



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

**OSI  
Implementers'  
Guide**

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SERIES X: DATA NETWORKS, OPEN SYSTEM  
COMMUNICATIONS AND SECURITY

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**OSI Implementers' Guide – Version 1.1**

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# OSI IMPLEMENTERS' GUIDE

Version 1.1

December 2006

# OSI IMPLEMENTERS' GUIDE

## 1 Introduction

### 1.1 Background

This Guide is a compilation of reported defects and their resolutions to the Open Systems Interconnection (OSI) ITU-T Recommendations in the following series:

- X.200-series
- X.600-series (excluding X.680/X.690-series on ASN.1)
- X.800-series

and their equivalent (common text or twin text) standards, technical reports, and international standardized profiles in ISO/IEC.

Other Implementers' Guides cover Open Systems Interconnection (OSI) ITU-T Recommendations (and their ISO/IEC equivalents) in the X.400-series, X.500-series and X.700-series.

This Guide is intended to be an additional authoritative source of information for implementers to be read in conjunction with the Recommendations | International Standards themselves.

This Guide itself is neither an ITU-T Recommendation nor an ISO/IEC International Standard. However, it records agreed corrections to reported defects.

### 1.2 Scope of the Guide

The Guide records the resolution of defects in the following categories:

- editorial errors
- technical errors such as omissions or inconsistencies
- ambiguities

NOTE: This Guide does not address proposed additions, deletions, or modifications to the Recommendations or International Standards that are not strictly related to implementation difficulties in the above categories. Proposals for new features should be made in the normal way through contributions to ITU-T Study Group 17 and/or ISO/IEC JTC 1.

### 1.3 Approval of the Guide

This Guide is approved by ITU-T Study Group 17.

### 1.4 Distribution of the Guide

This Guide is available on-line at no charge from the ITU (<http://www.itu.int>).

### 1.5 Contact

Any comments should be addressed to the ITU-T secretariat for Study Group 17:

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## **2 Defect Report and Resolution Procedures**

### **2.1 Submission of Defects**

Any implementer of the X.200-series, X.600-series and X.800-series Recommendations or their ISO/IEC equivalents is invited to submit a defect report using the form found in Annex A of the Guide. The defect report should be submitted to the ITU-T Study Group 17 secretariat (see clause 1.5). Each form should cover a single defect. It is important that the form is completed accurately, especially the sections that relate to the base material against which the defect report is being raised.

### **2.2 Resolution of Defects**

ITU-T Study Group 17 and where appropriate in collaboration with the appropriate counterpart in ISO/IEC JTC 1 will address the submitted defect. Following agreement on a resolution to the defect, the proposed resolution will be approved using the appropriate procedures in ITU-T and where necessary in ISO/IEC JTC 1.

Please note that no individual responses can be given to those submitting reports, and that the procedure is not intended as a consulting service.

### **2.3 Documenting the Resolution of Defects**

The following ITU-T Recommendations and their ISO/IEC equivalents have defects. The defects and their resolutions are recorded in Annex B.

- ITU-T Recommendation X.225 | ISO/IEC 8327-1
- ITU-T Recommendation X.227 | ISO/IEC 8650-1
- ITU-T Recommendation X.227bis | ISO/IEC 15954
- ITU-T Recommendation X.228 | ISO/IEC 9066-2
- ITU-T Recommendation X.237 | ISO/IEC 10035-1
- ITU-T Recommendation X.274 | ISO/IEC 10736
- ITU-T Recommendation X.638 | ISO/IEC ISP 11188-3
- ITU-T Recommendation X.830 | ISO/IEC 11586-1
- ITU-T Recommendation X.880 | ISO/IEC 13712-1
- ITU-T Recommendation X.882 | ISO/IEC 13712-3

## Annex A

### Defect report form

Please send an electronic copy to [tsbsg17@itu.int](mailto:tsbsg17@itu.int)

1. Defect Report Number:
2. Date:
3. Source (your complete contact information):
4. Defect Report Concerning ITU-T Recommendation (give Recommendation number and date):
5. Qualifier (e.g.: error, omission, clarification required):
6. References in Document (e.g.: page, clause/section, figure, and/or table numbers):
7. Nature of Defect (complete, concise explanation of the perceived problem):
8. Solution Proposed by the Source (optional):
9. Editor's Response:

(Any material proposed for processing as an erratum to, an amendment to, or a commentary on the ITU-T Recommendation is attached separately to this completed report.)

## Annex B

### Defects and their resolution

#### **ITU-T Recommendation X.225 (11/1995) – Information technology – Open Systems Interconnection – Connection-oriented Session protocol: Protocol specification**

Defect 1 – Corrected by publication of Technical Corrigendum 1 (03/2000)

##### Resolution of Defect 1

1) Subclause 7.4.1

In 7.4.1 b) 5), in the middle of the paragraph, replace the *cross reference for CONNECT SPDU* “[see 7.1.1, b), 4)]” by “[see 7.1.1, b), 5)]”.

2) Subclause 8.3.4.13

In 8.3.4.13, replace number in last line “654539” by “65539”.

---

#### **ITU-T Recommendation X.227 (04/1995) – Information technology – Open Systems Interconnection – Connection-oriented protocol for the Association Control Service Element: Protocol specification**

##### Defect 1

References are made to withdrawn Recommendation X.208

##### Resolution of Defect 1

Replace all occurrences of Recommendation X.208 with Recommendation X.680.

##### Defect 2

B.1: Assigned name

Note that the body of ITU-T Rec. X.227 defines {joint-iso-itu-t association-control(2) as-id(3) acse-ase(1) version(1)} whereas its Annex B defines {joint-iso-itu-t association-control(2) authentication-mechanism(3) password-1(1)}.

##### Resolution of Defect 2

The authentication mechanism OID is wrong (since it came second historically, it is Annex B that is at fault). However, the fact that no one has ever raised this problem makes it clear that either no one has implemented Annex B, or if they have, they have not found any problems in colliding with the OID for the ASE. As a consequence, the OID is not changed. It references both the authentication mechanism using password and the Association Control ASE.

##### Defect 3

ASN.1 module named ACSE-1

##### Resolution of Defect 3

Replace  
FROM InformationFramework

```

{ joint-iso-ccitt ds(5) module(1)
informationFramework(1) 2 };

with:
FROM InformationFramework
{joint-iso-itu-t ds(5) module(1)
informationFramework(1) 3};

```

---

## ITU-T Recommendation X.227 bis (09/1998) – Information technology – Open Systems Interconnection – Connection-mode protocol for the Application Service Object Association Control Service Element

### Defect 1

#### B.1: Assigned name

This subclause is in agreement with subclause B.1 of ITU-T Rec. X.227. The third arc of the object identifier defined in this subclause refers to the authentication-mechanism using password.

Subclause 9.1 and subclause B.1 of ITU-T Recommendation X.227bis contradict each other as is the case in X.227.

### Resolution of Defect 1

The authentication mechanism OID is wrong since it came second historically. However, the fact that no one has ever raised this problem makes it clear that either no one has implemented Annex B, or if they have, they have not found any problems in colliding with the OID for the ASE. As a consequence, the OID is not changed. It references both the authentication mechanism using password and the Association Control ASE.

### Defect 2

Section 9.1, Structure of ACSE APDUs, pages 38-39, definitions of AP-Title and ASO-qualifier.

AP-Title and ASO-qualifier have 3 forms, but none of them provide the efficiency that could be obtained by use of the new ASN.1 type RELATIVE-OID. A fourth form should be added using the RELATIVE-OID type.

### Resolution of Defect 2

Replace AP-Title with:

```

AP-title ::= CHOICE {
    ap-title-form1,
    ap-title-form2,
    ...,
    ap-title-form3,
    ap-title-form4
}

```

and replace ASO-qualifier with:

```

ASO-qualifier ::= CHOICE {
    aso-qualifier-form1,
    aso-qualifier-form2,
    ...,
    aso-qualifier-form3,
    aso-qualifier-form4
}

```

where AP-title-form4 and ASO-qualifier-form4 are:

```
AP-title-form4 ::= [0] IMPLICIT RELATIVE-OID
```

```

ASO-qualifier-form4 ::= [0] IMPLICIT RELATIVE-OID
-- This is a RELATIVE-OID with exactly one arc.

```

This is an extension addition, and implementations that are not aware of it will behave appropriately.

---

## CCITT Recommendation X.228 (11/1988) – Reliable transfer: Protocol Specification

### Defect 1 – Corrected by publication of Technical Corrigendum 1 (03/2000)

#### Resolution of Defect 1

*Add the following at the end of 8.1.1.1.3.5:*

Those components shall be encoded according to the Basic Encoding Rules defined in CCITT Rec. X.209 | ISO 8825. Each encoded component shall contain Identifier and Length octets.

A comparison between the session connection identifier element on an RTORQ APDU with the session connection identifier parameter of an (earlier) A-ASSOCIATE service primitive succeeds if the values of the three components, ignoring the BER-derived identifier and length octets, are the same. It is a local matter how the responding RTPM performs this.

### Defects 2-5

9:Abstract Syntax Definition of APDUs

Module Reliable-Transfer-APDU:

#### Resolution of Defect 2

Replace

APPLICATION-SERVICE-ELEMENT

FROM Remote-Operations-Notation-extension{joint-iso-ccitt remote-operations(4) notation-extension(2)}

with

CONTRACT

FROM Remote-Operations-Information-Objects {joint-iso-itu-t remote-operations(4) informationObjects(5) version1(0)}

#### Resolution of Defect 3

Replace

rTSE APPLICATION-SERVICE-ELEMENT ::= {joint-iso-ccitt reliable-transfer(3) aseID (1)}

with

rTSE CONTRACT ::= {ID {joint-iso-itu-t reliable-transfer(3) aseID (1)} }

#### Resolution of Defect 4

Addition of the definition of OPEN:

OPEN ::= CLASS{&Type} WITH SYNTAX { TYPE &.Type }

#### Resolution of Defect 5

Replace of all occurrences of ANY with OPEN . &Type.

---

## **ITU-T Recommendation X.237 (04/1995) – Information technology – Open Systems Interconnection – Connectionless protocol for the Association Control Service Element: Protocol specification**

Defect 1 – Corrected by publication of Technical Corrigendum 1 (10/1996) to Amendment 1, Incorporation of extensibility markers and authentication parameters (10/1996)

### Resolution of Defect 1

Subclause 9.1

- a) *Insert missing semi-colon at end of IMPORTS statement;*
- b) *Insert missing tag [12] between calling-authentication-value and EXPLICIT.*

---

## **ITU-T Recommendation X.274 (07/1994) – Information technology – Telecommunications and information exchange between systems – Transport layer security protocol**

### Defect 1

Annex C - The second arc of ASSR-ID is wrong. Arc 3 below joint-iso-ccitt is already reserved. Also identified organization should be identified-organization

### Resolution of Defect 1

Replace

```
ASSR-ID {joint-iso-ccitt(2) identifier organization(3) oiw(14) secsig(3)
oiwsecsigassrobjectidentifier(5) rule(1)}
```

with

```
ASSR-ID {iso(1) identifier-organization(3) oiw(14) secsig(3)
oiwsecsigassrobjectidentifier(5) rule(1)}
```

---

## **ITU-T Recommendation X.638 (10/1996) – Minimal OSI facilities to support basic communications applications**

### Defect 1

B 5.1 Transfer syntaxes supported – [PICS proforma, A.9.1]

### Resolution of Defect 1

This subclause defines the following identifier {joint-iso-itu-t(2) standard(0) X.637(11188-1) mosi(3) default-transfer-syntax(2) version(1)} instead of {iso(0) standard(0) 11188-1 mosi(3) default-transfer-syntax(2) version(1)}.

Note that the same error also needs to be corrected in:

- Subclause B.5.2:
- Table D.2/X.638
- Table E.3/X.638
- Subclauses F.1, F.2, and F.3.

## ITU-T Recommendation X.830 (04/1995) – Information technology – Open Systems Interconnection – Generic upper layers security: Overview, models and notation

### Defect 1

References are made to withdrawn Recommendation X.208

### Resolution of Defect 1

Replace all occurrences of Recommendation X.208 with Recommendation X.680.

### Defect 2

Annex A - Incorrect ASN.1 module Notation

### Resolution of Defect 2:

NOTE: The highlighted texts correspond to those parts to be changed or the replacement texts, respectively

Replace

```
PROTECTED {BaseType, PROTECTION-MAPPING: protectionReqd} ::=
  CHOICE
  {
    dirEncrypt BIT STRING (CONSTRAINED BY {BaseType
      -- dirEncrypt is for use only with the
      -- dirEncryptedTransformation,
      -- and generates the same encoding as the
      -- X.509/9594-8 ENCRYPTED type--}),
    dirSign SEQUENCE
      {
        baseType BaseType OPTIONAL,
        -- must be present for dirSignedTransformation
        -- and must be omitted for
        -- dirSignatureTransformation
        algorithmId AlgorithmIdentifier,
        encipheredHash BIT STRING (CONSTRAINED BY{BaseType --
contains enciphered hash-- of a value of BaseType --})
      }
      -- dirSign is for use only with the
      -- dirSignedTransformation or
      -- dirSignatureTransformation, and generates
      -- the same encoding as the corresponding
      -- X.509/9594-8 SIGNED or SIGNATURE type--,
    noTransform [0] BaseType,
      -- noTransform invokes no security transformation.
      -- Subject to security policy, noTransform may be used
      -- if adequate protection is provided by lower layers
      -- and any application relays through which the data
      -- may pass are trusted to maintain the required
      -- protection. This alternative may only be used
      -- if protectionReqd.&bypassPermitted is TRUE,
    direct [1] SyntaxStructure
      {
        {{protectionReqd.&SecurityTransformation}},
        -- direct generates a protecting transfer syntax
        -- value, which is encoded using the same encoding
        -- rules as the surrounding ASN.1 (The type
        -- SyntaxStructure is imported from Rec. X.833 |
        -- ISO/IEC 11586-3)
    embedded [2] EMBEDDED PDV (WITH COMPONENTS {
      identification (WITH COMPONENTS {
        presentation-context-id,
          context-negotiation (WITH COMPONENTS {
            transfer-syntax (CONSTRAINED BY {OBJECT IDENTIFIER :
protectionReqd.&protTransferSyntax}))}),
```

```

        transfer-syntax (CONSTRAINED BY {OBJECT IDENTIFIER :
protectionReqd.&protTransferSyntax})),
        data-value (WITH COMPONENTS {notation (BaseType)})
        -- The data value encoded is a value of type BaseType
    })
}
-- BaseType is the type to be protected, and protectionReqd is an ASN.1
-- object of class PROTECTION-MAPPING. The use of PROTECTED requires
-- the importation into the user's module of the PROTECTED parameterized
-- type, together with the necessary PROTECTION-MAPPING object
-- definition.

```

with

```

PROTECTED {BaseType, PROTECTION-MAPPING: protectionReqd} ::=
CHOICE
{
    dirEncrypt BIT STRING (CONSTRAINED BY {BaseType
        -- dirEncrypt is for use only with the
        -- dirEncryptedTransformation,
        -- and generates the same encoding as the
        -- X.509/9594-8 ENCRYPTED type--}),
    dirSign SEQUENCE
        {
            baseType BaseType OPTIONAL,
            -- must be present for dirSignedTransformation
            -- and must be omitted for
            -- dirSignatureTransformation
            algorithmId AlgorithmIdentifier,
            encipheredHash BIT STRING (CONSTRAINED BY{BaseType --
contains enciphered hash-- of a value of BaseType --})
        }
        -- dirSign is for use only with the
        -- dirSignedTransformation or
        -- dirSignatureTransformation, and generates
        -- the same encoding as the corresponding
        -- X.509/9594-8 SIGNED or SIGNATURE type--,
    noTransform [0] BaseType,
        -- noTransform invokes no security transformation.
        -- Subject to security policy, noTransform may be used
        -- if adequate protection is provided by lower layers
        -- and any application relays through which the data
        -- may pass are trusted to maintain the required
        -- protection. This alternative may only be used
        -- if protectionReqd.&bypassPermitted is TRUE,
    direct [1] SyntaxStructure
        {
            {{protectionReqd.&SecurityTransformation}},
            -- direct generates a protecting transfer syntax
            -- value, which is encoded using the same encoding
            -- rules as the surrounding ASN.1 (The type
            -- SyntaxStructure is imported from Rec. X.833 |
            -- ISO/IEC 11586-3)
        },
    embedded [2] EMBEDDED PDV (WITH COMPONENTS {
        identification (WITH COMPONENTS {
            presentation-context-id,
            context-negotiation (WITH COMPONENTS {
                transfer-syntax (CONSTRAINED BY {OBJECT IDENTIFIER :
protectionReqd.&protTransferSyntax})),
                transfer-syntax (CONSTRAINED BY {OBJECT IDENTIFIER :
protectionReqd.&protTransferSyntax})),
                data-value (CONTAINING BaseType )
                -- The data value encoded is a value of type BaseType
            })
        })
    }
}
-- BaseType is the type to be protected, and protectionReqd is an ASN.1
-- object of class PROTECTION-MAPPING. The use of PROTECTED requires
-- the importation into the user's module of the PROTECTED parameterized
-- type, together with the necessary PROTECTION-MAPPING object
-- definition.

```

### Defect 3

Annex A - Incorrect ASN.1 module GulsSecurityTransformations:

### Resolution of Defect 3

Replace

```
gulsSignedTransformation {KEY-INFORMATION: SupportedKIClasses }
    SECURITY-TRANSFORMATION ::=
    {
        IDENTIFIER {securityTransformations guls-signed (4) }
        INITIAL-ENCODING-RULES {joint-iso-itu-t asn1 (1) ber-derived (2)
                                canonical-encoding (0)}
        -- This default for initial encoding rules may be overridden
        -- using a static protected parameter (initEncRules).
        XFORMED-DATA-TYPE SEQUENCE
        {
            intermediateValue EMBEDDED PDV (WITH COMPONENTS {
                identification (WITH COMPONENTS
                    {transfer-syntax (CONSTRAINED BY {
                        -- The transfer syntax to be used is that
                        -- indicated by the initEncRules value within
                        -- the intermediate value -- }) PRESENT}),
                data-value WITH COMPONENTS ({notation (IntermediateType
                    { {SupportedKIClasses} })))
                -- The data value encoded is a value of type
                -- IntermediateType
            })),
            appendix BIT STRING (CONSTRAINED BY {
                -- the appendix value must be generated following
                -- the procedure specified in D.4 of DIS 11586-1 -- })
        }
    }

with

gulsSignedTransformation {KEY-INFORMATION: SupportedKIClasses }
    SECURITY-TRANSFORMATION ::=
    {
        IDENTIFIER {securityTransformations guls-signed (4) }
        INITIAL-ENCODING-RULES {joint-iso-itu-t asn1 (1) ber-derived (2)
                                canonical-encoding (0)}
        -- This default for initial encoding rules may be overridden
        -- using a static protected parameter (initEncRules).
        XFORMED-DATA-TYPE SEQUENCE
        {
            intermediateValue EMBEDDED PDV (WITH COMPONENTS {
                identification (WITH COMPONENTS
                    {transfer-syntax (CONSTRAINED BY {
                        -- The transfer syntax to be used is that
                        -- indicated by the initEncRules value within
                        -- the intermediate value -- }) PRESENT}),
                data-value (CONTAINING IntermediateType({SupportedKIClasses}))
                -- The data value encoded is a value of type
                -- IntermediateType
            })),
            appendix BIT STRING (CONSTRAINED BY {
                -- the appendix value must be generated following
                -- the procedure specified in D.4 of DIS 11586-1 -- })
        }
    }
```

---

**ITU-T Recommendation X.880 (07/1994) – Information technology – Remote Operations: Concepts, model and notation**

Defect 1 – Corrected by publication of Technical Corrigendum 1 (07/1995)

## Resolution of Defect 1

### a) Subclause 9.4.1

Replace the ASN.1 box with the following:

```
ReturnResult {OPERATION:Operations} ::= SEQUENCE
{
    invokeId  InvokeId
                (CONSTRAINED BY {-- must be that for an outstanding operation --}
                ! RejectProblem : returnResult-unrecognisedInvocation)
                (CONSTRAINED BY {-- which returns a result --}
                ! RejectProblem: returnResult-resultResponseUnexpected),
    result    SEQUENCE
    {
        opcode  OPERATION.&operationCode
                ({Operations})(CONSTRAINED BY {-- identified by invokeId --}
                ! RejectProblem : returnResult-unrecognisedInvocation),
        result  OPERATION.&ResultType    ({Operations} {@.opcode}
                ! RejectProblem : returnResult-mistypedResult)
    }
    OPTIONAL
}
(CONSTRAINED BY { -- must conform to the above definition -- }
! RejectProblem : general-mistypedPDU)
```

### b) Subclause 10.11

Replace the contents of the ASN.1 box with the following:

```
recode {OPERATION:operation, Code:code} OPERATION ::=
{
    ARGUMENT          operation.&ArgumentType
    OPTIONAL           operation.&argumentTypeOptional
    RESULT             operation.&ResultType
    OPTIONAL           operation.&resultTypeOptional
    RETURN RESULT      operation.&returnResult
    ERRORS              {operation.&Errors}
    LINKED              {operation.&Linked}
    SYNCHRONOUS         operation.&synchronous
    ALWAYS RESPONDS     operation.&alwaysReturns
    INVOKE PRIORITY     {operation.&InvokePriority}
    RESULT-PRIORITY     {operation.&ResultPriority}
    CODE                code
}
}
```

### c) Subclause 10.12

Replace the contents of the ASN.1 box with the following:

```
switch {OPERATION-PACKAGE:package, OBJECT IDENTIFIER:id} OPERATION-PACKAGE ::=
{
    OPERATIONS          {package.&Both}
    CONSUMER INVOKES     {package.&Consumer}
    SUPPLIER INVOKES     {package.&Supplier}
    ID                   id
}
}
```

d) Subclause 10.13.1

Replace the contents of the ASN.1 box with the following:

```
combine {OPERATION-PACKAGE:ConsumerConsumes, OPERATION-PACKAGE:ConsumerSupplies,
OPERATION-PACKAGE:base} OPERATION-PACKAGE ::=
{
    OPERATIONS      {ConsumerConsumes.&Both | ConsumerSupplies.&Both}
    CONSUMER INVOKES {ConsumerConsumes.&Consumer | ConsumerSupplies.&Supplier}
    SUPPLIER INVOKES {ConsumerConsumes.&Supplier | ConsumerSupplies.&Consumer}
    ID               base.&id
}
```

e) Annex A

In the module:

Remote-Operations-Generic-ROS-PDUs {joint-iso-itu-t remote-operations(4) generic-ROS-PDUs(6) version1(0)},

replace the definition of:

ReturnResult{ OPERATION:Operations}

with the following:

```
ReturnResult {OPERATION:Operations} ::= SEQUENCE
{
    invokeId  InvokeId
                (CONSTRAINED BY {-- must be that for an outstanding operation --}
                ! RejectProblem : returnResult-unrecognisedInvocation)
                (CONSTRAINED BY {-- which returns a result --}
                ! RejectProblem: returnResult-resultResponseUnexpected),
    result    SEQUENCE
    {
        opcode OPERATION.&operationCode
                ({Operations})(CONSTRAINED BY {-- identified by invokeId --}
                ! RejectProblem : returnResult-unrecognisedInvocation),
        result OPERATION.&ResultType  ({Operations} {@.opcode}
                ! RejectProblem : returnResult-mistypedResult)
    }
    OPTIONAL
}
(CONSTRAINED BY {-- must conform to the above definition --}
! RejectProblem : general-mistypedPDU)
```

In the module:

Remote-Operations-Useful-Definitions {joint-iso-itu-t remote-operations(4) useful-definitions(7) version1(0)}

replace the definitions of:

recode{ OPERATION:operation, Code:code}

with the following:

```

recode {OPERATION:operation, Code:code} OPERATION ::=
{
    ARGUMENT          operation.&ArgumentType
    OPTIONAL           operation.&argumentTypeOptional
    RESULT            operation.&ResultType
    OPTIONAL           operation.&resultTypeOptional
    RETURN RESULT     operation.&returnResult
    ERRORS             {operation.&Errors}
    LINKED             {operation.&Linked}
    SYNCHRONOUS        operation.&synchronous
    ALWAYS RESPONDS    operation.&alwaysReturns
    INVOKE PRIORITY    {operation.&InvokePriority}
    RESULT-PRIORITY    {operation.&ResultPriority}
    CODE               code
}

```

*In the module:*

Remote-Operations-Useful-Definitions {joint-iso-itu-t remote-operations(4) useful-definitions(7) version1(0)}

*replace the definition of:*

switch { OPERATION-PACKAGE:package, OBJECT IDENTIFIER:id }

*with the following:*

```

switch {OPERATION-PACKAGE:package, OBJECT IDENTIFIER:id} OPERATION-PACKAGE ::=
{
    OPERATIONS      {package.&Both}
    CONSUMER INVOKES {package.&Consumer}
    SUPPLIER INVOKES {package.&Supplier}
    ID               id
}

```

*In the module:*

Remote-Operations-Useful-Definitions {joint-iso-itu-t remote-operations(4) useful-definitions(7) version1(0)}

*replace the definition of:*

combine { OPERATION-PACKAGE: ConsumerConsumes, OPERATION-PACKAGE:ConsumerSupplies,  
OPERATION-PACKAGE:base }

*with the following:*

```

combine {OPERATION-PACKAGE:ConsumerConsumes, OPERATION-PACKAGE:ConsumerSupplies,  
OPERATION-PACKAGE:base} OPERATION-PACKAGE ::=
{
    OPERATIONS      {ConsumerConsumes.&Both | ConsumerSupplies.&Both}
    CONSUMER INVOKES {ConsumerConsumes.&Consumer | ConsumerSupplies.&Supplier}
    SUPPLIER INVOKES {ConsumerConsumes.&Supplier | ConsumerSupplies.&Consumer}
    ID               base.&id
}

```

**ITU-T Recommendation X.882 (07/1994) – Information technology – Remote Operations: OSI realizations – Remote Operations Service Element (ROSE) protocol specification**

Defect 1 – Corrected by publication of Technical Corrigendum 1 (07/1995)

Resolution of Defect 1

a) Subclause 10.5.3

*Replace the contents of the ASN.1 box with the following:*

```
AllValues {APPLICATION-CONTEXT:ac} ::= CHOICE
{
    bind          Bind{ac.&associationContract.&connection.&bind},
    unbind        Unbind{ac.&associationContract.&connection.&unbind},
    ros-singleAS  ROS-SingleAS
    {
        {ROSEInvokeIds},
        combine
        {
            {
                ac.&associationContract.&OperationsOf
            |
            ac.&associationContract.&InitiatorConsumerOf
            |
            ac.&associationContract.&ResponderConsumerOf
            },
            {...},
            {}
        }
    }
}
```

b) Annex B

*In the module:*

Remote-Operations-Abstract-Syntaxes {joint-iso-itu-t remote-operations(4) remote-operations-abstract-syntaxes(12) version1(0)},

*replace the definition of:*

AllValues{APPLICATION-CONTEXT:ac}

*with the following:*

```
AllValues {APPLICATION-CONTEXT:ac} ::= CHOICE
{
    bind          Bind{ac.&associationContract.&connection.&bind},
    unbind        Unbind{ac.&associationContract.&connection.&unbind},
    ros-singleAS  ROS-SingleAS
    {
        {ROSEInvokeIds},
        combine
        {
            {
                ac.&associationContract.&OperationsOf
            |
            ac.&associationContract.&InitiatorConsumerOf
            |
            ac.&associationContract.&ResponderConsumerOf
            },
            {...},
            {}
        }
    }
}
```

## Defect 2

ASN.1 module Remote-Operations-Abstract-Syntaxes:

### Resolution of Defect 2

In order to compile, modification of the definition of AllValues :

```
AllValues {APPLICATION-CONTEXT:ac} ::= CHOICE {
    bind      Bind{ac.&associationContract.&connection.&bind},
    unbind    Unbind{ac.&associationContract.&connection.&unbind},
    ros-singleAS      ROS-SingleAS
    {
        {ROSEInvokeIds},
        combine
        {
            {
                ac.&associationContract.&OperationsOf
                ac.&associationContract.&InitiatorConsumerOf
                ac.&associationContract.&ResponderConsumerOf
            },
            {ID {1 2 --OID to be provided --} -- Information Object of class
OPERATION-PACKAGE to be defined; illegally empty --}
        }
    }
}
```

## Defect 3

8.3.4 - The object identifier {joint-iso-itu-t association-realizations(10) association-by-rtse(2)} has been wrongly defined.

### Resolution of Defect 3

Replace it with {joint-iso-itu-t remote-operations(4) association-realizations(10) association-by-rtse(2)}.

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