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Foreword

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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 (see www.iso.org/directives).

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This document was prepared by SNIA (as Storage Management Technical Specification, Part 3 Common Profiles, Version 1.8.0, Revision 5) 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 second edition cancels and replaces the first edition (ISO/IEC 24775-3:2014), which has been technically revised.

The main changes compared to the previous edition are as follows:

— USAGE text was revised to address code (now included in the front matter for all SNIA specifications)

— All recipes and their references were deleted.

— Instances of subprofile were changed to profile. In the annex, instances of subprofile were changed to component profile (TSG meeting voice vote).

— Profile versions and related text were updated. (TSG meeting voice vote).

— Indications have been replaced by DMTF Indications, and all affected clauses updated. (TSG meeting voice vote).

— Instances of Experimental within profiles already labeled as Experimental were removed to avoid confusion and redundancy. (Editorial change)

— CIM/XML was changed to CIM-XML (Response to ballot comments).

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— Annex: SMI-S Information Model.

— The CIM schema version was changed to 2.51 for V1.8.0 Rev3.

— Multiple profiles (TSG-SMIS-SCR00315.001):

  — Promoted the maturity level from DRAFT to EXPERIMENTAL for these revisions: Update profiles to remove SNIA_ classes and use DMTF CIM_ classes in these profiles: Common, SAS Target Port, SB Target Ports, FC-SB-x Initiator Ports, Generic Initiator Ports, iSCSI Initiator Ports, FC Initiator Ports, SAS Initiator Ports, ATA Initiator Ports, SB Initiator Ports, FCoE Initiator Ports, Cascading, Server Profile, Experimental Indications, Proxy Server System Management, Operational Power, Indications.

— ATA Initiator Ports

  — Deprecated this experimental profile (TSG-SMIS-SCR00318).

— Backend Ports

  — Removed this obsolete and deprecated profile (TSG-SMIS-SCR00318).

— Base Server Profile

  — Changed references from DSP1011 version 1.0.1 to DSP1011 version 1.0.2.
  — Made the DMTF Computer System Profile Mandatory, since Base Server specializes the Computer.

— System profile

  — Fixed the reference to the Record Log profile.
  — Fixed the version numbers on the Related Profiles to match what the profiles claim,
  — Added the specialization information.
  — Fixed the Descriptions to the References in CIM_ComputerSystemPackage.

— Cluster Profile

  — Removed this obsolete and deprecated profile (TSG-SMIS-SCR00318).

— Cascading Profile

  — Deleted the text of this profile (was deprecated) and added a reference to the last (non-deprecated) version of this profile, in SMI-S Version 1.4.0 Revision 6.

— DA Target Ports Profile

  — Added the specialization information.
  — Made PortType Mandatory, since it is Mandatory in Generic Target Ports.

— Direct Attach (DA) Ports Profile

  — Promoted to Stable (TSG-SMIS-SCR00318).

— Extra Capacity Set

  — Removed this obsolete and deprecated profile (TSG-SMIS-SCR00318).

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— Fan Profile

  — Added the specialization information.

— FC Initiator Ports Profile

  — Promoted to Stable (TSG-SMIS-SCR00318).
  — Added back in the specialization notations.
  — Redefined CIM_FCPortStatistics to be a specialization of CIM_StatisticalData.

— FC Target Ports Profile

  — SMI Referenced Properties/Methods for CIM_FCPort Table, Row for NetworkAddresses (added): text changed to “8 unseparated upper case hex digits”.
  — Added back in the specialization notations, including the fact that the profile specializes the Generic Target Ports Profile.

— FCoE Initiator Ports Profile

  — Added back in the specialization notations.
  — Redefined CIM_FCPortStatistics to be a specialization of CIM_StatisticalData.

— FCoE Target Ports Profile

  — Moved within Part 3 to follow FC Target Ports Profile (CORE-SMIS-SCR-00084).
  — Text tweaked for FCoE, including test and figure referencing ProtocolControllerForPort (CORE-SMISSCR-00084).
  — Added back in the specialization notations, including the fact that the profile specializes the Generic Target Ports Profile.
  — Removed the CIM_LogicalPort, since the CIM_FCPort specializes it.

— Generic Initiator Ports

  — Promoted to Stable (TSG-SMIS-SCR00318).
  — Changed CIM_LogicalPortStatistics to CIM_StatisticalData to resolve specialization issues.

— Health Package

  — Promoted sections 25.1.8 (RECE) and 25.1.6 (TSG-SMIS-SCR00318).

— Indication Profile

  — Removed this obsolete and deprecated profile (TSG-SMIS-SCR00318).

— Initiator Ports profile

  — Added back in properties that were dropped.
  — Change the name of the clause to match the name of the profile.

— iSCSI Initiator Port Profile

  — Promoted to Stable (TSG-SMIS-SCR00318).
  — Removed the statement that this profile specializes the Generic Initiator Ports Profile (it does not).

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— iSCSI Target Ports Profile (SMIS-161-Errata-SCR00002)

  — Fixed typo: For CIM_ElementCapabilities, USAGE=CIM_iSCSICapabilities to System References.
  — Added the method CreateiSCSIProtocolEndpointUsingCS to CIM_iSCSIConfigurationService as optional.
  — Put in the existing methods of the service as Optional (since we never told anyone they were required).
  — Made CIM_SystemDevice (ComputerSystem to EthernetPort) conditional, since EthernetPort is Optional.
  — Fixed the reference descriptions in CIM_ConcreteDependency.
  — Fixed descriptions on the references in CIM_SAPAvailableForElement.
  — Changed the Central Class from EthernetPort to CIM_iSCSICapabilities (TSG-SMIS-SCR00333).

— Job Control Profile

  — Changed the Central Class from Service (e.g., StorageConfigurationService) to CIM_ConcreteJob (TSGSMIS-SCR00333).

— Location Profile

  — Added the Physical Package Related Profile to the spec.

— Media Access Device Profile

  — A CIM_ElementCapabilities was added to the Profile to link CIM_MediaAccessDevice to CIM_EnabledLogicalElementCapabilities.
  — Added the key property to CIM_EnabledLogicalElementCapabilities.
  — Made the DMTF Indications Profile optional, since both indications in the profile are optional.

— Miscellaneous Security Profiles

  — Removed this obsolete and deprecated profile (TSG-SMIS-SCR00318).

— MultiSystem Profile

  — SMI Referenced Properties/Methods for CIM_RedundancySet table: RedundancyStatus row revised (SMIS-160-Errata-SCR00010).
  — Changed the Central Class from ComputerSystem to CIM_ComputerSystem (Non-Top-Level System).
  — Fixed the profile versions in the Related Profiles table (TSG-SMIS-SCR00333).

— Parallel SCSI (SPI) Target Ports Profile

  — Removed per von Behren SMI-S V1.7r3 comments 2 and 3.

— Physical Package Package

  — Changed the Central Class from PhysicalPackage to CIM_PhysicalPackage (System) (TSG-SMISSCR00333).

— Power Supply Profile

  — Promoted to Stable (TSG-SMIS-SCR00318).
  — Added the Failover method to CIM_RedundancySet.

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— Profile Introduction

— Removed the statement that Packages are not advertised in the CIM Server (SMIS-180-Errata-SCR00005).

— Profile Registration

— Added clarifying statements on the direction of the CIM_ReferencedProfile association (SMIS-180-Errata-SCR00006).
— Added back in the specialization notations.
— Added the Scoping class to the SynopsisComments.

— Proxy Server System Management Profile

— Added a reference to the last version of this profile in SMI-S Version 1.6.1 Revision 5.

— Recipe Overview

— Removed this obsolete and deprecated profile (TSG-SMIS-SCR00318).

— References

— Updated some references here and within profiles, removed others (irrelevant).
— Added DMTF DSP1054 v1.2.2, Indications Profile (and changed version to 1.2.2 throughout book).
— Removed DSP0004, DSP0200, DSP0202, DSP0207.

— SAS Initiator Ports Profile

— Promoted to Stable (TSG-SMIS-SCR00318).
— Added the specialization information.
— Added a key to CIM_SASPhyStatistics.
— Fixed the references in both CIM_ElementStatisticalData CIM Elements tables.

— SAS Target Ports Profile

— Added back in the specialization notations, including the fact that the profile specializes the Generic Target Ports Profile.

— Serial Attached SCSI (SAS) Target Port Profile (LSI/NetApp and HP implementations)

— Promoted to Stable (TSG-SMIS-SCR00318).

— SATA Target Port Profile

— Deprecated this experimental profile (TSG-SMIS-SCR00318).

— SB Initiator Ports Profile

— Added back in the specialization notations, including the fact that this profile specializes the Generic Initiator Ports Profile.

— SB Target Ports Profile

— Added back in the specialization notations, including the fact that the profile specializes the Generic Target Ports Profile.

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— Added back in properties that were dropped.

— Server Profile

— Copied the 1.6.1 version of the profile into this clause and edited it as follows:
— Created a Synopsis subclause and deleted the Supported Subprofiles and Packages, and the Registered Name and Version.
— Deleted the Experimental Indications Profile from the Related Profiles table.
— Replaced the Indications Supported Profile Group with the DMTF Indications Profile.
— Deleted the CIM_CIMXMLCommunicationMechanism (in favor of using the CIM_ObjectManagerCommunicationMechanism class).
— Made CIM_ObjectManagerCommunicationMechanism Mandatory, since it now covers CIM-XML as well as WS-Man.
— Deleted the deprecated WQL indication.
— Removed deprecated properties from CIM_Namespace.
— Changed the Scoping Class from System to ObjectManager (SMIS-180-Errata-SCR00004).

— Software Inventory Profile

— Fixed the references on CIM_ElementSoftwareIdentity.
— Added TargetOSTypes to CIM_SoftwareIdentity.
— Added ResourceType to CIM_SoftwareIdentityResource.

— SPI Initiator Ports Profile

— Deprecated this experimental profile (TSG-SMIS-SCR00318).

— SPI Target Ports Profile

— Deprecated this experimental profile (TSG-SMIS-SCR00318).
— Promoted to Stable (TSG-SMIS-SCR00318).

— Storage Enclosure Profile (TSG-SMIS-SCR00328)

— Added “Specializes: DMTF Physical Asset Profile” to the Synopsis.
— Fixed the version numbers on the Related Profiles to match what the profiles claim.
— Changed references to “Base System” to be “Base Server”.
— Included the classes inherited from the DMTF Physical Asset Profile.

— Annex A (informative) SMI-S Information Mode

— Removed statement about SNIA_ classes.
— This standard is now based on DMTF’s CIM schema Version 2.51.

— Annex B Cross Profile Considerations

— Added: content moved within Part 3 to Annex B. (CORE-SMIS-SCR-00084).

A list of all parts in the ISO/IEC 24775 series can be found on the ISO website.

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.

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INTENDED AUDIENCE

This document is intended for use by individuals and companies engaged in developing, deploying, and promoting interoperable multi-vendor SANs through the Storage Networking Industry Association (SNIA) organization.

CHANGES TO THE SPECIFICATION

Each publication of this specification is uniquely identified by a three-level identifier, comprised of a version number, a release number and an update number. The current identifier for this specification is version 1.8.0. Future publications of this specification are subject to specific constraints on the scope of change that is permissible from one publication to the next and the degree of interoperability and backward compatibility that should be assumed between products designed to different publications of this standard. The SNIA has defined three levels of change to a specification:

- Major Revision: A major revision of the specification represents a substantial change to the underlying scope or architecture of the SMI-S API. A major revision results in an increase in the version number of the version identifier (e.g., from version 1.x.x to version 2.x.x). There is no assurance of interoperability or backward compatibility between releases with different version numbers.

- Minor Revision: A minor revision of the specification represents a technical change to existing content or an adjustment to the scope of the SMI-S API. A minor revision results in an increase in the release number of the specification's identifier (e.g., from x.1.x to x.2.x). Minor revisions with the same version number preserve interoperability and backward compatibility.

- Update: An update to the specification is limited to minor corrections or clarifications of existing specification content. An update will result in an increase in the third component of the release identifier (e.g., from x.x.1 to x.x.2). Updates with the same version and minor release levels preserve interoperability and backward compatibility.

TYPOGRAPHICAL CONVENTIONS

Maturity Level

In addition to informative and normative content, this specification includes guidance about the maturity of emerging material that has completed a rigorous design review but has limited implementation in commercial products. This material is clearly delineated as described in the following sections. The typographical convention is intended to provide a sense of the maturity of the affected material, without altering its normative content. By recognizing the relative maturity of different sections of the standard, an implementer should be able to make more informed decisions about the adoption and deployment of different portions of the standard in a commercial product.

This specification has been structured to convey both the formal requirements and assumptions of the SMI-S API and its emerging implementation and deployment lifecycle. Over time, the intent is that all content in the specification will represent a mature and stable design, be verified by extensive implementation experience, assure consistent support for backward compatibility, and rely solely on content material that has reached a similar level of maturity. Unless explicitly labeled with one of the subordinate maturity levels defined for this specification, content is assumed to satisfy these requirements and is referred to as "Finalized". Since much of the evolving specification

content in any given release will not have matured to that level, this specification defines three subordinate levels of implementation maturity that identify important aspects of the content's increasing maturity and stability. Each subordinate maturity level is defined by its level of implementation experience, its stability and its reliance on other emerging standards. Each subordinate maturity level is identified by a unique typographical tagging convention that clearly distinguishes content at one maturity model from content at another level.

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Experimental Maturity Level

No material is included in this document unless its initial architecture has been completed and reviewed. Some content included in this document has complete and reviewed design, but lacks implementation experience and the maturity gained through implementation experience. This content is included in order to gain wider review and to gain implementation experience. This material is referred to as “Experimental”. It is presented here as an aid to implementers who are interested in likely future developments within the SMI specification. The contents of an Experimental profile may change as implementation experience is gained. There is a high likelihood that the changed content will be included in an upcoming revision of the specification. Experimental material can advance to a higher maturity level as soon as implementations are available. Figure 1 is a sample of the typographical convention for Experimental content.

EXPERIMENTAL

Experimental content appears here.

EXPERIMENTAL

Figure 1 - Experimental Maturity Level Tag

Implemented Maturity Level

Profiles for which initial implementations have been completed are classified as “Implemented”. This indicates that at least two different vendors have implemented the profile, including at least one provider implementation. At this maturity level, the underlying architecture and modeling are stable, and changes in future revisions will be limited to the correction of deficiencies identified through additional implementation experience. Should the material become obsolete in the future, it must be deprecated in a minor revision of the specification prior to its removal from subsequent releases. Figure 2 is a sample of the typographical convention for Implemented content.

IMPLEMENTED

Implemented content appears here.

IMPLEMENTED

Figure 2 - Implemented Maturity Level Tag

Stable Maturity Level

Once content at the Implemented maturity level has garnered additional implementation experience, it can be tagged at the Stable maturity level. Material at this maturity level has been implemented by three different vendors, including both a provider and a client. Should material that has reached this maturity level become obsolete, it may only be deprecated as part of a minor revision to the specification. Material at this maturity level that has been deprecated may only be removed from the specification as part of a major revision. A profile that has reached this maturity level is guaranteed to preserve backward compatibility from one minor specification revision to the next. As a result, Profiles at or above the Stable

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maturity level shall not rely on any content that is Experimental. Figure 3 is a sample of the typographical convention for Implemented content.

STABLE

Stable content appears here.

STABLE

Figure 3 - Stable Maturity Level Tag

Finalized Maturity Level

Content that has reached the highest maturity level is referred to as “Finalized.” In addition to satisfying the requirements for the Stable maturity level, content at the Finalized maturity level must solely depend upon or refine material that has also reached the Finalized level. If specification content depends upon material that is not under the control of the SNIA, and therefore not subject to its maturity level definitions, then the external content is evaluated by the SNIA to assure that it has achieved a comparable level of completion, stability, and implementation experience. Should material that has reached this maturity level become obsolete, it may only be deprecated as part of a major revision to the specification. A profile that has reached this maturity level is guaranteed to preserve backward compatibility from one minor specification revision to the next. Over time, it is hoped that all specification content will attain this maturity level. Accordingly, there is no special typographical convention, as there is with the other, subordinate maturity levels. Unless content in the specification is marked with one of the typographical conventions defined for the subordinate maturity levels, it should be assumed to have reached the Finalized maturity level.

Deprecated Material

Non-Experimental material can be deprecated in a subsequent revision of the specification. Sections identified as “Deprecated” contain material that is obsolete and not recommended for use in new development efforts. Existing and new implementations may still use this material, but shall move to the newer approach as soon as possible. The maturity level of the material being deprecated determines how long it will continue to appear in the specification. Implemented content shall be retained at least until the next revision of the specialization, while Stable and Finalized material shall be retained until the next major revision of the specification. Providers shall implement the deprecated elements as long as it appears in the specification in order to achieve backward compatibility. Clients may rely on deprecated elements, but are encouraged to use non-deprecated alternatives when possible.

Deprecated sections are documented with a reference to the last published version to include the deprecated section as normative material and to the section in the current specification with the replacement. Figure 4 contains a sample of the typographical convention for deprecated content.

DEPRECATED

Content that has been deprecated appears here.

DEPRECATED

Figure 4 - Deprecated Tag

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FOREWORD

The Storage Management Technical Specification is published in several parts. *Storage Management Technical Specification, Part 3 Common Profiles, 1.8.0 Rev 4* defines profiles that are used by profiles in other parts of this standard. In general, the common profiles do not fully define storage elements, but define non-storage management aspects that are common to storage domains. For example, the Access Points Profile defines a technique that the arrays, switches, or libraries may use to inform clients of non-CIM network interfaces that are available.

Some of the common profiles are based on DMTF profiles. For these profiles, the DMTF profile may be "specialized" to assure SNIA requirements are met.

Parts of this Standard

This standard is subdivided in the following parts:

- *Storage Management Technical Specification, Part 1 Overview, 1.8.0 Rev 4*
- *Storage Management Technical Specification, Part 2 Common Architecture, 1.8.0 Rev 4*
- *Storage Management Technical Specification, Part 3 Common Profiles, 1.8.0 Rev 4*
- *Storage Management Technical Specification, Part 4 Block Devices, 1.8.0 Rev 4*
- *Storage Management Technical Specification, Part 5 Filesystems, 1.8.0 Rev 4*
- *Storage Management Technical Specification, Part 6 Fabric, 1.8.0 Rev 4*
- *Storage Management Technical Specification, Part 7 Host Elements, 1.8.0 Rev 4*
- *Storage Management Technical Specification, Part 8 Media Libraries, 1.8.0 Rev 4*

SNIA Web Site

Current SNIA practice is to make updates and other information available through their web site at http://www.snia.org

SNIA Address

Requests for interpretation, suggestions for improvement and addenda, or defect reports are welcome. They should be sent via the SNIA Feedback Portal at http://www.snia.org/feedback/ or by mail to the Storage Networking Industry Association, 4360 ArrowsWest Drive, Colorado Springs, Colorado 80907, U.S.A.

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1 Scope

Storage Management Technical Specification, Part 3 Common Profiles, 1.8.0 Rev 4 defines profiles that are supported by profiles defined in the other parts of this standard. The first few clauses provide background material that helps explain the purpose and profiles. Common port profiles are grouped together since they serve as transport-specific variations of a common model. The port profiles are followed by other common profiles.

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2 Normative References

The following referenced documents are indispensable for the application 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.

2.1 Approved References

ISO/IEC 14776-413, SCSI Architecture Model - 3 (SAM-3) [ANSI INCITS 402-200x]

ISO/IEC 14776-452, SCSI Primary Commands - 3 (SPC-3) [ANSI INCITS.351-2005]

ANSI/INCITS 374:2003, Information technology - Fibre Channel Single - Byte Command Set-3 (FC-SB-3)

2.2 DMTF References (Final)

DMTF Final documents are accepted as standards.

DMTF DSP1001 Management Profile Specification Usage Guide 1.2.0
http://www.dmtf.org/sites/default/files/standards/documents/DSP1001_1.2.0.pdf

DMTF DSP1004 Base Server Profile 1.0.1
http://www.dmtf.org/sites/default/files/standards/documents/DSP1004_1.0.1.pdf

DMTF DSP1009 Sensors Profile, 1.1.1
http://www.dmtf.org/sites/default/files/standards/documents/DSP1009_1.1.1.pdf

DMTF DSP1011 Physical Asset Profile 1.0.2
http://www.dmtf.org/standards/published_documents/DSP1011_1.0.2.pdf

DMTF DSP1013, Fan Profile 1.0.1
http://www.dmtf.org/standards/published_documents/DSP1013_1.0.1.pdf

DMTF DSP1015 Power Supply Profile 1.1.0
http://www.dmtf.org/standards/published_documents/DSP1015_1.1.0.pdf

DMTF DSP1025 Software Update Profile 1.0.0
http://www.dmtf.org/standards/published_documents/DSP1025_1.0.0.pdf

DMTF DSP1033 Profile Registration Profile 1.1.0
http://www.dmtf.org/sites/default/files/standards/documents/DSP1033_1.1.0.pdf

DMTF DPS1052 Computer System Profile 1.0.3
http://www.dmtf.org/sites/default/files/standards/documents/DSP1052_1.0.3.pdf

DMTF DSP1054 Indications Profile 1.2.2
http://www.dmtf.org/sites/default/files/standards/documents/DSP1054_1.2.2.pdf

DMTF DSP1092:2013, WBEM Server Profile 1.0
http://www.dmtf.org/standards/published_documents/DSP1092_1.0.pdf

DMTF DSP1102 Launch in Context Profile 1.0.0
www.dmtf.org/sites/default/files/standards/documents/DSP1102_1.0.0_0.pdf

DMTF DSP1103 Job Control Profile v1.0.0
http://www.dmtf.org/sites/default/files/standards/documents/DSP1103_1.0.0_0.pdf

2.3 References under development

DMTF DSP1119, Diagnostics Job Control Profile v1.0.0b
http://www.dmtf.org/sites/default/files/standards/documents/DSP1119_1.0.0b.pdf

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Storage Management Technical Specification, Part 2 Common Architecture, 1.8.0 Rev 4

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3 Terms and Definitions

3.1 General

For the purposes of this document, the definitions, symbols, abbreviations, and conventions given in *Storage Management Technical Specification, Part 2 Common Architecture, 1.8.0 Rev 4* and the following apply.

3.2 Terms

3.2.1
FC-SB-X
Fibre Channel Single-Byte command set used in FICON™[1] devices

3.2.2
SAS
Serial Attached SCSI

3.2.3
SATA
Serial ATA

1.FICON™ is an example of a suitable product available commercially. This information is given for the convenience of users of this standard and does not constitute an endorsement of this product by SNIA or any standards organization.

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