Body of European Regulators
for Electronic Communications

BEREC

BEREC Report
“Enabling the Internet of Things”

Dr. Julia Marquier (BNetzA)

CEPT M2M Conference 21/22 March 2016

Mainz, Germany

Overview

I. Introduction
II. Summary of BEREC's considerations
III. Selected Topics of the BEREC IoT Report
    1. Numbering
    2. Regulatory Framework / Electronic Communication Service
    3. Roaming
    4. Switching
    5. Privacy
IV. Conclusion / Q&A

I. Introduction / Scope of the Report

- Focus on mobile connectivity:
  - NRAs have primarily been contacted by stakeholders on issues regarding mobile network based IoT solutions (e.g. numbering, roaming and switching).
  - However, only a minor fraction of M2M connections based on mobile technologies.
  - Hence, many IoT services exist or may be developed which are based on another kind of connectivity than mobile connectivity.
  - Any possible regulation with regard to mobile connectivity would only apply to a small subset of the market.

- No definition of IoT or M2M-communication for the purpose of the BEREC Report.

I. Introduction: Conditions for IoT/M2M to thrive

1. Sufficient resources in order to support the service – Section 2
   - Spectrum
   - Identifiers (numbers and IP addresses)

2. Legal framework fit for IoT/M2M – Section 3
   - Regulatory Framework / Electronic Communication Service
   - Roaming
   - Switching

3. Consumers' acceptance of M2M services – Sections 3.4 and 4
   - Privacy
   - Network and Data Security
   - Interoperability of services

II. Summary of BEREC's considerations

- No special treatment of IoT services and/or M2M communication appears necessary or appropriate, except for the following areas:
  - Roaming
  - Switching
  - Number portability

- Privacy: careful evolution – but not an entire overhaul – of the existing EU data protection rules.

- No need for a European numbering scheme

- This assessment does not preclude that within the DSM review further areas for amendments of the Regulatory Framework might be identified taking into account the peculiarities of IoT services and/or M2M communication.

III. Selected Topics of the BEREC IoT Report

1. Numbering
2. Regulatory Framework / Electronic Communication Service
3. Roaming
4. Switching
5. Privacy

III.1. Numbering (1)

- Numbering issues are primarily dealt with by CEPT and/or ITU on an international level.

- Main numbering issues for NRAs:
  - Scarcity/E.164 numbers: Analysis and solution at national level
  - Assignment of MNC to IoT users/E.212 numbers: Flexibility for national approaches
  - Extra-territorial use of numbers

III.1. Numbering (2)

- Global marketing of connected devices (which rely on numbers as identifiers)

  - Use of existing numbering resources seems to be a reasonable approach:
    - the extraterritorial use of national numbers and
    - the use of global ITU numbers

  - The following aspects appear to be key for IoT services to be economically viable:
    - Permissibility of extra-territorial use of national E. 164 and E.212 numbers (an internationally harmonised approach is desirable).
    - Actual possibility to develop IoT solutions based on global ITU resources (development: increased assignment of ITU resources + roaming “footprint” based on ITU resources)

III.1. Numbering (3)

Review process:

- No need for a European numbering scheme
- Reasoning: From a cost-benefit perspective, BEREC believes that the introduction of a European numbering scheme does not seem to carry any significant benefits which would justify the deployment costs of setting up such a solution.

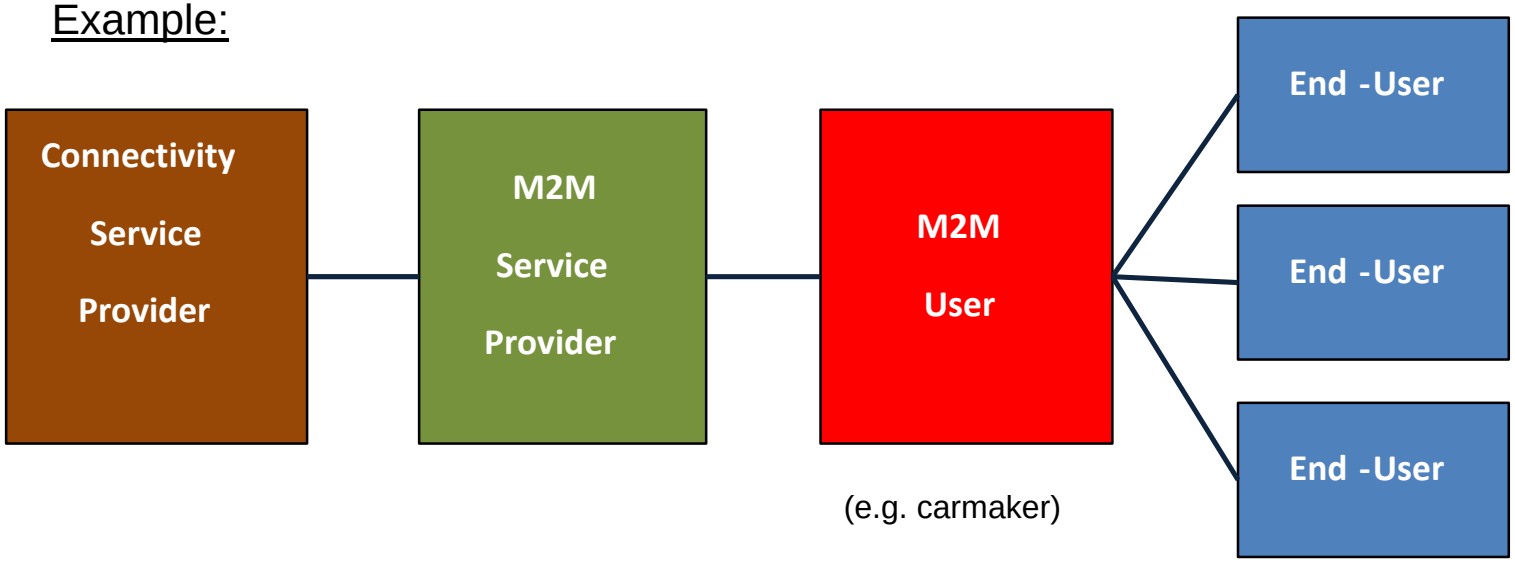
III.2. Regulatory Framework (1)

- Applicable framework (e.g. notification regime, telco-specific rules on consumer protection, data protection and network security) depends on finding of an electronic communication service (ECS).

- Art. 2 lit. c Framework Directive: an ECS is *"a service normally provided for remuneration which consists* ***wholly or mainly*** *in the conveyance of signals on electronic communications networks, […]"*.

III.2. Regulatory Framework (2) – IoT value chain

Example:



- Connectivity service provider = ECS
  (who provides connectivity for remuneration over a public network)
- IoT/M2M-user = typically no ECS, unless reseller
- However, careful case-by-case approach necessary, since there are so many different types of packages including connectivity and since business models are just beginning to evolve.

III.3. Roaming (1)

- Many M2M services, which use mobile connectivity, are currently based on permanent roaming.

- Permanent roaming might facilitate the creation of a global M2M market.

- Applicability of Roaming Regulation to IoT/M2M?
  - Access right to wholesale roaming?/ Price caps?
  - In general, a case-by-case evaluation taking account of standard scenarios should be envisaged.
  - See also new BEREC Guidelines on Roaming - BoR 16 (34), para. 83, 84.
  - Amendments introduced by TSM Regulation in 2015 (“periodic travel” vs. “permanent roaming”).

III.3. Roaming (2)

- Typical IoT roaming scenarios

  - **Scenario 1:** The connected device is travelling periodically (e.g. a car used for a leisure trip) – Roaming Regulation is applicable.

  - **Scenario 2:** The connected device is used most of the time on the basis of permanent roaming, but the object is moving either within one country or across borders (e.g. a car which is sold abroad). – Less clear whether Roaming Regulation applicable.

  - **Scenario 3:** The connected device is static (e.g. smart meter, sensors) is used on the basis of permanent roaming but is not travelling at all, often with a long period of usage. - BEREC believes that it should not be considered in the scope of the Roaming Regulation (i.e. no access right to wholesale roaming, while agreements concerning permanent roaming could still be commercially negotiated).

- Review process should take into account the particularities of IoT communications.

III.4. Switching (1) / “Lock-in” issue

- If a customer intends to change connectivity service provider, it is currently necessary that the SIM is replaced physically.

- In the IoT-context, the costs of doing so might prevent switching the connectivity service provider (“lock-in”).

- Possible solutions:
  - Own SIM for IoT/M2M-user (i.e. right to apply for own MNC/IMSI range)
  - Over-the-air (OTA) provisioning of SIM is appealing under the condition that it is designed in an open, transparent and non-discriminatory manner.

III.4. Switching (2) / “Lock-in” issue

- NRAs could have good reasons to consider
  - introducing more flexibility in MNC assignment and
  - also to become active in the OTA provisioning of if connectivity service providers do not introduce it themselves in a timely manner.

- Overall, BEREC sees the need for flexible solutions at national level.

<u>Review Process:</u>

- If OTA provisioning does not enable switching between connectivity service providers within a reasonable time period, it might be considered to adopt
  - a statutory obligation to introduce OTA provisioning at a certain point in time, or
  - at least regulatory mechanisms or incentives to foster OTA provisioning.

III.4. Switching (3) / Number Portability

Review process:

- A new approach might be appropriate in certain cases:
  - The nature of IoT services, which differs considerably from voice communications services and where in many instances a B2B or B2B2C business model is applied, has to be taken into account.
  - Number portability obligation might not be appropriate in case the E.164 number of the connected device is not known by the IoT user (and/or by the IoT end-user).
  - This usually happens when the device is not designed to send or receive any voice calls or SMS.

III.5. Privacy (1)

- Personal data may be collected by a number of connected devices.

- Current legal framework:
  - Privacy Directive (Directive 95/46/EC); and
  - ePrivacy Directive (Directive 2002/58/EC as amended by Directive 2009/136/EC);
  - No specific rules with regard to IoT/M2M.

- Revision of EU data protection framework under way, aim also to adapt privacy rules to digital era.

III.5. Privacy (2)

Review process:

- No need for special treatment with regard to principles:
  - Principles like consent-based data collection and processing also apply in IoT context.

- However, careful adaption to / evolution for the IoT-context:
  - User-friendly information and consent procedures (example: smart home area)

IV. Conclusion

- No special treatment of IoT services and/or M2M communication appears necessary, except for certain areas where a clarification and/or a new approach might be appropriate (roaming, switching, number portability).
- Privacy: careful evolution of the existing EU rules.
- No need for a European numbering scheme.

Q&A?

Thank you for your attention!

Backup:
Spectrum

- A range of technology options are likely to be used to deploy M2M services.
- Given the variation in maturity in the evolution of the M2M market across Member States, NRAs should monitor market developments and spectrum use.
- For the benefit of harmonization, industry is invited to make use of the established processes via ETSI and CEPT if it identifies the demand for additional spectrum.
- Based on these harmonized European Standards and frequencies, NRAs are invited, where appropriate, to make spectrum available to support these applications.

- Review process: No need for special treatment

Backup:
Network security

- National legislation of a Member State concerning network security does not specifically address IoT services.
- All obligations apply also to IoT services provided that they are considered ECS or to the ECS which is underlying any IoT service.
- Draft NIS-Directive (political compromise reached)
- BEREC acknowledges that the appropriate security level depending on the specific IoT service in the respective value chains should be applied by all the parties involved because the security measures are as effective as the weakest link.
- Review process: No special treatment required

Backup:
Standardisation

- Standards play a significant role in the development of M2M technologies as they define openness, interoperability and ultimately competitiveness in the M2M environment.
- Standardisation bodies are already addressing the issue of standardisation in the M2M environment in a significant manner.
- IoT industry is currently driven more by proprietary standards than by open standards.
- In an initial phase of development of the market, the adoption of proprietary standards might have a positive effect for the investments and R&D.
- It is necessary to monitor the market in particular to prevent any possible anti-competitive effects (such as the possible anti-competitive national fragmentation in the standardization process).
- Review process: No special treatment

Backup:
Questions to stakeholders (1)

1. How do you evaluate the three options mentioned in the Draft Report, section 2.2.1.4 (extra-territorial use of national E.164 and E.212 numbers, use of global ITU numbering resources, use of a European numbering scheme) for the provision of M2M services? Which of these solutions is preferable to address the need for global marketing of connected devices? Should these solutions be used complementarily?
2. How do you regard the market situation in the M2M sector with regard to permanent roaming and national roaming?
3. Which solution – OTA provisioning of SIM or MNC assignment to M2M users – do you think is preferable to facilitate switching between connectivity providers in the M2M sector? Which advantages, which disadvantages are attached to the two solutions?

Backup:
Questions to stakeholders (2)

4. Do you think there is a need to adapt Art. 13a of the Framework Directive to address security concerns in the M2M context? If so, which adaptations do you consider to be useful?
5. Do you think there is a need to adapt the Privacy Directive and ePrivacy Directive to address privacy concerns in the M2M context? If so, which adaptions? Do you think that the reform of the Privacy Directive as foreseen in the Council's General Approach of 15 June 2015 on the future General Data Protection Regulation goes in the right direction?
6. What is the impact of open and proprietary standards on the development of the M2M sector? What are the advantages and disadvantages of open and proprietary standards, taking in account that M2M services may be provided on private or public networks?