



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Q.1701

(03/99)

SERIES Q: SWITCHING AND SIGNALLING

Signalling requirements and protocols for IMT-2000

Framework for IMT-2000 networks

ITU-T Recommendation Q.1701

(Previously CCITT Recommendation)



Documents

Document Sharing Hub

ITU-T Q-SERIES RECOMMENDATIONS
SWITCHING AND SIGNALLING

SIGNALLING IN THE INTERNATIONAL MANUAL SERVICE	Q.1-Q.3
INTERNATIONAL AUTOMATIC AND SEMI-AUTOMATIC WORKING	Q.4-Q.59
FUNCTIONS AND INFORMATION FLOWS FOR SERVICES IN THE ISDN	Q.60-Q.99
CLAUSES APPLICABLE TO ITU-T STANDARD SYSTEMS	Q.100-Q.119
SPECIFICATIONS OF SIGNALLING SYSTEMS No. 4 AND No. 5	Q.120-Q.249
SPECIFICATIONS OF SIGNALLING SYSTEM No. 6	Q.250-Q.309
SPECIFICATIONS OF SIGNALLING SYSTEM R1	Q.310-Q.399
SPECIFICATIONS OF SIGNALLING SYSTEM R2	Q.400-Q.499
DIGITAL EXCHANGES	Q.500-Q.599
INTERWORKING OF SIGNALLING SYSTEMS	Q.600-Q.699
SPECIFICATIONS OF SIGNALLING SYSTEM No. 7	Q.700-Q.849
DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1	Q.850-Q.999
PUBLIC LAND MOBILE NETWORK	Q.1000-Q.1099
INTERWORKING WITH SATELLITE MOBILE SYSTEMS	Q.1100-Q.1199
INTELLIGENT NETWORK	Q.1200-Q.1699
SIGNALLING REQUIREMENTS AND PROTOCOLS FOR IMT-2000	Q.1700-Q.1799
BROADBAND ISDN	Q.2000-Q.2999

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

ITU-T RECOMMENDATION Q.1701

FRAMEWORK FOR IMT-2000 NETWORKS

Summary

This Recommendation sets out the "family of systems" concept which provides the basis for the development of IMT-2000 standards including the set of signalling requirements for IMT-2000. It also contains a description of the interfaces in the system which may need to be standardized by the ITU. It has been agreed that the development of IMT-2000 requirements will be performed in Capability Sets and this Recommendation sets out the contents of Capability Set 1 and the vision for subsequent Capability Sets.

Source

ITU-T Recommendation Q.1701 was prepared by ITU-T Study Group 11 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 15th of March 1999.

Keywords

FPLMTS, Family concept, IMT-2000, IMT-2000 Capability Sets, Third generation systems.

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.

© ITU 1999

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.

CONTENTS

	Page
1 Scope	1
2 References	1
3 Definitions	2
4 Abbreviations and acronyms	3
5 Introduction	5
5.1 IMT-2000 System.....	5
5.2 Functional subsystems.....	5
6 IMT-2000 Family concept.....	6
6.1 IMT-2000 Family	6
6.2 An IMT-2000 Family Member.....	6
6.3 Key features of IMT-2000 Family members.....	6
7 Service concepts and network capabilities	7
7.1 Capability Set concept.....	7
7.2 Capability Set 1	7
7.3 Future capabilities for IMT-2000	15
8 Interfaces for study	15
8.1 List of interfaces	15
8.2 Network-to-Network Interface (NNI).....	18
8.2.1 Serving CN to Home CN functional communication	18
8.2.2 Serving CN to Transit CN functional communication.....	18
8.2.3 CN-CN functional communication for Packet Data.....	18
8.3 MT-RAN interface	18
8.3.1 MT-RAN functional communication.....	18
8.3.2 MT-CN functional communication.....	19
8.4 The UIM-to-MT interface	19
8.4.1 UIM-MT and UIM-CN functional communications.....	19
8.5 The RAN-to-CN interface	19
8.5.1 RAN-CN functional communication	19

Recommendation Q.1701**FRAMEWORK FOR IMT-2000 NETWORKS***(Geneva, 1999)***1 Scope**

The scope of this Recommendation is to provide an overall framework for the development of ITU-T IMT-2000 signalling requirements. This Recommendation is a guideline document for the other IMT-2000 Recommendations: Recommendations to be developed for the network functional model, information flows, the UIM-MT interface, the radio interface, the access interface, and the network interface. Specifically, this Recommendation provides:

- 1) a description of the IMT-2000 "family of systems" concept and what constitutes a family member;
- 2) identification of IMT-2000 service and network capabilities for IMT-2000 Capability Set 1 (and beyond);
- 3) a description of the approach to providing ITU-T IMT-2000 requirements in Capability Sets;
- 4) identification and description of the IMT-2000 interfaces necessary to be standardized to support Capability Set 1; and
- 5) a description of the structure of IMT-2000 Recommendations.

2 References

The following ITU 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 applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU Recommendations is regularly published.

- [1] ITU-T Recommendation A.3 (1996), *Elaboration and presentation of texts and development of terminology and other means of expression for Recommendations of the ITU Telecommunications Standardization Sector*.
- [2] ITU-T Recommendation M.3100 (1995), *Generic network information model*.
- [3] ITU-R Recommendation M.687-2 (1997), *International Mobile Telecommunications (IMT-2000)*.
- [4] ITU-R Recommendation M.816-1 (1997), *Framework for services supported on International Mobile Telecommunications-2000 (IMT-2000)*.
- [5] CCIR Recommendation M.817 (1992), *International Mobile Telecommunications-2000 (IMT-2000). Network architectures*.
- [6] ITU-R Recommendation M.818-1 (1993), *Satellite operation within International Mobile Telecommunications-2000 (IMT-2000)*.
- [7] ITU-R Recommendation M.819-2 (1997), *International Mobile Telecommunications-2000 (IMT-2000) for developing countries*.
- [8] ITU-R Recommendation M.1034-1 (1997), *Requirements for the radio interface(s) for International Mobile Telecommunications-2000 (IMT-2000)*.

**Documents**

Document Sharing Hub

- [9] ITU-R Recommendation M.1035 (1993), *Framework for the radio interface(s) and radio sub-system functionality for International Mobile Telecommunications-2000 (IMT-2000)*.
- [10] ITU-R Recommendation M.1078 (1993), *Security principles for International Mobile Telecommunications-2000 (IMT-2000)*.
- [11] ITU-R Recommendation M.1167 (1995), *Framework for the satellite component of International Mobile Telecommunications-2000 (IMT-2000)*.
- [12] ITU-R Recommendation M.1168 (1995), *Framework of International Mobile Telecommunications-2000 (IMT-2000)*.
- [13] ITU-R Recommendation M.1223 (1995), *Evaluation of security mechanisms for IMT-2000*.
- [14] ITU-R Recommendation M.1224 (1997), *Vocabulary of terms for International Mobile Telecommunications-2000 (IMT-2000)*.
- [15] ITU-T Recommendation F.115 (1995), *Service objectives and principles for future public land mobile telecommunication systems*.
- [16] ITU-T Recommendation F.700 (1996), *Framework Recommendation for audiovisual/multimedia services*.
- [17] ITU-T Recommendation I.211 (1993), *B-ISDN service aspects*.
- [18] ITU-T Recommendations I.375.x series (1998), *Network capabilities to support multimedia services*.
- [19] CCITT Recommendation Q.1001 (1988), *General aspects of public land mobile networks*.
- [20] ITU-T Recommendation Q.1290 (1998), *Glossary of terms used in the definition of intelligent networks*.
- [21] ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan*.
- [22] ITU-T Recommendation E.212 (1998), *The international identification plan for mobile terminals and mobile users*.
- [23] CCITT Recommendation E.213 (1988), *Telephone and ISDN numbering plan for land mobile stations in public land mobile networks (PLMN)*.
- [24] ITU-T Recommendation X.121 (1996), *International numbering plan for public data networks*.
- [25] CCITT Recommendation E.214 (1988), *Structure of the land mobile global title for the signalling connection control part (SCCP)*.
- [26] ITU-R Recommendation M.1311 (1997), *Framework for modularity and commonality within IMT-2000*.

3 Definitions

This Recommendation makes use of the terms defined for cellular radio technologies in Recommendation Q.1001, with the following definitions from Recommendation Q.1290.

3.1 bearer control: The set of functions used to direct the low layer (common) means of transmission in a node.

NOTE – The underlined part is an addition to the Q.1290 definition.

3.2 call: An end-to-end logical relationship between two or more parties, established on behalf of an initiating party, associated with a service invocation.

3.3 call control: The set of functions used to progress a call, i.e. service negotiation, set-up modification and release of single or multiple calls, used in conjunction with the service request from the user. There may be zero, one, or several connections established for one call.

3.4 connection: An association of transmission channels or circuits, switching and other functional units set up to provide a means for a transfer of information between two or more points in a telecommunications network. A connection is composed of several connection links. There are one or more connections for each media component of a call.

3.5 connection control: The set of functions used for setting up, maintaining and releasing a communications path between two or more users and a network entity, e.g. a dual-tone multifrequency receiver.

3.6 Home CN: The Home CN is the IMT-2000 network which is related by subscription to the subscriber. The Home CN permanently contains user-specific data including location, authentication, and service profile information related to the IMT-2000 user.

3.7 IMT-2000 network capabilities: A capability of an IMT-2000 network which is utilized to support service capabilities but which is not itself a service capability.

3.8 IMT-2000 service capabilities: A capability of an IMT-2000 network to offer a service or service feature to subscribers. A service capability becomes visible to a user or subscriber as part of a service or service feature provided by a network operator. Service capabilities depend on network capabilities.

3.9 Serving CN: The serving CN is the IMT-2000 network where a registered IMT-2000 user is being served.

3.10 Transit CN: A CN located on the communication path between the serving CN and the remote end party.

3.11 Virtual Home Environment (VHE): This is a capability whereby a user is offered the same service experience in a visited network as in his home network.

NOTE – The degree to which the VHE matches the actual home environment may be subject to, for example, the degree of cooperation between the visited and home networks, their relative technical capabilities, and the compatibility of the user terminal.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations.

ATM	Asynchronous Transfer Mode
BCSM	Basic Call State Model
BER	Bit Error Rate
BS	Base Station
CLNS	Connectionless Network Service
CN	Core Network
CONS	Connection Oriented Network Service
CS	Capability Set
FE	Functional Entity
FT	Fixed Terminal