Information technology - ASN.1 encoding rules: XML Encoding Rules (XER)

CONTENTS

Page

1 Scope 1
2 Normative references 1
2.1 Identical Recommendations | International Standards 1
2.2 Additional references 2
3 Definitions 2
3.1 ASN.1 Basic Encoding Rules (BER) 2
3.2 Additional definitions 2
4 Abbreviations 4
5 Encodings specified by this Recommendation | International Standard 4
6 Encoding instructions specified by this Recommendation | International Standard 5
7 Conformance 5
8 Basic XML encoding rules 5
8.1 Production of a complete BASIC-XER encoding 5
8.2 The XML prolog 6
8.3 The XML document element 6
8.4 Encoding of the EXTERNAL type 7
8.5 Encoding of the open type 7
8.6 Decoding of types with extension markers 7
9 Canonical XML encoding rules 7
9.1 General rules for canonical XER 7
9.2 Real values 8
9.3 Bitstring value 8
9.4 Octetstring value 8
9.5 Sequence value 8
9.6 Set value 8
9.7 Set-of value 8
9.8 Object identifier value 9
9.9 Relative object identifier value 9
9.10 GeneralizedTime 9
9.11 UTCTime 9
9.12 Open type value 10
9.13 The `TIME` type and the useful time types 10
10 Extended XML encoding rules 10
10.1 General 10
10.2 EXTENDED-XER conformance 11
10.3 Structure of an EXTENDED-XER encoding 13
11 Notation, character set and lexical items used in XER encoding instructions 13
12 Keywords 14
13 Assigning an XER encoding instruction to an ASN.1 type using a type prefix 15
14 Assigning an XER encoding instruction using an XER encoding control section 17
14.1 The encoding instruction assignment list 17
14.2 Identification of the targets for an XER encoding instruction using a target list 18
14.2.1 General rules 18
14.2.2 Target identification using an ASN.1 type reference and identifiers 20
14.2.3 Target identification using a built-in type name 22
14.2.4 Use of identifiers in context 23

14.2.5 Use of imported types identification 23
15 Multiple assignment of XER encoding instructions 23
15.1 Order in which multiple assignments are considered 23
15.2 Effect of assigning a negating encoding instruction 24
15.3 Multiple assignment of encoding instructions with multiple categories 24
15.4 Multiple assignment of XER encoding instructions of the same category 24
15.5 Permitted combinations of final encoding instructions 25
16 XER encoding instruction support for XML namespaces and qualified names 27
17 Specification of EXTENDED-XER encodings 28
17.1 The XML document element 28
17.2 The "TypeNameOrModifiedTypeName" production 28
17.3 The "AttributeList" production 29
17.4 The "ExtendedXMLValue" production 29
17.5 The "ExtendedXMLChoiceValue" production 30
17.6 The "ExtendedXMLSequenceValue" and "ExtendedXMLSetValue" productions 31
17.7 The "ExtendedXMLSequenceOfValue" and "ExtendedXMLSetOfValue" productions 31
17.8 The "ModifiedXMLIntegerValue" production 33
17.9 The "ModifiedXMLRealValue" production 33
18 The ANY-ATTRIBUTES encoding instruction 34
18.1 General 34
18.2 Restrictions 34
18.3 Effect on encodings 35
19 The ANY-ELEMENT encoding instruction 36
19.1 General 36
19.2 Restrictions 36
19.3 Effect on encodings 37
20 The ATTRIBUTE encoding instruction 37
20.1 General 37
20.2 Restrictions 37
20.3 Effect on encodings 38
21 The BASE64 encoding instruction 39
21.1 General 39
21.2 Restrictions 40
21.3 Effect on encodings 40
22 The DECIMAL encoding instruction 40
22.1 General 40
22.2 Restrictions 41
22.3 Effect on encodings 41
23 The DEFAULT-FOR-EMPTY encoding instruction 41
23.1 General 41
23.2 Restrictions 42
23.3 Effect on encodings 43
24 The ELEMENT encoding instruction 43
24.1 General 43
24.2 Restrictions 44
24.3 Effect on encodings 44
25 The EMBED-VALUES encoding instruction 44
25.1 General 44
25.2 Restrictions 44
25.3 Effect on encodings 45
26 The GLOBAL-DEFAULTS encoding instruction 45
26.1 General 45

26.2 Restrictions ... 46
26.3 Effect on encodings ... 46
27 The LIST encoding instruction ... 46
27.1 General ... 46
27.2 Restrictions ... 46
27.3 Effect on encodings ... 47
28 The NAME encoding instruction ... 47
28.1 General ... 47
28.2 Restrictions ... 48
28.3 Effect on encodings ... 48
29 The NAMESPACE encoding instruction ... 49
29.1 General ... 49
29.2 Restrictions ... 50
29.3 Effect on encodings ... 50
30 The PI-OR-COMMENT encoding instruction ... 50
30.1 General ... 50
30.2 Restrictions ... 51
30.3 Effect on the encodings ... 51
31 The TEXT encoding instruction ... 52
31.1 General ... 52
31.2 Restrictions ... 52
31.3 Effect on encodings ... 52
32 The UNTAGGED encoding instruction ... 53
32.1 General ... 53
32.2 Restrictions ... 54
32.3 Effect on encodings ... 54
33 The USE-NIL encoding instruction ... 55
33.1 General ... 55
33.2 Restrictions ... 55
33.3 Effect on encodings ... 56
34 The USE-NUMBER encoding instruction ... 56
34.1 General ... 56
34.2 Restrictions ... 56
34.3 Effect on encodings ... 56
35 The USE-ORDER encoding instruction ... 57
35.1 General ... 57
35.2 Restrictions ... 57
35.3 Effect on encodings ... 58
36 The USE-QNAME encoding instruction ... 58
36.1 General ... 58
36.2 Restrictions ... 59
36.3 Effect on encodings ... 59
37 The USE-TYPE encoding instruction ... 59
37.1 General ... 59
37.2 Restrictions ... 59
37.3 Effect on encodings ... 60
38 The USE-UNION encoding instruction ... 60
38.1 General ... 60
38.2 Restrictions ... 61
38.3 Effect on encodings ... 61
39 The WHITESPACE encoding instruction ... 62

39.1 General 62
39.2 Restrictions 62
39.3 Effect on encodings 63
40 Identification of the encoding rules 63
Annex A Examples of BASIC-XER and CXER encodings 64
A.1 ASN.1 description of the record structure 64
A.2 ASN.1 description of a record value 64
A.3 Basic XML representation of this record value 64
A.4 Canonical XML representation of this record value 65

B.1 Partial XML content 66
B.2 Recommended restrictions on encodings producing partial XML element content 66

C.1 Introduction 69
C.2 Simple examples 69
C.2.1 A base-ball card 69
C.2.2 An employee 70
C.3 More complex examples 70
C.3.1 Using a union of two simple types 70
C.3.2 Using a type identification attribute 71
C.3.3 Using enumeration values 71
C.3.4 Using an empty encoding for a default value 71
C.3.5 Using embedded-values for notification of a payment due 71