



Supporting Metaverse Services via Standardized oneM2M IoT Platform

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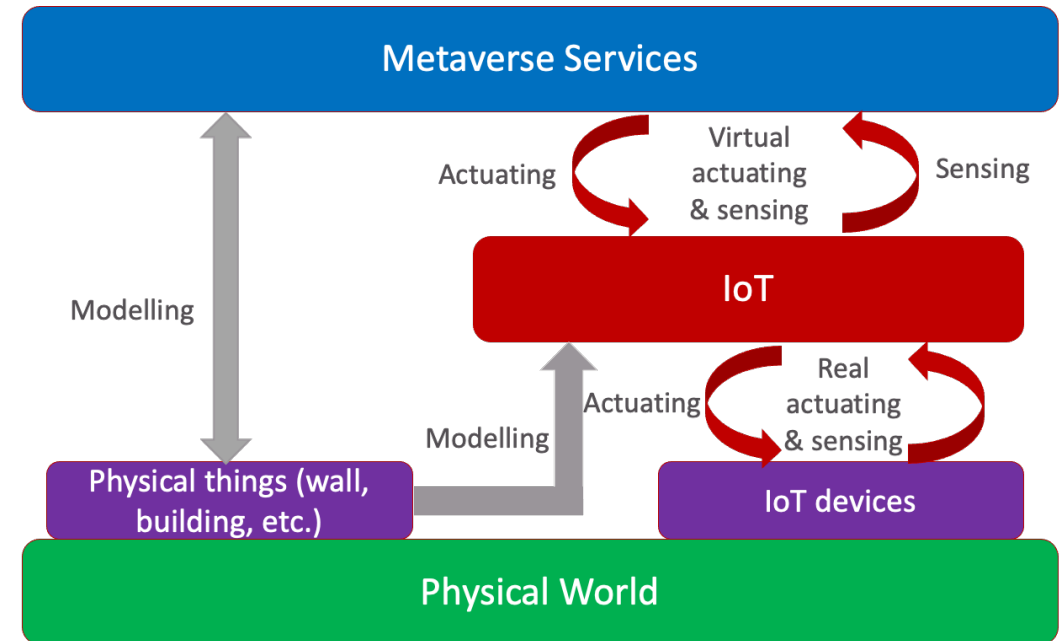
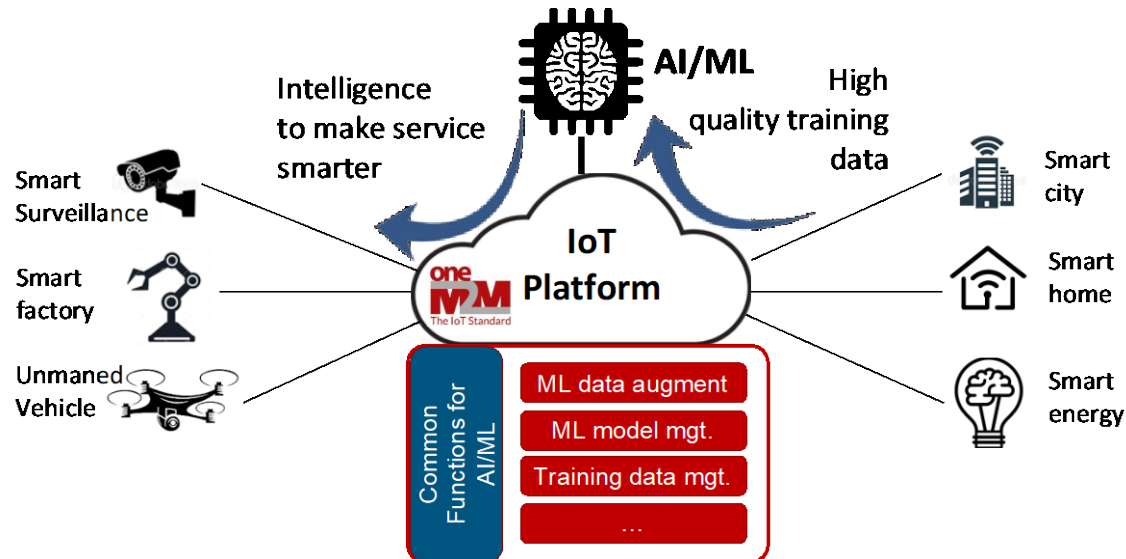
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What do we have for Metaverse

- Metaverse technologies consists of
 - IoT
 - AI → dedicated work item in Rel-5
 - VR/AR/XR
 - Blockchain/NFT
 - and others



Work Item for Metaverse

- Enablement of IoT in the Metaverse (MetalIoT)
 - The scope of the Work Item is feasibility study including **key use cases and requirements** for enabling **metaverse services based on IoT**. This WI also defines the **metaverse-IoT concept and potential solutions** for the metaverse enablement. Especially, the Work Item focuses on the **metaverse devices** and defines their **information model as a part of oneM2M SDT** based Information model specification.

WORK ITEM	
Work Item Title:	Enablement of IoT in the metaverse (MetalIoT)
Document Number	WI-0110
Supporting Members or Partner type 2	Hansung University, Nokia, KETI, Sejong University
Date:	2022-09-28
Abstract:	Propose a Work Item for enabling Metaverse services on IoT
*Template Version: January 2020 (do not modify)	

oneM2M International Hackathon (2022)



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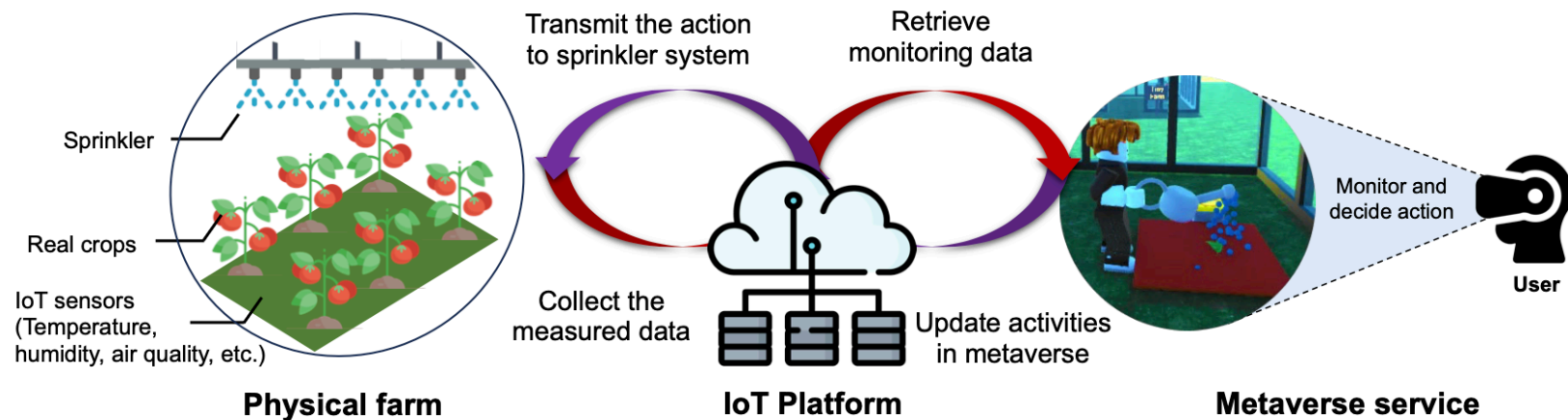
Video of the Hackathon Awards Ceremony

Winners

1st Prize: Fire Situation Monitoring System (KR)
 2nd Prizes: Air quality monitoring system (AT)
 Smart School Bus (KR)

Technical Report of MetaloT

- Bridging Metaverse and Physical World via oneM2M system (TR-0069)
 - Analysis of other SDO's metaverse standardization activities
 - JTC 1/SC 24, 3GPP, ITU-T
 - Potential MetaloT use cases and requirements
 - Integrating Digital Contents in Metaverse
 - Dynamic Monitoring in a Metaverse-based Smart Farm
 - Key Issues
 - Conclusion



Technical Report of MetaloT

- Bridging Metaverse and Physical World via oneM2M system (TR-0069)
 - Gap analysis of MVIoT requirements specified in FGMV-31 (ITU-T)

Table 6.2.3.2-1: Gap analysis of requirements in ITU-T FGMV-31

Requirements in FGMV-31	Supported in oneM2M	Description
[CommR-ReqR-1] It is required that MVIoT forms a link between IoT devices and the MVIoT services.	Yes	IoT devices are represented as <node> resources in oneM2M. Metaverse services can be represented as oneM2M applications (i.e. AE) and <AE> resources can have nodeLink information which is the resource identifier of a <node> resource.
[CommR-RecR-1] It is recommended that MVIoT forms a responsive and uninterrupted link between IoT devices and the MVIoT services.	Yes	Via oneM2M platforms, oneM2M provides communications between IoT devices and services.
[CompR-RecR-1] It is recommended that MVIoT supports cloud computing and multi-access edge computing technologies for data analysis, scene/object recognition and modelling.	Partially yes	oneM2M supports cloud and multi-access edge computing for deployment. Data analysis, recognition and modelling would be supported in Rel-5 with AI enablement.
[CompR-RecR-2] It is recommended that MVIoT has diversity computational capabilities; it is also recommended that the communication infrastructure and the metaverse service platform have computational capacities.	Not applicable	oneM2M specifies application layer communications and common service functions for IoT devices, platforms and applications.
[CompR-RecR-3] It is recommended that MVIoT supports the collaborative management and scheduling of computing resources to achieve the optimal performance of metaverse service performance.	Yes	Process management supports process offloading and resource announcement feature can be used for computing resource offloading.
[IR-RecR-1] It is recommended that MVIoT supports protocols identification and conversion for IoT devices to integrate diverse IoT devices into the MVIoT platform.	Yes	oneM2M provides the interworking specifications (e.g. OCF, LwM2M) and also defines general interworking framework for legacy protocols and devices.
[IR-RecR-2] It is recommended that MVIoT supports mappings between the IoT devices in the physical world and corresponding virtual objects in the virtual world to ensure consistency and accuracy.	Yes	oneM2M resource structure represents the mappings between physical and virtual objects.

Metaverse IoT Implementation

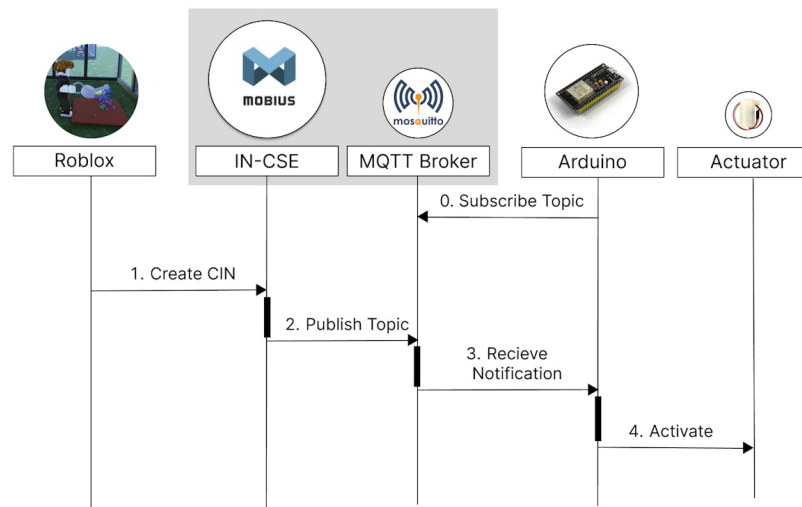
- Metaverse project from oneM2M International Hackathon 2023
 - Motivation: remote farming for the whom have busy urban life



2nd Prize



Smart Farm Infrastructure with Metaverse



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Demo

https://www.youtube.com/watch?v=W_MbRjRxMik

Thank you!