



Do You Need A Storage Management Policy?

*An NTP Software
White Paper*

Many companies have made significant investments in Storage Resource Management, and derive great benefit from it. Why did they do this, and should you do it too?

Abstract

Companies vary greatly in their approach to storage management. Most organizations have some policy; a few have none. Of those with formal policies, many use 3rd party technology as a part of their efforts. The purpose of this paper is to help you understand why they went down this path and how they succeeded.

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Introduction

While companies vary greatly in their approach to storage management, out of necessity, most have some formal policies in this regard. Today's disks are large and relatively inexpensive. But at any given time there is a finite amount of space to be had. Unlike electricity and bits from the Internet, network storage is not renewed over time.

The challenge, then, is to figure out how to avoid running out of resource (capacity, performance, protection), on a day to day basis, and provide the user community with a consistent, cost-effective level of service.

The purpose of this paper is to help you understand the issues and organizational dynamics that underlie Storage Resource Management (SRM). This will give you insight into how to move from where you may be today into a well planned and well managed, stable, reliable environment, offering a consistently high level of service to your client community that can only enhance your career.

The Context for Storage Management

Storage management is just one of the many aspects of IT operations management. As such, it is subject to the same conditions that are involved in the other areas of systems management, namely:

- Providing cost-effective and reliable service
- Monitoring performance and maintaining control
- Allocating cost

We will examine each of these in turn to see what they mean to storage resource management.

Providing a service

The first thing to realize is that the storage on your network is not an object, it is a service: short and long term business object storage and retrieval. Once you see storage as a service rather than an object, it is easier and more obvious to understand that provisioning (purchasing disk drives and adding them to the network) is just one aspect – and the easiest part – of storage management.

Delivering a guaranteed, uniform level of service over time, and doing so cost-effectively, are the harder aspects of storage management. This means we need a standard of performance and the ability to measure our delivery.

To offer any committed level of service over time, we also need to ensure that the actions of one user cannot interfere with the entitlement of another. This means we need the ability to control the amount and manner by which storage resources are used.

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Establishing control

As with most of the network, storage is a shared resource, used by many people at the same time. If someone hogs it all, others are denied. If some are denied, then our committed level of service is not met.

In well managed IT shops today, formal Service Level Agreements (SLAs) are common. Just as users should expect SLAs for application availability and response time, SLAs for information storage, retention, and retrieval time are perfectly appropriate.

But, before you put yourself on the hook for a committed level of service, you had better establish some sort of control mechanism. It is a fool's exercise to be held responsible for results without being able to exert some control over the process by which they are obtained. Without a measure of control, your success is entirely in the hands of others whose interests are not the same as yours. Your success becomes, at best, a random event.

Cost allocation

Finally, competent IT operations management includes the ability to tell users and senior management alike where their money is being spent. In an open market, no one buys services without a sense of the cost and an ability to track it. This common sense rule is not suspended simply because services are provided internally. To do the storage management job well, we need to be able to track costs and assign them where they belong.

Effective Storage Resource Management

Gaining effective management control of storage improves the use of resources, increases up-time, and saves money. Competent storage management has a positive impact upon reliability, scalability, security, efficiency, and challenges in law (e.g.: copyright violations). A Storage Management Policy is a necessary part of appropriately controlling the use of corporate resources.

IT professionals serve their user community by keeping corporate computing resources and information available with consistent and predictable levels of service. The goal is to maintain the timely and free flow of information maximizing overall employee productivity. It is never the goal to deny service, nor any quantity of service, to someone with a valid and appropriate need.

Hardware is not the issue

Storage volume requirements continue to increase dramatically over time. Storage Area Networks (SAN) and large capacity drives are available to meet this demand at a wide variety of price points. The challenge is not one of finding hardware large enough to accommodate the need. It is one of having the storage it provides on-line and available at the right moment, without spending wastefully.

Storage management software is available

Storage management is often a problem for network administrators who spend time manually compiling information, writing scripts, analyzing disks, partitions, and managing users over and over again, without gaining any leverage.

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Specialized software is available to automate these tasks, and help network administrators prevent problems. This software can monitor and limit use, highlight potential concerns, and provide storage administrators and management alike with an enterprise-wide view of their operations.

The right storage management software provides tremendous timesavings and allows the organization that employs it to focus their efforts at a higher level. Rather than spend time manually deleting files and hassling users to do the same, the empowered systems management staff can devote their attention to planning for growth and managing costs.

What do we need to manage?

- Quantity – how much of the resource a user or group of users consume
- Content – what they put in what they consume, and where they put it
- Concurrency and performance – how many customers do you service at one point and to what standard of performance

Concurrency and performance is heavily tied in with your network architecture and needs to be part of what you manage. However, network architecture is beyond the scope of this paper and can't be dealt with here. The remaining aspects of concurrency relate to issues of quantity and are a part of that discussion below.

Quantity

To maintain control, the first thing we need to do is establish limits on quantity of use: both on the amount that can be taken by one person or group and on the number of people we will service from any particular point. **The purpose of these limits is not to deny service.** Rather, we need limits to maintain and ensure our ability to provide some measure of service to everyone.

The amount of system resource available, be it bits on the disk or bits in the wire, is finite at any moment in time. If we do not control usage, then we have no way to assure that our promise to the next user can be met. An uncontrolled scenario leads to the same result for storage as it does for electricity. Power company brownouts and blackouts are the result of letting users consume as much as they want, whenever they want.

If we don't control what one user or a group of users can consume at any given point in time, then sooner or later someone with a valid claim to service will be denied.

Content management

Once we have established some limits on how much space can be used, we need to exert some control on how it can be used, or we will be back in trouble again. If users exhaust their home directories with downloaded MP3 files, have we managed storage effectively? If weeks of work disappear because it was only saved on a crashed C: drive that had no backup, is our storage policy adequate? Who doesn't know of someone in each of these situations?

Managing storage effectively not only means controlling how much space gets used, but also what gets put where.

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What else do we need?

Effective storage management technology

Effective storage management technology lets administrators do more, save money, anticipate future needs, and eliminates the risk of unexpectedly running out of space – thereby harming everyone’s productivity.

To do this, good storage management software provides the following functions:

- Storage limits on users and groups of users
- Limits on the size of shared objects
- Control over what can be written to servers and/or desktop machines
- A user-friendly mechanism for giving status and enforcing limits
- Real-time monitoring and alerts
- A consolidated, enterprise-wide view of currently in force storage policies

A Storage Management Policy... the rest of the solution

Storage hardware and software management tools are available and in use by many. But often overlooked is the lack of a clearly articulated policy for their implementation and the use of the resources they supervise.

If you recognize the value of storage hardware and management software, then you should also realize the value of a Storage Management Policy – a set of guidelines defining the corporate rules and responsibilities for storage services and usage. Your storage architecture is incomplete without a Storage Management Policy that includes buy-in from your user community and senior management.

Users and management need to understand that they share a responsibility to participate with you in keeping things under control and clean for the good of everyone. Their data is more likely to be available the moment they want it if the corporate storage resources are not filled with “junk”.

A sensitive issue that requires the right approach

Storage hardware and software management tools are only a part of the solution. On-going cleanup and management will directly impact your users. They (the users) play a key role in deciding whether to leave information on-line, delete it, or archive it. It’s their data and only they know what is important to the business and what is not.

Simply having the right technology is not enough. You may need to go through a structured policy development process to address the institutional dynamics of change, and help your clients accept limits where there were none before. While this may sound like a lot of work, doing it this way will make your job a lot easier in the long run.

This can be a sensitive issue because you may be asking your users to place limits on something they perceive as infinite or free. Success takes a human touch. Storage management software will tell you if something is wrong, and will it help you to fix the problem, but it won’t deal with misunderstandings between users and systems administrators.

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Your goals and the value of Storage Resource Management to the institution need to be carefully communicated. The people being affected need to understand why the company is implementing storage management. They need to know what their role in the process may be. And they need to see value in it for themselves.

Key points

Three key points to keep in mind going forward:

1. Recognize that you need a clear Storage Management Policy, not just storage hardware and management software
2. Understand that you need buy-in from all parts of the organization to be successful in implementing SRM
3. Use proven techniques to set up your Storage Management Policy

Policy success - avoiding political problems

An understanding of human nature is important in this task. Your approach in preparing the user and management community and in developing policy is critical to the success of the project. Your users' perception of the value of this change to them will make the implementation of storage management either easy or difficult.

Don't Dictate

Network administrators (and IT personnel in general) often have little experience with marketing or 'spin'. As a result, their public messages can sound dictatorial - like a general commanding a computer. Blunt statements directing users will not endear them to you or to your management, nor will they get you to your objective with the least resistance. Dictatorial messages are not the right approach because of the way people perceive them.

In situations that require the cooperation of others, salesmanship wins the day. IT management is well advised to "play the game" to get what they want. If the concept of Storage Resource Management and of a storage policy is "sold" to the organization, your job and that of the job of the storage administrators will be much easier.

Help users understand why

The timely and free flow of network data depends on users' actions too. They need to understand the reason for storage management, quotas, and why their participation matters. They should also understand that "a policy" clarifies the rules of the game and makes it fair. Everyone knows what is expected, and what is prohibited. The reason to control user disk space is to improve service to everyone.

What's in it for them?

The "why" above is what's in it for the institution. But people at work rarely function based on altruism. The rational person wants to know what's in it for them. Remember, quotas aren't about the denial of service, they are there to preserve the ability to offer service. A new storage policy needs to be explained not only from the perspective of the good of the institution; the benefits to each individual user need to be explained.

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One of the primary benefits to each individual is that they need not live in fear of being the odd man out. If storage is left unmanaged, *someone will be denied*. The payoff for participation is that you are no longer at risk. You will not be denied.

Get the authority to do it

Senior management needs to publicly endorse the storage management initiative and the new policy. This might be in the form of an email from the President or CEO stating the reasons for the undertaking and what is expected of all employees. They should go on to explain the benefits to the institution including the dollar value of what's being done.

If appropriate, ask Human Resources to be directly involved and to help with the legal and employee relations issues (i.e.: policies relating to objectionable materials on network and copyright violations).

Provide advance notice

Just letting your users know that storage management is becoming a priority will, in and of itself, cause some people to clean up what they have. Once the policy has been developed, publish it and the outline of your project plan. Give users a chance to see where everyone is headed. Offering them a "heads up" that this is coming will make their transition easier.

All users are not the same

Find out when there are special storage requirements and who needs what and why. Different groups of users will have different needs. You need to know what they (the groups) need and treat them accordingly – and differently.

One group of users may have relatively large storage needs (i.e. engineers' CAD files, marketing users' graphics images), while other groups of users' needs may be minimal. Survey departments and assess their needs. Audit current usage trends and see what patterns emerge.

Questions A Storage Management Policy Addresses

A document consisting of a couple of pages that clearly articulates the rules, roles, and responsibilities should be sufficient for most companies. It can be posted on your Intranet for easy reference and, in more formal institutions, it can become part of your employee handbook.

The policy you create needs to be acceptable to users and to management, and it needs to be appropriate to the scope and ability of the technology within the company.

The process you use to develop your Storage Management Policy and the policy itself should address:

- Who gets to set the rules?
- Who can make exceptions to the rules?
- What should be the default quota size for various user groups?
- Are there any content prohibitions?

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- Are quotas soft or hard? When do you make the transition?
- What is the process when users reach quotas? (e.g.: Alert when close to quota, allow time-limited overdraft, etc.)
- Management's and users' roles and responsibilities
- Backup and archiving responsibilities and service levels

How To Form a Corporate Storage Management Policy

Why not save yourself time and aggravation by setting up your Storage Management Policy using a proven, structured approach? The following section offers suggestions on how to successfully navigate the process of building your Storage Management Policy.

Use a team approach

Different groups within a company can see themselves at odds. In the case of user storage requirements, the network administrator may be in conflict with a consuming user (who may be well connected and important in the company).

“Just give me more space, please! My job is important and has to be done now!”, is a common response from a user to the storage administrator.

An improper approach will make users take on the view that big brother is watching them, and they are being harassed. The user in question needs to see him or her self a member of a group all of which is being fairly dealt with.

People relate to inclusive words that have a positive sound like “we” and “our” and “team”. The users and storage managers are on the same team. They just have different jobs, each of which has to be done with integrity and fairness to all. “We need to address this issue *together* so that *everyone* can enjoy quality service.”

Part of your job is selling the concept and helping users understand that the information on the corporate network belongs to the company, not to them personally. Convince them that they are part of the same team and that their contributions in helping you manage storage will benefit everyone – including them.

Keep all users involved

People like to feel like they are informed and that their opinion counts. Let your users know that your company is going to develop and implement a Storage Management Policy and that you seek their advice and input. You need to work together with the user community to make sensible policies. Involve a representative from important constituencies who can articulate their group's requirements.

Keep management involved

Recognize that change is stressful on management too. Anyone who is not happy takes his or her complaint to management. Management profits from knowing in advance who will be complaining and why. You need to give management the words to use in explaining why the unhappy person should abandon their current position and go along with the plan.

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In addition, management needs reassurance that the program is succeeding – that all the pain and effort is worth it.

Use a pilot group

Start with a subset of the employee base when you implement your policy and storage management solution, preferably with a group that is sympathetic and see the value of your undertaking. The goal should be to start small and work through the things that may have been missed in the initial plan with a small, friendly group – not when the whole company is watching you.

Transition period – soft to hard quotas

Give your user community a transition period and move forward in steps. In some situations, you should use soft quotas at first. Start with reminders but not hard denials of service. This will allow you to see if the initial limits are truly adequate and you will find out who cannot live within their means. When you do move to hard quotas, there won't be any surprises.

Your opportunity to look good!

Consider this a career enhancing opportunity. If you use the approach discussed in this paper to develop a corporate Storage Management Policy, you will succeed. Providing a cost-effective, consistent, and reliable service with a clearly articulated usage policy will put you head and shoulders above most others in the industry.

Appendix A – Sample user quotas

The values below represent the average of a broad sample taken across companies of various sizes and industries. They are intended to provide a starting point that should allow users adequate space while not being overly wasteful.

The right limit for you to set depends on your business and your cost for providing additional resources. If your storage environment is configured dynamically, then the cost of additional resources is low. You can just drop in a few more drives, edit a few parameters and go. In this case, you should tend toward economic efficiency and set somewhat lower quotas.

On the other hand, if your systems require rebooting, reformatting, and reconfiguration to add capacity, then your provision cost is high. Given this, you should set higher quotas as the cost of wasting space is low compared to the cost of provisioning more.

<u>Role</u>	<u>Low limit</u>	<u>High Limit</u>
General User	50 MB	500 MB
Power user	500 MB	1,000 MB
Administrative staff	500 MB	1,000 MB
Contractor	250 MB	500 MB
Marketing or Graphics	1,000 MB	5,000 MB
Developer	1,000 MB	2,000 MB
Executive	2,000 MB	(no limit)
Network Administrator	2,000 MB	(no limit)

In addition to the base quota above, and depending on how many users you host in one area, we would also suggest an aggregate quota to improve the overall efficiency in the allocation of resources, as follows:

Given any large group of users, say 200, every user won't all be at or near his or her quota. In fact, a reasonable model would be to have a quota such that about ½ the users were below 50% of it, and ½ the users were above 50%. This means that the actual storage used would be about ½ times the number of users times the quota. (For every use above half, there is one below half, which means, on average, each user consumes ½ the quota.)

We could then set an aggregate limit of ¾ths of the number of users times the quota and release the remaining storage to other applications. This is similar to the way airlines and hotels overbook – we promise more than we have so that actual use is nearer to actual capacity. In a large network with many users this improvement in economic efficiency can be worth hundreds of thousands of dollars a year.

Appendix B – Sample Storage Management Policy

Quotas

User quotas

As indicated in the previous Appendix

Shared directory quotas

As appropriate for each shared resource based on actual use

File screening

Prohibited files for servers

.MP? (MP3, MP2, etc.) – all music files

.VBS – virus protection

(optional)

.PST – no personal email stores (security issue)

.GIF; .JPG – for those concerned with downloaded images (i.e.: objectionable content)

Prohibited files for workstations

.DOC, .XLS, .PPT – corporate work product is required to be stored on server directories with backup

.VBS – virus protection

.PST – (as above)

.GIF;.JPG – (as above)

Backup and Archive

Backups

Full backups weekly, primarily for disaster recovery, incrementals done nightly, weekly tapes off-site after 1 week

Archive

(Optional) If present, then integrated with quota policies

Retrieval

Automatic (but not instantaneous) for archive, 4 hours from backup tape

Performance

Four second maximum delay accessing any server-based file

Appendix C – NTP Software Professional Services

For further assistance in creating a corporate Storage Management Policy, please contact your NTP Software Account Representative at 800-266-2755 or 603-622-4400.

NTP Software offers end to end consulting and training services to assist in the deployment and configuration of your storage management software. Our Professional Services staff is certified in our, Microsoft's, and other technologies and includes certified instructors for these technologies as well.

<http://www.ntpsoftware.com>