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AMENDMENT 1
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Information technology — Abstract Syntax Notation One (ASN.1): Information object specification

AMENDMENT 1: Rules of extensibility

Technologies de l'information — Notation de syntaxe abstraite numéro 1 (ASN.1): Spécification des objets d'information

AMENDEMENT 1: Règles pour l'extensibilité

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Amendment 1 to International Standard ISO/IEC 8824-2:1995 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 21, *Open systems interconnection, data management and open distributed processing*, in collaboration with ITU-T. The identical text is published as ITU-T Rec. X.681/Amd.1.

Introduction

This Recommendation | International Standard documents the changes to ITU-T Rec. X.681 | ISO/IEC 8824-2 needed to support the ASN.1 Rules of Extensibility.

The ASN.1 Rules of Extensibility in ITU-T Rec. X.680/Amd.1 | ISO/IEC 8824-1/Amd. 1 describe how to write an ASN.1 module in such a way to allow a phased migration to a new version of an ASN.1 specification. The new version may differ from the previous version by new components being added to a SET, SEQUENCE or CHOICE, new enumeration being added to an enumerated type, an by constraints on a subtype specification being relaxed.

This Recommendation | International Standard describes how to write an ASN.1 module in such a way as to allow new information objects to be added to an information object set after the definition of the ASN.1 module, and as late as during the execution of the program that uses the object set. By defining the object set as extensible, the designer makes the statement that the contents of the object set were not fully known at the time the ASN.1 specification was written, and therefore, means possibly outside the scope of ASN.1 must be provided by an implementor to add objects to the object set and to remove previously added objects from the object set.

INTERNATIONAL STANDARD

ITU-T RECOMMENDATION

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INFORMATION TECHNOLOGY –
ABSTRACT SYNTAX NOTATION ONE (ASN.1):
INFORMATION OBJECT SPECIFICATION

AMENDMENT 1
(to Rec. X.681 | ISO/IEC 8824-2)

Rules of extensibility

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1 Scope

This Recommendation | International Standard documents the changes to ITU-T Rec. X.681 | ISO/IEC 8824-2 needed to support the ASN.1 Rules of Extensibility.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent editions of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunications Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

– ITU-T Recommendation X.680 (1994) | ISO/IEC 8824-1:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*

– ITU-T Recommendation X.680/Amd.1 (1995) | ISO/IEC 8824-1/Amd.1:1996, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation – Amendment 1: Rules of extensibility.*

– ITU-T Recommendation X.681 (1994) | ISO/IEC 8824-2:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification.*

– ITU-T Recommendation X.682 (1994) | ISO/IEC 8824-3:1995, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification.*

3 Changes to Introduction

{Add the following text to the Introduction of ITU-T Rec. X.681 | ISO/IEC 8824-2 immediately before the existing paragraph which begins "Annex A, which ...":}

The set of information objects used in defining an object set may be partially or entirely unknown at the time of definition of an ASN.1 specification. Such cases occur, for example, in network management where the set of managed objects varies while the network manager is executing. This Recommendation | International Standard specifies the rules for inclusion of an **extension marker** in the definition of object sets to signal to implementors the intention of the designer that the contents of the object set is not fully defined in the ASN.1 specification. When an object set is defined with an extension marker, the implementor must provide means, possibly outside the scope of ASN.1, for dynamically adding objects to the object set and removing previously added objects from the object set.

4 Changes to Definitions

{Add the following text after 3.1}

3.1 *bis*   Information object specification

This Recommendation I International Standard uses the following terms defined in ITU-T Rec. X.680/Amd. 1 I ISO/IEC 8824-1/Amd. 1:

> –   extension marker

{Add the following definition to ITU-T Rec. X.681 I ISO/IEC 8824-2, maintaining the alphabetical order of definitions. Note that the alphabetic character appearing in the clause number below will be changed to an appropriate numeric character when the definition is added to the base publication:}

3.4.3a   extensible object set: An object set with an extension marker.

5   Changes to Object Set Definition

{Change 12.2 to read:}

The information object set, which shall be of the class referenced by "DefinedObjectClass", is that defined by the construct "ObjectSet"

> **ObjectSet ::= "{" ObjectSetSpec "}"**
> **ObjectSetSpec ::= ElementSetSpecs I "..."**

"ElementSetSpecs" is specified in ITU-T Rec. X.680 I ISO/IEC 8824-1 clause 44 and enables an information object set to be specified in terms of information objects or sets thereof of the governing class. There shall be at least one information object in the set unless the second alternative of "ObjectSetSpec" is specified. In the latter case the presence of the ellipses is an indication that the object set is initially empty but will have objects dynamically added to it by the application program.

> NOTE – Unlike extensible types such as set or sequence, or extensible subtype constraints, which are static in respect to the set of "understood" values being set for each version of the ASN.1 specification, an extensible object set can grow and contract dynamically within a given version. Indeed, it may expand and contract within a given instance of use of an application program as it dynamically defines or undefines objects.

{Add the following text after 12.2}

12.2 *bis*   If an extensible object set, A, is referenced in the definition of another object set, B, its extension marker is inherited by B.

12.2 *bis*   If a "ValueSetFromObjects" (see clause 15) is defined using an extensible object set, the resulting value set does not inherit the extension marker from the object set.

12.2 *quater*   If a type is constrained by a table constraint (see 10.3 of ITU-T Rec. X.682 I ISO/IEC 8824-3) and the object set referenced in the table constraint is extensible, the type does not inherit the extension marker from the object set. If the type is meant to be extensible then an extension marker shall be explicitly added to its "ElementSetSpecs".

6   Changes to ABSTRACT-SYNTAX Definition

{Change B.2 to read:}

The ABSTRACT-SYNTAX information object class is defined as:

> **ABSTRACT-SYNTAX ::= CLASS {**
> **&id   OBJECT IDENTIFIER,**
> **&Type,**
> **&property   BIT STRING {handles-invalid-encodings(0)} DEFAULT {}**
> **} WITH SYNTAX {**
> **&Type IDENTIFIED BY &id [HAS PROPERTY &property]**
> **}**

The &id field of each ABSTRACT-SYNTAX is the abstract syntax name, while the &Type field contains the single ASN.1 type whose values make up the abstract syntax. The property "handles-invalid-encodings" indicates that the invalid encodings are not to be treated as an error during the decoding process, and the decision on how to treat such invalid encodings is left up to the application.