INTERNATIONAL STANDARD

ISO/IEC

8824-4

Fifth edition
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Information technology — Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications

Technologies de l'information — Notation de syntaxe abstraite numéro un (ASN.1): Paramétrage des spécifications de la notation de syntaxe abstraite numéro un

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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.

This fifth edition cancels and replaces the fourth edition of ISO/IEC 8824-4:2008 which has been technically revised. It also incorporates ISO/IEC 8824-4:2008/Cor.1:2014.

ISO/IEC 8824-4 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 X.683 (08/2015).

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International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

X.683
(08/2015)

SERIES X: DATA NETWORKS, OPEN SYSTEM
COMMUNICATIONS AND SECURITY

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

Information technology – Abstract Syntax
Notation One (ASN.1): Parameterization of
ASN.1 specifications

Recommendation ITU-T X.683

ITU-T X-SERIES RECOMMENDATIONS

DATA NETWORKS, OPEN SYSTEM COMMUNICATIONS AND SECURITY

For further details, please refer to the list of ITU-T Recommendations.

INTERNATIONAL STANDARD ISO/IEC 8824-4
RECOMMENDATION ITU-T X.683

Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications

Summary

Recommendation ITU-T X.683 | ISO/IEC 8824-4 defines the provisions for parameterized reference names and parameterized assignments for data types which are useful for the designer when writing specifications where some aspects are left undefined at certain stages of the development to be filled in at a later stage to produce a complete definition of an abstract syntax.

History

Edition	Recommendation	Approval	Study Group	Unique ID[*]
1.0	ITU-T X.683	1994-07-01	7	11.1002/1000/3045
2.0	ITU-T X.683	1997-12-12	7	11.1002/1000/4446
2.1	ITU-T X.683 (1997) Amd. 1	1999-06-18	7	11.1002/1000/4703
3.0	ITU-T X.683	2002-07-14	17	11.1002/1000/6088
3.1	ITU-T X.683 (2002) Technical Cor. 1	2007-05-29	17	11.1002/1000/9107
4.0	ITU-T X.683	2008-11-13	17	11.1002/1000/9607
4.1	ITU-T X.683 (2008) Cor. 1	2014-03-01	17	11.1002/1000/12146
5.0	ITU-T X.683	2015-08-13	17	11.1002/1000/12482

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[*] To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). 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, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

CONTENTS

Introduction

Application designers need to write specifications in which certain aspects are left undefined. Those aspects will later be defined by one or more other groups (each in its own way), to produce a fully defined specification for use in the definition of an abstract syntax (one for each group).

In some cases, aspects of the specification (for example, bounds) may be left undefined even at the time of abstract syntax definition, being completed by the specification of International Standardized Profiles or functional profiles from some other body.

> NOTE 1 – It is a requirement imposed by this Recommendation | International Standard that any aspect that is not solely concerned with the application of constraints has to be completed prior to the definition of an abstract syntax.

In the extreme case, some aspects of the specification may be left for the implementer to complete, and would then be specified as part of the Protocol Implementation Conformance Statement.

While the provisions of Rec. ITU-T X.681 | ISO/IEC 8824-2 and Rec. ITU-T X.682 | ISO/IEC 8824-3 provide a framework for the later completion of parts of a specification, they do not of themselves solve the above requirements.

Additionally, a single designer sometimes requires to define many types, or many information object classes, or many information object sets, or many information objects, or many values, which have the same outer level structure, but differ in the types, or information object classes, or information object sets, or information objects, or values, that are used at an inner level. Instead of writing out the outer level structure for every such occurrence, it is useful to be able to write it out once, with parts left to be defined later, then to refer to it and provide the additional information.

All these requirements are met by the provision for parameterized reference names and parameterized assignments by this Recommendation | International Standard.

The syntactic form of a parameterized reference name is the same as that of the corresponding normal reference name, but the following additional considerations apply:

– When it is assigned in a parameterized assignment statement, it is followed by a list of dummy reference names in braces, each possibly accompanied by a governor; these reference names have a scope which is the right-hand side of the assignment statement, and the parameter list itself.

> NOTE 2 – This is what causes it to be recognized as a parameterized reference name.

– When it is exported or imported, it is followed by a pair of empty braces to distinguish it as a parameterized reference name.

– When it is used in any construct, it is followed by a list of syntactic constructions, one for each dummy reference name, that provide an assignment to the dummy reference name for the purposes of that use only.

Dummy reference names have the same syntactic form as the corresponding normal reference name, and can be used anywhere on the right-hand side of the assignment statement that the corresponding normal reference name could be used. All such usages are required to be consistent.

INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology –
Abstract Syntax Notation One (ASN.1):
Parameterization of ASN.1 specifications

1 Scope

This Recommendation | International Standard is part of Abstract Syntax Notation One (ASN.1) and defines notation for parameterization of ASN.1 specifications.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

– Recommendation ITU-T X.680 (2015) | ISO/IEC 8824-1:2015, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*

– Recommendation ITU-T X.681 (2015) | ISO/IEC 8824-2:2015, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification.*

– Recommendation ITU-T X.682 (2015) | ISO/IEC 8824-3:2015, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification.*

3 Definitions

For the purposes of this Recommendation | International Standard, the following definitions apply.

3.1 Specification of basic notation

This Recommendation | International Standard uses the terms defined in Rec. ITU-T X.680 | ISO/IEC 8824-1.

3.2 Information object specification

This Recommendation | International Standard uses the terms defined in Rec. ITU-T X.681 | ISO/IEC 8824-2.

3.3 Constraint specification

This Recommendation | International Standard uses the terms defined in Rec. ITU-T X.682 | ISO/IEC 8824-3.

3.4 Additional definitions

3.4.1 normal reference name: A reference name defined, without parameters, by means of an "Assignment" other than a "ParameterizedAssignment". Such a name references a complete definition and is not supplied with actual parameters when used.

3.4.2 parameterized reference name: A reference name defined using a parameterized assignment, which references an incomplete definition and which, therefore, must be supplied with actual parameters when used.