An Introduction to Storage Management

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Abstract

This session will discuss managing the storage infrastructure. It will describe the basic of storage management, describe how SMI-S helps with managing diverse storage networks, and provides approaches that can be undertaken to get answers to many storage questions.

This presentation will explain ways to get started, where you can get some help, and outlines goals and objectives that can assist you in obtaining sponsorship from your storage management project.

Learning Objectives:

- Review basics of managing a storage environment and how SMI-S fits with providing better management.
- Describe approaches that can be taken and define the goals and objectives that will help you achieve improved management of your storage infrastructure.
- Tie storage management to enterprise management, including automation, service management and links to your enterprise management solutions.
Presentation Topics

- The evolution of our storage networks
- Storage management challenges
- Why is management important? What needs to be managed?
- What does managing storage mean?
- What is a Storage Resource Manager and how does it help?
- How can you get started?
- How does SNIA and SMI-S help you manage your storage network?
Managing Information in Silos has become Obsolete

1950s
“Server-Centric”

Terminals
System
Subsystems

1990s
“Network-Centric”

Desktops
Server
Storage
SAN
LAN
Workstations
Storage
SAN

21st Century
“Information-Centric”

Workstations
LAN
SAN
Server
Handheld devices
Desksops
Information
Server
Storage
Storage Management Challenges

- **Variety of Information**
  - Information Technology holds the promise of bringing a variety of new types of information to the people who need it.

- **Volume of Data**
  - Data *continues to* grow exponentially.

- **Velocity of Change**
  - IT Organizations are under tremendous pressure to deliver the right IT services.
  - 85% of problems are caused by IT staff changing something.
  - 80% of problems not detected by IT staff until reported by end user.
Why is Management Important?

- Virtualization
- Archiving
- Disk Volumes
- NAS, iSCSI

IT staff size the same?

Compliance Regulations
Mergers, Acquisitions
Consolidations
Old & New Technologies
Administration of a Storage Network

Each element has to be administered!
Storage Management

How much storage do I have available for my applications?

Which applications, users and databases are the primary consumers of my storage?

When do I need to buy more storage?

How can I quickly find some available storage for a new project?

How is my storage being used?

Check out SNIA Tutorial:
Help! My User base Eats Storage for Lunch!
How does a SRM help?

- **Reports on storage infrastructure**
  - Assets/Capacity
  - Applications and Database awareness

- **Data Classification**
  - Managing storage and data based on level of criticality of information
  - Manage compliance

- **Chargeback for storage usage**
  - Control storage costs
How do I simplify and centralize the management of my storage infrastructure?

How do I know the storage is not the bottleneck for user response time issues?

How reliable is my SAN?

Is the storage infrastructure available and performing as needed?

Check out SNIA Tutorial: Storage Virtualization I and II
How does a SRM help?

- Centralization
  - End to end visibility
  - Storage provisioning
  - Event management
  - Performance Management
  - Configuration Management

- Tiered Storage
  - Manage storage tiers and tier based service levels

- Storage Virtualization
  - Storage Virtualization can provide non-disruptive
How do I monitor and centrally manage my replication services?

How do I maintain storage service levels?

Which files must be backed up, archived and retained for compliance?

How can I ensure all my storage is being used effectively, balancing value versus cost?
How does a SRM help?

- Disaster Recovery
  - Manage storage copy services (configuration, performance, reporting)
- Drive Backup via File Reports
  - Automate backup ups via file scans
- Archiving and Compliance
  - Identify files that can/should be archived
How can I more quickly configure and deploy my storage resources?

How can I quickly determine the relationships between my applications, servers, and storage resources?

How can I automate the provisioning of my storage systems, databases, file systems and SAN?
How does a SRM help?

- **Analytics and Trending**
  - Historical configuration changes
  - Workload based provisioning
  - Performance analysis
  - Configuration analysis

- **Service Management**
  - Align your storage and data management policies with your business goals
  - Automation/workflow based management
How can you get started?

❖ If you want to
  ❖ Provide Regular Asset and Capacity Reports to management
  ❖ Forecast and Track storage usage
  ❖ Establish a chargeback process
  ❖ Provide a tiered storage approach

❖ If you want to
  ❖ Centralize your storage administration across the SAN and manage the storage SAN end to end
  ❖ Automate the configuration of your storage resources
  ❖ Optimize your storage configuration
  ❖ Provide a service-based approach

Start by deploying the reporting capabilities

Start by deploying the operational capabilities

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Starting with Reporting

Find unused storage

- Applications
- Databases
- Old Files Unused Databases
- Free space allocated to databases
- Unused file shares and directories
- Unallocated disks
- New Files
- File Systems
- Users
- Temporary Files
- Old Files

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Armed with storage reports, storage utilization can be managed.
Starting with Operational

Storage Resource Managers provide a centralized approach to managing storage

- Discover the Storage Network
- Central Operations for SAN Management
- End-to-End Topology Views
- Availability and Performance Management

- Track SAN Configuration Changes
- Apply Best Practices
- Pinpoint SAN Bottlenecks
- Actively Monitor Storage Service Levels
Gaining operational control of your storage network, advanced approaches can now be adopted.
SNIA and SMI-S Basics

What is SNIA?
- The Storage Networking Industry Association
  - Made up of some 400 member companies and nearly 7000 individuals. Refer to [www.snia.org/home](http://www.snia.org/home) for more information.

What is SMI-S?
- Storage Management Initiative Specification
  - The specification was designed with the purpose of standardizing and streamlining storage management functions and features into a common set of tools that address the day-to-day tasks of the IT environment.
  - Refer to [www.snia.org/forums/smi/tech_programs/smis_home](http://www.snia.org/forums/smi/tech_programs/smis_home)
SMI-S Based Storage Management

Storage Management Applications

Storage Devices

Storage Area Network

‘Clients’

TCP/IP connection (CIM/WEBM)

‘Providers’

Providers can be located on the storage device or via Proxy

Management agents are typically required to be installed on hosts for file system and database scans

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What can SMI-S Cover?

- **Fabric**
  - Discovery and Topology
  - Zoning Discovery
  - Zoning Config and Control
  - Fabric Device Management Interface (FDMI)

- **Switches**
  - Asset information
  - Status and Statistics
  - Blades

- **Arrays**
  - Asset information
  - Storage allocation.
  - LUNs: creation, masking & mapping

- **Libraries**
  - Media management and Library virtualization

- **Routers**
  - Masking and Mapping

- **Virtualization**
  - In Band and Out of band

- **Host attachment**
  - iSCSI/SATA ..
  - Mount/dismount volumes
  - Multi-pathing

- **Volume Management**

- **NAS**
**SMI-S Capabilities**

- **Automated Discovery**
  - Allows new devices to be configured, monitored and deployed automatically
  - Discovery of what the device is capable of and the interface for managing that capability
  - Storage Managers can discover and show a topology of the SAN and the status of each device
  - The topology can be used as a launch point for device and vendor specific user interfaces
SMI-S Capabilities

- Monitoring
  - SMI-S Provides basic status for each device
  - Changes in status can be sent as indications

- Indications
  - Events are signaled asynchronously and delivered to any application that needs to know
  - Indications can also be fed into event managers and correlated
SMI-S Capabilities

- **Active Management**
  - SMI-S enables control over storage devices in the SAN
    - LUN Masking and Mapping
    - Ability to manipulate the access control to array volumes (LUNs) from host FC ports
  - LUN Creation and Pool Management
  - Carve volumes from undifferentiated storage specifying Quality of Service-like parameters
  - Active Zone Management

- **Performance Management**
  - **Array Support**
    - Block Server Performance
    - Extent Composition Mapping (enables composite Volumes)
  - **Switch Support**
    - Fabric Path Performance (Source and Destination of packets)

View classes have been created to improve SRM applications performance
Q&A / Feedback

Please send any questions or comments on this presentation to SNIA: trackexecutive@snia.org

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