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Storage Resource Management—Building a Foundation for ILM

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A sustainable storage strategy requires balancing the cost of storing and managing information with its changing value to the enterprise over time. This concept is now known to IT professionals as Information Lifecycle Management (ILM). ILM offers a practical methodology for aligning storage costs with business priorities. Applying an ILM approach to managing the storage domain can help enterprises reduce storage costs, manage information growth and enhance data protection.

ILM projects are now underway within many medium to large scale IT organizations. The drivers for these projects generally fall into the following categories:

- The need to respond to regulatory compliance mandates
- The desire to impose management policies that encompass all data within the enterprise
- The desire to leverage lower-cost, higher capacity storage options
- The need to further improve the availability of time-critical data by removing less critical data from high-performance storage devices
- The universal requirement to maintain IT operational staffing at current levels while data volumes continue to grow—often in excess of 100% per year

ILM itself offers a new process for managing information. It is not a new storage device, solution, or management technology. Portions of that process can be applied today with readily available resources and technologies. However, the software vendor community presently offers more vision than substance when it comes to delivering products that truly can assist with the ILM process. Nevertheless, users are preparing for more substantive ILM offerings by building ILM foundations today—foundations which fall in the realm of Data Lifecycle Management (DLM)—a subset of ILM. Up to now, those foundational elements included the addition of low-cost, high-capacity disk, hybrid disk/tape backup and archiving systems, and automated capacity provisioning software. Now is the time for enterprises to view Storage Resource Management (SRM) software as another key foundational element.

Enter Storage Resource Management

Storage resource management (SRM) software is not new to IT departments. For several years, SRM tools have been providing real-time and historical data on storage infrastructure to organizations involved with managing storage resources. Reports on storage availability, capacity and performance are all standard features of many SRM tools. Additionally, SRM software provides information on storage usage, availability and performance and can group that information by application, business unit or physical location. A good SRM tool helps IT to discover storage assets, track storage utilization, recover lost capacity, and verify that data is protected. This can result in driving storage costs down, pushing operational efficiency up, and simplifying data protection processes.

The ILM Foundation

An effective ILM strategy starts with a comprehensive vision of an IT organization's storage *and* data resources, while projecting the evolution of these resources forward in time. The often stated goal of ILM projects is to gain storage management efficiencies by matching the *perceived* value of data at a given point in time with the *actual* value of the supporting storage infrastructure at that same point in time. To get started, an IT organization must first gain a comprehensive understanding of data and infrastructure resources as a baseline. That's where the value of SRM software can be initially demonstrated.

The three functional areas where SRM software can demonstrate substantial value as a foundational ILM element are:

- Discovery
- Visualization
- Classification

Discovery

To begin, storage administrators must develop a detailed inventory of both infrastructure and data assets—the more detailed the better. Information to be gathered should include but not necessarily be limited to:

- Physical infrastructure elements (arrays, switches, tape libraries, etc.) along with their capacities and asset valuations
- Performance characteristics
- Interconnectivity among infrastructure elements
- Security provisions (World Wide Names (WWNs) and zones)
- Existing device management software tools
- Data constructs (files, LUNs, volumes, etc.)
- Associations of the above to supported user applications

Discovery can be done manually or in an automated way by using SRM software. The manual approach is time consuming and error-prone.

Visualization

Once the discovery process is complete, the storage domain can then be visualized in the form of a map. The visualized map can be as detailed as desired and can indicate many, if not all, of the attributes gathered by the discovery process as well as the physical and logical connections and interdependencies among the discovered objects.

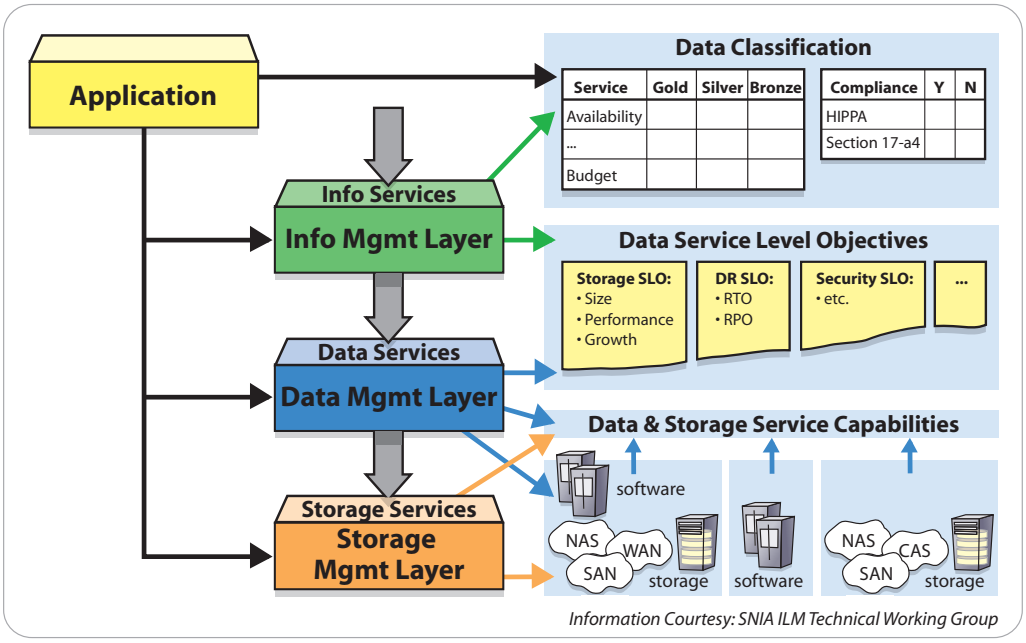
Classification

Once all objects—logical and physical—have been discovered and visually mapped, they can be classified. Objects can be grouped together based on policies developed by storage administrators in conjunction with IT and other enterprise executives who have a vested interest in ILM.

SRM: Enabling the ILM Model

The value of discovering, visualizing, and classifying objects encompassed within the storage domain can be seen when one examines an ILM architectural model. The architectural models used by vendors to describe ILM services generally have one thing in common: they all depict ILM as composed of functional layers. Rather than focusing on any single vendor's model, the Storage Networking Industry Association (SNIA) model is used below.

Data gathered by SRM software residing within the storage and data management layers can be fed in to the classification process, as an end result of processes



Information Courtesy: SNIA ILM Technical Working Group

occurring within the ILM "stack." Once these processes are put in place, they continue to function while an installed ILM architecture grows in complexity and takes on more functionality by continually feeding data to the upper layers. SRM software serves to provide critical baseline data for use at the inception of an ILM project, and goes on to play a critical role in the continued evaluation and function of the ILM process.

ILM "Outside" of the IT Organization

One of the greatest challenges storage administrators face is explaining and justifying storage-related implementation projects to those outside the IT sphere of influence. The "outside forces" include business unit managers, compliance officers, records retention managers, security officers, and risk managers—in addition to financial managers who are normally involved in the approval process—all of whom now have a vested interest in storage-related processes that fall within the ILM spectrum. As a result, these non-IT managers and senior executives are now more often involved in making decisions about storage technologies and processes, which they know little about.

The problem has become increasingly acute as enterprises cope with regulatory compliance, Internet-borne security threats, and litigation relating to the various forms of electronic messaging—all of which touch the storage domain *and* ILM.

SRM software can play a critical role in helping storage administrators address these non-IT decision makers. SRM tools can be used, for example, to generate reports for records retention managers. But just as important, SRM software provides the data that can be used to justify both present and future ILM-related projects and infrastructure acquisitions to senior corporate decision makers. Measurement data collected over time can be used as hard evidence to support the need for ILM-related management processes.

Conclusion

ILM is a continually evolving process, rather than an actual product and the beginnings of that evolutionary process are taking hold within enterprise IT. Storage administrators are beginning to build tiered storage architectures in anticipation of layering ILM-related data management services on top. SRM software should be considered a critical foundational element in this process, one that automates the generation of the storage domain as it exists today, and that can be used to support ILM services going forward.

Storability Software's Global Storage Manager

Storability Software, now a division of StorageTek (STK), offers a proven SRM tool in its Global Storage Manager product. Versions of the product have been on the market since 2002. Contained within the newest release are a number of capabilities that can serve as ILM foundation points.

GSM is designed to address the needs of large-scale IT organizations that manage significant centralized, multi-vendor storage resources as well as operations in remote locations. GSM offers a centralized aggregation point for storage resource monitoring, tracking and trending. It is capable of processing large volumes of management data, producing relevant management information that can be sent upstream to other associated processes running in the ILM "stack." GSM can also generate management reports for use by IT and other corporate business managers such as risk managers and compliance officers.

GSM: The ILM Foundation

Global Storage Manager offers a number of capabilities that can serve as foundational elements to an ILM architectural model:

Automated Discovery: GSM provides administrators with a detailed inventory of their entire storage infrastructure and data assets. Reducing or completely eliminating the problems associated with manual data gathering, GSM automatically discovers all discoverable storage infrastructure components and maps their interconnections and relationships. Discoverable data includes device configuration, capacity allocation, and more. This data is continually fed to the GSM Knowledgebase.

Enhanced Visualization: GSM enables large enterprises to visualize multi-vendor, multi-site storage environments from a central location. GSM maps the topology of the storage domain

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Storability Software GSM (cont'd.)

and visually displays the entire storage infrastructure in a useful, hierarchical map that starts at the highest level (e.g. fabrics) and allows users to drill down to more specific details (e.g. switches). Application- and business-aware views of storage resources can be created to display how much storage each application is using for a particular device to help ensure that the right devices are being used for each type of data.

GSM also consolidates all data known about each server in a single tabular interface. Users can view data relating to the filesystem, storage allocation, fabric configuration, backup jobs run, databases installed, and billing for an individual server. Pre-defined views present data in its most useful format (as defined by the administrator) so that users can drill down to greater levels of detail based upon their role in the organization.

Data Classification: Global Storage Manager is designed to help businesses make sense out of the tremendous volume of information contained within their storage environments. GSM's business analytics turn raw data into relevant information, improving the ability of business managers to analyze it and use it as the basis for critical decisions for their organization. GSM reports can help users to group assets by location, data protection, or even data security characteristics. A unique, "Views" functionality, allows storage administrators to classify data manually to meet the specific service level needs of the organization. Once grouped into Views, scheduled reporting, and policy functions can be applied to these logical groupings.

GSM enabling the ILM Model

A key component of Global Storage Manager is a highly secure, redundant architecture that facilitates the collection of data from multiple networks, including remote sites. This adaptable technology can be integrated into a customer's existing infrastructure and firewalls, and works within security requirements and policies. In addition, the architecture is component based, allowing new vendor offerings to be supported quickly and non-disruptively.

GSM uses distributed data collectors to gather storage infrastructure-related data from a variety of sources—both application host-based and storage domain-based. GSM's SMI-S compliant architecture[1] allows storage administrators to implement these collectors as either host-based Smart Agents or Agentless SMI-S Clients.

All management data is collected by a Central Manager via distributed Local Managers. The Central Manager deposits this data into a Knowledgebase that stores configuration, performance, usage, and operational data within its central repository. This repository can then be used as a permanent source of management information by other ILM processes. GSM's robust business analytics correlates the information stored in the central repository and presents information to the business users in a meaningful way.

Storage resource management tools like Global Storage Manager can enable IT organizations to more quickly comprehend their storage environments, control enterprise storage activities, and capitalize on improved storage operations. With the comprehensive information that SRM tools provide, enterprises can now blend this information with data classification and corporate policy formulation processes to more effectively implement ILM within their environments.

[1] See Data Mobility Group report entitled "Implementing SMI-S in the Real World (July 2003).