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Financial services — Universal financial industry message scheme —

Part 8: ASN.1 generation

Services financiers — Schéma universel de messages pour l'industrie financière —

Partie 8: Génération ASN.1

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 68, *Financial services*, Subcommittee SC 9, *Information exchange for financial services*.

This second edition cancels and replaces the first edition (ISO 20022-8:2013), which has been technically revised.

The main changes are as follows:

— generation of a root element and type, only if specified for the MessageDefinition;

— added optional attributes revision, variation, and draft;

— added optional attribute “id” to MessageComponentTypes to enable internal referencing by non-compoiste MessageAssociationEnds and Pointers, using the Token type;

— added generation of Pointer, String and Boolean data types, to align with metamodel;

— support for base 64 and base 16 representations of binary data types;

— MessageElements in a ChoiceComponent are required, to prevent empty choices.

A list of all parts in the ISO 20022 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The ISO 20022 series defines a scalable, methodical process to ensure consistent descriptions of messages throughout the financial services industry.

The purpose of the ISO 20022 series is to describe precisely and completely the externally observable aspects of financial services messaging in a way that can be verified independently against operational messaging.

The trigger for the creation of the ISO 20022 series was the rapid growth in the scale and sophistication of messaging within financial services during the 1990s using the ISO 15022 series. The financial services industry (from here on referred to as "the industry") created the first version of the ISO 20022 series as the successor to the ISO 15022 series in response to that trigger. Since the ISO 15022 series, the industry has broadened the scope from securities to the entire industry for the ISO 20022 series.

The ISO 20022 series is based on open technology standards, which historically have evolved more rapidly than the industry itself. Consequently, the ISO 20022 series adopted a model-driven approach where the model of the industry's messaging can evolve separately from the evolution of the messaging technology standards. The period during which the ISO 20022 series has emerged followed the widespread adoption of the internet for business. The eXtensible Mark-up Language (XML) emerged as the de facto standard for document representation on the Web and it became the first syntax for the ISO 20022 series.

The modelling process is further refined into three levels which, in addition to the messaging technology standard, is why the ISO 20022 series is based on four levels: the scope level, the conceptual level, the logical level and the physical level. This four-level approach is based on the first four levels of the Zachman Framework.[25] The remaining two levels of the Zachman Framework are equivalent to the implementations and the operational levels, respectively.

In ISO 20022-1, the first, second and third levels are described in Unified Modelling Language (UML) because it is widely supported and supports multiple levels of abstraction. The models created in accordance with the ISO 20022 series are technology independent in that they do not require any particular physical expression or implementation. Such models aim to describe all parts of the message exchange. The models form the definition of the protocol between participants exchanging messages. ISO 20022-1 defines a method that describes a process by which these models can be created and maintained by the modellers.

The model artefacts are stored in an ISO 20022 Repository (hereafter referred to as "the Repository"). The Repository and physical level artefacts are exposed in a publicly accessible location, such as a website, serviced by a Registration Authority. The name and contact information of the Registration Authority for the ISO 20022 series can be found at www.iso.org/maintenance_agencies.

The Repository is organized into two areas:

— a DataDictionary containing the industry model elements likely to have further or repeated use;

— a BusinessProcessCatalogue that contains models describing specific message definitions and business processes and physical syntax implementations.

The ISO 20022 series is organized into the following parts:

— ISO 20022-1 describes the metamodel of all the models and the Repository according to ISO/IEC 19502:2005 (MOF).

— ISO 20022-2 covers the UML profile, a grounding of general UML into a specific subset defined for the ISO 20022 series (to be used when UML is selected to define the models).

— ISO 20022-3 describes a modelling method to produce models for the ISO 20022 series.

— ISO 20022-4 covers XML schema generation rules to transform a Logical level model into a Physical level description in the syntaxes.

— ISO 20022-5 covers business concept model interoperability, and logical model alignment and reverse engineering.

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— ISO 20022-6 covers message transport characteristics that define the quality of service required by the business process definitions so that they can operate successfully.

— ISO 20022-7 describes the process of managing the registration of models and physical syntax implementations.

— This document gives ASN.1 syntax generation rules to transform a logical level model into a physical level description in ASN.1.

— ISO 20022-9 describes generic guidelines which are used to define schema generation rules for any specific syntax.

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Financial services — Universal financial industry message scheme —

Part 8: ASN.1 generation

1 Scope

This document describes the transformation rules to generate ASN.1 abstract syntax from an ISO 20022 compliant MessageDefinition. The generated abstract syntax is for the description and validation of Messages.

The transformation rules are a transformation from Level 3 to Level 4. It is a deterministic transformation, meaning that the resulting ASN.1 is completely predictable for a given MessageDefinition. There is neither manual input to the transformation itself nor manual adjustment to the result of the transformation.

This document is the ASN.1 equivalent of ISO 20022-4. In ISO 20022-4 the abstract syntax generated is XML Schema; in this document it is ASN.1. In ISO 20022-4 the only encoding supported is UTF-8 XML; in this document there are multiple encodings supported for ASN.1. These include all the standard encodings, but in addition the ability to register custom encodings in Encoding Control Notation (ECN).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 20022-1, *Financial services — Universal financial industry message scheme — Part 1: Metamodel*

ISO/IEC 8825-5:2021, *Information technology — ASN.1 encoding rules — Part 5: Mapping W3C XML schema definitions into ASN.1*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20022-1 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org

4 ISO 20022 transformation rules for MessageSet

4.1 Registration and Repository

ASN.1 is present in the Repository as a SyntaxScheme. Every ISO/IEC 8825 Encoding shall be added to the Repository as an EncodingScheme for the ASN.1 Syntax Scheme. The Registration Authority may register additional EncodingSchemes in the Repository for ASN.1 if they can be completely and precisely described in ECN. The definition in ECN shall be included in the Repository.

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