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M2M: the Need for Standardization in the Services Layer

Friedhelm Rodermund explains the background to a move to standardise M2M processes at the service layer as the market grows

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With a strong industry forecast of significant growth in connected M2M devices reaching billions within the next seven years, it is clear that all sectors from consumer devices and healthcare, to transportation, retail and public safety will be impacted in a positive way with the explosion of M2M deployments.

As this 'internet of things' grows so will the need and complexity for all of these devices to be remotely managed, whether they are being reminded to transmit and process data, or are under maintenance and undergoing upgrades. To be able to standardize these processes at the service layer as the market grows, a new communication protocol "Lightweight M2M" (LWM2M) is being introduced. This new standard acts as a communications protocol between LWM2M software clients embedded on a range of M2M devices and their M2M management platforms.

The term 'Lightweight' has been inspired by the deliberate design to make such a protocol simplistic so that the amount of data transferred between the devices and management platforms is as small as possible and can work on any connection speed. LWM2M is a new effort between the Open Mobile Alliance (OMA) and a team of experts from system, software and service providers.

Why do we need LWM2M?

Device management is not a new subject within the industry. Other non M2M devices have been around for a while and they also require remote configuration and management: such as VoIP phones or smart phones. Technical standards have been created to manage these kinds of devices, for example TR-069 from the Broadband Forum for remote

management of end user devices or 'OMA DM 1.2.1, 1.3' from The Open Mobile Alliance for smart phones. The design goal of LWM2M was to create a mechanism that is not only suitable for powerful computing devices such as Android-based Smartphone's but also caters for the needs of more constrained M2M devices; such as those that run a lifetime on a single battery or that need to be very low cost.

LWM2M has five outstanding characteristics: firstly it features a modern architectural design appealing to software developers and secondly it defines a data model that is extensible to enable any kind of M2M service. As well as this it has been designed with performance and constraints of M2M devices in mind, therefore enabling low-cost devices. LWM2M also builds on an internet-style protocol called CoAP (Constrained Application Protocol), which is highly optimized for M2M services as it is designed for communication with performance-constrained devices and networks', meaning less data is transmitted over the wide area network interface. Finally, it can be used across any type of network.

As the specification has developed testing of the new protocol has taken place between OMA, ETSI and IPSO Alliance, with the latest test event taking place in November 2013. These look at the interoperability of different CoAP implementations including OMA LWM2M and Security and are in line with the standardization work of the oneM2M Partnership Project, where CoAP and OMA LWM2M are considered key components of the future global standardized M2M architecture. Results found that the level of interoperability of LWM2M is excellent and is showing good maturity on a basic level, making it a promising standard as the M2M market develops.

The commercial benefits of LWM2M

LWM2M is supposed to open up a partially closed market as previously a large part of the M2M market was developed by manufacturers creating M2M modules, terminals and devices with limited remote management capability. By having a more open management standard the market becomes more open with M2M devices being interoperable with different software management systems from different vendors. This should also promote more independent innovation on the device and server side.

From the perspective of an M2M customer, an open specification such as LWM2M can help reduce problems of vendor lock-in (being locked into a solution where your M2M device can only speak to the M2M management software of the same vendor).

Challenges for LWM2M?

"There are always challenges with new standards which need to achieve a certain market penetration to become successful. Open sources projects have already been created around LWM2M and developer tools are being created which will help companies to start leveraging LWM2M to enable their products and services."Standards such as Long Term Evolution and Lightweight M2M will be the key to unlock the real potential of M2M communications and move towards the often predicted prospering market with immeasurable compelling services offered by billions of devices.

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