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**Information technology — Cloud Data
Management Interface (CDMI) Version
2.0.0**

*Technologies de l'information — Interface de management des
données du nuage informatique (CDMI) Version 2.0.0*



Reference number
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Foreword

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This document was prepared by SNIA (as Cloud Data Management Interface (CDMI™), Version 2.0.0) and drafted in accordance with its editorial rules. It was adopted, under the JTC 1 PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, Information technology.

This third edition cancels and replaces the second edition (ISO/IEC 17826:2016), which has been technically revised.

The main changes are as follows:

- Specification changes:
 - no longer a reliance on X-CDMI-SPECIFICATION-VERSION header, as per IETF guidelines;
 - support for PATCH HTTP verb, in addition of PUT, for resource updates;
 - use of /cdmi/v2.0.0/ root URI in examples;
 - new format for query parameters in URIs;
 - exports section has been re-written;
 - versioning examples have been updated;
 - audit and logging clauses have been removed (due to no vendor implementations);

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- Bibliography section has been re-written;
- RFC references have been updated;
- HTTPS is used instead of HTTP in examples;
- references updated from CIFS to SMB;
- document formatting cleanup.
- Incorporated Extensions into Specification:
 - Encrypted Object extension;
 - Delegated Access Control extension;
 - JSON Transfer Encoding extension.
- Incorporated Extensions into Annex A:
 - summary metadata for bandwidth;
 - expiring access control entries;
 - group storage system metadata;
 - header-based metadata;
 - immediate query.

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 and www.iec.ch/national-committees.

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Part I

CDMI Preamble

This Cloud Data Management Interface (CDMI™) International Standard is intended for application developers who are implementing or using cloud storage. It documents how to access cloud storage and to manage the data stored there.

This document is organized as follows:

Table 1: Overview of this document

Clause 1	Scope	Defines the scope of this document
Clause 2	Normative references	Lists the normative references for this document
Clause 3	Terms	Provides terminology used in this document
Clause 4	Conventions	Describes the conventions used in presenting the interfaces and the typographical conventions used in this document
Clause 5	Overview of Cloud Storage	Provides a brief overview of cloud storage and details the philosophy behind this International Standard as a model for the operations
Clause 6	Data Object Resource Operations using HTTP	Provides the normative standard of data object resource operations using HTTP
Clause 7	Container Object Resource Operations using HTTP	Provides the normative standard of container object resource operations using HTTP
Clause 8	Data Object Resource Operations using CDMI	Provides the normative standard of data object resource operations using CDMI
Clause 9	Container Object Resource Operations using CDMI	Provides the normative standard of container object resource operations using CDMI
Clause 10	Domain Object Resource Operations using CDMI	Provides the normative standard of domain object resource operations using CDMI
Clause 11	Queue Object Resource Operations using CDMI	Provides the normative standard of queue object resource operations using CDMI
Clause 12	Capability Object Resource Operations using CDMI	Provides the normative standard of capability object resource operations using CDMI
Clause 13	Exported Protocols	Discusses how virtual machines in the cloud computing environment can use the exported protocols from CDMI containers
Clause 14	Snapshots	Discusses how snapshots are accessed under CDMI containers
Clause 15	Serialization/Deserialization	Discusses serialization and deserialization, including import and export of serialized data under CDMI
Clause 16	Metadata	Provides the normative standard of the metadata used in the interface
Clause 18	Retention and Hold Management	Describes the optional retention management disciplines to be implemented into the system management functions
Clause 19	Scope Specification	Describes the structure of the scope specification for JSON objects
Clause 20	Results Specification	Provides a standardized mechanism to define subsets of CDMI object contents
Clause 21	Notification Queues	Describes how CDMI clients can efficiently discover what changes have occurred to the system
Clause 22	Query Queues	Describes how CDMI clients can efficiently discover what content matches a given set of metadata query criteria or full-content search criteria
Clause 23	Encrypted Objects	Describes how to work with transparently encrypted objects
Clause 24	Delegated Access Control	Describes how to delegate access control to external systems
Clause 25	Data Object Versions	Describes how to work with versioned data objects
Clause 26	Extensions	Provides informative vendor extensions. Each extension is added to the standard when at least two vendors implement the extension.

Clause 1

Scope

This CDMI™ International Standard specifies the interface to access cloud storage and to manage the data stored therein. This International Standard applies to developers who are implementing or using cloud storage.

Clause 2

Normative references

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

The provisions of the referenced specifications other than ISO/IEC, IEC, ISO, and ITU documents, as identified in this clause, are valid within the context of this International Standard. The reference to such a specification within this International Standard does not give it any further status within ISO/IEC. In particular, it does not give the referenced specifications the status of an International Standard.

ISO 3166:2013, *Codes for the representation of names of countries and their subdivisions (Parts 1, 2 and 3)* - see [35][36][37]

ISO 4217:2015, *Codes for the representation of currencies and funds* - see [38]

ISO 8601:2019, *Data elements and interchange formats – Information interchange – Representation of dates and times* - see [32][33]

ISO/IEC 9594-8:2017, *Information technology – Open Systems Interconnection – The Directory: Public-key and attribute certificate frameworks* - see [43]

ISO 14721:2012, *Space data and information transfer systems – Open archival information system (OAIS) – Reference model* - see [34]

ISO/IEC 14776-414:2009, *SCSI Architecture Model - 4 (SAM-4)* - see [29]

ISO/IEC 17788:2014, *Information technology – Cloud computing – Overview and vocabulary* - see [31]

ISO/IEC 20648, *TLS specification for storage systems* - see [39]

ISO/IEC 27040:2015, *Information technology – Security techniques – Storage security* - see [30]

ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standards*, 6th edition, 2011* - see [28]

IEEE 1003.1-2017, *IEEE Standard for Information Technology–Portable Operating System Interface (POSIX(R)) Base Specifications, Issue 7* - see [41]

RFC 1867, *Form-based File Upload in HTML* - see [20]

RFC 2045, *Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies* - see [9]

RFC 2046, *Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types* - see [10]

RFC 2119, *Key Words for Use in RFCs to Indicate Requirement Levels* - see [3]

RFC 2578, *Structure of Management Information Version 2 (SMIPv2)* - see [21]

RFC 2616, *Hypertext Transfer Protocol – HTTP/1.1* - see [23]

RFC 2617, *HTTP Authentication: Basic and Digest Access Authentication* - see [8]

RFC 3280, *Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile* - see [13]

RFC 3530, *Network File System (NFS) Version 4 Protocol* - see [1]

RFC 7143, *Internet Small Computer System Interface (iSCSI) Protocol (Consolidated)* - see [4]

RFC 3986, *Uniform Resource Identifier (URI): Generic Syntax* - see [2]

RFC 4627, *The Application/JSON Media Type for JavaScript Object Notation (JSON)* - see [5]

RFC 4648, *The Base16, Base32, and Base64 Data Encodings* - see [19]

RFC 4918, *HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)* - see [6]
RFC 5246, *The Transport Layer Security (TLS) Protocol Version 1.2* - see [25]
RFC 6068, *The 'mailto' URI Scheme* - see [27]
RFC 5652, *Cryptographic Message Syntax (CMS)* - see [12]
RFC 6208, *Cloud Data Management Interface (CDMI) Media Types* - see [26]
RFC 6839, *Additional Media Type Structured Syntax Suffixes* - see [11]
RFC 7515, *JSON Web Signatures* - see [17]
RFC 7516, *JSON Web Encryption* - see [18]
RFC 7518, *JSON Web Algorithms* - see [15]
RFC 8446, *The Transport Layer Security (TLS) Protocol Version 1.3* - see [24]
SNIA TLS, *TLS Specification for Storage Systems, version 1.1.0* - see [42]