IoTDM Proposal

Name

Internet of Things Data Management (IOTDM)

Repo Name

iotdm

Follow this link to the IoTDM Main page.

Description

The oneM2M Global Partnership is developing standards for MachinetoMachine (M2M) communications enabling largescale implementation of the Internet ofThings (IoT). It is progressing specifications supporting communications between the oneM2M service entities, and work is underway on oneM2Mspecific bindings for CoAP, HTTP, and MQTT protocol implementations.

The proposal is to develop a data-centric middleware that will act as a oneM2M compliant IoT Data Broker (IOTDM) and enable authorized applications to retrieve IoT data uploaded by any device. The choice of a data-centric paradigm, as opposed to a message-centric one, ensures that the network - as a distributed IoT platform - provides a single version of the global data space to interested applications. It also optimizes network traffic and application processing as applications and/or devices join and leave the IoT domain.

The IOTDM application (plugin) will interact with data producers (IoT devices such as sensors, and IoT management systems) and data consumers (analytics engines). The interaction is through a variety of IoT Protocol plugins, such as CoAP, MQTT, HTTP, etc.

Overall Architecture

blocked URL

References:

- http://www.onem2m.org
- Published specifications: http://www.onem2m.org/technical/published-documents
- more oneM2M technical specifications: http://www.onem2m.org/technical/candidate-release-august-2014
- Some latest documents are member-only, so you can register a free account and go to http://member.onem2m.org/Application/documentapp/documentlist/
  - oneM2M Functional Architecture: TS0001
  - oneM2M Service Layer Protocol: TS0004
  - CoAP Protocol Binding: TS0008
  - HTTP Protocol Binding: TS0009
  - MQTT Protocol Binding: TS0010
- oneM2M Webinar: Taking a look inside oneM2M
- The Constrained Application Protocol (CoAP), RFC7252; https://datatracker.ietf.org/doc/rfc7252
- Californium CoAP framework: http://eclipse.org/proposals/technology.californium/

Scope

IOTDM Core:

- Definition of a YANG model representing the oneM2M resource tree (TS0001, TS0004)
- Definition and implementation of RPCs for CRUD and notifications (TS0004)
- Integration of existing common IoT southbound protocols: CoAP (TS0008), MQTT (TS0010), HTTP (TS0009)
- Security Manager – User Authentication and Policy Enforcement
  - The entities (devices, applications, other IOTDMs) need to be authenticated and and authorized to access the data store. We can leverage the AAA module under development
  - Once authenticated, the clients accessing the data store must be limited to certain operations. oneM2M defines some mechanisms to address this need. We may explore other ways as we see fit (AAA authorization)
- Federation – distributed set of IOTDM instances

○ We expect that other oneM2M data stores will be deployed in the network. Some on ODL, some on different platforms. oneM2M defines some procedures to interconnect various data stores. We could implement them and others as we see fit.

South Bound Protocols:

- We will implement as many IoT southbound wire-protocols as possible (as contributions permit): HTTP, CoAP, MQTT, XMPP, Thread…

Resources Committed (developers committed to working)

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Vendor Neutral

- No vendor package names in code
- No vendor branding present in code or output of build
- No vendor branding present in documentation

Meets Board Policy (including IPR)