**oneM2M LPWA white paper**

**Working Title: Enabling New and Profitable IoT Revenue Streams**

**Target audience:**

* Communication service providers (CSPs).
* Equipment providers (?)

**Main subject areas:**

* Enterprise IoT
* Enabling CSPs to *“move up the value chain”* through deployment of the oneM2M service layer and 3GPP interworking. Relying on connectivity revenue
* oneM2M as a response to CSP demands for a ‘lightweight’ IoT operating system, akin to Android and iOS in the smartphone world, which reduces signalling inefficiencies. *In turn, this makes it more likely CSPs can realise profitable revenue*

**Exec summary:**

* Background: IoT market is nascent, but 3GPP-backed LPWA standards becoming commercially available – NB-IoT (Cat-NB1) in Europe and LTE-M (Cat-M1) in the US.
* Connectivity revenue only scratches surface of addressable IoT market for CSPs. (Recent Analysys Mason report put it at 14%.)
* CSPs recognise importance of “moving up the value chain” beyond connectivity. *It’s a business imperative, not a nice-to-have.* Deutsche Telekom in Germany, for example, recently launched two NB-IoT products for SMEs. One ‘plain vanilla’ connectivity, another (more expensive) value-added product with some cloud services (from DT’s own Cloud of Things ps platform) bundled in.
* Summary of oneM2M interworking offering in 3GPP LPWA context: ie making IoT-related features & services available to app developers, incorporated in 3GPP Releases, through easy-to-use APIs.
* Summary of key examples, illustrated in main text of WP, of practical use cases and ‘richer’ apps that can be built from certain 3GPP features
* Flag demands/desires from CSPs for a lightweight and ‘common’ IoT OS, quoting from Standards Module Feasibility Study, and outline ‘IoT signalling challenge’.

*Questions/clarifications (input from Andreas)*

* *=> first implementations need diameter, interworking via 3GPP SCEF API with oneM2M is much more desirable for a wider market also for makers….?*
* *What are the main WP messages for equipment providers? => Certification! Market scale!, common IoT platform like operating system (Andorid for IoT). => There was a GSMA WP proposing a light weight Operating System.*

**oneM2M interworking with NB-IoT, LTE-M, EC-GSM-IoT**

* Brief description of key performance network characteristics of the three 3GPP-backed standards (perhaps in table format) and some details of early CSP rollout. Recognise that LTE-M picking up momentum in USA (AT&T and Verizon), while Europe (primarily via Vodafone and Deutsche Telekom) arguably more focused on NB-IoT.
* Highlight most important features available, or will be available, through oneM2M and Service Capability Exposure Function – perhaps reuse interworking figure/diagram in Patricia Martigne (Orange) presentation – and how they can add extra value to plain vanilla connectivity of the three variants.
* Features mentioned in our chat included: Non-IP data delivery, triggering, network status monitoring, but no doubt more to include. Any guidance you could give on the most important/promising would useful.

Questions/clarifications**:**

* *3GPP announced recent enhancements to LTE-M, NB-IoT, EC-GSM-IoT (March 2017) How far is oneM2M up-to-speed in interworking with them? What are the most eye-catching enhancements/features from oneM2M/CSPs point of view?*

**IoT revenue: beyond connectivity** (I’m assuming this is the core of the report)

In detailing some 3GPP interworking use cases, perhaps best split into enterprise IoT categories which CSPs seem particularly keen on, and elaborate on possible scenarios that might generate different revenue streams beyond connectivity? Examples of any current oneM2M implementations would be great. Some suggestions, but feel free to highlight others

*Industrial IoT/manufacturing:*

Possible areas to look at: Predictive maintenance (Interworking with OPC-UA => from factory 4.0 to Industry 4.0 since oneM2M and cellular bridges different factories, and verticals….

Process optimization
Warehouse/supply chain optimization
Remote asset maintenance and control
Product lifecycle monitoring
Integrated plant management
Product-as-a-service

*Energy/utilities*

Possible areas to look at: Smart meter
Smart grid
Asset management

*Retail*

Possible areas to look at: Predictive equipment maintenance
Smart transportation
Supply chain/inventory management
Beacons, location-based services
Payment processes

**The signalling challenge**

* Overview of potential overhead problem as devices, sending signalling data, proliferate
* Benefits of having the main principles of the GSMA Connectivity Efficiency Guideline embedded into the oneM2M service layer. One less thing for CSPs (and app developers?) to worry about.

**Interworking with devices attached to non-3GPP networks**

* Andreas and Catalina raised the excellent point that oneM2M enables, in principle, that CSPs could collect VAS revenue from devices not connected to 3GPP networks. This seems an interesting avenue to explore, and would be great to flesh out with some practical/possible examples.
* What can we say, if anything, regarding interworking with non-3GPP LPWA systems, such as LoRa, SigFox and Ingenu?

**SUGGESTED CASE STUDIES**

* A notable example of how one CSP generates value-added IoT revenue from oneM2M/3GPP interworking.
* An app developer’s point of view: what do they get out of 3GPP/oneM2M interworking? Would any oneM2M member have an app developer contact, or provide info on this?