

oneM2M Industry Day



INFioT
LG CNS IoT Platform

LG CNS IoT Platform based on oneM2M

2018.09.14



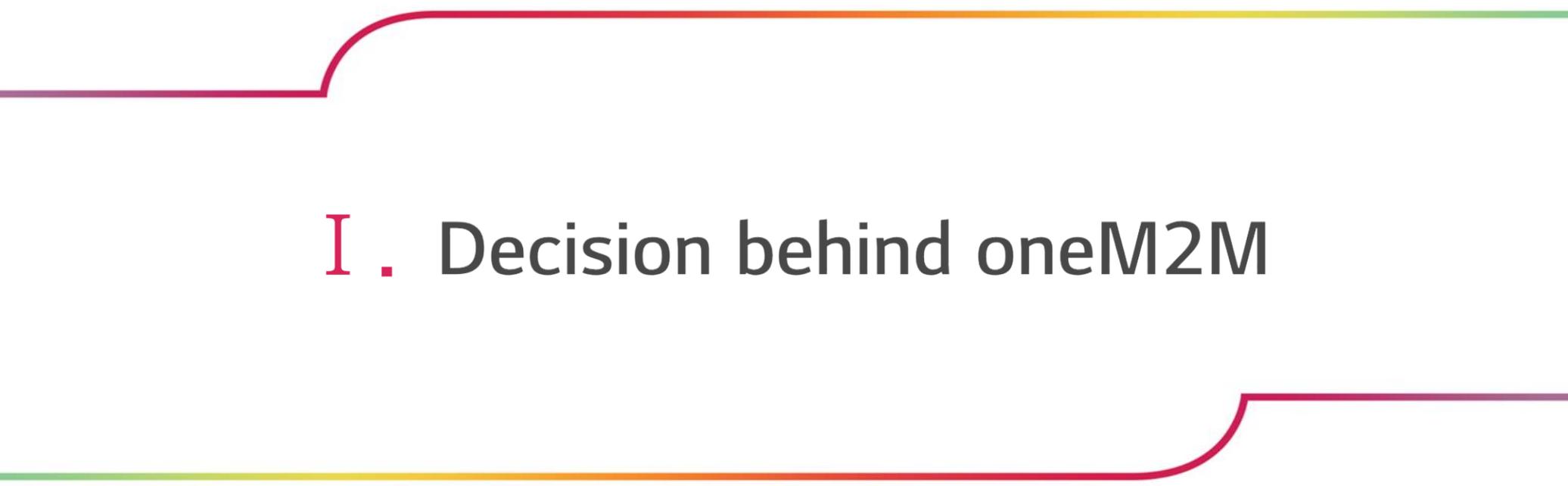
Introduction



- JI SEONG KIM
- LG CNS
Future Strategy & Business Division
IoT Unit
- IoT Platform Architect

Contents

- I . Decision behind oneM2M
- II . From oneM2M to INFioT
- III . Evolution into INFioT
- IV . INFioT References
- V . Wrapping Up



I . Decision behind oneM2M

Even before the term "IoT" became a trending topic,

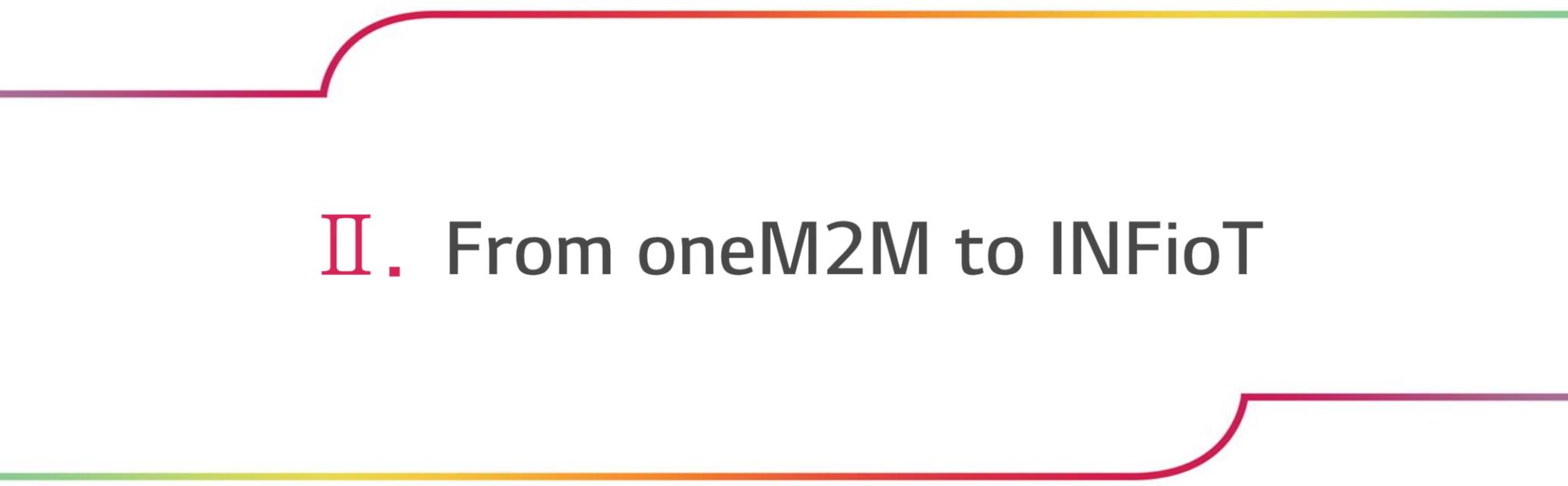
LG CNS, with its own standards, has been providing services, which are now what we call IoT, for factory and energy industries as well as buildings

Issues

- ✓ The difficulty for a company-specific standard to be widely used in the market
- ✓ The difficulty in creating an ecosystem embracing device manufacturers, IoT platform providers and service developers
- ✓ IoT devices each with their own protocols and message formats
- ✓ Absence of a standardized platform service

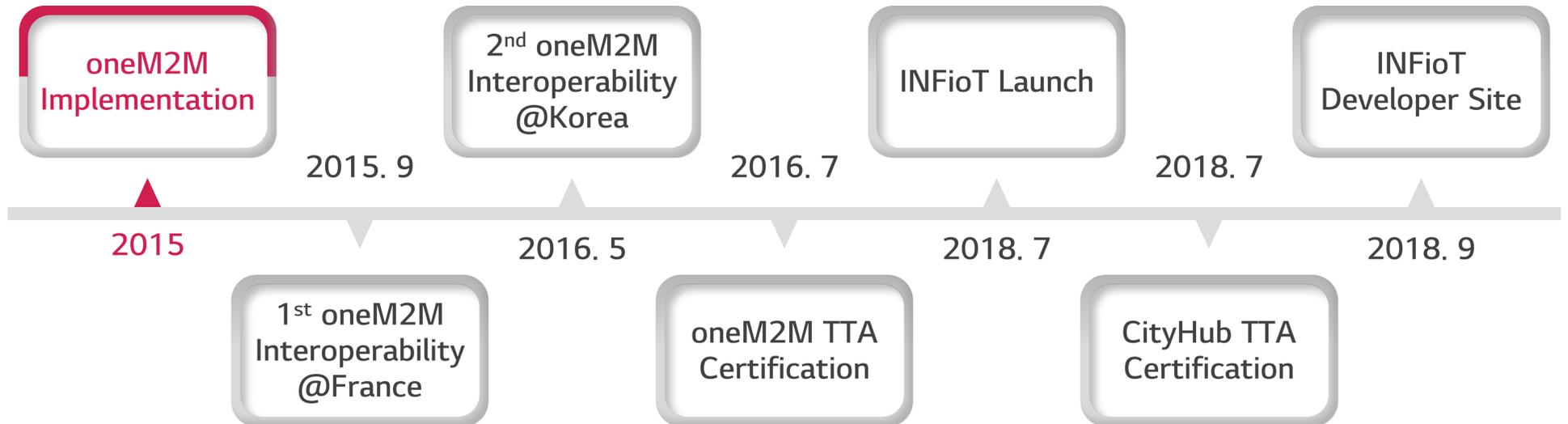
Due to the limitation of creating an IoT ecosystem with only company-specific standards, we decided to adopt the global standard (2015)





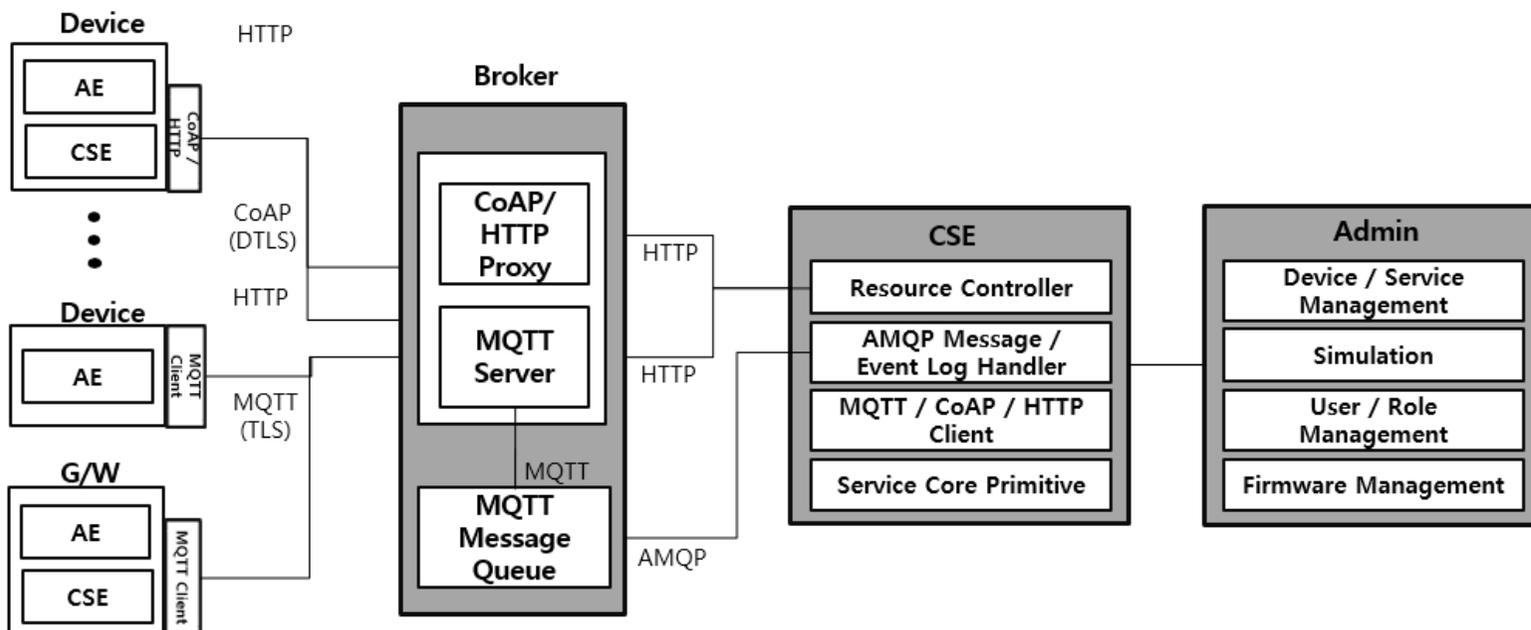
II. From oneM2M to INFioT

From oneM2M to INFioT

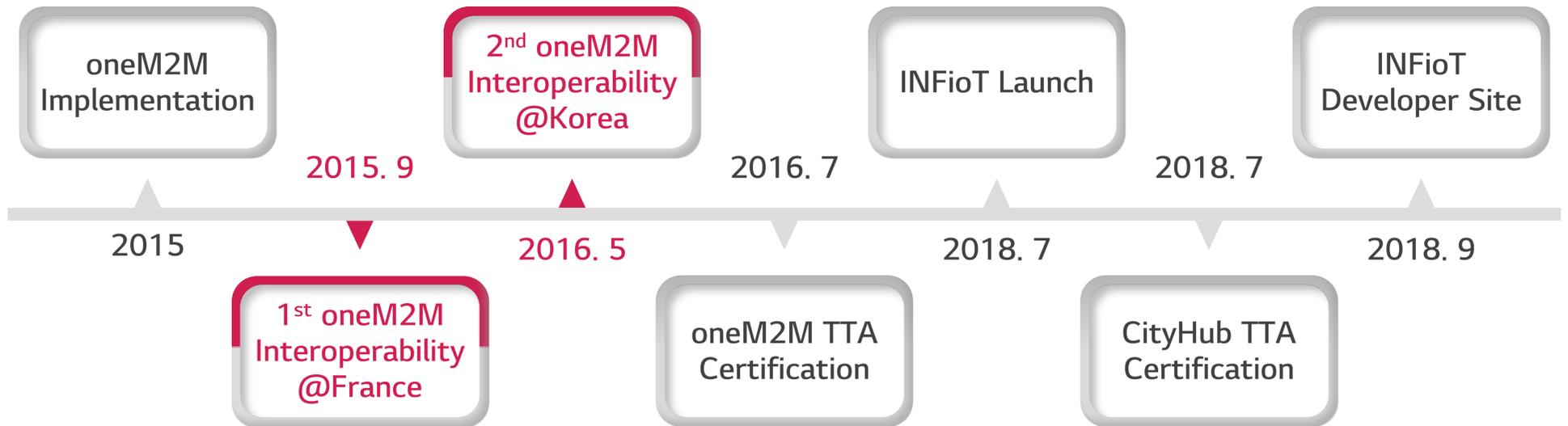


oneM2M IoT Platform Implementation

< Initial oneM2M platform >



From oneM2M to INFioT



oneM2M interoperability

First oneM2M Interoperability event, 14-16 September 2015, in Sophia Antipolis, France

© Published: Friday, 03 July 2015

 Print

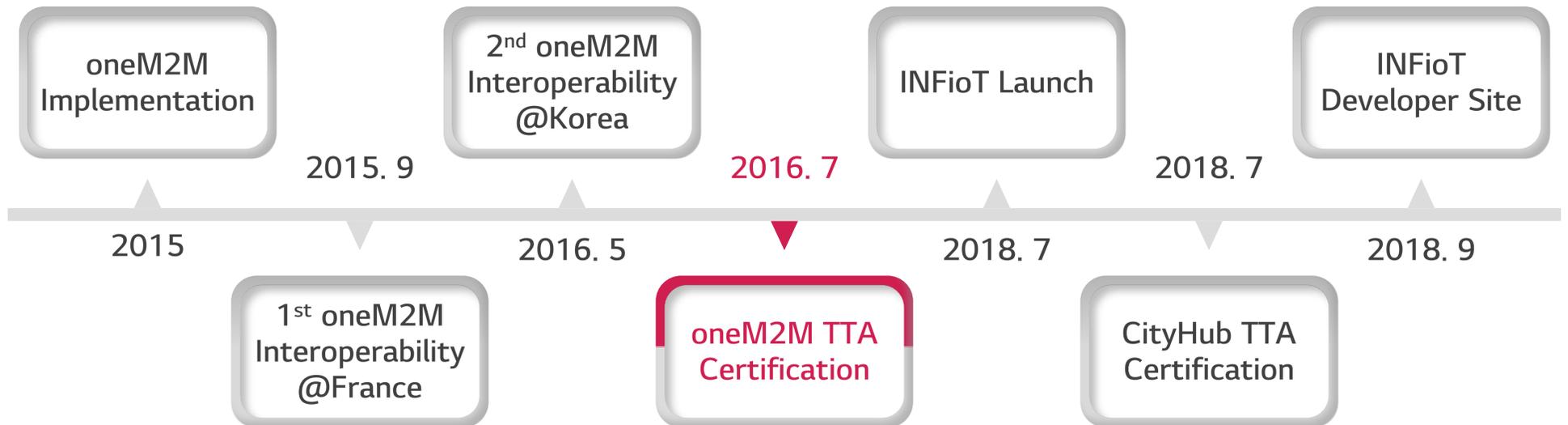
oneM2M, the global standards initiative for Machine to Machine (M2M) and the Internet of Things (IoT), will hold its first interoperability testing event from 14 to 16 September 2015. This will be the first opportunity for organizations implementing the oneM2M Release 1 Specifications to validate interoperability and end-to-end functionality via oneM2M interfaces.

oneM2M partners ETSI (European Telecommunications Standards Institute) and TTA (Telecommunications Technology Association of Korea) will host the event at the ETSI headquarters, in Sophia-Antipolis, France.

Richard Brennan, oneM2M's MARCOM Chair explains the event's significance: "Within the industry we see more initiatives building towards a ubiquitous Internet of Things. oneM2M is working with multiple organisations to establish interoperability standards for connected things, across multiple industry sectors. We are excited about this first Interoperability event and the support from oneM2M, ETSI, TTA, and the European Commission. We encourage industry players to attend this event and test their implementation of the oneM2M standards."

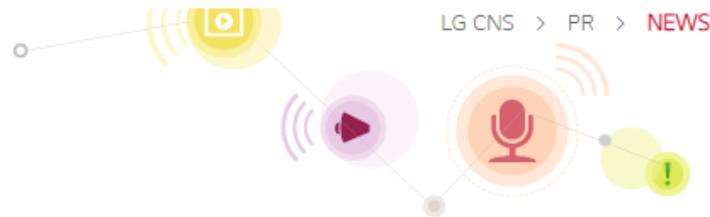
The event is open to all industry participants developing solutions based on the oneM2M specifications. The deadline to register is 31 July 2015.

From oneM2M to INFioT



LG CNS oneM2M Platform TTA Certification

NEWS



Title	Date
LG CNS, acquired International Standards Certification for IoT(Internet of Things)	2016-07-27

- 'oneM2M', 'CoAP protocol' certification, the first in IT services industry-

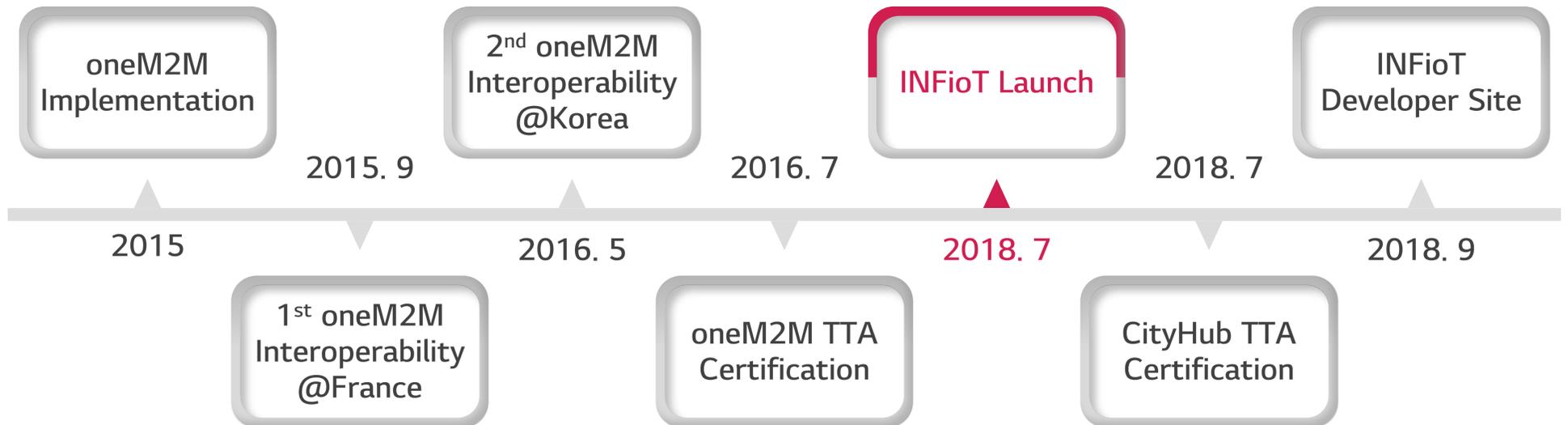
- Ensuring compatibility and expanding IoT products and services to foreign markets with International standards certification
- Leading to the spread of IoTuse based on low power IoT services

LG CNS(Young-Seob Kim, Representative) has recently acquired IoT(Internet of Things) International standards certification for 'oneM2M' and 'CoAP protocol', which is the first in IT services industry.

'OneM2M' is the world IoT standards participated by 230 enterprises including companies in the fields of communication, manufacturing, solutions, etc. LG CNS has laid the groundwork to enter the foreign markets as well as domestic market through this certification with IoT products and services



From oneM2M to INFioT



The launch of INFioT, IoT Platform based on oneM2M

oneM2M grows membership as momentum around IoT accelerates

🕒 Published: Tuesday, 21 August 2018

🖨️ Print

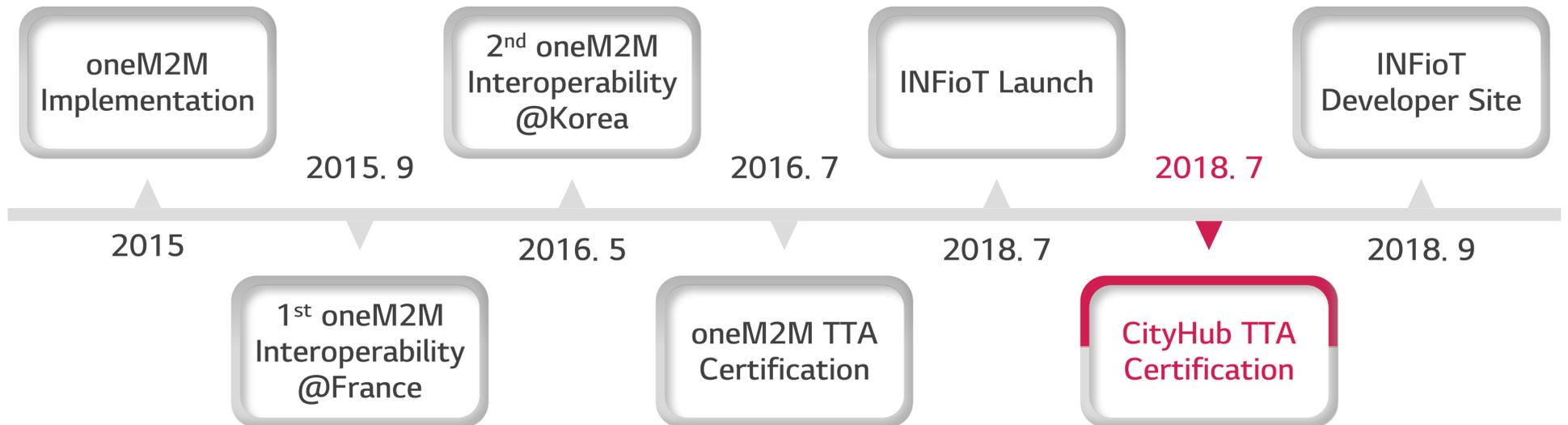
Ever-increasing efforts to advance the IoT has brought a jump in new oneM2M members.

Sophia Antipolis, France, 20 August 2018: A cybersecurity specialist, research institutes, service providers and Ireland's official standards body are among the latest companies to join the global Internet of Things (IoT) standards initiative oneM2M as it continues to evolve its universal framework to empower mass adoption of the IoT across a range of sectors.

The newest additions to oneM2M's vast membership – which is made up of vendors, operators and national bodies – highlights the wide relevance of oneM2M's work across the globe, with the new members coming from Canada, America, Europe and Asia.

LG CNS, another new addition to oneM2M's membership, has recently launched INFioT, an international standard which is based on oneM2M's horizontal platform. LG CNS has also embedded the oneM2M standard into its recently launched smart city platform 'Cityhub' which collects and analyses data generated and sent by various city infrastructures via IoT technology.

From oneM2M to INFioT



INFioT based CityHub Platform TTA Certification

LG CNS launches IoT-linked smart city platform 'Cityhub'

By Sohn Ji-young

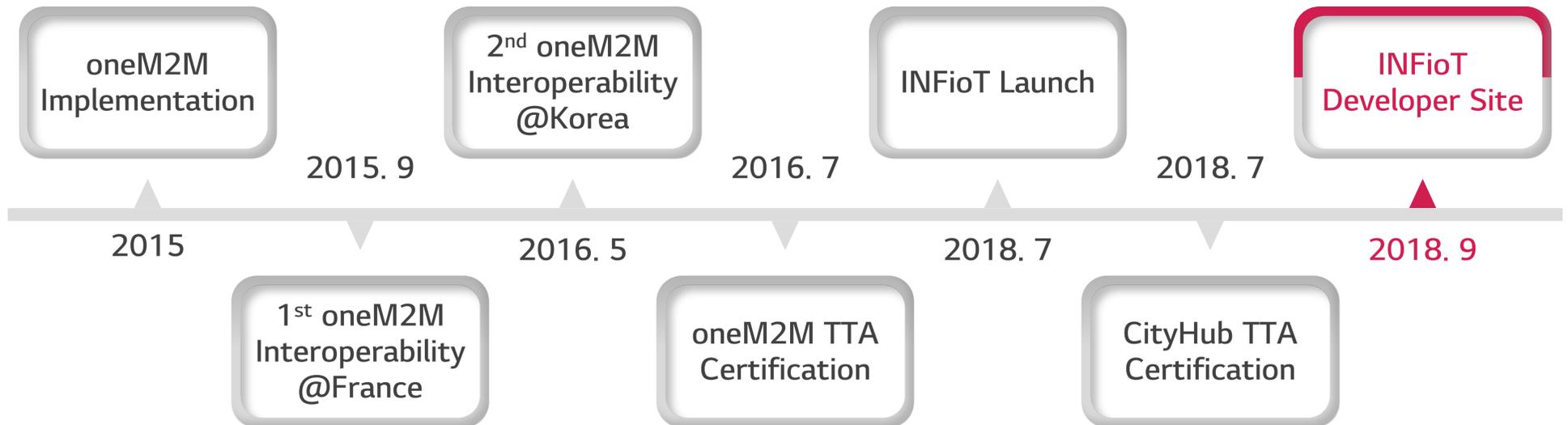
Published : Jul 5, 2018 - 15:55

Updated : Jul 5, 2018 - 15:55

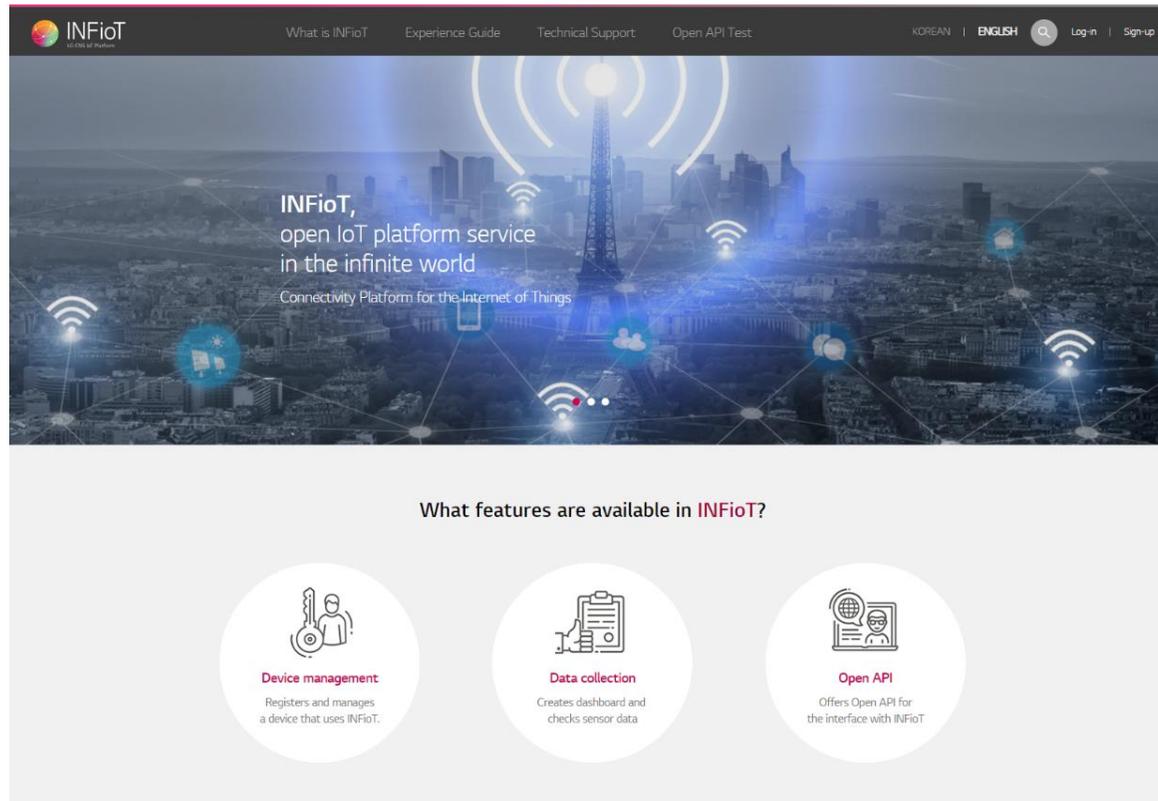
LG CNS, the information technology services unit of South Korea's LG Group, announced Thursday the launch of a comprehensive smart city management platform that collects and analyzes data generated and sent by various city infrastructure via internet of things technology.

Tentatively named "Cityhub," the smart city platform collects data from IoT sensors attached on vehicles, buildings, transportation infrastructure and street lights. Such data can also be analyzed via LG CNS' artificial intelligence engines to design, build and provide intelligent services, the firm said.

From oneM2M to INFioT



INFioT Open Developer Portal



The screenshot shows the INFioT Open Developer Portal website. The header includes the INFioT logo, navigation links for 'What is INFioT', 'Experience Guide', 'Technical Support', and 'Open API Test', and language options for 'KOREAN' and 'ENGLISH'. The main content area features a cityscape background with IoT connectivity icons and the text: 'INFioT, open IoT platform service in the infinite world. Connectivity Platform for the Internet of Things'. Below this, a section titled 'What features are available in INFioT?' lists three features: 'Device management' (Registers and manages a device that uses INFioT.), 'Data collection' (Creates dashboard and checks sensor data), and 'Open API' (Offers Open API for the interface with INFioT).

<http://infiot.lgcns.com>



III. Evolution into INFioT

What is INFioT?



After the development of oneM2M platform

There were no oneM2M compatible device
oneM2M seemed too complicated for small device companies to utilize

Smaller services required support for RDBMS, rather than NoSQL

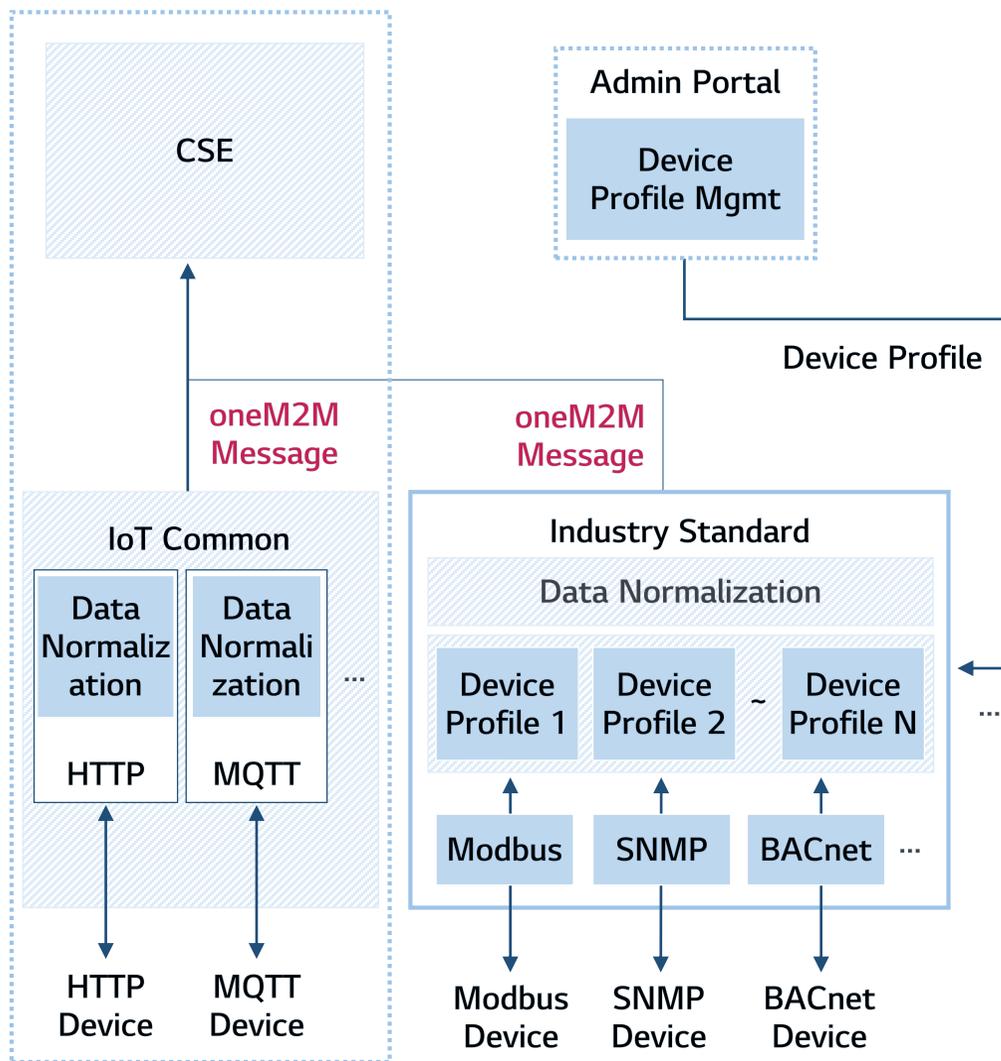
Tools for creating services were also required besides platform
functionalities



Evolution into INFIoT, LG CNS IoT Platform based on oneM2M

In practice, there were requirements demanding support for industry standard protocols as well as user defined message formats, rather than oneM2M spec

Expanding Connectivity



Supports widely used protocols for IoT: HTTP, MQTT, CoAP and WebSocket

Added support for industry standards: Modbus, SNMP, BACnet and more..

Dynamic configuration for device connection using device profile

Device manufacturers and developers had to understand oneM2M specs to connect to oneM2M platform

Was.. (2015)

- Low-level API based on oneM2m specs
- 5 Steps, connecting to INFioT



Device manufacturers had to learn oneM2M to use the older version of SDK

Improved (2018)

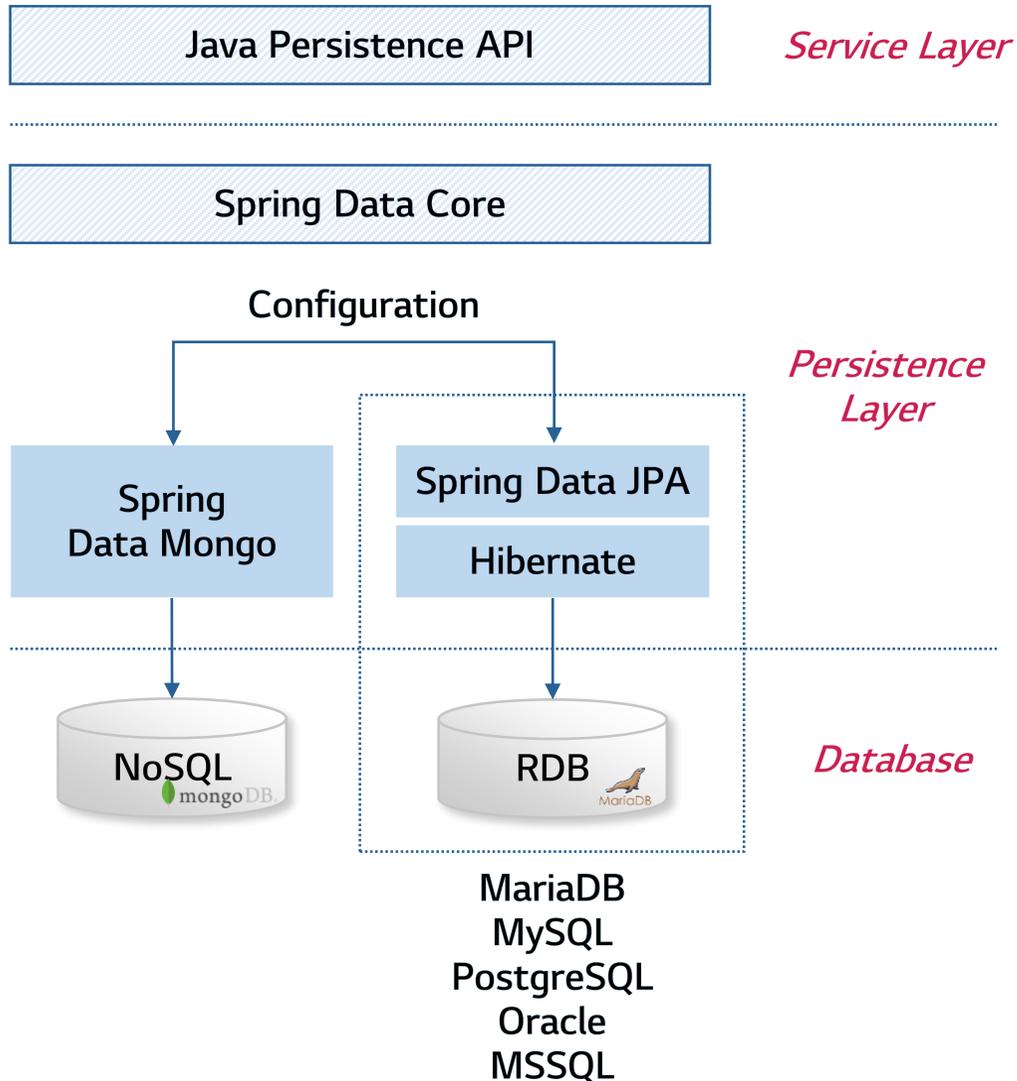
- High-Level API based on property configuration

```
# =====  
# General configuration  
# =====  
protocol=http  
# 프로토콜 명(http/mqtt/coap 중 1)  
host=http://infiotapi.lgcns.com  
# infiot api 도메인(고정 값)  
  
# =====  
# Device Detail  
# =====  
deviceId=C_AE-D-432be70eed-00VA  
# 6.1 3)의 디바이스 아이디  
deviceEnrollmentKey=dnGtovVzRDPQqs0j047Ju0Esc-UsVmao15Kz-_jisH4=  
# 6.1 3)의 디바이스 등록 키  
  
# =====  
# repository  
# =====  
resourceName=ae-1iy19by9zu8tg1iuvj6a  
# 6.1 3)의 리소스 명  
metaDataId=cnt-s1b6a6xtmo1j1jiloi5w, cnt-ubmf9v2jjmt51iusnvuz  
# 6.1 3)의 메타데이터 아이디(콤마로 구분하여 순서대로 입력)
```

Not all IoT services need NoSQL based DBMS to handle massive data

The type of DBMS to be used should be selected depending on project's characteristics and size

RDBMS Support



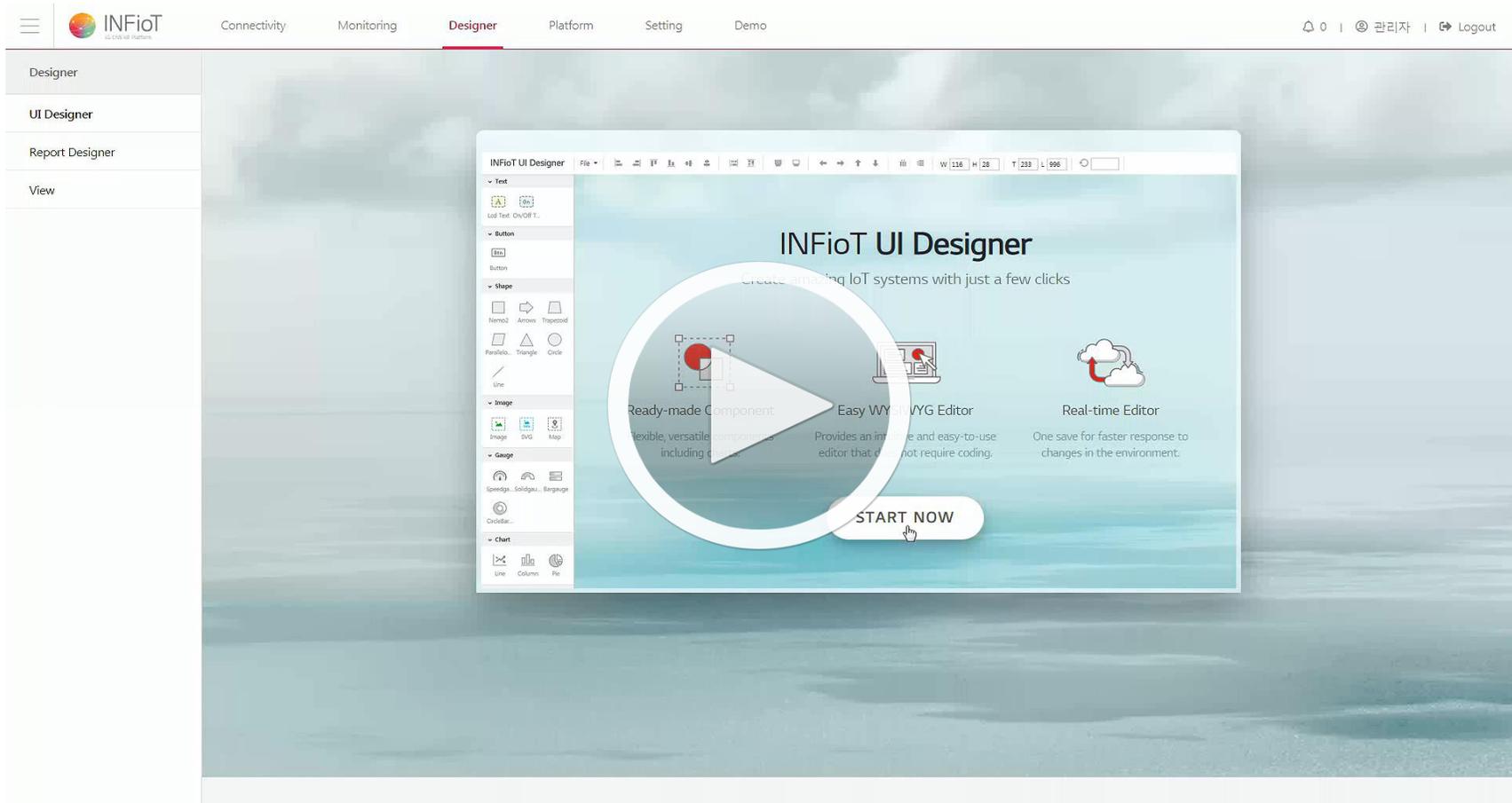
Provides options to use NoSQL or RDBMS depending on the IoT service

DBMS options: MongoDB, MariaDB, MySQL, PostgreSQL, Oracle and MSSQL

Web-based dashboard designer for creating real-time
data monitoring views

UI Designer

HTML5 WYSIWYG editor with various widgets to help create webpages for monitoring real-time data



Monitoring Scene - Marine IoT

Navigation info and marine engine status monitoring view of a sailing ship



Monitoring Scene - Home IoT

Monitoring view of a Home IoT device

Smart Home Control
by INFIoT



Room	Device	Status
BEDROOM 1	Temperature	24 °C
	Main Light	On
	Desk Lamp	Off
	Air Conditioner	Off
	Desk Lamp	Off
	TV	Off
LIVING ROOM	Temperature	24 °C
	Humidity	63%
	Electricity	7.2 KW
	Main Light	Off
	TV	Off
	Air Filter	Off
BEDROOM 2	Desk Lamp	Off
	Air Conditioner	24 °C
	Stand Lamp	Off
	CCTV	Off
	Main Door	Off
	TV	Off
BEDROOM 3	Main Light	On
	Sub Light	Off
	Main Light	On
	Sub Light	Off

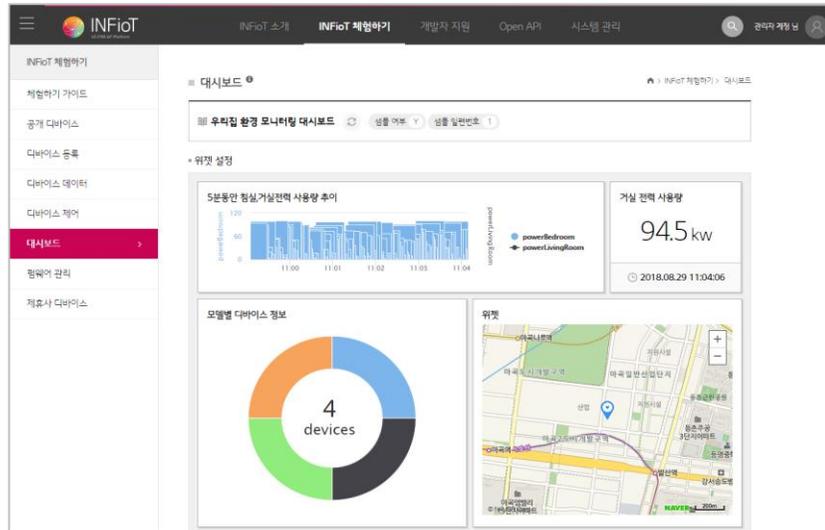
Monitoring Scene - Energy

Wind farm's power generation status monitoring view



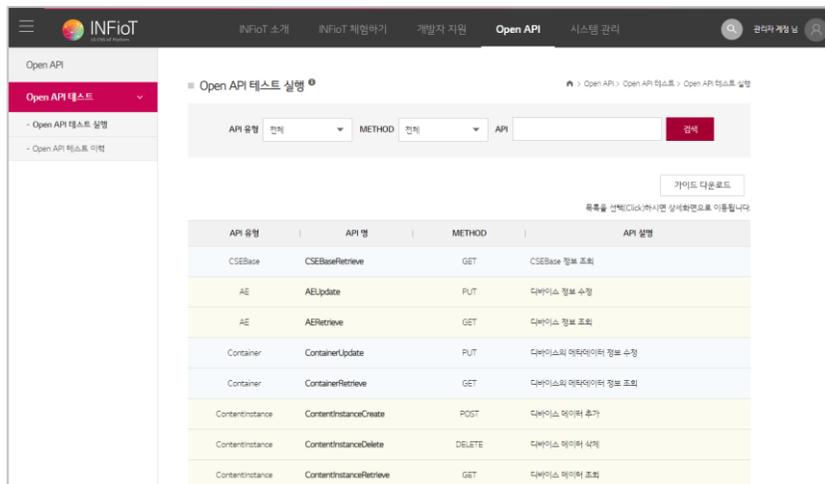
To fulfill the needs for easily developing services and connecting devices to INFioT, we provide the SDK and developer support through our Developer Portal

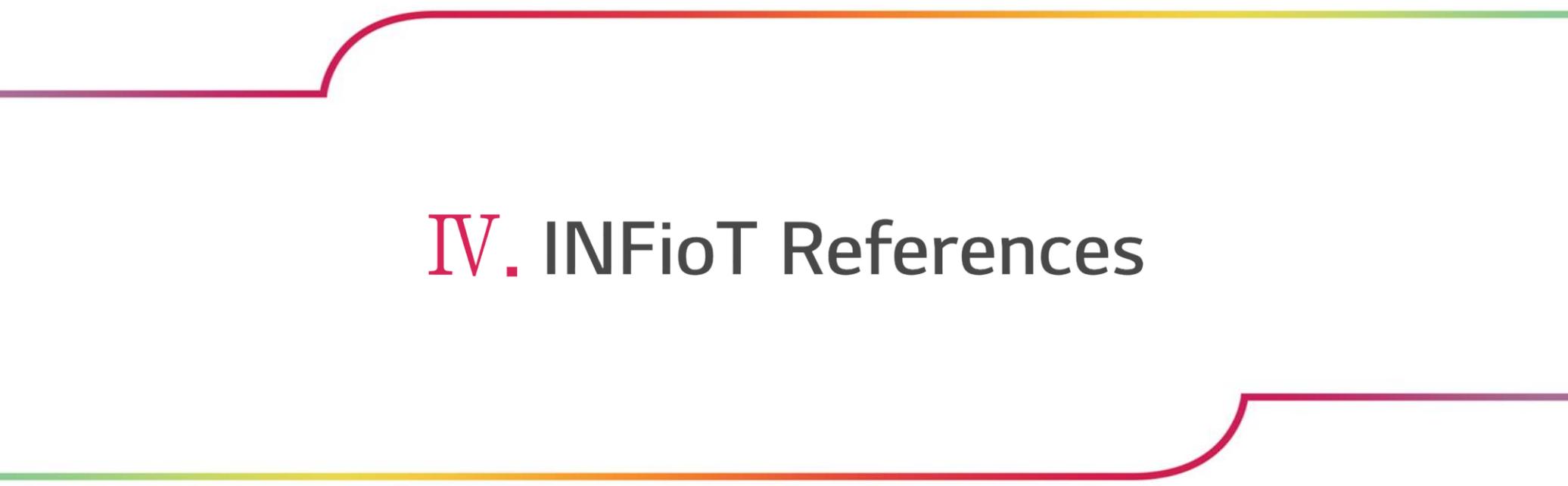
Developer Portal



Developer portal provides the SDK and oneM2M experience to support developers and device manufacturers

<http://infiot.lgcns.com>

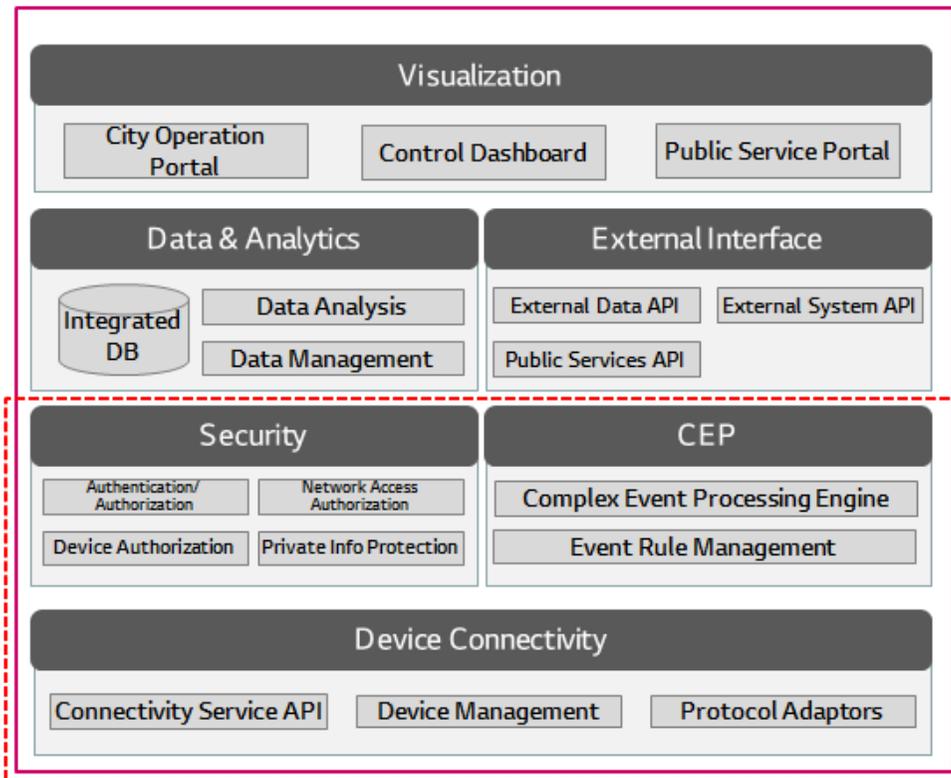




IV. INFioT References

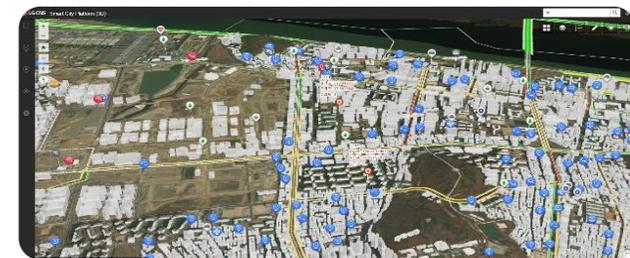
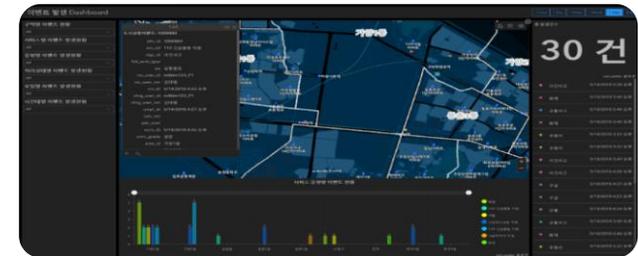
CityHub, Smart City Platform

INFIoT has been integrated into Smart City Platform. CityHub incorporates oneM2M standard, event based mass data processing, visualization to aid city control



INFIoT

City Event Statistics



3D GIS-based Supervision

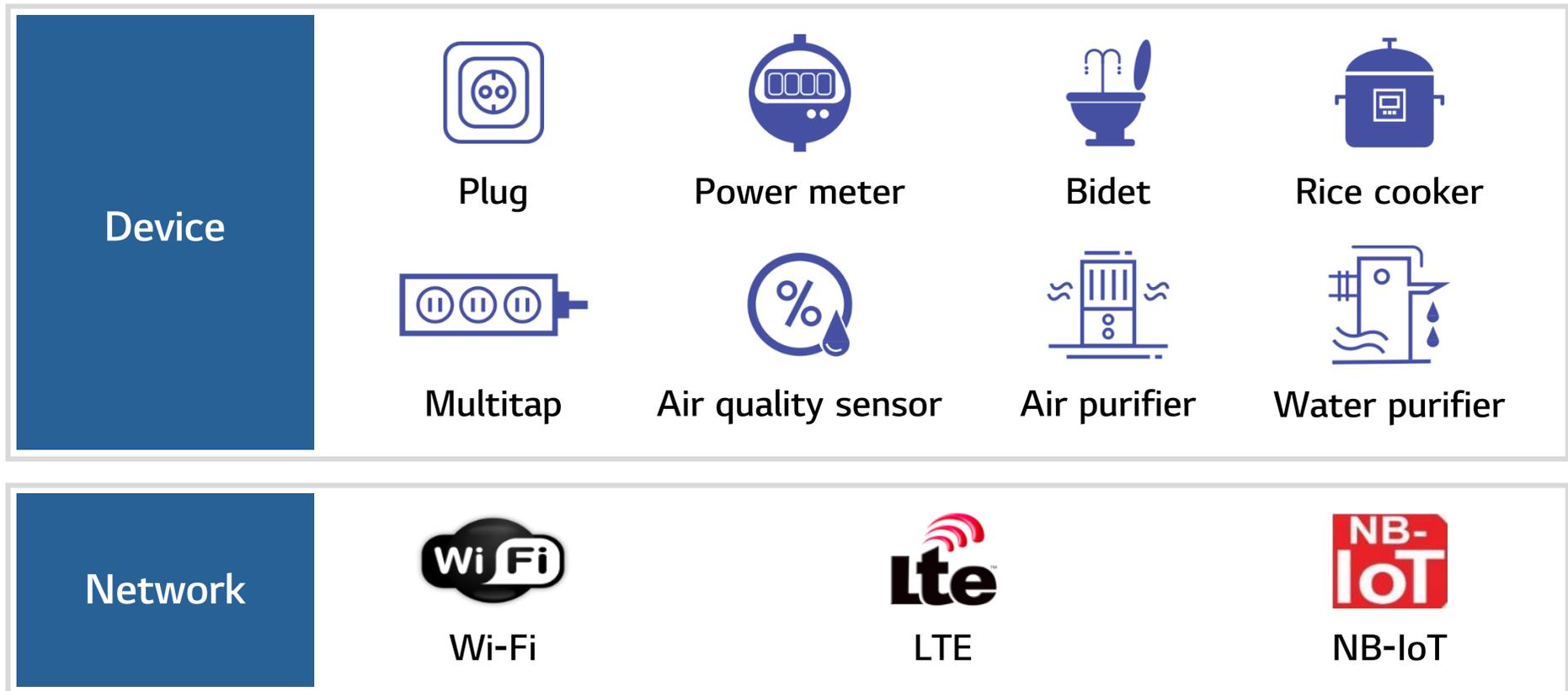
Operation Portal



Home IoT Service

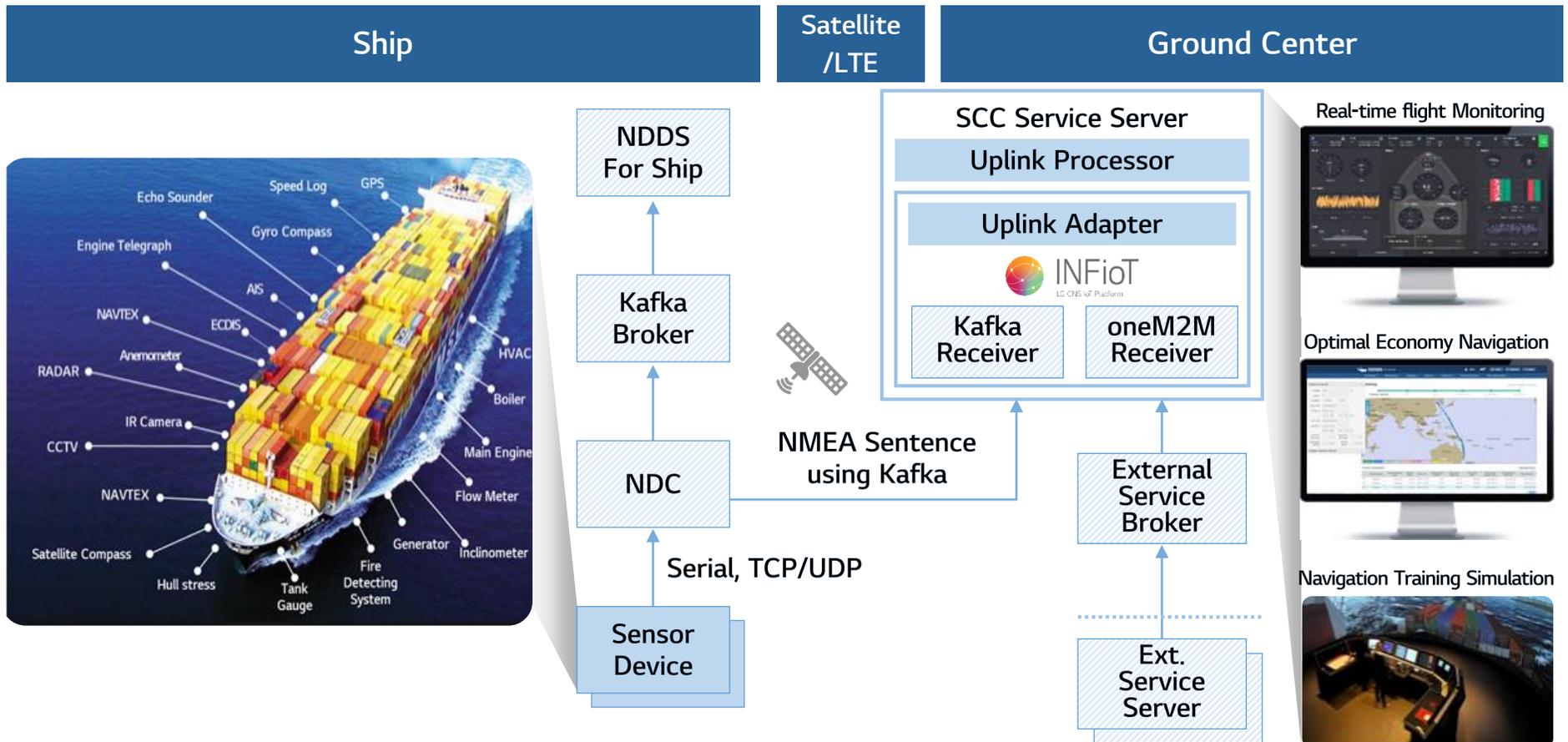
Using our oneM2M Platform, since 2015, we launched our client's IoT services that utilize Wifi devices.

Now, with INFioT, these services are expanding their device range to support Zigbee certified products, partnership products, and many more.



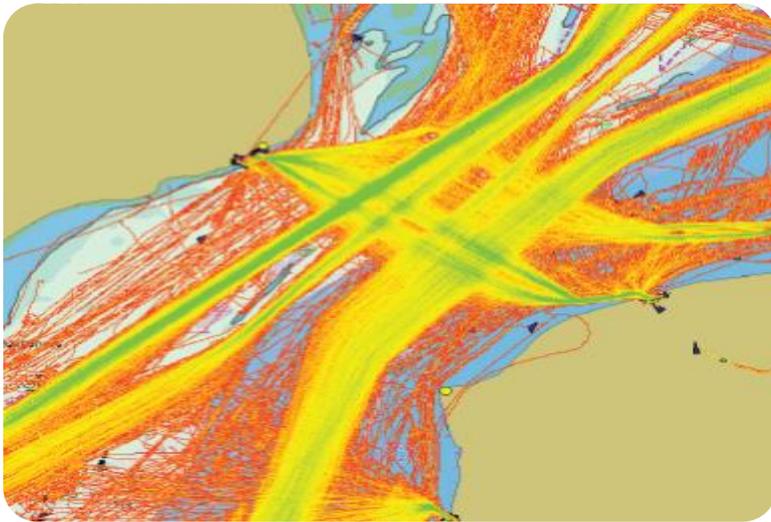
Ship Control Center Solution

INFioT has been integrated into Ship Control Center Solution which provide monitoring through LTE/satellite communication of navigation /institutional equipment data within large ships (currently operational in ships of Korea Maritime And Ocean University and more)

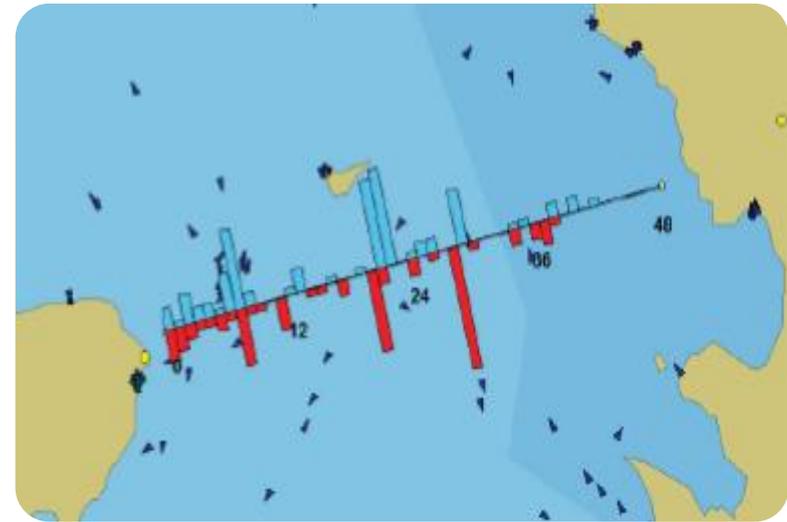


Marine Traffic Impact Assessment System

Currently under implementation to provide safety assessment, navigation plans, seaport entry/exit support, etc. based on data collected from ship tracking and ship density maps



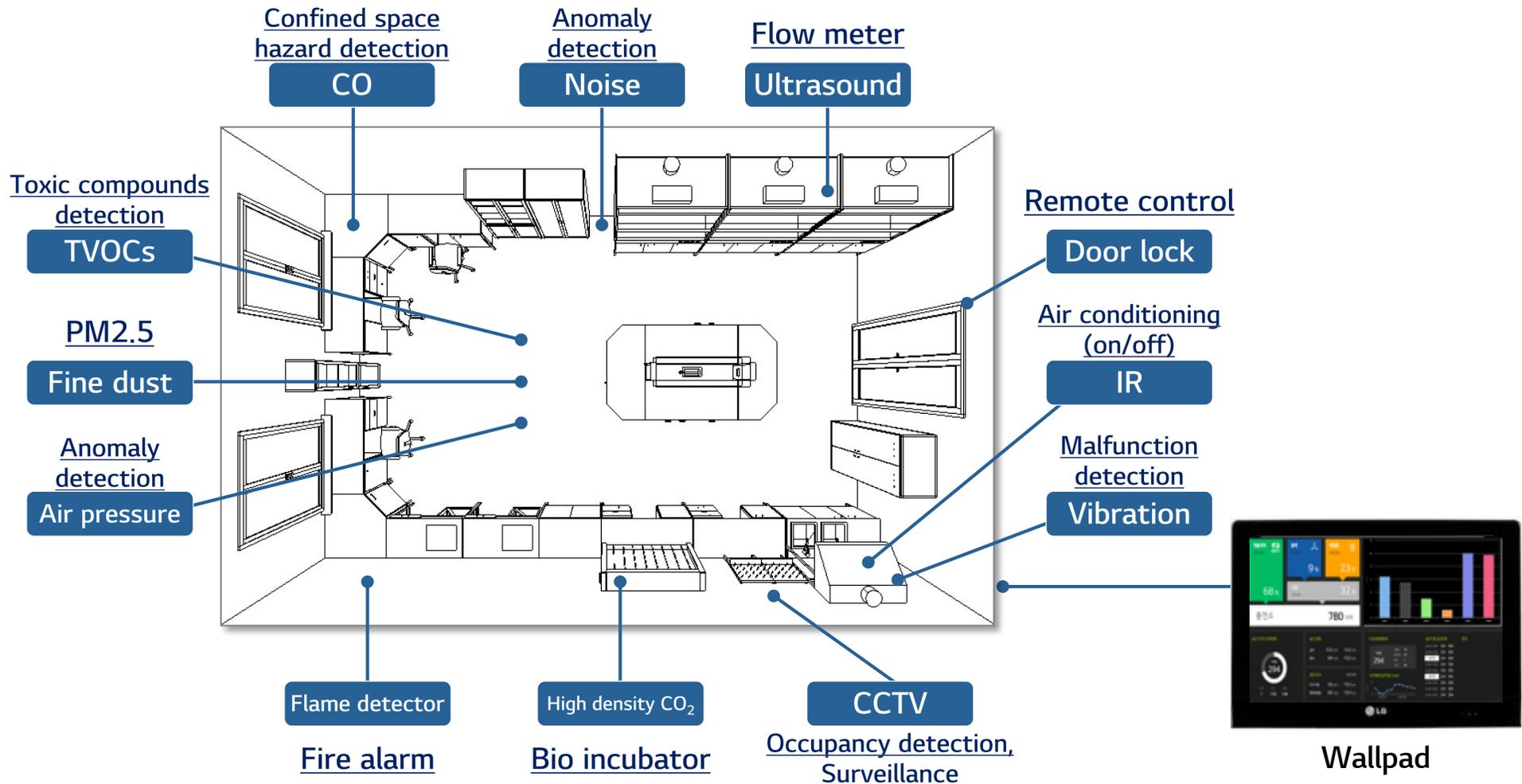
- Marine Traffic Monitoring
- Ship entry/exit route analysis, density analysis
- Data from radar, AIS, manual input and public data (e.g. climate)



- Display passage route & entry/exit traffic per route

Laboratory Safety Environment

We are currently in development to create lab safety monitoring system based on INFioT that detects any safety threats and alarms central control system in case of emergency





V. Wrapping Up

oneM2M platform spec can be quite complicated.

Do all the service developers need to know oneM2M spec?



oneM2M Service Framework for Service Developer

oneM2M is continuously improving

But there aren't many devices using oneM2M

How can we let developers create new services more easily?



**Needs more focus on not only the platform
but also devices and services**

LG CNS's IoT Korea Exhibition 2018





INFioT

LG CNS IoT Platform