DRAFT INTERNATIONAL STANDARD

ISO/DIS 24165-2

ISO/TC **68**/SC **8**

Secretariat: **SNV**

Voting begins on:
2021-02-05

Voting terminates on:
2021-04-30

Digital token identifier (DTI) — Registration, assignment and structure —

Part 2:
Data elements for registration

ICS: 03.060

This document is circulated as received from the committee secretariat.

Reference number
ISO/DIS 24165-2:2021(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 8, *Reference data for financial services*.

A list of all parts in the ISO 24165 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.

Introduction

With the rise in popularity of peer-to-peer payment systems relying less on centralized authorities, and instead on aspects of cryptography, decentralized processing, and a distributed network for the maintenance of a shared record of transaction activity, the need to identify the digital tokens issued, traded, transacted or stored on these networks has grown. Stakeholders in the trading community, service providers, custodians, and regulatory bodies have identified numerous use cases where a standard identifier for accounting, research, tracking, and management of these digital tokens would improve efficiency and eliminate confusion in the marketplace.

However, the nature of these new types of digital asset means they do not fit within the structure of existing ISO identifiers in part because they lack clear reference to an issuing authority and might not be considered the liability of an issuing authority or corporate governing body. These digital assets, in many cases, cross geographic and monetary governance jurisdictions.

Though these digital assets are sometimes referred to as cryptocurrencies, virtual currencies or digital currencies, the term 'currency' has a specific meaning as defined by ISO 4217. This definition is in conflict with the nature of the digital tokens identified within this document due to the reasons described above; namely, the lack of monetary authority and geographic location.

Where traditional financial instruments or currencies are tokenized for electronic exchange, and issued by a legal entity or a monetary authority responsible for it, other International Standards, such as ISO 6166 or ISO 4217 may apply. To eliminate confusion for users of this document, care has been taken to provide a clear definition and eligibility criteria for assignment of a Digital Token Identifier (DTI).

This document is addressed to applicants seeking to identify digital tokens conforming to the definition provided in ISO 24165-1. The data elements described in this document are used to distinguish one set of digital tokens from another; and are, wherever possible, objective, and publicly available. Inclusion in the registry and the issuance of an identifier signifies only the existence of the token and its 1:1 relationship to its identifier.

ISO 24165 is organized into the following parts.

— ISO 24165-1 describes the method of registration and assignment of a DTI

— ISO 24165-2 describes the data elements required for registration and display on the DTI registry

Digital token identifier (DTI) — Registration, assignment and structure —

Part 2:
Data elements for registration

1 Scope

This document defines the data elements included in the registry record and used to establish the 1:1 relationship between a digital token and the identifier assigned according to the method in ISO 24165-1.

2 Normative references

The following document is referred to in the text in such a way that some or all of its content constitutes requirements 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 24165-1, *Digital token identifier—Registration, assignment and structure—Part 1: Method for registration and assignment*

3 Terms and definitions

For the purposes of this document, both the terms and definitions below and those given in ISO 24165-1 apply.

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

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

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

3.1
asset
anything that has value to a stakeholder

[SOURCE: ISO/TS 19299:2015, 3.3]

3.2
auxiliary digital token
non-native digital token created as an application on an existing *blockchain* (3.7) or other distributed ledger technology for its issuance, storage, or transaction record.

Note 1 to entry: A distributed ledger may support zero or more auxiliary digital tokens.

3.3
auxiliary digital token distributed ledger
assigned DTI of a distributed ledger without a native digital token; or assigned DTI of a distributed ledger with a native digital token when the distributed ledger is used as the platform for one or more auxiliary digital tokens [3.2].

EXAMPLE If registering an ERC-20 token operating on the Ethereum blockchain, this data element will contain the DTI assigned to Ether because Ether is the native digital token on a distributed ledger platform that supports one or more auxiliary digital tokens.

Note 1 to entry: This indicates the DTI of either the type = 1 or type = 2 digital token identifier type used by the auxiliary digital token (See clause 5.3).

3.4
auxiliary digital token mechanism
protocol used to create an auxiliary digital token

EXAMPLE ERC-20 (used for Ethereum) and Omni Layer (used for Bitcoin.)

3.5
auxiliary digital token technical reference
element, such as a smart contract address, used to uniquely identify an *auxiliary digital token*'s (3.2) origin on a distributed ledger technology platform

Note 1 to entry: For *each auxiliary digital token mechanism* (3.4), refer to the specifications of the element including the syntax for that element, in the RA website (https://www.iso.org/maintenance_agencies.html). For example, for an auxiliary token mechanism ERC-20, the auxiliary token technical reference would likely be a smart contract address with a designated syntax.

3.6
block
data structure comprising a *block header* (3.11) and *block data* (3.8)

[SOURCE: ISO 22739:2020, 3.2]

Note 1 to entry: For the purposes of this standard, the division of data elements in a block between *block header* (3.11) and *block data* (3.8) is illustrative. Other methods of organizing the data elements typically contained in *block header* (3.11) and *block data* (3.8) may be utilized.

3.7
blockchain
distributed ledger (3.23) with confirmed *blocks* (3.6) organized in an append-only, sequential chain using cryptographic links.

Note 1 to entry: blockchains are designed to be tamper resistant and to create final, definitive and immutable ledger records.

[SOURCE: ISO 22739:2020, 3.6]

3.8
block data
data structure comprising zero or more transaction records or references to transaction records

[SOURCE: ISO 22739:2020, 3.3]

3.9
block hash
cryptographic hash value of the information contained in a block in a blockchain [3.7] as specified by the *consensus mechanism* (3.14)

3.10
block hash algorithm
cryptographic hash function, specified by the *consensus mechanism* (3.14) of a blockchain, used to produce the *block hash* (3.9)

EXAMPLE a double SHA-256 hash (a SHA-256 hash of a SHA-256 hash)

3.11
block header
data structure that includes a cryptographic link to the previous *block* (3.6)

Note 1 to entry: A block header can also contain a *timestamp* (3.44)], a nonce, and other *DLT* (3.24) platform specific data, including a hash value of corresponding transaction records.

[SOURCE: ISO 22739:2020, 3.4]

3.12
block height
number of blocks preceding a given block in a blockchain

EXAMPLE a genesis block [3.36] has block height = 0

3.13
consensus
agreement among *DLT* (3.24) nodes that 1) a transaction is validated and 2) that the *distributed ledger* (3.23) contains a consistent set and ordering of validated transactions

Note 1 to entry: Consensus does not necessarily mean that all DLT nodes agree.

Note 2 to entry: The details regarding consensus differ between blockchain designs and this is one key distinguishing characteristic between one design and another.

[SOURCE: ISO 22739:2020, 3.11]

3.14
consensus mechanism
rules and procedures by which *consensus* (3.13) is reached

[SOURCE: ISO 22739:2020, 3.12]

Note 1 to entry: This definition is not limited to high level categories of consensus mechanisms, such as proof-of-work or proof-of-stake, but also includes all specific rules for validating transactions and achieving *consensus* ([3.13]. E.g. Bitcoin Cash and Bitcoin are both *blockchains* (3.7) utilizing proof-of-work, but they have different consensus mechanisms; Bitcoin Cash increased the maximum block size relative to Bitcoin, which was a change in the consensus mechanism that caused the 2017 fork [x.x] that resulted in the creation of Bitcoin Cash.

3.15
consensus mechanism change response
binary choice denoting, if true, that the *consensus mechanism* (3.14) used to validate the *block* (3.6) at the *fork block height* (3.31) identified in the fork record differ from the *consensus mechanism* (3.14) used to validate the block immediately prior to the block at the *fork block height* (3.31) identified in the fork record (see clause 4.1 and 5.3)

3.16
digital token external identifiers type
enumerated list of external identifier [3.26] types for the digital token

3.17
digital token external identifiers value
list of other *external identifiers* (3.26) for the digital token

3.18
digital token identifier type
categorization of the digital token identifier within the registry (see clause 5.3)

3.19
digital token long name
string containing the full name of the digital token, as represented in alphanumeric basic Latin characters

3.20
digital token reference implementation URL
Uniform Resource Locator (URL) pointing to the digital token's reference implementation or software repository

Note 1 to entry: The supported set of protocols shall be provided in the RA website https://www.iso.org/maintenance_agencies.html.

3.21
digital token short name(s)
list of one or more short names or ticker symbols used to represent this digital token, as represented in alphanumeric basic Latin characters

3.22
digital token unit multiplier
multiplier used to map from the unit of value stored on the distributed ledger to the unit of value associated with the *digital token long name* (3.19)

EXAMPLE Bitcoin has a digital token unit multiplier of 100,000,000.

3.23
distributed ledger
ledger that is shared across a set of *DLT* (3.24) nodes and synchronized between the *DLT* (3.24) nodes using a *consensus mechanism* (3.14)

Note 1 to entry: a distributed ledger is designed to be tamper resistant, append-only and immutable containing confirmed and validated transactions.

[SOURCE: ISO 22739:2020, 3.22]

3.24
distributed ledger technology
DLT
technology that enables the operation and use of *distributed ledgers* (3.23)

[SOURCE: ISO/IEC 18014-1:2008, 3.23]

3.25
distributed ledger technology type
category of systems implementing *distributed ledger technology* (3.24) based on their *consensus mechanisms* [3.14].

Note 1 to entry: the applicability of the data elements in base records and *fork* (3.27) records is dependent on the combination of *digital token identifier type* (3.18) and distributed ledger technology type, see clause 5.3

3.26
external identifier
identifier, external to this standard, that may be used to identify either the digital token or the underlying asset that this digital token represents

EXAMPLE [ISO 6166]

3.27
fork
creation of two or more different versions of a *distributed ledger* (3.23) originating from a common starting point with a single history

[SOURCE: ISO 22739:2020, 3.37]

Note 1 to entry: A fork may or may not result in the creation of a new digital token.

Note 2 to entry: Terms such as hard fork and soft fork are sometimes used to distinguish backwards compatibility changes to the *consensus mechanism* (3.14) of a blockchain. This standard uses the term fork to encompass both scenarios.

3.28
fork block
block having a *block height* (3.12) equal to the *fork block height* (3.31) data element specified in a fork record

3.29
fork block hash
block hash (3.9) of the block with a *block height* (3.12) equal to the *fork block height* (3.31)

3.30
fork block hash algorithm
block hash algorithm (3.10) of the *fork block* (3.28)

Note 1 to entry: The fork block hash algorithm may differ from the genesis *block hash algorithm* (3.38) when a *fork* (3.27) defines a new *block hash algorithm* (3.10) as part of a *consensus mechanism* (3.14) change

3.31
fork block height
block height (3.12) of the first block after a *fork* (3.27)

Note 1 to entry: When a digital token is created as a result of a fork, the original blockchain and the new blockchain are identical for all blocks with a block height less than the fork block height. Blocks on the original and the new blockchains at the block height equal to or greater than the fork block height will differ.

3.32
fork block UTC timestamp
timestamp (3.44), expressed in Coordinated Universal Time, recorded in the *fork block* (3.28)

Note 1 to entry: Frequently, the fork block UTC timestamp is located in the *fork block header* (3.11)

3.33
functionally fungible
not technically compatible, but considered equivalent

3.34
functionally fungible group
set of digital tokens which are functionally *fungible* (3.33)

3.35
fungible
capable of mutual substitution between the individual units of digital assets

3.36
genesis block
first *block* (3.6) in a *blockchain* (3.7)

Note 1 to entry: A genesis block has no previous *block* (3.6) and serves to initialize the *blockchain* (3.7).

[SOURCE: ISO 22739:2020, 3.38]

3.37
genesis block hash
block hash (3.9) of the genesis block

Note 1 to entry: The genesis block hash is typically recorded in the second block of the blockchain.

3.38
genesis block hash algorithm
block hash algorithm (3.10) used to produce the *block hash* (3.9) of the *genesis block* (3.36)

3.39
genesis block UTC timestamp
timestamp (3.44), expressed in Coordinated Universal Time, recorded in the *genesis block* (3.36)

Note 1 to entry: Frequently, the genesis block UTC timestamp is located in the genesis *block header* (3.11).