

# Providing Predictability to Uncontrolled Storage Growth

## How Service-Oriented Software with Storage Analytics Addresses the Real Problems of Storage Management

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storage analytics: the value of knowing

## Contents

Overview .....	3
Service-Oriented Storage Management.....	4
Keeping the Software Simple .....	6
Gaining Storage Insight.....	7
Actionable Information.....	8
Delivering Storage Analytics .....	9
Controlling Storage Growth .....	10
About Us.....	11

## Overview

“Just buy more.” That’s the mantra many storage managers live by in trying to deal with their burgeoning storage management problems. With actual capacity and utilization of current storage resources typically a best guess and keeping numbers current a near impossibility, buying more storage capacity is often a storage manager’s only viable option.

Software reporting tools should make it easier for companies to understand and manage their storage resources. However, these tools tend to over-promise and under-deliver due to the complexity associated with installing and configuring them, which results in their failure to deliver on promised benefits, such as useful or actionable information. This leaves storage managers with selecting the less than desirable option of buying more storage capacity.

However the consequences of the “just buy more” philosophy show up in ways that fly below corporate radar screens. Continually buying more storage capacity negatively impacts companies in a number of ways including:

- ▶ Creation of more complex storage environments
- ▶ Data is stored on the wrong media leaving data under or over protected
- ▶ Hardware vendors use it as a backdoor to lock you in and charge you more
- ▶ Higher utility costs resulting from increased heating and cooling requirements
- ▶ Increased litigation risks resulting from retaining data too long or not long enough
- ▶ Money is spent on the wrong tier of storage
- ▶ More staff are needed to manage the complexity
- ▶ More hardware and software is needed to back the data up
- ▶ Storage purchases fail to match application data protection requirements

The mounting hidden costs associated with buying more storage capacity more than offset the short-term benefits that they deliver. Recognizing the impact of these hidden costs should give businesses the impetus they need to analyze, manage and control their storage environment in a manner that aligns with their larger business objectives of reducing costs. But to begin this process of reigning in uncontrolled storage growth requires companies first understand what storage resources they own and how they are utilizing them.

Internal and external ATA, FC, SAS and solid state disk drives housed by new and legacy modular and monolithic storage arrays are all contributing to a change in how companies manage and procure storage. But as the management and procurement of storage hardware changes, so also does storage management software need to evolve to match changing customer expectations for what they are willing to pay for the software and how they expect to use it once they pay for it.

To adapt to this new storage environment requires that companies employ a similarly new storage management software model that provides them a viable alternative to the “just buy more” philosophy. Key attributes that this storage management software should now deliver on to meet these new corporate requirements include a service-oriented architecture, a simple-to-navigate management interfaces, easy to create reports and actionable information for improved storage management.

# Service-Oriented Storage Management

Central to this evolution in storage management is the movement towards a service-oriented architecture that keeps the start-up and ongoing costs of software low. The traditional storage management software model usually calls for companies to pay a lot of money upfront regardless of the amount or type of storage under management. Conversely, the service-oriented approach allows companies to use the software in accordance with the dynamic nature of their environments.

By only requiring companies to make minimal upfront investment in the software in order to obtain it and then pay support costs in accordance with how they use it, they can easily start, stop or grow the software's use on a moment's notice based on what activities are occurring in their shop. For example,

- ▶ Some companies may only need to perform storage assessments once a quarter to determine if they need more storage for the next quarter and then turn it off once the assessment is complete.
- ▶ Others may want to collect statistics on a daily, weekly or monthly basis to establish usage trends and better manage their storage capacity on a day-to-day basis.
- ▶ Still others may only need to use the software once to prepare for a storage consolidation or corporate acquisition.
- ▶ Most companies will want to use storage management software for a mix of all of these purposes.

Using the flexible pricing model that a service-oriented architecture provides gives companies the ability to accomplish this while avoiding a pitfall common to storage management software – lengthy and complicated installs and configurations that create a type of dysfunctional consumer loyalty. For after companies pay a great deal for software that does not work, the company can feel obliged to go to heroic lengths to install and configure the new software regardless of the time and effort demanded since they paid so much for it initially.

With the new service-oriented model, companies put the onus back on the software vendor to prove their product works. Since companies only make a minimal investment in the software, the associated risk and product loyalty remains low until the product is installed and proves itself. Hence, storage management software vendors adopting this service-oriented model have a high degree of incentive to make their software easy to install and use so companies can quickly realize its promised value.

An initial way companies can measure the software's value is by assessing its ability to work with their current corporate storage assets. Companies generally prefer to use existing, paid-for assets until given just cause to do otherwise. So one of the first determinations companies should make is what they should do with storage assets they already own – keep using them or replace them.

Companies can only do that if the storage management software works with and in their current storage environment. This requires that the software remain agnostic to both corporate operating systems and storage hardware in order for it to capture needed storage

information. Examples of the types of reports that users should expect to create are utilization rates on storage volumes and file systems and whether the storage is internally or externally attached to the server hardware.

This storage agnostic approach also allows companies to predictably determine how to best use their existing storage assets when planning future capital expenditures. For instance, a company may need to bring a new archiving application online that requires large amounts of storage capacity with minimal performance requirements while at the same time they are preparing to retire excess storage capacity. This new storage management software can help companies stay apprised of this excess storage capacity and assist in determining if it meets the demands of this new archiving application. However, companies can only make these kinds of decisions if the software is deployed and in use.

## Keeping the Software Simple

Integral to this new service-oriented approach towards storage management software is the need to keep it simple at all stages of the software's lifecycle - from the software's initial install and configuration to its ongoing management to the ability of companies to understand the reports it produces, even to keeping it easy, unobtrusive and safe to uninstall.

One key to ensuring its simplicity and ease of deployment is the ability to quickly install agent software on servers without regard to the server's operating system version. Companies should expect to install this software without the necessity of a server reboot and to complete the software install in just a few minutes. Once installed, the agent software should gather needed storage data on each server and then send it to a central management server that aggregates and compiles the data from all of the managed hosts.

The central management server also needs the ability to communicate with the managed hosts in return to deliver additional management benefits. This mechanism permits administrators to easily create policies for a host or a group of hosts and then transmit the new or changed storage management policy to the affected host or hosts. Examples of changes that administrators might apply are changing or establishing what data on what hosts they need to gather, when and at what times the agents should gather it or if the host should stop gathering data altogether.

The creation of a central management server also minimizes the amount of staff time needed to learn the product and monitor and manage their storage infrastructure. It provides them with a common management interface from which policies can be centrally created and implemented. With corporate administrators now routinely managing tens or hundreds of servers with different operating systems, expecting them to log into each server that may have different operating systems and manage them in the same way is no longer practical. Centralizing the management of policies and making storage management processes definable and repeatable changes this. It also creates an environment with higher levels of predictability for daily storage management tasks as well as more insight into the data that resides on the storage.

# Gaining Storage Insight

Achieving this deeper level of understanding of how applications use the underlying storage infrastructure requires that the software monitor and report on three different storage attributes:

- ▶ File metadata present in local and mapped file systems
- ▶ Different virtualization layers
- ▶ Internally and externally attached volumes

The file metadata provides organizations with both basic and advanced levels of information. At a basic level, it lets organizations know how old files are, when they were last accessed or modified, who owns them, how large they are and where files on each system reside. Advanced capabilities that allow the software to distinguish between local and mapped file systems enable companies to determine if users or applications are storing and/or protecting their data appropriately.

Using this software across the enterprise also enables companies to quantify how much storage individuals, groups of individuals or applications consume on different servers and how frequently they are using it. Aggregating and centralizing this information across multiple different hosts gives companies a true, global picture of the total amount of storage that individuals, groups or applications are consuming as well as providing companies a better sense of the real storage costs that these different groups incur.

From this information, companies may start to draw a more complete picture of their storage environment. Capturing only file system or volume or disk level information gives companies at best an incomplete picture of their storage infrastructure.

Companies need both pieces of information to make informed decisions about what actions to take. For instance, receiving an alert that a file system is at capacity on a specific server is helpful. But for companies to know the right action to take, companies also need access to information that tells them how many volumes are allocated to that server, what percentage of their capacity is used – if any – and which ones can be added to the volumes that are hosting specific file systems to understand and address the problem at hand.

Equally important is the software's ability to determine if the server has internally and/or externally attached volumes and which is which. Internally attached volumes are considered by companies as sunk costs and unusable for any other purposes other than to serve applications on that server. Externally attached volumes offer companies the opportunity to reclaim these storage resources and provision them to other servers.

A failure of storage management software to capture the necessary data to allow it to distinguish between internally and externally attached storage volumes should be considered a failure of software at the most basic level. Without this data, storage administrators lack a critical piece of information that they need to make basic storage provisioning and purchasing decisions.

## Actionable Information

Though one cannot understate the importance of the software capturing the data, it is equally as important for the software to offer reports that make this information available to and actionable by end-users. Producing the reports they need should require actions as simple as pressing a button on the screen. Users no longer have the time or manpower to spend tens or hundreds of hours creating their own reports or to spend time downloading data into flat files before importing them into spreadsheets where the data can be further manipulated. While storage management software certainly needs to offer these options, using the software in this way should be viewed as the exception, not the rule.

Another software requirement is the necessity for users to generate these reports after just hours or days of operation, not weeks or months. The concept that software needs to run for weeks or months before users can glean any meaningful data is no longer practical in the dynamic, fluid environments in which users operate. In the same way that users bring storage hardware into their shops and expect to use it immediately, these same expectations now carry over to the software that they are using.

Yet even here a critical component is missing within storage management software. While some products have delivered these in the past, one distinct feature sets service-oriented storage management products apart from other software products.

Companies may only need to collect data on occasion or want to start and stop the software's functionality on a moment's notice. Used in this way, companies will generally find they lack the time, skill sets or personnel needed to understand and interpret the results produced by the storage management software.

To address this deficiency of time and skill sets, storage management software must increasingly take on higher level functions once performed by experienced storage administrators. This includes performing more complicated tasks like analyzing the collected data and providing recommendations as to what actions companies should take or best practices to implement to improve their storage management situation.

## Delivering Storage Analytics

Storage management software must now take the next step in its evolution – providing a storage analytics feature that enables companies to know how to act on the data once they have collected it. Merely collecting the data and providing reports is no longer sufficient as companies increasingly lack the experience and time to know how to interpret and act on the data and reports once they have it.

Including this new feature as part of the software gives companies direction as to what actions they should take. It helps to eliminate subjectivity that can creep into recommendations and allows users to match the data against industry-defined best practices in storage management and make recommendations accordingly. This helps to take much of the risk and skill out of the interpretation of these reports and assures companies that whatever actions they do take are in line with what other companies are doing.

Equally important, storage analytics introduces a centralized, enterprise-wide reporting and decision-making mechanism. By producing recommendations and actions that are in business lingo and not in tech-speak, everyone from the storage manager up to the company president can move forward with a greater degree of confidence on what their storage strategy is since they understand what is being recommended and on what facts these recommendations are based.

As these recommendations move from the board room to implemented procedure and practice, companies can then measure the effectiveness of these recommendations. By benchmarking what progress they are making through the use of either ongoing or periodic data collections, they can see what effects new policies are having on containing storage growth and on better managing their existing and new storage assets.

# Controlling Storage Growth

Uncontrolled growth is the result of poor storage management, not the cause of it. Changing to a predictable model of controlled storage growth requires that companies introduce affordable and easy to implement software that ends the spiraling, out-of-control cycle of storage growth often perpetrated by the “disk is cheap” agenda that hardware vendors espouse.

Two TeraCloud Corporation solutions, TSF Lite and TeraCloud Storage Analytics™ (TSA), provide companies with a way to escape this current model of storage management. Without breaking either the bank or the backs of the individuals tasked with implementing it, companies can affordably and easily implement Teracloud’s TSF Lite to collect data on their current storage environment.

Once data is collected, companies can then leverage TeraCloud’s Storage Analytics™ to benchmark their current storage environment using its embedded Storage Quotient™ capabilities. This allows companies to establish a base line on how current storage resources are being used and, over time, use it to document the impact that policies and best practices recommended by TeraCloud’s Storage Analytics™ are having on the organization. Ultimately, companies will see the real benefits of the product on their bottom line through better utilization of their current storage resources and by making more informed buying decisions in the future.

Neither TSF Lite nor TeraCloud’s Storage Analytics™ will end the upward storage spiral that all companies find themselves in. But using the information they provide can help companies act more intelligently and help to take out some of the risk and subjectivity that storage buying decisions typically introduce. And by helping companies stop feeling out of touch with their storage utilization and growth, TSF Lite and TeraCloud’s Storage Analytics™ start companies down a new path towards more predictable and controlled storage growth.

## About Us

TeraCloud Corporation continues to define the storage analytics market serving global Fortune 2000 and small and medium business (SMB) customers. TeraCloud's groundbreaking Storage Analytics (TSA) technology provides storage utilization analytics to pin-point conditions and predictive events where storage utilization is sub-optimized. Regardless of platform, the TeraCloud Storage Framework (TSF) v2.1 provides enterprise customers with instant knowledge for predictable storage management from a single view. TSF Lite is the only product to provide SMB's with a powerful, enterprise-level and cost-effective tool for predictable storage management. TeraCloud's SpaceFinder Suite v4.4.1 gives customers the knowledge for predictable storage management on the Z-series platform by providing automating storage administration that monitors, detects, analyzes and proactively resolves issues threatening storage availability.

Founded in 1991, TeraCloud Corporation is a privately held company based in Bellevue, Washington.