DRAFT International Standard

ISO/IEC DIS 20151

Information technology — Cloud computing and distributed platforms — Dataspace concepts and characteristics

ICS: 35.210

ISO/IEC JTC **1**/SC **38**

Secretariat: **ANSI**

Voting begins on:
2025-07-21

Voting terminates on:
2025-10-13

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENTS AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document is circulated as received from the committee secretariat.

Reference number
ISO/IEC DIS 20151:2025(en)

© ISO/IEC 2025



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Abbreviated terms ... **3**
5 Trusted data sharing using dataspaces ... **3**
5.1 General ... 3
5.2 Features and examples ... 3
5.3 Operation ... 5
5.3.1 General ... 5
5.3.2 Interaction phases ... 5
5.4 Organizational autonomy ... 6
5.5 Data Governance ... 6
5.6 Organizational interoperability ... 7
6 Dataspace concepts and related characteristics ... **9**
6.1 General ... 9
6.2 Maintain control ... 9
6.2.1 Concept ... 9
6.2.2 Characteristics of maintaining control ... 9
6.3 Establish trust ... 11
6.3.1 Concept ... 11
6.3.2 Characteristics of establishing trust ... 12
6.4 Discover data ... 14
6.4.1 Concept ... 14
6.4.2 Characteristics of discovering data ... 14
6.5 Negotiate data sharing contracts ... 14
6.5.1 Concept ... 14
6.5.2 Characteristics of negotiating data sharing contracts ... 14
6.6 Orchestrate data sharing and data use ... 15
6.6.1 Concept ... 15
6.6.2 Characteristics of orchestrating data sharing and data use ... 15
6.7 Observe actions ... 16
6.7.1 Concept ... 16
6.7.2 Characteristics of observing actions ... 16
6.8 Provide interoperability ... 16
6.8.1 Concept ... 16
6.8.2 Characteristics of providing interoperability ... 16
6.9 Optional services ... 19
7 Dataspace functional components ... **19**
7.1 General ... 19
7.2 Multi-level policies ... 19
7.3 Semantic models ... 20
7.4 Communication protocols ... 21
7.5 Processes and rules ... 22
Bibliography ... **23**

© ISO/IEC 2025 – All rights reserved

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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/IEC JTC 1, Subcommittee SC 38, *Cloud computing and distributed platforms*.

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.

© ISO/IEC 2025 – All rights reserved

Introduction

The use of data is now part of every aspect of the organization and the ecosystems in which it operates – such as supply chains, marketplaces and regulatory jurisdictions. As such, the value derived from the use of data is an important part of most economies.

When an organization itself generates data, it can govern, manage and extract the appropriate value from that data. However, much of the data used by an organization comes from others – along with possible restrictions on its use. Similarly, some of the data the organization generates can, with agreement, be used by others. To facilitate this use of data across multiple organisations – and to respect the rights and obligations associated with data while doing so – a method of trusted data sharing is needed.

Dataspaces provide a scalable and more automated approach to organizational agreements, and supporting software services that together enable trusted data sharing..

By providing clarity on the description of the data that is available to be shared as well as the agreed uses for the shared data, both the data provider and data recipient can make clear choices about data and improve its operational management as well as its overall governance and value.

This document provides an overview and concepts of dataspaces and their essential and optional characteristics. It builds on other cloud computing and distributed platforms documents such as ISO/IEC 22123-1[1], ISO/IEC 23751[2] and ISO/IEC 5140[3] which describe cloud computing, data sharing agreements and multi-cloud concepts.

© ISO/IEC 2025 – All rights reserved

Information technology — Cloud computing and distributed platforms — Dataspace concepts and characteristics

1 Scope

This document provides the foundational concepts for dataspaces and their essential characteristics. This document is applicable to all organizations.

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/IEC 22123-1, *Information technology — Cloud computing — Part 1: Vocabulary*

3 Terms and definitions

For the purposes of this document, the following terms and definitions given in ISO/IEC 22123-1, and the following apply.

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

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

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

3.1
dataspace
data space
governance framework (3.12) and supporting services to build *trustworthiness* (3.10) and enable *data sharing* (3.6) through an agreed set of policies, semantic models, protocols and processes

3.2
dataspace participant
participant
party that is acting in a *dataspace participant role* (3.3)

Note 1 to entry: By being accepted to be a participant in the dataspace, the party agrees to the governance arrangements and therefore the policies of the dataspace.

3.3
dataspace participant role
participant role
set of activities within a *dataspace* (3.1) for the purpose of *data sharing* (3.6) or related activities

Note 1 to entry: Related activities can include auditing or observing roles that do not include data sharing or governance activities.

3.4
dataspace governance authority role
DSGA role
set of activities provided by one or more parties that establishes, governs, manages and enforces the technical policies and business rules of a *dataspace* (3.1)

© ISO/IEC 2025 – All rights reserved

3.5
data policy
human and machine-readable set of rights and obligations regarding access and use of data

3.6
data sharing
access to the same data by more than one authorized entity

Note 1 to entry: Use of the data can be synchronous or asynchronous.

Note 2 to entry: Data can be shared, for example, (i) by allowing access to, or the execution of operations over, the original dataset, or (ii) by giving a copy of the data to the interested entity.

Note 3 to entry: The way in which data is shared fundamentally influences the available controls and the statements needed in a data sharing agreement.

[SOURCE: ISO/IEC 23751:2022[4], 3.7, modified - removed 'or processing of']

3.7
data sharing contract
formal and legally binding agreement between *dataspace participants* (3.3) containing policies, terms and conditions for *data sharing* (3.6)

Note 1 to entry: Data sharing contracts usually contain information about access to data, including its metadata, and data use.

Note 2 to entry: A data sharing contract is usually much more specific than a data sharing agreement which is often broader and often at an organizational level.

3.8
data use
handling or dealing with data for a specific purpose

[SOURCE: ISO/IEC 5207:2024[5](en), 3.30, modified – Note 1 to entry removed]

3.9
trust
decision by an entity to assume that a product, service or entity will behave as expected for a given circumstance

3.10
trustworthiness
set of verifiable evidence that can be used to form *trust* (3.9)

3.11
governance
human-based system comprising directing, overseeing and accountability

[SOURCE: ISO/IEC 38500:2024[6], 3.3]

3.12
governance framework
strategies, policies, decision-making structures and accountabilities through which the organization's *governance* (3.11) arrangements operate

[SOURCE: ISO/IEC TR 38502:2017[7], 3.1]

© ISO/IEC 2025 – All rights reserved