International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

X.690
Amendment 2
(06/2006)

SERIES X: DATA NETWORKS, OPEN SYSTEM COMMUNICATIONS AND SECURITY

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 2: Time type support

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INTERNATIONAL STANDARD ISO/IEC 8825-1
ITU-T RECOMMENDATION X.690

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

Amendment 2: Time type support

Summary

This amendment specifies the BER, DER and CER encodings for the **TIME**, **TIME-OF-DAY**, **DATE**, **DATE-TIME**, and **DURATION** types introduced by ITU-T Rec. X.680 (2002)/Amd.3 | ISO/IEC 8824-1:2002/Amd.3.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

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.

NOTE

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

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Amendment 2: Time type support

1) Contents

Update the Contents as follows:

2) Clause 8.23

Replace 8.23 with the following (giving it a heading):

8.23 Encoding for values of the Useful Types

The following "useful types" shall be encoded as if they had been replaced by their definitions given in clauses 42-44 of ITU-T Rec. X.680 | ISO/IEC 8824-1:

– generalized time;

– universal time;

– object descriptor.

3) New clause 8.24

Add the following new clause:

8.24 Encoding for values of the **TIME** type and the useful time types

8.24.1 Encoding for values of the **TIME** type

NOTE – The defined time types are subtypes of the **TIME** type, with the same tag, and have the same encoding as the **TIME** type.

8.24.1.1 The encoding of the **TIME** type shall be primitive.

8.24.1.2 The contents octets shall be the UTF-8 encoding of the value notation, after the removal of initial and final QUOTATION MARK (34) characters.

8.24.2 Encoding for values of the **DATE** type

8.24.2.1 The encoding of the **DATE** type shall be primitive.

8.24.2.2 The contents octets shall be the UTF-8 encoding of the value notation, after the removal of initial and final QUOTATION MARK (34) characters and all HYPHEN-MINUS (45) characters.

8.24.3   **Encoding for values of the `TIME-OF-DAY` type**

8.24.3.1   The encoding of the `TIME-OF-DAY` type shall be primitive.

8.24.3.2   The contents octets shall be the UTF-8 encoding of the value notation, after the removal of initial and final QUOTATION MARK (34) characters and all COLON (58) characters.

8.24.4   **Encoding for values of the `DATE-TIME` type**

8.24.4.1   The encoding of the `DATE-TIME` type shall be primitive.

8.24.4.2   The contents octets shall be the UTF-8 encoding of the value notation, after the removal of initial and final QUOTATION MARK (34) characters, all HYPHEN-MINUS (45) characters, all COLON (58) characters, and the LATIN CAPITAL LETTER T character.

8.24.5   **Encoding for values of the `DURATION` type**

8.24.5.1   The encoding of the `DURATION` type shall be primitive.

8.24.5.2   The contents octets shall be the UTF-8 encoding of the value notation, after the removal of initial and final QUOTATION MARK (34) characters and the LATIN CAPITAL LETTER P character.

4)   New clause 11.9

Add the following new clause:

11.9   The `TIME` type and the useful time types

11.9.1   The value notation for abstract values of the `TIME`, `TIME-OF-DAY`, `DATE,` `DATE-TIME`, and `DURATION` types shall be converted to a canonical form by the following transformations:

     a)   All commas used as decimal signs shall be converted to full stop.

     b)   The minutes digits for all time difference components that are an integral number of hours shall be removed.

     c)   If an interval or recurring interval contains a start point and an end point, and the end point contains the same time difference component as the start point, the time difference component of the end point shall be removed.

     d)   For a duration, and for a duration in an interval (or in an interval in a recurring interval) expressed with a start point and a duration or with a duration and an end point, the value notation shall be modified to remove all zero time components except the least significant time component that is present in the instance of the value notation.

11.9.2   The resulting value notation shall then be used to encode the abstract value as specified in 8.24.

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