



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

X.690 (2002)

Amendment 1
(10/2003)

SERIES X: DATA NETWORKS AND OPEN SYSTEM
COMMUNICATIONS

OSI networking and system aspects – Abstract Syntax
Notation One (ASN.1)

Information technology – ASN.1 encoding rules:
Specification of Basic Encoding Rules (BER),
Canonical Encoding Rules (CER) and Distinguished
Encoding Rules (DER)

Amendment 1:

Support for EXTENDED-XER

CAUTION !

PREPUBLISHED RECOMMENDATION

This prepublication is an unedited version of a recently approved Recommendation. It will be replaced by the published version after editing. Therefore, there will be differences between this prepublication and the published version.

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**INFORMATION TECHNOLOGY –
ASN.1 ENCODING RULES: SPECIFICATION OF BASIC ENCODING RULES (BER),
CANONICAL ENCODING RULES (CER) AND DISTINGUISHED ENCODING RULES
(DER)**

**DRAFT AMENDMENT 1
(to ITU-T Rec. X.690 | ISO/IEC 8825-1)**

Support for EXTENDED-XER

1 Summary

An Amendment 1 is provided for ITU-T Rec. X.680 | ISO/IEC 8824-1, ITU-T Rec. X.681 | ISO/IEC 8824-2, ITU-T Rec. X.690 | ISO/IEC 8825-1, ITU-T Rec. X.691 | ISO/IEC 8825-2 and ITU-T Rec. X.693 | ISO/IEC 8825-4. These amendments provide the following:

- Correction of a bug in CXER resulting from allowing white-space between a minus sign and a following INTEGER or REAL value (CXER was not canonical). This is no longer permitted, in value notation, XML Value Notation or in XER and CXER. **This is a change and not an addition.**
- Addition of encoding instructions in an ASN.1 module, using either a type prefix or within an encoding control section, in order to specify variations of the BASIC-XER encodings. These encoding instructions are designed to support mappings from an XSD specification to an ASN.1 specification. This provision has meant a change of terminology, where a type with "[...]" in front of it is a prefixed type, and the "[...]" notation may or may not be a tag. This change of terminology results in changes to the text (but not the substance) of the BER and PER specifications.
- The addition of NaN (Not-a-Number) and minus zero as new values for REAL (support for encoding these new values is provided in the amendment to ITU-T Rec. X.690 | ISO/IEC 8825-1 and ITU-T Rec. X.691 | ISO/IEC 8825-2, as well as in the amendment to ITU-T Rec. X.693 | ISO/IEC 8825-4).
- The addition of new XML Value Notations for **REAL**, **BOOLEAN**, **ENUMERATED**, and **INTEGER** that use text rather than empty-element tags for the values. These are available in XML Value Notation and in EXTENDED-XER, but not in BASIC-XER (for reasons of backwards-compatibility).
- Changes to the XML Value Notation for sequence-of (and the XER encodings) to provide delimitation of values where they are not XML elements (this occurs with the additional XML Value Notations, and only affects use of those additional XML Value Notations). This change is only concerned with use of XML Value Notations that have been added by this amendment, and these are not allowed in BASIC-XER, which is not affected.

This provides the necessary basic support for EXTENDED-XER.

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Support for EXTENDED-XER

NOTE: All new or changed text in this document is highlighted in yellow in clauses being replaced. When merging all such text into the base document the highlighting is to be removed.

Insert a new subclause 8.1.1.5 as follows:

8.1.1.5 There are no encoding instructions (see ITU-T Rec. X.680 | ISO/IEC 8824-1, 3.6.22ter) defined for the encoding rules specified in this Recommendation | International Standard.

Replace subclause 8.5.2 with the following:

8.5.2 If the real value is the value plus zero, there shall be no contents octets in the encoding.

Insert a new subclause 8.5.2bis as follows:

8.5.2bis If the real value is the value minus zero, then it shall be encoded as specified in 8.5.8.

Replace subclause 8.5.5 as follows:

8.5.5 Bit 8 of the first contents octet shall be set as follows:

- a) if bit 8 = 1, then the binary encoding specified in 8.5.6 applies;
- b) if bit 8 = 0 and bit 7 = 0, then the decimal encoding specified in 8.5.7 applies;
- c) if bit 8 = 0 and bit 7 = 1, then either a "SpecialRealValue" (see ITU-T Rec. X.680 | ISO/IEC 8824-1) or the value minus zero is encoded, as specified in 8.5.8.

Replace subclause 8.5.8 with the following:

8.5.8 When "SpecialRealValue"s or minus zero are to be encoded (bits 8 to 7 = 01), there shall be only one contents octet, with values as follows:

01000000	Value is PLUS-INFINITY
01000001	Value is MINUS-INFINITY
01000010	Value is NOT-A-NUMBER
01000011	Value is minus zero

All other values having bits 8 and 7 equal to 0 and 1 respectively are reserved for addenda to this Recommendation | International Standard.

Replace subclause 8.14 with the following:

8.14 Encoding of a value of a prefixed type

Insert a new subclause 8.14.1pre before subclause 8.14.1 as follows:

8.14.1pre If the prefixed type is an "EncodingPrefixedType", then the encoding is that of the "Type" in the "EncodingPrefixedType". If the prefixed type is a "TaggedType", then the following subclauses apply.

In subclause 8.14.2, replace "30.6" with "30.2.7".