The Design of Interworking Architecture Between oneM2M Platform and OIC Platform

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Extended Abstract/Poster Paper

Abstract – Recently, global companies such as Google, Apple, Amazon and others have led the market by providing an open platform for internet of things (IoT) service. Also, alliances standards are promoted through promotion of standardization of international standardization bodies and cooperation among companies. In addition to developing these standards, interworking with standard technology is indispensable. This paper proposes the interworking technology between oneM2M standard and Open Interconnect Consortium (OIC) platform.

Keywords: IoT, oneM2M, Interworking

1 Introduction

Recently, industry and standard groups to take the initiative of IoT services have worked hard. For IoT service, Google, Apple, Amazon, etc. are promoting the construction of IoT service environment centering on already secured users. Also, companies are making efforts to lead the IoT based on mutual strengths, through mutual collaboration.

OIC was established mainly in Samsung Electronics and Intel in July 2014, with the aim of developing a framework capable of realizing various IoT services in a smart home environment. Recently OIC has been working with Qualcomm, Microsoft and others to expand the industry group with the new name OCF to expand and grow the IoT business.

AllSeen Alliance is an industrial consortium formed in Dec 2013 by Qualcomm, Microsoft, LG Electronics etc. as the main axis. The AllSeen Alliance has expanded its IoT services by publishing the AllJoyn framework which is an open source IoT platform, and many companies are releasing products based on AllJoyn.

This paper proposes the interworking technology of oneM2M and OIC, which are standardization organizations developing actual platforms.

2 The oneM2M Standard Architecture

Fig. 1 shows the oneM2M functional architecture specified in oneM2M technical specification TS-001 [1]. The oneM2M architecture is composed of two domains, Field Domain and Infrastructure Domain.

![Fig. 1: Functional architecture of oneM2M](image)

Each domain is composed Infrastructure Node (IN), Middle Node (MN), Application Service Node (ASN), Application Dedicated Node (ADN). A node of oneM2M is roughly configured as an end device, a gateway, or a network server. End device and gateways are located in field domain and oneM2M devices are connected to network server via underlying network [2].

In the Fig. 1, Common Service Entity (CSE) provides 12 general functions such as registration, search, security, data. The AE provides various service logics, and the Network Service Entity (NSE) provides the network function from the underlying network to the CSE.

The oneM2M provides Mca(communication between AE and CSE), Mcc(communication between CSE), Mcc'(communication between CSE of another service provider’s domain) reference points for interfaces between each node.
3 OIC Architecture

The OIC core framework is a standardized version of the functions provided by the OIC platform, and it defines device resource representation and addressing, CRUDN (Create, Read, Update, Delete and Notification) operation, etc. based on RESTful architecture [3].

The OIC architecture is a structure that finds an actual device having an OIC resource through an entity handler and create/mapping. Also, OIC has a basic structure that operates in a server-client manner of RESTful architecture. The operation is a structure in which a state operation request of a resource is passed to a CRUDN command from a client to an OIC server having an OIC resource and target resources are identified by unique URIs.

OIC defines a structure supporting access of OIC devices on a remote network, and configures a network based on XMPP technology.

4 Interworking of oneM2M and OIC

Fig. 2 shows the interworking architecture between oneM2M and OIC. Interworking Proxy Entity (IPE) is defined for interworking with the legacy system with oneM2M. The IPE is equipped with OIC client module and oneM2M AE module to convert the OIC device to oneM2M resource. A gateway or server registers and publishes the resource to the other gateway or server.

The OIC device discovered through the IPE is registered to oneM2M gateway and AE resource is registered to server. The registered resource are registered to member of AE resource group through IPE.

The oneM2M server maps OIC resource through the IPE into oneM2M resource and creates the resource. Interworking of oneM2M and OIC can control the OIC data in the oneM2M domain.

Fig. 3: Resource Tree Viewer in the oneM2M system

Fig. 3 shows the Resource Tree Viewer in the oneM2M system. Through the viewer, user retrieve the resource and real-time monitoring resource. Also, information on the OIC registered in the server through the IPE can be referred.

5 Conclusions

This paper briefly explains the developing IoT platform. Also, interworking between oneM2M and OIC is briefly explained. The problem that is not linked between IoT technologies will lead to ecosystem leadership conflict between IoT services among global companies. Therefore, the interworking technology between the IoT standards in the IoT service environment would be the answer to the global IoT service environment.

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