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Enterprise Storage (SAN NAS), Virtualization
Disaster Recovery, IT Consulting & Services

Tiered Storage Solutions

Technical Whitepaper

August 2007

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TABLE OF CONTENTS

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EXECUTIVE SUMMARY

The increasing use of business applications are underlying factors in volume growth and increased complexity of business information and data. This poses much challenge for organizations of all sizes with regards to the optimal storage management strategy to employ.

Industry surveys have revealed that the field of backup, disaster recovery, security and long term archiving as top storage concerns. In order to address the above concerns, it is vital to manage volumes and volumes of data and multiple business applications with varying service level requirements. Despite taking into consideration necessary dedicated staff and storage resources, this can not only be time consuming and labour intensive, but costly as well.

What is the answer to this? 'Consolidation' with tiered storage is the key to these challenges. It allows for an effective, streamlined method in managing increasing data volumes whilst reducing the efforts required for managing this data, improving utilization levels and availability and even more so improving backup, recovery and archiving.

This paper aims to discuss consolidation with tiered storage for creating and optimized storage environment.

THE CONCEPT OF STORAGE CONSOLIDATION

The value of data is well known to many, from small and medium businesses, to enterprise organizations. Due to the importance of this information, there is much challenges associated with storage of this data, and more so the ways in which to protect this data and ensure of its availability to users and applications on demand.

The growth of data in recent years has forced many organizations to provide necessary storage infrastructures to meet these demands, and thus the environment is increasingly becoming more complex with higher capacity, performance and availability requirements. These solutions usually are a conglomerate of storage subsystems, from disparate technology providers, on a per needs basis over time. This has its advantages of accommodating needs of organizations, however poses new challenges in that the resulting infrastructure is more complex and costly, difficult to manage and scale, less than optimally equipped to meet the capacity, performance and availability requirements for applications and servers.

Storage consolidation is a method to easily and cost effectively meet growing requirements of data sharing, high performance and high availability through centralized storage resources amongst numerous application servers. Storage consolidation architectures solve the many problems that businesses are faced with whereby the data storage requirements are outgrowing the capabilities of traditional storage solutions. The benefits include enhanced storage utilization, higher availability, centralized management, and lower total cost of ownership (TCO). In addition, through streamlining of storage, consolidation improves backup, recovery and archiving as well, allowing businesses to have better protection of data with reduced backup and recovery timeframes and better disaster recovery solutions.

TIERED STORAGE CONSOLIDATION

Traditional storage consolidation can improve the way in which businesses store, protect and access their valuable data, however it can also under deliver if all applications are treated equally. As the number of applications increase on the same array, it becomes more difficult to associate the most widely used information with the best performing hardware, thus preventing businesses from enjoying the full benefits and cost savings of storage consolidation.

CONSOLIDATION THROUGH TIERED STORAGE SOLUTIONS

Tiered storage is a methodology by which storage of varying performance and cost characteristics within the same or multiple storage systems are employed to accommodate varying demands of business applications. This is an initiative to create a complete and efficient storage environment, giving administrators flexibility in resource utilization through hardware

level alignment to the appropriate information value respectively, i.e. lower performing disk drives and software solutions to be deployed for non critical businesses applications for cost effectiveness whilst meeting the requirements.

Through precise execution, tiered storage can enhance service levels for critical data while lowering the overall costs. This advantage makes tiered storage a very attractive option for today's businesses. In tiered storage methodology, different categories of data are assigned to different types of storage media. Tier-1 storage categorized as mission-critical, frequently accessed, or high confidential files which can be stored on more expensive, higher quality media. On the other hand, the vice-versa applies for higher tiered numbers whereby as the numbering increases, more cost effective media will be deployed instead.

MAXIMIZING VALUE OF TIERED STORAGE WITH QUALITY OF SERVICE TOOLS

Given the requirements to optimize budgets for IT despite growing needs of data storage, it is imperative that in order to meet these demands, many organizations are considering the cost savings of storage consolidation technologies. However, while consolidation can be a cost effective solution, a consolidated environment can be complex – thus implementing and managing it can be labour-intensive and expensive if the required software functionality does not exist.

Today's storage consolidation technologies simplify and automate quality of service (QoS) management, thus justifying the business value in storage consolidation. QoS tools allow for easier, reliable and efficient delivery of high service levels for mission-critical applications by automating the dynamic process of allocating system resources accordingly. QoS tools also allow administrators to determine the cause of performance problems when they occur, isolating the root cause of the problem and assisting with diagnosis and resolution. This allows for more accurate and effective problem resolution as they occur.

An effective QoS storage management tool will provide the following capabilities:

- Storage resource management based on service levels, monitoring and array performance tuning to meet application performance demands;
- Optimize performance based on policies that allow for performance goals setting for critical applications and limits on lower priority applications, scheduled policies to run at different intervals;
- Understanding of application performance from a storage context

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TIERED STORAGE TECHNOLOGY

Storage Area Networks (SAN) technology has been adopted by many organizations for managing their corporate data. The fundamental appeal lies in its capacity for speed and ability to interconnect storage devices with associated servers. In this environment, disk mirroring, backup and restore, archival and retrieval of archived data, data migration between storage devices and other advanced storage functionality is available.

The two most common and widely used standards for storage connection in a SAN environment are Fibre Channel (FC) and Internet Small Computer System Interface (iSCSI). The higher performance of the two being FC SAN for connecting high performance mission critical servers to shared storage systems. The counterpart iSCSI SAN is an IP-based standard for linking data storage devices over an IP network and transferring data through SCSI commands. This infrastructure is very flexible, allowing transmission of data over local area networks (LANs), wide area networks (WANs) or the Internet, enabling location independence of data storage and retrieval.

The most noticeable difference between the two standards is that of performance and cost. On the performance throughput comparison, Fibre Channel is much higher than what is achievable with iSCSI at present. However, with the soon to release 10GBps Ethernet standard for iSCSI, this improvement would pose much competition to Fibre Channel.

Fibre Channel is a matured technology aimed at high performance environments such as large enterprises. On the other hand, iSCSI can provide the right level of performance for typical email and OLTP applications for mid-market enterprises. Today, many organizations of all sizes are becoming aware of the benefits of iSCSI, as it can be delivered at a lower cost.

CONCLUSION

There are many challenges today for organizations in storage management given the ever growing volumes of information. Tiered storage is a practical and viable choice for overcoming these challenges. In order to fully utilize the advantages of consolidating with tiered storage, organizations must employ a system with performance, price and connectivity support to its storage environment respectively.

Netelligent Group is a specialist IT Consulting company in the field of Enterprise Storage (SAN/NAS), Virtualization and Disaster Recovery. Netelligent Group is focused at addressing the IT Challenges of your organization through practical value based propositions of 'cutting-edge' independent tiered storage consolidation technologies.

FURTHER INFORMATION

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