INTERNATIONAL TELECOMMUNICATION UNION

# ITU-T Z.107

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SERIES Z: LANGUAGES AND GENERAL SOFTWARE ASPECTS FOR TELECOMMUNICATION SYSTEMS

Formal description techniques (FDT) – Specification and Description Language (SDL)

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# SDL with embedded ASN.1

ITU-T Recommendation Z.107

(Previously CCITT Recommendation)

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**ITU-T RECOMMENDATION Z.107**

# SDL WITH EMBEDDED ASN.1


## Summary

*Scope-objective*

This Recommendation defines how to use ASN.1 embedded in SDL. The intention is to allow an SDL user to declare SDL types using directly ASN.1 data definitions and type constructors, and to describe SDL actions using directly the ASN.1 value constructors. This Recommendation is an extension of Recommendations Z.100 (1999) and Z.105 (1999).

*Coverage*

This Recommendation details the extensions to the Z.100 production rules related to data definition, type constructor and extended primary expression.

*Applications*

The main area of application of this Recommendation is the specification and design of telecommunication systems. ASN.1 embedded in SDL permits a coherent use of ASN.1 when building SDL models.

*Status and stability*

This Recommendation is the complete reference manual describing the in-line use of ASN.1 in SDL. It has to be considered jointly with Recommendations Z.100 (1999) and Z.105 (1999).

Changes to either Recommendation X.680, or Recommendation Z.100 or Recommendation Z.105 may require modifications to this Recommendation.

*Associated work*

– Recommendation Z.100 (1999): SDL;

– Recommendation Z.105 (1999): SDL combined with ASN.1 modules;

– Recommendation X.680: ASN.1.



## Source

ITU-T Recommendation Z.107 was prepared by ITU-T Study Group 10 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on 19 November 1999.

## Keywords

type definition, use of data.

## FOREWORD

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The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 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 term *recognized operating agency (ROA)* includes any individual, company, corporation or governmental organization that operates a public correspondence service. The terms *Administration*, *ROA* and *public correspondence* are defined in the *Constitution of the ITU (Geneva, 1992)*.

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As of the date of approval of this Recommendation, the 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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**Recommendation Z.107**

# SDL WITH EMBEDDED ASN.1

*(Geneva, 1999)*

## 1 Extensions to lexical rules

The restriction on use of the dash as defined in Recommendation Z.105 (1999), applies for the extensions defined by this Recommendation.

The following SDL <name>s are keywords in this Recommendation:

ABSENT, APPLICATION, COMPONENT, COMPONENTS, DEFINED, ENUMERATED, EXPLICIT, IMPLICIT, INCLUDES, MAX, MIN, PRESENT, PRIVATE, SEQUENCE, TAGS, UNIVERSAL.

In accordance with ASN.1 and to limit the impact on SDL of ASN.1 lexical rules, corresponding lower case keywords do not exist.

The above keywords cannot be used as <name>s, even in SDL constructs that are not related to the use of ASN.1.

The SDL <keyword>s as defined in Recommendation Z.100 cannot be used as <name>s in ASN.1 data definitions, type constructors or value constructors.

## 2 Use of ASN.1 data definitions, type constructors and value constructors

### 2.1 Use of ASN.1 data definitions

The *Concrete textual grammar* of <data definition> as defined in 13.1/Z.100 is extended as follows:

**<data definition> ::=**
**{ <data type definition>**
**| <interface definition>**
**| <syntype definition>**
**| <synonym definition>**
**| <TypeAssignment>**
**| <ValueAssignment> } <end>**

where <TypeAssignment> represents **TypeAssignment** as defined in 3.1.1/Z.105 and where <ValueAssignment> represents **ValueAssignment** as defined in 3.1.2/Z.105.

### 2.2 Use of ASN.1 type constructors

The *Concrete textual grammar* of <data type constructor> as defined in 13.1.7/Z.100 is extended as follows:

**<data type constructor> ::=**
**<literal list>**
**| <structure definition>**
**| <choice definition>**
**| <SequenceType>**
**| <SequenceOfType>**
**| <SetOfType>**
**| <ChoiceType>**
**| <EnumeratedType>**
**| <IntegerType>**
**| <SubrangeType>**

where:

<SequenceType> represents **SequenceType** as defined in 3.2.1/Z.105;

<SequenceOfType> represents **SequenceOfType** as defined in 3.2.2/Z.105;

<SetOfType> represents **SetOfType** as defined in 3.2.2/Z.105;

<ChoiceType> represents **ChoiceType** as defined in 3.2.3/Z.105;

<EnumeratedType> represents **EnumeratedType** as defined in 3.2.4/Z.105;

<IntegerType> represents **IntegerType** as defined in 3.2.5/Z.105;

<SubrangeType> represents **SubrangeType** as defined in 3.2.6/Z.105.

NOTE 1 – INTEGER is a keyword in Recommendation Z.105 as occurring in <SubrangeType> or <IntegerType>, whereas it is a <name> in Recommendation Z.100 and in this Recommendation. This <name> must have the upper case spelling INTEGER.

NOTE 2 – BIT STRING are keywords in Recommendation Z.105 as occurring in <IntegerType>, whereas they are <name>s in Recommendation Z.100 and in this Recommendation. These <name>s must have the upper case spelling BIT and STRING respectively.

### 2.3 Use of ASN.1 value constructors

The *Concrete textual grammar* of <extended primary> as defined in 12.2.4/Z.100 is extended as follows:

```
<extended primary> ::=
            <indexed primary>
      |     <field primary>
      |     <structure primary>
      |     <Value>
```

where <Value> represents **Value** as defined in 3.4/Z.105.

## 3 Predefined types and values

The following types and values are added to **package Predefined**:

```
            syntype
            INTEGER = <<package Predefined>> Integer
      endsyntype;
            syntype
            OCTET_STRING = <<package Predefined>> Octetstring
      endsyntype;
            syntype
            BIT_STRING = <<package Predefined>> Bitstring
      endsyntype;
            synonym TRUE <<package Predefined>> Boolean = True;
            synonym FALSE <<package Predefined>> Boolean = False;
```

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