

POWER Everywhere — IBM Extends NAS Gateway to Entry SMB

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Management Summary

It is easy to develop a product roadmap. First you introduce the product and then you determine ways to build upon the basic architecture and deliver bigger and better variations of the same thing. In the world of convenience stores, for example, it was relatively easy for the Southland Corporation to introduce the “*Big Gulp*”, a 32-ounce fountain drink, at its 7-Eleven stores. After that, it only followed that if they could make a profit at 32 ounces, why not try 44 ounces with the *Super Big Gulp* and get even more profit. With success there, the next step was obvious – the 64-ounce *Double Gulp* and even more profit, and it still fits in the auto cup holder. Now, what was once the largest soft drink on the fast food landscape, the Big Gulp, is now the second smallest on the 7-Eleven menu. Interestingly, 7-Eleven did not come out with a smaller drink size (and smaller profit). With the American consumer, if big is good, bigger is better.

This does not mean to pick on the fast food industry. When was the last time you visited the cereal aisle in the supermarket? The boxes start as large and then progress to giant, then to family, and beyond. They no longer fit on the kitchen cabinet shelf. They have to go under the counter where there is more space. We, as consumers, are insatiable, and the enterprises providing these products to us take advantage of our lust for more. It seems that “economy size” has almost disappeared from our vocabulary.

The automotive industry still recognizes a need for an economy model. However, once you buy the economy model, you are stuck there until you are ready for a trade-in. This same scenario is often the case within the Information Technology (IT) world also. Take Network Attached Storage (NAS), for example. EMC covers the NAS environment with three separate products: *NetWin*, *NSx00*, and *Celerra*, with *NetWin* being their entry-level solution. Network Appliance (NetApp) takes a similar approach, with the *FAS200* family for entry-level configurations and the *FAS900* family for the larger enterprise solutions. IBM, however, has chosen a different tact.

In January 2004, IBM announced the *NAS Gateway 500* as their enterprise NAS engine with the capability to connect to 244 TB of data. Today, the data center can configure that same box to support a 1TB entry-level site with the power of POWER4+ within it. To learn more about how IBM has downsized the Gateway 500, please read on.

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SMB NAS Gateway Requirement

In its simplest terms, an SMB is a small or medium-sized business. What constitutes an entry-level SMB? How does the industry measure one? There are many ways to define this enterprise class. Different elements within the IT industry have chosen to measure one by:

- The number of employees,
- The amount of revenue,
- The number of active servers, or
- The amount of storage installed.

The definition of an entry-level SMB prospect for Network Attached Storage (NAS), however, can be based upon the amount of storage the enterprise has, the amount used, and their expectations for storage growth. The storage requirements for an entry-level SMB are changing daily. Storage demands are expanding from both the growth of personal desktop storage requirements evolving toward the network storage device and also the implementation of multi-tiered storage solutions within this enterprise class. In fact, the growth rate for storage is greater than the compound, annual growth rate for processor speed, increase in I/O connection speed, or memory growth. Last year a CIO could find a NAS solution from a major supplier designed to support an environment of less than one terabyte. Today, that figure could be considered low by many.

Best industry practices and fiduciary responsibilities to protect the enterprise management from legal action have increased the storage requirements for even the entry-level SMB. This is bringing literally thousands of new SMBs into play every day, causing renewed attention from some of the industries largest NAS players for the entry-level prospect.

As more and more enterprises attach servers to networks, more and more users require IP connections in order to gain access to FC-based SAN storage. They require a common access to the shared storage in order to eliminate the requirement

for duplicate paths. This required, open gateway must be easily expandable and upgradable, to match the growth in storage requirements with a commensurate growth in the performance and capacity of the gateway. Generically, the solution to this problem lies in the NAS Gateway. Specifically, the solution may best be found in IBM's *NAS Gateway 500*¹, announced early in 2004 and recently reconfigured to enable access by the entry-level SMBs previously ignored by the industry leaders.

NAS Gateway 500 Configurability

With an increase in the number of entry-level SMBs seeking a NAS solution, IBM has extended the range for the NAS Gateway 500 downward, reducing its minimum configuration, and thus the cost. This remodeling change consists of the certification of a mono-processor *POWER4+* implementation with 2GB of memory, instead of the dual-processor with 4GB announced initially.

In fact, this mono-processor implementation is available for \$30K, a 40% reduction from the price of the dual-processor system. In addition, **many of these SMBs already have IBM application server solutions based on the *POWER* architecture with *AIX* and they can now reduce support complexity through the implementation of a homogeneous solution.** By responding to this resurgence of interest in the entry-level NAS market with its less demanding installations, IBM hopes to increase volumes significantly using an upgradable mono-processor *POWER* NAS gateway.

The gateway allows the connection of a entry-level SAN and other storage array data sources over an IP network into a virtualized location for simplified access. Although scaled down initially, this model is fully upgradable, scaling to the same configurability levels as previously announced, up to four processors and 32GB of memory. It

¹ See **The Clipper Group Navigator** dated July 22, 2004, entitled *IBM Plunges Into Enterprise NAS With the NAS Gateway 500* at <http://www.clipper.com/research/TCG2004005.pdf>.

must be noted that these levels were significantly higher than required for the entry-level SMB. Components included in upgrade programs include processors, memory, and Ethernet and Fibre Channel controllers as well as engine clustering for redundancy. It is worth noting here that the leading competitors for SMB NAS coverage each require multiple models to cover the same range that IBM handles with a single upgradable server.

One potential drawback, however, is the added risk of a single point of failure due to the mono-processor configuration. However, the installation of a second NAS server in a high-availability cluster can alleviate that risk. In addition, a mono-processor system can be mirrored, via IP, to a remote mono-processor system using the new *HACMP/XD* feature for disaster recovery.

Although scaled down in terms of throughput, the NAS Gateway 500 maintains the same level of system functionality as before. (See Exhibit 1.) Furthermore, by using the POWER microprocessor, IBM has positioned the NAS server to take advantage of the performance of the POWER and the resiliency features available with AIX. In addition, IBM has certified the NAS Gateway 500 for SAN connection to the *FASiT100* and *FASiT600*, now known as the *DS4000* Family, with SATA drives. With

Exhibit 1 - NAS Gateway Highlights

Access – Designed to enable IP clients and servers to access SAN devices without having to directly connect to the Fibre Channel;

Scalability – Can increase physical capacity to 224TB non-disruptively;

Flexibility – Cross-platform file sharing can reduce network complexity and expense via NFS, CIFS, HTTP, and FTP

Manageable – Integrated system diagnostics and tools minimize downtime;

Performance – Optimized for network file serving and storage requirements.

Exhibit 2 – NAS Gateway 500 Performance

Configuration	Memory	NFS ops/sec	CIFS MB/sec
4x, Dual Node	32GB	68,444	276
2x, Dual Node	16GB	39643	159*
4xMono	32GB	35097	138
2xMono	16GB	20833	80

*Projected result

From IBM TotalStorage Performance Report dated 6/28/04

SATA, the *DS4000* family may be used for either primary or secondary tier storage support, providing another low cost element for the entry-level SMB.

Less demanding also means a lowering of performance expectations. IBM has not yet released performance figures for the NAS 500 in a mono-processor configuration. However, figures released earlier this summer indicate that the single processor should have more than enough throughput for the entry environment. (See Exhibit 2, above.)

NAS Gateway 500 Software

In addition to the new configurability, IBM has also announced the availability of software functionality that had been announced but not available previously:

- **EtherChannel and IEEE 802.3ad Link Aggregation** – to provide link aggregation support in environments where two NAS Gateway 500s are clustered together to form a high-availability system. These technologies were designed to allow several Ethernet adapters to be aggregated together to form a single pseudo Ethernet device. This enables the network bandwidth of all of the adapters to appear with a single network presence. If any adapter fails, it automatically sends the packets on the next available adapter, without disruption.
- **Remote Mirroring over IP networks** – This feature supports three modes of

mirroring, Asynchronous, Synchronous, and Mirror Write Consistency, over an IP network for IBM's *High Availability Clustered Multiprocessing over Extended Distances (HACMP/XD)*. This enables nearly unlimited distance data mirroring, similar to the *HAGEO* product. It is designed to provide data synchronization during production, failover, recovery, and restoration.

- **Asynchronous Mode** – Data is written to the local disk and then the application is notified that the write is complete. The same write is sent to the remote disk as soon as possible, but there could be a delay. The application sees the action as complete although it has not yet been written to the remote site.
- **Synchronous Mode** – Data is written to the remote site first, then it is written to the local disk. The application is notified that the write is complete
- **Mirror Write Consistency** – The data is sent to the remote disk at the same time that it is written to the local device. The write is not complete until the remote site acknowledges that the write is complete.

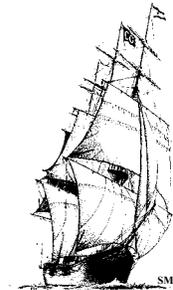
Conclusion

When IBM first announced the NAS Gateway 500, it was widely assumed that they were reverting to form to compete at the high-end of the enterprise market with their eternal storage competitor, EMC. Well, today it would appear that the assumption was incorrect. With the announcement of the certification of a slimmed-down, but definitely not dumb-downed, Gateway 500, IBM has injected itself back into the heat of the battle. IBM appears ready to compete not only with EMC, but also with the likes of NetApp and Dell for the hearts and minds, as well as storage networking, of the SMB world.

With the availability of a mono-processor version of the NAS Gateway 500, IBM has repositioned the entry point for this server, in terms of not only configurability and performance, but also in terms of price. By slicing 40% off the starting price† for the NAS 500, IBM has made this server available to an entirely new enterprise spectrum.

Not only does it enable a broader class of storage users to gain access to the SAN, but it also enables them to grow with the same box. An upgrade is just that, an upgrade. It is not a forklift upgrade. **One model may not fit all, but the entry-level of the NAS Gateway 500 certainly provides the foundation to enable many more enterprises to enter the storage-networking arena.**

If your enterprise has needed an IP link to a SAN environment, but the cost has scared you off, look at IBM's solution. It may enable you to simplify your office network and save money at the same time.



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