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Strategic Snapshot

NAS Gateways

The Evolution of New Datacenter Solutions

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ABSTRACT

The business value of enterprise storage solutions rests on the notion that preserving and providing ready access to information such as intellectual property, product development data, and sales and marketing results can enhance or improve the way an organization operates. How businesses choose to execute their storage strategies can embrace a wide range of applications and hardware, but over time, optimal system flexibility and price/performance remain two essential qualities businesses look for in storage solutions. While Network Attached Storage (NAS) has long been recognized as a cost-effective approach for fulfilling low-end storage requirements, its appropriateness for large enterprise and datacenter environments has been debated. However, recent developments in NAS technologies have altered the landscape of these solutions, extending their capabilities and flexibility while preserving their cost-effectiveness. As a result, some NAS solutions can play key roles for the highest-end enterprise storage users.

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NAS as a Tactical Solution

Originally, NAS was envisioned as a tactically deployed solution incorporating single-purpose storage appliances that leveraged existing IP-based networks within enterprises. This style of network-based storage was designed to address the needs of enterprise workgroups and departments, remote locations such as field offices, and SMB. NAS solutions were typified by their low cost and relatively low impact on IT, but over time, enthusiasm for NAS was tempered by the technology's inherent challenges of limited capacity, linear scaling (through complex clustering), and the difficulties of managing growing numbers of stand-alone systems. As NAS appliances were rarely considered part and parcel of the IT organization, they were easily relegated a lower priority for the limited resources available to IT.

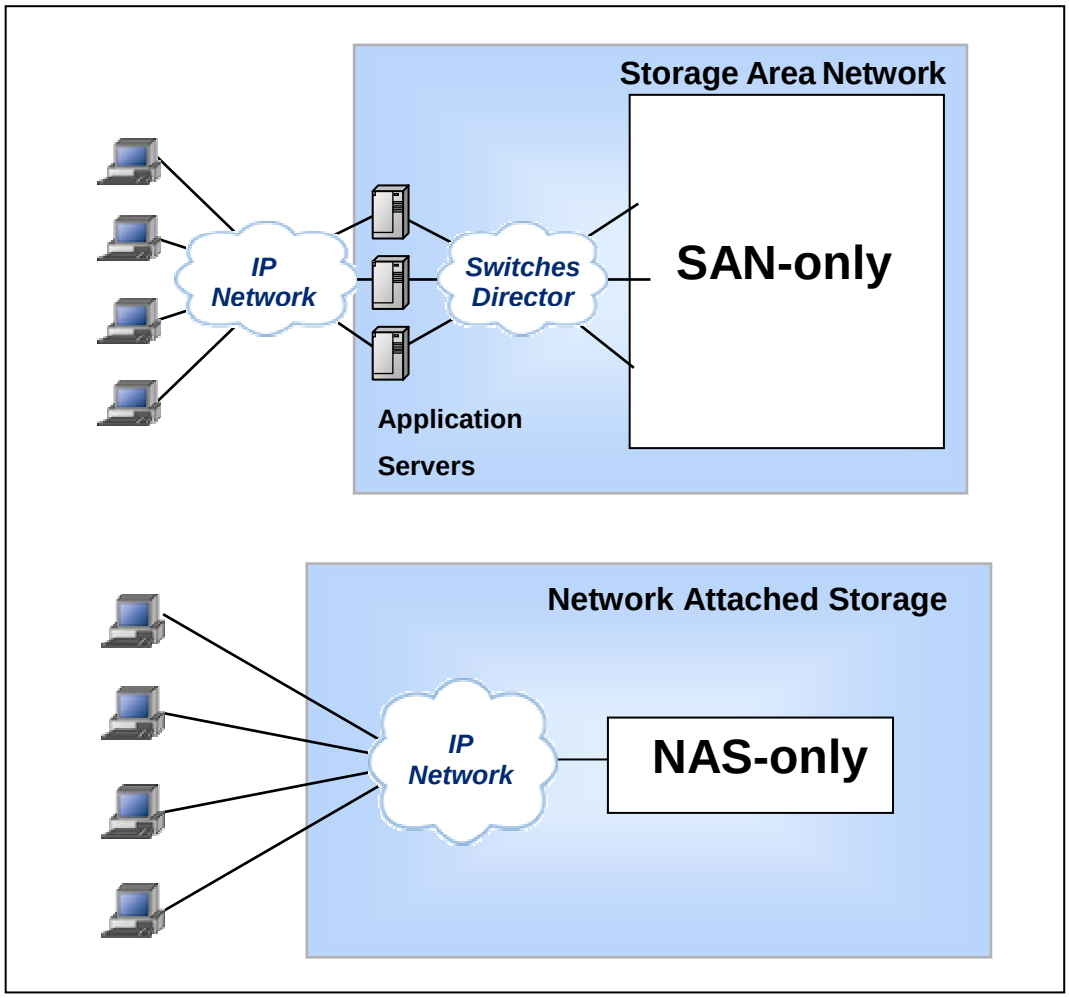

Figure 1: Traditional Discrete Infrastructures

Today, an essential decoupling of the NAS head, or gateway, from its body, the storage arrays (separating the brain from the brawn, if you will) is occurring. Product complexities and end-user frustration with stranded, underutilized storage resources that were directly coupled (and totally dedicated) to their NAS control units are among the factors that helped drive

these developments. Much like the painful experience customers faced with Direct Attached Storage (DAS) on generic servers — where available resources on one host could not be leveraged by another that was starved for capacity — NAS appliances present businesses many of the same challenges.

Gateways to the Datacenter

Although decapitation is rarely an exercise with a positive outcome, in the case of NAS it offers a number of beneficial upshots for enterprise IT, as well business users. The bifurcation of NAS components helps organizations by allowing them to optimize the combination of front-end NAS control and management features with back-end storage resources, all linked through the Storage Area Network (SAN). This expands the storage options of the enterprise by allowing the matching of different service levels or storage tiers to the most appropriate elements of the network, including long-term archiving solutions such as tape and Content Addressable Storage (CAS). At the same time, this approach affords organizations the potential for greater integration of IP and FibreChannel-attached SAN resources, allowing companies the ability to more effectively use and gain benefits from their overall storage investments by consolidating both block and file-based data within the same storage infrastructure.

These significant changes to NAS topology are fundamentally shifting the role NAS plays in the enterprise, permitting NAS to become a more effective *datacenter* solution. By bringing SAN and NAS together, organizations can reap the benefits of sharing back-end storage resources through a variety of connectivity options as part of a highly flexible and automated networked storage design. These enhancements suggest that even organizations that currently prefer stand-alone NAS solutions may find that that they are best served by purchasing NAS systems that are gateway-enabled. By deploying such solutions today, NAS customers ensure themselves the ability to enjoy more flexible and scalable solutions in the future.

Business Benefits of NAS Gateways

There are direct technological benefits provided by decoupled NAS solutions; however, significant business benefits can also be realized through their use. Some of the most significant include:

- Enhanced flexibility in how and where storage resources are deployed within the enterprise;
- Higher overall storage resource utilization which leads to decreased costs, since enterprise storage needs can be met with fewer, and sometimes less expensive, storage assets;
- Improved storage management capabilities and processes as all of an organization's storage assets can be placed under centralized, automated control;
- The ability to more effectively and flexibly scale storage resources to meet the demands of business processes and related applications;
- Potentially lower ongoing costs through enhanced resource utilization and reduction in the number of discrete storage management activities;
- Decoupled NAS offering an effective model/methodology for storage consolidation initiatives across the enterprise.

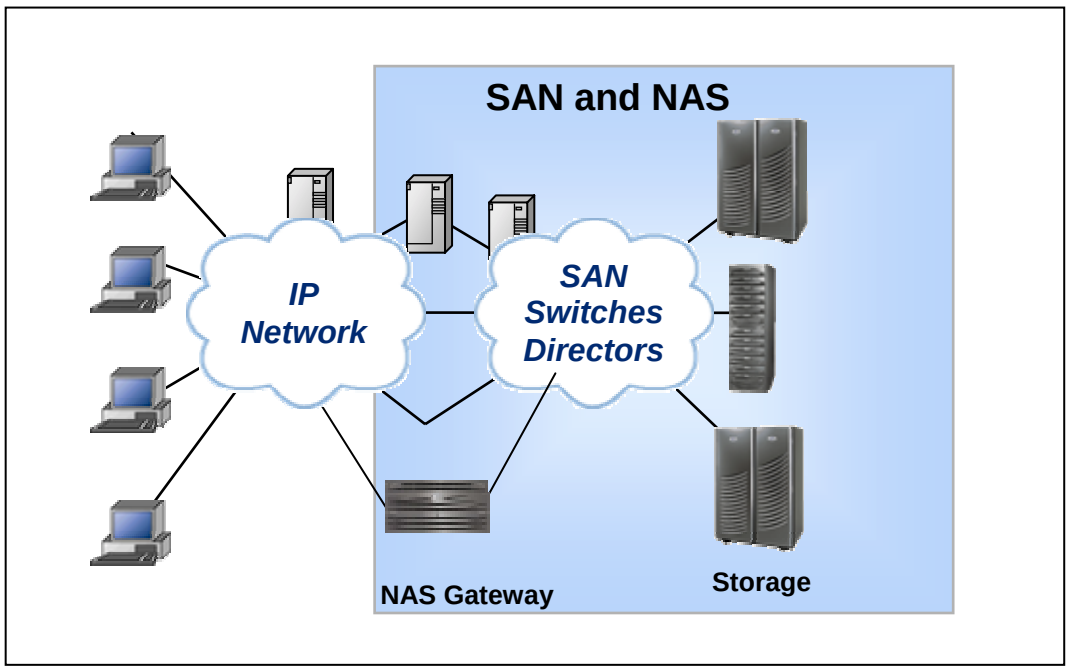

Figure 2: New SAN *and* NAS Converged Model

Each of these benefits by itself offers to improve overall storage efficiency within the organization, but when taken together, they represent a fundamental improvement in the business efficiency, and hence cost of storage operations. In an era where the sheer amount of enterprise data continues to escalate with no end in sight, the bottom-line benefit of enhanced efficiency and operation cannot and should not be overlooked.

EMC's NAS Gateways

A NAS gateway provides the IP network connectivity (Ethernet) and its resilient file processing horsepower, along with the FibreChannel links to the SAN and its storage pool. This is an essential benefit of NAS gateway solutions: allowing customers to leverage advanced array-level functionality to support NAS environments versus the reliance on generic undifferentiated disk technology often found in single-purpose appliances. EMC's experience in developing both advanced SAN and NAS solutions presented the necessary background for creating integrated, flexible NAS gateways. The company's NS700G NAS gateway products, which is available in field-upgradeable single or dual processor configurations, readily plug into the SAN and can access available and appropriate storage capacity located across a range of EMC Symmetrix and CLARiiON storage arrays. The NS700G utilizes the latest version of EMC's Data Access Real Time (DART) operating system (file-optimized operating environment), and has been designed to be coupled on the back end with EMC CLARiiON CX300-700 arrays, as well as EMC Symmetrix 5.x and above solutions. The EMC NS700G can also be configured for High Availability Mode for enhanced access to critical data, or High Performance Mode for maximizing file sharing throughput and response times.

In addition, EMC has introduced the NS704G, a new solution designed for larger and more demanding data consolidation efforts. Upgradeable from the NS700G, the NS704G supports up to 24TB of usable FibreChannel capacity, delivers approximately three times the performance of the NS700G, and also offers advanced clustering availability capabilities (3+1

configuration), along with optional dual control stations. The NS704G also features four data movers, plus improved I/O connectivity features including two Gigabit Ethernet (optical) ports per Data Mover.

EMC has also introduced two new mid-tier NAS solutions, the NS500 and the NS500G, entry level solutions which offer high performance, multi-protocol NAS for SMB customers and small department/branch office environments. The NS500 is an integrated NAS with single or dual data movers and four Ethernet ports, supporting up to 16TB total ATA and FibreChannel capacity (with up to 4TB of usable FibreChannel capacity per Data Mover). The NS500 can also be upgraded to a NAS gateway, the NS500G, which allows mid-tier customers to leverage EMC's CLARiiON CX and Symmetrix solutions for higher-performance shared storage requirements.

How do these new solutions benefit business customers? Since the new NAS gateways enable customers to easily integrate enterprise-level file sharing capabilities with existing SAN-connected EMC CLARiiON and Symmetrix solutions, EMC customers can reap benefits from their existing EMC investments instead of purchasing separate, standalone NAS solutions. The NS700G provides the potential for gaining the tangible benefits including improved storage utilization, simplified management processes, and lower overall storage management costs; and the NS704G extends those same benefits to storage consolidation efforts along with an N+1 availability model that is unique to this part of the market. The new NS500 demonstrates how EMC is driving enterprise-class benefits downstream to SMB customers, both in a standalone NAS solution and in a NAS gateway. At the end of the day, NAS gateways are all about making the most of storage resources and easing management processes, issues that increasingly concern businesses of every size. Overall, we believe EMC's NAS gateways offer seamless and cost-effective means of adding NAS to existing SAN-attached storage environments.

What Does It All Mean?

NAS solutions today are very different from their antecedents. Decoupled NAS gateways have changed the elemental capabilities and strategic value of NAS. Gone are the days where tactically deployed islands of data and information are beyond the central and managerial reach of the entire organization. NAS gateway solutions provide enterprises the means to efficiently leverage existing SAN-attached storage environments independent of their physical attributes (disk, tape, appliance, etc.) and their connectivity to the network (IP, FibreChannel, etc.). In other words, NAS has matured from a solution with limited applicability into one that can fully complement and extend an enterprise's greater business and IT strategies.

The upshot of this is that EMC's NS500G, NS700G, and NS704G NAS gateways reflect the company's dedication to delivering solutions that enable a broader range of business customers to efficiently utilize and manage their storage resources. While each individual benefit of decoupled NAS helps to increase overall storage effectiveness, when taken together the collective benefits represent a fundamental improvement in the flexibility, efficiency, and cost of storage operations. By enhancing datacenter performance, NAS gateway solutions such as the NS500G, NS700G, and NS704G provide cost efficient solutions for businesses from SMBs to large enterprises to enhance their storage performance while protecting past investments and making better utilization of storage resources. In general, organizations that are considering a NAS deployment should demand that any technology investment offer the flexibility and leverage inherent in a decoupled NAS gateway. In particular, enterprises that are considering investments in NAS solutions would be well served to consider EMC's NS500G, NS700G, and NS704G offerings.