INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

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OF ITU

Amendment 1
X.882
(11/95)

DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS

OSI APPLICATIONS – REMOTE OPERATIONS

INFORMATION TECHNOLOGY – REMOTE OPERATIONS: OSI REALIZATIONS – REMOTE OPERATIONS SERVICE ELEMENT (ROSE) PROTOCOL SPECIFICATION

AMENDMENT 1: MAPPING TO A-UNIT-DATA AND BUILT-IN OPERATIONS

Amendment 1 to

ITU-T Recommendation X.882

(Previously "CCITT Recommendation")

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. Some 179 member countries, 84 telecom operating entities, 145 scientific and industrial organizations and 38 international organizations participate in ITU-T which is the body which sets world telecommunications standards (Recommendations).

The approval of Recommendations by the Members of ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, 1993). In addition, the World Telecommunication Standardization Conference (WTSC), which meets every four years, approves Recommendations submitted to it and establishes the study programme for the following period.

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. The text of ITU-T Recommendation X.882, Amendment 1, was approved on 21st of November 1995. The identical text is also published as ISO/IEC International Standard 13712-3.

NOTE

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

ITU-T X-SERIES RECOMMENDATIONS

DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS

(February 1994)

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Summary

This amendment to Rec. X.882 | ISO/IEC 13712-3 provides the protocol procedures for the mapping of ROSE APDUs onto the A-UNIT-DATA service, and the inclusion of three built-in operations – Probe, Acknowledge and Cancel – which are of general utility to designers of ROSE-based applications.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – REMOTE OPERATIONS: OSI REALIZATIONS – REMOTE OPERATIONS SERVICE ELEMENT (ROSE) PROTOCOL SPECIFICATION

AMENDMENT 1
Mapping to A-UNIT-DATA and built-in operations

1) Clause 1

Rewrite the third sentence of the first paragraph as follows (with the changes underlined):

The ROSE services, defined in ITU-T Rec. X.881 | ISO/IEC 13712-2, are provided in conjunction with the Association Control Service Element (ACSE) services (ITU-T Rec. X.217 | ISO/IEC 8649) and the ACSE protocol (ITU-T Rec. X.227 | ISO/IEC 8650-1 <u>and ITU-T Rec. X.237 | ISO/IEC 10035-1)</u>, optionally the Reliable Transfer Service Element (RTSE) services (ITU-T Rec. X.218 | ISO/IEC 9066-1) and the RTSE protocol (ITU-T Rec. X.228 | ISO/IEC 9066-2), and the Presentation service (ITU-T Rec. X.216 | ISO/IEC 8822).

2) Subclause 2.1

Add the following references:

- ITU-T Recommendation X.237 (1995) | ISO/IEC 10035-1:1995, *Information technology – Open Systems Interconnection – Connectionless protocol for the Association Control Service Element: Protocol specification.*
- ITU-T Recommendation X.880 (1994)/Amd.1 (1995) | ISO/IEC 13712-1:1995/Amd.1:1996, *Information technology – Remote Operations: Concepts, model and notation – Amendment 1: Built-in operations.*
- ITU-T Recommendation X.881 (1994)/Amd.1 (1995) | ISO/IEC 13712-2:1995/Amd.1:1996, *Information technology – Remote Operations: OSI realizations – Remote Operations Service Element (ROSE) service definition – Amendment 1: Mapping to A-UNIT-DATA and built-in operations.*

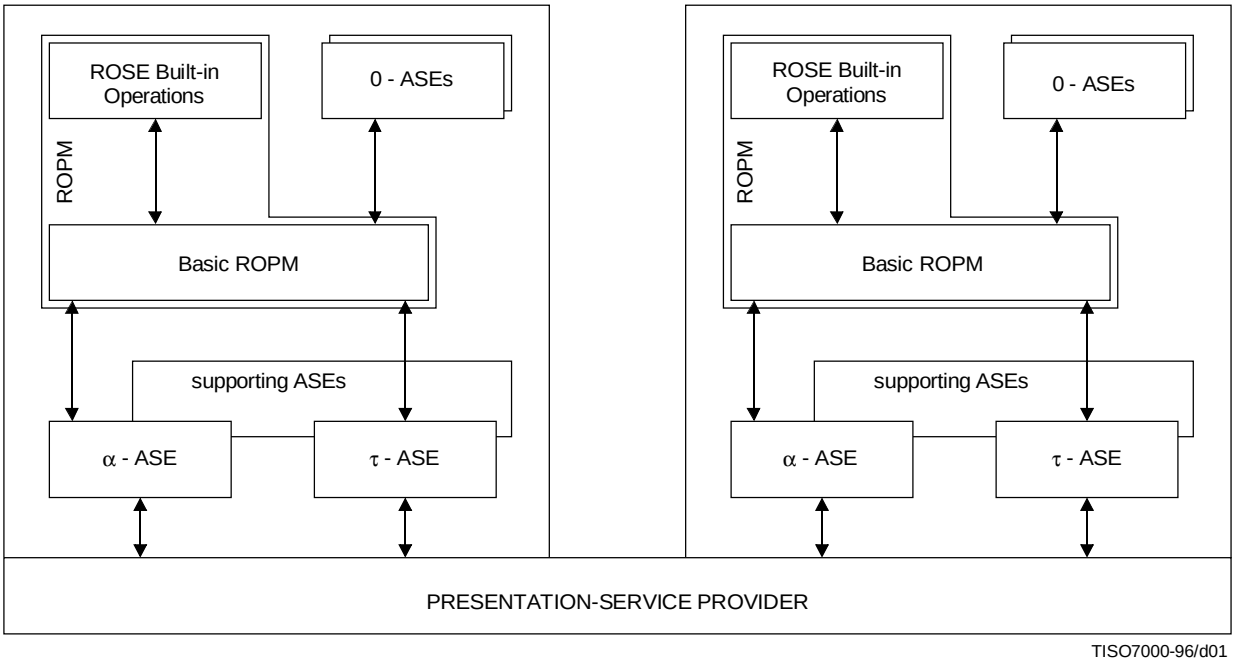
3) Subclause 6.2

Rewrite the last paragraph as follows (with additions underlined and deletions struckthrough):

Two specific association realizations are included, one based upon ACSE and one on RTSE. ~~Two~~<u>Three</u> specific transfer realizations are included, based respectively on the use of P-DATA, <u>A-UNIT-DATA</u> and RT-DATA to transfer the APDUs.

4) Subclause 6.3

Replace the existing Figure 1 with the following figure:



α – ASE	ASE providing association establishment and release
τ – ASE	ASE providing information transfer
ROPM	Remote Operations protocol machine
0 – ASEs	Operation-specific ASEs

Figure 1 – Protocol model

5) Clause 8

Change clause 8 to 9, and similarly for all subclauses contained therein.

Add the following new clause 8:

8 Built-in operations

8.1 Probe and acknowledge

If the `probe` or `acknowledge` operation is included in the application context, then a ROPM, having sent a ReturnResult or ReturnError APDU for a non-idempotent operation retains that APDU until it has been acknowledged. While retained, that APDU is re-sent if a `probe` takes place during that period. As a local matter, the APDU may also be re-sent periodically.

A retained ReturnResult or ReturnError APDU is considered acknowledged, and can be deleted, if:

a) the operation to which the retained APDU was a reply is synchronous, and a synchronous operation is subsequently invoked by the same invoker; or

b) the `acknowledge` operation is invoked by the same invoker, citing the operation invocation to which the operation invocation to which the retained APDU was the return; or

c) having re-sent the APDU, a Reject APDU is received, citing the operation invocation to which the retained APDU was the return, and indicating, if the retained APDU was a ReturnResult, `returnResult : resultResponseUnexpected` or, if the retained APDU was a ReturnError, `returnError : errorResponseUnexpected`.

If `probe` or `acknowledge` is included in the application context, then an ROPM having received a ReturnResult or ReturnError APDU for a non-idempotent operation shall acknowledge such receipt either:

a) if the operation to which the received APDU was a reply is synchronous, by subsequently invoking a synchronous operation; or

b) by invoking the `acknowledge` operation, citing the operation invocation to which the received APDU was a return. The `acknowledge` operation, which is idempotent, can be invoked repeatedly until it produces a result.

6) Clause 9

Renumber clause 9 as 10, and similarly for all subclauses contained therein.

Renumber subclause 9.1 as 10.1 and modify the first paragraph as shown below (with additions underlined and deletions struckthrough):

A transfer realization may require the inclusion in the application context of an ASE which provides services for the transfer of information. Alternatively, the realization may involve direct use of the presentation service. The realization may require a number of supporting ASEs to be present. ~~Two~~Three transfer realizations are specified in this clause. The P-DATA realization is specified in ~~9.2~~10.2, and uses the connection-oriented services of the Presentation service directly. The A-UNIT-DATA realization uses the connectionless-mode OSI upper layer services and is specified in 10.3. The RT-TRANSFER realization is specified in ~~9.3~~10.4.

Renumber 9.2 as 10.2.

Renumber 9.3 as 10.4.

7) Subclause 9.3.2

Renumber the existing Table 18 as Table 19.

8) Clause 10

Add a new subclause 10.3 as shown below:

10.3 A-UNIT-DATA

10.3.1 This subclause specifies a transfer realization employing the A-UNIT-DATA service of ACSE.

10.3.2 The *TRANSFER* service assumed by ROSE is provided as shown in Table 18.

Table 18 – Actual transfer primitives for the A-UNIT-DATA realization

Pseudo-primitive	Actual primitive(s)
TRANSFER	A-UNIT-DATA
user-data	User information

10.3.3 This realization imposes a maximum size of the APDU which can be transferred.

NOTE – The value of this maximum size is for further study.

10.3.4 This realization permits several *TRANSFER* requests arising close to one another in time to be combined into a single A-UNIT-DATA request. Each *TRANSFER* request conveys a single ROSE APDU, a presentation data value (PDV). The A-UNIT-DATA carries all the concatenated PDVs.

10.3.5 The realization specified in this subclause can be included as the **&transferRealization** field of an **APPLICATION-CONTEXT** by referencing the definition **aUnitData**:

```
aUnitData REALIZATION ::=
{RealizationParameter (WITH COMPONENT {realization-type(transfer-service)})
IDENTIFIED BY (joint-iso-ccitt association-control(2) abstract-syntax(1) apdus(1) version(1)}
}
```

9) Clause 10

Renumber clause 10 as clause 11 and similarly for all its subclauses.

10) Clause 11

Renumber clause 11 as clause 12.

Renumber 11.1 as subclause 12.1, and modify as follows (with additions underlined and deletions struckthrough):

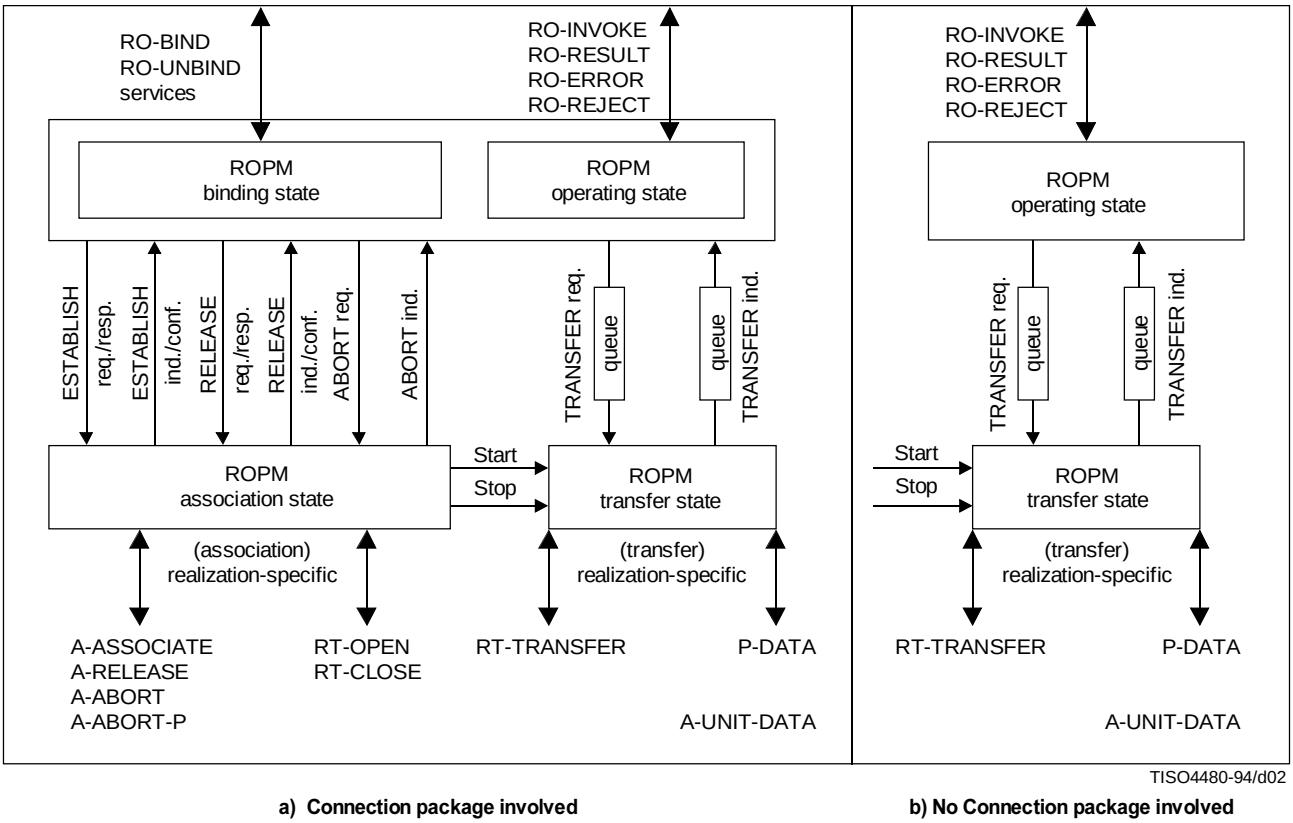
An implementor shall state the following:

a) the application context for which conformance is claimed, including whether the system supports the mapping of ROSE onto RTSE, onto the Presentation service, or A-UNIT-DATA or ~~both~~ combinations of these mappings.

Renumber 11.2 and 11.3 as 12.2 and 12.3 respectively.

11) Subclause A.1

Replace Figure A.1 with the following figure:



a) Connection package involved **b) No Connection package involved**

Figure A.1 – Components of the ROPM state

12) Subclause A.4

Modify the itemized list of tables at the end of A.4 as follows (with additions underlined, and deletions struckthrough):

A.5 Transfer state table – A-UNIT-DATA realization

~~A.5~~A.6 Transfer state table – RT-TRANSFER realization

13) Subclause A.5

Add the following new tables numbered A.5 and renumber existing Table A.5 as A.6:

Table A.5(IN) – Transfer state – A-UNIT-DATA realization

Abbreviated name	Source	Name and description
TRANSreq	primary	*TRANSFER* request
PDV	ACSE	PDV carried within an A-UNIT-DATA indication.
start	association	start the transfer state machine
stop	association	stop the transfer state machine

Table A.5(ST) – Transfer state – A-UNIT-DATA realization

Abbreviated name	Name and description
TAU01	inactive
TAU02	active

Table A.5(OUT) – Transfer state – A-UNIT-DATA realization

Abbreviated name	Target	Name and description
TRANSind	primary	*TRANSFER* indication
PDV	ACSE	PDV carried on an A-UNIT-DATA request

Table A.5(TABLE) – Transfer state – A-UNIT-DATA realization

	TAU01	TAU02
TRANSreq		PDV TAU02
PDV		TRANSind TAU02
start	TAU02	
stop		TAU01

14) Annex C

Change the object identifier of the module reference as follows (with the change underlined):

Remote-Operations-Realizations {joint-iso-itu-t remote-operations(4) realizations(9) version2(1)}

Add the following item to the module body:

aUnitData REALIZATION ::=
{RealizationParameter (WITH COMPONENT {realization-type(transfer-service)})
IDENTIFIED BY {joint-iso-ccitt association-control(2) abstract-syntax(1) apdus(1) version(1)}}

15) Annex D

Add the following item to the table, and change 9.2 to 10.2 and 9.3 to 10.4:

Reference	Object Identifier Value Object Descriptor Value
Clause 10.3	**{joint-iso-ccitt association-control(2) abstract-syntax(1) apdus(1) version(1)}** The above is the object identifier of the transfer realization information object when using the A-UNIT-DATA.