|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **itu-old** | INTERNATIONAL TELECOMMUNICATION UNION | | | | COM 17 – C 0239 – E |
| **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2013-2016 | | | **September 2014** | |
| **English only**  **Original: English** | |
| **Question(s):** | | 11/17 |  | | |
| **STUDY GROUP 17 − CONTRIBUTION 0239** | | | | | |
| **Source:** | | ETRI | | | |
| **Title:** | | Proposal for new ITU-T | ISO/IEC JTC 1 joint work item for OID based device identifier for the Internet of Things | | | |

# 1. Background

In the Internet of Things (IoT)[ITU-T Y.2060], numerous things including physical and virtual things need to be identified as shown in the Figure 1.

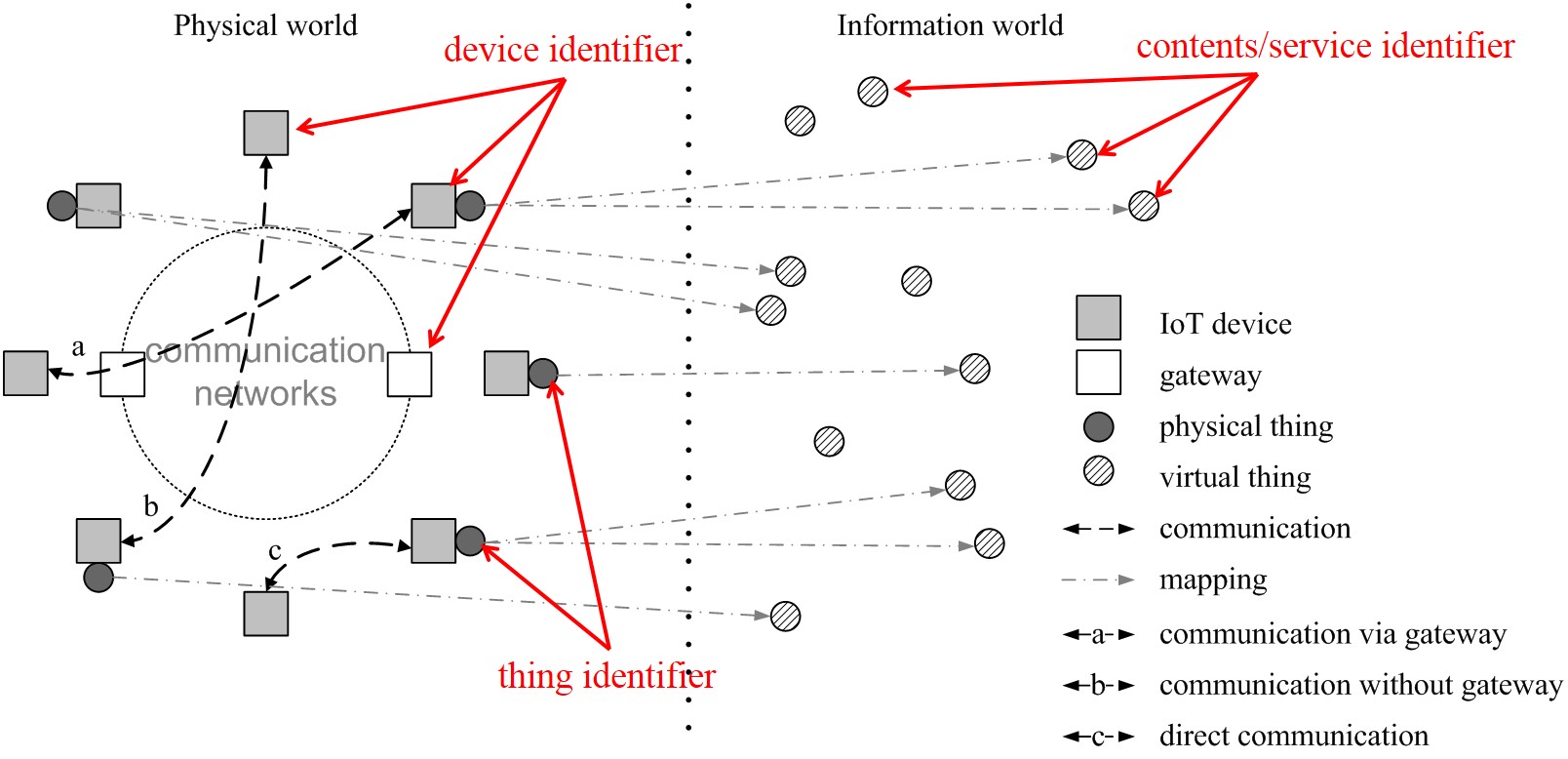


Figure 1 – Targets of identification in the IoT (Source: modified from ITU-T Y.2060)

In the IoT, every “things” should be identified by globally or locally unique identifier to be accessed as shown in Figure 1. It does not need to be globally unique but if it is not globally unique then it need to be used in restrict environment.

Already there are a lot of identifiers are existing in international level or national level. For example, IPv4 and IPv6 addresses, universally unique identifiers (UUIDs) in ITU-T X.667 and unique resource identifier (URI) etc.

We believe that there will be multiple identifiers for the IoT and we also believe that we need some mechanisms for providing interoperability between different identifiers.

From the network technology point of view, any identifiers which do not have any dependency with underlying networking technology, such as universal content identifier (UCI), can be used for content or service identifier.

We believe that IoT device identifier should be independent from underlying networking technology so that any device can be identified by the same identification scheme even those devices are belong to the different network which are using different networking technologies. For example, device in ZigBee® network and device in IPv6 network should be identified by the same identification scheme.

# 2. Discussion

By the ITU-T Y.2060, there are four different types of devices are needed to be identified as shown in Figure 2.

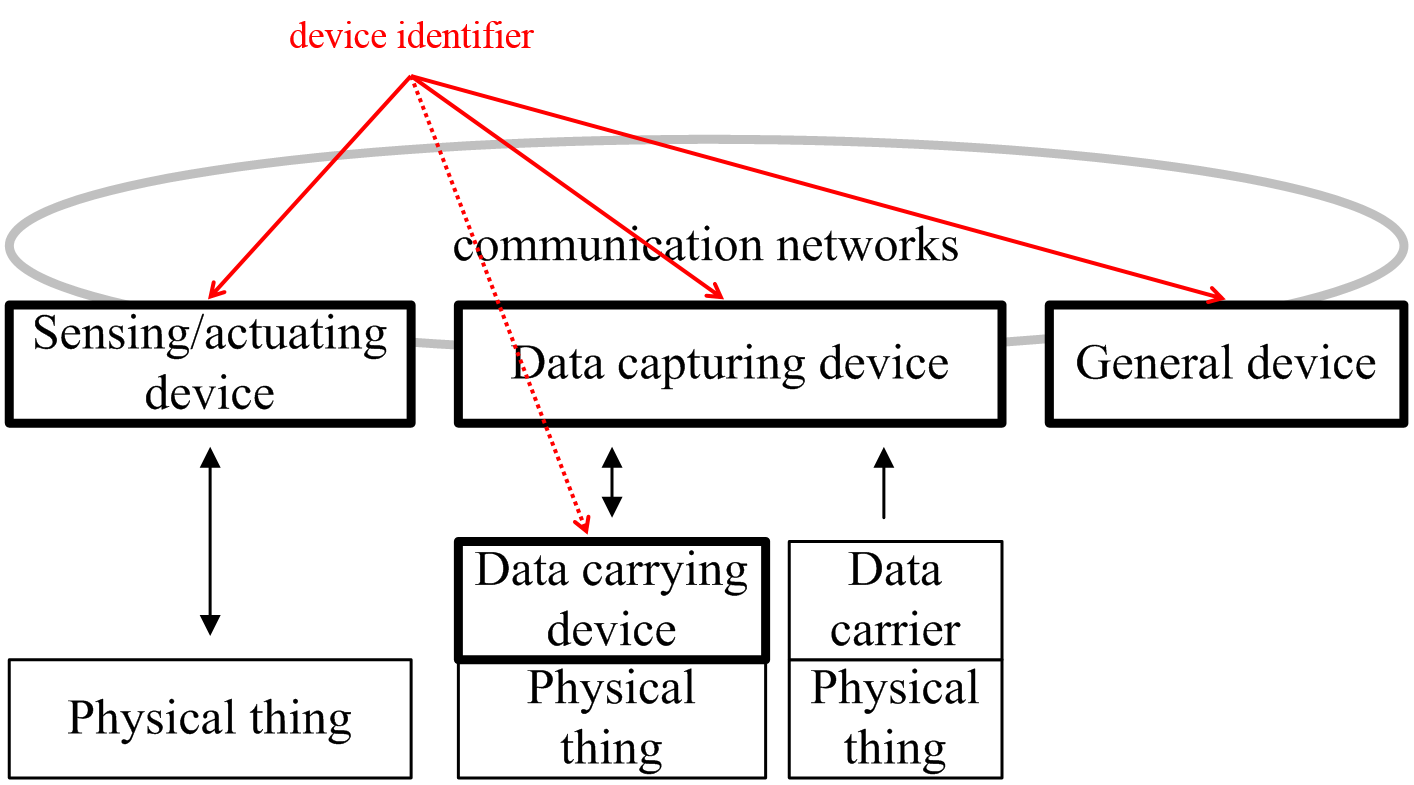


Figure 2 – Types of devices to be identified in the IoT (Source: modified from ITU-T Y.2060)

From the view point of ITU-T and ISO/IEC JTC 1, among four different types of devices, data carrying devices can be identified by RFID since these will be attached to physical things such as boxes and bottles.

In case of other three types of devices, it can be identified by different identifiers already exist such as IPv4 or IPv6 addresses but most of identifier currently used have dependence with the underlying networking technology used. For example, a device can be identified by IPv6 address if it is in the IPv6 network or can be identified by EUI-64 address if it is in the ZigBee® network.

We believe that Object Identifier (OID) is one of the good solution to identify devices except data carrying devices which doesn’t have any dependence with underlying networking technologies and globally unique.

The [oneM2M](http://www.onem2m.org/) published candidate technical specification for oneM2M functional architecture ([oneM2M-TS-0001-V-2014-08](http://www.onem2m.org/candidate_release/TS-0001-oneM2M-Functional-Architecture-V-2014-08.pdf)) and it contains text for M2M node identifier which should identify an M2M node globally unique. Also, it contains an informative Annex which shows the examples of allocating a globally unique M2M node identifier using OID as shown in Figure 3.

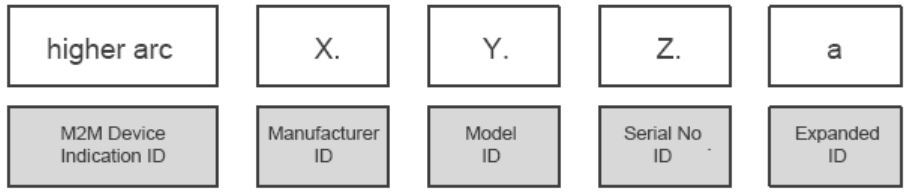


Figure 3 – M2M device ID using OID (Source: oneM2M)

The “higher arc” in Figure 3 can be one common arc for all over the world or can be multiple different arc allocated by each country or company. For example, OID **{joint-iso-itu-t(2) iot-device(52) x y z a}** can be used for one common arc or OID **{iso(1) member-body(2) kr(410) iot-device(1234) x y z a}** can be used for devices defined by some company in Korea.

In case of one common arc for “higher arc”, it has to be done by ITU-T and ISO/IEC JTC 1 jointly and if it use different arcs for country or company, it need some mechanisms for providing interoperability between different identifiers such as OID resolution to figure out the specific structure of sub arcs which might be differently defined by each country or company.

# 3. Proposal

In this contribution, we proposed to initiate a new ITU-T | IOS/IEC JTC 1 joint work for “OID based device identifier for the Internet of Things” with the following scope:

* Concept and scope of device identification in the Internet of Things
* Common OID arc for device identification
* Detail structure of the OID for device indemnification
* Guideline for allocating OID for device identification with non-common OID arcs
* Guideline for the interoperability between OID for device identification

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_