

INTERNATIONAL STANDARD



Information technology –
Storage management

ITh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC 24775:2011](#)

<https://standards.iteh.ai/catalog/standards/sist/612b82e0-3aaf-405b-940a-8b0d08b96846/iso-iec-24775-2011>



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2011 ISO/IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about ISO/IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: www.iec.ch/searchpub

The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: www.iec.ch/online_news/justpub

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: www.iec.ch/webstore/custserv

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:

Email: csc@iec.ch
Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00



ISO/IEC 24775

Edition 2.0 2011-02

INTERNATIONAL STANDARD



Information technology –
Storage management

STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC 24775:2011](#)

<https://standards.iteh.ai/catalog/standards/sist/612b82e0-3aaf-405b-940a-8b0d08b96846/iso-iec-24775-2011>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE **XU**

ICS 35.200

ISBN 978-2-88912-367-4

Contents

FOREWORD	37
INTRODUCTION	39
1 Scope	40
2 Definitions, Symbols, Abbreviations, and Conventions	41
2.1 Terms and definitions	41
2.2 Acronyms and abbreviations	46
2.3 Keywords	47
2.4 Conventions	48
3 Business Overview	49
3.1 Preamble	49
3.2 Business Rationale	49
3.3 Interface Definition	49
3.4 Technology Trends	52
3.5 Management Environment	53
3.6 Architectural Objectives	54
4 Typographical Conventions	56
4.1 Deprecated Material	56
4.2 Experimental Material	56
4.3 Maturity Model	56
5 Overview	57
5.1 Base Capabilities	57
5.1.1 Object Oriented	57
5.1.2 Messaging Based	59
5.2 Functionality Matrix	61
5.2.1 Overview	61
5.2.2 Multi-Level Model Of Networked Storage Management Functionality	61
5.2.3 FCAPS	62
5.2.4 Management Functionality Within Each Level Of The Model	62
5.2.4.1 (Level 1) Device Level Functionality	62
5.2.4.2 (Level 2) Connectivity Level Functionality	62
5.2.4.3 (Level 3) Block Level Functionality	62
5.2.4.4 (Level 4) File/Record Level Functionality	62
5.2.4.5 (Level 5) Application Level Functionality	63
5.2.5 Referring To Levels And Capabilities In The Multi-level Model	63
5.2.6 Functionality Descriptions in SMI-S Profiles	63
5.3 Capabilities of This Version	63
5.3.1 Device Level	63
5.3.1.1 Fault Management	63
5.3.1.2 Configuration Management	63
5.3.1.3 Accounting Management	63
5.3.1.4 Performance Management	63
5.3.1.5 Security Management	63
5.3.2 Connectivity Level	64
5.3.2.1 Fault Management	64
5.3.2.2 Configuration Management	64

STANDARD PREVIEW

[\(standards.iteh.ai\)](https://standards.iteh.ai/)

ISO/IEC 24775:2011

<https://standards.iteh.ai/catalog/standards/sis/61268280-3aaf-405b-940a-80008090840/iso-iec-24775-2011>

5.3.2.3	Accounting Management.....	64
5.3.2.4	Performance Management.....	64
5.3.2.5	Security Management	64
5.3.3	Block Level	64
5.3.3.1	Fault Management	64
5.3.3.2	Configuration Management.....	64
5.3.3.3	Accounting Management.....	64
5.3.3.4	Performance Management.....	64
5.3.3.5	Security Management	64
5.3.4	File/Record Level.....	65
5.3.4.1	Fault Management	65
5.3.4.2	Configuration Management.....	65
5.3.4.3	Accounting Management.....	65
5.3.4.4	Performance Management.....	65
5.3.4.5	Security Management	65
5.3.5	Application Level.....	65
5.4	Operational Environment	66
5.5	Using this Specification	67
5.6	Language Bindings	67
6	Transport and Reference Model.....	68
6.1	Introduction	68
6.1.1	Overview.....	68
6.1.2	Language Requirements.....	68
6.1.3	Communications Requirements.....	68
6.1.4	XML Message Syntax and Semantics	68
6.2	Transport Stack.....	69
6.3	Reference Model.....	70
6.3.1	Overview.....	70
6.3.2	Roles for Interface Constituents	70
6.3.2.1	Client	70
6.3.2.2	Agent.....	70
6.3.2.3	CIM Server	71
6.3.2.4	Provider	71
6.3.2.5	Lock Manager.....	71
6.3.2.6	Directory Server (SLP Directory Agent)	71
6.3.3	Cascaded Agents	71
7	Object Model General Information	72
7.1	Model Overview (Key Resources).....	72
7.1.1	Overview	72
7.1.2	Introduction to CIM UML Notation	72
7.2	Techniques.....	73
7.2.1	CIM Fundamentals	73
7.2.2	Modeling Profiles	75
7.2.3	CIM Naming.....	76
7.2.4	Correlatable and Durable Names	77
7.2.4.1	Overview	77

7.2.4.2	Guidelines for SCSI Logical Unit Names.....	78
7.2.4.3	Guidelines for Port Names	78
7.2.4.4	Guidelines for Storage System Names	79
7.2.4.5	Standard Formats for Correlatable Names	79
7.2.4.6	Case Sensitivity.....	85
7.2.4.7	Testing Equality of correlatable Names.....	86
7.2.4.8	Operating System Device Names	86
7.2.4.9	iSCSI Names.....	86
7.3	Health and Fault Management.....	88
7.3.1	Objectives	88
7.3.2	Overview	88
7.3.3	Terms.....	88
7.3.4	Description of Health and Fault Management	89
7.3.4.1	Operational Status and Health State (Polling).....	89
7.3.4.2	Standard Errors and Events	90
7.3.4.3	Indications	90
7.3.4.4	Event Correlation and Fault Containment	90
7.3.4.5	Fault Regions	93
7.3.4.6	Examples.....	95
7.4	Policy.....	99
7.4.1	Objectives	99
7.4.2	Overview.....	99
7.4.3	Policy Terms.....	99
7.4.4	Policy Definition	100
7.4.4.1	Query Condition	100
7.4.4.2	Method Action	100
7.4.4.3	Query Condition Result	100
7.4.4.4	Method Action Result	100
7.4.4.5	Capabilities.....	101
7.4.5	Policy Recipes	101
7.5	Standard Messages	103
7.5.1	Overview.....	103
7.5.2	Required Characteristics of Standard Messages.....	103
7.5.2.1	Common Messages	105
7.5.2.2	Storage Messages	118
7.5.2.3	Fabric Messages	132
7.6	Recipe Overview	135
7.6.1	Recipe Definition.....	135
7.6.2	Recipe Pseudo Code Conventions	135
7.6.2.1	Overview	135
7.6.2.2	General Syntax.....	135
7.6.2.3	CIM related variable and methods	136
7.6.2.4	Data Structure	137
7.6.2.5	Operations.....	137
7.6.2.6	Control Operations	138
7.6.2.7	Functions.....	139
7.6.2.8	Exception Handling	139

7.6.2.9	Built-in Functions	139
7.6.2.10	Extrinsic method calls	141
8	Normative References	142
8.1	Introduction to Profiles	144
8.1.1	Profile Content	144
8.1.1.1	Profile Definition	144
8.1.1.2	Format for Profile Specifications	145
9	Object Model	148
9.1	Registry of Profiles and Subprofiles	148
9.2	Packages, Subprofiles and Profile	154
9.2.1	Common Profiles	154
9.2.1.1	Access Points Subprofile	154
9.2.1.2	Cascading Subprofile	159
9.2.1.3	Cluster Subprofile (DEPRECATED)	188
9.2.1.4	Device Credentials Subprofile	189
9.2.1.5	Extra Capacity Set Subprofile (DEPRECATED)	194
9.2.1.6	Health Package	195
9.2.1.7	Job Control Subprofile	203
9.2.1.8	Location Subprofile	216
9.2.1.9	Multiple Computer System Subprofile	219
9.2.1.10	Physical Package Package	231
9.2.1.11	Policy Package	238
9.2.1.12	Software Installation Service Subprofile	306
9.2.1.13	Software Package	313
9.2.1.14	Software Subprofile	316
9.2.1.15	Software Repository Subprofile	319
9.2.2	Common Target Port Subprofiles Overview	325
9.2.2.1	Parallel SCSI (SPI) Target Ports Subprofile	328
9.2.2.2	FC Target Port Subprofile	333
9.2.2.3	iSCSI Target Ports Subprofile	339
9.2.2.4	Direct Attach (DA) Port Subprofile	374
9.2.3	Common Initiator Port Subprofiles Overview	379
9.2.3.1	Parallel SCSI (SPI) Initiator Port Subprofile	381
9.2.3.2	Fibre Channel Initiator Port Subprofile	386
9.2.3.3	iSCSI Initiator Port Subprofile	393
9.2.3.4	Back End Ports Subprofile (DEPRECATED)	400
9.2.4	CIM Server Related Profiles	405
9.2.4.1	Server Profile	405
9.2.4.2	Indications Subprofile	436
9.2.4.3	Object Manager Adapter Subprofile	464
9.2.5	Security Profiles and Subprofiles	468
9.2.5.1	Security Profile	468
9.2.5.2	Authorization Subprofile	481
9.2.5.3	Security Resource Ownership Subprofile	499
9.2.5.4	Security Role Based Access Control Subprofile	516
9.2.5.5	IdentityManagement Subprofile	532

9.2.5.6	CredentialManagement Subprofile	557
9.2.5.7	3rd Party Authentication Subprofile	568
9.2.6	Fabric Topology Profiles	580
9.2.6.1	Fabric Profile	580
9.2.6.2	Enhanced Zoning Subprofile	611
9.2.6.3	Zone Control Subprofile	618
9.2.6.4	FDMI Subprofile	636
9.2.6.5	Fabric Path Performance Subprofile	649
9.2.6.6	Switch Profile.....	655
9.2.6.7	Switch Configuration Data Subprofile.....	693
9.2.6.8	Blades Subprofile	698
9.2.6.9	Extender Profile.....	704
9.2.7	Host Profiles	736
9.2.7.1	FC HBA Profile	736
9.2.7.2	iSCSI Initiator Profile	766
9.2.7.3	Host Discovered Resources Profile.....	779
9.2.7.4	SCSI Multipath Management Subprofile	792
9.2.7.5	Disk Partition Subprofile	805
9.2.8	Storage Profiles	822
9.2.8.1	Array Profile.....	822
9.2.8.2	Storage Virtualizer Profile.....	829
9.2.8.3	Volume Management Profile	838
9.2.8.4	NAS Head Profile	848
9.2.8.5	Self-Contained NAS Profile	889
9.2.8.6	Filesystem Manipulation Subprofile.....	926
9.2.8.7	File Export Manipulation Subprofile.....	963
9.2.8.8	Pool Management Policy Subprofile	994
9.2.8.9	Resource Ownership Subprofile	1014
9.2.8.10	Block Services Package.....	1022
9.2.8.11	Block Server Performance Subprofile	1091
9.2.8.12	Copy Services Subprofile	1162
9.2.8.13	Disk Drive Subprofile (DEPRECATED).....	1276
9.2.8.14	Disk Drive Lite Subprofile	1277
9.2.8.15	Disk Sparring Subprofile	1285
9.2.8.16	Extent Composition Subprofile	1303
9.2.8.17	Extent Mapping Subprofile (DEPRECATED)	1329
9.2.8.18	LUN Creation Subprofile (DEPRECATED)	1330
9.2.8.19	LUN Mapping and Masking Subprofile.....	1331
9.2.8.20	Masking and Mapping Subprofile	1332
9.2.8.21	Pool Manipulation Capabilities, and Settings Subprofile (DEPRECATED) ..	1370
9.2.8.22	Storage Library Profile.....	1371
9.2.8.23	Element Counting Subprofile.....	1388
9.2.8.24	InterLibraryPort Connection Subprofile	1394
9.2.8.25	Partitioned/Virtual Library Subprofile.....	1398
9.2.8.26	Library Capacity Subprofile	1402
9.2.8.27	LibraryAlert Events/Indications for Library Devices.....	1405
9.2.8.28	Media Movement Subprofile	1426

9.2.8.29 Limited Access Port Elements Subprofile	1432
9.3 Cross Profile Considerations.....	1439
9.3.1 Overview.....	1439
9.3.2 HBA model.....	1439
9.3.2.1 Recipes	1439
9.3.3 Switch Model	1440
9.3.3.1 Recipes	1440
9.3.4 Array Model	1445
9.3.4.1 Storage Virtualization Model	1446
9.3.5 Fabric Topology (HBA, Switch, Array)	1447
9.3.5.1 Overview	1448
9.3.5.2 Main Recipe	1448
9.3.5.3 Array paths	1457
9.3.5.4 Host Discovered Resource.....	1460
9.3.5.5 Common Initiator Port	1461
9.3.5.6 Fabric Layer	1463
9.3.5.7 IP Network Layer.....	1472
9.3.5.8 Local Disk Layer.....	1473
9.3.5.9 Logical Disk Layers	1477
9.3.5.10 Multipath Layer.....	1480
9.3.5.11 Virtualizer Layer	1481
9.3.5.12 Volume Manager Layer.....	1487
10 SMI-S Roles.....	1492
10.1 Complete reference model.....	1492
10.2 Overview	1492
10.3 SMI-S Client.....	1493
10.3.1 Overview.....	1493
10.3.2 SLP Functions	1493
10.3.3 CIM-XML Protocol Functions.....	1493
10.3.4 Security Considerations.....	1493
10.3.5 Lock Management Functions.....	1494
10.4 Dedicated SMI-S Server	1494
10.4.1 Overview.....	1494
10.4.2 SLP Functions	1494
10.4.3 CIM-XML Protocol Functions.....	1494
10.4.3.1 General.....	1494
10.4.3.2 Required Intrinsic Methods.....	1495
10.4.3.3 Required Model Support	1495
10.4.4 Security Considerations.....	1496
10.4.5 Lock Management Functions.....	1496
10.5 General Purpose SMI-S Server	1496
10.5.1 Overview.....	1496
10.5.2 SLP Functions	1496
10.5.3 CIM-XML Protocol Functions.....	1496
10.5.3.1 General.....	1496
10.5.3.2 Required Intrinsic Methods.....	1496

10.5.3.3	Required Model Support	1496
10.5.3.4	Security Considerations	1496
10.5.4	Lock Management Functions.....	1497
10.5.5	Provider Subrole	1497
10.5.5.1	Overview	1497
10.5.5.2	Required Model Support	1497
10.6	Directory Server	1497
10.6.1	SLP Functions	1497
10.6.2	CIM-XML Protocol Functions.....	1497
10.6.3	Security Considerations.....	1497
10.6.4	Lock Management Functions.....	1497
10.7	Combined Roles on a Single System.....	1497
10.7.1	Overview.....	1497
10.7.2	General Purpose SMI-S Server as a Profile Aggregator	1497
10.7.2.1	SLP Functions	1497
10.7.2.2	CIM-XML Protocol Functions	1498
10.7.2.3	Security Considerations	1498
10.7.2.4	Lock Manager Functions	1498
11	Service Discovery	1499
11.1	Objectives	1499
11.2	Overview	1499
11.3	SLP Messages.....	1501
11.4	Scopes	1502
11.5	Services Definition	1503
11.5.1	Service Type.....	1503
11.5.2	Service Attributes.....	1503
11.6	User Agents (UA).....	1505
11.7	Service Agents (SAs)	1505
11.8	Directory Agents (DAs)	1506
11.9	Service Agent Server (SA Server)	1506
11.9.1	General Information	1506
11.9.2	SA Server (SAS) Implementation	1506
11.9.3	SA Server (SAS) Clients.....	1507
11.9.3.1	Description	1507
11.9.3.2	SAS Client Requests – SA Server Responses	1507
11.9.4	SA Server Configuration	1507
11.9.4.1	Overview	1507
11.9.4.2	SLP Configuration File	1507
11.9.4.3	Programmatic Configuration.....	1508
11.9.4.4	DHCP Configuration.....	1508
11.9.4.5	Scope	1508
11.9.5	SA Server Discovery.....	1509
11.9.6	SAS Client Registration	1509
11.10	'Standard WBEM' Service Type Templates	1509
12	Bibliography	1514
13	Installation and Upgrade.....	1515
13.1	Introduction	1515

iteh STANDARD PREVIEW

(standards.iteh.ai)

ISO/IEC 24775:2011

[https://standards.iteh.ai/catalog/standards/sist/612b82e0-3aaf-405b-940a-](https://standards.iteh.ai/catalog/standards/sist/612b82e0-3aaf-405b-940a-8b0d08b96846/iso-iec-24775-2011)

[8b0d08b96846/iso-iec-24775-2011](https://standards.iteh.ai/catalog/standards/sist/612b82e0-3aaf-405b-940a-8b0d08b96846/iso-iec-24775-2011)

13.2	Role of the Administrator	1515
13.3	Goals	1515
13.3.1	Non-Disruptive Installation and De-installation	1515
13.3.2	Plug-and-Play	1515
13.4	Device Support	1516
13.4.1	Installation	1516
13.4.2	Discovery and Initialization of Device Support	1516
13.4.3	Uninstallation	1516
13.4.4	Update	1516
13.4.5	Reconfiguration	1517
13.4.6	Failure	1517
13.5	WBEM Service Support & Related Functions	1517
13.5.1	Installation	1517
13.5.2	Multiple CIM Servers on a Single Server System	1517
13.5.3	Uninstallation/Upgrade	1518
13.5.4	Reconfiguration	1518
13.5.5	Failure	1518
13.6	Client	1518
13.6.1	Uninstallation	1518
13.6.2	Reconfiguration	1518
13.7	Directory Service	1518
13.7.1	Installation	1518
13.7.2	Uninstallation/Failure	1518
13.8	Issues with Discovery Mechanisms	1518
Annex A (informative)	Mapping CIM Objects to SNMP MIB Structures	1520
A.1	Purpose of this Annex	1520
A.2	CIM-to-MIB Mapping Overview	1520
A.3	The SML MIB	1520
Annex B (normative)	Compliance with the SNIA SMI Specification	1521
B.1	Compliance Statement	1521
B.2	How Compliance Is Declared	1521
B.3	The Server Profile and Compliance	1521
B.4	Backward Compatibility	1522

List of Tables

Table 1 -	Functionality Matrix	61
Table 2 -	SLP Properties	75
Table 3 -	Standard Formats for StorageVolume Names	80
Table 4 -	Standard Formats for Port Names	81
Table 5 -	Standard Formats for Storage System Names	82
Table 6 -	Standard Operating System Names for Tape Devices	84
Table 7 -	LogicalDisk.Name for disk partitions	85
Table 8 -	GenericDiskParittion.Name for disk partitions.....	85
Table 9 -	Standard Operating System Names for Unpartitioned Disks	85
Table 10 -	OperationalStatus for Disk Drive	89
Table 11 -	Example Standard Message Declaration	104
Table 12 -	Example Standard Message Values	105
Table 13 -	Authorization Failure Message Arguments	105
Table 14 -	Authorization Failure Error Properties	106
Table 15 -	Operation Not Supported Message Arguments	106
Table 16 -	Property Not Found Message Arguments	107
Table 17 -	Invalid Query Message Arguments	107
Table 18 -	Parameter Error Message Arguments.....	108
Table 19 -	Parameter Error Properties	108
Table 20 -	Query Syntax Error Message Arguments.....	109
Table 21 -	Query Syntax Error Properties	109
Table 22 -	Query Too Expensive Message Arguments.....	109
Table 23 -	Query Too Expensive Error Properties	110
Table 24 -	Class or Property Invalid in Query Message Arguments.....	110
Table 25 -	Class or Property Invalid in Query Error Properties	110
Table 26 -	Invalid Join in Query Message Arguments.....	111
Table 27 -	Invalid Join in Query Error Properties	111
Table 28 -	Unexpected Hardware Fault Message Arguments.....	111
Table 29 -	Unexpected Hardware Fault Error Properties	111
Table 30 -	Too busy to respond Message Arguments	112
Table 31 -	Shutdown Started Message Arguments.....	112
Table 32 -	Shutdown Started Alert Information.....	112
Table 33 -	Component Overheat Message Arguments.....	113
Table 34 -	Component Overheat Error Properties.....	113
Table 35 -	Component Overheat Alert Information	113
Table 36 -	Device Failover Message Arguments.....	114
Table 37 -	Functionality is Not Licensed Message Arguments.....	114
Table 38 -	Functionality is not licensed Error Properties.....	115
Table 39 -	Invalid Property Combination During Instance Creation or Modification Message Arguments	115
Table 40 -	Invalid Property Combination during instance creation or modification Error Properties	116
Table 41 -	Property Not Found Message Arguments.....	116
Table 42 -	Property Not Found Error Properties.....	116
Table 43 -	Proxy Can Not Connect Message Arguments.....	117
Table 44 -	Proxy Can Not Connect Error Properties	117
Table 45 -	Not Enough Memory Message Arguments	117
Table 46 -	Not Enough Memory Error Properties	118
Table 47 -	Object Already Exists Error Properties.....	118
Table 48 -	Device Not ready Message Arguments.....	119
Table 49 -	Device Not ready Error Properties	119
Table 50 -	Internal Bus Error Properties.....	119
Table 51 -	DMA Overflow Error Properties.....	120
Table 52 -	Firmware Logic Error Properties	120
Table 53 -	Front End Port Error Message Arguments.....	120
Table 54 -	Front End Port Error Alert Information.....	121
Table 55 -	Back End Port Error Message Arguments	121
Table 56 -	Back End Port Error Alert Information	121
Table 57 -	Remote Mirror Error Message Arguments	122

Table 58 - Remote Mirror Error Properties.....	122
Table 59 - Remote Mirror Error Alert Information.....	122
Table 60 - Cache Memory Error Properties.....	123
Table 61 - Unable to Access Remote Device Error Properties.....	123
Table 62 - Error Reading Data Alert Information.....	124
Table 63 - Error Writing Data Alert Information.....	124
Table 64 - Error Validating Write (CRC) Alert Information.....	124
Table 65 - Copy Operation Failed Error Properties.....	125
Table 66 - RAID Operation Failed Error Properties.....	125
Table 67 - Invalid RAID Type Error Properties.....	125
Table 68 - Invalid Storage Element Type Error Properties.....	126
Table 69 - Configuration Change Failed Error Properties.....	126
Table 70 - Buffer Overrun Error Properties.....	127
Table 71 - Stolen Capacity Message Arguments.....	127
Table 72 - Stolen Capacity Error Properties.....	127
Table 73 - Invalid Extent passed Message Arguments.....	128
Table 74 - Invalid Extent passed Error Properties.....	128
Table 75 - Invalid Deletion Attempted Error Properties.....	128
Table 76 - Job Failed to Start Error Properties.....	129
Table 77 - Job was Halted Message Arguments.....	129
Table 78 - Invalid State Transition Message Arguments.....	130
Table 79 - Invalid State Transition Error Properties.....	130
Table 80 - Invalid SAP for Method Message Arguments.....	130
Table 81 - Invalid SAP for Method Error Properties.....	131
Table 82 - Resource Not Available Message Arguments.....	131
Table 83 - Resource Not Available Error Properties.....	131
Table 84 - Resource Limit Exceeded Message Arguments.....	132
Table 85 - Resource Limit Exceeded Error Properties.....	132
Table 86 - Zone Database Changed Message Arguments.....	132
Table 87 - Zone Database Changed Alert Information.....	133
Table 88 - ZoneSet Activated Message Arguments.....	133
Table 89 - ZoneSet Activated Alert Information.....	133
Table 90 - Session Locked Error Properties.....	134
Table 91 - Session Aborted Error Properties.....	134
Table 92 - Standards Dependencies for SMI-S.....	142
Table 93 - Profile Components.....	146
Table 94 - Registry of Profiles and Subprofiles.....	148
Table 95 - RemoteAccessPoint InfoFormat and AccessInfo Properties.....	155
Table 96 - CIM Server Requirements for Access Points.....	156
Table 97 - CIM Elements for Access Points.....	156
Table 98 - SMI Referenced Properties/Methods for CIM_HostedAccessPoint.....	157
Table 99 - SMI Referenced Properties/Methods for CIM_RemoteServiceAccessPoint.....	157
Table 100 - SMI Referenced Properties/Methods for CIM_SAPAvailableForElement.....	158
Table 101 - Related Standards for Access Points.....	158
Table 102 - Supported Subprofiles for Cascading.....	169
Table 103 - Extrinsic Methods Supported by Cascading Subprofile.....	169
Table 104 - Cascading Capabilities Patterns.....	172
Table 105 - CIM Server Requirements for Cascading.....	172
Table 106 - CIM Elements for Cascading.....	173
Table 107 - SMI Referenced Properties/Methods for CIM_Dependency (System Dependency).....	174
Table 108 - SMI Referenced Properties/Methods for CIM_Dependency (Object Manager Dependency).....	175
Table 109 - SMI Referenced Properties/Methods for CIM_Dependency (RegisteredProfile OM Dependency).....	175
Table 110 - SMI Referenced Properties/Methods for CIM_ElementCapabilities.....	176
Table 111 - SMI Referenced Properties/Methods for CIM_ElementConformsToProfile (Leaf).....	176
Table 112 - SMI Referenced Properties/Methods for CIM_HostedCollection (AllocatedResources).....	177
Table 113 - SMI Referenced Properties/Methods for CIM_HostedCollection (Remote Resources).....	177
Table 114 - SMI Referenced Properties/Methods for CIM_HostedService.....	178

Table 115 - SMI Referenced Properties/Methods for CIM_MemberOfCollection (Allocated Resources)	178
Table 116 - SMI Referenced Properties/Methods for CIM_MemberOfCollection (Remote Resources)	178
Table 117 - SMI Referenced Properties/Methods for CIM_Namespace (Leaf).....	179
Table 118 - SMI Referenced Properties/Methods for CIM_NamespaceInManager (Leaf).....	180
Table 119 - SMI Referenced Properties/Methods for CIM_ObjectManager (Leaf)	180
Table 120 - SMI Referenced Properties/Methods for CIM_ObjectManager (Cascading Profile)	181
Table 121 - SMI Referenced Properties/Methods for CIM_RegisteredProfile.....	181
Table 122 - SMI Referenced Properties/Methods for CIM_RemoteServiceAccessPoint.....	182
Table 123 - SMI Referenced Properties/Methods for CIM_SAPAvailableForElement.....	183
Table 124 - SMI Referenced Properties/Methods for CIM_SystemDevice	183
Table 125 - SMI Referenced Properties/Methods for SNIA_AllocatedResources.....	184
Table 126 - SMI Referenced Properties/Methods for SNIA_AllocationService	184
Table 127 - SMI Referenced Properties/Methods for SNIA_CascadingCapabilities.....	185
Table 128 - SMI Referenced Properties/Methods for SNIA_RemoteResources.....	186
Table 129 - Related Standards for Cascading	187
Table 130 - CIM Server Requirements for Device Credentials	190
Table 131 - CIM Elements for Device Credentials	190
Table 132 - SMI Referenced Properties/Methods for CIM_ElementConformsToProfile	191
Table 133 - SMI Referenced Properties/Methods for CIM_HostedService	191
Table 134 - SMI Referenced Properties/Methods for CIM_RegisteredProfile.....	191
Table 135 - SMI Referenced Properties/Methods for CIM_RegisteredSubProfile	191
Table 136 - SMI Referenced Properties/Methods for CIM_SharedSecret	192
Table 137 - SMI Referenced Properties/Methods for CIM_SharedSecretIsShared	192
Table 138 - SMI Referenced Properties/Methods for CIM_SharedSecretService	192
Table 139 - SMI Referenced Properties/Methods for CIM_SubProfileRequiresProfile	193
Table 140 - Related Standards for Device Credentials	193
Table 141 - OperationalStatus Details	197
Table 142 - CIM Server Requirements for Health	200
Table 143 - CIM Elements for Health	200
Table 144 - SMI Referenced Properties/Methods for CIM_ComputerSystem.....	201
Table 145 - SMI Referenced Properties/Methods for CIM_LogicalDevice	201
Table 146 - SMI Referenced Properties/Methods for CIM_RelatedElementCausingError.....	201
Table 147 - Related Standards for Health	202
Table 148 - OperationalStatus to Job State Mapping	205
Table 149 - Standard Message for Job Control Subprofile	206
Table 150 - CIM Server Requirements for Job Control	209
Table 151 - CIM Elements for Job Control	210
Table 152 - SMI Referenced Properties/Methods for CIM_AffectedJobElement	211
Table 153 - SMI Referenced Properties/Methods for CIM_AssociatedJobMethodResult.....	211
Table 154 - SMI Referenced Properties/Methods for CIM_ConcreteJob.....	212
Table 155 - SMI Referenced Properties/Methods for CIM_MethodResult	214
Table 156 - SMI Referenced Properties/Methods for CIM_OwningJobElement.....	215
Table 157 - Related Standards for Job Control.....	215
Table 158 - CIM Server Requirements for Location.....	217
Table 159 - CIM Elements for Location.....	217
Table 160 - SMI Referenced Properties/Methods for CIM_Location.....	217
Table 161 - SMI Referenced Properties/Methods for CIM_PhysicalElementLocation	218
Table 162 - Related Standards for Location.....	218
Table 163 - Redundancy Type	220
Table 164 - CIM Server Requirements for Multiple Computer System	226
Table 165 - CIM Elements for Multiple Computer System	227
Table 166 - SMI Referenced Properties/Methods for CIM_ComponentCS.....	228
Table 167 - SMI Referenced Properties/Methods for CIM_ComputerSystem.....	228
Table 168 - SMI Referenced Properties/Methods for CIM_ConcretelIdentity	229
Table 169 - SMI Referenced Properties/Methods for CIM_IsSpare.....	229
Table 170 - SMI Referenced Properties/Methods for CIM_MemberOfCollection.....	229
Table 171 - SMI Referenced Properties/Methods for CIM_RedundancySet.....	230
Table 172 - Related Standards for Multiple Computer System	230

Table 173 - CIM Server Requirements for Physical Package	233
Table 174 - CIM Elements for Physical Package	234
Table 175 - SMI Referenced Properties/Methods for CIM_Container	235
Table 176 - SMI Referenced Properties/Methods for CIM_PhysicalPackage	235
Table 177 - SMI Referenced Properties/Methods for CIM_Product	236
Table 178 - SMI Referenced Properties/Methods for CIM_ProductParentChild	236
Table 179 - SMI Referenced Properties/Methods for CIM_ProductPhysicalComponent	236
Table 180 - SMI Referenced Properties/Methods for CIM_SystemPackaging	237
Table 181 - Related Standards for Physical Package	237
Table 182 - Static Policy Instance Manipulation Methods	259
Table 183 - Dynamic Policy Instance Manipulation Methods	259
Table 184 - Methods that cause Instance Creation, Deletion, or Modification of Dynamic Policy Rules	259
Table 185 - SMI-S Supported PolicyCapabilities Patterns	263
Table 186 - CIM Server Requirements for Policy	263
Table 187 - CIM Elements for Policy	264
Table 188 - SMI Referenced Properties/Methods for CIM_CompoundPolicyAction (Pre-defined)	266
Table 189 - SMI Referenced Properties/Methods for CIM_CompoundPolicyAction (Client defined)	268
Table 190 - SMI Referenced Properties/Methods for CIM_CompoundPolicyCondition (Pre-defined)	270
Table 191 - SMI Referenced Properties/Methods for CIM_CompoundPolicyCondition (Client defined)	271
Table 192 - SMI Referenced Properties/Methods for CIM_ElementCapabilities	273
Table 193 - SMI Referenced Properties/Methods for CIM_MethodAction (Pre-defined)	273
Table 194 - SMI Referenced Properties/Methods for CIM_MethodAction (Client defined)	275
Table 195 - SMI Referenced Properties/Methods for CIM_PolicyActionInPolicyAction (Pre-defined)	276
Table 196 - SMI Referenced Properties/Methods for CIM_PolicyActionInPolicyAction (Client defined)	277
Table 197 - SMI Referenced Properties/Methods for CIM_PolicyActionInPolicyRule (Pre-defined)	278
Table 198 - SMI Referenced Properties/Methods for CIM_PolicyActionInPolicyRule (Client defined)	278
Table 199 - SMI Referenced Properties/Methods for CIM_PolicyConditionInPolicyCondition (Pre-defined)	279
Table 200 - SMI Referenced Properties/Methods for CIM_PolicyConditionInPolicyCondition (Client defined)	280
Table 201 - SMI Referenced Properties/Methods for CIM_PolicyConditionInPolicyRule (Pre-defined)	281
Table 202 - SMI Referenced Properties/Methods for CIM_PolicyConditionInPolicyRule (Client defined)	282
Table 203 - SMI Referenced Properties/Methods for CIM_PolicyContainerInPolicyContainer (Pre-defined)	283
Table 204 - SMI Referenced Properties/Methods for CIM_PolicyRule (Pre-defined)	284
Table 205 - SMI Referenced Properties/Methods for CIM_PolicyRule (Client defined)	287
Table 206 - SMI Referenced Properties/Methods for CIM_PolicyRuleInSystem (Pre-defined)	290
Table 207 - SMI Referenced Properties/Methods for CIM_PolicyRuleInSystem (Client defined)	290
Table 208 - SMI Referenced Properties/Methods for CIM_PolicySetAppliesToElement (Pre-defined)	291
Table 209 - SMI Referenced Properties/Methods for CIM_PolicySetAppliesToElement (Client defined)	292
Table 210 - SMI Referenced Properties/Methods for CIM_PolicySetValidityPeriod (Pre-defined)	293
Table 211 - SMI Referenced Properties/Methods for CIM_PolicySetValidityPeriod (Client defined)	293
Table 212 - SMI Referenced Properties/Methods for CIM_PolicyTimePeriodCondition (Pre-defined)	295
Table 213 - SMI Referenced Properties/Methods for CIM_PolicyTimePeriodCondition (Client defined)	298
Table 214 - SMI Referenced Properties/Methods for CIM_QueryCapabilities	299
Table 215 - SMI Referenced Properties/Methods for CIM_QueryCondition (Pre-defined)	300
Table 216 - SMI Referenced Properties/Methods for CIM_QueryCondition (Client defined)	302
Table 217 - SMI Referenced Properties/Methods for CIM_ReusablePolicy	304
Table 218 - SMI Referenced Properties/Methods for CIM_ReusablePolicyContainer	304
Table 219 - Related Standards for Policy	305
Table 220 - CIM Server Requirements for Software Installation Service	309
Table 221 - CIM Elements for Software Installation Service	310