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(09/97)

SERIES Q: SWITCHING AND SIGNALLING

**Specifications of Signalling System No. 7 – Signalling
System No. 7 management**

Transaction capabilities test responder

ITU-T Recommendation Q.755.2

(Previously CCITT Recommendation)

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

ITU-T RECOMMENDATION Q.755.2**TRANSACTION CAPABILITIES TEST RESPONDER****Summary**

The 1993 version of Recommendation Q.755 for Protocol Testers contained just the MTP Tester. It has now been split into a series of Recommendations.

Recommendation Q.755.2 defines the Transaction Capabilities (TC) Test Responder; it is an addition to the 1993 version of Recommendation Q.755.

A TC Test Responder present in the system under test allows the use of Abstract Test Suites for testing the defined TC functionality of that system, independently of the functionalities employed by the TC-Users actually present.

Source

ITU-T Recommendation Q.755.2 was prepared by ITU-T Study Group 11 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 12th of September 1997.

FOREWORD

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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 expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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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.

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Recommendation Q.755.2

TRANSACTION CAPABILITIES TEST RESPONDER

(Geneva, 1997)

1 Scope

This Recommendation defines the Transaction Capabilities (TC) Test Responder, to be used as an aid when testing the TC of ITU Signalling System No. 7.

The Recommendation draws upon Recommendation Q.750 for architectural considerations of the relationship between the Test Responder and SS No. 7 management (OMAP) [9].

The Recommendation defines a simple and flexible Test Responder which enables the use of Abstract Test Suites (ATS) for Transaction Capabilities independently from the actual TC-Users which reside in a System Under Test (SUT).

No assumption is made about the actual implementation of the interface between this function and TC.

The availability of a standardized TC Test Responder has the following advantages:

- It makes it possible to write a unique Abstract Test Suite which can be executed against any TC implementation which resides in a system where the Test Responder is also implemented.
- It allows all the defined TC functionalities to be tested, irrespective of the subset of functionalities actually used by the TC-Users which are available when an equipment is under test.
- It helps to isolate faults during testing, since the proper response to a TC message or component will be independent of the proper execution of a real TC-User operation.
- It allows the TC stack to be tested before being delivered to a customer for supporting one or more particular TC-User applications.
- The Test Responder can even be used to perform stack-to-stack interoperability testing independently of any particular TC-User application.

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; 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-T Recommendations is regularly published.

- [1] ITU-T Recommendations X.680-X.683 (1994), *Information technology – Abstract Syntax Notation One (ASN.1)*.
- [2] ITU-T Recommendation X.690 (1994) | ISO/IEC 8825-1:1995, *Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*.



Documents

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- [3] ITU-T Recommendations Q.711-Q.714 (1993), *Specifications of Signalling System No. 7: Signalling connection control part.*
- [4] CCITT Recommendations Q.771-Q.775 (1988), *Specifications of Signalling System No. 7: Transaction Capabilities Application Part (TCAP).*
- [5] ITU-T Recommendations Q.771-Q.775 (1993), *Transaction capabilities application part.*
- [6] ITU-T Recommendation X.290 (1995), *OSI conformance testing methodology and framework for protocol Recommendations for ITU-T applications – General concepts.*
ISO/IEC 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts.*
- [7] ITU-T Recommendation I.320 (1993), *ISDN protocol reference model.*
- [8] CCITT Recommendation I.321 (1991), *B-ISDN protocol reference model and its application.*
- [9] ITU Recommendation Q.750 (1993), *Overview of Signalling System No. 7 management.*

3 Symbols and abbreviations

This Recommendation uses the following abbreviations:

AE	Application Entity
APDU	Application Protocol Data Unit
ASE	Application Service Element
ASN.1	Abstract Syntax Notation One
ATS	Abstract Test Suite
DPC	Destination PC
GPC	Generator PC
IUT	Implementation Under Test
LME	Level Management Entity
LT	Lower Tester
MIB	Management Information Base
MSU	Message Signal Unit
MT	MTP Tester
MTP	(SS No. 7) Message Transfer Part
OPC	Originating PC
PC	Point Code
PDU	Protocol Data Unit
SAP	Service Access Point
SCCP	(SS No. 7) Signalling Connection Control Part
SP	Signalling Point
SS No. 7	Signalling System No. 7

SUT	System Under Test
TC	Transaction Capabilities
TMP	Test Management Protocol
TPC	Turn-around PC
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

4 General

The protocol tester may be used as an aid when testing the Transaction Capabilities (TC) of Signalling System No. 7 (SS No. 7), either when performing validation testing of an implementation or compatibility testing between two implementations. The testers' main function is simulation of an ordinary user part or application, as seen from TC for the generation of test traffic.

Recommendations I.320 [7] and I.321 [8] specify the ISDN protocol reference model to be used for N-ISDN and B-ISDN. User plane (U-plane), Control plane (C-plane) and Management plane (M-plane) are identified. The layering principles apply in each of these planes. The U-plane provides the user information flow transfer with associated controls. The C-plane handles the call and connection control information. The M-plane is divided into two portions, the Layer Management functions and the Plane Management functions. The Plane Management performs management functions related to a system as a whole; it provides coordination between all the planes and has no layered structure. The Layer Management plane contains Layer Management Entities (LME). Each of them provides management functions relating to resources and parameters residing in its own protocol entity. Layer Management handles the operation and maintenance information flows. The interface between adjacent layers within a plane and between LME and its associated layer have to be defined in terms of service primitives. The interface between the LMEs and Plane Management does not need to be specified; it is implementation dependent.

For SS No. 7, the **Level Management Entity** is defined by analogy with the LME of Recommendations I.320 and I.321. This is to account for the different positions of the boundaries between SS No. 7 lower levels and those of OSI (e.g. the upper part of the MTP is level 3 in SS No. 7, the SCCP is level 4, but both would be within layer 3 if the OSI model is strictly applied). For SS No. 7, the term "LME" is taken to mean "Level Management Entity".

Thus the TT (TC Test Responder) is within the LME of the application AE. The procedures, the messages and the TT substructure are described. The undefined primitives between the Plane Management (MIB) and the TT are only required to activate/deactivate the concerned testing functions (see Figure 1, which is a copy of Figure 5/Q.750).