

SMI Program Report

June 2010



Please Forward Within Your Organization

The SNIA Storage Management Initiative (SMI, www.snia.org/smi/) exists to unify the storage industry on an extensible, interoperable, open, and highly functional interface for storage management. The SMI brings together the resources of the SNIA to deliver this interface, called the *SMI Specification* or *SMI-S*.

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What's new in SMI-S? by Mike Walker

The SMI is frequently asked “What’s new in SMI-S?” The answer often depends on how the question is framed. For example, quantitatively, the spec grew 27% from SMI-S 1.1 to SMI-S 1.2. By the time SMI-S 1.5 was released, the spec had grown by 84%! Impressive—perhaps, but in this context these numbers simply represent page count. Furthermore, generating more pages does not necessarily translate into an equivalent amount of new content. Framing the same question from a “qualitative” perspective would yield a more interesting and useful answer.

Another example of where proper framing is helpful is when trying to understand the relationship between vendor participation in the SNIA Conformance Test Program (CTP) and SMI-S activity. At first glance an outside observer might conclude that vendors are “testing” less because not much has changed in the spec since the release of SMI-S 1.1. Quantitatively speaking, this assessment might make sense, but it would be inaccurate because CTP participation is not driven by testing the cumulative changes in the spec. It is, however, driven by conformance tests that reflect *improvements* to the specification (spec tightening) and *improvements* to the CTP tests.

What's new in the Standard

From a specification development point of view, although there have been many new profiles introduced since SMI-S 1.1, the majority were component profiles, which are optional functions. The number of autonomous profiles (main profiles for devices) has not grown that much. There were no new autonomous profiles in 1.2, only two new autonomous profiles in 1.3 (Base Server and Virtual Tape Library), and only one in 1.4 (Partitioned Tape Library).

Most of the action in SMI-S has been in new component profiles and improvements to existing profiles. Some of the noteworthy enhancements have been View Classes in Arrays to aid scalability and Volume Composition for constructing volumes from other volumes introduced in SMI-S 1.2. In V1.3, most of the implementation on the release was focused on enhancements to existing profiles (e.g., identifying configuration capabilities by StoragePool), although View Classes were introduced as an optional component profile of Fabric (for scalability of fabric discovery).

In SMI-S 1.4, two of the noteworthy enhancements were Thin Provisioning (where storage is not actually provisioned until it is written) and Replication Services (including remote copy and copy groups). For a more comprehensive list of enhancements in SMI-S 1.4, SNIA members can refer to [SMI-S-14.pdf](#) on SMI-S Central.

Work on the standard is continuing in SMI-S 1.5 with things like Group Masking and Mapping (for efficiency), Operational Power (for monitoring power consumption), Indications (event handling) enhancements, support for FCoE HBAs, Fabric NPIV support, a Host Filesystem (autonomous) profile, and the introduction of View Classes for Libraries. For a more comprehensive list of enhancements in SMI-S 1.5, SNIA members can refer to [SMI-S-15.pdf](#) on SMI-S Central.

In addition, over the last two releases (SMI-S 1.4 and 1.5), the SMI has focused on specification tightening based on peer reviews from both SMI-S Client and Provider vendors. As a result, much of the growth in the standard for these releases has resulted from refinement of the standard (improving the quality).

Maturity of the Standard

SMI processes for developing the standard includes a “maturity model,” a designation that tells readers of the standard the maturity of the material they are reading. The various levels of maturity of SMI-S 1.5 profiles are illustrated in Figure 1.

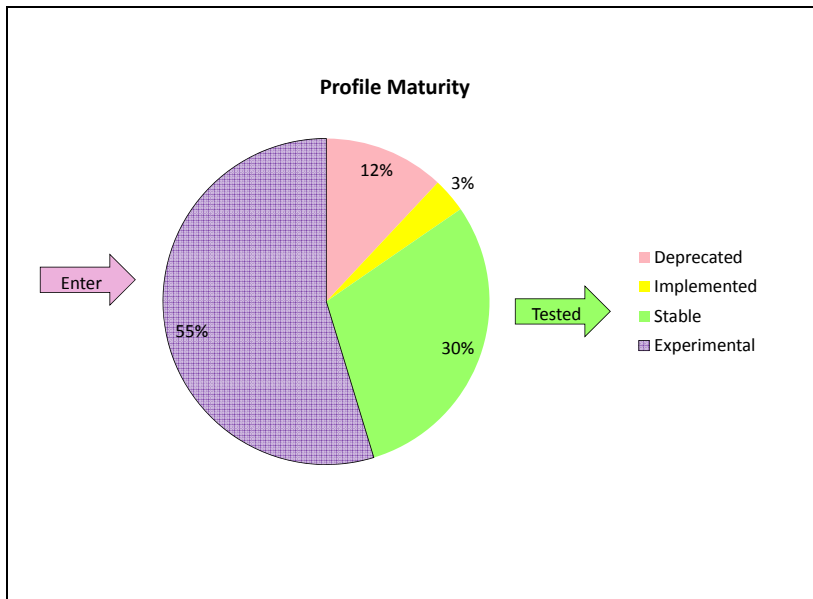


Figure 1. Maturity of SMI-S 1.5 Profiles

The first level of maturity is “Experimental.” It indicates that the material (e.g., a profile) has been designed but may be changed as it goes through implementation experience with the vendor community. Once SMI has two vendor implementations, the material may move to “Implemented.” Once SMI has three or more vendor implementations, the material may move to “Stable.” Implementations must include at least one provider vendor but may also include client application vendors.

Experimental profiles

When SMI publishes a release of SMI-S with a new profile, the profile is typically “Experimental,” with only one company implementing the profile. Every profile introduced in SMI-S starts out as “Experimental” until there is enough experience with the profile to promote it to a higher level. Figure 1 shows that over half of SMI-S 1.5 is “Experimental.” This does not mean that half the standard was introduced in 1.5 but rather that 55% of the material introduced in 1.5 (or earlier releases) has not yet demonstrated more than one implementation.

An example of an “old” experimental profile is the Volume Management profile. The profile was introduced in SMI-S 1.1. There was one vendor that claimed to have an implementation, but no other vendor came forward with another implementation. As a result, the Volume Management profile stayed “Experimental.” Indeed, due to other growth in SMI-S and interactions with the Volume Management design, the Volume Management profile has been “Deprecated” in SMI-S 1.5. This maturity state indicates that SMI will be abandoning the profile in the next version of the standard. The vendor that originally designed the profile was acquired by another company and no longer participates in maintaining the profile. The vendor that implemented the profile still participates in SMI, but not with the Volume Management Profile.

Stable profiles

On the more positive side, about a third (30%) of the profiles in SMI-S 1.5 have progressed to “Stable,” indicating there are at least three implementations. Some profiles, like the Array and Block Services profiles, have over a dozen vendors implementing them.

"Tested" profiles

Ultimately, SMI likes to move stable profiles to a tested state. The tested state is one in which the SMI reports CTP testing (and conformance to the standard) of the profile on its CTP web pages (see [CTP_ConformingProviders](#)). The tested state is not designated in the maturity markings in the standard. Up until SMI-S 1.2, the SMI would only CTP test "Implemented" or "Stable" profiles in the standard. For SMI-S 1.5, that would mean that CTP would only test a third of the standard. So starting with SMI-S 1.2, SMI introduced the "Early Adopter" feature of CTP. With this feature, SMI now identifies testing on "Experimental" profiles. This modification has been quite successful. For example, several vendors have completed "Early Adopter" testing of the Block Storage Views Profile (the profile that provides scalable discovery of disk subsystem information). See [CTP_EarlyAdopters](#) for the Early Adopter testing in CTP for 1.3 and 1.4.

Managing Maturity of the Standard

When the SMI introduced the Maturity Model markings in the standard, it would rely on vendor claims of implementations. Over the years, the SMI has become more demanding. The preferred way of getting material (and profiles) promoted out of the "Experimental" purgatory is to bring the implementations into SMI-Lab for informal testing and use by client application software. This process exposes weaknesses in the profiles and generates fixes to correct those weaknesses. Exposing the implementations to client applications helps SMI validate the usefulness of the profile. Frequently this activity will generate either fixes to the profile or "future enhancement" requests to the profile.

A profile can move all the way to "Stable" in the SMI-Lab informal testing. It is not necessary for the profile to be formally tested in any CTP Release. A good example is the NAS profiles in the Filesystem Book. The NAS profiles were introduced in SMI-S 1.1, but they have never appeared in any CTP Test Suite. However, three vendors (NetApp, Pillar and EMC) have brought their implementations to SMI-Lab, and they have gone through fairly extensive testing in the lab. As a result, the base profiles of NAS are marked in the standard as "Stable."

Another key example is the Host Hardware RAID Controller Profile in the Host Book. This profile was introduced in SMI-S 1.2 and has languished in the "Experimental" state since then. But a vendor (PMC-Sierra) finally brought in an implementation for testing with CTP for SMI-S 1.4. The informal testing in SMI-Lab turned up a number of flaws in this profile. These were fixed in SMI-S 1.4. Indeed, if any other vendor had implemented the 1.2 version of the profile, it would not have passed the tests for the SMI-S 1.4 version. The flaws were such that changes that broke backward compatibility were necessary. Because the profile was experimental, the changes were made. Thanks to PMC-Sierra's efforts, the profile was fixed, and the SMI was able to list PMC-Sierra as an Early Adopter for the Host Hardware RAID Controller (see [CTP_EarlyAdopters-PMC](#)). All that is needed now is another implementation and the profile can be promoted to "Implemented."

One last thing to consider is improvement to the CTP Test Suites. Most notably, with CTP for SMI-S 1.4, SMI now tests for optional configuration function implementations. Even though over a dozen vendors have passed CTP for the Array and Block Services Profiles since SMI-S 1.1, only four vendors (EMC, HDS, Hitachi and HP) have established conformance to SMI-S 1.4. CTP for SMI-S 1.4 introduced testing for Volume creation and removal and StoragePool creation and removal. Any vendor that qualified on CTP for 1.3 or earlier releases may not qualify on these functions (they are optional in the standard and were not tested). SMI can now test optional features of a profile to verify implementations of the optional features. It should be noted that SMI-Lab members have access to the CTP Test Suites and can run the test suites against their implementations, independent of whether or not they actually apply for listing on the CTP web pages.

Program Updates

SMI Technical Steering Group (TSG) by Mike Walker

In June, the TSG completed production of the Final Draft of SMI-S 1.5.0 and submitted it to the Technical Council for SNIA membership and final IP Review. This release includes nine new profiles (including an Operational Power Profile, FCoE Initiator Ports, and Library Views) and enhancements to many existing profiles, including some major restructuring of profiles in the Fabric Book and new Indications functions in the Experimental Indication Profile.

In May, the TSG completed scoping for the next release of SMI-S (SMI-S 1.6.0). This should be another interesting release, with new profiles for Storage Relocation, FCoE in Fabrics, and HHRC view classes (among others). This release will also add WS-Management support clarifications.

The production of the Initial Draft of SMI-S 1.6.0 is due out in July, with the Fully Scoped Draft due out in October. The Final draft of SMI-S 1.6 won't be produced until mid 2011.

The TSG meets weekly on Fridays to discuss issues related to SMI-S. It also schedules occasional face-to-face meetings (including at the upcoming July SNIA Summer Symposium in San Jose). New members are welcome, especially those who are interested in participating in spec development.

Conformance Testing Program (CTP) by Mike Walker

The second official release of CTP for SMI-S 1.4.0 was released in April and added testing for Fabric, Switch and HHRC (Host Hardware RAID Controller) profiles. It is important to note that this is the first time CTP has included testing of HHRC (many thanks to PMC-Sierra for getting this into the tests).

In the meantime, the "bootstrap" version of the Test Specification for SMI-S 1.5.0 has been published (in CVS) and work has begun on developing the test harness. The initial drop of CTP for SMI-S 1.5.0 was delivered to SMI-Lab in May. It included a new test case for testing infrastructure support for CIM pull operations.

Other items planned for CTP for 1.5.0 include testing new (in 1.5.0) experimental indications methods for creating subscription, managing FilterCollections and testing ListenerDestinations. It is also anticipated that a number of new profiles will be added to the test in 1.5.0.

The first official release of CTP for SMI-S 1.5.0 is currently planned for September. The contents of the first release will depend on what vendors will be testing in SMI-Lab between now and September.

Please contact James Rigger, Conformance Testing Programs Manager at 719-884-8901 or james.rigger@snia.org if you have questions about the Conformance Testing Program or are interested in CTP testing of your company's products.

For additional information on CTP, see <http://www.snia.org/ctp/>.

SMI-Lab Program by Tom Mancuso



Attendees at the May 2010 Plugfest

Riding on the heels of the May Plugfest (#2), which saw SMI-S implementers addressing scalability and discovery issues, the SMI-Lab Program is moving full speed ahead. It is already promoting its agenda for the August plugfest (#3) and is finalizing key dates for the 2011 Program. Program participants have requested advanced planning, because they feel it will help them better prepare for plugfest activities and allow plenty of time for travel approval requests.

The May Plugfest attracted implementers from both coasts and as far away as China and Japan. In all, 9 companies were represented. Whether across the continent, across the country or across town, the SMI-Lab plugfests draw a cadre of SMI-S specialists looking for direct support and guidance on issues that are more efficiently solved through face-to-face interaction. One attendee claimed to have saved weeks of troubleshooting time while another boasted about uncovering problems through plugfest activities that otherwise might not have been discovered until after production release.

Vendors looking to implement and support WS-Management to obtain an edge over their competition or to satisfy a customer's need can quickly get up to speed by participating in Plugfest #3, which is scheduled for August 16 – 20. Presenters from Microsoft and PMC-Sierra, along with WBEM and Pegasus integration experts, will be on hand to work directly with attendees to target their specific issues. Likewise, vendors wishing to get a head start on vetting their SMI-S 1.5 implementations (ahead of the official CTP release) will have an opportunity to do so during Plugfest #3.

SMI-Lab is the SMI's interoperability lab, which is focused on vendors wishing to accelerate and pre-test their SMI-S implementations. The lab resides at the SNIA Technology Center in Colorado Springs, CO. The Technology Center enables SMI-Lab participants to remotely access other participating vendors' equipment to perform interoperability testing. Face-to-face plugfests are also held at the SNIA Technology Center and offer SMI-S vendors the ability to interact directly with each other in a vendor-neutral setting.

See http://www.snia.org/forums/smi/tech_programs/lab_program/ for more information about plugfests and SMI-Lab—and to register for the next plugfest.

SMI Marketing, by Troy Biegger

The SMI Marketing Committee has been busy creating informational updates around activities that involve SMI, such as plugfests (announcements and follow-up summaries), the opening of the new Technology Center, and opportunities for individuals and companies to get involved in SMI. The committee also recently produced press releases about 1.4 CTP testing. Brochures are being reviewed and updated, and a new brochure highlighting the benefits of the SMI-Lab program has been created. This committee also provides direction and updates to the SMI public web pages. Please let us know if you have suggestions!

The SMI Marketing Committee would like to extend an invitation to all to consider participating at the Fall Storage Networking World (SNW, October 11-14) as well as the upcoming Management Developers Conference (MDC, November 15-18). Both conferences are currently accepting presentations.

The SMI Marketing Committee meets regularly on Thursdays at 9:00 AM Pacific Time. Meetings are open to all SMI member companies. If you have comments or questions about SMI's marketing effort or would like more information, please contact Troy Biegger, Marketing Chair at smimarketing-chair@snia.org or Tom Mancuso, Sr. Program Manager, SMI, at tom.mancuso@snia.org.

SMI Marketing Committee Teleconference

Thursdays, 9:00 AM Pacific Time

Join us. Visit

<https://www.snia.org/apps/org/workgroup/smimarketing/>

Key Milestones

SNIA Members may access detailed SMI-S production schedules for each version by visiting **SMI-S Central** at: <http://www.snia.org/members/smis/>.

SMI-S Spec	SMI-S 1.5 Technical Position Completed August 2010	>	SMI-S 1.6 Initial Draft Completed July 2010	>	SMI-S 1.6 Full Scope Draft Completed October 2010
SMI CTP	CTP for SMI-S 1.5 Provider Test "First Official Release" September 2010	>	CTP for SMI-S 1.5 Provider Test "Final Release" January 2011	>	CTP for SMI-S 1.6 Provider Test "First Official Release" TBD
SMI-Lab	Plugfest #3 Aug 16-20, 2010	>	Plugfest #4 Oct 25 – 29, 2010	>	SMI-Lab II Program Begins Dec 01, 2010

Upcoming Events

2010 Dates	Location	Event
July 20	San Jose, CA	SNIA Summer Symposium
August 16 – 19	SNIA Tech Center Colorado Springs, CO	SMI-Lab Plugfest #3
September 20 – 23	Santa Clara, CA	SNIA Technical Symposium
October 25 – 28	SNIA Tech Center Colorado Springs, CO	SMI-Lab Plugfest #4

List of Vendors Conformant to SMI-S



Many vendors have passed SNIA-CTP SMI-Provider and SMI-Client conformance tests for SMI-S v1.0.2 to 1.4.0. Over the life of CTP, 27 different companies have successfully run CTP against 52 different software products (clients and agents) covering over 500 device products.

For more information on the statistics for CTP, see:

http://www.snia.org/forums/smi/tech_programs/ctp/ctp_statistics.

To learn more about SNIA-CTP and vendor's products that have passed SNIA-CTP, please visit:

http://www.snia.org/forums/smi/tech_programs/ctp/.

Vendors with Products Conforming to SMI-S 1.4

[EMC Corporation](#)

[Hitachi Data Systems](#)

[Brocade Communication Systems, Inc.](#)

[Hitachi Limited](#)

[Hewlett-Packard Company](#)

[PMC-Sierra](#)

Vendors with Products Conforming to SMI-S 1.3

[EMC Corporation](#)

[Hitachi Data Systems](#)

[Hewlett-Packard Company](#)

[Hitachi Limited](#)

Vendors with Products Conforming to Previous SMI-S releases

For the list of vendors that have passed conformance testing for previous releases see

http://www.snia.org/forums/smi/tech_programs/ctp/conformingprovidersarchive.

SMI Community

Some key web links to SMI information are:

Conformance Testing Program	http://www.snia.org/ctp/
SMI-S Developers Group	http://groups.google.com/group/smi-s-developers-group
SMI Specification	http://www.snia.org/tech_activities/standards/curr_standards/smi/
SMI-Lab Program	http://www.snia.org/forums/smi/tech_programs/lab_program/
SMI-S Central	http://www.snia.org/members/smis/

SMI Governing Board

Chair: Don Deel, EMC smiboard-chair@snia.org

Vice-Chair: Steve Quinn, HDS

Treasurer: Doug Voigt, HP

Secretary: Alan Yoder, NetApp

Mike Walker (non-voting)

Paul von Behren (non-voting)

Tom Mancuso, SNIA (non-voting)

Conformance Testing Program (CTP)

Chair: Steve Quinn, HDS, smiconformance-chair@snia.org

Program Manager: James Rigger, SNIA, james.rigger@snia.org

Website: <http://www.snia.org/ctp>

SMI-Lab Program (SMI-Lab)

Chair: Paul von Behren, smiimplement-chair@snia.org

Plugfest Content: Jim Davis, jim.davis@wbemsolutions.com

Website: http://www.snia.org/forums/smi/tech_programs/lab_program

Plugfest Registration Link: https://www.snia.org/apps/SMI_Lab_Plugfest_Registration/register.php

SMI Technical Steering Group (TSG)

The Storage Management Initiative (SMI) Technical Steering Group (TSG) is a sub-group of the SNIA Technical Council (TC). Its primary purpose is to provide a single storage management focus by guiding and managing the SNIA technical efforts for the creation, maintenance, and evolution of a SNIA Storage Management Initiative Specification (SMI-S). This standard will allow storage management systems to reliably and securely identify, monitor, and control physical and logical resources, enabling multi-vendor management interoperability.

Chair: Steve Quinn, HDS tsg_smi-chair@snia.org

Website: www.snia.org/apps/org/workgroup/techcouncil/tsg_smi/

Technical Work Groups

These Technical Work Groups (TWGs) function under the direction of the SMI TSG.

Technical Work Group	Title	Contact	Company	Email
Disk Resource Management TWG	Chair	Scott Baker	Individual	snia-drm-chair@snia.org
Fibre Channel TWG	Chair	John Crandall	Brocade	snia-snmwg-fc-chair@snia.org
File Systems Management TWG	Co-Chairs	Gary Steffens Mike Thompson	Pillar Data EMC	fsmtwg-chair@snia.org
Host TWG	Chair	Steve Peters	PMC-Sierra	hosttwg-chair@snia.org
SMI-S Core TWG	Co-Chairs	John Crandall Paul von Behren	Brocade Individual	smiscoretwg-chair@snia.org
Storage Media Library TWG	Chair	Dr. Krishna Harathi	IBM	snia-sml-chair@snia.org