



ECC Report 194

Extra-Territorial Use of E.164 Numbers

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0 EXECUTIVE SUMMARY

This ECC Report studies the impact of the extra-territorial use of E.164 numbers, which is defined as follows:

“Use of E.164 numbers of one country in another country on a permanent basis”

In the beginning a general description of extra-territorial use is provided followed by some practical examples.

The Report discusses the relevant standards (ITU-T Recommendations) and legal frameworks (EU Directives) and concludes that the extra-territorial use of E.164 numbers does not seem to be intended by the ITU-T. Furthermore possible restrictions or assignment conditions regarding the extra-territorial use of numbers seems to be possible with regards to the relevant provisions of the EU Directives.

In Chapter 6 a detailed problem analysis is given including the applicable legislation and enforceability, competition, lawful interception and end-user issues. This is followed by an overview of the advantages and disadvantages from the respective points of view of users, operators and numbering plan administrators.

Finally, the Report analyses the different policy option for regulators and concludes as follows:

As a general rule the extra-territorial use of E.164 numbers should not be allowed because the negative effects listed in this Report outweigh the perceived benefits.

As a consequence:

- A country should refuse the assignment of E.164 numbers belonging to its numbering plan to be used outside of its territory on a permanent basis.
- A country should not allow the use of E.164 numbers belonging to another country's numbering plan in its territory on a permanent basis.
- Extra-territorial use of numbers should only be permitted in exceptional cases which have been defined by an ECC Decision. Possible candidates are some nomadic voice services and some M2M services.

As an exception from the general rule, for very small countries or territories¹, the extra-territorial use of numbers can be beneficial for the citizens of the involved countries and can therefore be made possible through bilateral agreements between these countries.

¹ Examples include the use of numbers from the national numbering plan of Italy in the Republic of San Marino and the State of the Vatican City and other similar arrangements between the UK and the Isle of Man.

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LIST OF ABBREVIATIONS

Abbreviation	Explanation
CC	Country Code
CEPT	European Conference of Postal and Telecommunications Administrations
CLI	Calling Line Identification
EC	European Commission
ECC	Electronic Communications Committee
EU	European Union
HLR	Home Location Register
IC	Identification Code
IFS	International Freephone Service
IMSI	International Mobile Subscription Identity
ITU	International Telecommunication Union
M2M	Machine-to-Machine communications
MNC	Mobile Network Code
NDC	National Destination Code
NP	Number Portability
NRA	National Regulatory Authority
PSAP	Public Service Answering Point
SIM	Subscriber Identification Module
SMS	Short Message Service
USD	Universal Service Directive
VoIP	Voice over Internet Protocol

1 INTRODUCTION

Technical developments allow that E.164 numbers are increasingly used in a flexible way. For a long time it has been a common practice that users can use their mobile phones using their existing national mobile number in a foreign country via roaming arrangements. Also nomadic services like VoIP offer users a possibility to place and receive calls based on a telephone number which does not necessarily belong to the numbering plan of the visited country.

High end-user tariffs for international roaming encourage visitors who are staying outside their home country for a long period of time, to conclude a contract with an operator from the visited country, with E.164 numbers from that country. This implies that for such cases there are no incentives to keep the old E.164 number from a user's home country. Also until now, the nomadic characteristic of VoIP services is rather marginally used. This means that, to date, national numbers behind an E.164 country code are predominantly used to serve the national market, which is well in line with the structure of the international numbering plan (ITU-T Rec. E.164). Changes in the market put this principle under pressure.

Operators have approached some CEPT countries' regulators to request the use of telephone numbers from another country on a permanent basis in their territory. In this report this kind of use of numbers is called extra-territorial use of E.164 numbers. One example of this use is the so called M2M communication, where operators acting in several countries can reach cost efficiencies by different means due to using numbers from only one country's numbering plan.

It is expected that international retail tariffs in Europe will converge near to national tariffs and that roaming tariffs will decrease. This implies that, from a commercial point of view, there is less need to use numbers from the visited country in order to gain attractive tariffs. Users can keep their number if they move temporarily or permanently to other countries and that is a big advantage from their point of view. As extra-territorial use of numbers is not clearly addressed in national or international numbering regulations this may result in unclear legal situations and generate potential risks for market parties and public authorities. Such risks are related, for example, to national scarcity of numbers, applicable jurisdiction and the adherence to specific legal requirements. Due to the nature of the problem an international common approach is needed.

The analysis made in this report takes account of EU legislation and the intention is to ensure that the rights and obligations of consumers and other stakeholders, as set out in national and international legislation, are protected while policy proposals are made to support innovative services and technological evolutions.

This report makes a high-level assessment of the potential effects of extra-territorial use of E.164 numbers and forms the basis of future detailed policy development at national and international level.

2 DEFINITIONS

Term	Definition
Extra-territorial use of E.164 numbers	Use of one country's E.164 numbers in another country on a permanent basis. E.g. in the context of M2M communications: use of numbers from country A (e.g. France) in electricity meters in country B (e.g. Belgium).
Home network	A public communications network located within a country and used by the roaming provider for the provision of regulated retail roaming services to a roaming customer.
Roaming	The use of a mobile device by a roaming customer to make or receive international calls, to send or receive international SMS messages, or to use packet switched data communications, while in a country other than that in which the network of the provider is located, by means of arrangements between the home network operator and the visited network operator.
Roaming customer	A customer of a roaming provider of roaming services, by means of a terrestrial public mobile communications network situated in a country, whose contract or arrangement with that roaming provider permits roaming.
Visited network	A terrestrial public mobile communications network situated in a country other than that of the roaming customer's domestic provider that permits a roaming customer to make or receive calls, to send or receive SMS messages or to use packet switched data communications, by means of arrangements with the home network operator.

3 SCOPE

This ECC Report defines and describes extra-territorial use of E.164 numbers. It studies the use of E.164 numbers from national numbering plans outside of the national borders. Use of other kinds of numbers apart from E.164 numbers, such as national short codes or other identifiers (e.g. E.212 numbers) are outside the scope of this Report.

The Report gives examples and analyses the impacts of the given cases concerning the general requirements of the EU Directives, national legislation and the relevant ITU Recommendations. It also describes differences between extra-territorial use of E.164 numbers and international roaming.

This report has due regard and is without prejudice to agreements such as integrated numbering plans and dialling arrangements that have been put in place between different countries where it may not be feasible to operate an independent numbering plan or communications network. Examples include the use of numbers from the national numbering plan of Italy in the Republic of San Marino and the State of the Vatican City.

This report also notes that there are some countries or territories around the world that may be subject to territorial disputes and that may not have succeeded in obtaining full member status within the United Nations (UN). In the absence of full UN member status, such territories may have difficulty obtaining an E.164 country code. In order to provide communications services to its citizens, those territories need to enter into agreements to use numbers from the national numbering plans of other ITU member states. This report recognises the existence of these special arrangements but it does not provide commentary nor draw any conclusions on the status of those territories within the UN or the ITU.

The following chapters will discuss the national practices today and the consequences that will occur in legal frameworks (e.g. regarding applicable legislation, emergency call handling, and lawful interception) with extra-territorial use of numbers.

Moreover the Report determines the advantages and disadvantages for operators and regulators and gives an overview of national and/or harmonised regulatory options. The Report ends by drawing conclusions of possible actions by NRAs.

4 DESCRIPTION OF EXTRA-TERRITORIAL USE OF NUMBERS

4.1 EXTRA-TERRITORIAL USE OF E.164 NUMBERS

Extra-territorial use of E.164 numbers is in this Report defined as:

“Use of E.164 numbers of one country in another country on a permanent basis”

The permanent use of an E.164 number from a numbering plan has to be understood as the use of a number belonging to the national numbering plan of one country in another country for a long term period. E.164 numbers used by, e.g. travellers or people who work during a fixed short term period abroad, are not considered as permanent.

The above defined situation can be realised with or without roaming².

In a scenario without roaming a customer device can be connected to a switch located in another country. Internet based telecommunications services offer also the possibility that users can be connected and be called based on a telephone number which does not belong to the numbering plan of the country in which the user is located on a permanent basis.

In the case where roaming, normally providing for a temporary situation to host foreign mobile users in other networks other than the home network, is used to realise on a permanent basis the extra-territorial use of numbers, the home location register is located in another country where the user permanently resides.

If the extra-territorial use of numbers increases this will have a fundamental impact on how national numbering plans will be organized and managed.

² Note that if an operator in country B concludes a contract with a customer in country B with a telephone number from Country A, it can easily be argued that according to the Roaming Regulation of the European Parliament and the European Council, the operator in country B provides the home network, even if the HLR is located in country A and all signalling passes through A.

4.2 GENERIC CASE DESCRIPTION OF EXTRA-TERRITORIAL USE OF E.164 NUMBERS

Figure 1 aims to illustrate extra-territorial use of E.164 numbers.

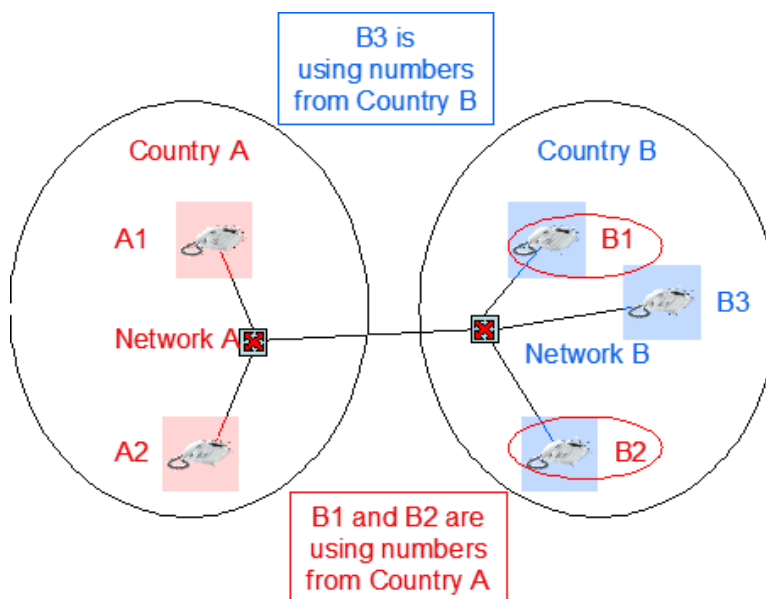


Figure 1: Example of extra-territorial use of numbers

In the example illustrated in Figure 1 there are two countries: Country A and Country B. Country A is using E.164 numbers under CC_A and Country B respectively numbers under CC_B assigned to them by the ITU-T. However, subscriber numbers B1 and B2 are assigned from Country A (extra-territorial use of numbers).

4.3 EXAMPLES RELATED TO EXTRA-TERRITORIAL USE OF E.164 NUMBERS

The examples given in this chapter are not exhaustive.

4.3.1 Roaming

Roaming is a situation where customers from country A using their mobile E.164 numbers in a foreign country B on a temporary basis. This example is not considered to be extra-territorial use of E.164 numbers.

4.3.2 Roaming with an Extra-Territorially Used E.164 Number

In this example, customers from country A are using their mobile E.164 numbers from the numbering plan of country B on a permanent basis via roaming in country C. This kind of usage is considered as extra-territorial usage of E.164 numbers.

4.3.3 Nomadic VoIP

In this example customers from country A using their E.164 numbers on a permanent basis via VoIP technology in country B. This is considered as extra-territorial use of E.164 numbers.

4.3.4 Large block of numbers being used in another country

This scenario arises when a number range from country A is hosted on a network in country B and high tariff services are offered to customers on these numbers in country B. Numbers have been used in this manner before in order to circumvent premium rate services regulation in country B. Customers are usually unaware that calls to these numbers do not terminate in country A but are “short stopped” in country B. For further details of this kind of use, please refer to ECC Report 86³. This is considered to be extra-territorial use of numbers.

4.3.5 “Virtual Presence” Services - Offshore Call Centres

Some companies outsource their call centre operations. For example, French companies may outsource operations to French-speaking African countries such as Algeria, Morocco and Tunisia. Customers dial a number from their own country, which is assigned to a company in that country, and calls are delivered by third party operators to an interconnection point (like any other numbers) to the local operator chosen by the company and the call is then forwarded to foreign call centres at the number assignee’s expense. This use is not considered to be extra-territorial use of E.164 numbers.

4.3.6 M2M

In this example a mobile operator in Country A facilitates the permanent use of numbers from a special M2M or mobile numbering range from Country A in energy meters or alarms in Country B. These devices connect to a mobile network in Country B of an operator which may be affiliated to the operator in Country A, and the traffic remains in country B, while the signalling goes via an HLR in the mobile network of operator A in Country A. This use is considered as extra-territorial usage of E.164 numbers.

4.3.7 Principalities, Territories and Islands

Several countries have integrated numbering plans or special dialling arrangements to facilitate communications with other countries. Examples include the use of numbers from the national numbering plan of Italy in the Republic of San Marino and the State of the Vatican City and other similar arrangements between the UK and the Isle of Man. This situation is regarded as extra-territorial usage of E.164 numbers but given the cost of network provision, the cost of regulation and the need for citizens to have communications services, these special arrangements are considered valid.

³ Consumer Abuses and Fraud Issues Relating To High Tariff Services
<http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP086.PDF>

5 STANDARDS AND LEGAL FRAMEWORKS

5.1 ITU-T RECOMMENDATIONS

The following ITU-T Recommendations are applicable for the assignment and use of E.164 numbers:

- E.164 The international public telecommunication numbering plan [1]
- E.164.1 Criteria and procedures for the reservation, assignment and reclamation of E.164 country codes and associated identification codes (ICs) [2]
- E.190 Principles and responsibilities for the management, assignment and reclamation of E Series international numbering resources [3]

The international E.164 numbering plan is segmented in five parts, namely:

1. country codes (CC) for geographic areas;
2. country codes for global services;
3. country codes for groups of countries;
4. country codes for networks; and
5. country codes for trials.

According to ITU-T Recommendation E.164 [1] the country code (CC) for geographic areas identifies a specific country, countries in an integrated numbering plan or a specific geographic area (E.164 / 4.1). The context of this Report deals with E.164 numbers under category of (country codes for) geographic areas.

The national (significant) number provides unique identification of one subscription irrespective of where the call is generated from within the country or geographical area characterized by a CC.

The subscriber number provides unique identification of one subscription irrespective of where the call is generated from within a local area identified by a national dialling code (NDC), where applicable. The subscriber number is a complete number and, therefore, cannot be separated.

A national Administration can determine whether or not the requested number can be implemented within its territory (E.164.1 / 4.1) [2].

International numbering resources exist for, and should be assigned to, serve the needs of the telecommunications community for the evolution of services, the introduction of geographic and non-geographic applications, and changes in the national boundaries (E.190 / 6.2.2) [3].

If extra-territorial use of E.164 numbers had been envisaged it would have made no sense to have geographical segments in the E.164 Recommendation. Furthermore, the section 7.1 “Country code for geographic areas” of E.164 Recommendations states as follows:

“The country code is used to select the destination country* (i.e., the country where the identified subscriber is registered or the country containing a point where the service is provided) and varies in length from 1 to 3 digits.

** NOTE: Whenever the term “country”, “destination country” or “originating country” is used in this clause, it identifies a specific country, a group of countries in an integrated numbering plan or a specific geographical area.”*

The international E.164 number includes the country code, which the ITU-TSB has assigned to a country (“destination country”). If this E.164 number is now used in another country, the clause “destination country” will not be the same “destination country” mentioned in the ITU-T Rec. E.164 section 7.1.

Even though it is not directly addressed, this implies that the spirit of these Recommendations may suggest that extra-territorial use of numbers is not intended.

5.2 EU DIRECTIVES

5.2.1 The Framework Directive

According to the EU Framework the only restrictions which can be attached to the rights of use of numbers are contained in Annex C of the Authorisation Directive. Under point 1, a condition can be made that numbers are designated only for national use.

Point 9 states that “Obligations under relevant international agreements relating to the use of numbers” may be included in the numbering assignment regulations. Applicable ITU-T Recommendations can be considered as a relevant international agreement in the context of Annex C of the Authorisation Directive.

Thus restrictions or assignment conditions regarding the extra-territorial use of numbers do not conflict with the EU rules on non-discriminatory access to numbers. Furthermore, there is (or there should always be) a national numbering alternative to be used instead of considering number ranges from another country (extra-territorial use of E.164 numbers).

5.2.2 Free Movement of Goods and Services

For the avoidance of doubt, a number is not a service in itself and numbers do not fall under the principle of free movements of goods and services in the European Union.

5.3 APPLICABLE LEGISLATION IN CASE OF EXTRA-TERRITORIAL USE OF E.164 NUMBERS

5.3.1 General Provisions

National numbering plans are designed to provide sufficient resources of numbers for electronic communication services only in a specific country. The objectives in designing a national numbering plan are to provide a sufficient capacity of numbers, create fair competition and provide transparency for users on services and tariffs in the national market. Extra-territorial use of numbers could put these objectives in danger. The existence of a national numbering plan would be under pressure if numbers can unconditionally be used in foreign countries.

5.3.2 Dilemma of Two Applicable Legislative Frameworks

In this chapter reference is made to the description given in chapter 4.2.

5.3.2.1 *Numbering Specific Regulations*

Generally, the numbering related jurisdiction of Country A shall apply to numbers belonging to its numbering plan. This principle can also be understood from the relevant ITU-T Recommendations listed above. This shall also be a general rule in case of extra-territorial use of Country A's numbers, although enforcement of Country A's legislation in Country B may be problematic. Some exceptions, where legislation of Country B is applied, may exist. However, such a scenario may have additional disadvantages, for example Country B's use of instruments in enforcing numbering regulations may be limited, e.g. in withdrawal of numbers.

5.3.2.2 *General Electronic Communications Regulations*

Generally, regulations of Country B shall apply, but there is likely to be exceptions, where both Country A's and Country B's regulations apply. This, however, is not a desirable solution as legislation from another country may be not the same as the respective laws in another country, and therefore can result in confusion, conflicts and legal uncertainty.

5.3.2.3 *Law Enforcement Challenges*

As a general statement, if legislation in Country A is applied in Country B, there will be a problem in enforcing these regulations. Jurisdiction from both Country A and Country B may simultaneously apply in the case of certain (more general) regulations, such as number portability and interconnection.

If rules and legislations of Country B only would be applicable to numbers from Country A's numbering plan, then – in fact – the Country A would lose this part of its numbering plan. Furthermore, any changes in Country A's numbering plan would not be applicable to these extra-territorially used numbers in Country B.

In conclusion, it is likely to create practical problems and confusion, if any other legislation other than that of Country A is applied to numbers within Country A's numbering plan. As network operators and service providers in Country B are subject to Country B's legislation, this conclusion means that they shall apply regulations from two countries at the same time: general legislation from Country B and at the same time numbering related regulations from Country A dealing with extra-territorial numbers from Country A's numbering plan used in Country B.

5.4 CONCLUSION ON STANDARDS AND LEGAL FRAMEWORKS

An unconditional and systematic extra-territorial use of E.164 numbers causes many delicate legal problems. Therefore the NRAs should take the issues mentioned earlier in this chapter into account before they consider permitting the extra-territorial use of numbers from their respective national numbering plans.

6 DETAILED PROBLEM ANALYSIS

6.1 APPLICABLE LEGISLATION AND ENFORCEABILITY

In chapter 5 we identified the problem: namely which legislation applies under which circumstances related to numbers used in an extra-territorial mode. Directly related is the question of cross-border enforceability of legislation.

As mentioned earlier it seems in first instance to be logical that the rules from Country A are supervised by the NRA from Country A and that the rules from country B are supervised by the NRA from Country B. However an important point to consider is that cross border enforcement is impossible without a formal bilateral agreement and also difficult to realize in practice. The supervision of Country A over numbers which are used extra-territorially may not be efficient or effective after the assignment of the concerned numbers. So basically only conditions that have to be fulfilled before acquiring a number could be supervised by the NRA in Country A and conditions to be fulfilled during use should be supervised by the NRA in Country B, with certain exceptions. It should be realized that this will present a very complex legal situation and difficult task for the NRA supervising rules of another country. At least this would require close bilateral cooperation between NRAs of the concerned countries.

With number portability and interconnection, cooperation of market parties in Country A may be involved, dependent on how the traffic to the numbers is routed. Therefore in this case the formal supervision of both the NRAs of country A and B may be required.

Another complicating factor is that specific rules may be required in the country where the numbers are taken or the country where the numbers are used for the extra-territorial use of numbers. Such rules may on their own have risks. One example for such risks could be that different number fees (or no fees at all) apply in the concerned countries.

6.2 NATIONAL NUMBERING PLAN

As implied in the name, geographic numbers contain location information as defined in the numbering plan from the specific country. In the case of extra-territorial use of geographic numbers this kind of information is lost for those number ranges in question.

Furthermore if the applicable legislation in one CEPT country is less restrictive, market players will tend to apply for these numbers instead of numbers from a Country with a strict numbering regime. This would lead to competition between different national numbering plans with uncertain results.

One consequence could be number scarcity for specific number ranges in a country with “attractive”, numbering regulations. It is nearly impossible for NRAs to predict future market needs and consequently to adapt the national numbering policies in this case as all kinds of international factors will influence the future demand for numbers.

The situation may differ between specific M2M number ranges and traditional (voice) services. For specific M2M number ranges, scarcity may not be an issue if the numbers range is used for M2M or similar services with different regulatory requirements compared to traditional services. Therefore on the basis of this specific consideration M2M numbers could be treated differently from other types of numbers.

6.3 COMPETITION AND NUMBER PORTABILITY

The end user located in Country B with an extra-territorial E.164 number from Country A wanting to port a number can only port that number to an operator which supports the number portability system of Country A. This means that if extra-territorial use of numbers would become a normal practice, operators from Country B would need to support all the NP-systems, of the different countries, which is expensive and not practical because of the different implementations.

Also the question comes which legislation applies: that of country A or B?

No cross-border NP database exists as per 2013. A number cannot be ported from Country A to Country B. Operators from Country B do not have direct access to the number porting system in Country A. The routing regime, standards and NP implementations are not equipped to handle cross border portability. Onward routing might be a solution, but there are regulatory challenges.

If numbers are used extra-territorially, the inability to port a number to another operator in Country B may constitute a breach of USD article 30. It forms lock-in effects and represents a barrier to competition.

As numbers may not be portable, the effects on competition are negative. E.g. as number portability should apply to all subscriber numbers used in a country, the complexity to deal with both domestic and foreign numbers may be transferred to a new operator who has no influence on the type of number used by new customers. This may lead to unfair practices and undesirable negative effects on competition.

The only way to resolve this is to harmonise the different operational number portability systems in Europe which seems very unrealistic today.

6.4 END-USER ISSUES IN GENERAL

It is unclear who and how complaints of end-users can be handled. Are the authorities in the country to which the number belongs to or the country where the number is used in an extra-territorial way responsible in the case of an end-user complaint?

Furthermore end-users might be confused regarding the applicable tariffs (transparency) e.g. in the case that a E.164 number used extra-territorially is routed in the foreign country B only.

6.5 PRESERVING TARIFF TRANSPARENCY

End users of telecommunications services are broadly familiar with dialing plans within their own countries and are generally aware of the tariffs they can expect to be charged for dialing different numbers such as those designated for mobile, fixed or high tariff services. It is important that this tariff transparency is preserved even when numbers are used extra-territorially. For example if a caller in Country A dials a number from Country A's numbering plan but it terminates in Country B, the caller should not be charged any more than they would expect to pay if a call to the same number was terminated in Country A.

6.6 EMERGENCY CALLS

Article 26 of the USD requires that undertakings providing end-users with an electronic communications service for originating national calls to a number or numbers in a national telephone numbering plan provide access to emergency services. It is clear that this provision also applies to calls originating from E.164 numbers that are used extra-territorially.

Emergency services are still today dependent on using E.164 numbers to determine the location of callers and there is currently no technical possibility to ensure a correct routing of emergency calls originated from numbers if they are being used on an extra-territorial basis. Routing of emergency calls to the correct PSAP is highly dependent on national circumstances.

In many countries there exist detailed requirements regarding how calls to emergency services have to be handled. One example is that emergency calls should be routed to the nearest PSAP (or a PSAP as designated by the NRA and/or emergency services). It is clear that for requirements related to emergency calls the regulations of Country B should be applicable. There are no technical problems to route the emergency calls to the appropriate PSAP with exceptions of services with nomadic characteristics.

More importantly, in the case of extra-territorial use, a number from Country A may be presented as calling line information in Country B. This may cause problems for the PSAP as the CLI will be that of a foreign country. In theory the national database(s) in Country A which are used by the emergency services to link the number to connection (and the person and location (for fixed connections)) could be extended also to contain

numbers that are used on an extra-territorial basis. This will lead to extra costs and cause confusion for the emergency call handlers.

For some M2M applications it makes, from a practical point of view, no sense that they are able to make calls to emergency services. However, it must be noted that article 26 of the USD is independent of the application and that from a strict legal point of view it is not evident to waive that obligation. For certain types of M2M applications it could be useful that access to emergency services is possible, but this should then be realised on the basis of the exploitation of the concerned service (e.g. e-call).

6.7 INTERCONNECTION

The EU regulatory framework imposes an interconnection obligation on network operators to provide access to all numbers provided in the Community and specifies the obligation to be technology neutral. Numbering plans have national significance denoted by the country code. Beyond that, national numbering plans are likely to have fixed numbers with national geographic significance. The country and location significance conveyed by the telephone number's digit string means that numbers that are not located in the associated country or area can present complications for the regulator in terms of retail prices and wholesale interconnection charges. For instance, the calling party is likely to have an expectation of the cost of the call (in so much as whether the call is local, national or international). The digit string also has significance for network providers in routing calls to appropriate points of handover and termination.

Some countries may already accept that geographic number use need not be limited to the geographic area code with which the number is associated, as users, in particular businesses, may wish to have a "local" presence without actually being based within the area code. In these cases the party using the number outside of the associated geographic area and their service provider are likely to have an agreement which requires the called party to pay a premium for incoming calls to cover the costs associated with additional routing. In other words, the called party would pay a proportion of the costs for receiving incoming calls in an alternative location and this also ensures that the calling party pays what they would expect to pay for the call.

At the wholesale interconnection level the issue, on the face of it, is very much the same. The calling party and the called party may well be on different networks (e.g. Customer A on Network A and Customer B on Network B). Network A would only expect to pay Network B a local call termination rate (more than one switch may be used even for local calls and therefore the rate may be slightly higher) and, as stated above, the difference in the costs would need to be recovered by Network B from Customer B. This is very similar to what happens with freephone calls (although in the case of freephone calls Network B would pay Network A for originating the call).

The scenario above suggests that the use of numbers from one country in another country does not present the regulator in either country concerned with additional interconnection issues. As the originating network would have no visibility of the actual physical destination of the call or have any need to know, the originating operator would pass the call to the terminating operator (or a transit operator) at the normal agreed point of handover and would therefore pay a call termination rate consistent with the call terminating in the geographic area regardless of where it actually terminates. This would also ensure that the calling party pays what they would expect for the call. Therefore the "status quo" would prevail.

The conclusion is that from the side of interconnection no specific problems will be generated in the case of extra-territorial use of numbers as the above system is taken as a reasonable condition for interconnection.

6.8 ROAMING

The EC Regulation No 531/2012 sets rules on roaming on public mobile telephone networks within the Community [5]. This regulation defines (union-wide) roaming as: *"The use of a mobile device by a roaming customer to make or receive intra-Union calls, to send or receive intra-Union SMS messages, or to use packet switched data communications, while in a Member State other than that in which the network of the domestic provider is located, by means of arrangements between the home network operator and the visited network operator."*

As extra-territorial use of E.164 number is use of a number in another country on a permanent basis (see Definitions), roaming on a non-permanent basis is not considered to establish an extra-territorial use of E.164 numbers. This is why roaming is different from extra-territorial use of E.164 numbers.

When a user uses an extra-territorial number he or she can use that number to roam in a third country (see examples in chapter 4.3).

6.9 LAWFUL INTERCEPTION

Lawful interception is technically⁴ not done on a E.164 number and as such it is not expected that extra-territorial use of numbers will directly affect the technical capabilities of law enforcement authorities to carry out this function. However, the E.164 number is the key to start the lawful interception process. Therefore the issues described in chapter 6.1 have to be considered.

In the case that the called party B is subject for lawful interception and the calling party A uses E.164 numbers extra-territorially it could be more complicated to identify the calling party A subscription as the number is an international number and authorities in Country A may have to be involved.

6.10 DATA RETENTION

Extra-territorial use of E.164 numbers will likely increase the complexity of Data Retention [8] for law enforcement authorities because data might have to be collected in Country B and retained in Country A. It is questionable if such circumstances are acceptable for both countries involved. Furthermore, which jurisdiction is authoritative in such a case, e.g. is the operator in Country B obliged to grant access to the relevant databases for law enforcement authorities from Country A? It is anticipated that additional bilateral or multilateral agreements are needed to deal with the above described issues.

6.11 CALL BARRING

Selective barring for outgoing calls is a facility whereby the subscriber can, on request to the designated undertaking that provides telephone services, bar outgoing calls to specific numbering ranges and or specific services (e.g. premium rate services).

It is technically possible for undertakings which provide electronic communications services, which use extra-territorial numbers, to comply with the national call barring regulations. The normal rules should therefore be applicable, although special arrangements may be required if the call is not routed to network A for B to make the call barring. The use of extra-territorial numbers has no impact on the enforceability of the call barring rules outside the general difficulties regarding law enforcement mentioned in section 6.1.

6.12 CALLING LINE IDENTIFICATION

The number used as a CLI must have the international E.164 format to avoid clashes with the national numbering plans in the country where the number is used extra-territorially. No further impact to the CLI is expected.

⁴ We may not forget that the court decision for lawful interception is based on the E.164 number, which could create confusion.

7 ADVANTAGES AND DISADVANTAGES OF EXTRA-TERRITORIAL USE OF NUMBERS

7.1 ADVANTAGES

7.1.1 For Users

End-users can retain their “old” number if they move permanently to another country which is consumer friendly and offers the advantage that people from their home country can call them at local tariffs or free of charge. The latter advantage is disappearing because more and more operators offer also cheap or free of charge international calls.

7.1.2 For Operators

Operators could optimise their billing systems (and consequently their costs) if they have only to support one specific national number range (e.g. mobile numbers).

For specialised services such as M2M it is possible to serve different countries using one platform in one country with one number range coming from one national numbering plan.

Less administrative burden for operators: they have only to apply in one country and pay the fee one time and can serve customers in many countries.

7.1.3 For the National Numbering Plan Administrators

One general advantage of the extra-territorial use of numbers could result in a more efficient use of number blocks, because operators have to apply for number resources in one country only. Thus the amount of unused numbers per block would be reduced.

For M2M the mentioned issue of cutting losses is likely to be higher than for other types of number use as for M2M relative large number blocks will be allocated. On the other hand, scarcity risks of number ranges that are especially created for M2M are less apparent as they tend to provide for large capacities of numbers. Furthermore, in the case of M2M, for E.164 numbers it is relatively easy (technically and commercially) to change these numbers for devices during the life cycle of these devices.

7.2 DISADVANTAGES

Historically, legislation, numbering plans and assignment rules are designed to meet the needs of national markets and national frameworks may differ significantly. Because of the different legal frameworks numbers from one country could be more attractive than numbers from another country for operators starting their business. As a consequence all kinds of international factors will influence the demand for national numbers which could be difficult to predict by national numbering plan administrators. These circumstances and the number length limitation of 15 digits according to the ITU-T Rec. E.164 could lead to number scarcity in some number ranges in countries with “attractive” assignment rules.

As a general rule number portability must apply for all E.164 numbers. Existing portability procedures today work on a national level only, therefore it's might not be possible to port numbers which are used extra-territorially. An exception of this general rule could lead to unfair practices and undesirable negative effects on competition.

Consumers may be confused about the use of a foreign E.164 number. Which tariff applies for that number, national or international? In the case that the call is routed on the national level only, is it justified to charge the international tariff?

It is difficult to keep supervising national rules to numbers which are used in another country especially when the relevant legal obligations differ from each other. Which jurisdiction should apply in that case?

The above mentioned issues are not comprehensive. Some disadvantages, as described in Chapter 6, disappear if the E.164 numbers are only used for either originating or terminating calls e.g. In the case of emergency calls where the service is an “incoming only” service,

8 POLICY OPTIONS

There are in theory several options for an NRA to deal with the possibility of using numbers extra-territorially. These options are:

1. Forbid the extra-territorial use of numbers in all cases

This option would avoid the complexities as described in the previous chapters. However, such policy may not be flexible enough to facilitate technical and commercial innovation in the market where such use might be justified (example: deployment of nomadic VoIP-services).

2. Allow the extra-territorial use of numbers unconditionally

This option has large consequences for the longer term regarding the use of numbers, both at the national and international level as described in this report.

3. Forbid the extra-territorial use of numbers as a basic rule and leave scope for exceptions

This option basically forbids the extra-territorial use of numbers, not excluding the possibility to deviate from this policy in certain cases where specific benefits may stem from the extra-territorial use. As an example, a condition for an exception could be that the numbers should substantially serve the national market. This means that there must be certain benefits for residents of the country where the numbers belong to either as parties using the numbers or as parties calling the numbers. In addition more detailed conditions, in the form of special requirements applied to the party using the numbers extra-territorially, may be applied where appropriate.

As the extra-territorial use of numbers could have consequences for the related countries, in the cases where a need is identified, to agree on the conditions and to clarify the competencies in case of extra-territorial use of numbers via multilateral agreements under the form of ECC Decisions. These could be used as effective instruments to implement the exceptions.

9 CONCLUSIONS

It is recognized that extra-territorial usage of E.164 numbers offers some advantages but we enter in an unexplored territory with potentially many challenges.

As the extra-territorial use of numbers fall in a grey zone concerning laws and regulations, there are more questions than answers. The main problems are listed below (the list is not exhaustive):

- The ITU TSB has assigned the relevant E.164 Country Code to the country in question. The NRA is the manager of the national numbering plan and assigns numbers and number ranges to market players. Generally, numbering related jurisdiction of the Country shall apply to numbers belonging to its numbering plan. If this principle is not followed, the geographic hierarchical framework of the E.164 numbering as agreed in the relevant ITU-T Recommendations is under pressure and this gives risks for the long-term stability of this numbering structure.
- Extra-territorial use of numbers leads to legal uncertainty: it is unclear which legislation applies for what and potentially we can be faced with conflicting legal requirements. The enforcement of national electronic communications regulations including numbering regulations for the NRA of the country where the numbers belong to becomes in practice impossible for numbers used by a foreign operator in another country.
- In practice, extra-territorial use of E.164 numbers may increase costs (1) for the public service answering point operators, as they need to be able to identify non-national numbers, and (2) for the operators as they need to have access to NP-systems in other countries involved.

The ECC concludes that as a general rule the extra-territorial use of E.164 numbers should not be allowed because the negative effects listed in this Report outweigh the perceived benefits.

As a consequence:

- A country should in general refuse the assignment of E.164 numbers belonging to its numbering plan to be used outside of its territory on a permanent basis.
- A country should in general not allow the use of E.164 numbers belonging to another country's numbering plan in its territory on a permanent basis.
- Extra-territorial use of numbers should only be permitted in exceptional cases which have been defined by an ECC Decision. Possible candidates are some nomadic voice services and some M2M services.

As an exception from the general rule, for very small countries or territories⁵, the extra-territorial use of numbers can be beneficial for the citizens of the involved countries and can therefore be made possible through bilateral agreements between these countries.

This approach seems not to be in conflict with the current ITU-T Recommendations and EU regulatory framework, but it is advisable to make this explicitly clear in the relevant ITU-T Recommendations.

⁵ Examples include the use of numbers from the national numbering plan of Italy in the Republic of San Marino and the State of the Vatican City and other similar arrangements between the UK and the Isle of Man.

ANNEX 1: LIST OF REFERENCES

- [1] ITU-T Recommendation E.164: The international public telecommunication numbering plan (11/2010)
- [2] ITU-T Recommendation E.164.1: Criteria and procedures for the reservation, assignment and reclamation of E.164 country codes and associated identification codes (ICs) (09/2008)
- [3] ITU-T Recommendation E.190: Principles and responsibilities for the management, assignment and reclamation of E Series international numbering resources (05/1997)
- [4] ITU-T Recommendation E.152: International Freephone service (05/2006)
- [5] Regulation (EU) No 531/2012 of The European Parliament and of The Council of 13 June 2012 on roaming on public mobile communications networks within the Union
- [6] Directive 2009/136/EC of The European Parliament and of The Council of 25 November 2009 amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services, Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector, and Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for the enforcement of consumer protection laws
- [7] ITU-T Recommendation E.212 Amendment 3: Revised Annex E – The use of an MCC+MNC in a country other than the country to which the MCC has been assigned by the Director of TSB
- [8] Directive 2006/24/EC of The European Parliament and of The Council of 15 March 2006 on the retention of data generated or processed in connection with the provision of publicly available electronic communications services or of public communications networks and amending Directive 2002/58/EC