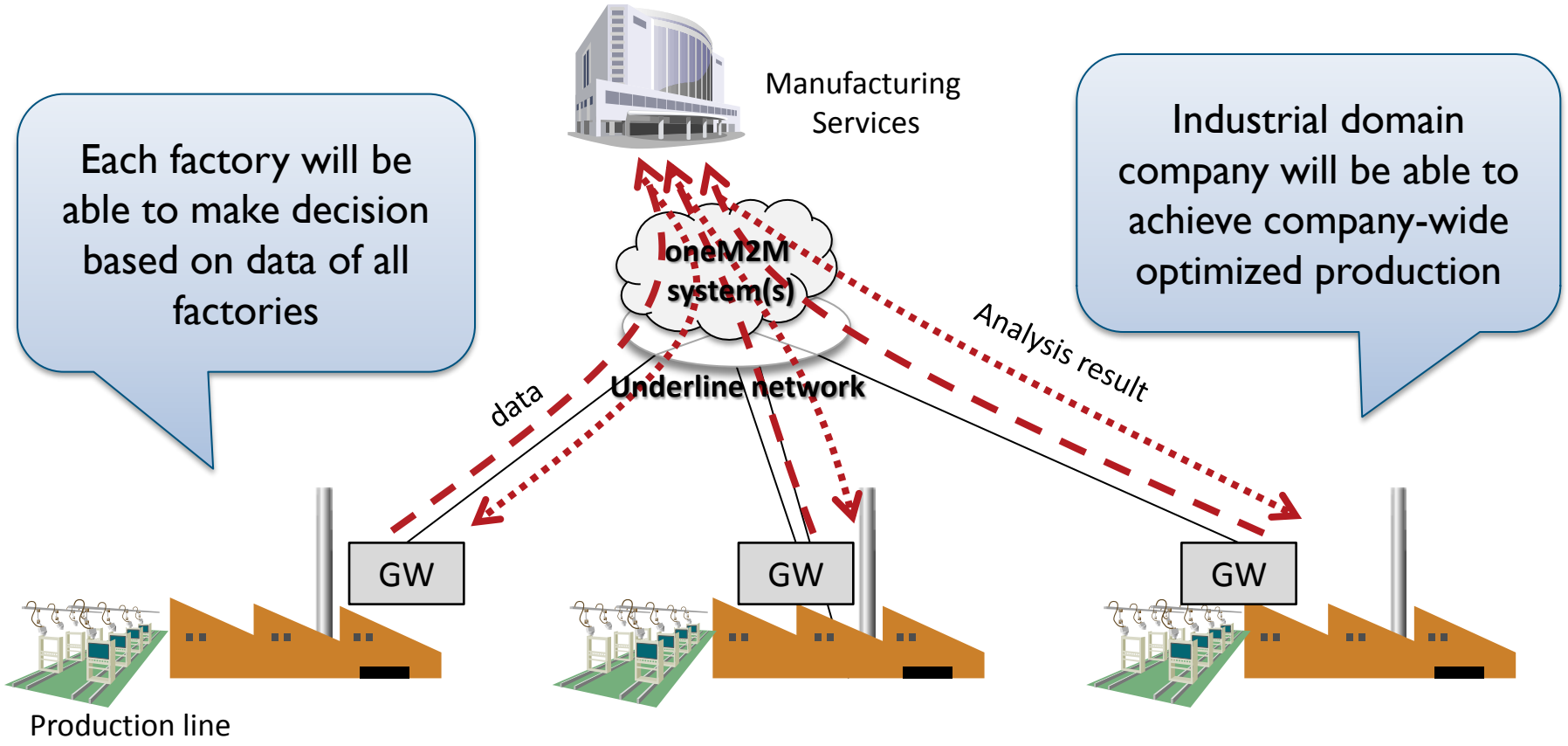


From REQ-2015-0526-Industrial_Domain_Overview

Slide material courtesy of Hitachi

Expectation of oneM2M on the Industrial Domain

Industrial Domain is expected to be more efficient, flexible, secure with oneM2M technologies.



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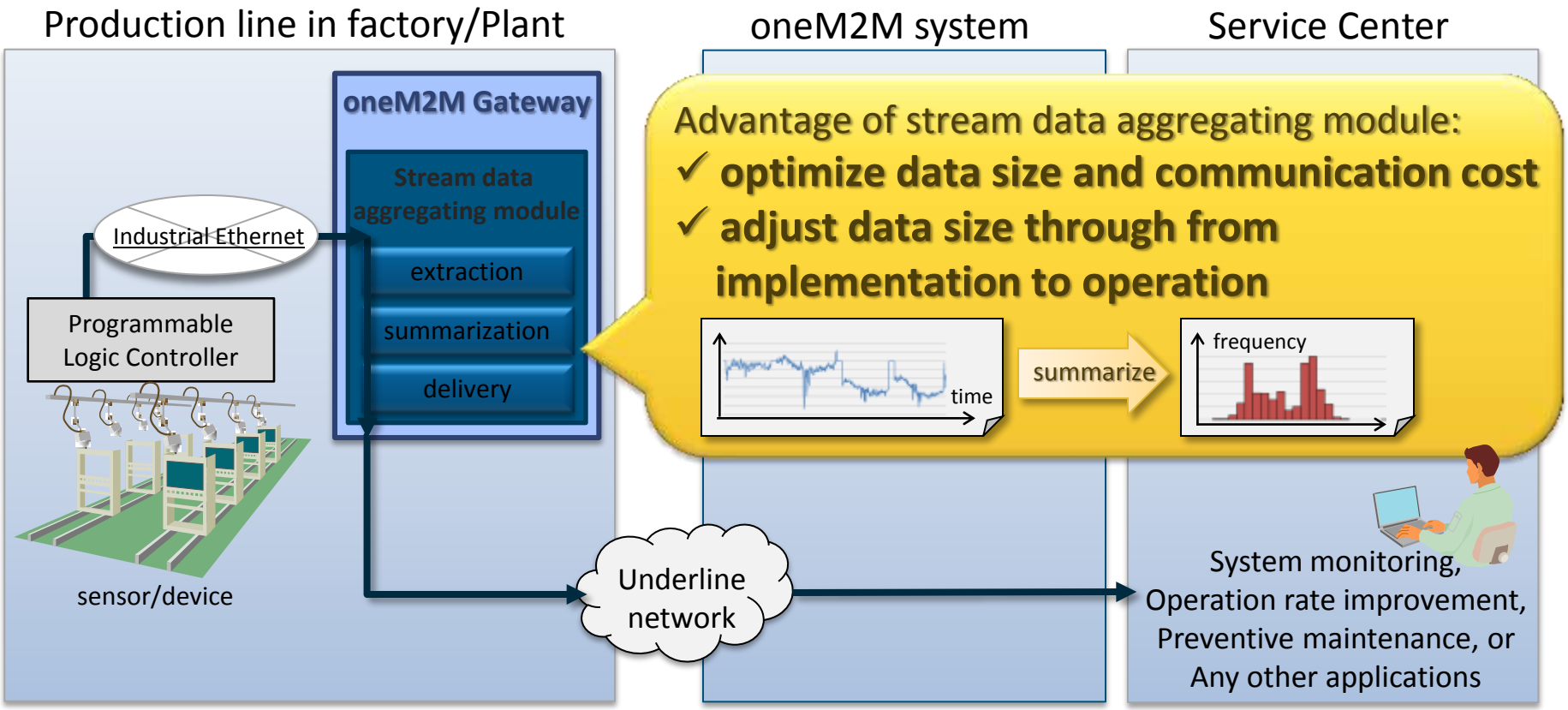
Use Case (Data Aggregating)

Data has to be processed more efficiently.

➡ oneM2M gateway can utilize data aggregating function.



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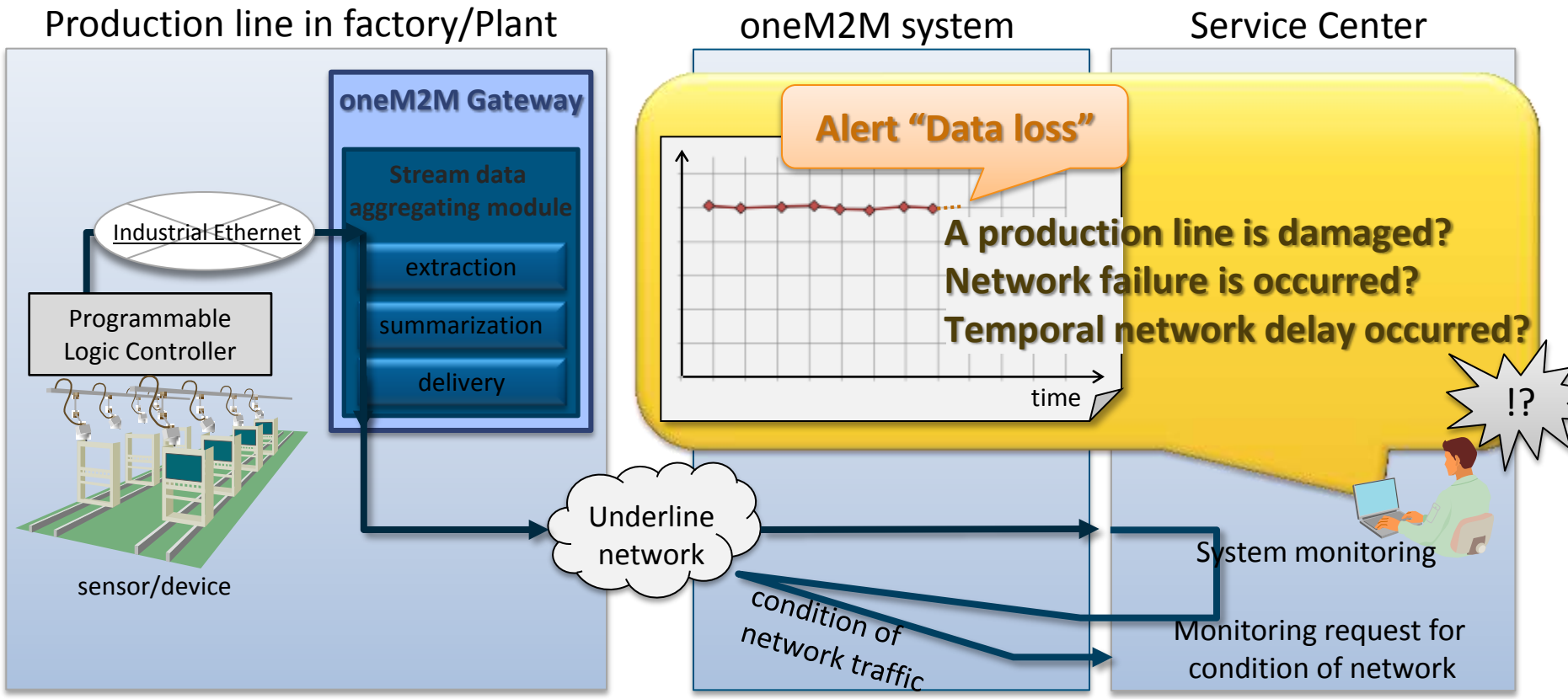
Use Case (Reliability Guarantee)

User requires Integrity of data for system monitoring:

- oneM2M gateway can utilize monitoring function for condition of network.



What now?

- Release 1 of oneM2M is done and publicly available
- First implementations demonstrated Dec'14 and Jun'15 (open source and commercial)

- Current work on Release 2 has started in January 2015
- New Work Items defined but can be adapted
- New round of use cases / requirements gathering ongoing
- Collaboration between IEEE P2413 and oneM2M

Thank You!

Q&A