
Information technology — Cloud Data Management Interface (CDMI)

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

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO/IEC 17826:2016

<https://standards.iteh.ai/catalog/standards/iso/90065525-0e51-4b28-abf9-ef3cae7eb110/iso-iec-17826-2016>

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO/IEC 17826:2016

<https://standards.iteh.ai/catalog/standards/iso/90065525-0e51-4b28-abf9-ef3cae7eb110/iso-iec-17826-2016>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, 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
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC 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.

ISO/IEC 17826 was prepared by SNIA and was adopted, under the PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

This second edition cancels and replaces the first edition (ISO/IEC 17826:2012), which has been technically revised.



Cloud Data Management Interface (CDMI™)

Version 1.1.1

ABSTRACT: This 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 has been released and approved by the SNIA. The SNIA believes that the ideas, methodologies, and technologies described in this document accurately represent the SNIA goals and are appropriate for widespread distribution. Suggestion for revision should be directed to <http://www.snia.org/feedback/>.

SNIA Technical Position

March 19, 2015

USAGE

The SNIA hereby grants permission for individuals to use this document for personal use only, and for corporations and other business entities to use this document for internal use only (including internal copying, distribution, and display) provided that:

- 1 Any text, diagram, chart, table or definition reproduced shall be reproduced in its entirety with no alteration, and,
- 2 Any document, printed or electronic, in which material from this document (or any portion hereof) is reproduced shall acknowledge the SNIA copyright on that material, and shall credit the SNIA for granting permission for its reuse.

Other than as explicitly provided above, you may not make any commercial use of this document, sell any excerpt or this entire document, or distribute this document to third parties. All rights not explicitly granted are expressly reserved to SNIA.

Permission to use this document for purposes other than those enumerated above may be requested by emailing tcmd@snia.org. Please include the identity of the requesting individual or company and a brief description of the purpose, nature, and scope of the requested use.

All code fragments, scripts, data tables, and sample code in this SNIA document are made available under the following license:

BSD 3-Clause Software License

Copyright (c) 2014, The Storage Networking Industry Association.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither the name of The Storage Networking Industry Association (SNIA) nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

DISCLAIMER

The information contained in this publication is subject to change without notice. The SNIA makes no warranty of any kind with regard to this specification, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The SNIA shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this specification.

Suggestions for revisions should be directed to <http://www.snia.org/feedback/>.

Copyright © 2015 SNIA. All rights reserved. All other trademarks or registered trademarks are the property of their respective owners.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO/IEC 17826:2016

<https://standards.iteh.ai/catalog/standards/iso/90065525-0e51-4b28-abf9-ef3cae7eb110/iso-iec-17826-2016>

Revision History

Version	Date	Originator	Comments
1.1.1	March 19, 2015	CDMI TWG	Released as a SNIA Technical Position.

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

ISO/IEC 17826:2016

<https://standards.itih.ai/catalog/standards/iso/90065525-0e51-4b28-abf9-ef3cae7eb110/iso-iec-17826-2016>

Contents

SECTION 1 - CDMI Preamble	1
Introduction	2
1 Scope	4
2 Normative references	4
3 Terms, acronyms, and definitions	6
4 Conventions	10
4.1 Interface format	10
4.2 Typographical conventions	10
4.3 Request and response body requirements	11
4.4 Key word requirements	11
5 Overview of cloud storage	13
5.1 Introduction	13
5.2 What is cloud storage?	13
5.3 Data storage as a Service	13
5.4 Data management for cloud storage	15
5.5 Data and container management	16
5.6 Reference model for cloud storage interfaces	16
5.7 Cloud Data Management Interface	17
5.8 Object model for CDMI	18
5.9 CDMI metadata	19
5.10 Object ID	20
5.11 CDMI object ID format	20
5.12 Security	21
5.12.1 Security objectives	21
5.12.2 HTTP security	22
5.12.3 Client authentication	22
5.12.4 Use of TLS and HTTP	23
5.12.5 Further information	23
5.13 Required HTTP support	23
5.13.1 RFC 2616 support requirements	23
5.13.2 Content-type negotiation	23
5.13.3 Range support	23
5.13.4 URI escaping	24
5.13.5 Use of URIs	24
5.13.6 Reserved characters	25
5.14 Time representations	25
5.15 Backwards compatibility	25
5.15.1 Value transfer encoding	25
5.15.2 Container export capabilities	26
5.16 Object references	26
SECTION 2 - Basic Cloud Storage	28
6 Data object resource operations using HTTP	29
6.1 Overview	29
6.2 Create a data object using HTTP	29
6.2.1 Synopsis	29

6.2.2	Capabilities	29
6.2.3	Request headers	30
6.2.4	Request message body	30
6.2.5	Response headers	30
6.2.6	Response message body	30
6.2.7	Response status	30
6.2.8	Example	31
6.3	Read a data object using HTTP	31
6.3.1	Synopsis	31
6.3.2	Capabilities	31
6.3.3	Request header	31
6.3.4	Request message body	31
6.3.5	Response headers	32
6.3.6	Response message body	32
6.3.7	Response status	32
6.3.8	Examples	32
6.4	Update a data object using HTTP	33
6.4.1	Synopsis	33
6.4.2	Capabilities	33
6.4.3	Request headers	33
6.4.4	Request message body	34
6.4.5	Response header	34
6.4.6	Response message body	34
6.4.7	Response status	34
6.4.8	Examples	34
6.5	Delete a data object using HTTP	35
6.5.1	Synopsis	35
6.5.2	Capability	35
6.5.3	Request headers	35
6.5.4	Request message body	35
6.5.5	Response headers	35
6.5.6	Response message body	35
6.5.7	Response status	36
6.5.8	Example	36
7	Container object resource operations using HTTP	37
7.1	Overview	37
7.2	Create a container object using HTTP	37
7.2.1	Synopsis	37
7.2.2	Capability	37
7.2.3	Request headers	38
7.2.4	Request message body	38
7.2.5	Response headers	38
7.2.6	Response message body	38
7.2.7	Response status	38
7.2.8	Example	38
7.3	Read a container object using HTTP	38
7.4	Update a container object using HTTP	38
7.5	Delete a container object using HTTP	39
7.5.1	Synopsis	39
7.5.2	Capability	39
7.5.3	Request headers	39
7.5.4	Request message body	39
7.5.5	Response headers	39
7.5.6	Response message body	39
7.5.7	Response status	40
7.5.8	Example	40
7.6	Create (POST) a new data object using HTTP	40

7.6.1	Synopsis	40
7.6.2	Capabilities	41
7.6.3	Request headers	41
7.6.4	Request message body	41
7.6.5	Response header	41
7.6.6	Response message body	42
7.6.7	Response status	42
7.6.8	Examples	42

SECTION 3 - CDMI Core 43

8 Data object resource operations using CDMI 44

8.1	Overview	44
8.1.1	Data object metadata	45
8.1.2	Data object consistency	45
8.1.3	Data object representations	46
8.2	Create a data object using CDMI	46
8.2.1	Synopsis	46
8.2.2	Delayed completion of create	46
8.2.3	Capabilities	47
8.2.4	Request headers	47
8.2.5	Request message body	48
8.2.6	Response headers	51
8.2.7	Response message body	51
8.2.8	Response status	52
8.2.9	Examples	52
8.3	Read a data object using CDMI	55
8.3.1	Synopsis	55
8.3.2	Capabilities	55
8.3.3	Request headers	56
8.3.4	Request message body	56
8.3.5	Response headers	56
8.3.6	Response message body	57
8.3.7	Response status	59
8.3.8	Examples	59
8.4	Update a data object using CDMI	62
8.4.1	Synopsis	62
8.4.2	Capabilities	63
8.4.3	Request headers	63
8.4.4	Request message body	64
8.4.5	Response header	67
8.4.6	Response message body	67
8.4.7	Response status	67
8.4.8	Examples	67
8.5	Delete a data object using CDMI	71
8.5.1	Synopsis	71
8.5.2	Capability	71
8.5.3	Request header	71
8.5.4	Request message body	71
8.5.5	Response headers	71
8.5.6	Response message body	71
8.5.7	Response status	72
8.5.8	Example	72

9 Container object resource operations using CDMI 73

9.1	Overview	73
-----	----------------	----

9.1.1	Container metadata	74
9.1.2	Reserved container names	74
9.1.3	Container object addressing	74
9.1.4	Container object representations	75
9.2	Create a container object using CDMI	75
9.2.1	Synopsis	75
9.2.2	Delayed completion of create	75
9.2.3	Capabilities	76
9.2.4	Request headers	76
9.2.5	Request message body	77
9.2.6	Response headers	79
9.2.7	Response message body	79
9.2.8	Response status	81
9.2.9	Examples	81
9.3	Read a container object using CDMI	83
9.3.1	Synopsis	83
9.3.2	Capabilities	83
9.3.3	Request headers	84
9.3.4	Request message body	84
9.3.5	Response headers	84
9.3.6	Response message body	84
9.3.7	Response status	86
9.3.8	Examples	86
9.4	Update a container object using CDMI	88
9.4.1	Synopsis	88
9.4.2	Delayed completion of snapshot	88
9.4.3	Capabilities	89
9.4.4	Request headers	89
9.4.5	Request message body	90
9.4.6	Response header	92
9.4.7	Response message body	92
9.4.8	Response status	92
9.4.9	Examples	92
9.5	Delete a container object using CDMI	93
9.5.1	Synopsis	93
9.5.2	Capability	93
9.5.3	Request header	94
9.5.4	Request message body	94
9.5.5	Response headers	94
9.5.6	Response message body	94
9.5.7	Response status	94
9.5.8	Example	94
9.6	Create (POST) a new data object using CDMI	95
9.6.1	Synopsis	95
9.6.2	Delayed completion of create	95
9.6.3	Capabilities	96
9.6.4	Request headers	97
9.6.5	Request message body	98
9.6.6	Response headers	101
9.6.7	Response message body	101
9.6.8	Response status	102
9.6.9	Examples	103
9.7	Create (POST) a new queue object using CDMI	105
9.7.1	Synopsis	105
9.7.2	Delayed completion of create	105
9.7.3	Capabilities	106
9.7.4	Request headers	107
9.7.5	Request message body	107

9.7.6	Response headers	108
9.7.7	Response message body	108
9.7.8	Response status	110
9.7.9	Example	110

SECTION 4 - CDMI Advanced 112

10 Domain object resource operations using CDMI 113

10.1	Overview	113
10.1.1	Domain object metadata	114
10.1.2	Domain object summaries	114
10.1.3	Domain object membership	117
10.1.4	Domain usage in access control	119
10.1.5	Domain object representations	120
10.2	Create a domain object using CDMI	120
10.2.1	Synopsis	120
10.2.2	Capabilities	120
10.2.3	Request headers	120
10.2.4	Request message body	121
10.2.5	Response headers	122
10.2.6	Response message body	122
10.2.7	Response status	123
10.2.8	Example	123
10.3	Read a domain object using CDMI	124
10.3.1	Synopsis	124
10.3.2	Capabilities	124
10.3.3	Request headers	124
10.3.4	Request message body	124
10.3.5	Response headers	125
10.3.6	Response message body	125
10.3.7	Response status	126
10.3.8	Examples	126
10.4	Update a domain object using CDMI	127
10.4.1	Synopsis	127
10.4.2	Capability	128
10.4.3	Request headers	128
10.4.4	Request message body	128
10.4.5	Response header	129
10.4.6	Response message body	129
10.4.7	Response status	130
10.4.8	Example	130
10.5	Delete a domain object using CDMI	130
10.5.1	Synopsis	130
10.5.2	Capability	131
10.5.3	Request header	131
10.5.4	Request message body	131
10.5.5	Response headers	131
10.5.6	Response message body	131
10.5.7	Response status	131
10.5.8	Example	132

11 Queue object resource operations using CDMI 133

11.1	Overview	133
11.1.1	Queue object metadata	134
11.1.2	Queue object addressing	134
11.1.3	Queue object representations	134

11.2	Create a queue object using CDMI	134
11.2.1	Synopsis	134
11.2.2	Delayed completion of create	135
11.2.3	Capabilities	135
11.2.4	Request headers	136
11.2.5	Request message body	136
11.2.6	Response headers	138
11.2.7	Response message body	138
11.2.8	Response status	139
11.2.9	Examples	140
11.3	Read a queue object using CDMI	141
11.3.1	Synopsis	141
11.3.2	Capabilities	141
11.3.3	Request headers	142
11.3.4	Request message body	142
11.3.5	Response headers	142
11.3.6	Response message body	142
11.3.7	Response status	145
11.3.8	Examples	145
11.4	Update a queue object using CDMI	148
11.4.1	Synopsis	148
11.4.2	Capability	148
11.4.3	Request headers	148
11.4.4	Request message body	149
11.4.5	Response header	150
11.4.6	Response message body	150
11.4.7	Response status	150
11.4.8	Examples	150
11.5	Delete a queue object using CDMI	151
11.5.1	Synopsis	151
11.5.2	Capability	151
11.5.3	Request header	151
11.5.4	Request message body	152
11.5.5	Response headers	152
11.5.6	Response message body	152
11.5.7	Response status	152
11.5.8	Example	152
11.6	Enqueue a new queue value using CDMI	152
11.6.1	Synopsis	152
11.6.2	Capabilities	153
11.6.3	Request headers	153
11.6.4	Request message body	153
11.6.5	Response headers	155
11.6.6	Response message body	155
11.6.7	Response status	156
11.6.8	Examples	156
11.7	Delete a queue object value using CDMI	159
11.7.1	Synopsis	159
11.7.2	Capability	159
11.7.3	Request header	159
11.7.4	Request message body	159
11.7.5	Response headers	160
11.7.6	Response message body	160
11.7.7	Response status	160
11.7.8	Examples	160
12	Capability object resource operations using CDMI	161
12.1	Overview	161