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| logogreen | **ASIA-PACIFIC TELECOMMUNITY**  **The 15th Meeting of APT Wireless Group (AWG-15)**  27 – 30 August 2013, Bangkok, Thailand | **Document:**  **AWG15/OUT-21 (Rev.1)**  30 August 2013 |

**Working Group on Service and Applications**

**QUESTIONNAIRE ON EMBEDDED NARROW BAND M2M**

1. **Introduction**

The 15th AWG discussed the study of on embedded narrow band M2M and has decided to investigate detailed requirements and challenges have not been achieved by existing technologies or standards and information of potential solutions addressing the requirements and challenges, especially from the spectrum usage perspective, and to develop a report accordingly. Once the results of the survey are available AWG will undertake study on embedded narrow band M2M which also will contain the survey results. AWG will also summary on going standardization activity that is related with M2M such as 3GPP, ITU-T, and oneM2M, etc. All of APT members are invited to contribute in this questionnaire.

This questionnaire is only for consumer focused M2M services. Consumer focused M2M services are services that are usually provided in daily life such as meter reading/sensors in household, mail tracking and etc, where the features of low data rate, low cost, low power consumption and high network capacity are strongly required, compared with enterprise focused M2M services such as smart grid/video camera, which need high data rate and have no strict requirement for cost and power consumption. From the operator’s point of view, the following two requirements when deploying M2M service are probably demanded: 1) sites, spectrum & equipment sharing with current cellular network; 2) easy and quick to deployment are highly appreciated.

To utilize the spectrum efficiently while providing the M2M services is highly considered in the proposed study. There are four choices for spectrum sharing:

1. Stealing a small part of frequency resource from cellular for M2M. Taking LTE as an example, it is possible to steal two radio bearers from 10M LTE system to use for are M2M network.



1. Using guard band from cellular for M2M. Taking LTE as an example, guard band for 20M LTE system is 2M and it is also possible that part of this guard band is used for M2M network.



1. It is also possible that fragmentary spectrum beside cellular’s spectrum is used for M2M network as a dedicated carrier, which is a normal cellular spectrum and a small portion of unused spectrum belonging to the operator for M2M.



1. The spectrum for cellular is compressed so that the residual spectrum is used for M2M network as a dedicated carrier. Taking LTE as an example, 8M from 10M bandwidth is used for LTE and the left 2M is used for M2M as a dedicated carrier, which is a compressed cellular spectrum and a dedicated carrier for M2M.



To achieve the above spectrum sharing solution, narrow band is an inevitable choice.

1. **Institution/Company Information and Profile**

Name of the institution :

Name of contact person :

Email address :

1. **Questionnaire**
2. What typical M2M services are considered that cannot be supported very well with current cellular network? And what are requirements that are not satisfied by cellular network?

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| M2M services | Requirements that are not satisfied |
| *e.g. meter reading/sensor, mobile tracking, and etc.* | *e.g. coverage, cost, capacity, power consumption and etc.* |

1. How many dB(s) for coverage enhancement are considered to be enough for M2M services when compared with coverage of current cellular network?
   1. No enhancement  <please provide details here>
   2. With 10dB enhancement  <please provide details here>
   3. With 15dB enhancement  <please provide details here>
   4. With 20dB enhancement  <please provide details here>
2. Which is the acceptable manufacturing cost for M2M user equipment?
   1. <$1  <please provide details here>
   2. $1~$5  <please provide details here>
   3. $5~$10  <please provide details here>
   4. >$10  <please provide details here>
3. What is typical traffic interval for M2M services?
   1. 10 minutes  <please provide details here>
   2. 1 hour  <please provide details here>
   3. 1 day  <please provide details here>
   4. 1 month  <please provide details here>
4. Given the traffic model in Q4, what is typical requirement for M2M UE’s battery life time,
   1. One month  <please provide details here>
   2. One year  <please provide details here>
   3. Five years  <please provide details here>
   4. Ten years  <please provide details here>
5. How many UEs are expected within one M2M cell (macro)?
   1. < 5, 000  <please provide details here>
   2. 5,000 –10,000  <please provide details here>
   3. 10,000–50,000  <please provide details here>
   4. 50,000–100,000  <please provide details here>
   5. >100,000  <please provide details here>
6. Which is preferred to carry M2M network?
   1. Sharing spectrum with GSM  <please provide details here>
   2. Sharing spectrum with UMTS  <please provide details here>
   3. Sharing spectrum with LTE  <please provide details here>
   4. Separate spectrum  <please provide details here>
7. What kind of spectrum sharing method with cellular network is preferred as described in introduction part? What is your concern with spectrum sharing method (for example interference)?
8. What is requirement for security of M2M network?
   1. Higher than cellular network  <please provide details here>
   2. The same as cellular network  <please provide details here>
   3. Lower than cellular network  <please provide details here>
9. Which architecture is preferred for M2M network?
   1. Sharing core network with cellular network  <please provide details here>
   2. Separate core network  <please provide details here>
10. Which deployment type is preferred for M2M network?
    1. A M2M BBU (Base Band Unit) + a new RRU (Remote Radio Unit)

<please provide details here>

* 1. A M2M BBU + existing RRU with some software upgrades

<please provide details here>

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