Technical Report

ISO/TR 6277

Blockchain and distributed ledger technologies (DLT) — Data flow models for blockchain and DLT use cases

Technologies des chaînes de blocs et technologies de registre distribué — Modèles de flux de données pour les chaînes de blocs et les cas d'utilisation de DLT

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Foreword

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This document was prepared by Technical Committee ISO/TC 307, *Blockchain and distributed ledger technologies.*

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

This document consolidates a set of system-level models from ISO 23257 and ISO/TR 3242 to give a data-flow-centric description framework for blockchain and distributed ledger technology (DLT) use cases. The framework enables a data flow analysis approach for blockchain and DLT use cases which has been defined in ISO 23257, successfully applied across all use cases in ISO/TR 3242 and extended in this document to display more detailed information on data flows.

The robust descriptive capabilities provided by this framework can help to improve blockchain and DLT application design and enhance interoperability. This can be beneficial for:

— clear understanding of data types and data flows in distributed ledger systems that allows for better-designed, fit-for-purpose systems;

— better governance and risk management;

— a sound basis for interoperability modelling for the use cases that require data exchange in hybrid or orchestrated systems environment.

Understanding data flows can be a necessary foundation for DLT users to ensure data privacy and data confidentiality in DLT use cases, or a decision-making basis when implementing technology selection or scheme assessment. From this perspective, data flow analysis is especially essential to scenarios which frequently involve data flows among stakeholders or devices. To illustrate the features of data flows in DLT use cases with the above characteristics, this document provides three uses cases which apply the description framework to unfold data flows among devices, data flows along with business process, as well as data flows between physical and virtual spaces. These use cases can also provide an insight into the role of data flow analysis in balancing business value maximization and risk controls.

This document is organized as follows:

— Clause 5 presents an overview of DLT data flows, including data flow categories, data categories, roles/subroles and considerations related to data flow.

— Clause 6 and Clause 7 provide analysis of typical intra-system and inter-system data flows for DLT systems.

— Clause 8 provides three DLT use cases based on a descriptive and visualization template focusing on data flows.

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1 Scope

This document uses a set of models that describe the flows of different types of data between distributed ledger technologies (DLT) and related systems, as well as between different DLT nodes.

It provides a descriptive analysis of data flows in the development of use cases, as well as the basis for understanding the characteristics of DLT data flows, to support DLT application design and system analysis.

The models referenced are in accordance with ISO 23257 and the use case analysis approach provided in ISO/TR 3242.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their 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 22739, *Blockchain and distributed ledger technologies — Vocabulary*

ISO 23257, *Blockchain and distributed ledger technologies — Reference architecture*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22739, ISO 23257 and the following 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/

3.1
cloud computing
paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand

Note 1 to entry: Examples of resources include servers, operating systems, networks, software, applications, and storage equipment.

Note 2 to entry: Self-service provisioning refers to the provisioning of resources provided to cloud services performed by cloud service customers through automated means.

[SOURCE: ISO/IEC 22123-1:2023, 3.1.1]

3.2
data category
class of data items that are closely related from a formal or semantic point of view

[SOURCE: ISO 30042:2019, 3.8, modified — Example and Notes 1 and 2 to entry deleted.]