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Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation

AMENDMENT 1: Support for EXTENDED-XER

Technologies de l'information — Notation de syntaxe abstraite numéro un (ASN.1): Spécification de la notation de base

AMENDEMENT 1: Support pour règles de codage XML étendu

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

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INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation

Amendment 1

Support for EXTENDED-XER

NOTE – All new or changed text in this amendment is underlined in the clauses being replaced. When merging all such text into the base Recommendation, the underlining is to be removed.

1) Introduction

a) *In the Introduction, insert the following paragraph immediately prior to the paragraph that begins with "An ASN.1 specification will initially be produced with a set of fully defined ASN.1 types.":*

It is also possible to assign encoding instructions to a type in order to affect the encoding of that type. This can be done either by a type prefix placed before a type definition or use of a type reference, or by an encoding control section placed at the end of an ASN.1 module. The generic syntax of type prefixes and encoding control sections is specified in this Recommendation | International Standard, and includes an encoding reference to identify the encoding rules that are modified by the encoding instruction. The semantics and detailed syntax of encoding instructions are specified in the encoding rules Recommendation | International Standard identified by the encoding reference.

b) *In the Introduction, insert the following paragraph between the paragraphs beginning with "Annex C" and "Annex D":*

Annex C *bis* forms an integral part of this Recommendation | International Standard and specifies the currently defined encoding references and the Recommendation | International Standard that defines the semantics and detailed syntax of encoding instructions with those encoding references.

2) Subclause 2.2

In subclause 2.2, replace the Note 1 with the following:

NOTE 1 – The above reference is included because it provides names for control characters and specifies categories of characters.

3) New subclause 3.6.18 *bis*

Insert a new subclause 3.6.18 bis as follows:

3.6.18 *bis* default encoding reference (for a module): An encoding reference that is specified in the module header and is assumed in all type prefixes which do not contain an encoding reference.

NOTE – If a default encoding reference is not specified in the module header, then all type prefixes which do not contain an encoding reference are assigning tags.

4) New subclauses 3.6.22 *bis* to 3.6.22 *quat*

Insert three new subclauses 3.6.22 bis to 3.6.22 quat as follows:

3.6.22 *bis* encoding control section: Part of an ASN.1 module that enables encoding instructions to be assigned to types defined or used within that ASN.1 module.

3.6.22 *ter* **encoding instruction**: Information which can be associated with a type using a type prefix or an encoding control section, and which affects the encoding of that type by one or more ASN.1 encoding rules.

NOTE – An encoding instruction does not affect the abstract values of a type, and is not expected to be visible to an application.

3.6.22 *quat* **encoding reference**: A name (see Annex C *bis*) that identifies which encoding rules are affected by an encoding instruction in a type prefix or an encoding control section.

NOTE – The encoding reference **`TAG`** can be used to specify that a type prefix is assigning a tag rather than an encoding instruction (see 30.2).

5) Subclause 3.6.54

Replace subclause 3.6.54 with the following:

3.6.54 **real type**: A simple type whose distinguished values (specified in clause 20) include the set of real numbers (numerical real numbers) together with special values such as **`NOT-A-NUMBER`**.

6) Subclause 3.6.69

Replace subclause 3.6.69 with the following:

3.6.69 **tag**: Additional information, separate from the abstract values of the type, which is associated with every ASN.1 type and which can be changed or augmented by a type prefix.

NOTE – Tag information is used in some encoding rules to ensure that encodings are not ambiguous. Tag information differs from encoding instructions because tag information is associated with all ASN.1 types, even if they do not have a type prefix.

7) Subclause 3.6.71

Replace subclause 3.6.71 with the following:

3.6.71 **tagging**: Assigning a new tag to a type, replacing or adding to the existing (possibly the default) tag.

8) New subclause 3.6.74 *bis*

Insert a new subclause 3.6.74 bis as follows:

3.6.74 *bis* **type prefix**: Part of the ASN.1 notation that can be used to assign an encoding instruction or a tag to a type.

9) Subclause 8.1

Replace subclause 8.1 with the following:

8.1 A tag is specified (either within the text of this Recommendation | International Standard or by using a type prefix) by giving a class and a number within the class. The class is one of:

- universal;
- application;
- private;
- context-specific.

10) Subclause 8.3

*In subclause 8.3 replace "clause 30" with "*30.2*", and in the Note replace "*Clause 30*" with "*Subclause 30.2*".*

11) New subclause 8 *bis*

Insert a new clause 8 bis as follows:

8 *bis* Encoding instructions

8 *bis*.1 An encoding instruction is assigned to a type using either a type prefix (see 30.3) or an encoding control section (see clause 50).

8 *bis*.2 A type prefix may contain an encoding reference. If it does not, the encoding reference is determined by the default encoding reference for the module (see 12.4 *bis*).

8 *bis*.3 An encoding control section always contains an encoding reference. There may be multiple encoding control sections, but each encoding control section shall have a distinct encoding reference.

8 *bis*.4 An encoding instruction consists of a sequence of lexical items specified in the Recommendation | International Standard determined by the encoding reference (see Annex C *bis*).

8 *bis*.5 Multiple encoding instructions with the same or with different encoding references may be assigned to a type (using either or both of type prefixes and an encoding control section). Encoding instructions assigned with a given encoding reference are independent from those assigned with a different encoding reference, and from any use of a type prefix to perform tagging.

8 *bis*.6 The effect of assigning several encoding instructions with the same encoding reference (using either or both of type prefixes and an encoding control section) is specified in the Recommendation | International Standard determined by the encoding reference (see Annex C *bis*), and is not specified in this Recommendation | International Standard.

8 *bis*.7 If an encoding instruction is assigned to the "Type" in a "TypeAssignment", it becomes associated with the type, and is applied wherever the "typereference" of the "TypeAssignment" is used. This includes use in other modules through the export and import statements.

12) New subclause 11.20 *bis*

Insert a new subclause 11.20 bis as follows:

11.20 *bis* Encoding references

Name of item – encodingreference

An "encodingreference" shall consist of a sequence of characters as specified for a "typereference" in 11.2, except that no lower-case letters shall be included.

NOTE – Currently defined encoding references are listed in Annex C *bis* with the Recommendation | International Standard that specifies the syntax and semantics of the corresponding encoding instructions. The "encodingreference" shall consist only of the sequences listed in Annex C *bis* in this or in future versions of this Recommendation | International Standard.

13) Subclause 11.23.2

Replace subclause 11.23.2 with the following:

11.23.2 In analyzing an instance of use of this notation, a "true" is distinguished from a "valuereference" or an "identifier" or an instance of XML boolean "extended-true" by the context in which it appears.

NOTE – This sequence does not contain any white-space characters (see 11.1.2).

14) New subclause 11.23 *bis*

Insert a new subclause 11.23 bis as follows:

11.23 *bis* XML boolean extended-true item

Name of item – extended-true

11.23 *bis*.1 This item shall consist of either the sequence of characters:

true

or of the single character:

1 (DIGIT ONE)

11.23 *bis*.2 In analyzing an instance of use of this notation, an "extended-true" is distinguished from a "valuereference" or an "identifier" or an instance of XML boolean "true" by the context in which it appears.

NOTE – This sequence does not contain any white-space characters (see 11.1.2).

15) Subclause 11.24.2

Replace subclause 11.24.2 with the following:

11.24.2 In analyzing an instance of use of this notation, a "false" is distinguished from a "valuereference" or an "identifier" or an instance of XML boolean "extended-false" by the context in which it appears.

NOTE – This sequence does not contain any white-space characters (see 11.1.2).

16) New subclauses 11.24 *bis* to 11.24 *quat*

Insert new subclauses 11.24 bis, ter and quat as follows:

11.24 *bis* XML boolean extended-false item

Name of item – extended-false

11.24 *bis*.1 This item shall consist of either the sequence of characters:

false

or of the single character:

0 (DIGIT ZERO)

11.24 *bis*.2 In analyzing an instance of use of this notation, a "false" is distinguished from a "valuereference" or an "identifier" or an instance of XML boolean "false" by the context in which it appears.

NOTE – This sequence does not contain any white-space characters (see 11.1.2).

11.24 *ter* XML real not-a-number item

Name of item – "NaN"

11.24 *ter*.1 This item shall consist of the sequence of characters:

NaN

11.24 *ter*.2 In analyzing an instance of use of this notation, a "NaN" is distinguished from any other lexical item commencing with an upper-case letter by the context in which it appears.

NOTE – This sequence does not contain any white-space characters (see 11.1.2).

11.24 *quat* XML real infinity item

Name of item – "INF"

11.24 *quat*.1 This item shall consist of the sequence of characters:

INF

11.24 *quat*.2 In analyzing an instance of use of this notation, an "INF" is distinguished from any other lexical item commencing with an upper-case letter by the context in which it appears.

NOTE – This sequence does not contain any white-space characters (see 11.1.2).

17) Subclause 11.25.5

a) Replace subclause 11.25.5 with the following:

11.25.5 If the ASN.1 built-in type is a "PrefixedType", then the type which determines the "xmlasn1typename" shall be "Type" in the "PrefixedType" (see 30.1.5). If this is itself a "PrefixedType", then this subclause 11.25.5 shall be recursively applied.

NOTE – The subclauses of 25.11 specify the "Type" to be used for a "SelectionType" and a "ConstrainedType".

18) Table 4

*In Table 4, replace "*TaggedType*" with "*PrefixedType*".*

19) Subclause 11.27

In subclause 11.27, insert the following 3 new reserved words in new cells in the table in the appropriate alphabetical position:

ENCODING-CONTROL

INSTRUCTIONS

NOT-A-NUMBER

20) Subclause 12.1

In subclause 12.1, replace the production "ModuleDefinition" with the following:


```
ModuleDefinition ::=
        ModuleIdentifier
        DEFINITIONS
        EncodingReferenceDefault
        TagDefault
        ExtensionDefault
        "::="
        BEGIN
        ModuleBody
        EncodingControlSections
        END
```


and insert the following new production immediately before the "TagDefault" production:

```
EncodingReferenceDefault ::=
        encodingreference INSTRUCTIONS
    |   empty
```

21) Subclause 12.2

*In subclause 12.2 in the Note, replace "*Clause 30*" with "*Subclause 30.2*".*

22) New subclause 12.4 *bis*

Insert a new subclause 12.4 bis as follows:

12.4 *bis* The "EncodingReferenceDefault" specifies that the "encodingreference" is the default encoding reference for the module. If the "EncodingReferenceDefault" is "empty", then the default encoding reference for the module is **TAG**.

NOTE – Annex C *bis* contains a list of allowed encoding references, together with the Recommendation | International Standard which specifies the form and meaning of the corresponding encoding instructions.