Defining Information
Technology Services

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SYSTEM 3 WHITE PAPER SERIES

Storage for your Networked Enterprise

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Introduction:

Data is increasing in today's business. As more and more organizations invest in information technology (IT), they are becoming more dependent on the value of data. Many applications, such as customer relationship management (CRM), have been developed specifically to enhance the ability to use data to gain a competitive advantage. Other examples include Microsoft's widely deployed Office suite, which provides rich functionality and ease of use, and PowerPoint presentations, which have become a standard method of sharing information. Email has also contributed to significant data growth, as it has become a critical means of communication. All of these applications are examples of how data capacity needs have grown in a typical business.

While data capacity demands are growing, available resources in many small and medium-sized businesses (SMBs) continue to be limited. The responsibility to maintain sufficient capacity and reliable storage often falls on relatively small IT departments, or perhaps on a single individual. Current business climates are demanding more for less, with managers scrambling to keep up with demand without adding to staff or expanding budgets. Many IT managers and network administrators experience the following challenges:

- Limited time to implement and manage network and storage infrastructure
- Limited staff - many times a one-person operation
- Limited budget and the imperative to keep total cost of ownership (TCO) as low as possible
- Need for easy integration of products into existing environments
- Need for simplified management

Within environments such as workgroup local area networks (LANs), general-purpose servers have become the traditional method by which to share resources, including user files, printing services, and applications. Typical methods of adding storage to workgroup environments have been to either add hard disk drives to existing general-purpose servers or to eventually add new servers.

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A Typical Workgroup Environment

Networks evolved from a need for users to share resources, including files. The ability for multiple users to access the same file data- whether they are sharing a design drawing, software code, or images - is essential for many businesses.

Workgroup environments can be composed of either entire SMBs or a single, smaller group of users within a larger company. In workgroup environments, general-purpose servers have been deployed to provide a variety of functions. In some cases, one or two servers may provide all services for the organization, including file sharing, printing, email, and applications that are vital to the company's business. Many times the servers proliferate as the organization grows and adds new applications and resources.

Over time, IT managers have deployed several general-purpose servers to address specific tasks. For instance, one server might provide file sharing and/or printing capabilities, another might run an email database, and another still might serve as an Internet gateway to provide Web access to users on the LAN. This phenomenon of having each server dedicated to a limited number of tasks has evolved from the need to provide maximum performance for all network functions. Having one general purpose server running all applications can often result in a bottleneck in throughput and response time, depending on applications and the number of users.

Today's Growth Storage

The need for storage is exploding among all segments, from small businesses to large datacenters. Today's workgroup environment is no exception. Storage needs are increasing due to a variety of factors:

- A general increase in file sizes
- More graphics, video, and audio content
- An increase in digital applications, marketing materials, and online facilities as many small businesses enter the digital media age
- An increase in email content and reliability
- An increased need for backing up existing file and application servers

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In general, applications typically found in SMBs have evolved to become extremely robust and content rich. Pervasive products, such as Microsoft Office, continue to advance in functionality and features, and they continue to drive demand for more storage capacity. File sizes are expanding as more content contains graphics and other content-rich features, such as audio and video.

Email is another application that continues to grow, seemingly unabated. This application is a major driver for storage capacity because it has become a vital means of communicating and transferring information among workgroup users. Email is also affected by new content-rich features, as large attachments, such as documents, design drawings, and video and audio content, are becoming increasingly commonplace.

Not only is email taking up a larger chunk of the storage resources, it is also becoming more critical to the livelihood and productivity of many businesses. After the September 11 terrorist attacks, IDC learned that many businesses consider email to be a mission critical element to their organization.

In short, businesses have learned to exploit their data. For many, the value of the organization's data has become the value of the organization itself. Those in charge of managing and protecting the growing volume of critical data are often left paralyzed and overwhelmed.

So what is the Solution, the Tradional Ways

Adding a Hard Disk Drive: What might appear to be a logical approach to increase storage is to add or upgrade HDDs in existing servers. IDC (a research company) believes this a standard procedure when it comes to adding storage. While the cost associated with this procedure is enticing, there are other issues that significantly degrade this option's popularity.

First and foremost is time. A huge pain point for many IT managers and administrators is finding the appropriate time to service the network infrastructure while minimizing the impact on the users. Upgrading and reconfiguring new disk drives require taking down the server for at least several hours if not days. For most managers in SMBs, the process involves undesirable late night or weekend efforts. Adding to the business disruption caused by downtime is the complexity of reconfiguring the new drives. While many managers describe this process as being relatively straightforward, they still think of it as arduous - largely due to the manual process of making sure everything is reconfigured correctly.

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Adding General Purpose Servers: Another method by which to add storage is to add general-purpose servers to the network. As with adding disk drives, this solution appears to solve a problem, but comes with its own share of issues.

First, from a storage perspective, this option is relatively costly, beginning with the initial purchase of the server itself. By definition, a general-purpose server is capable of performing a variety of tasks, mostly enabled by a full operating system. In terms of simply increasing storage capacity, adding a full general-purpose server can be overkill. If the server is deployed as a resource to share files among network users, many of the features contained in the server and its operating system go unused. In addition to the initial hardware cost, software licenses must be purchased depending on the number of users or applications accessing the server.

Adding new servers, like adding HDDs, requires IT managers to consider the time factor. While the existing servers can still function to provide minimal impact on network users, IT managers are once again faced with finding the time to set up the new server - usually a day or more.

Of course the proliferation of network servers also means more hardware to manage. Managing more physical units and multiple file systems only adds to the IT managers' burden. Further, the more servers on the network, the more people-intensive the process and complexity of implementing the backup and restore procedures.

Another disadvantage of having multiple general-purpose servers is managing unused capacity that might be left stranded on one server while other servers' capacities are full. Manually reconfiguring and remapping drives add to the management complexity and once again lead to inefficient use of time for the overworked administrator.

So is there a Solution ?

Specific network storage architectures and products have evolved over time to address increasing capacity needs while easing long-term management. Networked storage solutions allow for the sharing of storage resources to ease the burden of managing individual pools of storage. In the same way that having a network printer negates the need for individual printers for each user, networked storage can consolidate the need for multiple storage pools and can further consolidate backup procedures as well as the need for multiple or transferable tape drives.

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STORAGE AREA NETWORK

A storage area network (SAN) consists of multiple storage systems, or arrays, connected through a hub or switch to various servers on the network. The most common type of protocol used for this connection is Fibre Channel - a block-based, point-to-point connection.

For a variety of reasons, SANs are not an appropriate solution for many small businesses. SANs help to consolidate storage resources at a block level. "Block-level" communication is the method by which disk drives communicate with the central processing unit (CPU) of a computer. Files consist of blocks of data organized and managed by a file system contained within the operating system. While disk resources could be shared and maximized with a SAN, the architecture does little for improving or consolidating file sharing without continuing to burden the file systems on the existing servers.

SANs can also be costly for most SMBs. On top of the initial purchase of storage arrays, IDC estimates that an entry-level Fibre Channel switch may cost as much as a small, general-purpose server. In addition, Fibre Channel requires specialized tools and skills to implement and manage. While TCP/IP and Ethernet are pervasive and expertise is in abundance, Fibre Channel expertise can be difficult to find and costly.

The typical installation for SANs requires skills that are beyond the capabilities of many organizations and can be relatively time-consuming, requiring the help of outside consultants.

NETWORK ATTACHED STORAGE

Network attached storage (NAS) provides an approach to adding networked storage that is similar to general-purpose servers, but its installation is nondisruptive, and it has been optimized to do one thing: file sharing. IDC believes NAS is an appropriate and cost-effective solution to address many SMB storage needs.

NAS appliances are storage systems that contain an internal operating system and corresponding file system. The operating system is optimized for file sharing by including only those functions pertaining to the file system and protocols that allow file-level communication with network users or applications. All other functions that are not integral to file sharing are generally removed or disabled from the system.

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Summary

Storage is critical for your networked architecture, if you are not thinking of it now, you are late, the data in your organisation is growing exponentially and keeping records of data are becoming more and more important day by day.

System3 has partnered with companies, and developed it's own line of Network Attached Storage, and Storage Area Network solutoins, we can get you up and running in as low as 15 minutes, and attend to your immediate need of growing data.

Learn More

Give us a call at +91.11.4171.6194 or 4171.6195, and speak to one of our storage specialists. In case you wish to discuss a case study on how we can implement a solution for your enterprise, send us a mali at sales@system3.net, and we will work out a solution, within your budget, and put a team to implement it.