INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

E.212

(11/98)

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

Operation, numbering, routing and mobile services – 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

(Previously CCITT Recommendation)

ITU-T E-SERIES RECOMMENDATIONS

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

OPERATION, NUMBERING, ROUTING AND MOBILE SERVICES	
INTERNATIONAL OPERATION	
Definitions	E.100–E.103
General provisions concerning Administrations	E.104–E.119
General provisions concerning users	E.120–E.139
Operation of international telephone services	E.140–E.159
Numbering plan of the international telephone service	E.160–E.169
International routing plan	E.170–E.179
Tones in national signalling systems	E.180–E.199
Maritime mobile service and public land mobile service	**E.200–E.229**
OPERATIONAL PROVISIONS RELATING TO CHARGING AND ACCOUNTING IN THE INTERNATIONAL TELEPHONE SERVICE	
Charging in the international telephone service	E.230–E.249
Measuring and recording call durations for accounting purposes	E.260–E.269
UTILIZATION OF THE INTERNATIONAL TELEPHONE NETWORK FOR NON-TELEPHONY APPLICATIONS	
General	E.300–E.319
Phototelegraphy	E.320–E.329
ISDN PROVISIONS CONCERNING USERS	E.330–E.399
QUALITY OF SERVICE, NETWORK MANAGEMENT AND TRAFFIC ENGINEERING	
NETWORK MANAGEMENT	
International service statistics	E.400–E.409
International network management	E.410–E.419
Checking the quality of the international telephone service	E.420–E.489
TRAFFIC ENGINEERING	
Measurement and recording of traffic	E.490–E.505
Forecasting of traffic	E.506–E.509
Determination of the number of circuits in manual operation	E.510–E.519
Determination of the number of circuits in automatic and semi-automatic operation	E.520–E.539
Grade of service	E.540–E.599
Definitions	E.600–E.699
ISDN traffic engineering	E.700–E.749
Mobile network traffic engineering	E.750–E.799
QUALITY OF TELECOMMUNICATION SERVICES: CONCEPTS, MODELS, OBJECTIVES AND DEPENDABILITY PLANNING	
Terms and definitions related to the quality of telecommunication services	E.800–E.809
Models for telecommunication services	E.810–E.844
Objectives for quality of service and related concepts of telecommunication services	E.845–E.859
Use of quality of service objectives for planning of telecommunication networks	E.860–E.879
Field data collection and evaluation on the performance of equipment, networks and services	E.880–E.899

For further details, please refer to ITU-T List of 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.

Recommendation 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, E.212, were developed in accordance with the principles contained in Recommendation E.190, and the statements contained in Recommendation E.190 take precedence over Recommendation E.212.

Source

ITU-T Recommendation E.212 was revised by ITU-T Study Group 2 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 9th of November 1998.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The 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 Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 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 term *recognized operating agency (ROA)* includes any individual, company, corporation or governmental organization that operates a public correspondence service. The terms *Administration, ROA* and *public correspondence* are defined in the *Constitution of the ITU (Geneva, 1992)*.

INTELLECTUAL PROPERTY RIGHTS

The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The 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, the 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

Recommendation E.212

THE INTERNATIONAL IDENTIFICATION PLAN FOR MOBILE TERMINALS AND MOBILE USERS

(revised in 1998)

1 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.

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[2] 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.

Recommendation 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, E.212, were developed in accordance with the principles contained in Recommendation E.190, and the statements contained in Recommendation E.190 take precedence over Recommendation E.212.

2 Scope

This Recommendation describes an international identification plan for mobile terminals or mobile users[3] 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.

3 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; all users of this Recommendation are therefore encouraged to investigate the possibility of appying the most recent edition of the Recommendation and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

---

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 "Network" is as defined in Recommendation E.164.

3 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 (1993), *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.*

– CCITT 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).*

4 Definitions

This Recommendation defines the following terms.

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

4.2 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. The IMSI consists of three fields: the MCC, the MNC, and the MSIN.

4.3 Mobile Country Code (MCC): The MCC is the first field of the IMSI and is three digits in length. An MCC either identifies a country or a group of Networks that share an MCC for international services.

4.4 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.

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

4.6 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.

4.7 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).

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

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

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

5 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

6 Considerations

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

6.1 The assignment of Recommendation E.212 resources will be in conformance with the principles in Recommendation E.190.

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

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

6.4 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.

6.5 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 7.2 for further information.

6.6 For shared MCCs, the length of MNCs is determined by the Telecommunication Standardization Bureau (TSB) and the length of MSINs is determined by the Network to which the MNC is assigned.

6.7 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.

6.8 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.

6.9 The IMSI should, if necessary, enable:

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

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

c) 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;

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

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

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

g) 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

h) mobile user identification during the user authentication procedure, e.g. UPT: the IMSI is then called the Personal User Identity (PUI).

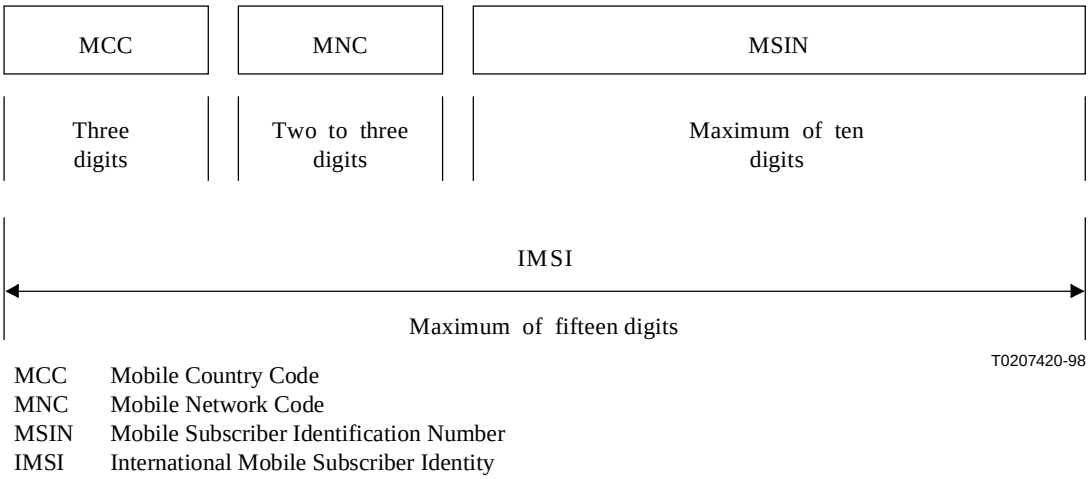
This list is not exhaustive.

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

7 IMSI Structure, Format and Assignment procedures

7.1 Structure and Format of the IMSI

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



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

Figure 1/E.212

7.2 IMSI Assignment procedures

7.2.1 TSB assigns MCCs to countries and assigns MCCs to be shared by Networks. Countries or groups of Networks will be assigned additional MCCs 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 an MCC shared by Networks, the MCC administrator may determine to request information from existing MNC assignees to confirm efficient use of the original MCC. TSB shall encourage efficient use of MCCs.

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

7.2.3 MSINs are administered by the MNC assignee.

7.2.4 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.

7.2.5 In principle, only one IMSI shall be assigned to each mobile terminal or mobile user. 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.

ITU-T RECOMMENDATIONS SERIES

Series A	Organization of the work of the 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	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
Series Z	Programming languages