"*Customer-Driven SMI-S"* for End Users

Changing the Development of SMI-S

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. SMI-S continues to define management standards for new storage functionality such as power monitoring and Fibre Channel over Ethernet (FCoE) and incorporates several new objectives:

- More comprehensive specification reviews
- Increased flexibility for vendor conformance
- More user-centric testing (consumability)
- Development and distribution of educational collateral

SMI-S: The Basis for Managing Storage Networks

SMI-S is a standard for storage management defining the communication between management applications (such as a Storage Resource Management application) and instrumentation (software/firmware components) that enables management of storage devices.

An objective of "*Customer-Driven SMI-S*" is to increase consumability by extending SMI-S solutions from Fibre-Channel devices to support for all types of storage:

- Making SMI-S easier to deploy
- Ensuring it scales and performs
- Providing collateral to facilitate adoption and document SMI-S importance

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What is a Storage Management Standard?

Storage Management is the ability to discover, report on, and provision the configuration of a storage system. This ability is implemented as a set of messages that flow between a storage management application and the instrumentation for the storage.

How many arrays are there?

Tell me about RAID and LUN masking

Create a new .5 TB RAID 5 LUN masked to the payroll server

A disk failed, spare located

Reconstruction in progress, 2 % done

Reconstruction in progress, 30 % done

How many switches are there?

Tell me about zoning

Port hardware failure

Create a new zone

Alternate path available, but bandwidth limited

Storage Array

FC Switch

A **Storage Management Standard** provides a common language for these messages between a storage management application and the instrumentation for storage systems. SMI-S is unique in providing a standard that allow multiple storage applications to manage a variety of storage systems from a variety of vendors.

As customers incorporate multiple products from multiple vendors into their environment, "*Customer Driven SMI-S"* will increase vendor participation in SMI-S; extending SMI-S to ease interoperation and collaboration with these products. In addition, SMI-S member companies are creating a way for vendors to develop and share "vendor extensions" based on the SMI-S infrastructure. This can serve as an incubator for managing emerging storage functionality and also for functionality that is not in widespread use (and not optimal for standardization). The SMI-S infrastructure also provides best-of-breed security capabilities that can be extended to provide for secure storage administration and management.

Focus on End User Experience and Consumability

SMI-S is increasing the focus on "consumability": installation, deployment and interoperation of multiple vendor solutions. This will include best practices documentation on how to prepare for and successfully install and deploy SMI-S based solutions.

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

SMI-S plugfests allow SMI-S device and application vendors to assure interoperability of products; plugfests now include activities that focus on topics of interest to developers that are not directly covered by the standard (for example, scalability or discovery). These activities include training, development of prototypes, and visits from experts to help evaluate emerging technology. SMI is also planning plugfest topics that help application developers discover new and more optimal approaches for things like scalability.
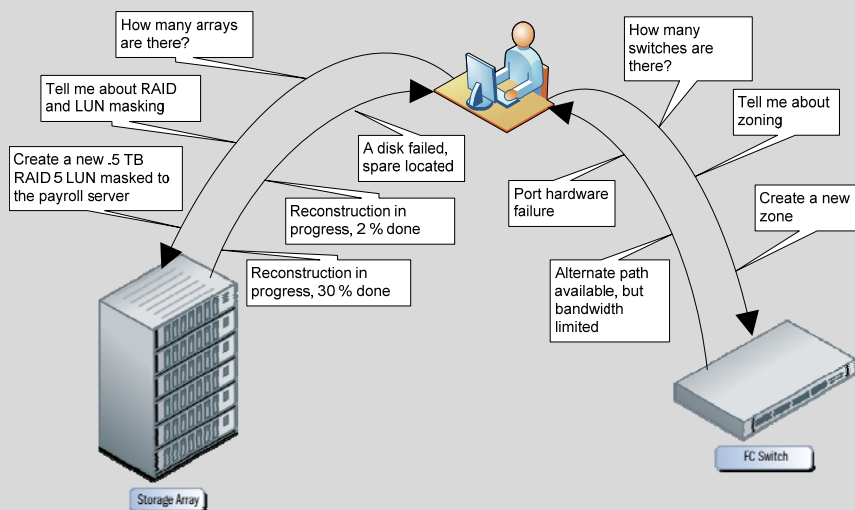
Customer-Driven Conformance Testing

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 introducing a tiered conformance process (Active, Passive, Event Driven) that will encourage vendors to support more advanced capabilities of SMI-S as well as clearly differentiate the level of SMI-S support for end users across the vendor community. CTP is also enhancing its reporting to identify specific features supported by the implementation. The reports describe 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 how 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.

Customer-Driven Collateral

"Best practices" tutorials have been created to help developers make SMI-S solutions easier to install and configure. The Initiative is creating additional best practices documentation to help developers more clearly understand customer requirements. 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.

Case studies/references, RFP/justification on how SMI-S reduces costs/increases value over non standard approaches, information on the current state of SMI-S, and tutorials on SMI-S are also being developed.

Roll-Out Plan

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

- SMI presented tutorials on "Installation Best Practices" at the SNIA Developers Conference and at the Management Developers Conference in Fall 2008. SMI will continue to develop and share best practice guides.
- Event handling enhancements are actively being developed, but will take about a year to complete. New event 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 events will be in the SMI-S 1.5 specification (available to the public Fall 2010). 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 specification (Fall 2010)
- CTP enhancements for passive and active testing and finer grained reporting are being validated March 2009 and will become available for testing of SMI-S 1.4 in Fall 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.
- The first results of the improved specification reviews are included in SMI-S 1.4, which is available publicly in April 2009. The specification reviews are continuing, and additional results will be seen in upcoming SMI-S versions.
- Customer-driven activities (for example: scalability and performance) will be included in 2009 plugfests.

For additional updated information, visit the SMI end user web portal: http://www.snia.org/forums/smi/knowledge/end_user

About the Storage Management Initiative

SMI is a membership-based initiative created by the SNIA to develop and standardize interoperable storage management technologies and promote them to the storage networking and end user communities. http://www.snia.org/smi

2009 Storage Management Initiative Member Companies: