SMI Program Report
March 2009

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*.

Feedback or comments regarding this report may be directed to Paul von Behren, SMI Chairman, at smiboard-chair@snia.org.

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Introducing *Customer Driven SMI-S*

A New Era in Storage Management Initiative (SMI) Activities

The Storage Networking Industry Association (SNIA) is introducing a new era in Storage Management Initiative (SMI) activities, based on feedback on the current SMI-S program. This article answers the questions "What exactly is Customer Driven SMI-S" and "When will I see results?"

SMI-S is a standard for storage management; it defines the communication between management applications and software/firmware components that enable management of storage devices. SMI-S has been created by and for the engineers developing these applications and device management components. These engineers have contributed to the standard as well as implementing products that use SMI-S. The support from storage vendors has been phenomenal; SMI-S enabled products dominate the storage in data centers across the planet. SNIA continues to make engineering-driven enhancements to SMI-S, including management for emerging capabilities such as Fibre Channel over Ethernet (FCoE) and power monitoring of storage devices.

The range of devices supported by SMI-S and the ability of SMI-S to manage devices across the network introduce challenges for customers of SMI-S solutions. *Customer Driven SMI-S* consists of projects that go beyond the standard itself, to help customers install SMI-S components and also to see how SMI-S relates to various customers of SMI-S. These customers include end-users, solutions integrators, and developers of SMI-S solutions who are not necessarily involved directly in the development of the standard.

End-User (and Integrator) Driven SMI-S

Some new projects relate to **end-users** (the folks in data centers using storage products) and **solutions integrators**. *Customer Driven SMI-S* will focus on creating data center plug-and-play interoperability between SMI-S compliant management applications and devices. "Best practices" tutorials have been created to help developers make SMI-S solutions easier to install and configure. We will create additional best practices documentation to help developers create customer driven products. SMI is also creating a web site with information from multiple vendors that can help anyone (including integrators) installing SMI-S enabled products. This work will also create "best practices" information for end users and integrators to help plan SMI-S installations.

SMI-S Alert enhancements allow implementations to provide alert features equivalent to those in existing non-standard solutions. This project introduces more alert messages into the standard, introduces new features to help application developers use alerts, and extends the conformance testing program with comprehensive event testing.

SMI-S 1.2.0 introduced some techniques for arrays to effectively manage large configurations, addressing both scalability and performance of management communication. Vendors have implemented support for this approach and the testing results have been promising, so we are extending this to other types of devices.

Enhanced CTP

The Conformance Testing Program (CTP) is being enhanced in several ways to help end users. More functionality is being tested, helping vendors discover and address potential issues in interoperability and robustness before products are delivered to customers. CTP is also enhancing its reporting to identify specific features supported by the implementation. The reports will talk about how these features relate to business-oriented goals (such as "LUN creation" and "Pool creation"), in addition to the engineering-driven "Block Services" profile name.

There will be many more features reported than the current list of profiles, providing finer-grained information about the SMI-S functionality supported by the device. The combination of business-oriented feature names and finer-granularity in reporting helps end users understand whether SMI-S enabled products support specific uses of the standard. This can help in purchasing decisions and in selecting combinations of applications and devices that contribute to a desired solution.

New Developer-driven SMI-S

Developers of SMI-S solutions are also customers of the standard. *Customer Driven SMI-S* includes projects to assist developers by helping to ensure that SMI-S success with managing Fibre Channel devices grows so that SMI-S becomes the primary management interface into all storage networking products in the market.

A vital component of achieving this objective is assisting the vendors with the implementation of vendor/product unique extensions to SMI-S profiles. The vendor-extension program will introduce a website where vendors can share their extensions to SMI-S for functionality that is not in current version of the standard. Vendor extensions serve as incubators for new functionality, allowing vendors with similar device capabilities to collaborate in developing a proposal for a future SMI-S version. Vendor extensions also help application developers who are interested in implementing support for vendor-specific or emerging technologies. By extending the SMI-S framework, vendors may be able to phase out legacy, proprietary frameworks – some of which may not have been designed for current security guidelines.

Developers (and other readers of SMI-S) will also benefit from a more intense review process that is in progress across the entire standard. This process includes a larger set of reviewers than for previous SMI-S reviews, and specifically targets key application developers as well as device experts.

Provider CTP is being enhanced to allow vendors to select whether they want testing limited to passive management, passive plus active management (adds testing of provisioning features, or event-driven management (active management, plus testing of subscription and delivery of indications). There will be separate pricing plans for these three levels, allowing companies to request minimal testing at a lower price, or more advanced testing that validates support for advanced SMI-S features.

SMI-S plugfests now include activities that focus on topics of interest to developers that are not directly covered by the standard (for example, scalability or installability). These activities are driven by suggestions made at plugfests, and involve training, development of prototypes, visits from experts to help evaluate emerging technology, and sometimes revisit things that may not be working as expected. Recent plugfests have included activities around SLP discovery, scalability, and events/indications. SMI is also planning plugfest topics that help application developers discover new and more optimal approaches for things like scalability. Plugfests also provide an early opportunity for testing interoperability between SMI-S components.

Last, but not least, we have created the **SMI-S Developers Group** as a way for developers—even non-SNIA members—to get answers to questions about SMI-S:

Visit http://groups.google.com/group/smi-s-developers-group

When will you see Customer Driven SMI-S?

Most of the *Customer Driven SMI-S* programs have already been started and, as mentioned, some results are already available:

- SMI presented tutorials for "installation best practices" at the SNIA Developers Conference and at the Management Developers Conference in Fall of 2008. SMI will continue to develop best practice guides and make them available to developers.
- Alert Enhancements are actively being developed, but will take about a year to complete. New alert messages have been added to key profiles in the last two SMI-S releases, and more will be added in upcoming releases. New interfaces to help application developers with alert indications will be in an SMI-S 1.5 draft available to SNIA members within the next few months. Testing enhancements for events will be available within the next few months, but it will take about a year for all the planned enhancements to become available.
- The highest impact scalability enhancements will be made available in the SMI-S 1.5 draft.

- CTP enhancements for passive and active testing, and finer grained reporting will become available for testing of SMI-S 1.4. Validation of these extensions is taking place over the next few months, and CTP 1.4 results will be posted by the end of 2009. Event-driven CTP testing will become partially available in 2009 and completed in 2010.
- The vendor extension program will be introduced by the summer of 2009; documentation for vendor extensions will be available by the end of 2009.
- The first results of the improved specification reviews are included in the final draft of SMI-S 1.4, which is available to SNIA reviewers now. The specification reviews are continuing, and additional results will be seen in upcoming SMI-S versions.
- Customer driven activities are part of plugfests scheduled for 2009. See the plans for upcoming plugfests at http://www.snia.org/forums/smi/tech_programs/lab_program/

Engineers continue to extend SMI-S with additional storage types and features. The new *Customer Driven SMI-S* programs extend the SMI-S program to address the objectives of end-users, integrators and developers of new applications and devices. The combination of both an engineering focus and a customer focus helps drive SMI-S implementations that address the objectives of all these stakeholders in storage management.

Program Updates

SMI Technical Steering Group (TSG)

The TSG is supporting "Customer Driven SMI-S" through "content and xml Reviews". These were initiated last summer and some of the results of these reviews actually began to be incorporated into SMI-S 1.3. A new version of SMI-S 1.3 has been generated and is currently going through a SNIA Membership review. But the bulk of the edits to the specification will be done in SMI-S 1.4 and SMI-S 1.5.

In addition to make adjustments to the specification for adding clarity, the content reviews have turned up requests for additional functions for many of the profiles. Since SMI-S 1.4 had already gone out to our developers for implementation, these enhancements are being targeted for SMI-S 1.5. One of particular note is the Indication Profile (reporting Events). Numerous requests were made for enhancements from both the content review of the profile and from the "IndicationFest" that was held last year in an SMI-Lab plugfest.

The TSG is in the process of completing the initial draft of SMI-S 1.5, including the enhancements in the Indication Profile. This is just a draft of the new work and the TSG will be refining the proposals over the course of the next six months. The plan is to publish the Implementation Draft (for our developers to start implementing) in the September timeframe.

Conformance Testing Program (CTP)

Starting with CTP for SMI-S 1.3 the conformance testing program has been "upgrading" in support of "Customer Driven SMI-S". Provider CTP for 1.3 included some enhancements to recognize "specification tightening" work done in SMI-S 1.3 (and errata written against the final version).

The first official version of Provider CTP for 1.3 was released last October covering the Array profiles. A second release of Provider CTP has just been released and it covers host profiles (FC HBA and Host Discovered Resources) as well as the Array profiles.

But the bulk of the enhancements to the Provider CTP program will become apparent with the program for 1.4. Last fall, the Conformance Committee approved the plan for Provider CTP for 1.4. There are a number of enhancements to this version of CTP that are directly targeted to support "Customer Driven CTP."

There are several changes that will relate to more specification tightening, but the most visible changes will be in two areas:

- Level of Test

  CTP will be able to test a profile at one of three levels, rather than one level of testing.

- Reporting in End User Terms

  CTP results will be reported in "end-user" terms, rather than just in terms of component profiles.

These were covered in some detail in the November Program Report. What is new in this program report is that initial builds of the Provider CTP for 1.4 have been generated. The basic support for these two features has already been added.

With the Level of Test identification, a customer will be able to tell whether or not an implementation supports basic discovery capability (PASSIVE), configuration capability (ACTIVE) or changes caused by events in the devices (EVENT_DRIVEN). Vendors that demonstrate that they support the ACTIVE level of testing will be recognized for providing that support. Vendors that can demonstrate that they support Indications for their elements will be recognized for that support (EVENT_DRIVEN).

Equally important, each of the test cases in the Provider CTP will be identified as supporting specific "end user" functions and will be reported in "end user terms". The purpose is to make the test reporting more relevant to the consumers of the CTP information.

Initial testing of the Provider CTP for 1.4 was expected to begin in February at the plugfest scheduled for the end of the month. The actually release of Provider CTP for 1.4 is scheduled for later in the year.

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

SMI-Lab Program

The February 23-27 2009 plugfest focused on vendor-contributed test cases. These test cases can include new/planned functionality in a client application, prototypes, or code intended for the new vendor test case capability of CTP. In addition, we will start testing new SMI-S 1.4 profiles.

Upcoming plugfests:

- The April 27 – May 1 plugfest will revisit indications testing, including testing standard alerts.
- The June 8 – 12 plugfest will revisit Array ScaleFest, adding client pull operation testing. In addition, we will be looking at tape library view classes.

The SMI Implementation Committee oversees the SMI's interoperability lab (SMI-Lab) 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 directly interact with each other in a vendor-neutral setting.

SMI Marketing

The main theme for this program report is centered on "Customer Driven SMI-S" and although you may have read in the first article that Customer Driven SMI-S was based on feedback from the SMI Program, you may be wondering, "feedback from whom exactly?" Customer Driven SMI-S is the result of feedback from SMI-member companies, who pull their requirements from their customers, who are IT end users, who in turn pull their requirements from their customers. It's a rather simple value chain.

What is the SMI Marketing Committee's role in supporting Customer Driven SMI-S? Glad you asked. The SMI Marketing Committee is embarking on a two-year plan to work more closely with end users and analysts and to cause greater awareness of the value of SMI-S and CTP.

For end users, it is a matter of demonstrating that SMI-S, in its current state, is actually meeting their needs today. Storage Networking World (SNW) is just around the corner and it is the ideal setting for beginning this important work. We also see SNW as a great opportunity to meet with analysts. Our objective here will be to meet with key industry analysts ands friends of SNIA to go over our plans and timelines for rolling out Customer Driven SMI-S. This will enable them to report more on fact than on conjecture.

We plan to step up the visibility of SMI-S and CTP at SNW, expect to see and hear more about SMI-S in publications from SNIA and other organizations.

On the vendor front, in many instances SMI-S *is* addressing vendors' needs whether they realize it or not. This was the topic of a presentation given by Steve Peters, formerly with HP, at the SNIA Winter Symposium titled "Why SMI-S is Important to Vendors." This presentation talked about how end user requests for multi-vendor storage configurations, a common management console, or "stop making me use multiple vendor-specific tools" can be addressed by SMI-S solutions. As we move forward we'll look at ways to capitalize on and promote known SMI-S successes.

We are always looking for volunteers to help us take SMI-S to the next level and we encourage you to get involved to make a difference.

SMI Marketing Committee Weekly Meetings
Wednesdays at noon Pacific Time
Meetings are open to staff from all SMI member companies. If you have comments or questions about SMI's marketing effort or would like more information, please contact Paul von Behren, Interim Marketing Chair at Paul_von_Behren@symantec.com or Tom Mancuso, Sr. program Manager, SMI, at tom.mancuso@snia.org.

Calendar of Upcoming SMI-Related Events

Dates	Location	Event
March 14 -16, 2009	San Jose, CA	SNIA Technical Symposium http://www.snia.org/members/eventcentral
Apr 06 – 09, 2009	Orlando, FL	SNW Spring 2009 http://www.snwusa.com
Apr 27 – 30, 2009	Colorado Springs, CO	SMI-Lab9 Plugfest #2 "Indicationsfest 2" http://www.snia.org/forums/smi/tech_programs/lab_program/smi_plugfest_reg
May 12 – 15, 2009	Chicago, IL	SNIA Technical Symposium http://www.snia.org/members/eventcentral

Key Program Milestones

The matrix below shows SMI-Specification development milestones as they relate to all versions of the spec in the development or standardization pipeline. SNIA Members may access detailed production schedules for each version by visiting SMI-S Central at: http://www.snia.org/members/smis/.

Storage Management Initiative Outlook

SMI TSG	SMI-S 1.4 Technical Position Completed Q1 2009	> SMI-S 1.5 Initial Draft Completed Q1 2009	> SMI-S 1.5 Full Scope Draft Completed Q2 2009
SMI CTP	CTP for SMI-S 1.3 Second Provider Test Released Q1 2009	> CTP's First Official SMI-S 1.4 Provider Test Released Q3 2009	> CTP for SMI-S 1.4 Final Provider Test Released Q1 2010
SMI-Lab	Plugfest #1 "Recipefest" 02/23/09 to 02/27/09	> Plugfest #2 "Indicationsfest 2" 04/27/09 to 04/30/09	> Plugfest #3 "ScaleFest 2" 06/08/09 to 06/12/09
SMI Marketing	SNW Spring 2009 04/06/09 – 04/09/09	> SNW Fall 2009 10/12/09 – 10/15/09	
ANSI/ISO	SMI-S 1.3 Submission to INCITS Q1 2009	SMI-S 1.4 Submission to INCITS (Planned submission date) Q1 2010	SMI-S 1.5 Submission to INCITS (Planned submission date) Q1 2011

List of Vendors Conformant to SMI-S

Many vendors have passed SNIA-CTP SMI-Provider and SMI-Client conformance tests from SMI-S v1.0.2 to 1.3.0. 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 statistic for CTP, see:
http://www.snia.org/forums/smi/tech_programs/ctp/ctp_statistics.

To learn more about SNIA-CTP and the 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 1.3

EMC Corporation
Hewlett-Packard Company
Hitachi Data Systems
Hitachi Limited

Vendors with Products Conforming to SMI-S 1.2

Brocade Communication Systems, Inc.
EMC Corporation
Hewlett-Packard Company
Hitachi Data Systems
Hitachi Limited
IBM
NetApp

Vendors with Products Conforming to SMI-S 1.1

3PAR
ADIC
Brocade Communication Systems, Inc.
Cisco Systems
DataDirect Networks
EMC Corporation
Emulex
Fujitsu Limited
Hewlett-Packard Company
Hitachi Data Systems
Hitachi Limited
IBM
LSI Corporation, Engenio Storage Group
McDATA Corporation
NEC Corporation
NetApp
Pillar Data Systems
QLogic
Quantum
Xyratex

Vendors with Products Conforming to SMI-S 1.0

Brocade Communication Systems, Inc.
Cisco Systems
CNT
Dell Computer
EMC Corporation
Emulex
Fujitsu Limited
Hewlett-Packard Company
Hitachi Data Systems
Hitachi Limited
IBM
LSI Corporation, Engenio Storage Group
McDATA Corporation
NetApp
QLogic
Silicon Graphics
StorageTek
Sun Microsystems, Inc.

SMI-related Groups and Committees

The groups and individuals listed below provide guidance and direction within SMI; they are on a careful path, managing the components and infrastructure of the SMI Program.

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

The SMI Governing Board is comprised of an elected set of volunteer governing members and a contingent of (non-voting) representatives from SMI-related groups and SNIA staff. The SMI Governing Board establishes the strategic direction of the initiative, establishes SMI policies and procedures, and oversees SMI's various committees and taskforces.

Chair: Paul von Behren, Symantec smiboard-chair@snia.org
Co-Chair: Jerry Duggan, HP smiboard-chair@snia.org
Treasurer: Don Deel, EMC
Secretary: Mike Walker, IBM (Retired)
Vincent Franceschini, HDS

Conformance Testing Program (CTP)

CTP provides conformance test standards for the SNIA SMI Specification and assists in developing programs to support launch of SMI-S certification for companies developing products conformant to SMI-S.

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)

The SMI-Lab program is an industry-wide collaborative program that helps companies accelerate the development and implementation of SMI-S based Client and Provider products from SNIA member companies.

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

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 Interface 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: Chair: Duane Baldwin, IBM (tsg_smi-chair@snia.org)

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

Technical Work Group	Title	Contact	Company	Email
Disk Resource Management TWG	Chair	Scott Baker	Olocity	snia-drm-chair@snia.org
Fibre Channel TWG	Chair	John Crandall	Brocade	snia-snmwg-fc-chair@snia.org
File Systems Management TWG	Co-Chair	Gary Steffens	Pillar Data	fsmtwg-chair@snia.org
File Systems Management TWG	Co-Chair	Mike Thompson	EMC	fsmtwg-chair@snia.org
Host TWG	Chair	Duane Baldwin	IBM	hosttwg-chair@snia.org
Management Application TWG	Co-Chair	Duane Baldwin	IBM	maptwg-chair@snia.org
Management Application TWG	Co-Chair	Kurt Krems	Olocity	maptwg-chair@snia.org
Management Protocol TWG	Chair	Paul von Behren	Symantec	protocoltwg-chair@snia.org
SMI-S Core TWG	Co-Chair	John Crandall	Brocade	smiscoretwg-chair@snia.org
SMI-S Core TWG	Co-Chair	Paul von Behren	Symantec	smiscoretwg-chair@snia.org
Storage Media Library TWG	Chair	Dr. Krishna Harathi	IBM	snia-sml-chair@snia.org