

Work Item	Work Item
Work Item Title:	System enhancements to support AI capabilities
Document Number	WI-0105
Supporting Members or Partner type 2	KETI, Hyundai Motors, Exacta GSS, Deutsche Telekom, SBS, Nokia, Hansung University, Orange, Convida Wireless
Date:	2023-04-24
Abstract:	This work item aims to enable oneM2M to utilize Artificial Intelligence models and data management for AI services.
Template Version:23 February 2015 (Do not modify)	Template Version:23 February 2015 (Do not modify)

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## 1 Title (Acronym)

System Enhancements to support Artificial Intelligence capabilities.

## 2 Justification

Today's business world is changing with the adoption of Internet of Things (IoT). IoT is helping in prominently capturing a tremendous amount of data from multiple sources. However, wrapping around the variety of data coming from countless number of IoT devices, makes it complex to collect, process, and analyze the data.

Realizing the future and full potential of IoT services will require an investment in new technologies. The convergence of Artificial Intelligence (AI) and Machine Learning (ML) with IoT can redefine the way industries, business, and economies functions. AI/ML enabled IoT creates intelligent machines that simulate smart behavior and supports in decision making with little or no human interference.

Combining these two streams benefits the common person and specialists alike. While IoT deals with devices interacting using the internet, AI/ML makes the devices learn from their data and experience. So oneM2M needs to investigate what features are needed to support AI/ML capabilities in oneM2M architecture and service layers.

### 3 Intended Output

Tick all the appropriate cases

Check	Case
x	Change request(s) to existing Technical Specification(s) Change request(s) to existing Technical Reports(s) New Normative Technical Specifications(s)
x	New Permanent Technical Reports(s) New Temporary Technical Reports(s)

### 4 Impact

#### 4.1 oneM2M Work Items

None

### 5 Scope

This Work Item will initially focus on the creation of a Technical Report analysing existing AI technologies (incl. Machine Learning) that can be resourced into oneM2M architecture. The TR will also investigate potential AI service use cases that use IoT data. The study on AI technologies and use cases will be further analysed to understand what features are supported and unsupported by the oneM2M system. Unsupported features will be used to generate potential requirements.

The Technical Report will investigate items as follows:

- State of the art AI technologies that uses data from IoT systems
- Potential use cases and requirements to support AI services and their data management
- Managing and manipulating training data in oneM2M to support AI technologies to build a model
  
- Managing and manipulating serving data in oneM2M to support AI technologies to run a model
- Feasibility study on running AI algorithms in oneM2M as a new CSF
- Generalization of steps performing AI algorithms to identify required common functions that can be supported by oneM2M
- Supporting different parameters schemes i.e., power consumption, cost for the future etc. in oneM2M to support AI services
- Distributed and federated ML on Edge/Fog oneM2M nodes

- Services to assist with deploying trained machine learning models onto field device nodes such that inferencing can be performed by the field device nodes using the models

This work item will also serve to capture input contributions generated from ETSI STF 601, started in Feb 2021. ETSI STF 601 objectives are to identify use cases where IoT data and services require usability specifications. The data that IoT devices and platforms provide should be easily accessed, understood and acted upon by a large non-technical public in the case of humans (e.g. medical teams and their patients in the medical sector, mechanics in the automotive sector, first responders in the emergency sector, etc.) and by machines and processes when the data are fed to the AI components of a system (e.g. machine learning). This also means that the IoT technologies, devices and platforms themselves can be trustily used according to their initial objectives (e.g. easy installation, configuration, operation and maintenance). Based on these use cases, requirements and guidelines should be derived towards a horizontal cross-domain standard, with the specification of minimum requirements for usability of professional and general public IoT services, whether they are critical or not.

The work item will take into account of the activities in the following organizations:

- ETSI STF584 Artificial Intelligence for IoT Systems deliverables
- ETSI ISG SAI (Securing AI) regarding security of the AI/ML models
- 3GPP SA2 on AI/ML capabilities for SGC as Release 17 features
- AISTar R&D project in South Korea regarding data management and interoperability for AI/ML

Additional functionality will be identified through use case analysis and investigation of potential mechanisms.

Results of this WI are expected to propose changes for existing TS as CRs.

## 6 Schedule and impacted specifications

### 6.1 New Specifications (if any)

Provide the schedule of tasks to be performed;

Document Type	Document Number	Document Title	Schedule				Lead WG	Impacted WGs	Comments
			Schedule (TP No.)	Schedule (TP No.)	Schedule (TP No.)	Schedule (TP No.)			
			Start	Control	Freeze	Approval			

Document  
Type | Document

Number\* |Title |  
Schedule (TP No.) |  
Schedule (TP No.) |  
Schedule (TP No.) |  
Schedule (TP No.) |Lead WG |Impacted WGs |Comments | |TR |TR-0068  
|AI-enablement to oneM2M |TP 50 |TP 53 |TP 59 |TP 60 |RDM |SDS | |

\* Optional for first versions (i.e. before it will be assigned by the secretariat)

## 6.2 CRs to existing specifications (if any)

Impacted TS/TR	CR number (when known)	Subject of the CR	Approved at plenary#	Impacted WGs	Comments

## 7 Work Item Rapporteur(s)

JaeSeung Song (Sejong University & KETI), jssong@sejong.ac.kr

## 8 History

### Document history

Version	Date	Description
V.0.0.1	2021-06-03	Initial proposal
V.0.0.1	2021-06-08	Uploaded as a permanent document following agreement of TP-2021-0053R02
V0.1.0	2023-04-19	Updated the approval of TR-0068
V0.1.0	2023-04-24	Uploaded as a permanent document following agreement of TP-2023-0039R01