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SPECIFICATIONS OF SIGNALLING SYSTEM No. 7

FUNCTIONAL DESCRIPTION OF THE MESSAGE TRANSFER PART (MTP) OF SIGNALLING SYSTEM No. 7

ITU-T Recommendation Q.701

(Previously "CCITT Recommendation")

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. 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, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation Q.701 was revised by the ITU-T Study Group XI (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

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

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Recommendation Q.701**FUNCTIONAL DESCRIPTION OF THE MESSAGE TRANSFER
PART (MTP) OF SIGNALLING SYSTEM No. 7***(Geneva, 1980; modified at Helsinki, 1993)***1 Introduction****1.1 General**

The Message Transfer Part (MTP) provides the functions that enable User Part significant information passed to the MTP to be transferred across the Signalling System No. 7 network to the required destination. In addition, functions are included in the MTP to enable network and system failures that would affect the transfer of signalling information to be overcome. This constitutes a sequenced connectionless service for the MTP user.

The Message Transfer Part together with one of its “users”, the Signalling Connection Control Part (SCCP), described in Recommendations Q.711-Q.716, forms the Network Service Part (NSP).

The Network Service Part meets the requirement for Layer 3 services as defined in the OSI Reference Model (Recommendation X.200). The relationship of the MTP with this model and to other parts of SS No. 7 is described in Recommendation Q.700.

1.2 Objectives

The overall objectives of the Message Transfer Part are to provide the means for

- a) the reliable transport and delivery of “User Part” signalling information across the SS No. 7 network;
- b) the ability to react to system and network failures that will affect a), and take the necessary action to ensure that a) is achieved.

The “Users” of MTP are the SCCP, Telephone User Part (TUP) (Recommendation Q.721-Q.725) Data User Part (DUP) (Recommendation Q.741) and ISDN User Part (ISUP) (Recommendation Q.761-Q.766). The MTP Testing User Part is for further study.

1.3 General characteristics**1.3.1 Method of description**

- functions provided by each level within the MTP;
- services provided by the MTP;
- interaction with the signalling network;
- interaction with the MTP “User”;
- the message transfer capability of the MTP.

The functions of each level of the MTP are performed by means of the level protocol between two systems which provides a “level service” to the upper levels (i.e. level 1 Signalling Data Link, level 2 Signalling Link and level 3 Signalling network) as described in Recommendations Q.702, Q.703 and Q.704 respectively.

The service interface to the level 4 “User” of MTP is described by means of primitives and parameters.

1.3.2 Primitives

Primitives consist of commands and their respective responses associated with the services requested of the SCCP and of the MTP (see Figure 1). The general syntax of a primitive is shown below:

X	Generic name	Specific name	Parameter
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- “X” designates the functional block providing the service (“MTP” for MTP).
- “Generic name” describes the action that should be performed by the addressed layer.
- “Specific name” indicates the direction of the primitive flow.
- “Parameters” are the elements of information which are to be transmitted between layers.

Four specific names exist in general:

- request;
- indication;
- response¹⁾;
- confirmation¹⁾.

Primitives and parameters of the Message Transfer Part service are listed and described in 8.

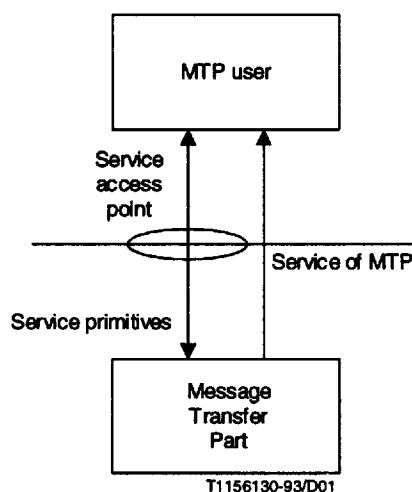


FIGURE 1/Q.701
Service primitives

1.3.3 Peer-to-peer communication

Exchange of information between two peers of the MTP is performed by means of a protocol. The protocol is a set of rules and formats by which the control information and MTP “User” data is exchanged between the two peers. The protocol caters for

- the transfer of “User” data in Message Signal Units (MSUs);
- level 2 control by use of Link Status Signal Units (LSSUs);
- testing and maintenance of signalling links by means of the signalling link test message carried in an MSU.

¹⁾ Not all generic names contain all four specific names (see Figure 2).

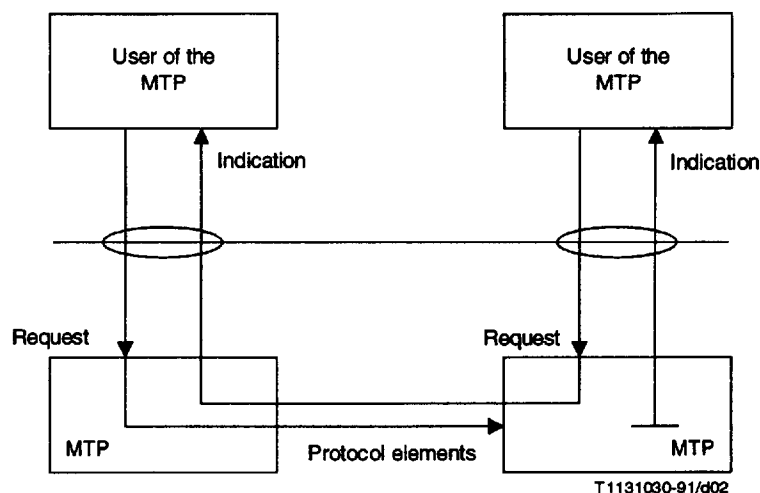


FIGURE 2/Q.701

Specific name of primitives and peer-to-peer communications

1.3.4 Contents of Recommendations Q.701 to Q.707-Series relating to the MTP

Recommendation Q.701 contains a functional description and overview of the Message Transfer Part of SS No. 7.

Recommendation Q.702 details the requirements of a signalling data link to support SS No. 7.

Recommendation Q.703 describes the signalling link functions.

Recommendation Q.704 describes signalling network functions and messages.

Recommendation Q.706 defines and specifies values for MTP performance parameters.

Recommendation Q.707 describes the testing and maintenance functions applicable to the MTP.

2 Signalling system structure

2.1 Basic functional division

The fundamental principle of the signalling system structure is the division of functions into a common Message Transfer Part (MTP) on one hand and separate User Parts for different users on the other. This is illustrated in Figure 3.

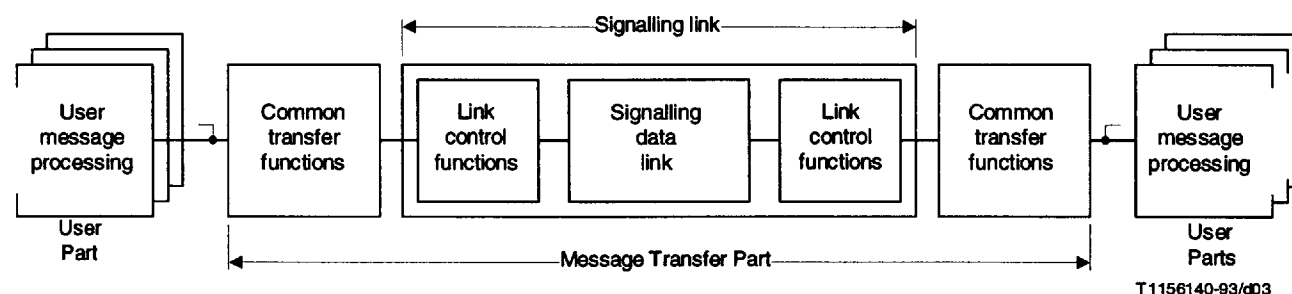


FIGURE 3/Q.701

Functional diagram for the common channel signalling system

The overall function of the Message Transfer Part is to serve as a transport system providing reliable transfer of signalling messages between the locations of communicating user functions.

The term *user* in this context refers to any functional entity that utilizes the transport capability provided by the Message Transfer Part. A User Part comprises those functions of, or related to, a particular type of user that are part of the common channel signalling system, typically because those functions need to be specified in a signalling context.

The basic commonality in signalling for different services resulting from this concept is the use of a common transport system, i.e. the Message Transfer Part. Also, a degree of commonality exists between certain User Parts, e.g. the Telephone User Part (TUP) and the Data User Part (DUP).

2.2 Functional levels

2.2.1 General

As a further separation, the necessary elements of the signalling system are specified in accordance with a level concept in which

- the functions of the Message Transfer Part are separated into three functional levels; and
- the User Parts constitute parallel elements at the fourth functional level.

The level structure is illustrated in Figure 4. The system structure shown in Figure 4 is not a specification of an implementation of the system. The functional boundaries B, C and D may or may not exist as interfaces in an implementation. The interactions by means of controls and indications may be direct or via other functions. However, the structure shown in Figure 4 may be regarded as a possible model of an implementation.

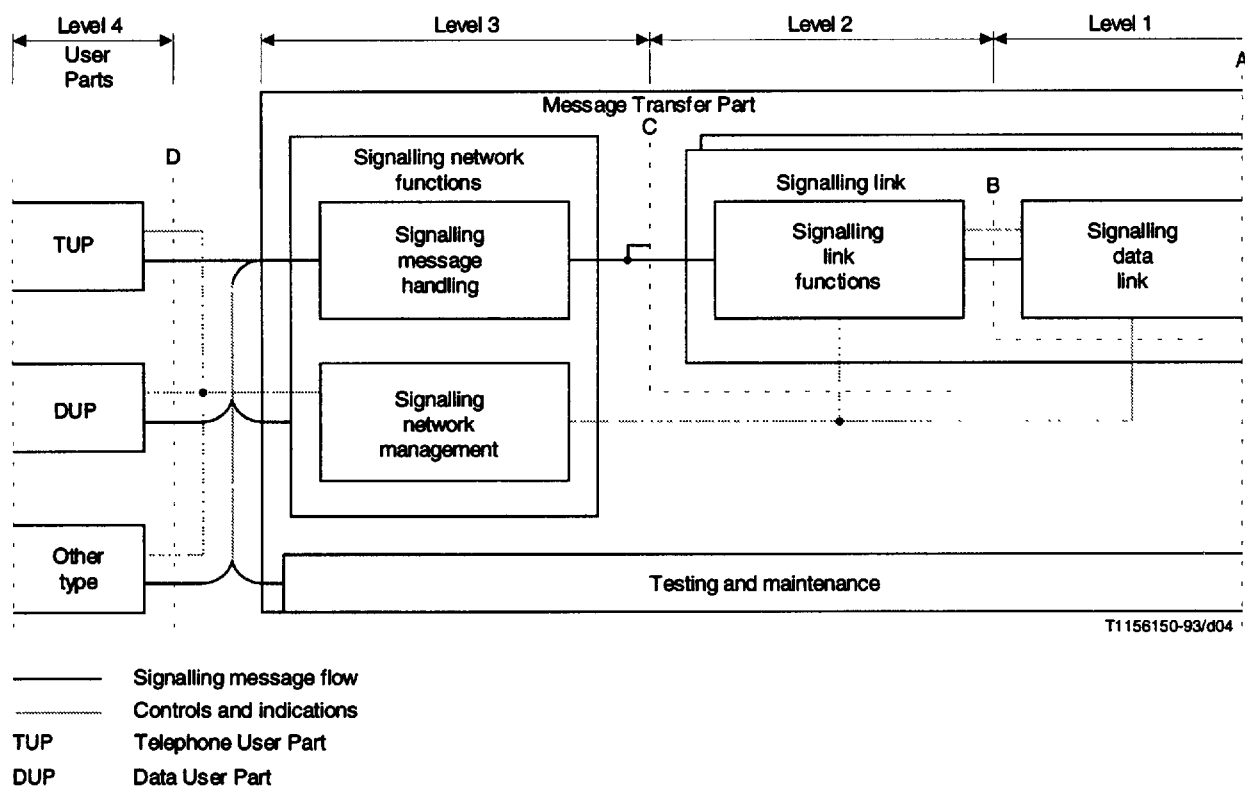


FIGURE 4/Q.701

General structure of signalling system functions