INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

E.212
(05/2004)

SERIES E: OVERALL NETWORK OPERATION, TELEPHONE SERVICE, SERVICE OPERATION AND HUMAN FACTORS

International operation – Maritime mobile service and public land mobile service

The international identification plan for mobile terminals and mobile users

ITU-T Recommendation E.212

ITU-T E-SERIES RECOMMENDATIONS

OVERALL NETWORK OPERATION, TELEPHONE SERVICE, SERVICE OPERATION AND HUMAN FACTORS

For further details, please refer to the list of ITU-T Recommendations.

ITU-T Recommendation E.212

The international identification plan for mobile terminals and mobile users

Summary

A plan for unique international identification of mobile terminals and mobile users is required in order to enable these terminals and users to roam among public networks which offer mobility services. International Mobile Subscriber Identity (IMSI) is required so that a visited network can identify a roaming mobile terminal or mobile user, e.g., in order to query a subscriber's home network for subscription and billing information.

ITU-T Rec. E.190 describes the general principles to be utilized in the assignment of ITU-T E-series international numbering resources. The procedures in this Recommendation were developed in accordance with the principles contained in ITU-T Rec. E.190, and the statements contained in ITU-T Rec. E.190 take precedence over this Recommendation.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

CONTENTS

Page

ITU-T Recommendation E.212

The international identification plan for mobile terminals and mobile users

Introduction

A plan for unique international identification of mobile terminals and mobile users is required in order to enable these terminals and users to roam among public networks which offer mobility services. International Mobile Subscriber Identity (IMSI[1]) is required so that a visited network can identify a roaming mobile terminal or mobile user, e.g., in order to query a subscriber's home network for subscription and billing information.

IMSIs may also be allocated to fixed or wireline networks that offer mobility services, or to achieve compatibility with networks that have mobility services. An example is a network supplying a public messaging service.

It is desirable that the allocation of IMSIs should be made independently of the numbering plans used for accessing mobile terminals and mobile users. This identification plan enables Administrations to develop their own national numbering plans for mobility services without the need for coordinating them with other countries. Similarly, this identification plan enables networks to develop their internal numbering schemes for mobility services without the need for coordinating them at a level beyond what is specified in other ITU-T Recommendations.

ITU-T Rec. E.190 describes the general principles to be utilized in the assignment of ITU-T E-series international numbering resources. The procedures in this Recommendation were developed in accordance with the principles contained in ITU-T Rec. E.190, and the statements contained in ITU-T Rec. E.190 take precedence over this Recommendation.

1   Scope

This Recommendation describes an international identification plan for mobile terminals or mobile users[2] of public networks enabling roaming capabilities. It also establishes procedures for the assignment of International Mobile Subscriber Identities (IMSIs) to the mobile terminals and mobile users of such networks. This Recommendation describes the format of the IMSI.

The plan described in this Recommendation may also be used by fixed or wireline networks that offer mobility services or to achieve compatibility with networks that offer mobility services.

2   References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

---

[1] An IMSI can identify a mobile terminal or mobile user. The term "international mobile subscriber identity" is used in this Recommendation to reflect the more general scope of the IMSI, formerly known as the "international mobile station identity".

[2] For example, an IMSI could be used to identify a UPT user or a subscriber to mobility services, as well as to identify a mobile terminal.

– ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan*.

– ITU-T Recommendation E.168 (2002), *Application of E.164 numbering plan for UPT*.

– ITU-T Recommendation E.190 (1997), *Principles and responsibilities for the management, assignment and reclamation of E-series international numbering resources*.

– ITU-T Recommendation E.214 (1988), *Structure of the land mobile global title for the Signalling Connection Control Part (SCCP)*.

– ITU-T Recommendation F.850 (1993), *Principles of Universal Personal Telecommunication (UPT)*.

– ITU-T Recommendation F.851 (1995), *Universal Personal Telecommunication (UPT) – Service description (service set 1)*.

3 Definitions

This Recommendation defines the following terms:

3.1 home network: The network of the service provider to which a given subscriber is subscribed.

3.2 International Mobile Subscriber Identity (IMSI): The IMSI is a string of decimal digits, up to a maximum of 15 digits, that identifies a unique mobile terminal or mobile subscriber internationally. IMSIs may also be used for terminal or subscriber identification within fixed or wireline networks that offer mobility services, or to achieve compatibility with networks that have mobility services. The IMSI consists of three fields: the MCC, the MNC, and the MSIN.

3.3 Mobile Country Code (MCC): The MCC is the first field of the IMSI and is three digits in length. The MCC identifies a country, and a country may be assigned more than one MCC. A MCC may be designated as "shared" where the assignment of the MNCs in that MCC is managed by the ITU-T TSB.

3.4 Mobile Network Code (MNC): The MNC is the second field of the IMSI and is two to three digits in length. The MNC, in combination with the MCC, uniquely identifies the home network of the mobile terminal or mobile user. The MNC may also uniquely identify a fixed or wireline network or a group of fixed or wireline networks that offer mobility services or for the purpose of achieving compatibility with networks that have mobility services.

3.5 mobile subscriber: An entity or person that contracts to receive or pay for a mobility service.

3.6 Mobile Subscriber Identification Number (MSIN): The MSIN is the third field of the IMSI and is a maximum of 10 digits. The MSIN, within a given MCC + MNC, identifies a unique mobile terminal or mobile subscriber within a public network.

3.7 mobility service: A telecommunication service that supports mobility for terminals or users by providing access to and from the public network via a home network and/or visited network(s).

3.8 mobile terminal: Any portable, transportable, or handheld terminal supporting mobility services.

3.9 mobile user: A user that utilizes a subscription to a mobility service in order to access a mobility service.

3.10 visited network: The network providing service to a user when the user roams outside the home network.

4 Abbreviations

This Recommendation uses the following abbreviations:

IMSI   International Mobile Subscriber Identity

MCC   Mobile Country Code

MNC   Mobile Network Code

MSIN   Mobile Subscriber Identification Number

UPT   Universal Personal Telecommunication

5 Considerations

The considerations that form the basis for the international identification plan for mobile terminals and mobile users are as follows:

a)   The assignment of ITU-T Rec. E.212 resources will be in conformance with the principles in ITU-T Rec. E.190.

b)   Mobility services may be provided across national boundaries, i.e., internationally.

c)   There may be more than one public network offering mobility services in a country.

d)   The IMSI permits the identification of the home country (MCC) as well as the home network (MCC + MNC) to which the mobile terminal or mobile user is subscribed.

e)   For countries, the number of digits (2 to 3) of MNCs is a national matter; and the number of digits of MSINs is also a national matter. Please refer to 6.2 for further information.

f)   For shared MCCs, the length of MNCs is determined by the Telecommunication Standardization Bureau (TSB) and the length of MSINs is determined by the MNC assignee.

g)   The identifiers assigned to a subscriber under this identification plan should, for security reasons, not be directly related to the numbers assigned to that same subscriber under numbering plans, e.g., E.164, in use for different services.

h)   The IMSI may be input manually by the user, entered via a card for use with card operated terminal equipment, or automatically transmitted from mobile terminal equipment.

i)   The IMSI should, if necessary, enable:

   1)   determination of the home public network of a visiting mobile terminal or mobile user;

   2)   determination of the visited public network in which a visiting mobile terminal or mobile user is registered;

   3)   mobile terminal or mobile user identification when information about a specific mobile terminal or mobile user is to be exchanged between networks offering mobility services;

   4)   mobile terminal identification on the radio control path for registering a mobile terminal in a visited network;

   5)   mobile terminal identification for signalling on the radio control path;

   6)   mobile terminal or mobile user identification for charging and billing purposes;

   7)   subscriber identification and subscription management, e.g., for retrieving, providing, changing and updating of subscription data for a specific mobile terminal or mobile user; and

   8)   mobile user identification during the user authentication procedure, e.g., UPT: the IMSI is then called the Personal User Identity (PUI).
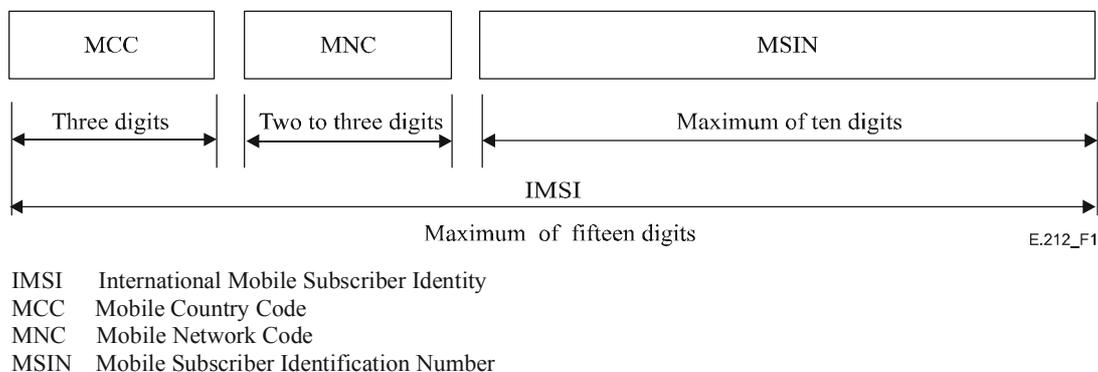
This list is not exhaustive.

The IMSI is not used for dialling purposes in the public switched network.

6 IMSI structure, format and assignment procedures

6.1 Structure and format of the IMSI

The IMSI structure and format are as shown in Figure 1.

IMSI   International Mobile Subscriber Identity
MCC   Mobile Country Code
MNC   Mobile Network Code
MSIN   Mobile Subscriber Identification Number

Figure 1/E.212 – Structure and format of the IMSI

6.2 IMSI assignment procedures

6.2.1 The TSB assigns MCCs to countries and assigns shared MCCs. Additional MCCs will be assigned only in anticipation of exhaust of assigned code(s). When a country is applying for an additional MCC, the country must provide evidence of the efficient use of the existing resources allocated to it. In the case of exhaust of a shared MCC, the MCC administrator may determine to request information from existing MNC assignees to confirm efficient use of the original MCC. The TSB shall encourage efficient use of MCCs.

6.2.2 MNCs are administered by the designated administrator within each country or by the TSB in the case of shared MCCs. Additional MNCs are assigned to MNC assignees within a shared MCC only for exhaust of the assigned code(s). When a MNC assignee is applying for an additional MNC, it must provide evidence of the efficient use of the existing resources allocated to it. In the case of shared MCCs, the TSB will make an effort to determine that the existing MNCs have been utilized in an efficient manner.

6.2.3 MSINs are administered by the MNC assignee.

6.2.4 The utilization of IMSIs should be such that not more than the first 6 digits of the IMSI have to be analysed in a visited public network for querying the home network.

6.2.5 In principle, only one IMSI shall be assigned to each mobile terminal or mobile user.[3] In case of multiple subscriptions (subscriptions to more than one mobility service from one or more service providers), a mobile terminal or mobile user may be assigned a different IMSI for each subscription.

---

[3] IMSIs may also be assigned to terminals or users of fixed or wireline networks that offer mobility services, or to achieve compatibility with networks that have mobility services.

Annex A

Criteria and procedures for the assignment and reclamation of shared E.212 Mobile Country Codes (MCC) and their respective Mobile Network Codes (MNCs)

A.1   Introduction

The ITU-TSB assigns and reclaims E.212 Mobile Country Codes (MCCs) for countries and shared MCCs for Networks according to ITU-T Rec. E.212. The ITU-TSB is also responsible for the assignment and reclamation of Mobile Network Codes (MNCs) for shared MCCs. Mobile Subscriber Identification Numbers (MSINs) are administered by the MNC assignee.

A.2   Scope

This annex (Annex A/E.212) is intended to provide advice to the ITU-TSB on how to allocate MNCs under shared MCCs. It describes the procedures and criteria to be utilized by the TSB for the assignment and reclamation of Mobile Network Codes (MNCs) associated with shared MCCs.

A.3   Principles for assignment

A.3.1   In accordance with ITU-T Rec. E.212, the shared MCC resources assigned to Networks shall consist of a 3-digit shared MCC followed by a 2- or 3-digit MNC.

A.3.2   For a specific shared MCC, the length of all MNCs within that MCC shall be the same.

A.3.3   Both the shared MCC(s), and the specific MNC(s) associated with a shared MCC for allocation to Networks, will be assigned by the Director of the ITU-TSB.

A.3.4   Subsequent shared MCCs and/or MNCs that are part of shared MCCs can be assigned by the Director of ITU-TSB in the event of exhaust or another substantiated reason.

A.4   Criteria for assignment

Throughout the following clauses, when using the term "applicant", it is assumed that the applicant is either a Network operator or is a group of Network operators. However, it should be noted that many National Administrations require that any such applicant correspond with the ITU-T only via that National Administration. It should be recognized that it may be a National Administration presenting an application on behalf of an applicant rather than the applicant making a direct approach to the Director ITU-TSB.

A.4.1   The applicant must either be a sector member of the ITU-T or be a Recognized Operating Agency (ROA) according to the Constitution and the Convention of the ITU. ROAs that are not ITU-T sector members are subject to a fee. The details of the fee will be determined by the appropriate ITU body.

A.4.2   The Director of the ITU-TSB receives a written request from an applicant for assignment.

A.4.3   The applicant requesting the numbering resource must affirm that it has overall responsibility for the management, operation, and maintenance of the Network that will utilize the requested resource.

A.4.4   It is a national matter whether requests for codes require national Administration review or approval. The applicant shall certify that they have met all of their country's national, legal and/or regulatory requirements for submission of the application.

A.4.5   The applicant must also affirm that all national, regulatory, and legal requirements of the countries in which the applicant's Network will operate and provide service are met at the time of Network implementation.

A.4.6 If an applicant has been granted a shared E.164 country code resource per E.164.1 for the Network cited in the application, it can be assumed that they have fulfilled the following criteria for assignment (see A.4.1, A.4.3 and A.4.7). The applicant must certify that they continue to meet these criteria. However, if the application is for a Network that is not associated with a shared E.164 country code resource, all of the criteria must be addressed.

A.4.7 The applicant must demonstrate that its international network infrastructure will contain connecting physical nodes in two or more countries. In the case of satellite terminals, serving mobile terminals in two or more countries will satisfy this requirement.

A.4.8 The applicant is required to state the planned date of commercial implementation in at least two countries, or in geographical areas in two different countries.

A.4.9 The applicant will affirm that the requested resources will be used for offering public correspondence services between two or more countries within a maximum of 1 year from the date of assignment.

A.4.10 The applicant must demonstrate that the use of a MNC under a shared MCC is an appropriate, efficient and effective method to identify terminals or users of the Network for routing, addressing and billing purposes. The applicant must attach substantiating documentation justifying this fact.

A.4.11 The applicant must demonstrate that other reasonable technical and operational alternatives (e.g., use of national resources), are not appropriate. The applicant must attach substantiating documentation justifying this fact.

A.4.12 The applicant may apply for a subsequent MNC under the following circumstances:
• The current assignment is approaching exhaust;
• The applicant can demonstrate that the resource will be utilized by a distinct shared Network. Such a request will be treated as a new application;
• Other substantiated reasons with proper justification.

A.4.13 Additional assignments of MNCs will be based on confirmation that the existing resource is being used in an efficient manner (e.g., that the format and length of the numbering plan is appropriate). The applicant must provide substantiated information that the resource is approaching exhaustion. The terms and conditions of the original assignment must be met.

A.5 Assignment

A.5.1 Requests for the assignment of a shared MCC + MNC to a Network will be addressed in writing to the Director of the ITU-TSB. The written request should be submitted on official company letterhead and signed by an appropriate company representative. The signature of the appropriate company representative affirms that, in the applicant's view, all the criteria are met. This written request shall include:
a) A planned code activation date in order to determine the relevant urgency of the request;
b) Sufficient information so that the request can be analyzed to satisfy the criteria given in clause A.4 (e.g., provide evidence that criteria will be complied with by the activation date, planned network architecture and call flows);
c) Evidence of payment of any applicable fee.

A.5.2 In making decisions, the Director of the ITU-TSB consults with the appropriate ITU-T Study Group if necessary.

A.5.3 Provided the criteria in clause A.4 are met, an applicant's request for assignment of a MNC under a shared MCC will be granted by the Director of the ITU-TSB with consultation from the appropriate ITU-T Study Group, if necessary.

A.5.4 Within a given shared MCC, applicants will receive MNCs in sequential order.

A.5.5 After the assignment has been made, the Director of the ITU-TSB will respond in writing to the applicant and include appropriate information for their ongoing responsibility as contained in ITU-T Recs E.212 and E.190. In addition, the assignment will be published in the appropriate media (e.g., the ITU Website (TIES)) and in the Operational Bulletin.

A.5.6 An assignment can be requested for non-commercial trials or testing purposes for a period of up to two years. The code subsequently assigned can be used only for non-commercial trial and testing purposes.

A.6   Voluntary return of unused MNCs

A.6.1 If an applicant or assignee determines that a MNC assigned to their Network is no longer required, the Director of ITU-TSB shall be notified of that fact in writing.

A.6.2 The Director of the ITU-TSB will respond in writing to the applicant acknowledging the return of the MNC.

A.6.3 The Director of the ITU-TSB is to publish the date of the return of the MNC in the appropriate media (e.g., ITU website (TIES)) and in the Operational Bulletin.

A.6.4 The returned MNC(s) should not be reassigned for a period of 2 years.

A.6.5 At the end of the aging two-year period, the Director of the ITU-TSB will return a code to spare status.

A.7   Criteria for reclamation

A.7.1 The assigned MNC is subject to reclamation if any of the following occurs:

•   The assigned MNC is not implemented;

•   The Network no longer satisfies the assignment criteria;

•   The Network is not operational between at least two countries; or,

•   The MNC is not in use for a period of 2 years.

A.8   Reclamation

A.8.1 If a shared MCC+MNC meets the reclamation criteria provided in A.7.1, the Director of the ITU-TSB will notify the assignee in writing that the code is subject to reclamation.

A.8.2 At the time of reclamation of an assigned MNC code under a shared MCC, the Director of the ITU-TSB shall publish the date of MNC reclamation via the appropriate media (e.g., ITU website (TIES), and in the Operational Bulletin).

A.8.3 The returned MNCs should not be reassigned for a period of 2 years from the date of reclamation.

A.8.4 At the end of the two-year period, the Director of the ITU-TSB will return a code to spare status.

A.9   Appeals process

An applicant for a MNC associated with a shared MCC who has been denied an assignment can appeal the denial to the Director of the ITU-TSB in the following manner. The appeal could include a presentation by the applicant to Study Group 2.

A.9.1 In response to a letter of denial from the Director of the ITU-TSB, the applicant can submit a supplement to its original application that responds to the reason(s) for denial contained in the letter. The applicant should submit its appeal, in writing, to the Director of the ITU-TSB. In order to be considered by the Director of the ITU-TSB, the response must include new or clarifying

information. The submission should present the position of the applicant regarding the application and its denial, including its justification for this appeal. The applicant must attach to the submission a copy of the original application, the supplement to it, and the letter of denial from the Director of the ITU-TSB. The applicant may also present the appeal at the Study Group meeting. If the appeal is to be presented to Study Group 2 it should be submitted at least two months prior to the ITU-T Study Group meeting.

A.9.2 The Director of the ITU-TSB will consult with the ITU-T Study Group and/or its delegated representatives. The ITU-T Study Group and/or its delegated representatives will then provide advice to the Director of the ITU-TSB regarding the amended application and the contents of the submitted supplement to the original application.

A.9.3 If the Director of the ITU-TSB determines that, based on the new information, the reservation or assignment should be made, the applicant will be so informed as per the procedures in A.5.5.

A.9.4 If the Director of the ITU-TSB determines that the application is still to be denied after proper consultation with the concerned Study Group, the applicant will be so informed and the reason(s) for the denial will be provided.

SERIES OF ITU-T RECOMMENDATIONS

Series A   Organization of the work of ITU-T

Series B   Means of expression: definitions, symbols, classification

Series C   General telecommunication statistics

Series D   General tariff principles

Series E   Overall network operation, telephone service, service operation and human factors

Series F   Non-telephone telecommunication services

Series G   Transmission systems and media, digital systems and networks

Series H   Audiovisual and multimedia systems

Series I   Integrated services digital network

Series J   Cable networks and transmission of television, sound programme and other multimedia signals

Series K   Protection against interference

Series L   Construction, installation and protection of cables and other elements of outside plant

Series M   TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits

Series N   Maintenance: international sound programme and television transmission circuits

Series O   Specifications of measuring equipment

Series P   Telephone transmission quality, telephone installations, local line networks

Series Q   Switching and signalling

Series R   Telegraph transmission

Series S   Telegraph services terminal equipment

Series T   Terminals for telematic services

Series U   Telegraph switching

Series V   Data communication over the telephone network

Series X   Data networks and open system communications

Series Y   Global information infrastructure, Internet protocol aspects and Next Generation Networks

Series Z   Languages and general software aspects for telecommunication systems