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Part 4: Block devices

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Foreword

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This document was prepared by SNIA (as Storage Management Technical Specification, Part 4 Block Devices, 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 24775-4:2014), 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— Indications have been replaced by DMTF Indications, and all affected clauses updated.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.

— TSG-SMIS-SCR00315.001

— Promoted the maturity level from DRAFT to EXPERIMENTAL for these revisions that update profiles to remove SNIA_ classes and use DMTF CIM_ classes in these profiles: Array, Block Services Package, Block Storage Views, CKD Block Services, Disk Drive Lite, Sparing, Erasure, Extent Composition, Masking and Mapping, Storage Server Asymmetry, Storage Virtualizer, Storage Element Protection, Replication Services, Pools from Volumes, Group Masking and Mapping, Storage Relocation, Thin Provisioning. Registry of Storage Extent Discriminators.

— TSG-SMIS-SCR00316.001

— Promoted the changes from Draft to Experimental in SMI-S 1.7.0 for these revisions: Add additional alerts for CIM/ block and file classes in these profiles: Array, Block Services Package, Replication Services.

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

— Array Profile (SMIS-170-Draft-SCR00004)

— Added additional Mandatory Indication Filters to track modification of OperationalStatus and ElementName for the top-level CS.
— Fixes required for SCR00316 to resolve duplicate use of standard messagesArray Profile.
— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Fixed the version reference in the CIM Elements table for CIM_ComputerSystem (Top Level System) to match the version defined by the Array Profile.
— Changed the Requirement for CIM_SystemDevice (System to SCSIProtocolController) to Conditional (from Mandatory), since the SCSIProtocolController is Conditional.
— Made the Requirement for OtherIdentifyingInfo and IdentifyingDescriptions in CIM_ComputerSystem (Top Level System) Mandatory to maintain backward compatibility with 1.6.1.

— Automated Storage Tiering Profile

— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Changed “DeleteOnEmptyElement” to “DeleteOnEmptyStorageTier” in CIM_StorageTier and CIM_TierSettingData to match the mof.

— Automated Storage Tiering Policy Profile

— Propagated the Automated Storage Tiering changes to the Automated Storage Tiering Policy Profile.
— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.

— Block Server Performance Profile (SMIS-170-Draft-SCR00001.001):

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— Added support for Advanced Metrics.
— Updated and promoted the SNIA classes to CIM Classes.
— Made a minor adjustment to discovery of Rated Data.
— Marked the rated data properties experimental.
— Cleaned up references to Volume Management, which has been deprecated.
— In Summary of Statistics Support by Element table, revised legend for ReadIOTimeCounter and WriteIOTimeCounter for Top Level Computer System to be Optional (comments to SCR# SMIS-170-Draft-SCR00001).
— Promoted Draft material to Experimental (SMIS-170-EXPERIMENTAL-SCR00001).
— Corrected QueryStatisticalCollection to QueryStatisticsCollection.
— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Promoted "Advanced Metrics" from Draft to Experimental.
— Added the GetRateStatisticsCollection() method to the CIM Elements table for CIM_BlockStatisticsService as defined in the text of the profile.

— Block Services Package

— Added a new condition for keeping OperationalStatus on storage pools (SMIS-170-Draft-SCR00003).
— Added additional Mandatory Indication Filters for Storage Pools, Storage Volumes and Logical Disks to track size and name changes (SMIS-170-Draft-SCR00004).
— Added Alert indications from TP (SMIS-170-Draft-SCR00004).
— Removed Experimental qualifier and dependency on Experimental Indications (SMIS-170-Draft- SCR00004).
— AlertIndication DRM30 was marked as Mandatory (SMIS-170-Draft-SCR00004).
— Removed RECIPE entry for unused recipe SMI_BlockServices_ExpandStorageElement (SMIS-150- Errata-SCR00061).
— Promoted to experimental a new condition for keeping OperationalStatus on storage pools and updated the health section to reflect new OperationalStatus encodings (SMIS-170-Draft-SCR00003).
— Promoted several sections to Stable (DRM-SMIS-SCR00254).
— Added footnote to Table 15.
— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Added Storage Pool Diagnostics in the Related Profiles table.
— Changed the property AvailableFormFactor to AvailableFormFactorType in CIM_StorageCapabilities to match the mof.
— Deleted the AvailablePortType property from CIM_StorageCapabilities since it is not in the mof (it was replaced by AvailableInterconnectType).
— Added SupportedCompressionElements property to CIM_StorageCapabilities (completes TEMP00001.001).
— Changed the property FormFactor to FormFactorType in CIM_StorageSetting to match the mof.

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— In CIM_StorageConfigurationCapabilities (Concrete) the enumeration values were extended for SupportedSynchronousActions. SupportedAsynchronousActions and SupportedStorageElementFeatures to match the text of the profile (and the mof).
— In CIM_StorageConfigurationCapabilities (Global and Primordial) the enumeration values were extended for SupportedStorageElementFeatures to match the text of the profile (and the mof).
— Added the CreateOrModifyAnyElementFromStoragePool() method to CIM_StorageConfigurationService to match the text of the profile.
— Added CompressionActive, CompressionPercent, CompressionRate, CompressionState, DedupActive and DedupPercent to the CIM Element tables for CIM_StoragePool (all variations).
— Promoted DedupActive and DedupPercent from Draft to Experimental in CIM_StoragePool (all variations).
— Changed the Central Class from StorageConfigurationService to CIM_StoragePool (Primordial) (TSGSMIS-SCR00333).
— Changed the property EncryptionSupported to Encryption in CIM_StorageCapabilities (SMIS-180-Errata-SCR00001).
— Removed the property SupportedCompressionElements from CIM_StorageCapabilities (SMIS-180-Errata-SCR00001).

— Block Services Resource Ownership Profile

— Added reference to SMI-S Version 1.4 Revision 6.

— Block Services with Thin Provisioning (SMIS-170-Draft-SCR00004)

— Added mandatory indications

— Block Storage Views Profile

— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Changed the Related Profile reference to Copy Services to be Replication Services, since Copy Services was deprecated in favor of Replication Services.
— Deleted an extra DDLocationIndicator entry from the CIM_DiskDriveView CIM Elements table.

— CKD Block Services Profile

— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Propagated the Block Services Package changes to the CKD Block Services Profile.
— Changed the Central Class from StoragePool to CIM_StoragePool (Primordial) (TSG-SMIS-SCR00333).
— Changed the property EncryptionSupported to Encryption in CIM_StorageCapabilities (SMIS-180-Errata-SCR00001).
— Removed the property SupportedCompressionElements from CIM_StorageCapabilities (SMIS-180-Errata-SCR00001).

— Copy Services Profile

— Marked as Deperecated (DRM-SMIS-SCR-00253.001).

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— Disk Drive Profile

— Removed this obsolete and already deprecated clause (DRM-SMIS-SCR00254).

— Disk Drive Lite (SMIS-170-Draft-SCR00004)

— Added additional Mandatory Indication Filter to track modification of OperationalStatus.

— Disk Drive Lite Profile

— Changed the references to “Disk Drive Light” to “Disk Drive Lite” in the Synopsis.
— Added DiskType, FormFactor and Encryption properties to the CIM_DiskDrive CIM Elements table to match the text of the profile.

— Disk Sparing Profile

— Removed the Draft “ExtentDiscriminator” property from CIM_LogicalDisk, CIM_StorageVolume and
CIM_StorageExtent.
— Changed the Central Class from ComputerSystem to CIM_StorageRedundancySet (TSG-SMISSCR00333).

— Erasure Profile

— Added conditional requirements for the conditions for implementing CIM_LogicalDisk and CIM_StorageVolume.
— Changed ErasureSetting to StorageErasureSetting, ErasureService to StorageErasureService ErasureCapabilities to StorageErasureCapabilities.

— Extent Composition Profile

— Changed the version of the profile to be 1.7.0 due to indication classes removed in 1.7.0.
—. Added footnotes to Table 292.

— Extent Mapping Profile

— Removed this obsolete and already deprecated clause (DRM-SMIS-SCR00254)

— Group Masking and Mapping Profile

— Propagated the Masking and Mapping changes to the Group Masking and Mapping Profile.
— Added MoveMembers and CreateOrModifyMaskingGroup to the CIM Element table for CIM_GroupMaskingMappingService.
— Removed the property GetMaskingGroupOperationOrder and the method GetSupportedGroupMaximums from the CIM Elements table for CIM_GroupMaskingMappingCapabilities, since they are not in the mof and not referenced anywhere in the profile text.
— Made Alert Indication mandatory (SMIS-170-Draft-SCR00004).
— Promoted to Stable (DRM-SMIS-SCR00254.000).

— LUN Creation Profile

— Removed this obsolete and already deprecated clause (DRM-SMIS-SCR00254).

— LUN Mapping and Masking Profile

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— Removed this obsolete and already deprecated clause (DRM-SMIS-SCR00254).

— Masking and Mapping Profile

— Added CIM_SystemDevice between the ProtocolController and its scoping system.
— Added SupportedAsynchronousActions and SupportedSynchronousActions to the CIM Elements table for CIM_ProtocolControllerMaskingCapabilities.
— Changed the version of the profile to be 1.8.0 due the aforementioned changes.
— Added additional Mandatory Indication Filter to track modification of masking objects StorageHardwareID, SAPAvailableForElement (SMIS-170-Draft-SCR00004).
— Added alert if the Masking View changes(SMIS-170-Draft-SCR00004).
— Added element and element desciprtion: 14.6.1 CIM_AssociatedPrivilege (TSG meeting voice vote).

— Pools from Volumes Profile

— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.

— Pool Manipulation Capabilities, and Settings Profile

— Removed this obsolete and already deprecated clause (DRM-SMIS-SCR00254).

— Replication Services Profile

— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Removed the Condition for semi-fixed filter support, since the class has been deleted from the spec and made adjustments to the conditions defined on it.
— Changed the method name GetReplicationRelationshipInstance to GetReplicationRelationshipInstances in the CIM Elements table for CIM_ReplicationService.
— Made CIM_AllocatedResources and its CIM_HostedCollection Conditional on the "Remote" condition.
— In CIM_SAPAvailableForFileShare changed the "FileShare" reference to be "ManagedElement" to match the mof.
— In CIM_SettingsAffectSettings changed the " ManagedElement " reference to be "Dependent" and
changed the "SettingData" reference to be "Antecedent" to match the mof.
— Promoted to Implemented (DRM-SMIS-SCR00253).
— Made InstDeletion of StorageSynchronized mandatory(SMIS-170-Draft-SCR00004).

— Storage Element Protection Profile

— Changed all references to CIM_ElementProtectionSettingData to CIM_ElementStorageProtectionSettingData.
— Added Keys to StorageProtectionCapabilities, StorageProtectionService and StorageProtectionSettings.
— Changed the version of the profile to be 1.8.0 due to the aforementioned changes

— Storage Pool Diagnostics Profile

— Edited the profile to remove experimental indication classes and filter collections.
— Added propagation information for the specialization of the DMTF Diagnostics Profile.

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— Changed the references in CIM_ElementDiagnostics to be Antecedent and Dependent to match the mof.
— Changed the property name of TestType to TestTypes in CIM_StoragePoolDiagnosticTest to match the mof.
— Changed the property name of OtherStoragePoolTestTypeDescription to OtherStoragePoolTestType in CIM_StoragePoolDiagnosticTest to match the mof.
— Fixed the information on CIM_ServiceAffectsElement to replace reference to port controllers to storage pools.
— Changed the version to 1.8.0 because it will rely on CIM 2.51.
— Added a new profile to cover diagnostic tests on storage pools (SMIS-170-Draft-SCR00003).
— Promoted to experimental the new profile to cover diagnostic tests on storage pools (SMIS-170-DraftSCR00003.002).
— Table 671: corrected Version column for Diagnostic Job Control to be 1.0.0b.
— Table 683: Changed DIAG2 to DIAG0.

— Storage Relocation Profile

— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.

— Storage Server Asymmetry Profile

— Added a class table for CIM_StorageResourceLoadGroup.
— Added keys to the class tables for CIM_StorageServerAsymmetryCapabilities and CIM_TargetPortGroup.
— Added a related profile for the Multiple Computer System profile (TSG-SMIS-SCR00332).
— Changed Central Class to CIM_StorageServerAsymmetryCapabilities since it is defined in the profile.
(TSG-SMIS-SCR00332).

— Storage Virtualizer Profile

— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Changed the related profile group for initiators to be optional (to be consistent with 1.6.1).
— Clarified the possible values for Dedicated in the Top Level System and Shadow systems.
— Changed the version of the profile to be 1.8.0 (since a mof was added to 2.51 to support the profile).
— Removed reference to Cascaing Profile, which has been removed.
— Revised Figure 96: Storage Virtualizer System Instance to remove ProtocolControllerForPort and
reference to SPC (TSG meeting voice vote).

— Thin Provisioning Profile

— Propagated the Block Services Package changes to the Thin Provisioning Profile.
— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Added Storage Pool Diagnostics to the Supported Profile List.

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— Changed the Central Class from StorageConfigurationService to CIM_StoragePool (Primordial) (TSGSMIS-SCR00333).
— Changed the property EncryptionSupported to Encryption in CIM_StorageCapabilities (SMIS-180-
Errata-SCR00001).
— Removed the property SupportedCompressionElements from CIM_StorageCapabilities (SMIS-180-
Errata-SCR00001).
— Promoted to Stable (DRM-SMIS-SCR00254).
— AlertIndication DRM30 was marked as Mandatory (SMIS-170-Draft-SCR00004).

— Volume Composition Profile

— Fixed versions numbers in the Related Profiles table to match the version identified for the related profiles.
— Extended the enumeration values for SupportedStorageElements in CIM_StorageElementCompositionCapabilities.
— Changed GetSupportedCompositeStripeDepths and GetSupportedCompositeStripeDepthRange to GetSupportedStripeDepths and GetSupportedStripeDepthRange to match the mof.
— Addded GetSupportedStripeLengths and GetSupportedStripeLengthRange to CIM_StorageElementCompositionService.
— Added CreateOrModifyCompositeElementFromStoragePool to CIM_StorageElementCompositionService.
— Changed the version of the profile to be 1.8.0 due to the aforementioned changes.
— Changed the Central Class from StorageVolume to CIM_StorageElementCompositionService (TSGSMIS-SCR00333).

— Volume Management Profile

— Added reference to SMI-S Version 1.6.1 in deprecated Volume Management Profile.

— Annex A (informative) SMI-S Information Mode

— Removed statement about SNIA_ classes.

— References

— Updated and added references.
— Added DMTF v1.2.2, Indications Profile (and changed references to V1.2.2 throughout book).
— Removed irrelevant references: DSP0207, DSP0207.
— Added reference to DMTF DSP1102 Launch in Context Profile 1.0.0.

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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 Block Devices part of the *Storage Management Technical Specification* contains the profiles for devices that serve block storage. These devices include RAID arrays, Storage Virtualizers, host volume managers, and disk drives. This part also contains supporting profiles, such as the Block Services package.

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

This Technical Specification defines an interface for the secure, extensible, and interoperable management of a distributed and heterogeneous storage system. This interface uses an object-oriented, XML-based, messaging-based protocol designed to support the specific requirements of managing devices and subsystems in this storage environment. Using this protocol, this Technical Specification describes the information available to a WBEM Client from an SMI-S compliant WBEM Server.

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2 Normative References

2.1 Overview

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.

2.2 Approved references

INCITS 514-2014, Information Technology - SCSI Block Commands - 3 (SBC-3)
http://webstore.ansi.org/RecordDetail.aspx?sku=INCITS+514-2014

2.3 References under development

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

DMTF DSP1119 Diagnostics Job Control Profile 1.0.0b
http://www.dmtf.org/sites/default/files/standards/documents/DSP1119_1.0.0b.pdf

DMTF DSP1113 Disk Drive Diagnostics Profile 1.1.0a
http://www.dmtf.org/sites/default/files/standards/documents/DSP1113_1.1.0a.pdf

DMTF DSP1002 Diagnostics Profile 2.1.0a
http://www.dmtf.org/sites/default/files/standards/documents/DSP1002_2.1.0a.pdf

2.4 Other references

DMTF DSP1052 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 DSP1010 Record Log Profile 2.0.0
http://www.dmtf.org/sites/default/files/standards/documents/DSP1010_2.0.0.pdf

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

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

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3 Terms, Definitions, Symbols, Abbreviations, and Conventions

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

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4 Array Profile

4.1 Description

4.1.1 Synopsis

Profile Name: Array (Autonomous Profile)

Version: 1.7.0

Organization: SNIA

Central Class: ComputerSystem

Scoping Class: ComputerSystem

Table 1 describes the related profiles for Array.

Table 1 - Supported Profiles for Array

Profile Name	Organization	Version	Requirement	Description
Access Points	SNIA	1.3.0	Optional	
Block Server Performance	SNIA	1.7.0	Optional	
Disk Drive Lite	SNIA	1.7.0	Optional	
Extent Composition	SNIA	1.7.0	Optional	
Location	SNIA	1.4.0	Optional	
Software	SNIA	1.4.0	Optional	
Copy Services	SNIA	1.5.0	Optional	Deprecated. Use Replication Services.
Device Credentials	SNIA	1.3.0	Optional	
Masking and Mapping	SNIA	1.8.0	Optional	
Group Masking and Mapping	SNIA	1.8.0	Optional	
Disk Sparing	SNIA	1.7.0	Optional	
Block Services	SNIA	1.8.0	Mandatory	
CKD Block Services	SNIA	1.7.0	Optional	Experimental.
Physical Package	SNIA	1.5.0	Mandatory	
Health	SNIA	1.2.0	Mandatory	
Multiple Computer System	SNIA	1.2.0	Optional	
Block Storage Views	SNIA	1.7.0	Optional	Experimental.
Volume Composition	SNIA	1.8.0	Optional	Experimental.
Job Control	SNIA	1.5.0	Optional	
Storage Element Protection	SNIA	1.7.0	Optional	Experimental.
Storage Server Asymmetry	SNIA	1.7.0	Optional	Experimental.

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Table 1 - Supported Profiles for Array

Profile Name	Organization	Version	Requirement	Description
Erasure	SNIA	1.7.0	Optional	Experimental.
Thin Provisioning	SNIA	1.7.0	Optional	
Replication Services	SNIA	1.8.0	Optional	
Pools from Volumes	SNIA	1.7.0	Optional	Experimental.
Automated Storage Tiering	SNIA	1.7.0	Optional	Experimental.
Automated Storage Tiering Policy	SNIA	1.7.0	Optional	Experimental.
Operational Power	SNIA	1.7.0	Optional	Experimental.
Launch In Context	DMTF	1.0.0	Optional	Experimental. See DSP1102, version 1.0.0
FC Target Ports	SNIA	1.7.0	Support for at least one is mandatory.	
iSCSI Target Ports	SNIA	1.8.0		
SAS Target Ports	SNIA	1.7.0		
SB Target Ports	SNIA	1.7.0		Experimental.
FCoE Target Ports	SNIA	1.7.0		Experimental.
FC Initiator Ports	SNIA	1.7.0	Optional	
FCoE Initiator Ports	SNIA	1.7.0		Experimental.
iSCSI Initiator Ports	SNIA	1.2.0		
SB Initiator Ports	SNIA	1.7.0		Experimental.
SAS Initiator Ports	SNIA	1.7.0		
Indications	DMTF	1.2.2	Mandatory	See DSP1054, version 1.2.2

4.1.2 Overview

The Array Profile describes RAID array systems. The RAID systems supported by this profile are standalone and use local disks to store the data. Systems that use external storage or a combination of local and external storage are “Storage Virtualizers”. Systems that plug into backplanes or are on mother boards should use 8 Host Hardware RAID Controller Profile in *Storage Management Technical Specification, Part 7 Host Elements, 1.8.0 Rev 4*.

The model consists of multiple component profiles and packages. The main component profiles are:

- The Array Profile contains a CIM_ComputerSystems object that represents the array as a whole. It is the top level object for the profile.
- Block Services Package is the main part of the model. It contains the StorageExtents that represent the physical storage, StoragePools that gather together the extents and supports allocation and QoS (Quality of Service) settings, and StorageVolmes that represent the logical devices allocated from the pools.
- Target Ports component profile model the ports (e.g., Fibre Channel or iSCSI) through which the LUNs are made available to hosts.

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