
AT&T Comments on BEREC’s Draft Report on Enabling the Internet of Things

6 November 2015

AT&T is pleased to provide the following comments on BEREC’s *Draft Report on Enabling the Internet of Things* (BoR (15) 141) (“the Draft Report”). AT&T, given its leadership in working with customers to develop mobile solutions, particularly in the machine-to-machine (M2M) and Internet of Things (IoT) space,¹ welcomes the opportunity to inform policies that will further stimulate the proliferation of diverse mobile solutions and innovation across the European Union.

AT&T welcomes BEREC’s initiative to assess the current M2M-IoT market to better understand its characteristics so as to create a supportive operating environment that facilitates IoT deployment. Indeed, policy that enables IoT competition, protects consumers and encourages regulatory and technological innovation requires careful fact-driven analysis. AT&T applauds BEREC for taking this next step in its work to promote the continued development of the IoT.

AT&T previously provided comments² to BEREC’s M2M Project Team in advance of our participation on 29 September 2014 in the Team’s interviews with stakeholders. As detailed in those comments, as well as in our responses below to the specific questions raised in the Draft Report, AT&T submits that the relatively nascent stage of IoT deployment coupled with its growth trajectory, as well as an overall technology transformation in terms of networking and service delivery, warrants a flexible policy approach that enables multiple solutions.

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Question 1: How do you evaluate the three options mentioned in 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?

AT&T believes that extra-territorial use of both national E.164 and E.212 numbers, and also use of global International Telecommunications Union (ITU) numbering resources, should be considered

¹ AT&T has a proven M2M/IoT success record, with more than 24 million connected devices almost 2,400 approved devices and industry analyst recognition for solution deployment experience and capability. For example, in Current Analysis’ latest global M2M product report on AT&T, principal analyst Kathryn Weldon again recognises AT&T as a “leader” in the global M2M services market and writes that AT&T has “excellent traction for its M2M initiatives” and “expertise in key verticals” (Current Analysis, “*AT&T - Global M2M Services and Strategies Product Assessment*,” June 2015). AT&T also collaborates with other U.S. industry leaders such as Cisco, GE, IBM, and Intel. In 2014, AT&T and these foremost M2M/IoT companies announced the Industrial Internet Consortium, now with more than 200 members, to help establish standards and accelerate M2M service growth.

² See http://www.attglobalpolicy.com/wp-content/uploads/2014/06/ATT-Comments_BEREC-M2M-Project-Team-19-June-2014.pdf

complementary options for the provision of M2M services. Although neither model should be mandated, promoted, imposed or prevented by regulation, AT&T notes that the use of national numbers through existing commercial and technical roaming agreements is already a proven and efficient approach to providing global M2M services. Furthermore, AT&T does not see any compelling case for the introduction of an EU M2M numbering scheme as a third option. We outline in further detail below AT&T's position on each of the three options.

Extra-territorial Use of National Numbers

AT&T believes that to facilitate the growth and development of M2M services, and also to dampen unnecessary demand for Mobile Network Code (MNC) resources,³ national numbering plans should explicitly allow the extra-territorial use of numbering resources. Such extra-territorial use of numbering resources for M2M services should work in both directions—that is, national regulators should allow use of their numbers outside their national territories, as well as allowing the use of foreign numbering within their national territories.

Fundamental to any analysis relative to M2M communications and the IoT is that the business models supporting this technology are substantially different from those of more traditional mobile communications. Significant benefits arise from the use of a single numbering solution with M2M. M2M business models require delivery of services on a globally consistent manner, including being able to operationalise centralised manufacturing and plant resources, and establishing common management systems for consistent policy controls (*e.g.*, ordering, provisioning, customer care, cyber security, billing and reporting). As noted in more detail in our answer to Question 2 below, the international M2M roaming framework is an existing, well-defined and well-established commercial model that provides a practical basis for accommodating and facilitating the extra-territorial use of numbers on a bilateral and transparent basis. By contrast, a fragmented distribution model, involving a separate SIM/International Mobile Subscriber Identity (IMSI) per country and integration with each national mobile network operator (MNO) “platform” would force M2M users (as defined in BEREC’s Draft Report) to:

- Have country-specific SIMs provisioned for each M2M/IoT device to be distributed in each country, thereby requiring manufactures to establish unique platforms with dozens or even hundreds of carriers;
- Manage the entire customer logistics chain with extreme precision on a per-country basis (*i.e.*, forecast demand, distribution, activation, support, repair), negatively impacting efficiency; and
- Have the capability to interface with and navigate a unique platform for each MNO with which it contracts in every country, costing several hundred thousand euros per platform.

³ Looking at the future demand for MNCs, BEREC should consider that allowing service providers to utilise foreign IMSIs in an extra-territorial matter within a given country could reduce the demand for national MNCs. Specifically, if extra-territorial use is not allowed, then multiple operators may apply for national MNCs that otherwise would have no technical need to do so.

AT&T commends, therefore, the recent policy conclusions of the Belgian regulator, BIPT, and the German regulator, BNetzA, that the extra-territorial use of national numbers for M2M services should be specifically allowed. In August 2015, BIPT published a summary⁴ of conclusions to its 2014 public consultation on the future of the Belgian numbering plan and confirmed its recommendation to formally introduce more flexibility in extra-territorial use of numbering resources.⁵ For M2M services in particular, BIPT calls for Belgium's Royal Numbering Decree to be amended to expressly authorise the permanent use of Belgian numbers abroad and of foreign numbering capacity in Belgium.⁶ Shortly thereafter BNetzA published draft regulations that, inter alia, explicitly permit the use of foreign IMSIs that are either permanently installed in a telecommunications network in Germany or are used in Germany by way of permanent roaming to provide M2M services.⁷ Both of these precedents reflect sound policy, and will promote M2M services in the countries. AT&T also notes that the U.S. Government has also confirmed⁸ that it places no conditions on the use in the United States of M2M devices containing SIM cards/IMSIs from other countries.

Use of Global ITU Numbering Resources

ITU-assigned numbering resources (from the E.212 shared 901 Mobile Country Code (MCC) and/or E.164 +882/+883 ranges) provide another potential numbering solution for M2M services that are to be deployed in multiple countries.⁹ However, as other global carriers assigned such resources have also noted,¹⁰ adopting ITU number resources can present a number of challenges. For example, implementing an E.212 shared MCC 901 MNC could require considerable time and expense because it

⁴ *Summary and further analysis answers to the consultation at the request of the BIPT Council of 25 November 2014 on reviewing the policy regarding the numbering plan management of 28 July 2015* ("BIPT Summary") at <http://www.bipt.be/en/operators/telecommunication/Numbering/regulation/summary-and-further-analysis-answers-to-the-consultation-at-the-request-of-the-bipt-council-of-25-november-2014-on-reviewing-the-policy-regarding-the-numbering-plan-management-of-28-july-2015> (French and Dutch)

⁵ BIPT's conclusions will need to be implemented via amendments to the Royal Numbering Decree.

⁶ Article 8 of the Royal Numbering Decree will be amended to include the following statement: "The use on a permanent basis of Belgian numbers abroad and vice versa of foreign numbering capacity in Belgium is authorized for M2M applications." ("L'utilisation sur une base permanente de la capacité de numérotation belge à l'étranger et vice versa de la capacité de numérotation étrangère en Belgique est autorisée pour les applications M2M.") BIPT Summary (French version) section 10 at page 35.

⁷ See

http://www.bundesnetzagentur.de/cln_1431/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Nummerierung/TechnischeNummern/IMSI/AnhoerungEntwurfIMSI.html?nn=268376 (German)

⁸ U.S. Response to Questions 8 and 9 of the recent CITEL (Comisión Interamericana de Telecomunicaciones) M2M Questionnaire refers (CCP.I-TIC/doc. 3622/15 dated 28 May 2015).

⁹ As BEREC notes at endnote 44 of the Draft Report, AT&T is among the global operators assigned such numbers by the ITU.

¹⁰ Orange presentation to CEPT/ECC Public Workshop on Extra-territorial Use of E.164 Numbers, Brussels, 27 January 2015 at slide 13 (available at: http://www.cept.org/Documents/wg-nan/22666/Presentation-3_Philippe-Fouquart-Orange); and Vodafone Contribution 141 to ITU-T Study Group 2 on Vodafone Group's M2M Strategy on E.212 & E.164 Shared Resources (Mar 2012) (available at <https://www.itu.int/md/T09-SG02-C-0141/en>)

would necessitate amending existing roaming agreements (potentially, in more than 200 countries and territories with around 700 operators) and testing new SIMs on each roaming partner's network. Further, if all carriers were required to replace their national numbering resource with ITU shared MCC 901 MNCs, then in addition to aggregate industry costs, there would be added delays because, as a practical matter, carriers can only manage a limited number of simultaneous code implementations.

Apart from concerns with cost and delay, the mandatory use of shared MCC 901 MNCs could reduce the number of carriers eligible to provide global M2M services by establishing higher barriers to entry and risk exhausting that number resource. First, there are higher burdens to obtain a 901 MNC. To illustrate, there are ongoing costs to obtain and maintain ITU sector membership (approximately €7,320-€29,280 annually), which may discourage small operators from participating. Moreover, an applicant to the ITU for a 901 code must demonstrate that its international network infrastructure will contain connecting physical nodes in two or more countries. Smaller operators, therefore, might not be able to satisfy the stringent criteria that the ITU requires for the assignment of the 901 MNC.

Second, number resource exhaustion is also a significant concern if several countries were to mandate the use of 901 because the pool of 901 MNCs is limited. Specifically, the ITU uses 2-digit MNCs, and with 41 codes already issued (ITU E.212 Database, October 21, 2015), at most only 58 codes remain available for assignment. By comparison, there exist around 700 mobile operators globally, in addition to a large number of commercial enterprises that could be interested in the codes necessary to support global M2M services. While some of these constraints could be rectified (*e.g.*, a new shared 90X MCC is being contemplated by ITU Study Group 2), changing the codes would take time and proper resolution would be uncertain.

For the reasons outlined above, AT&T asserts that it would be harmful to insist on ITU global numbering resources as the exclusive, or even preferred, numbering option for deploying global M2M services. Rather, M2M service providers should have the flexibility to select the numbering model that best suits their needs and those of their customers.

Use of a European Numbering Scheme

AT&T does not believe that there is any need to introduce an EU-level M2M numbering space option alongside the existing alternatives of using national numbers on an extra-territorial basis or using ITU global number resources. It is likely that the challenges identified above with implementing ITU numbers would be replicated with a new EU M2M numbering resource. If other regions of the world were to adopt a similar approach, the complexities and challenges would be multiplied several times over.

As Roberto Viola, Director General of DG Connect at the European Commission, recently identified in his thoughtful blog,¹¹ in which he floated the idea of a new European M2M numbering space, IPv6 addressing offers an eventual longer term solution to the requirement for identifiers for potentially

¹¹ See <http://ec.europa.eu/digital-agenda/en/blog/machine-machine-connectivity-digital-single-market>

billions of connected devices. However, with many consumer and industrial devices having product lifecycles of 10 to 20 years, traditional numbering resources, both E.212 and E.164 numbers, will continue to be necessary and relevant for M2M services decades to come.

Question 2: How do you regard the market situation in the M2M sector with regard to permanent roaming and national roaming?

An established and well-functioning international M2M roaming framework exists today that is based on transparent bilateral commercial relationships between mobile carriers. Under the M2M roaming framework—endorsed through MNOs’ adoption of the GSM Association’s (GSMA) M2M Roaming Principles—procedures are in place to transparently identify, measure and distinguish M2M roaming traffic from traditional handset or tablet roaming traffic.¹² This bilateral framework has enabled large and small manufacturers alike to develop and export devices around the world, and to scale their business without the upfront entry barrier of establishing a distinct platform for each country before selling a single device. This framework supports both permanent and temporary roaming scenarios and, in AT&T’s view, is currently the most efficient manner of delivering global M2M services. AT&T welcomes BEREC’s recognition¹³ that permanent roaming is presently being used for M2M under this framework and has the potential to contribute to the creation of a truly single EU market.

AT&T believes that it is vital that the evolving EU Roaming III Regulation¹⁴ and the anticipated guidance and implementing acts to facilitate the abolition of retail roaming charges in the EU by 15 June 2017 should not impede the functioning of this established global market to the detriment of the development of M2M services and the IoT in Europe. As BEREC notes, under the recently adopted amendments to the EU Roaming III Regulation via the new so-called Telecom Single Market (TSM) Regulation,¹⁵ EU operators may include conditions to prevent permanent roaming or anomalous or abusive use of wholesale roaming access for purposes other than provision of regulated roaming services. Notwithstanding that market protection, AT&T asserts that any potential concerns with regard to permanent roaming in conventional person-to-person mobile communications following the abolition of retail roaming charges in the EU (*e.g.*, potential arbitrage between lower and higher cost EU countries for mobile service) do not arise in the case of permanently roaming M2M devices. Nor do “bill shock” concerns that have instigated the regulation of retail roaming rates in the EU. As compared to both of the two previous concerns that have been cited in the context of traditional handsets, M2M business models typically have significantly lower Average Revenue Per Unit (ARPU) than traditional handset business and the amount of data used for a particular M2M business process is known and rated in

¹² Among other things, the GSMA M2M Roaming Principles ensure transparency in the provision of M2M services by requiring the parties to agree to identify their M2M traffic separately from other traffic and to exclude traditional wireless services (*e.g.*, conventional 2-way dialable PSTN voice).

¹³ “*Considering that M2M connectivity services might be a truly single European market, BEREC notes that permanent roaming is currently used for the provision of a number of M2M services and might facilitate the creation of such a market.*” Draft Report, Executive Summary at p. VI

¹⁴ EU Regulation No 531/2012

¹⁵ See http://europa.eu/rapid/press-release_IP-15-5927_en.htm

advance. Importantly, in the case of freely negotiated commercial contracts for M2M roaming, the visited network MNOs benefit from any M2M devices permanently roaming on their network. Therefore, before reaching any conclusion on whether the amended roaming framework should apply to M2M, the threshold policy question of actual consumer harm must be evaluated and the technological advancements and innovations that continue to define the M2M marketplace considered.

In view of the importance of roaming in the M2M context, AT&T agrees with BEREC that the “*rationale for roaming [regulation] underlying person-to-person communication relates to consumer protection arguments which do not apply to M2M communication*”¹⁶ and supports BEREC’s suggestion that there needs to be further clarification on the application of the revised EU Roaming Regulation to M2M permanent roaming:

*“Therefore, in order to ensure legal certainty to all players involved, further clarification in the Roaming Regulation and/or in a Commission Communication as to (i) the admissibility of permanent roaming in the M2M context as such and (ii) the application of the Roaming Regulation to permanent roaming in the M2M context might be helpful.”*¹⁷

AT&T believes that the outcome of such clarification should be that M2M services are excluded from the scope of the EU Roaming III Regulation. Indeed, as BEREC notes, the regulation is a consumer protection instrument applicable to “travelling in the Union”,¹⁸ and the recently agreed changes contained in the TSM Regulation specify that the aim is to give “end-users the confidence to stay connected when they travel within the Union.”¹⁹ By contrast, M2M services typically do not provide open-ended Internet connectivity or involve traditional any-to-any voice communications, but are closed user group applications where the M2M user (per BEREC’s definition) is likely to be an enterprise seeking to deploy a service on a global basis. Although AT&T does not believe the EU Roaming III Regulation should be applicable to M2M roaming, we fully support the clear principle established in the Regulation that roaming services can be sold separately from domestic mobile services and that there is no requirement for an alternative roaming provider to offer any domestic service as part of its roaming offer. This principle is equally applicable to M2M roaming services, even if it is ultimately clarified that the Regulation is not.

Finally, AT&T does not agree with BEREC’s characterisation²⁰ of the use of permanent roaming as a possible response to the absence of national roaming. Rather, permanent roaming reflects the global nature of many M2M business models and the need for an efficient and scalable global deployment platform. If mobile operators in a particular country are challenged in terms of providing coverage

¹⁶ Draft Report at 3.2.5, p. 20

¹⁷ Draft Report at 3.2.2, p. 19

¹⁸ EU Regulation 531/2012, Article 1(1)

¹⁹ TSM Regulation, Recital 1

²⁰ “*The use of permanent roaming might in some instances reflect the absence of national roaming.*” Draft Report at 3.2.3, p. 20

compared to operators using a global SIM approach for M2M services relying on permanent roaming, the solution should be to explore technical and commercial arrangements to overcome any perceived disadvantage, but not for the national regulator to impose arbitrary and distortive restrictions on the permanent roaming of global SIMs in that country.

Question 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?

AT&T believes that over-the-air (OTA) provisioning offers a preferable way to facilitate switching. The OTA capability has been evolving since the first release of the GSMA specification²¹ and, while further work is required to fully enable the functionality, the latest version 3.0 of the specification, which became available in October 2015, does allow full, interoperable OTA provisioning between different carriers. Moreover, OTA provisioning can be crucial because during the manufacturing process, it is often unknown which mobile operator will be supplying the wireless connectivity, particularly relative to M2M applications. OTA provisioning also accommodates changes to profiles of different MNOs over the life span of the product, enabling opportunities for greater choice by M2M manufacturers.

As for other options of direct assignment of MNCs to M2M users, such as utility companies or car manufacturers, AT&T agrees with BEREC on the various technical, security and operational questions that would need to be addressed, including what infrastructure requirements would apply to the M2M user, how would switching operate and with what risks, and what would be the impact on MNC resources.²² AT&T further notes that, in order to ensure equitable treatment of all market players, if MNCs were to be assigned to M2M users, they should be subject to similar numbering obligations as those applicable to the assignment and use of such numbers by MNOs and Mobile Virtual Network Operators (MVNOs). This would effectively mean that the M2M user would need to become a provider of electronic communications services (ECS) or electronic communications networks (ECN).

Relative to number portability, AT&T agrees with BEREC that this “might not be an issue for M2M users and/or end-users who do not need to communicate, or even be aware of a possible phone number associated to their M2M devices.”²³ In the M2M context, the M2M device makers or the M2M service providers typically contract with the MNO; the MNO does not typically contract with the consumer/end-user. The MNO usually allocates a block of IMSIs to each M2M service provider who provisions the number in the device. The end-user is likely not able to change wireless connectivity providers as they do not have a relationship with that provider and will likely have neither knowledge of or interest in which MNO is providing the connectivity. If the M2M service provider changes MNO, the expectation is that the E.164 number would be changed along with the E.212 number assigned. Porting would not be

²¹ See <http://www.gsma.com/connectedliving/wp-content/uploads/2014/10/SGP-11-Remote-Provisioning-Architecture-for-Embedded-UICC-Test-Specification.pdf>

²² Draft Report at 3.3.1, p.22

²³ Draft Report at 3.3, p.22

required because the new MNO serving the M2M service providers would provide a new IMSI and a new mobile telephone number. Therefore, as a starting presumption, number portability obligations should not apply to M2M devices.

Question 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?

AT&T agrees with BEREC that secure and reliable communications for connected M2M devices are essential to building trust and confidence in innovative M2M services. AT&T does not believe, however, that there is any requirement for special treatment of M2M services in the context of the Framework Directive's existing network security obligations on providers of publicly available networks and services. Ensuring security in the M2M context depends on cooperation across all players in the M2M ecosystem, many of which, as BEREC recognises,²⁴ are not providers of ECS. It would be disproportionate to impose additional security obligations on just one part of the ecosystem, especially when there is strong ongoing industry cooperation, as evidenced by a wide variety of standards bodies working on security specifications for M2M (e.g., by the "oneM2M" initiative referenced by BEREC, and by 3GPP, GSMA and the ITU, among others).

Question 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 adaptations? 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?

AT&T agrees with BEREC's conclusion that there is no need to deviate from the basic principles of data protection law in the M2M context and no need for special treatment of M2M services. Existing data protection laws can effectively apply. AT&T further believes that a stand-alone privacy directive specifically addressing electronic communications is not necessary. In the case of M2M services, where some players in the ecosystem fall within the requirements of the e-Privacy Directive (2002/58/EC) and others do not, the result is potential market distortion, as well as confusion for providers and end-users as to which rules are applicable to particular elements of a service.

AT&T therefore supports the proposal that the relevant provisions of the e-Privacy Directive should be integrated into the forthcoming General Data Protection Regulation. A single legislative instrument covering all aspects of the ecosystem would provide greater clarity and certainty to all stakeholders, notably providers and end-users, as to applicable requirements (e.g., regarding data breaches) and privacy standards, regardless of technology, sector or geography.

²⁴ "[T]he M2M user (e.g., car manufacturer, provider of energy including smart meter) typically does not seem to provide an ECS." Draft Report, Executive Summary at p.V

Question 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?

AT&T shares BEREC's view that common, interoperable technical standards are crucial to achieving significant economies of scale in the provision of M2M services, which have particular requirements with regard to power consumption and data throughput. Indeed, AT&T is actively supporting the development of interoperable specifications across the M2M industry, including in many of the initiatives highlighted by BEREC. The GSMA's work on the embedded SIM specification for OTA provisioning testifies to industry's strong collaboration towards globally interoperable service standards to reduce deployment costs and complexity and to deliver the optimal customer experience. AT&T believes that European regulators should welcome and endorse such efforts, recognising that M2M opportunities are global in nature and therefore international interoperability should be the ambition. Given the progress that IoT market players are already achieving concerning the desired outcomes in this area, AT&T does not see the need for regulatory intervention.

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AT&T commends BEREC for engaging stakeholders to inform regulatory policy that fosters IoT deployment. The IoT is central to the digital transformation currently underway in Europe. Indeed, BEREC chair Fatima Barros emphasised the importance of the IoT for the EU economy and expressed "regulators' concerns for finding solutions instead of building obstacles . . . to adopt the most efficient, proportionate and least intrusive regulatory approach."²⁵ AT&T absolutely agrees and suggests that explicitly approving well-established market practices—particularly as regards the extra-territorial use of numbers and permanent roaming—will advance the delivery of the IoT to the benefit of European consumers and businesses. We would be pleased to answer any questions concerning these comments.

Respectfully submitted,



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²⁵ See http://www.berec.europa.eu/eng/news_and_publications/whats_new/3052-berec-chair-fatima-barros-emphasizes-the-importance-of-internet-of-things-for-the-eu-economy