Lightweight Machine to Machine Requirements

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Open Mobile Alliance

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Table 6: High-Level Functional Requirements – Confidentiality Items 13

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1. Scope (Informative)

This document contains use cases and requirements for the OMA DM Lightweight M2M enabler. It describes a set of functional requirements for M2M service enablement between the LWM2M Server and the LWM2M Client and the device management from the LWM2M Server to the LWM2M Clients.

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2. References

2.1 Normative References

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt

2.2 Informative References

[OMADICT] "Dictionary for OMA Specifications", Open Mobile Alliance™, OMA-ORG-Dictionary-V2_9, URL:http://www.openmobilealliance.org/

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Appendix B. Use Cases (Informative)

B.1 Streetlight Control

B.1.1 Short Description

John is a streetlights supervisor – responsible to manage streetlights system at his home town. There are thousands of streetlights in the city and he expects to have low-cost M2M sensors embedded in these streetlights. He needs a capability to remotely turn on/off a specific streetlight or a group of streetlights. He needs a capability to know the control status of each streetlight. He needs a capability to make sure that remote instructions sent to these streetlights are only accepted from authorized users (such as himself).

The following figure shows a typical construct of street light control system.

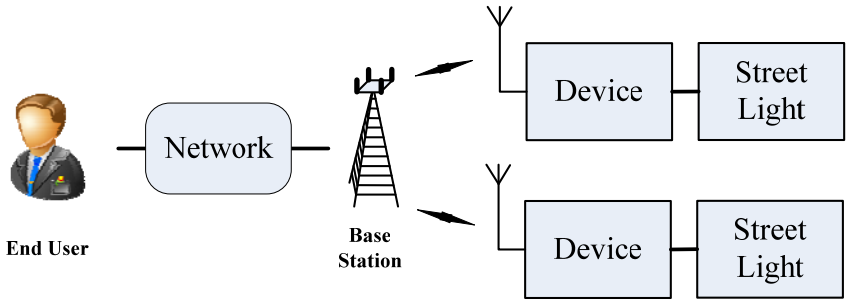

Figure 1: The Streetlight Control System

B.1.2 Market benefits

The market already has millions of streetlights deployed. This streetlight control system will help to save energy.

B.2 Air Conditioning Control

B.2.1 Short description

Ted is a HVAC supervisor – responsible to manage air-conditioning systems at his multi-story corporate office. There are multiple air-conditioning systems in his office for full HVAC support. He expects to have low-cost M2M sensors embedded in these HVAC systems. He needs a capability to remotely turn on/off a specific air conditioning system or a group of systems. He needs a capability to specify the air-conditioning system to provide its metering data. He needs a capability to configure the temperature threshold for turning on/off the air-conditioning systems.

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The following Figure 2 shows the infrastructure of a HVAC M2M system.

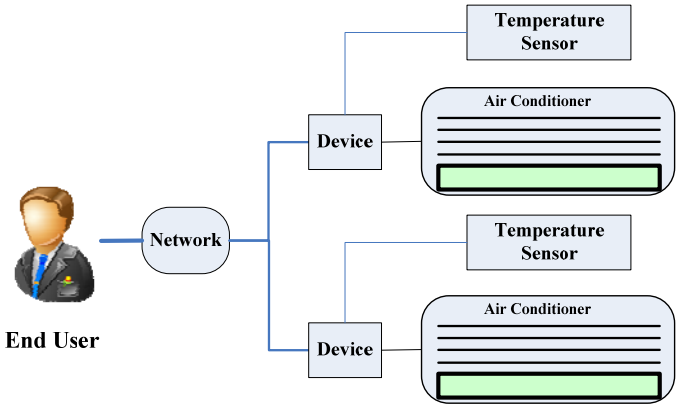

Figure 2: The Infrastructure of Air Conditioning M2M System

B.2.2 Market Benefits

There already have millions of air conditioners deployed at offices. These air conditioners are now operated directly by human. If the low cost LWM2M Device is embedded into the air conditioner, the air conditioner can be controlled /configured remotely. This will absolutely help people to save energy.

B.3 Usecase for Terminology Explanation

B.3.1 Short description

AcmeAssetMgmt is a company that provides mobile asset management service for cars using NetOperator's wireless network. AcmeAssetMgmt embeds the LWM2M Device in Peter's car. The LWM2M Client in the LWM2M Device has the capability to provide M2M services (e.g., navigation, location, remote alarm report, shut engine, etc.).

In case #1, Peter has subscribed mobile services with NetOperator for the LWM2M Device. The LWM2M Client in the LWM2M Device in Peter's car is able to access NetOperator's wireless network and exchange messages with AcmeAssetMgmt's LWM2M Server. In case Peter's car is stolen, Peter can use his smart phone to interact with AcmeAssetMgmt's LWM2M Server to find its current location and remotely shut down its engine. LWM2M Server will also inform his smart phone of any alarm(s) received from Peter's car. In the above case, AcmeAssetMgmt is a M2M Service Provider, NetOperator is a Network Provider, and Peter is M2M User. Peter has a M2M service subscription with AcmeAssetMgmt, so Peter is a M2M Service Subscriber. Peter has a subscription with NetOperator, so Peter is a M2M Network Subscriber.

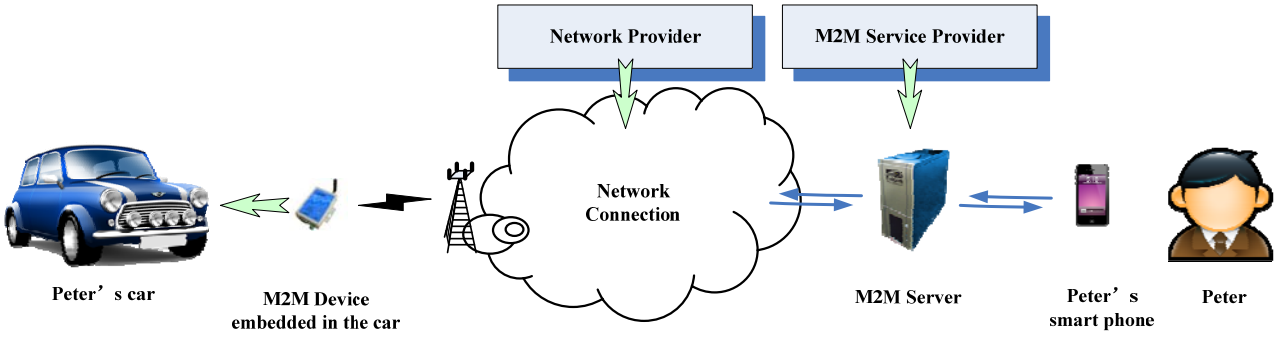

Figure 3: The Concept of a M2M service system

In case #2, Peter uses a smart phone as a router to provide network connection for the LWM2M Client in the LWM2M Device. Peter already has a network service subscription with a Network Provider for his smart phone. When the smart phone

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leaves the car or Peter shuts it down, the LWM2M Client in the LWM2M Device lost the network connection. In this case, Peter plays the role of M2M Service Subscriber and M2M User. But there is no existing M2M Network Subscriber.

In case #3, AcmeAssetMgmt decides to have a subscription with NetOperator directly. Now, AcmeAssetMgmt plays the role of M2M Service Provider and M2M Network Subscriber at the same time. Peter is a M2M Service Subscriber and a M2M User, not a M2M Network Subscriber.

In case #4: Tom, Peter's friend, wants to borrow the car for weekend. Peter wishes that Tom can enjoy the M2M service during the weekend. So Peter registers Tom's information with AcmeAssetMgmt. After the registration, Tom can enjoy a similar service as for Peter. During that weekend, Peter unregisters his own information with AcmeAssetMgmt, because he doesn't want to control the car when Tom drives it. If this happens, Peter is a M2M Service Subscriber and he is not a M2M User any more.

In case #5: NetOperator provides a similar service as AcmeAssetMgmt. Peter terminates the contract with AcmeAssetMgmt and signs a new subscription with NetOperator in order to use the M2M service and the network service provided by NetOperator. NetOperator is M2M Service Provider and Network Provider at the same time.

B.4 Temporarily suspending the device connection

B.4.1 Short Description

Ben is a system administrator at the M2M Service Provider responsible for managing a large number of LWM2M Devices and multiple services. During a particularly high traffic peak, the system is at a risk of being brought down. Hence, he wishes to temporarily, for a certain period of time, prohibit a certain set of devices from connecting and hence be able to deal with the remaining ones running a service which is considered a higher priority. However, the affected devices are allowed and meant to proceed fulfilling their general function (e.g., data collection, asset control, etc.) during this outage. It is only their network connection that is temporarily affected.

In principle, this consists of the following steps:

- The LWM2M Client in the LWM2M Device attempts to download service data from a M2M Service Provider Server.
- However, the M2M Service Provider's M2M Server is under heavy utilization and hence Ben wants to temporarily disable its low priority services and LWM2M Devices supporting these services.
- In order to manage the utilization properly, the M2M Service Provider administrator (i.e., Ben) issues a command to the low-priority LWM2M Devices to basically suspend their reconnecting to the network over a certain period of time (e.g., 5min or 2 hours).

B.4.2 Market Benefits

The M2M Service Provider and Ben can manage and administer their overall system which includes all of their network infrastructure and LWM2M Devices efficiently and effectively without wasting network and LWM2M Device resources while being able to prioritise the services they support.

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