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**Information technology — ASN.1  
encoding rules: Specification of Packed  
Encoding Rules (PER)**

**AMENDMENT 3: PER encoding instructions**

*Technologies de l'information — Règles de codage ASN.1:  
Spécification des règles de codage compact (PER)*

*AMENDEMENT 3: Instructions de codage PER*

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Amendment 3 to ISO/IEC 8825-2:2002 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems* in collaboration with ITU-T. The identical text is published as ITU-T Rec. X.691 (2002)/Amd.3 (05/2007).

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**INTERNATIONAL STANDARD  
ITU-T RECOMMENDATION**

**Information technology – ASN.1 encoding rules:  
Specification of Packed Encoding Rules (PER)**

**Amendment 3: PER encoding instructions**

**1) Clause 1**

*Replace the text of clause 1 with the following:*

This Recommendation | International Standard specifies a set of Packed Encoding Rules that may be used to derive a transfer syntax for values of types defined in ITU-T Rec. X.680 | ISO/IEC 8824-1. These Packed Encoding Rules are also to be applied for decoding such a transfer syntax in order to identify the data values being transferred.

The encoding rules specified in this Recommendation | International Standard:

- are used at the time of communication;
- are intended for use in circumstances where minimizing the size of the representation of values is the major concern in the choice of encoding rules;
- allow the extension of an abstract syntax by addition of extra values, preserving the encodings of the existing values, for all forms of extension described in ITU-T Rec. X.680 | ISO/IEC 8824-1;
- can be modified in accordance with the provisions of ITU-T Rec. X.695 | ISO/IEC 8825-6.

**2) Subclause 2.1**

*Append the following to 2.1:*

- ITU-T Recommendation X.695 (2007) | ISO/IEC 8825-6:2008, *Information technology – ASN.1 encoding rules: Registration and application of PER encoding instructions.*

**3) Subclause 3.5 bis**

*Insert a new subclause 3.5 bis as follows:*

**3.5 bis PER Encoding Instructions**

This Recommendation | International Standard makes use of the following term defined in ITU-T Rec. X.695 | ISO/IEC 8825-6:

- identifying keyword.

**4) Subclause 7.10**

*Replace subclause 7.10 with the following:*

**7.10** The rules of this Recommendation | International Standard apply to both algorithms and to both variants unless otherwise stated (but see 8 bis.2 and 8 bis.3).

**5) Subclause 8.1**

Replace subclause 8.1 with the following:

**8.1** Dynamic conformance is specified by clause 98 bis onwards.

**6) Clause 8 bis**

Insert a new clause 8 bis as follows:

**8 bis PER encoding instructions**

**8 bis.1** PER encoding instructions can be associated with a type in accordance with the provisions of ITU-T Rec. X.680 | ISO/IEC 8824-1 and ITU-T Rec. X.695 | ISO/IEC 8825-6.

NOTE 1 – The application of some PER encoding instructions can make it impossible to encode all the abstract values of the type. Where this can arise, the specific PER encoding instruction identifies the problem. It is a designers decision, based on the possible need to use multiple encoding rules, whether to add an explicit constraint on the type in order to restrict the range of abstract values to those that can be handled by the encoding using the PER encoding instruction. This can make the specification less readable, but ensures that all encoding rules can encode all allowed abstract values, making relaying possible without errors.

NOTE 2 – Each PER encoding instruction starts with an identifying keyword that unambiguously identifies that encoding instruction.

**8 bis.2** If the ALIGNED version of either BASIC-PER or CANONICAL-PER is in use, then all PER encoding instructions shall be silently ignored and have no affect on the encoding.

**8 bis.3** If the UNALIGNED version of either BASIC-PER or CANONICAL-PER is in use, then if a type has an associated encoding instruction, the following subclauses shall apply.

**8 bis.3.1** If the identifying keyword is not known, then a "not supported" error message shall be issued.

**8 bis.3.2** If the identifying keyword is known, the procedures of this Recommendation | International Standard shall be modified by the amendments to those procedures that are specified by the PER encoding instruction (see ITU-T Rec. X.695 | ISO/IEC 8825-6).

NOTE 1 – If multiple PER encoding instructions are associated with a type, then the amendments specified for all of them shall be applied.

NOTE 2 – It is an error in the register of PER encoding instructions if amendments produced by two or more separate encoding instructions conflict and it is not stated that they are mutually exclusive.

**7) Subclause 9.3.2 bis**

Add a new subclause 9.3.2 bis as follows:

**9.3.2 bis** User-defined constraints (see ITU-T Rec. X.682 | ISO/IEC 8824-3, 9.1) are not PER visible.

**8) Subclause 9.6.3 ter**

Delete subclause 9.6.3 ter (which was added by Amendment 1).

**9) Subclause 15.6**

Replace subclause 15.6 with the following:

**15.6** If the type is extensible for PER encodings (see 9.3.8), then a bit-field consisting of a ~~If an extension marker is present in the size constraint specification of the bitstring type, a single bit shall be added to the field-list in a bit-field of length one.~~ The bit shall be set to 1 if the length of this encoding is not within the range of the extension root, and zero otherwise. In the former case, 15.11 shall be invoked to add the length as a semi-constrained whole number to the field-list, followed by the bitstring value. In the latter case, the length and value shall be encoded as if ~~the~~no extension marker is ~~not present in the constraint.~~