Establishment of Harmonized Policies for the ICT Market in the ACP Countries

Numbering:
Knowledge-based Report

ICB4PAC

Capacity Building and ICT Policy, Regulatory and Legislative Frameworks for Pacific Island Countries

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Foreword

Information and communication technologies (ICTs) are serving as the most important driving force behind the Pacific Islands' economic and social integration into the wider global community.

In light of the huge changes that are taking place and mindful of the need to shape them in ways that best reflect the aspirations of the individual islands societies -- each with their unique heritage -- 15 Pacific countries in the Group of African, Caribbean and Pacific States (ACP) have come together to develop and promote the use of harmonised ICT policies, legislation and regulatory frameworks.

This cooperation has taken the form of a project entitled "Capacity Building and ICT Policy, Regulatory and Legislative Frameworks Support for Pacific Island countries" (ICB4PAC). Executed by the International Telecommunication Union (ITU), the project has been undertaken in close collaboration with the Pacific Islands Forum Secretariat (PIFS), Secretariat of the Pacific Community (SPC), Pacific Islands Telecommunication Authority (PITA), and the Pacific ICT Regional Regulatory Centre (PIRRC), with the support of the University of the South Pacific (USP). A global steering committee composed of the representatives of the ACP Secretariat and the Development and Cooperation - EuropeAid (DEVCO, European Commission) oversees the overall implementation of the project.

This project is taking place within the framework of the ACP Information and Telecommunication Technologies (@CP-ICT) programme and is funded under the 9th European Development Fund (EDF), which is the main instrument for providing European aid for development cooperation in the ACP States, and co-financed by the ITU. The @CP-ICT aims to support ACP governments and institutions in the harmonization of their ICT policies in the sector by providing high-quality, globally-benchmarked but locally-relevant policy advice, training and related capacity building.

All projects that bring together multiple stakeholders face the dual challenge of creating a sense of shared ownership and ensuring optimum outcomes for all parties. ICB4PAC has given special consideration to this issue from the very beginning of this project in November 2009. Having agreed upon shared priorities, stakeholders reviewed the methodology and governance for implementing the project. The specific needs of the region were then identified and likewise potentially successful regional practices; these were then benchmarked against practices and standards established elsewhere.

These detailed assessments (knowledge-based reports), which reflect country-specific particularities, served as the basis for the model policies and legislative texts that offer the prospect of a legislative landscape for which the whole region can be proud. The project is certain to become an example for other regions to follow as they too seek to harness the catalytic force of ICTs to accelerate economic integration and social and economic development.

I take this opportunity to thank the European Commission and ACP Secretariat for their financial contribution. I also thank the Pacific Islands Forum Secretariat (PIFS) and the Secretariat of the Pacific Community (SPC) for their contribution to this work. Without political will on the part of beneficiary countries, not much would have been achieved. For that, I express my profound thanks to all the ACP governments for their political will which has made this project a resounding success.

Brahima Sanou
BDT, Director

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1   Executive Summary

This assessment report on the current situation regarding numbering and number misappropriation is part of the Capacity Building and ICT Policy, Regulatory and Legislative Framework's support for the Pacific Island Countries (ICB4PAC) project jointly funded by the European Commission (EC) and the International Telecommunication Union (ITU). The study on which this assessment is based involved a review and assessment of the frameworks and practices relating to the management and administration of national numbering resources in 15 Pacific Island countries, together with an examination of the problem of number misappropriation, generally referred to as number hijacking. The term national numbering in this report refers to the telephone range of numbers in each countries and each country.

The assessment has produced six key findings.

(i)   The mandates provided for the management and administration of numbering resources in most of the study countries are poor, although this tends to reflect the fact that most of the markets are still statutory monopolies.

(ii)   All but one of the study countries has a numbering plan and all of these have been shared with ITU. However, use of ITU's recommended format for numbering plans or ITU Recommendation E.129 did not encourage the inclusion of any rules or restrictions relating to the use of numbering resources in the numbering plans. This is not usually a cause for concern since most countries will set out such rules and restrictions in some form of supplementary numbering regulation. However, this was not a trend in the study countries, with only Papua New Guinea developing supplementary numbering documents.

(iii)   Compared to international best practices in the management and administration of numbering resources, the monopoly markets in the study countries perform rather poorly in terms of the extent to which criteria are relevant to their circumstances, primarily due to poorly documented processes and rules. And the liberalized markets are only marginally better. The exception, once again, is Papua New Guinea, a liberalized market.

(iv)   The study countries with relatively recent ICT-sector legislation tend to recognise or treat Internet country code top-level domain (ccTLD) name resources similar to national numbering resources (or, at least, they have created the potential to do so). Generally, electronic naming and addressing resources tend to be administered quite differently from numbering resources. This is an international trend that is most evident in the delegation of responsibilities to registrars. However, greater information about the existing arrangements in the study countries is required to gain a more complete understanding of this activity area.

(v)   Sub-groups of different study countries have similar needs and intentions in relation to their management and administration of numbering resources, and similar capability gaps. This creates an opportunity for a segmented approach to the delivery of capacity-building projects in the region.

(vi)   Number misappropriation remains a poorly understood challenge for many of the study countries. Although there are no panaceas, there are initiatives that the study countries could jointly pursue to improve their understanding of the problem and their ability to detect and rectify specific cases of misappropriation.

These findings have lead to five integrated recommendations.

(i)   All ministries that oversee the management of numbering resources, and all regulators that have (or expect to soon have) responsibility for numbering issues, should develop or improve their knowledge of and capabilities in numbering administration. The particular issues that they should focus on can be identified by reference to the training needs matrix in Table 5-3.

(ii) The development of the knowledge and capabilities shown in Table 5-3 would be best achieved through on-the-job experience gained either by undertaking numbering tasks directly or by working alongside an expert on a specific numbering project.

(iii) As there are sub-groups of Pacific Island countries that appear to have similar needs and similar capability gaps, ITU should adopt a segmented approach to numbering capacity development activities in the region. As part of that approach, there would be value in aligning the timing of similar numbering projects, for example numbering plan reviews, across a sub-group of countries. Similarly the timing of the development and documentation of numbering assignment and usage rules and procedures should also be aligned. In this way, ITU could engage a relevant subject-matter expert to assist all countries in the sub-group to undertake a project. That is, an expert could be dedicated to completing a particular type of numbering project across a sub-group of countries. Economies of scale and scope would enable external training and development expertise to be used cost-effectively across the region. Further, project alignment would encourage, as far as possible, a degree of harmonization and consistency across the region. It would also enable sub-groups of countries with similar base levels of knowledge and experience to come together for common training and development activities, helping to ensure such training activities are pitched at the right level.

(iv) All study countries should develop formal rules and restrictions relating to the use of national numbering resources. These should include processes and criteria for the assignment and withdrawal of numbering resources. They should be documented in either their numbering plans or in supplementary numbering regulations. The approach adopted by Papua New Guinea in this regard provides a sound example for the region. Including such things as part of numbering plans may require the study countries to adopt a modified format for the presentation of their numbering plan nationally. This may be distinct from the presentation of numbering plans internationally via submission to ITU, the format for which is set out in ITU-T Recommendation E.129[1]. This recommendation applies to both monopoly and liberalized markets, but acknowledges that the content and level of detail in any rules or procedures will differ between liberalized and monopoly markets.

(v) All study countries should self-assess their current arrangements for the management and administration of numbering resources against the best practice guidelines outlined in section 5.6. This guidance should be taken into account when reviewing arrangements or developing new arrangements in the future. The main problem is the lack of resources in the countries to use section 5.6 to their advantage.

(vi) The study countries should coordinate their activities relating to number misappropriation and, in particular, preventive initiatives and investigations, and their broader international activities. There would be value in developing and agreeing to a consistent strategy across the region that draws upon the ideas and initiatives in section 6.5 in a coordinated fashion. As a minimum, study countries should develop a mechanism (such as a website) to pool and share their resources and knowledge across the region. They should also take an active interest in the existing international fora that are trying to address the problem of number misappropriation, such as the ITU Study Group 2 on numbering misappropriation, and the European Conference of Postal and Telecommunications Administrations (CEPT) early alert system.

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[1]   Refer www.itu.int/rec/T-REC-E.164/en

2 Introduction

2.1 The ICB4PAC project

The ICB4PAC project[2] was officially launched in the Pacific by the International Telecommunication Union (ITU) and the European Commission (EC) in November 2009 in Nadi, Fiji. The launch was supported by the Pacific Island Forum Secretariat and other regional organizations, as well as donor and partner organizations. Participants in the official launch included 15 ACP member countries of the Pacific Islands countries. Civil society, private sector and academia representatives also participated.

Discussions about the topics to be addressed by the project were held, and participants agreed on six topics given the limited time frame and funding. These were:

- national ICT policy;
- interconnection and cost modelling, and international mobile roaming;
- licensing;
- numbering;
- universal access and services;
- cyber-crime and security.

The methodology was also agreed, which included conducting an assessment of the current situation for each topic in each of the 15 recipient countries; organizing regional workshops to discuss and agree the assessment reports; and transposing some topics to the national level, as requested by the countries. This report on numbering and number misappropriation (or number hijacking) is one of six reports which review all recipient country assessments for each of the agreed topics.

The final draft of this assessment was revised and agreed upon by the country contact points referred in this report as focal points at a workshop (Cook Islands, August 2010). A list of the workshop's 52 participants is in Annex A.

2.2 Objectives of ICB4PAC

ICB4PAC has three key objectives.

- It is building local capacity and facilitating the establishment of enabling and sustainable telecommunication and ICT policy, regulations, legislative and strategic frameworks to accelerate telecommunication and ICT development in and among ACP countries in the Pacific Islands region
- It aims to maximise economic and social benefits
- National priorities are being served in line with the goals of the ITU World Telecommunication Development Conference (WTDC) and the WSIS Plan of Action[3].

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[2] The full title of the ICB4PAC project is "Capacity Building and ICT Policy, Regulatory and Legislative Frameworks Support for Pacific Island Countries". ICB4PAC is a sub-project of the ITU-EC-ACP project carried out with funding from the European Union set at EUR 8 million and a complement of USD 500,000 by ITU. It is implemented by ITU in collaboration with regional organizations and the involvement of other partners in the region (see www.itu.int/projects/ITU_EC_ACP/icb4pis/index.htmil).

[3] WSIS refers to the World Summit of the Information Society led by ITU. The first summit was held in Geneva in 2003 where the WSIS Declaration was agreed upon by all ITU Member States. The second summit was held in Tunisia in 2005 where the Plan of Action was finalised and agreed by all ITU Member States.

It is assisting individual beneficiary countries to adopt and implement ICT policies, regulatory and legislation guidelines. The project also focuses on building human and institutional capacity in the field of ICT through a range of targeted training and knowledge sharing measures at both regional and national levels.

The project uses a demand-driven, bottom-up approach, and pays specific attention to linking the substance of policies and regulation with capacity building. Regional discussions are transposed to individual country's needs so that these can be matched to the project's objectives.

This assessment, therefore, considers the issues at a country level. Individual countries and ITU can then identify the best possible solutions for both the region as a whole and individual island countries.

2.3   Beneficiary countries of ICB4PAC

The beneficiary countries of the ICB4PAC are Cook Islands, Fiji, Kiribati, Republic of Marshall Islands, Federated States of Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor Leste, Tonga, Tuvalu and Vanuatu. These countries will benefit from the regional capacity building workshops as well as the transposition of certain topics to a national level. Such assistance aims to develop and promote capacity building in ICT policies, regulatory and legislative frameworks. This is being achieved through a range of targeted training, education and knowledge-sharing measures.

2.4   Methodology

This study of the current situation in the ACP member countries of the Pacific island region has been completed through desk-based research and analysis, and regional consultation. The study was initiated by sending a pro-forma data request via the ITU Project Coordinator to all 15 countries. A copy of that data request is in Annex B. The management and administration of national numbering resources occurs within a broader international regulatory context. ITU sets the numbering structure and functions of the numbering process.

2.5   International public telephone numbering plan

Telecommunication public telephone numbering is guided by the ITU-T *Recommendation E.164: The international public telecommunications numbering plan*.[4] This recommendation sets out the number structure and functionality for the four categories of numbers used in international public telecommunications:

- geographic areas;
- global services;
- networks;
- groups of countries (that is, where several countries recognised by ITU or the UN share the same country code and group identification code).

For each category, the recommendation sets out the numbering structure and digit analysis required to route calls successfully. The focus of this study is on numbers for geographic areas, the structure of which is shown in **Table 2-1**.

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[4]   Available at www.itu.int/rec/T-REC-E.164/en

Section II

Table 2.1: International number structure

CC	NDC	SN
≤3 digits	National significant number	
	International number (≤15 digits)	
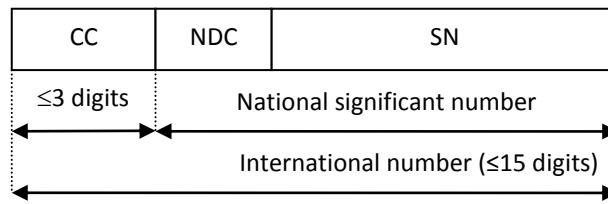
Where:
CC   = Country code for a geographical area
NDC = National destination code
SN   = Subscriber number

The country code is assigned by ITU. The national significant number abbreviated as N(S)N[5] is administrated at a national level by the appropriate numbering administrator. The N(S)N comprises a national destination code (NDC) and the subscriber number (SN). The NDC field is intended to accommodate the identification of the destination network. Its use and length are variable depending on national requirements as determined by the national numbering administrator. The use of the NDC field is optional as shown in **Table 2-2**, if it is used it can reflect:

   a. a destination network (DN) code, which can be used to select a DN serving the destination subscribers;

   b. a trunk code (TC) ;

   c. any combination of (a) and (b).

These options are demonstrated in **Table 2-2**.

Table -2.2: Structure of national destination code

NDC structure type 1	DN	
NDC structure type 2	TC	
NDC structure type 3	DN	TC
NDC structure type 4	TC	DN

In Article 7.4.1 of the E.164 Recommendation, it is recommended that each national numbering plan administrator should give careful consideration to the preparation of a national numbering plan for the national network. This plan should be designed with the following considerations:

   a) To allow generous provision for future growth in the number of subscribers and services to the national system

   b) So that the national network will ultimately be accessible to subscribers in other countries by means of international dialling procedures.

   c) So that subscribers would always be called by either the same leading numbers of the National Significant Number (N(S)N) or subscriber number (SN), a national matter, regardless of where the call originated from within the national numbering plan.

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[5]   Refer www.itu.int/itu-t/recommendations/rec.aspx?id=10688 6th edition, page 4

The E.164 Recommendation also specifies that numbers that only exist in the local, intra-network and/or national level are not considered international ITU-T E.164-numbers[6]. Prefixes and other information concerned with identifying selection procedures or network service parameters (such as quality of service or transit delay) do not form part of the international number[7]. As shown in **Table 2-1**, an N(S)N can only comprise of an NDC and an SN (or just an SN). Accordingly, the phrase 'dialling plan' is often used to refer to a plan that reflects the digits actually dialled by an end-user and to distinguish that plan from the national numbering plan (or numbering scheme) for international E.164 numbers. The focus of this study is on numbering schemes, not dialling plans.

2.6   World Trade Organization

As part of the General Agreement on Trade in Services (GATS), the multilateral trade round in 1994, a basic services agreement was drafted together with a reference paper on telecommunication regulation. At the treaty inception in 1998 over 60 countries had signed up to the reference offer and since then, through free trade agreements and preferential trade agreements (both bilateral and regional), over 100 countries have committed to the undertakings in the reference paper. Section five of this paper deals with independent regulators, and says:

> *The regulatory body is separate from, and not accountable to, any supplier of basic telecommunications services. The decisions of and the procedures used by regulators shall be impartial with respect to all market participants[8] (WTO, 1994).*

Section six deals with the allocation of and use of scarce resources (including numbering resources) and says:

> *Any procedure for the allocation and use of scarce resources, including frequencies, numbers and rights of way, will be carried out in an objective, timely, transparent and non-discriminatory manner[9] (WTO, 1995).*

These requirements represented best practice in 1998 and are accepted as typical practice to this day. Most of the countries in this study, however, are not World Trade Organization (WTO) members and, therefore, have not acceded to the obligations in the reference paper. However, adopting these standards is not conditional on being a WTO treaty signatory.

2.7   Administration of national numbering resources

There are essentially three dimensions to the administration of national numbering resources:

- The numbering plan, which divides the numbering resource into ranges for different services or applications

- The requirements or obligations associated with the use of each numbering range or service

- The number assignment process.

These dimensions are typically the responsibility of a national numbering administrator. That numbering administrator will typically be the national regulatory authority for telecommunications.

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[6]   www.itu.int/itu-t/recommendations/rec.aspx?id=10688, 6th edition; section A.2.5 page 15
[7]   Refer 6 above
[8]   WTO, 1996. www.wto.org/english/news_e/pres97_e/refpap-e.htm,
[9]   WTO, (1996).

2.8 The legislative mandates for national numbering administration

The allocation of responsibility for the management and administration of a country's numbering resources should be reflected clearly within the national legal and regulatory framework. This is important because such responsibilities are essentially vested in government by virtue of the E.164 Recommendation [10]. If those responsibilities are to be delegated, for instance from the government to an independent regulatory agency or a telecommunication operator, then that delegation should be a formal act of government (that is, via legislation). The delegation should be public and ideally also incorporate some broad guidance explaining how the government expects the regulatory agency or telecommunication operator to fulfil the responsibilities that the government has delegated to it to manage a national scarce resource.

The extent to which such a numbering mandate is reflected in legislation or other subordinate legislation, such as rules or regulations, will naturally be influenced by such factors as whether or not the telecommunication sector has been liberalized and whether or not a separate regulatory body exists, (that is, independent of operators and government). Nevertheless, in such circumstances, it would be good practice to at least acknowledge the numbering administration function, its international context, and the responsible organization in any legislation that governs the structure of the telecommunication sector.

If a numbering mandate is specified in a law or regulation, it ideally should answer a number of key issues.

- Who is required to make, manage and administer the national numbering plan?

- What will the management and administration of the numbering plan entail in terms of the powers, obligations and responsibilities of the numbering administrator; and the scope of the numbering plan (for example, telephone numbering only or all electronic addressing)?

- What, if anything, should the numbering plan include in terms of specific policies or uses of numbers?

- Who (in general terms) is entitled to be allocated numbers by the manager of the numbering resources and for what purposes (in general terms) may they use them?

- Who should the numbering administrator consult prior to finalising the numbering plan or any amendment to it?

- Who is required to comply with the numbering plan, and what are the penalties for not complying?

- Are there any charges associated with the allocation of numbers?

- Under what conditions may numbers, once allocated or issued, be withdrawn or cancelled?

- What rights or reasonable expectation should there be for the continued usage of a number once allocated or issued?

- Who 'owns' numbers, especially when number portability and universal access numbers are introduced?

- Can the rights for numbers and the entitlement to use them be transferred, and, if so, under what conditions?

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[10] https://www.itu.int/itu-t/recommendations/rec.aspx?id=10688, 6th edition; section 4.7 pp 3.

Section II

A good example of the articulation of numbering objectives and procedures can be seen in Australia's telecommunication law. It designates the Australian Communications and Media Authority (ACMA) as the numbering administrator for Australia; requires ACMA to make a numbering plan; explicitly authorises the ACMA to include in the numbering plan rules about particular matters (such as allocation, surrender and portability); and obliges the ACMA to take account of international standards and other regulatory obligations on service providers that may have a bearing on the access to, or use of, numbers. It also establishes a three-tier concept for number management, distinguishing specification of numbers (that is, for use in association with particular types of services), from the allocation of numbers (to service providers by the numbering administrator), and from the issue of numbers to particular customers and end-users.

2.8.1   Numbering mandates in the monopoly markets

Generally, monopoly markets do not have any numbering mandate reflected in legislation or regulation because the incumbent telecommunication operators assume responsibility for the management of numbering resources. However, those countries that intend to liberalize their telecommunication sectors appear to be planning new legislation to govern the industry that will, among other things, manage and administer numbering resources. The following chapter provides abstracts from each of the countries where telecommunications remain a monopoly.

3   The context for the administration of numbering resources in non-liberalized markets

There are three dimensions to the administration of national numbering resources:

- the numbering plan, which divides the numbering resource into ranges for different services or applications;
- the requirements or obligations associated with the use of each numbering range or service;
- the number assignment process for both licensees and non-licensees.

These dimensions are typically the responsibility of a national numbering administrator. That numbering administrator will typically be the national regulatory authority for telecommunications. However, as the telecommunication markets in most of the study countries are still monopolies, it is more common for numbering in the Pacific Island countries to be the responsibility of the incumbent telecommunication operator. As the relevant actors in the study countries have differing levels of experience in numbering issues, and have (or will have) differing levels of responsibility for technical numbering issues, future capacity-building efforts should be tailored to sub-groups of individuals and organizations with similar developmental needs.

Capacity development would be best achieved through 'on-the-job' experience gained while working alongside an expert consultant or contractor on a specific numbering project. The expert would be able to supplement the on-the-job experience with training workshops focused on relevant best practices and technical numbering skills and processes.

The types of projects that would lend themselves to such capacity-building exercises should relate to at least one of the three dimensions of numbering administration since all the study countries need to take some form of action with respect to at least one of these areas. For example, some of the study countries wish to, or need to, review their numbering plans in light of either the imminent introduction of competition or a need to improve the efficiency with which numbering resources are used.

Some study countries have poorly documented or informal number allocation processes and intend to, or need to, document number assignment and withdrawal procedures, possibly in association with the introduction of financial charges. Virtually all of the study countries need to develop rules and obligations relating to the assignment and use of numbers, and document them either in their numbering plans or in separate regulations. Studies into the costs and benefits of introducing number portability are longer-term considerations (if at all) and therefore need not be part of any short-term capacity-building efforts. However, the administration of ccTLDs, and the development of rules governing their administration by registrars, is an emerging area of responsibility and thus another potential issue to be addressed by the ICB4PAC project in the future.

3.1   Cook Islands

The prevailing *Telecommunications Act 1989*[11] does not include a numbering mandate. However, such provisions are intended to be included, or may have already been included, should the Cook Island government decided to amend the Act to liberalize the telecommunication sector.

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[11]   Government of Cook Islands (1989)

3.2 Kiribati

The *Telecommunications Act 2004*[12] does not include a numbering mandate but it is understood that there is a proposal for this to be changed through a planned legislative amendment.

3.3 Marshall Islands

There is currently no legislative numbering mandate in the Marshall Islands. However, it is understood that there is an intention for this to be addressed as part of a new telecommunication bill that has been proposed.

3.4 Micronesia

There is no legislative numbering mandate in Micronesia as there is currently not any telecommunication-specific legislation.

3.5 Nauru

The current arrangements in Nauru were not made available to this study.

3.6 Niue

In Niue, the numbering mandate is dealt with indirectly in the *Communications Act 1989*[13], which requires that the Cabinet (or any person authorised by the Cabinet to act on its behalf) and the head of the ministry for telecommunications to administer the Communications Act in a manner that, as far as practicable, is 'in accordance with any applicable standards, rules and regulations set by international agreements binding upon Niue' section2 (2) pp2.). This would appear to require the regulation of telecommunications, including numbering, in accordance with ITU recommendations (which arguably qualify as 'standards'). However, the Communications Act makes no specific reference to numbering.

3.7 Palau

There is currently no legislative numbering mandate in Palau as telecommunication legislation is pending in the Congress. However, the Ministry of Commerce and Trade is currently responsible for the national numbering plan and has submitted the same to ITU.

3.8 Timor Leste

The Decree Law no. 12/2003[14], *Establishing the communications regulatory authority and approving the statutes thereof*, states that the Communications Regulatory Authority (ARCOM) is responsible for 'ensuring the numbering management in the communications sector' pp1.

3.9 Tuvalu

There is currently no legislative numbering mandate in either the *Tuvalu Telecommunications Corporation Act 1993* (Government of Tuvalu, 1993).

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[12]   Government of Kiribati (2004)
[13]   Government of Niue, (1989)
[14]   Government of Timor Leste (2003)

4   Numbering mandates in the liberalized markets

The principal telecommunication law in each of the liberalized markets sets out a clear numbering mandate for the national regulatory authority. Often this is accompanied by some guidance or instruction on the types of issues that the national government would like to see reflected in the numbering plan and in the administration of numbering resources. See, for example, section 184 of the Papua New Guinea Government's *National Information and Communications Technology Act*[15] .

4.1   Fiji

The *Telecommunications Promulgation 2008* (section 43, pp.24)[16] empowers the Telecommunications Authority of Fiji (TAF) to establish and maintain a national numbering plan. In doing so, the promulgation also obliges the TAF to:

- take account of relevant international standards;

- ensure that sufficient numbers are available for the current and reasonably anticipated future needs of operators;

- have regard to the role that numbers play in conveying useful information to consumers, including about the type of service being used;

- promote efficient use of numbers;

- promote fair and open competition;

- minimise the imposition of costs onto consumers as a result of any changes to the numbering system;

- take account of number portability (if it has been implemented).

The TAF is also encouraged and authorised to establish one or more industry working groups to provide advice and proposals on the management of various numbering issues as it states in section 46) of the *Telecommunications Promulgation 2008, pp.25*[17]

4.2   Papua New Guinea

The new National Information and Communications Technology Authority (NICTA), established by the *National Information and Communications Technology (NICT) Act 2009*[18], will have responsibility for making and managing a national numbering plan (section184). This numbering plan:

- must specify the numbers that are for use in connection with the supply of ICT services;

- must specify those numbers, if any, that have been allocated by NICTA to each licensee;

- may specify different numbers for use in connection with the supply of different types of ICT services.

The NICT act also sets outs a non-exhaustive list of the matters that the NICTA can addresss in the numbering plan, including:

- the allocation, porting, surrender and withdrawal of allocated numbers;

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[15]   Government of Papua New Guinea (2009)
[16]   Government of Fiji (2008) *Telecommunications Promulgation 2008* (section 43, pp.24)
[17]   *Government of Fiji* (2008)
[18]   Government of Papua New Guinea (2009)

- rules limiting the permitted uses of, or imposing conditions on, the use of numbers (such as the permitted types of call charges or the issue of allocated numbers by a licensee to a wholesale customer);

- rules about the provision of particular types of services in the context of the use of numbers (such as the supply of operator services or calling line identification).

NICTA is required to engage in public consultation in relation to the development of, or variation to, the numbering plan. This process must include the publishing of a draft plan or change thereto, the opportunity for the public to make submissions of that draft, and the consideration of those submissions by NICTA (section185).

The Act also stipulates that all licensees must comply with the numbering plan and makes provision for the Minister to specify someone as the provider and maintainer of an integrated public number database if such a role has not already been filled by a licensee pursuant to a licence condition.

4.3   Samoa

In Samoa, the *Telecommunications Act 2005 (section 6 pp.94.)* makes the regulator responsible for the preparation and management of a national number plan, and for assigning numbers and number ranges to service providers and customers (section61). The regulator must publicise any proposed changes to the numbering plan and ensure that the numbering plan is consistent with the requirements of relevant international agreements and recommendations. The Act requires service providers to use numbers efficiently and in accordance with the rules stipulated in the number plan.

The Act also clarifies rights of use, stipluting that neither service providers nor customers have any property rights in numbers, and that a service provider can change a customer's number only in specified circumstances (section62).

The regulator has the power to introduce by regulation fees for the use of numbers (section10). However, it appears that any such fees (together with any licensing or radio spectrum usage fees) must be intended to contribute either in whole or in part to funding the operations of the Office of the Regulator and must be approved by the Head of State.

4.4   Solomon Islands

Under the *Telecommunications Act 2009[19], (section 81(1) pp.62)* responsibility for the preparation and maintenance of a national numbering plan, and the management and administration of numbering resources, is vested with the Telecommunications Commission. In making a numbering plan, the Telecommunications Commission must:

- consider any numbering plan proposed by a recognised service provider association, if any, and rely where reasonable upon industry self-regulation;

- ensure that numbers are allocated in an open, objective, transparent and non-discriminatory manner;

- ensure that it is consistent with the requirements of relevant international treaties, commitments, and recommendations.

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[19]   Solomon Island Government (2009)

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The Act obliges service providers to use numbers efficiently and in accordance with the numbering plan, but notes that neither service providers nor users have any property rights in numbers. It also explicitly prohibits service providers from using any numbers not assigned to them in accordance with the numbering plan, or adopting any private numbering arrangements that conflict with the national numbering plan.

The Act also specifies transitional arrangements relating to number allocation block size, the right of the incumbent to continue using its existing allocation of numbers, and the entitlement of both the incumbent and the new entrant to a minimum block allocation of mobile numbers (section81(5) pp.62).

4.5 Tonga

In Tonga, the numbering mandate is in Part VII of the *Communications Act 2000*[20] which vests the Department of Communications with responsibility for 'the control, planning, administration, management and assignment of the numbering and electronic addressing of network services and applications services' (section53).

The department is required to prepare a numbering plan if directed to do so by the Minister for Communications. The Minister must then approve the numbering plan.

The numbering plan is to be made available to the public, but the department may, at its discretion, impose a fee to access and inspect it (section54). However, Tonga has confirmed that it currently does not impose such a fee.

The department, if authorised to act by the Minister, has the power to direct a licensee to comply with the numbering plan (section54). Failure to comply with such a direction constitutes an offence against the Communications Act and is liable to incur a penalty of $15,000 Pa'aga or six months in prison (section119).

There is not any guidance in the Communications Act concerning what should be covered by the numbering plan, or how it should covered.

4.6 Vanuatu

The regulator's responsibility for the management of numbering resources is acknowledged in all the operating licences, including those issued to mobile operators, Digicel and TVL. Digicel is the new entrant while TVL is the local telecom operator (section17). There is no explicit mandate provided for in the *Telecommunications and Radiocommunications Regulation Act 2009*[21]. A mandate may be established in the Settlement Agreement between the Government and TVL; however, it has not been possible to review this document as it is confidential.

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[20]   Government of Tonga (2000)
[21]   Government of Tonga (2009)

5   Numbering plan managers

In a liberalized market, the management of a numbering plan should be the responsibility of a national regulatory authority (NRA). This is because numbering, like access to other essential resources that are needed to provide telecommunication services such as licences and access to radiofrequency spectrum, should be managed independently of telecommunication operators. This is in the interests of equality between competitors, and, ultimately, in the overall public and user interest. If numbering matters are managed by one particular competitor in a competitive market, that competitor would have the potential and incentive to use that responsibility in an anti-competitive manner. For instance access to additional numbering resources could be denied or unnecessary or asymmetric conditions could be attached to the use of numbers.

Numbers are an essential resource and all operators should have equivalent rights to their use, although the level of this use and the quantity or type of numbers that an individual operator may require will depend on the types of services that they offer and consumers' demand for them. The design and management of a numbering plan can also be a very technical and complicated job, particularly in large markets with many operators. As such, it typically requires a degree of specialisation that is often not feasible within ministries that must focus on policy issues of a higher order.

In markets that remain statutory monopolies, there is no need for an independent body to assume responsibility for numbering. Indeed, in such circumstances it is unlikely that a suitable independent body will even exist and it is best to leave responsibility with the organization that has the appropriate expertise.[22] However, in anticipation of liberalization in some countries, relevant ministries may retain some power to manage a high level of numbering, that is, of operator codes, and keep some numbers spare for later allocation to new entrant(s) as is the case in Palau.

The trend among the Pacific Island countries of numbering responsibility is shown in **Table 5-1**.

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[22]   Nevertheless, even in such circumstances, there can be value in some form of regulatory oversight or supervision being maintained by a relevant government ministry or department in case, for example, consumers are unsatisfied with how a particular aspect of numbering is being managed.

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**Table 5-1: Summary of the division of numbering responsibilities
in the Pacific Island countries**

		Development of numbering policy and governing framework			Day-to-day management and administration of numbering		
		Ministry	Regulator	Operator	Ministry	Regulator	Operator
Monopoly markets	Cook Islands			✓			✓
	Kiribati		✓			✓	
	Marshall Islands			✓			✓
	Micronesia			✓			✓
	Nauru	✓			✓		
	Niue			✓			✓
	Palau			✓			✓
	Timor Leste		✓			✓	
	Tuvalu			✓			✓
Liberalised	Fiji		✓			✓	
	Papua New Guinea		✓			✓	
	Samoa	✓				✓	
	Solomon Islands	✓				✓	
	Tonga	✓			✓		
	Vanuatu		✓			✓	

5.1   Managing the transitional challenge

A challenge emerges during the process of market liberalization. At such times, ministries of telecommunications or newly established regulators will typically be expected to assume responsibility for the management and day-to-day administration of the numbering plan but are unlikely to have the subject-matter expertise necessary to do so effectively. There are ways in which this transfer of responsibility can be implemented, although the feasibility of each will depend upon the circumstances in the country concerned. Training in numbering matters can be obtained externally and support is also available from regional and international organizations (such as ITU) and the more established regulators in the region. Consultation with industry experts prior to making any proposed changes to the numbering plan or to numbering arrangements generally is particularly important during this period.

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(i) Responsibilities should be divided between the regulator and incumbent at least on an interim basis since the newly established regulator is likely to have more important priorities to deal with during the early stages of liberalization (such as interconnection, pricing, licensing, and access to spectrum). There can be value in the regulator assuming only partial responsibility for numbering issues and leaving responsibility for the remainder with the incumbent, although this raises the issue of who will be responsible for the cost. However, a sensible division of responsibilities would have the regulator responsible for making decisions about allocations and usage, and the incumbent remaining responsible for the implementation of those decisions and the day-to-day administration of the numbering plan. This would provide regulatory oversight of the incumbent's management of the numbering resources and establish an avenue for complaint and remedial action in the event that the incumbent exercises its responsibilities inappropriately.

(i) An industry committee should be established to advise and assist the regulator, with the NRA assuming responsibility for numbering. If all telecommunication operators are involved in decision-making activities, care should be taken not to lose the incumbent's expertise and historic knowledge. A committee of industry participants chaired by the regulator can provide useful ideas and advice to the regulator and generally assist in the regulator's management of the numbering plan. This option provides for the independent management of numbering resources without losing the expertise of the incumbent or, indeed, the new entrants. The *Telecommunications Act, 2009 section 81(1) pp.62)* in the Solomon Islands expressly provides for the establishment of such a committee, but most regulators would be able to establish such an advisory or consultative committee without it being provided for explicitly in the relevant legislation. Many countries with more developed markets maintain such advisory committees long after liberalization so that their management of the numbering plan can continue to benefit from the specialist expertise and direct operational experience of operators.

5.1.1   Potential skill gaps among numbering plan managers

The near-term development needs of numbering plan managers and administrators will differ depending on the precise nature and extent of their role, and their familiarity with technical numbering issues. The latter is likely to depend on how long they have been responsible for numbering issues. This is illustrated in the matrix in **Table 5-2**.

Organizations and individuals are best placed to assess their own relative position within this matrix and thus their development needs.

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Table 5-2: Skills development matrix

	Length of time responsible for numbering	
	LOW	HIGH
HIGH	2	1
LOW	4	3

Level of involvement in numbering management

Those in **quadrant 1** are organizations and individuals that have been managing the national numbering plan and administering numbering resources for many years and have acquired a level of expertise in both numbering issues, generally, and national demands and arrangements, in particular. It is likely that the only countries that currently fall within this category are those where the telecommunication market is still a monopoly and numbering is still managed by the incumbent operator. Examples include Nauru and the Marshall Islands.

Those in **quadrant 2** are organizations and individuals that have recently assumed responsibility for numbering, for example, as a result of market liberalization and the transfer of numbering responsibilities from an operator to a newly established regulator. Samoa and Fiji are examples of countries that be in this quadrant. As the development of organizational capabilities must be forward-looking, it is also sensible to include in this quadrant those organizations that expect to assume responsibility for the management of numbering resources in the near future. For example, this include the Cook Islands. Given the trend towards market liberalization in the region, this quadrant is where we would expect to find most countries.

Those in **quadrants 3 and 4** are organizations and individuals that do not have an active role in the day-to-day administration of numbering, but do have a role in maintaining regulatory oversight or setting the broad policy framework within which numbering is administered. If they have had that role for many years and are familiar with the issues, then they are in quadrant 3; if they are new to the role and the issues, they are in quadrant 4. In the main, these two quadrants tend to include ministries and departments, rather than regulators and operators, although individual managers from all types of organizations may also fall into this category.

The training topics of most importance and relevance to the organizations and individuals in each of the quadrants are outlined in **Table 5-3**.

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Table 5-3: Potential training needs matrix

		Length of time responsible for numbering	
		LOW	**HIGH**
Level of involvement in numbering management	**HIGH**	1. The international context for numbering. 2. How competition is facilitated through numbering. 3. How to structure a numbering plan. 4. How to audit the numbering resources that are in use. 5. The importance of efficient use of numbering and how to promote it. 6. Key issues in developing number assignment processes and procedures. 7. The importance of rules and restrictions relating to access to, and use of, numbering resources. 8. The importance of consulting with industry and consumers on numbering issues. 9. Common challenges and pitfalls and how to overcome them.	1. Assessing and promoting the efficient use of number assignments. 2. Planning capacity to meet future numbering needs. 3. Planning for and managing major numbering changes. 4. Introducing charges of number assignments. 5. Introduction of number pools. 6. Emerging technological challenges for numbering. 7. The costs and benefits of number portability in small markets. 8. ENUM 9. The management and administration of other electronic naming and addressing resources.
	LOW	1. Numbering basics and key principles and concepts. 2. International context for numbering and how to become involved. 3. The division of responsibilities in the management and administration of numbering 4. The organization of numbering plans and why it is important.	1. Emerging technological challenges for numbering 2. How to plan and implement major numbering changes. 3. Issues to consider if wanting to introduce charges for numbers. 4. Industry management vs regulatory management of certain numbering activities

5.2 National numbering plans

All countries have a formal numbering plan, with the exception of Niue[23]. However, the level of awareness of the existence of these plans is low in some countries, for example, the government representatives of Marshall Islands and Micronesia were uncertain about whether or not they have a formal numbering plan even though the operators themselves knew that their respective countries do have a national numbering plan. This reflects the limited knowledge of government in countries where monopolies exist.

Most countries use the format recommended in ITU Recommendation E.129[24] for the presentation of their numbering plans. The format is important for creating consistency at an international level; however, the existence of the format also appears to have led most of the study countries not to develop or formalise any rules or restrictions relating to the assignment or use of numbers, or include them as part

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[23] Niue referred the consultant to its telephone directory and ITU has never received notification of a numbering plan from Niue.

[24] ITU (2006)

of their numbering plan. This would not in itself be a cause for concern except that only one of the study countries has any supplementary numbering regulations in which such rules or restrictions on usage have been (or can be) documented. This is Papua New Guinea, whose numbering code of practice provides a sound example for the other study countries.

As far as possible, the study countries' numbering plans have been assessed against international best practices in section **Error! Reference source not found.**. A few countries intend to review their numbering lans imminently, with a view to ensuring sufficient numbering capacity is provided for in the future. This is likely to be an important development area and suitable for a capacity-building project using external expertise.

5.2.1   Submission of numbering plans to ITU

Based on the responses to the data requests, all but three countries are aware of the need to provide ITU with a copy of their national numbering plan. A review of ITU webpage[25] that makes these plans available publicly shows that all countries except Niue have done this. It is possible to conclude that, although there may not be a universal awareness of the need among those that responded to the data request, there is certainly awareness among those that are responsible for the Actual day-to-day management of numbering resources.

The dates of each country's most recent advice to ITU are shown in **Table 5-4**. Each country should compare these dates with the dates of the most recent changes to their numbering plans to determine whether processes are in place to keep ITU informed of such changes.

5.2.2   Numbering plan reviews

Regular reviews of numbering plans are important as a means of ensuring that the management of numbering responses is responsive to the changing needs of telecommunication operators and end-users. Such reviews also ensure that numbering arrangements reflect the true and current industry practice. The frequency of such reviews is dependent on the numbering plan's level of complexity, with the more complicated plans requiring more frequent and more detailed reviews. Such complexity is typically a reflection of the size and maturity of the market, and it is unreasonable to expect that numbering plans will be reviewed as regularly as they tend to be in Europe or other parts of the Asia Pacific.

A general review of numbering arrangements once every 18-24 months, and a more strategic and forward-looking review every four years or so, would be appropriate and prudent for most of the countries covered in this study. However, it is more important that reviews coincide with any significant changes to the industry, such as the entry of additional operators, introduction of new services or technologies, and changes to key policies. For example, the licensing of a new entrant appears to have been the main impetus for the most recent reviews in Tonga and Vanuatu.

Table 5-4 shows the year in which each country last reviewed its numbering arrangements; whether it has indicated that it intends, or needs to, review its numbering arrangements in the near future; and the date of the most recent notification to ITU. All countries that indicated they propose to review numbering arrangement in the near future also indicated that they do not believe they have sufficient resources or capabilities within their organizations to complete the reviews without some sort of specialist assistance. There is an obvious need for capacity development in this area. In preparation for the reviews, it would be worthwhile focusing capacity building on the up-skilling of organizations and key individuals so that when the time comes to conduct the actual review, they are familiar with the general process and can effectively engage with any external specialists appointed to conduct the review.

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[25]   www.itu.int/oth/T0202.aspx?parent=T0202

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Table 5-4: Timing of numbering plan reviews

	Last reviewed or amended	Last update to ITU	Stated intention to review or update in new future
Cook Islands	2009	9/3/2006	Yes
Kiribati	Not known	6/1/2004	Yes
Marshall Islands	Not known	8/7/2009	Yes
Micronesia	Not known	28/11/2002	No
Nauru	Not known	5/11/2009	No
Niue	Not known	Not known	No
Palau	Not known	18/7/2006	No
Timor Leste	Not known	8/8/2003	No
Tuvalu	2009	16/10/2009	No
Fiji	Not known	14/8/2008	Yes
Papua New Guinea	2008	4/1/2010	Yes
Samoa	2009	28/9/2009	Yes
Solomon Islands	2008	4/2/2010	Yes[26]
Tonga	2010	1/10/2008	Yes
Vanuatu	2010	15/4/2010	Yes

5.2.3   Supplementary numbering documents

A few of the study countries have specified rules, procedures and policies relating to numbering in other documents, such as codes of practice or regulations. A list of these documents is in **Table 5-5**.

Table 5-5: List of supplementary national numbering documents

Country	Document title	Availability
Papua New Guinea	Numbering Code of Practice	Papua New Guinea Telecom website[27]
Samoa	Numbering Policy	Currently in development
Vanuatu	Digicel Licence	Regulator's website[28]
	TVL Licence	
	Settlement agreement between TVL and government	Confidential

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[26]   Section 82(1) of the Telecommunications Act 2009 precludes the telecommunication commissioner from reviewing or changing particular numbering arrangements within the first two years that the Telecommunications Act is in force.

[27]   Government of Papua New Guinea (2009) Available at
http://www.nicta.gov.pg/public_register/Numbering/PNG%20Numbering%20Code%20of%20Practice.pdf

[28]   Available at www.telecomregulator.gov.vu

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5.3 Number allocation and assignment methods

There is considerable variation in the number allocation and assignment processes in the region. Most countries have processes that are either informal or undocumented, which reflects the prominent role incumbent operators still play in the administration of numbering resources (including in some of the liberalized markets). Papua New Guinea is the exception and has set out detailed numbering assignment criteria and processes in a code of practice. A number of the other liberalized markets are in the process of, or intend to, document numbering assignment procedures in guidelines or regulations.

5.3.1 Numbering assignment practices in the monopoly markets

As numbering tends to be administered by the telecommunication operators in the monopoly markets there are few documented practices relating to assignment and allocation. The exceptions are Kiribati and Timor Leste, both of which are apparently developing documented processes in preparation for the liberalization of their markets.

5.3.1.1 Cook Islands

The Cook Island Government confirmed that there are not any documented practices relating to number assignment. Decisions about assignments are made by telecommunication engineers from Telecom Cook Islands.

5.3.1.2 Kiribati

Although there are not any documented procedures, the Telecommunications Authority of Kiribati is preparing guidelines covering applications for, and the assignment of telephone numbers. The current practice links the assignment of numbers to the completion of an application form to supply public telecommunication services. The size of the number blocks allocated is not fixed and will vary depending on the quantity of numbers requested. The Kiribati Regulator advises that it has a policy whereby operators wishing to use telephone numbers must pay a charge. No further information was available to indicate what level those charges are set at, whether they are one-off payments or recurring charges, or whether they are intended to recover costs or raise revenue.

5.3.1.3 Marshall Islands

The Marshall Islands have confirmed that there are not any documented procedures relating to number assignment. The Secretary of the Ministry of Transport and Communications advised that the management of telephone numbering is done by the Telephone Operator and not the Government.

5.3.1.4 Micronesia

The Assistant Secretary of the Division of Communications in Micronesia advised that it is the incumbent telecommunications operator are responsible for Micronesia's numbering resources and assignment of numbers, and advise ITU of their numbering system.

5.3.1.5 Nauru

The Regulator office within the Ministry of Communication is responsible for managing the numbering resources, and sends the numbering plan to ITU. The Regulator is responsible for allocating numbering to the operator.

5.3.1.6 Niue

Niue advises that there are not any documented procedures for assigning numbers. The Director of the Telecommunications Department is responsible for assigning numbers, but it is unclear whether this responsibility covers the assignment of numbers to Telecom Niue or to end-users directly. In the case of international premium services, the Cabinet must approve the number range.

5.3.1.7 Palau

Palau has confirmed that there are not any documented procedures relating to number assignment.

5.3.1.8 Timor Leste

It is understood that a procedure has recently been documented and proposed to ARCOM (the regulator), but it was not among the documents that were made available for this study. A proposed application procedure involves the completion of an application form and a confirmation of the number range's availability via a database lookup. Fixed telephony numbers are allocated in blocks of 1,000 numbers and mobile numbers in blocks of 10,000 numbers. A maximum of one block of numbers is assigned at a time.

5.3.1.9 Tuvalu

Tuvalu has confirmed that there are not any documented procedures relating to number assignment, although it has been selling its premium '900' number series since 1998.

5.3.2 Numbering assignment practices in the liberalized markets

Number assignment practices vary across the liberalized markets, with many countries still yet to document or formalise either the process or the eligibility and assessment criteria. Papua New Guinea is the exception and has documented its processes and procedures, together with rules relating to the use of numbering resources, in a numbering code of practice. Papua New Guinea and Vanuatu are the only two countries that appear to examine an applicant's use of existing numbering assignments before assigning additional numbers.

5.3.2.1 Fiji

It is understood that numbering assignment practices have been documented, at least in draft form, but this cannot be confirmed because information from Fiji was not made available to the consultant.

5.3.2.2 Papua New Guinea

Papua New Guinea has exceptionally well-documented number management and assignment practices. The Numbering Code of Practice sets outs the rules and processes governing the assignment and use of numbering resources.

NICTA (soon to be replaced by the National Information Communications Technology Authority (NICTA)) will only accept applications for additional numbering resources once 60 per cent of any existing geographic number assignments are utilized, or 50 per cent of any existing mobile number assignments are utilized.

Geographic numbers are assigned in blocks of 10,000. The application process requires a licensee to provide specific information in a prescribed form, namely:

- numbers reserved for actual customer orders and a forecast of expect utilization for the reserved numbers;
- the zone code (that is the national destination code for which the numbers are requested);

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- the exchange service area for which the numbers are requested;
- the local calling area for which the numbers are requested.

Mobile numbers are assigned in blocks of 100,000. An application for mobile numbers must include:

- mention of the numbers reserved for actual customer orders and a forecast of expected utilization for the reserved numbers;
- the network access code;
- the service area (providence or district) for which the numbers are requested;
- the city or town for which the numbers are requested.

Licensees are also required to submit a quarterly status report to NICTA showing the level of number utilization and the projected number usage within their networks.

In considering an application, NICTA will take into account:

- the principles and guidelines specified in the Code of Practice and the numbering plan;
- any relevant licence conditions;
- whether NICTA considers that the proposed use of the numbering range is appropriate;
- the views of the licensee and other interested parties.

NICTA will deny an application if:

- the requested number blocks are not available;
- the applicant does not meet the eligibility criteria;
- the planned activation date is beyond a reasonable period;
- the planned services are not considered to be appropriate for implementation on the requested number ranges;
- a previous allocation remains significantly underutilized compared to the licensee's stated plans;
- a previous related allocation has been used for services or purposes other than those specified or permitted in the terms of the allocation;
- it is considered that the reservation or allocation would unfairly impede competition.

NICTA will make a decision on an application within 45 days of its receipt, unless NICTA requests further information from the applicant, and all decisions are notified to the applicant in writing.

NICTA charges an application fee and application processing fee. It is unclear whether these charges are for the purposes of cost recovery.

5.3.2.3 Samoa

The regulator has documented new numbering management and assignment practices in a draft *Policy Guideline on the Use of Numbers*, which he expected to consult on and finalise during 2012. Currently, service providers make a written application to the regulator for numbers. The size of the number blocks allocated varies to reflect the needs and purposes outlined in the application letter.

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5.3.2.4 Solomon Islands

There are currently not any documented procedures for the management and assignment of numbers in the Solomon Islands, although this will change in the near future. Section 81 of the *Telecommunications Act 2009*[29] provides for geographic numbers to be assigned in blocks of 1,000 and mobile numbers in blocks of 10,000 until such time as an alternative practice is documented in a revised numbering plan (although the Telecommunications Commission may allocate blocks of a different size if justifiable).

5.3.2.5 Tonga

The number assignment practices in Tonga are not yet documented but there is an intention to do so. There are not any fees associated with numbering applications or usage but there is an intention to introduce some in the near future.

5.3.2.6 Vanuatu

Number assignment in Vanuatu is governed by clauses in the licences of TVL and Digicel (and also in all the other telecommunication licences issued), which provide for the regulator to allocate blocks of numbers to the licensees upon request. The regulator's practice is to allocate numbers in blocks of 1,000 after checking that at least 40 per cent of the applicant's existing number allocations (for the same type of service) are being utilized. In the case of a new service, the regulator would typically assign 2½ times the expected number of users of the service three years into the future. There are not any associated fees.

This procedure is apparently documented in the Settlement Agreement between the government and TVL, however this document is confidential. The *Telecommunications and Radiocommunications Regulation Act 2009*[30] enables the regulator to document additional numbering practices in regulations but no such regulations are intended to be made in the near future.

5.4 Number structure

Telephone numbers in the region are most commonly seven digits in length. The prefix digits of fixed numbers provide an indication of the broad geographic location of the called party. The prefix digits of mobile numbers indicate the called party's network operator.

5.4.1 Number length

Fixed telephony numbers tend to be either five or seven digits in length, while mobile numbers tend to be seven digits in length.

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[29] Government of Solomon Islands (2009)
[30] Government of Vanuatu (2009)

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Figure 5-1: Maximum lengths of fixed telephony numbers

	1	2	3	4	5	6	7
Cook Islands							
Fiji							
Kiribati *							
Marshall Islands							
Micronesia							
Nauru							
Niue							
Palau							
Papua New Guinea							
Samoa							
Solomon Islands							
Timor Leste							
Tonga *							
Tuvalu							
Vanuatu							
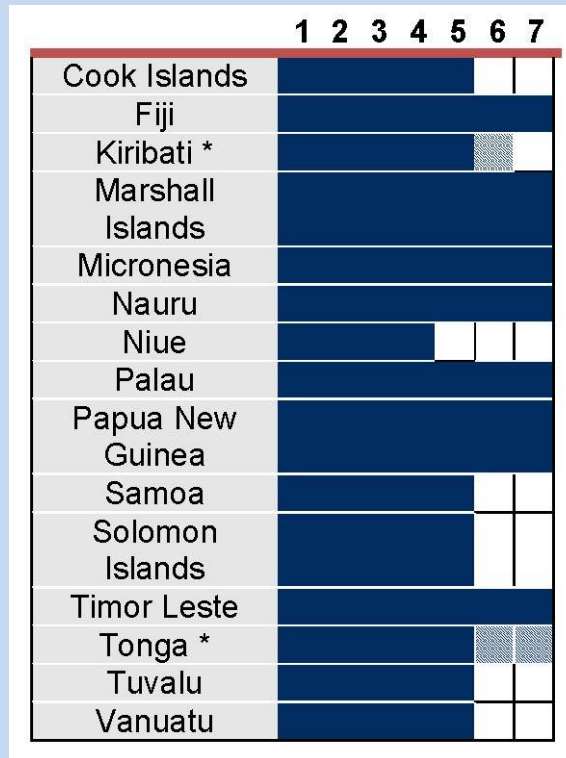
* Tonga recently increased and Kiribati intends to increase the length of their fixed telephony numbers.

Figure 5-2: Maximum lengths of mobile numbers

	1	2	3	4	5	6	7	8
Cook Islands								
Fiji								
Kiribati *								
Marshall Islands								
Micronesia								
Nauru								
Niue								
Palau								
Papua New Guinea								
Samoa								
Solomon Islands								
Timor Leste								
Tonga								
Tuvalu								
Vanuatu								
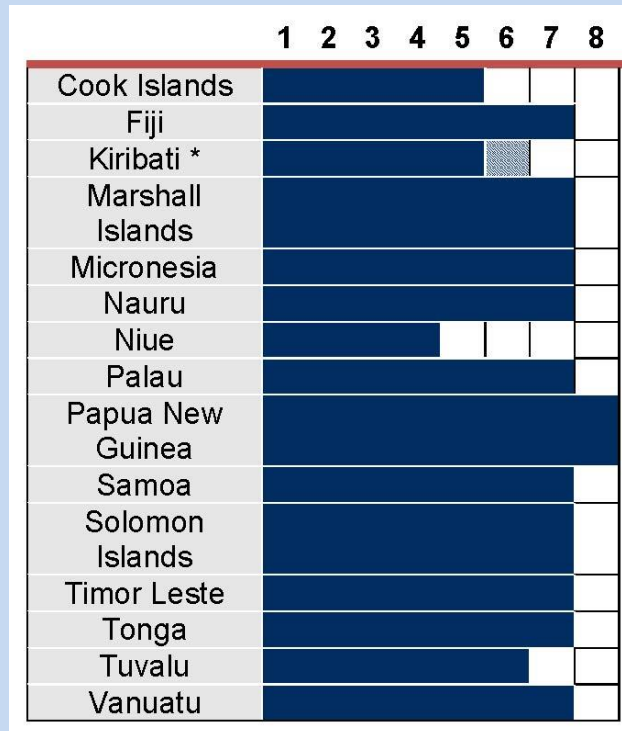
* Kiribati intends to increase the length of its mobile numbers.

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5.4.2   Significance of number prefixes

The prefixes of fixed telephony numbers tend to indicate that the called party is in a particular (although possibly broad) geographic region. It is not possible to determine whether those prefixes also indicate likely call costs to the calling party without additional information about the standard pricing structures adopted in each country. Mobile prefixes indicate the identity of the called party's mobile network operator.

Table 5-6: Significance of the prefix digits of fixed and mobile telephony numbers

	Fixed number prefixes indicate geographic region	Fixed number prefixes indicate likely call costs	Mobile number prefixes indicate network operator
Cook Islands	Yes	Not available	Yes
Fiji	Yes	Yes	Yes
Kiribati	Yes	Not available	Yes
Marshall Islands	Yes	Not available	Yes
Micronesia	Yes	Not available	Yes
Nauru	Yes	Not available	Yes
Niue	Yes	Not available	Yes
Palau	Yes	Yes	Yes
Papua New Guinea	Yes	Not available	Yes
Samoa	Yes	Not available	Yes
Solomon Islands	Yes	Not available	Yes
Timor Leste	Yes	Not available	Yes
Tonga	Yes	Not available	Yes
Tuvalu	Yes	Not available	Yes
Vanuatu	Yes	Not available	Yes

5.5   Short codes

Few countries have documented or formalised policies governing the use of short codes. The exception is Papua New Guinea, which sets out the assignment process and assessment criteria in its Numbering Code of Practice. Samoa intends to document its policies in the numbering guidelines that are currently being developed. Vanuatu is gathering information about the various operator-specific short codes that are currently in use with a view to possibly rationalising the number of short codes or establishing some standard short codes. Some of the short codes currently being used in the region to access common types of services are shown in **Table 5-7.**

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Table 5-7: Short codes in use in the region

	Emergency	Directory Assistance	Int'national directory assistance	Fault reporting	Weather/ tidal info	Customer service
Cook Islands	999	010	015			123
Fiji						
Kiribati	992/993/994	103		100		
Marshall Islands	911	411				
Micronesia	111					
Nauru	110/111/112	192				123
Niue	999	015		010	101	
Palau	911					
Papua New Guinea	11x					15xx
Samoa	995/994/996	933	900			
Solomon Islands	911/922/ 988/999	109/901	111/112	104	933	
Timor Leste	None advised	None advised	None advised	None advised	None advised	None advised
Tonga	911/922/999					
Tuvalu	911/000/999	010/012		444/555		
Vanuatu						

5.6 Best practice guidance for numbering management

In 2006, the European Communications Committee (ECC) within the European Conference of Postal and Telecommunications Administrations (CEPT) noted some common objectives guiding the organization of national numbering plans.[31]

- Tariff transparency for callers (that is enabling callers to obtain an indication of the tariff level from the first 1-3 digits of a national number)[32]

- An indication of the location of the called party for fixed services (although this tends to conflict with nationwide location portability and some countries prefer to remove or reduce location information)

- Grouping of similar services that some subscribers may wish to bar (for example, adult services, gambling or services with very high tariffs)

- Grouping of similar services for which the caller may have particular special expectations, for example, grouping of mobile services where calls may be intrusive, grouping of paging services, or grouping of services which may support the movement of fixed numbers to a different location.

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[31]   In ECC Report 087: The Future of E.164 Numbering Plans and Allocation Arrangements, available at www.erodocdb.dk/Docs/doc98/official/Word/ECCREP087.DOC

[32]   Although the relevance and significance of such information in numbers is starting to be eroded by new technologies such a VoIP and changing consumer expectations.

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- Continuity of numbering for users of essentially the same service (that is, avoiding the need to change number when new features are added to a service, for example, allowing existing fixed numbers to move to a different location.
- Grouping of similar services that require similar call handling, for example, number translation and portability
- Grouping of similar services that are subject to similar regulatory requirements, for example, number portability and the ability to support calls to emergency services.

Not all of these objectives will be directly relevant to, or align with the national objectives of, the study countries. Although their numbering plans must reflect national priorities and objectives, it is still possible to identify some high level and relevant best practice guidance for the development and content of numbering plans. These are outlined in sections 5.6.1-5.6.4 around the themes of general numbering management, numbering plan content, number ranges and assignment processes.

As much as possible, each of the study country's existing arrangements have been assessed against these principles. The findings are shown in Table 5-8.

This best practice guidance is based on the widely accepted and effective numbering practices in various developed markets around the world and from the past work of various international coordination and standardization bodies.[33] However, given the need to tailor numbering plans to national contexts, it is reasonable to expect numbering plan managers to optimise rather than maximise all of the virtues and objectives listed.

5.6.1 Best practice guidance on general numbering management

The management and administration of numbering resources should be carried out in a manner that:

- is objective and non-discriminatory: all operators should have equal access to equivalent numbering resources and be subject to common rules about their use;
- is proportionate: numbering arrangements reflect and accommodate the size and maturity of the market and the needs and resources of the industry;
- is timely and transparent: decision making is time-bound and involves public consultation, and decisions and the reasons for them are published;
- is independent of telecommunication operators;
- ensures numbers are available when needed and do not have to be changed rapidly;
- enables consumers to understand what service they are purchasing when they call a number and at what price;
- provides for review of decisions made by the numbering plan manager;
- involves and values consultation with industry and end-users.

Table 5-8 illustrates how each study country has been assessed against these best practices.

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[33] In particular ECTRA/REC(98)03 – ECTRA refers to the European Committee of Telecommunication Regulatory Affairs

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Table 5-8: Assessment of general numbering management against best practice guidelines

	Objective & non-discrim.	Proportionate	Timely & transparent	Managed independently	Scope for review of decisions	Consultation with stakeholder
Cook Islands	n/a	2	1	n/a	n/a	n/a
Kiribati	n/a	2	1	n/a	n/a	n/a
Marshall Islands	n/a	2	1	n/a	n/a	n/a
Micronesia	n/a	2	1	n/a	n/a	n/a
Nauru	?	?	?	n/a	n/a	n/a
Niue	n/a	2	1	n/a	n/a	n/a
Palau	n/a	2	1	n/a	n/a	n/a
Timor Leste	n/av	n/av	n/av	1	n/av	n/av
Tuvalu	n/a	?	?	n/a	n/a	n/a
Fiji	n/av	n/av	n/av	n/av	n/av	n/av
Papua New Guinea	3	3	3	3	1	3
Samoa	3	2	2	3	1	?
Solomon Islands	2	3	1	1	1	1
Tonga	n/av	n/av	n/av	3	1	n/av
Vanuatu	3	3	2	3	3	n/av

n/a = not applicable

n/av = information not available

? = assumption but could not be confirmed

5.6.2 Best practice guidance on the numbering plans

The national numbering plan (together with any associated numbering regulations) should:

- be consistent with relevant ITU-T recommendations;
- provide sufficient capacity for numbering requirements in both the short and long term;
- be stable;
- treat different providers of the same services equivalently and be (as far as practicable) technology-neutral;
- set the boundaries for the use of numbers by operators and end-users but not prevent innovation;
- promote efficient use of numbering resources.

5.6.3 Best practice guidance on number ranges

Number ranges should:

- provide a degree of tariff transparency (to the extent demanded or expected by end-users);

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- be allocated in block sizes that promote and foster efficient use;
- accommodate the needs and expectations of consumers.

5.6.4 Best practice guidance on number assignment

In relation to the assignment of numbers to operators:

- The types of entities that are eligible to request and receive an assignment of numbers are defined in writing
- The information required to accompany or support an application for numbers is specified in writing
- Assignment operates on a 'first come, first served' basis or through a competitive process where demand exceeds supply (for example, commercial '900' numbers or otherwise attractive universal access numbers)
- The grounds on which a request for an assignment of numbers may be refused are specified in writing
- Any fees that are associated with the submission of an application for, or the receipt of, an assignment of numbers are based on the principle of cost-recovery and/or increasing efficient use of numbers
- It is specified in writing that an assignment of numbers confers a right of use, not ownership (although '900' and universal access numbers may be sold in secondary markets).

5.7 Number portability

Number portability has not been introduced in any of the study countries. There are no current plans to introduce it in the future, although some countries, including Tonga and Marshall Islands, have indicated that they intend to look at this in the future.

5.7.1 Pre-implementation requirements

5.7.1.1 Fiji

In Fiji, under section 44 of the Telecommunications Promulgation, the Minister may, on the advice of the Telecommunications Authority of Fiji, make regulations that require the introduction of number portability if there is 'a reasonable likelihood of consumer demand' for it. However, there is no indication how such demand is to be assessed or measured. In advising the Minister on this matter, the Telecommunications Authority would first need to conduct a burden-benefit analysis as this is the priority rather than cost benefit.

5.7.1.2 Samoa

In Samoa, the regulator may, after consultation with stakeholders, issue an order directing one or more service providers to implement number portability in a manner and on a timeline that must be approved by the regulator as stated in the *Telecommunication Act 2005* (section63). However, in considering whether or not to take such a direction, the regulator must give due regard to the costs that would be incurred by service providers and the availability of technology that would permit cost-effective implementation.

5.7.1.3 Solomon Islands

Under section 83 of the *Telecommunications Act 2009*[34] the Telecommunications Commission may require the introduction of number portability after first conducting an analysis of the costs and benefits of implementation and its technical feasibility. However, that act also prevents the Telecommunication Commission from commencing such a study before 1 April 2012 or requiring number portability to be introduced before 1 April 2013.

5.7.1.4 Papua New Guinea

Under section 189 of the *National Information Communications Technology Authority Act 2009*[35] NICTA may conduct a public inquiry into the costs and benefits of introducing mobile number portability. After consultation with affected stakeholders, NICTA may make recommendations to the Minister about the introduction of number portability. However, the Minister retains the discretion to accept, reject or modify the recommendations.

5.8 Naming resources management

Limited information has been made available regarding the existing arrangements governing the management of Internet Top Level Domain Name or ccTLD in the study countries. A small number of countries have been found to be either currently managing, or to have provided for the future management of, the ccTLD in a manner akin to national numbering resources. Generally, this is only those countries with relatively recent legislation relating to the ICT sector, such as the Solomon Islands and Papua New Guinea. However, domain names in the study countries appear to be managed with even less prescription than numbering resources. It is likely that there are limited capabilities and expertise in the administration of ccTLD across the study countries and that this is an additional area that would benefit from capacity-building projects with subject-matter experts.

5.8.1 Niue

Although numbering is not specifically mentioned or addressed in the *Communications Act 1989*[36], responsibility for electronic addressing and the allocation of the ccTLD '.nu', is vested in the National Information Technology Committee.

5.8.2 Solomon Islands

Under the *Telecommunications Act 2009*, the responsibility for the registration and management of the '.sb' ccTLD must transfer from Solomon Telekom to the Telecommunications Commission or one of its nominees within 12 months of the appointment of the commissioner (section84 and section135). The Telecommunications Commission is also empowered to enforce specific rules, guidelines and procedures for the registration and allocation of domains.

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[34] Government of Solomon Islands (2009)
[35] Government of Papua New Guinea (2009)
[36] Government of Niue (1989)

5.8.3 Papua New Guinea

Under section 184(3)(d) of the *National Information Communications Technology Act 2009*[37], the NICT Authority may include in the number plan, rules relating to the registration and management of Internet domain names. It is also important to point out that there are other models available in the Pacific Islands such as the outsource model for ccTLD. For example, in Tuvalu, '.tv' is outsourced and currently managed by Verisign.

Table 5-12: Internet country code top-level domain resource management

Country	ccTLD	Relevant governing legislation	Body responsible for management	Recognised or treated as a national numbering resource
Cook Islands	.ck	none	Telecom Cook Islands	no
Fiji	.fj	none	University of the South Pacific	no
Kiribati	.ki	none	Ministry of Communications, Transport, and Tourism Development	Yes
Marshall Islands	.mh	none	Cabinet Office	no
Micronesia	.fm	none	FSM Telecommunications Corporation	no
Nauru	.nr	none	CenpacNet	no
Niue	.nu	*Communications Act 1989*	Internet Users Society	No
Palau	.pw	none	Micronesia Investment and Development Corp	no
Papua New Guinea	.pg	*NICTA Act 2009*	Papua New Guinea University of Technology	Yes
Samoa	.ws	none	Ministry of Foreign Affairs	no
Solomon Islands	.sb		Solomon Telekom	Yes
Timor Leste	.tl		Ministry of Infrastructure	unknown
Tonga	.to	*Communications Act 2009*	Government	Yes
Tuvalu	.tv	none	Ministry of Finance	no
Vanuatu	.vu	none	Telecom Vanuatu Ltd	no

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[37]   Government of Papua New Guinea (2009)

# 6 Misappropriation of national numbering resources

An international number is intended to indicate both the intended destination country and the intended recipient of a call. However, over the years, the high accounting settlement rates that are often attached to the termination of internationally originated traffic has created an incentive to use international country codes as pseudo-premium rate services or revenue share numbers. Such use of country codes may be authorised by the relevant numbering administrator, or may occur without their consent or knowledge. The authorised use of country codes in this manner is not within the scope of this study, which is focused on the unauthorised use of an administration's country code and N(S)Ns.

Although the term 'number hijacking' is often used within the Pacific region to describe such activities, it is more correctly labelled 'number misappropriation' by ITU as the practice is not as blatant as the term 'hijack' implies, and because 'hijack' is not a word that translates well into ITU's other official languages, in particular French and Arabic. For international consistency and to promote a common understanding and nomenclature, it is recommended that the phrase 'number misappropriation' also be used within the Pacific.

6.1 How it happens

The unauthorised use of a country's numbering resources is most commonly associated with the supply of premium-rate content services in another country. Examples of such premium-rate services include live or recorded information services, competitions and tele-voting, telephone sex services, and two-stage dialling access services. In the normal course of events, a service provider that supplies premium-rate content services (who may or may not also be the operator of a telecommunication network) will advertise its services and the premium-rate telephone number that has been issued to it for that purpose. Calls to the number will typically be charged on the basis of duration but they could also be charged either at a flat rate or a combination of the two.

As shown in **Figure 6-1**, a call to a premium-rate number is originated by a caller's originating-access service provider. This provider bills the customer for the cost of the call. The originating-access service provider will retain a small portion of the revenue collected from the caller and pass the remainder onto the terminating-access service provider. The value of the portion retained will typically have been pre-determined by either the regulator, based on costs with a small mark-up for profits, or by the operators themselves, based on a revenue-sharing formula. The terminating-access service provider will retain a portion of the call revenue (that is, its termination rate) and will pass the remainder of the call revenue onto the premium-rate service provider.

Figure 6-1: International routing scenario of an international premium-rate service

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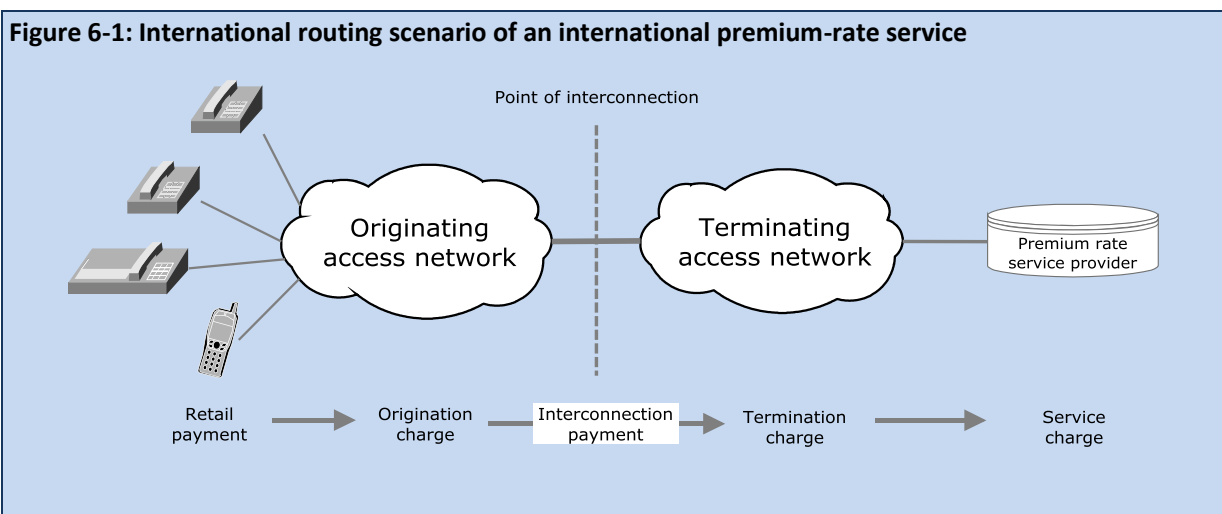
There are two scenarios in which a premium-rate service provider might seek to misuse a country's numbering resources, one involving the country concerned and the other without the involvement or possibly even the knowledge of anyone in the country concerned.

6.1.1   Scenario A: authorised use

In this scenario, the premium-rate service provider will establish itself in Country A and enter into a revenue-sharing agreement with a local telecommunication operator. The premium-rate service provider will advertise and supply its premium-rate services to consumers in Country B. The consumers in Country B access those services by calling a telephone number in Country A. This may circumvent any consumer protection regulations or access restrictions that Country B may apply to the supply of premium-rate content services using premium-rate numbers.

Although such a use of a country's numbering resources may not be authorised by the relevant numbering plan administrator or regulatory authority, it still requires the premium-rate service provider to enter into a consensual revenue-sharing agreement with someone, such as a local telecommunication operator, to be effective. Since such an agreement is consensual, this type of scenario is outside the scope of this study and is not considered further.

6.1.2   Scenario B: unauthorised use

In this scenario, the premium-rate service provider enters into a revenue-sharing agreement with an originating-access network operator in Country A or (more commonly) an international transit network operator. The relevant operator agrees to route to the premium-service provider all calls from Country A to a particular number or number range belonging to Country B (for example, +989 123 4567). The premium-rate service provider will then advertise these numbers in conjunction with its services in Country A, or whichever countries are likely to direct calls through the transit operator. Under the terms of the revenue-sharing agreement, the transit network operator routes to the premium-rate service provider all the calls that are made to the Country B number that originate in Country A (that is instead of to an international gateway operator in Country B). To ensure that calls are carried by the partner transit network, the relevant carrier selection codes might also be included in the advertisement. The termination fees that are charged and collected by the originating operator, and which would normally be paid to the terminating-access network operator in Country B, are retained by the transit operator and shared with the premium-service provider.

This practice is known as short-stopping because the routing of the call stops short of the appropriate destination country. It is also variously known as long lining and number hijacking. In ITU parlance, it is typically referred to as either the misappropriation or misuse of numbers.

In this scenario, there are first-order victims and second-order victims. The first-order victims are those end-users (in Country B) whose numbers have been misappropriated. Although they will continue to receive calls that originate nationally, and perhaps also internationally, they will not receive any calls from Country A that are transited by the partner transit operator. Such victims are uncommon as the perpetrators of a number misappropriation will usually try to use numbers that have not yet been assigned to an end-user or activated. However, if end-users are regularly receiving nuisance calls from particular international regions enquiring about a particular premium-rate product or company, it may indicate that that telephone number is being advertised in that region in association with that product or company.

The second-order victims are a consequence of the remedial action that is sometimes taken by regulators and telecommunication operators in the country where the misappropriation is being effected in an effort to protect the consumers in that country. For example, upon discovering that calls to telephone numbers in particular countries are being short stopped as part of a fraud, it is not uncommon for regulators and

operators to block all outgoing calls to all number ranges associated with that country. As a consequence, all end-users in the country whose numbers have been misappropriated (that is end-users in Country B) effectively become victims as they are unable to receive calls from the country that imposed the block. These end-users are unlikely to become aware of the problem unless they regularly receive or expect inbound international calls from that particular country. Further, the international gateway and local trunk network operators in the country whose numbers have been misappropriated are also victimised through the possible loss of revenue from terminating inbound international call traffic from the country that imposed the block. In addition, the country itself can also be a victim because its international reputation may be tarnished through an assumed association with the fraudulent activities of those responsible for the misappropriation.[38] For example, in the international community, the misappropriation could be assumed to be of the Scenario A variety and thus condoned by the numbering plan manager or incumbent operator.

6.1.3   Auto-diallers and modem-hijacking

A variation on this misappropriation involves the use of auto-dialler software that is downloaded onto the computer of an Internet-user and changes the dial-up settings of the user's modem to generate calls to a misappropriated number. While auto-dialler software is more of a user-side problem and cannot be entirely linked with number misappropriation, there is still a role for the responsible institution to educate users and/or make such an issue a crime in cybercrime legislation. This is variously called Internet-dumping, modem hijacking or simply the problem of auto-diallers. The auto-dialler software will typically be downloaded without the user's knowledge or informed consent, often as a result of clicking on a pop-up advertisement screen while visiting a pornographic, gaming or file-sharing website or via an email-distributed virus. The auto-dialling software is self-executing and disconnects the user's modem from its usual dial-up Internet access number and reconnects it to an international number.[39] This effectively connects the user to the Internet at an international call rate rather than the local call rates that apply to dial-up Internet access. This may occur during or immediately after an Internet dial-up access session. The Internet user would not typically discover the fraud until they received an unexpectedly high bill showing calls to an international destination.

The most effective solution to the problem of auto-diallers has been replacing dial-up Internet access with broadband access. Indeed, the fraudulent use of auto-diallers in many countries has been resolved or avoided through the progressive transition to broadband. However, it does remain a problem where dial-up Internet continues to be used.

6.2   Blocking country codes in response to misappropriation

A common response by regulators and telecommunication operators to the discovery that calls to numbers in particular countries are being misappropriated as part of a fraud is to block all outgoing international calls to all number ranges which are the '900' series associated with that country. For example, such blocks were applied in Australia in response to the auto-dialler case mentioned in **Box 6-1**. Although such action victimises end-users (and potentially also telecommunication operators) in the country whose numbers have been misappropriated, blocking a country code is a common response because the problem is typically framed as a consumer protection issue (that is protecting consumers from fraud or unexpected high bills) rather than a numbering issue. However, asking the local operators to block payment to such B-parties (country receiving the call) is more effective than blocking country codes. Regulators and telecommunication operators will typically only consider the problem from the

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[38]   In the public consultation by ComReg on its proposed action against auto-diallers in Ireland (discussed in section 6.2.1), ComReg reports that one 'respondent does not believe that any of the individual [listed countries] will act in any conclusive manner to solving dialler scams', reflecting an assumption that is the blocked countries that are responsible for either the problem or for solving it. (ComReg 04/99, p.12).

[39]   An alternative scheme sees the modem reconnected to a national premium-rate telephone number.

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perspective of the A-party (where the call originates from). Any consideration given to the implications arising from a solution involving blocking country codes will similarly tend to focus on the A-party and the ability to originate calls to the blocked country, rather than the second-order effects on the potential B-parties in the country to be blocked.

Box 6-1: An example of the auto-dialler problem in Australia [40]

In Australia, the problem of auto-diallers (known locally as 'Internet dumping') first became evident in early 2001. In January that year, the first month for which the Telecommunications Industry Ombudsman (TIO) collected data on the number of complaints from victims of Internet dumping, there were 51 complaints. Three years later, in the third quarter of 2003, the TIO received more than 730 complaints from Australian victims of Internet dumping.

The amounts being charged to consumers ranged from AU$0.37 to AU$3,500, with the average (for November 2003) being AU$194. The countries that these auto-diallers were generating calls to (and thus the countries whose numbers were presumably being misappropriated) included:

• Cocos Islands

• Cook Islands

• Diego Garcia

• Tokelau Islands

• Sao Tome

• Chile

• Guyana

• Lichtenstein/Germany

• Moldova

• North Korea.

If action is taken to block a country code, the country imposing the block should inform the affected country via the ITU Secretary General. Article 35 of the ITU Constitution states that:

'Each Member State reserves the right to suspend the international telecommunication service, either generally or only for certain relations and/or for certain kinds of correspondence, outgoing, incoming or in transit, provided that it immediately notifies such action to each of the other Member States through the Secretary-General.' [41]

Further, Article 7 of the Administrative Regulations (Radio Regulations and International Telecommunication Regulations), which complement the Constitution and the Convention, states:

'If a Member exercises its right in accordance with the Convention to suspend international telecommunication services partially or totally, that Member shall immediately notify the Secretary-General of the suspension and of the subsequent return to normal conditions by the most appropriate means of communication. The Secretary-General shall immediately bring such information to the attention of all other Members, using the most appropriate means of communication.'

If particular numbers (as distinct from number ranges) are able to be identified, an international telecommunication operator can block all outgoing traffic to that particular number without affecting the routing of traffic to all the other numbers under that relevant country code. This is obviously a more

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[40]   Data drawn from TIO media release, 6 March 2001,
www.tio.com.au/media_statements/releases/2001/release_17.htm and TIO Media release 17 December 2003,
www.tio.com.au/media_statements/RELEASES/2003/release_10.htm

[41]   ITU. (1998).

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targeted solution than blocking traffic to an entire country code and can mitigate the potential consequences of a blocking response. However, the availability of such an option will depend on the circumstances of the case and how much information is available about the misappropriated numbers.

6.2.1   A consideration of Ireland's blocking of calls to the Pacific

In 2004, the Commission for Communications Regulation (ComReg) in Ireland received over 300 complaints from Irish consumers who had fallen victim to an auto-dialler scam and received excessive telephone charges ranging from €20 to €2,000 (although one business customer incurred charges of €12,000). In September 2004, after issuing a consumer alert to inform consumers of the risk, ComReg issued two directions.[42] The first (see Box 6-2) required Internet service providers in Ireland to educate their customers about the risks of auto-diallers. The second (see Table 6-1) was more significant and required all service providers in Ireland to suspend direct dial access to 13 countries, namely:

- Cook Islands;
- Kiribati;
- Solomon Islands;
- Nauru;
- French Polynesia;
- Tuvalu;
- Wallis and Futuna;
- Norfolk Island;
- Tokelau;
- Diego Garcia (a British Indian Ocean Territory);
- São Tomé and Príncipe (a small island off the western coast of Africa);
- Comoros (an archipelago off the eastern coast of Africa);
- Mauritiana (a country in west Africa).

This did not mean that all telecommunications between Ireland and those 13 countries were blocked entirely. ComReg put in place an arrangement whereby people who wished to make legitimate calls to those countries could add those numbers to a 'white list' of legitimate telephone numbers. Prior to the block commencing on 4 October 2004, the white list was populated with all known residential and business numbers in the relevant countries. These numbers were not blocked. After 4 October 2004, Irish consumers were able to add numbers to the white list by making a request to their service provider. Once a number was on the white list, it was accessible to all Irish consumers, regardless of who may have requested the particular number to be unblocked. ComReg said: 'barring complete country codes and allowing access to a given number at the request of a consumer is viable, proportionate and reasonable response [to the problems caused by auto-diallers].'[43]

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[42]   ComReg's consultation paper www.comreg.ie/_fileupload/publications/ComReg0481.pdf Advice for victims on ComReg's consumer website: www.askcomreg.ie/Internet/safeguards_against_modem_hijacking.49.LE.asp

[43]   ComReg decision notice – appendix B is not replicated in this report

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Box 6-2 ComReg's 2004 directions to prevent abuse of auto-diallers[44]

Direction 1

The Commission for Communications Regulation directs that all Internet Service Providers are required no later than 2 weeks from the date of this Decision Notice to recommend to their subscribers, members and users, free or low-cost hardware and/or software solutions designed to remove or render inoperable dialler programs and to block the installation of dialler programs in the future. Internet Service Providers are directed to affect this by sending a targeted e-mail to all registered email accounts, where the subscribers to such accounts have not opted out of receiving information, followed by reminders at fortnightly intervals for a total period of 6 weeks.

Direction 2

The Commission for Communications Regulation directs that Providers of Publicly Available Telephone Services shall no later than 04 October 2004:

a) Suspend direct dial access to destinations listed in the attached Appendix B. The Appendix will be reviewed on a regular basis by ComReg and the network operators and amended appropriately in response to any significant changes to problem destinations; and

b) Permit direct dial access to specific telephone numbers located within the destinations referred to in the attached Appendix B only at the request of a subscriber and following the network operator having verified that the requested telephone number is a legitimate service only or

c) As an alternative to only permitting direct dial access in accordance with paragraph b), above, providers of publicly available telephone services can choose to no longer charge any consumers for unauthorised call charges arising from Autodiallers.

Providers of Publicly Available Telephone Services, with effect from 04 October 2004, shall not charge any subscriber account for direct dial calls to destinations listed in the Appendix B unless the call invoiced was to a number unbarred under a subscriber request as detailed above.

The requirements under a) and b) or c) shall be operable for a period of six months from the date of this Decision Notice and shall lapse if not renewed or otherwise amended following a further consultation.

6.3   Which numbers are most susceptible to misappropriation?

Not all countries are equally susceptible to number misappropriation. The numbers or country codes that would seem to be most attractive for this purpose, and therefore most susceptible, are those that relate to a country that meets at least one of three criteria.

1) The country does not receive a large volume of call traffic from the country in which the misappropriation is to be effected (for example, the country in which the premium-rate services are to be advertised). This minimises the risk of genuine call traffic to that country being short-shopped and the misappropriation being detected.

2) The country levies a high price on the termination of internationally originated traffic[45] – as this is the revenue source of the fraud.

3) There is a country code that is simple, attractive or unfamiliar (in the country in which the misappropriated numbers are to be advertised).

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[44]   ComReg on PR240904 www.comreg.ie/_fileupload/publications/PR240904.pdf

[45]   Accordingly, numbers used by organizations such as Inmarsat and other satellite operators are similarly at risk of misappropriation.

Many of the Pacific Island countries rank highly against all three of these criteria. The attractiveness of the various country codes from the region, and the high international termination rates, are shown in **Table 6-1.**

Table 6-1: Country codes and current international termination rates in the Pacific Island countries [46]

Country	Country code	Current international termination rate (per minute)	
		Local currency	USD [47]
Cook Islands	682	NZD 0.55	0.364
Fiji	679	FJD 0.21	0.103
Kiribati	686		
Marshall Islands	692		
Micronesia	691		
Nauru	674		
Niue	683		
Palau	680		
Papua New Guinea	675		
Samoa	685		
Solomon Islands	677		
Timor Leste	670		
Tonga	676	TOP 0.30	0.155
Tuvalu	688		0.20
Vanuatu	678		1.000–1.500 *
EU 27 average			0.06

* Rate estimated by the regulator

6.4 Misappropriation and country code blocking in the pacific

Only a few of the study countries have experienced the misappropriation of their numbering resources or are aware of this having happened.

6.4.1 Kiribati

Kiribati advises that it is currently trying to stop a company in Turkey from continuing to use its numbering resources. It is understood that the Turkish company was originally using these with Kiribati's consent but Kiribati has found it difficult to enforce the terms of its agreement with the company and prevent it from continuing to use Kiribati's numbers following the withdrawal of that consent.

This scenario highlights one of the problems in giving a foreign partner consent to use national numbering resources. Once that partner has established the necessary transit arrangements for a number range, it will not have any further need to prove to that transit operator that it has the consent of the country to

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[46]   Many countries did not (or were unable to) indicate the current prices for termination.
[47]   Converted using the interbank foreign exchange rates quoted by www.oanda.com on 7 June 2010.

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which the country code is assigned. In such circumstances, consent can be very difficult to rescind in practice. Kiribati also says seafarers working on foreign vessels and civil servants working aboard occasionally have their calls routed and terminated in other countries. These may be indicators of additional misappropriations.

6.4.2 Papua New Guinea

Papua New Guinea in May, 2010 become aware of a potential misappropriation of the number 675 1849 7899 and is investigating. The issue was brought to the attention of Papua New Guinea by Magyar Telekom of Hungary through ITU's Misuse of E.164 Numbering Resources website (discussed in section 6.5). Papua New Guinea has sought the assistance of Magyar Telekom in resolving the problem. In the interim, Magyar Telekom has blocked all outgoing traffic to that particular number.

6.4.3 Timor Leste

Timor Leste advises that it became aware of one of its numbers being misappropriated by a provider of premium-rate telephone sex services. ARCOM apparently complained directly to the provider of that service and the misappropriation was stopped.

6.4.4 Vanuatu

Vodafone's experience dealing with number misappropriation provides the greatest insight into the practices of those who misappropriate numbers. The Vanuatu regulator is not aware of any actual instances of misappropriation, but investigations have identified a number of Internet-based service providers that are offering to sell usage of misappropriated Vanuatu numbers to premium-rate service providers.

In March 2010, the regulator was approached by Monty Holdings, a Lebanese company enquiring about the potential to invest in the telecommunication market in Vanuatu. It requested an exclusive licence for international voice termination and an assignment of 10,000 numbers from Vanuatu's numbering plan in return for a share of the revenue it would earn providing services on the numbers. This request was refused as it contradicted Vanuatu's competition policy objectives.

The regulator's investigation of the information provided by Monty Holdings led to the discovery of a number of websites catering to the providers of premium-rate services that offered to sell usage of misappropriated Vanuatu numbers. One website in particular offered usage of about 200 mobile numbers in the range 678 77 80 000 – 678 77 80 299. Subsequent investigations determined that these numbers had been assigned to TVL, and about 190 of the affected numbers are currently in use by TVL customers.

The regulator notified ITU via the Misuse of E.164 Numbering Resources website (discussed in section 6.5) and requested that all international carriers ensure that calls intended for TVL's mobile customers within the affected ranges be routed to Vanuatu-based network operators only. However, the regulator reports that they do need evidence that the matter reported are still being looked by ITU since same numbers are still advertised for use on the Internet, when he last checked.

6.4.5 Awareness of number misappropriation in the Pacific

Based on responses to the data request, there is a general awareness of the potential for number misappropriation but variations in the level of awareness of its prevalence in Pacific. This is summarised in Table 6-2**.** Among the study countries, there was virtually no unprompted awareness of ITU's

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Recommendation E.156: Guidelines for ITU-T action on reported misuse of E.164 number resources[48] (discussed in section 6.6).

Table 6-2: Awareness of number misappropriation in the Pacific

	Country reported being aware of the problem	Evidence to suggest the country has been a victim in the past	Country reported being aware that it has been a victim in the past
Cook Islands	✓	✓	✗
Fiji	?*	✗	?
Kiribati	✓	✓	✓
Marshall Islands	✓	✗	✗
Micronesia	✓	✗	✗
Nauru	?	✓	?
Niue	✓	✗	✓
Palau	✓	✗	✗
Papua New Guinea	✓	✓	✓
Samoa	✓	✗	✗
Solomon Islands	✗	✓	✗
Timor Leste	✓	✓	✓
Tonga	✗	✗	✗
Tuvalu	✓	✗	✓
Vanuatu	✓	✓	✓

*? Means no information was made available by the administration

6.5   International initiatives to combat misappropriation

There are two main international initiatives trying to address the problem of misappropriation and mitigate its effects (such as blocking country codes). Both initiatives focus on information sharing.

At the World Telecommunications Standardization Assembly (WTSA) in 2004, the ITU-T Director was given greater power to intervene in cases of number misappropriations. This lead to the development of *Interim procedures for reporting possible misuse of numbering resources* being developed and circulated by the Telecommunications Standardization Bureau (TSB) Director (TSB Circular 9) and later, the development of *Recommendation E.156: Guidelines for ITU-T action on reported misuse of E.164 number resources.* This recommendation outlines The Actions that the TSB Director will take when reports of alleged misuse of numbering resources are received from ITU members as well as the methods to address and counter such misuse.

Most significantly, this led to the establishment of a website (www.itu.int/ITU-T/secured/misuse) where registered TIES users can report suspected misappropriations to the TSB Director, who will facilitate communications between the countries involved to try and resolve the problem. Two extracts from the website (both of which relate to the Pacific cases mentioned in sections 6.4.2 and 6.4.4) are in **Figure 6-2**

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and **Figure 6-3**. However, as reflected in Vanuatu's experience, the effectiveness of this process is constrained by the amount of information available about each instance, and in particular, the identity of the countries or telecommunication operators involved in the suspected misappropriation.

At ITU's World Telecommunications Standardizations Assembly (WTS) in 2008 (WTSA-08), a new resolution on number misappropriation was approved following an initiative and proposal from the Asia Pacific Telecommunity (APT). Recently, the Pacific ICT Regulatory Resource Center has been designated by ITU to report misappropriation of numbers on behalf of Pacific Island countries. *WTSA-08 Resolution 61[49]: Misappropriation of international telecommunication numbering resources* invites Member States to consider a number of points.

- There should be a mechanism by which national regulators can request carriers to release routing information in cases of fraud, within the constraints of national laws and regulatory frameworks.

- Administrations and national regulators should be encouraged to collaborate and share information on fraudulent activities related to the misuse of international numbering resources and to consider sharing information about these activities.

- All administrations and international telecommunication operators should be encouraged to enhance the effectiveness of ITU's role and give effect to its recommendations, particularly those of ITU-T Study Group 2, in order to promote a new and more effective basis for dealing with fraudulent activities due to number misappropriation. This would help to limit the negative effects of these fraudulent activities and the blocking of international calls to developing countries.

- Administrations and international telecommunication operators should be encouraged to implement the ITU-T recommendations in order to mitigate the adverse effects of fraudulent number misappropriation and blocking of calls to certain developing countries.

- The resolution also resolves a number of points.

- Administrations and operating agencies authorised by Member States should take all reasonable measures, within the constraints of their national laws and regulatory frameworks, to obtain the information necessary to address issues related to number misappropriation and misuse.

- Administrations and operating agencies authorized by Member States should take note of and consider, within the constraints of their national laws and regulatory frameworks, the *'Suggested guidelines for regulators, administrations and operating agencies authorized by Member States for dealing with number misappropriation'*,[50] in accordance with the attachment to the resolution.

- Member States and national regulators should take note of instances of activities related to the misuse of international numbering resources, in accordance with Recommendation ITU-T E.164, through ITU-T resources.

- Member States should ask Study Group 2 to study all aspects and forms of misappropriation of international country codes, with a view to amending Recommendation ITU-T E.156 and its Supplement 1[51].

- Member States should request Study Group 3 to study the economic effects of call blocking on developing countries.

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[49] ITU (2008).
[50] ITU, (2008).
[51] ITU, (2007).

Figure 6-2: Extract from ITU's number misuse database – Papua New Guinea

| ITU Sectors | Newsroom | Events | Publications | Statistics | About ITU |

Notification of possible misuse of E.164 resources

Date: 2/22/2010

Country of residence of person notifying the potential misuse:	Hungary (Republic of)
Country of residence of source of the potential misuse:	PAPUA NEW GUINEA
Notifying Member State:	ALL
OR	
Notifying Sector Member/Associate:	Magyar Telekom

Contact:

Name:	Agoston Foldvari		
Telephone No.:	+36 1 457 4181	**Fax:**	+36 1 458 0013
E-mail:	foldvari.agoston@telekom.hu		

Code that being misused (type only the digits, with no spaces as separators, for example 88299):   67518497899

Type of misuse: Code used other than as intended

Organization whom you believe is responsible for the reported potential misuse (if known):

Name:	Telikom PNG Limited		
Telephone No.:		**Fax:**	
E-mail:			

Brief explanation of misuse or why you believe that this situation should be investigated

We noticed cca 24 thousand minutes fraudulent traffic within one (!) day to these destinations between February 14-15, 2010. Several destination numbers in this +67518497899 range were noticed(according to the ITU-T Numbering plan information about Papua New Guinea (http://www.itu.int/dms_pub/itu-t/oth/02/02/T02020000A40001MSWE.doc) of January 4, 2010, the +675184 range is allocated to Telikom PNG Limited, for "Service PSDN X.28 "). International telephone traffic from Hungary to +67518497899 was blocked by Magyar Telekom until further decision.

Proposed or suggested corrective actions

1. Operators noticing such fraudulent traffic activity from/via their network are encouraged to block this range and stopping the "settlement payment chain" towards to the destination. 2. PANGTEL is requested to check and investigate what activities can be behind this range. Exact destination numbers can be also submitted if requested.

BACK

Figure -3: Extract from ITU's number misuse database – Vanuatu

| ITU Sectors | Newsroom | Events | Publications | Statistics | About ITU |

Notification of possible misuse of E.164 resources

Date: 3/05/2010

Country of residence of person notifying the potential misuse:	Vanuatu (Republic of)
Country of residence of source of the potential misuse:	NOT SPECIFIED - N.S.
Notifying Member State:	Vanuatu (Republic of)
OR	
Notifying Sector Member/Associate:	

Contact:

Name:	John Crook		
Telephone No.:	+67827621	Fax:	+67827440
E-mail:	john.crook@telecomregulator.gov.vu		

Code that being misused (type only the digits, with no spaces as separators, for example 88299): 6787780

Type of misuse: Misrouted code (e.g. routed to country other than assigned country)

Organization whom you believe is responsible for the reported potential misuse (if known):

Name:	Any carrier misdirecting Vanuatu traffic to "premium rate" numbers		
Telephone No.:		Fax:	
E-mail:			

Brief explanation of misuse or why you believe that this situation should be investigated

So-called "premium rate services" are advertising Vanuatu numbers that have never been assigned to them. These numbers are in fact assigned to mobile telephone customers of Telecom Vanuatu Limited. The "premium rate service" operators use of these numbers means that legitimate international calls intended for TVL customers do not get through to Vanuatu or the intended destination. Instead they are routed to unintended destinations that are being promoted for "adult" audiotex systems.

You can see examples of this misuse of Vanuatu numbers being promoted on the following websites:

- http://www.right2call.com/rates.pdf
- http://www.getpremiumnumbers.com/Premium-Rate-Numbers.aspx
- http://www.g-a-telecom.com/index.php?page=premium-rate-numbers
- http://www.cendate.com/Images/Downs/Cendate_Rate_Card_2009.xls
- http://pa-in.facebook.com/group.php?gid=250570120013 – India

Proposed or suggested corrective actions

We request that all carriers check and ensure that all calls intended for Telecom Vanuatu's mobile customers with numbers in the range 67877XXXXX are routed to Vanuatu service operators only.

6.6   European Conference of Postal and Telecommunications Administrations

The ECC within CEPT is also facilitating international communications and activity to rectify (and try and prevent) number misappropriation. The ECC Recommendation (05)09[52] on Customer protection in case of misuse or unauthorized use of international E.164 numbering resources identifies measures that can be taken in an effort to counter, or reduce the consequences of, number misappropriation. These are very high level and are unlikely to be of much practical use to the study countries. However, Recommendation (05)09 also established an early alert system for the exchange of information between national regulatory authorities concerning suspected and confirmed cases of number misappropriation. The system is housed at the European Communications Office website (www.ero.dk/eas) and detailed information about it, and participation in it, is restricted to national regulatory authorities only (although the participation of non-European regulatory authorities is understood to be welcomed).

6.7   Guidelines for dealing with number misappropriation

Number misappropriation is a challenge facing regulators and telecommunication operators around the world. The existing detection and remedial measures are still in their infancy and imperfect, but there are a number of actions that study countries can take in an effort to deter, identify early, and manage any consequences from the misappropriation of their numbering resources. As recognised by both the ITU and CEPT initiatives, sharing information internationally is a key component of any solution. Additional suggestions and guidance is provided by ITU in ITU-T Recommendation E.156, the CEPT in ECC Recommendation (05)09, and in the Asia-Pacific Tele-community's Proposal to WTSA–08 on a new resolution on number misappropriation.

6.7.1   What to look out for

There are a number of potential indicators that a country's numbering resources are susceptible to being, or are being, misappropriated.

- Unsolicited or suspicious approaches from foreign companies seeking assignments of national numbering resources, possibly in return for revenue sharing arrangements.
- Advertisement of national numbering resources in association with premium services in foreign media.
- Trends in consumer complaints about the inability to receive incoming international calls from particular countries or such calls repeatedly being misrouted to other countries.
- Trends in consumer complaints about nuisance calls (that is apparent 'wrong number' calls) from callers in other countries who consistently enquire about particular products, companies or premium-rate services.
- Unexpected or sudden declines in inbound international call traffic.
- Reports of unrealistic or excessively large quantities of international call traffic being routed to, or supposedly terminated in, a country.
- Unsolicited approaches from international transit operators or intermediaries offering to terminate international traffic to particular countries at prices significantly below market rates.

These indicators are not necessarily proof of number misappropriation or any particular misuse. However, if detected, they are likely to warrant further investigation or closer monitoring.

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[52]   EEC (2006).

6.7.2 What to do about it

There are a number of measures that study countries can take to try and deter the misappropriation of their numbering resources, detect it early and correct problems promptly.

6.7.2.1 Reduce the price of termination for incoming international calls

High termination rates for inbound international call traffic is a profit incentive for those misappropriating national numbering resources and using them as alternatives to premium rate service numbers. Countries that have price termination rates close to the international average or based on the underlying costs do not tend to have their numbering resources misappropriated. There are obviously other policy and commercial factors that need to be taken into account when considering the price of call termination. However, it is important to recognise that with call termination prices trending downwards internationally (typically in response to regulatory intervention), those who misappropriate numbers will increasingly focus their activities on those countries with termination rates that are high relative to other countries.

6.7.2.2 Investigate pro-actively

As demonstrated by the Telecoms Regulator in Vanuatu, proactive investigations can identify potential cases of number misappropriation before they start to affect end-users or lead to inbound international calls being blocked. There is value in monitoring websites, such as those listed in **Box 6-3**, to identify early potential cases of number misappropriation so that any necessary remedial action can be initiated promptly. Efforts should be ongoing to identify and monitor other similar websites.

Box 6-3: A list of websites identified by the Telecoms Regulator of Vanuatu that appear to sell use of misappropriated numbering resources

- www.getpremiumnumbers.com/Premium-Rate-Numbers.aspx [accessed 10 June 2010]

- www.right2call.com/rates.pdf [accessed 10 June 2010]

- www.getpremiumnumbers.com/Premium-Rate-Numbers.aspx [accessed 10 June 2010]

- www.g-a-telecom.com/index.php?page=premium-rate-numbers [accessed 10 June 2010]

- www.pa-in.facebook.com/group.php?gid=250570120013 [accessed 10 June 2010]

6.7.2.3 Participate in international fora

As the problems associated with number misappropriation cross international boundaries, resolutions require international communications and cooperation. The ITU-T and CEPT groups discussed in section 6.6 are currently the principal fora through which preventive and remedial number misappropriation issues can be addressed internationally. The work of these groups would benefit from the contributions of the study countries, just as study countries would benefit from the information sharing and communications channels that participation in those groups can provide. Further information about those groups and instructions on how to join and participate are available at:

- ITU: www.itu.int/ITU-T/misuse/index.html

- CEPT: www.ero.dk/eas and via email to e164misuses@ero.dk

Building upon the effective APT proposal to WTSA-2008, there would also be value in developing a regional submission to ITU–T Study Group 2, in particular, and Study Group 3. This would require regional agreement on an appropriate representative(s) to attend and present the proposal and to take the work forward. Regardless of whether any submission is made, monitoring and/or contributing to the work of ITU-T Study Group 2 (www.itu.int/ITU-T/studygroups/com02), which maintains a special project on number misappropriation, would still be worthwhile.

6.7.2.4 Lodge formal complaints via ITU when specific cases are identified

When a specific case of number misappropriation is detected, it needs to be drawn to the attention of the regulatory authorities and/or telecommunication operators in the country where the misappropriation is being effected as they are best placed to initiate the necessary corrective action. This is best done via ITU-T and, in particular, by liaising with the Counsellor for ITU-T Study Group 2, Mr Richard Hill (tsbsg2@itu.int), and by posting all available information on the dedicated ITU-T website (www.itu.int/ITU-T/misuse/index.html). Experience to date has shown that the reporting of specific instances of misappropriation in this way has been relatively successful in resolving particular cases. However, to be effective, this often requires information about the identity of the country where the misappropriation is being effected and the identity of the transit or network operator involved.

6.7.2.5 Pool resources and knowledge across the region

Fighting number misappropriation is likely to be a long-term challenge. To maintain historical knowledge over time and through personnel changes, it will be necessary to compile and maintain a central repository of information and knowledge about number misappropriation from across the region. This could take the form of a basic website with restricted access where regulators and operators can quickly and easily post importation about recent cases of misappropriation from the region; share alerts about suspicious approaches from foreign companies; share investigation tips and resources; and identify problematic transit operators or international routes that warrant monitoring. The benefit of establishing and maintaining a regionally focused website in addition to the existing ITU and CEPT website initiatives is that it can be Pacific-centric, maintained in a relatively informal manner, and accommodate greater flexibility about the type of information that is shared.

6.7.2.6 Make regular test calls to national number ranges from overseas destinations

Making or commissioning others to make regular test calls to national numbers from overseas destinations is one way to try and identify cases of number misappropriation, although as a solution it is very 'hit and miss' and depends on the chance selection of a misappropriated telephone number. If pursued, particular effort should be made to make the test calls from those countries where number misappropriation is suspected of being effected, which is something that might be revealed through proactive investigation and the monitoring of reports and trends within the ITU and CEPT fora.

7   Recommendations

7.1   Knowledge and capability in numbering administration

All ministries that oversee the management of numbering resources, and all regulators that have (or expect to soon have) responsibility for numbering issues, should develop or improve their knowledge of and capabilities in numbering administration. The particular issues that they should focus on can be identified by reference to the training needs matrix in Table 5-3. The development of that knowledge and those capabilities would be best achieved through on-the-job experience gained either by undertaking numbering tasks directly or by working alongside an expert consultant or contractor on a specific numbering project.

7.2   Align training to sub-groups of countries with similar issues

As there are sub-groups of Pacific Island countries that appear to have similar needs and similar capability gaps, ITU should adopt a segmented approach to numbering capacity development activities in the region.

As part of this approach, there would be value in aligning the timing of similar numbering projects with sub-groups of countries. For example, the timing of numbering plan reviews, or the timing of the development and documentation of numbering assignment and usage rules and procedures, could be aligned across the sub-group of countries. With the timing of similar types of numbering projects aligned across sub-groups, ITU could provide in-country support to assist each country in the sub-group with the same situation, for example, monopolies or liberalized markets.

This would create economies of scale and scope, particularly in the training and development aspects of the projects, which would enable external expertise to be used cost-effectively across the region. Further, project alignment would encourage a degree of regional harmonization and consistency. It would also enable sub-groups of countries with similar base levels of knowledge and experience to be brought together for common training and development activities, helping to ensure those training activities are pitched at the right level.

7.3   Develop rules and restrictions for managing national numbers

All study countries should develop formal rules and restrictions relating to the use of national numbering resources, together with processes and criteria for the assignment and withdrawal of numbering resources. These should be documented either in numbering plans or in supplementary numbering regulations. The approach adopted by Papua New Guinea in this regard provides a sound example for the region. Including such rules and restrictions in the numbering plans may require the study countries to adopt a modified format for the presentation of the plans nationally (as distinct from the presentation of numbering plans internationally via submission to ITU, the format for which is set out in ITU-T Recommendation E. 129)[53]. This recommendation applies to both monopoly and liberalized markets, even though the content and level of detail in any rules or procedures will differ between liberalized and monopoly markets.

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[53]   ITU (2009).

7.4 Use best practice guidelines for ADMINISTRATION of numbering

All study countries should self-assess their current arrangements for the management and administration of numbering resources against the best practice guidelines outlined in section 5.6 and take this guidance into account when reviewing arrangements or developing new arrangements in the future.

7.5 Countries to coordinate activities on number misappropriation

The study countries should coordinate their activities relating to number misappropriation, and in particular preventative initiatives, investigations and broader international activities. There is value in developing and agreeing to a consistent strategy across the region that draws upon the ideas and initiatives in section 6.5 in a coordinated fashion. As a minimum, study countries should develop a mechanism (such as a website) to pool and share resources and knowledge across the region. The study countries should also take an active interest in the existing international fora that are trying to address the problem (such as ITU-T Study group 2 and the CEPT early alert system).

Annex A: List of participants

NO	Name	Designation	Country
1	Mr. Save Vocea	Manager, Regional Relations Australasia Pacific, ICANN	Australia
2	Mr. Siaosi Sovaleni	Outreach Programme Coordinator Secretariat of Pacific Communities,	Fiji
3	Mr. Catheney Laukon	Director of Communications, Ministry of Transportation and Communication.	Marshall Islands
4	Mr. Khamla Narith	ICT Manager, Ministry of Justice	Cook Islands
5	Mr. Mitchell Tutangata	Systems Administrator, Office of the Prime Minister	Cook Islands
6	Mr. Apaya Apuahe	Technical Manager, Marshall Islands Technical Corporation	Marshall Islands
7	Mr. Robert Matheson	CEO, ITC, Ministry of Education	Cook Islands
8	Mr. Tutuli Heka	Director, Telecom Niue	Niue
9	Apii Piho	Minister, Government of Cook Islands	Cook Islands
10	Mr. Aporo Kirikava	ICT Manager, Police Department	Cook Islands
11	Mr. Criden Appi	Interim Regulator, Ministry of Transportation and Telecommunication	Nauru
12	Mr. TAKKON Chin	Chief of Department, Ministry of Public Infrastructure, Industries and Commerce	Palau
13	Mr. Kila Gulo-Vui	Director, Regulatory and External Affairs, NICTA	Papua New Guinea
14	Mr. Fred Christopher	General Manager, Pacific Islands Telecommunications Association	Fiji
15	Mr. Elvin Prasad	Technical Officer, Ministry of Public Enterprise, Tourism and Numbering	Fiji
16	Mr. Timoti Tangiruaine	Urban Rural Planner, Ministry of Infrastructure and Planning	Cook Islands
17	Mr. Charles Punaha	Director General, Radio Communications and Telecommunications Technical Authority	Papua New Guinea
18	Mr. Henao Iduhu	Secretary, Ministry of Communications and Information	Papua New Guinea
19	Mr. Andreas Pareanga	Internet Customer Support, Telecom Cook Islands	Cook Islands
20	Mr. Frederick Waiti	Director ICT Sig, Office of the Prime Minister and Cabinet	Solomon Islands
21	Mr. Mac Mokoroa	Chief of Staff, Prime Minister's Office	Cook Islands
22	Mr. Donnie Defreitas	Government of Samoa	Samoa
23	Mr Sandro Bazzanella	ITU-EC Project Manager, International Telecommunication Union	Switzerland
24	Mr. Simeti Lopati Kitiseni	Operator, Tuvalu Telecommunication Union	Tuvalu
25	Mr. Frank O'Carroll	Business Development Director, Digicel Pacific Group	Australia
26	Mr. Jolden Johnnyboy	Assistant Secretary for Communication, Government of FSM	Micronesia
27	Mr. Tofinga Aisake	ICT Manager, Ministry of Health	Cook Islands
28	Mr. Opetaia Simati	Director ICT, Government of Tuvalu	Tuvalu
29	Mr. Jules Maher	CEO- Telecom Cook Islands	Cook Islands
30	Mr. Loyd Fikiasi	Economic and Legal Advisor, Office of the Vanuatu	Vanuatu

Annex A

NO	Name	Designation	Country
		Telecommunications Regulator	
31	Mr. Colin Yates	Group Head of Fraud Management and Investigations, Vodafone Group Services Limited (Representing PITA)	United Kingdom
32	Mr. Mac Mokoroa	Chief of Staff, Office of Prime Minister	New Zealand
33	Mr. John Crook	Regulator – Rekuleta, Rekuleta Blong Telekomunikesen	Vanuatu
34	Mr. Robert Mcfadzien	IT Manager, Telecom Cook Islands	New Zealand
35	Mr. Tevita Rokobaro	Senior Engineer, Department of Communication	Fiji
36	Mr. Ronnie Sakai	Systems Service Technician, Office of the Prime Minister	Cook Islands
37	Mr. Ngatama Sakai	General Manager, Telecom Cook Islands	Cook Islands
38	Mr. Bwanouia Aberaam	CEO, Telecommunication Authority of Kiribati	Kiribati
39	Mr. Keith Davidson	Chairman, APTLD	Cook Islands
40	Mr. Jim Marurai	Prime Minister, Government of Cook Islands	Cook Islands
41	Mrs. Gisa Fuatai Purcell	ITU Project Coordinator	Fiji
42	Ms. Kelly Aisling	Legal Counsel, Digicel Pacific Limited,	Australia
43	Ms. Maureen Hilyard	ICT Advisor, Pacific Islands Chapter of ISOC	Cook Islands
44	Ms. Mereseini Rakuika	Chairman, Telecommunications Authority of Fiji	Fiji
45	Ms Elisa Kohlhase	Legal Counsel, Office of the Regulator	Samoa
46	Ms. Pua Hunter	Director, Prime Minister's Office, Government of Cook Islands	Cook Islands
47	Ms. Pamela Joseph	Marketing Associate, FSM Telecommunications Corporation	Micronesia
48	Ms. Lizzie Taura	Manager Economics & Legal, Office of the Vanuatu Telecommunications Regulator	Vanuatu
49	Ms. Marianne Berukilukilu	Telecom Engineer, Office of the Vanuatu Telecommunications Regulator	Vanuatu
50	Ms. Meere Karotu	Manager, Telecommunications Authority of Kiribati	Kiribati
51	Mr. Mathew O'Rourke	ITU Expert	Australia

Annex B: Data collection form

1)   Country: _____

2)   Website: _____

If there is a Government or Regulatory Authority website(s) which contains any of the information being sought please identify it (or them):

(Please check that any website referred to is working and up to date before including the details in this reply.) If not please provide any relevant document to the Project Coordinator, Ms. Gisa Fuatai Purcell Fuatai.purcell@itu.int or fax to +679 3220 34

3)   Market status:

3.1 Has the telecommunications sector been liberalized and opened to competition? If not, are there plans to do so?

3.2 List the service providers licensed or authorised to provide:

Fixed services

Mobile services

VoIP services (if separately licensed/authorised)

International gateway services

Any other relevant services (e.g. premium services, director assistance services)

4)   Legislation:

4.1 What legislation sets out the regulatory framework for the administration of telephone numbers (e.g. identifying who is responsible for the managing of numbering resources, requiring a numbering plan to be prepared and maintained)?

4.2 Please identify the legislation and where it may be accessed electronically. If it is not accessible electronically please send a fax or scanned copy of all relevant legislation to the Project Coordinator. Contact identified above.

5)   Numbering Plans:

5.1 Is there a formal numbering plan?

5.2 Please identify where it may be accessed electronically. If it is not accessible electronically please send a fax or scanned copy of all relevant regulations to the Project Coordinator.

5.3 What Government agency or authority, or telecoms operator, is responsible for maintaining the numbering plan and managing numbering resources under it?

5.4 How many staff do they have in total?

5.5 How many of those staff are dedicated to, or available to assist in, numbering issues? What qualifications or experience do they have?

5.6 Has the current copy of the numbering plan been provided to the ITU-T? If not, are you aware that this needs to be done?

5.7 Are there any policy or procedure documents or regulations other than the numbering plan that relate to the administration or usage of telephone numbers (e.g. which cap the price of calls to particular types of numbers)? If so, please identify where they may be accessed electronically. If it is not accessible electronically please send a fax or scanned copy of all relevant regulations to the Project Coordinator.

6)   Review of Numbering Plans:

6.1 What is the process for reviewing or updating the numbering plan (e.g. what type of events would prompt the numbering plan to be updated; how is the review undertaken, etc)?

6.2 How frequently are reviews of the numbering plan (including review of number utilisation and numbering policies)? When were these last reviewed?

6.3 Are there any plans to review the numbering plan (including number utilisation and numbering policies)? If so, what has prompted that review?

6.4 Are you confident that the capabilities exist in-house to conduct that review and implement any changes that may result from it?

7)   Numbering practices and procedures:

7.1 What is the procedure for assigning a number range to a particular type of service or service provider (i.e. announcing that a particular number range is reserved for use only with a particular type of service, such as mobile services, or by a particular operator, such as a new entrant)?

7.2 Is this procedure documented? If so, please identify where it may be accessed electronically. If it is not accessible electronically please send a fax or scanned copy of the relevant documents to the Project Coordinator.

7.3 What is the procedure for allocating numbers to service providers (e.g. who may request numbers; how are requests for numbers made; what is the size of the number blocks that are allocated; what checks are made to ensure previous allocations of number are being used efficiently or to prevent number hoarding or exhaustion; are there any fees involved; etc)? Is this procedure documented? If so, please identify where it may be accessed electronically. If it is not accessible electronically please send a fax or scanned copy of the relevant documents to the Project Coordinator.

7.4 Are there any policies or guidelines relating to the way numbers are issued to, and used by, end-users (e.g. covering rights of use, the withdrawal or surrender of numbers, quarantine periods before re-issue, etc)? If so, please identify where it may be accessed electronically. If it is not accessible electronically please send a fax or scanned copy of the relevant documents to the Project Coordinator.

Is any regular consultation undertaken with industry and other stakeholder groups in relation to numbering issues or policies? How regularly does this occur?

8)   VoIP

8.1 Is VoIP legal?

8.2 Please explain the current regulatory treatment of VoIP-based services, highlighting any differences in the classification of VoIP-based services?

8.3 Are there specific numbering policies relating to VoIP services or a particular number range reserved for use in associated with VoIP services (whether supplied by a locally licensed operator or by an operator (such as Skype) that is located off-shore?

Annex B

9)   Number length and short codes

9.1 What is the length of (i.e. the number of digits in) E.164 telephone numbers in your country?

9.2 Are there any plans to extend the length of telephone numbers in your country by adding additional digits to increase the quantity of numbers available? If so, please describe the plans.

9.3 Are short codes used in your country for special services? If so, what short codes have been assigned to emergency services, directory assistance and other such services?

9.4 Are there any policies relating to the use of these short codes or the creation of additional short codes?

10)   Number portability

10.1 Has number portability been introduced for any types of numbers or services? If not, are there any plans to introduce, or explore the introduction of, number portability?

10.2 Are there any licensing or other regulatory commitments or obligations that must be fulfilled before number portability could be introduced in your country (e.g. a moratorium for a particular period of time must first expire or a cost/benefit study must first be conducted)?

11)   ENUM

Are you aware of international developments regarding ENUM? Have any ENUM trials been proposed or conducted in your country?

12)   Number hijacking

Number hijacking refers to the unauthorised use of a country's numbering resources by an operator in another country. For example, a service provider in Country A might advertise premium services, such as telephone sex services, using a telephone number in Country B. Instead of calls to that number being routed to Country B for termination, the calls are terminated in Country A, enabling the service provider in Country A to profit by retaining whatever termination payments would normally be paid to an operator in Country B. Consequently countries with high international termination charges are often the targeted in such scams.

12.1 Were you aware that number hijacking was possible and has occurred in a number of countries around the world?

12.2 Are you aware of any instances of number hijacking, or a similar misappropriation of your country's numbering resources? If so, please describe what happened, how it was detected, how many numbers were hijacked, which countries were involved, what steps were taken to resolve the issue.

12.3 What actions do you believe you could take to identify if your numbering resources have been hijacked or misappropriated by an entity in another country?

12.4 What are the prices for the termination of incoming international calls in your country? (Please identify for both fixed and mobile services.)

12.5 Please explain, how can you tell that some of your numbers have been hijacked?

Annex B

13)   External experts

13.1 Has the organization responsible for administering numbering policy (that is referred to in Q5 above) used external experts for assistance on numbering issues in the last 5 years? If so please provide details.

14)   Contact:

Please nominate the person who should be contacted to clarify the answers above or for further information.

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