

How to develop a practical storage model

Establishing a strict storage model will help you contain costs and manage capacity growth.

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Is your storage growth out of control, and are your storage purchases unpredictable? Do your vendors just tell you to “buy more storage” to fix storage capacity issues? Is your tiered storage model not realizing the promised gains? Is your storage provisioning measured in days or weeks, not in hours? If the answer to any of these is yes—which is not uncommon—your storage is on the way to becoming a business beast. This situation is not unusual because, for many storage administrators, the growth in storage has been organic rather than structured, evolving and growing in fits and spurts.

Requirements for storage, and the impact on the storage environment, are expanding at an unprecedented rate. This is generating its own set of issues, with factors that vary in complexity between organizations. Some factors are clearly understood, such as the recent demands on contention and compliance for many companies (HIPAA for healthcare, Graham-Bliley for financial companies, SOX, etc.). Some specifically impact those seeking better data leverage, whether by e-mail, document retention, or data mining. Other factors include the increased need for disaster recovery and backup. Certain factors are not as obvious or even considered, such as the impact of implementing newer, cost-reducing IT infrastructure strategies such as server virtualization, where many servers are consolidated to gain efficiencies.

A long-term storage model

Because storage growth is not a short-term phenomenon, long-term solutions must be considered. Albert Einstein defined insanity as doing the same thing over and over and expecting different results. A more structured process model—not simply implementing bigger storage frames—is vital for controlling storage growth.

To change to a robust and predictable storage growth model and constrain capital and operational expenses, it is essential to change the way storage is perceived, architected, and operated. This requires sponsorship by both IT and the business, and a two-pronged approach is critical. A *strategic* approach is needed to obtain a long-term supportable model, and a *tactical* approach is required to manage day-to-day operations.

The strategy

A strategic approach for storage can be defined as a three-to-five-year process to enable a predictable storage growth and spending model. This will lower the cost of acquiring and maintaining business data. A successful strategy includes flexible architecture design, manufacturer selection, fiscal responsibility, and operational management, all of which must be structured to meet regulatory and compliance demands.

A practical storage model that can be leveraged and understood by your business is integral to a strategic approach. A storage model alters the initial cost of utilizing storage based on business function as well as the cost of the data over its lifecycle. A good working model provides tiers of storage, disaster-recovery options, and service times with set policies around enforcement by both business and IT groups. It needs enough flexibility to incorporate data classification and changes in technology, but with little room for individual line-of-business negotiation, as one-off agreements will drive up support costs.

Regulatory controls required by both business and IT must be included in the storage strategy. To meet compliance needs it is imperative to implement some form of data classification. This could, for instance, be along legal or security lines, which will allow the operational teams to know how to handle or protect data. Data classification has a long-term impact on the company, both legally and in being able to properly predict growth. Although some technologies can act independently of data classification to effect growth, a robust data-classification process allows operational staff to define the appropriate cost structure for business data.

The tactics

A tactical approach to storage consists of the short-term goals and processes required to operate a day-to-day storage environment, plus incremental improvements to meet a defined storage strategy. The primary elements considered in a tactical approach are the financing, operational support, process improvements, and technology mix.

The allocation of staff away from day-to-day management and “putting out fires” is critical; it is essential to have the commitment of both management and high-level technical support (architects), either internally or through third-party consultants. Their expertise is important for establishing a long-term model and defining achievable goals. Goals, such as provisioning within 48 hours or a utilization rate of 95%, should be clearly quantifiable. It is important to be realistic and to set milestone goals for the next few years. Establish priorities for each of these goals to provide additional guidance. For example, in day-to-day operations, there is often a trade-off between objectives (e.g., “Do we provision the storage quickly or prevent cable expense overruns?”).

Build a solution set capable of supporting the defined storage model to enable more-effective storage use and cost control. Associate standard processes to these solution sets to provide additional efficiencies. Limit control of the solutions to a small group with a strict approval process to provide governance over complexity and cost. If the organization is geographically dispersed, it is recommended that architectural directions come from a single group to provide conformity. If operational and architectural responsibilities can be centralized, this will further reduce the operational aspects of the budget.

An additional tactic is to change the capital acquisition model. In the last few years, as the storage industry has evolved, the financial models available from vendors have changed and may provide the ability to leverage a more sustainable storage environment. These features include new leasing options, capacity-on-demand, pre-purchased extended maintenance, and delayed payments for equipment refresh. Some features even include future price reduction guarantees. In most environments, the purchase of storage equipment is the start of a three-year relationship with that equipment and must be considered in that light. One of the challenges in many IT organizations is the sacrifice of long-term capital savings for lower short-term acquisition costs.

Look into several areas of day-to-day operations to create efficiencies and lessen manual tasks. Improved workflow helps minimize change-related availability impacts and provides the correct information for operational execution. In many organizations, the lack of clear workflow among purchasing, facilities, server, and storage teams significantly impacts provisioning times, capacity planning, and success.

Develop a multi-level tool set to improve efficiencies in a number of storage areas: provisioning, alerting, error reporting, change control, chargeback, path management, performance, host compatibility, and SAN status. These tools need to address features that feed into the business and

strategy, such as storage utilization reporting, business reports, customer dashboard views, etc.

Many of the tools on the market include mechanisms to prevent accidental mis-configurations and allow multiple individuals to schedule or perform activities on the same array at the same time. One reason that a multiple-tool model can provide additional benefits is that certain tools excel in certain areas but not in others, while some tool functionality remains vendor-specific. When implementing these tools, it is critical to identify a scalable model for them and the basis under which you will scale them. Scaling issues may occur if additional tool purchases are not associated with the purchase of additional storage.

The mix of technologies in the environment is another aspect of the tactical approach. To lower the cost of storage it is important to have different technologies that incorporate different cost structures. This will most likely result in multiple vendors for a number of reasons: best of breed, competitive pricing, and vendor relationship. However, this is a double-edged sword in terms of support. Although the Storage Networking Industry Association (SNIA) SMI-S standards have made headway into allowing support for more-heterogeneous environments, additional costs are always required to support multiple vendors. The more homogeneous an environment, the easier it will be to support. Adding vendors increases support costs by requiring further training and different strategies for maintenance. The harsh reality is that, as you consider the entire storage environment with virtualization, NAS, encryption, etc., multi-vendor support is unavoidable. So, provide a consistent methodology for multiple vendors.

Based on the selected architecture, it is possible to have multiple vendors with reduced additional complexity. Therefore, the issue is not multiple storage vendors or technologies, but awareness of the costs and headaches they present to your long-term storage environment. Develop a standard process to test and insert new technologies and vendors into your environment to help address this. This enables the easy addition of new technologies that act on the growth itself (i.e., data de-duplication technologies that may significantly change how much you need to grow and must be considered because of the long-term savings they offer). It is easier for organizations to use new technologies and approaches if the storage environment is current and strict refresh strategies are maintained.

With a valid tactical approach, it is possible to provide rapid provisioning, leverage more storage per administrator, achieve higher availability, use a tiered model, alleviate storage performance concerns, and reduce the maintenance

impact from which many organizations suffer. However, it does require some in-depth analysis, some expenditure, and process changes in day-to-day operations. The status quo in tactical functions will not address either the strategy or growth.

Storage growth is not going away. Storage has become an enterprise issue requiring a long-term scalable model. Both the strategy and the tactical plans must be continually revisited to ensure the model is still valid. As new technologies, different manufacturers, and changes in regulatory controls are introduced into the organization, re-evaluate both your storage strategy and your day-to-day storage tactics for expected impact.

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