



## M2M Case Study | Germany Promotes the IoT with Progressive IMSI Rules

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### Preparing for the Fourth Industrial Revolution

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The industrial revolution of the 18<sup>th</sup> century mechanized processes through steam and water power, and changed the course of history. Today, after the two subsequent industrial revolutions of electrical power and of information technology, the fusion of cyber and physical systems are set to deliver the “Fourth Industrial Revolution.”<sup>1</sup> Powered by the “Internet of Things” (IoT) and machine-to-machine (M2M) communications, the Fourth Industrial Revolution will radically transform the way we live, work and play. Many governments are preparing for these transformative opportunities. In fact, the German government, working with private industry and other stakeholders, has already launched a comprehensive effort called “Industrie 4.0” to promote the deployment of the IoT and M2M services to advance Germany’s technological leadership.<sup>2</sup> Notably, Germany acknowledges the need for a globally-integrated market for the vision of Industrie 4.0. Indeed, the success of the Fourth Industrial Revolution depends on interoperable polices that facilitate *global* connectivity.

### BNetzA Adopts IMSI Rules to Promote the IoT, Support the Fourth Industrial Revolution

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Regulators around the globe are assessing existing regulations that had been developed with earlier technologies in mind, to establish rules that will enable innovation and sustainable competition to support the IoT and the Fourth Industrial Revolution. For example, the German regulator Bundesnetzagentur (BNetzA)—recognizing the growth potential of connected (or “smart”) applications, as well as the global market for which these products and services are intended—completed an almost 2-year proceeding that reviewed the numbering rules that relate to International Mobile Subscriber Identification (“IMSI”) codes.<sup>3</sup> After thoughtful consideration of extensive industry input and review of the factual merits and policy

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<sup>1</sup> Klaus Schwab, *The Fourth Industrial Revolution: what it means, how to respond* (16 January 2016): “The First Industrial Revolution used water and steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now a Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.” See <http://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond>

<sup>2</sup> Industrie 4.0 is part of the German government’s High-Tech Strategy Action Plan 2020, which seeks to establish Germany as a lead provider and market for cyber-physical systems and advanced manufacturing solutions. See <http://www.gtai.de/GTAI/Content/EN/Invest/SharedDocs/Downloads/GTAI/Brochures/Industries/industrie4.0-smart-manufacturing-for-the-future-en.pdf?v=7>

<sup>3</sup> IMSIs are unique identification numbers that allow for device recognition and network routing. The IMSI consists of a mobile country code (MCC), to identify the country; a mobile network operator code (MNC), to identify a specific network within that country; and a Mobile Subscriber Identity Number (MSIN), which identifies a specific customer within the mobile network operator’s customer base.

objectives, BNetzA issued new IMSI rules that adopt three important and forward-looking policy precedents: (1) the extra-territorial use of IMSI codes for M2M applications, (2) not imposing a separate and specific notification requirement for the extra-territorial use of IMSIs for M2M applications, and (3) the ability of a Mobile Virtual Network Operator (“MVNO”) to directly apply for IMSI codes.

#### Support for Extra-Territorial Use of IMSIs

First, BNetzA’s new rules allow foreign IMSIs (i.e., IMSIs with non-German country codes) to be used in Germany, as well as for IMSIs with a German country code to be used outside of Germany.<sup>4</sup> In other words, BNetzA permits the extra-territorial use of IMSI codes. BNetzA notes that allowing the use of non-German IMSIs (and vice-versa), whether permanently embedded in devices or used through permanent roaming (“IoT roaming”),<sup>5</sup> will facilitate the deployment of IoT and M2M services not only in Germany but globally. Notably, the regulator acknowledges that “terminal equipment required for the [M2M] applications is usually produced for the world market.”<sup>6</sup>

#### No Notification Requirement

In a corollary determination, and another important precedent, BNetzA does not require a separate and specific notification to be filed with the regulator for the extra-territorial use of IMSIs for M2M applications. Reconsidering its earlier thinking,<sup>7</sup> BNetzA said that based on industry feedback, such a notification requirement would be too complex and could have a deterrent effect, and therefore would thwart innovation in the area of IoT and M2M services. In its final analysis, BNetzA determined that a streamlined approach to the extra-territorial use of IMSIs would best facilitate Germany’s growth objectives for M2M communications.

#### Liberalization of IMSI Application Eligibility

Finally, this decision includes crucial visionary policy. Germany now allows an MVNO—or a mobile service provider that does not own the wireless network over which it provides services—to apply directly for IMSI codes. Previously, only mobile network operators (“MNOs”) were entitled to obtain German IMSI codes from BNetzA. This change could promote competition in the German mobile market and encourage more differentiated product offerings. Moreover, in defining an eligible MVNO (i.e., an MVNO having required network elements), BNetzA stipulates that the requisite network infrastructure elements may be wholly or partially replaced by corresponding software if the software provides the same functionality as

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<sup>4</sup> “Bundesnetzagentur Promotes Machine-to-Machine Communications Using Public Networks” [Press Release], 15 June 2016, available at [http://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/PressSection/PressReleases/2016/150615\\_IMSI.pdf;jsessionid=E5F0B1C360DA35FF0DF081B2EEC75059?\\_blob=publicationFile&v=2](http://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/PressSection/PressReleases/2016/150615_IMSI.pdf;jsessionid=E5F0B1C360DA35FF0DF081B2EEC75059?_blob=publicationFile&v=2) (“15 June 2016 Press Release”)

<sup>5</sup> According to BNetzA, the use of a German IMSI while travelling (temporary roaming) does not constitute extra-territorial use. See [http://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/Areas/Telecommunications/NumberManagement/TechnicalNumbers/IMSI\\_Extra-territorial.pdf?\\_blob=publicationFile&v=1](http://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/Areas/Telecommunications/NumberManagement/TechnicalNumbers/IMSI_Extra-territorial.pdf?_blob=publicationFile&v=1) at 2.2.

<sup>6</sup> See 15 June 2016 Press Release

<sup>7</sup> BNetzA initially considered a notification requirement in the context of public safety, capacity planning relative to number management and clarity into the use of German IMSI numbers used abroad but determined that none of these objectives superseded the need for a streamlined approach to the extra-territorial use of IMSIs for M2M applications. See [http://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen\\_Institutionen/Nummerierung/TechnischeNummern/IMSI/IMSI\\_Auswertung\\_Teil2.pdf?\\_blob=publicationFile&v=2](http://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Nummerierung/TechnischeNummern/IMSI/IMSI_Auswertung_Teil2.pdf?_blob=publicationFile&v=2) at 1.1.3 (German).

the corresponding network infrastructure elements.<sup>8</sup> Significantly, this determination reflects the current industry transformation toward next-generation networks defined by software and virtualization.<sup>9</sup> Therefore, the IMSI decision not only encourages greater competition but recognizes, and accommodates, the technological progression underpinning the IoT.

This IMSI decision, with its forward-looking policy precedents, promotes growth in the crucial IoT and M2M market, and reduces administrative burden and production costs. BNetzA's decision also considers not only the future of the IoT, but the very evolution of communications networks toward software-centric infrastructure and service delivery. BNetzA understands that enabling agility in the telecom industry will deliver more innovation and better services for consumers and businesses alike. At this critical time in the convergence of technologies, and transformation of communications networks, flexible regulatory practices have never been more critical.

Although at an early stage of development, IoT and M2M communications will fuel the Fourth Industrial Revolution and provide substantial opportunities to improve efficiency, productivity and social welfare in diverse areas. Germany's BNetzA has shown foresight and decisive action to support the global deployment of IoT and M2M applications with its new IMSI rules. Indeed, as BNetzA President Jochen Homann says, "the new rules are intended to provide a stimulus for growth."<sup>10</sup> Several recommendations from different regulatory and policy authorities in other countries have been introduced in support of the extra-territorial use of numbers for M2M applications. BNetzA in Germany, however, is one of the first to formally establish *rules* that expressly allow the extra-territorial use of numbers worldwide.<sup>11</sup> With these new rules, BNetzA is reinforcing Germany's technological leadership and facilitating the cross-border deployment of the IoT and ultimately the Fourth Industrial Revolution.

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<sup>8</sup> See

[http://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/Areas/Telecommunications/NumberManagement/TechnicalNumbers/IMSI\\_NP.pdf?\\_\\_blob=publicationFile&v=1](http://www.bundesnetzagentur.de/SharedDocs/Downloads/EN/BNetzA/Areas/Telecommunications/NumberManagement/TechnicalNumbers/IMSI_NP.pdf?__blob=publicationFile&v=1) at 4.2.1(a).

<sup>9</sup> Software-defined networking (SDN) and network function virtualization (NFV) are industry-standard technologies that enable the deployment and management of network functionality via software instead of through complex, vendor-specific hardware. According to global provider of market intelligence, IDC, "SDN is indicative of a long-term value migration from hardware to software in the networking industry" and predicts the SDN market "will have a compound annual growth rate (CAGR) of 53.9% from 2014 to 2020." See <https://www.idc.com/getdoc.jsp?containerId=prUS41005016>

<sup>10</sup> See 15 June 2016 Press Release

<sup>11</sup> "Since hardly any rules are as yet in place for the extra-territorial use of IMSIs worldwide, our national rules explicitly allowing this have given us a leading role internationally." 15 June 2016 Press Release