



## 3PAR Enables Low-Cost Utility Storage for AIX HACMP Environments

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### Management Summary

Among the frequently-asked questions when purchasing a new car are the size of the engine in horsepower, the fuel economy in miles per gallon, and the available storage space in cubic feet. Very few people ask about the size of the tires. Even though there are innumerable manufacturers of automobile tires, the car buyer knows there are a variety of options available that will all fit any car. Whether you are looking at Goodrich or Goodyear, Michelin, or Pirelli, a 15" tire will fit your Toyota or your Chevy. There are economy tires and high-performance tires. You can spend a little or a lot, but you do not have to worry whether or not the tire will fit on your rim. Automobile standards take the worry out of that aspect of your purchase.

There are standards to cover the acquisition of Information Technology (IT) in the data center, also. Open systems standards were established to ensure the portability of application software from one revision, or one manufacturer, to the next. Intel established the x86 standard that has been at the core of every commodity server for decades. From the *x386* to *Pentium* to *Xeon*, the enterprise staff knew that they had compatibility. Further, they knew that any Windows application would run as long as there was an "Intel Inside". Over the past decade, companies like AMD, with *Opteron*, have taken the commitment to standards to new heights, and improved the server environment, providing a high level of competition and lower prices. But, what about the server-surround environment? There are standards for peripheral attachment, for example, SCSI and Fibre Channel. Some vendors, however, try to differentiate their servers with a unique peripheral-attach strategy to promote the sale of higher-priced, less-compatible hardware when connected to a more complex operating environment. They add this complexity by requiring unique drivers to connect to the operating system. IBM, for example, has a unique storage attachment to their System p when configured in their proprietary HACMP architecture. Here, IBM will usually promote their *DS* line of Total Storage disk arrays. Now, IBM customers have an option for a more flexible, or utility, storage solution when the storage rubber meets the road.

3PAR, the leading provider of Utility Storage, has now announced support for IBM's *High Availability Cluster Multi-Processing (HACMP)* for *AIX* by their InServ Storage Server. HACMP is IBM's state-of-the-art technology to provide monitoring, failure detection, and automated recovery for mission-critical enterprise applications. Now, an enterprise can deploy state-of-the-art utility storage in a mission-critical environment, reducing the total cost of ownership (TCO) for the data center. If you deploy HACMP and wish to lower your TCO, please read on.

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## The Transitioning of the Data Center

Over the past few years, the data center has seen a paradigm shift in the enterprise server architecture. It seems like only yesterday that data centers deployed a single dedicated application on a network of open systems servers with a single or dual, mono-core X86 processor. Unfortunately, the processor utilization of those servers was, to say the least, unacceptable. With a CPU utilization rate of 15% to 20%, the data center was wasting valuable resources and costing the enterprise on the bottom line. While the energy crisis causes all of us a degree of heartburn every time we stop at the gas station or look at our oil delivery bills, it has caused real pain to the CIO and CFO of every enterprise around the world.

In order to rectify this situation, and lower the enterprise TCO for IT, we see data center staffs taking advantage of a series of technological innovations to improve server utilization while reducing energy consumption. Two of the prime examples of this innovation are *multi-core processors* and *virtualization*. Both of these technologies have assisted the IT staff in consolidating their applications and reducing the number of servers required across the enterprise. Unfortunately, despite the availability of comparable technological innovations, we have not seen a comparable evolution within the storage environment of these same data centers.

For the past decade, data centers have been installing Storage Area Networks, or SANs, in order to enable storage consolidation on fewer platforms and to simplify the acquisition, deployment, and maintenance of storage arrays. Most of these arrays were scalable to some degree, some more than others. For the enterprise with multiple installations, there is a need for a system that can start small and grow in increments, thus avoiding over-provisioning and allowing the enterprise to take advantage of lower disk costs in the future. SANs do have their drawbacks. They can be very complex. It behooves the data center, therefore, to ensure that their SAN solution is easy to deploy and manage, without having to acquire costly administrative resources to optimize the various storage tiers manually.

SANs enable access to highly-scalable disk arrays with a variety of service levels, from Fibre Channel to SATA, from high-speed drives at 15K RPM down to more economical devices at 7.2K RPM. This allows the enterprise to assign storage according to the **present value** of the data, enabling the reassignment of the storage when the value changes. It is critical for the enterprise to deploy storage arrays that have the capability to install disk devices with a variety of service levels in order to manage an effective, integrated lifecycle manage-

ment plan<sup>1</sup>. *Utility Storage* is one class of storage that includes these features and more.

## The Deployment of Utility Storage

Utility storage is a new category of mid-range and high-end disk array, used as a building block to consolidate storage in a utility computing environment. A utility storage system has the ability to provide, effectively and safely, storage for multiple users, each running multiple applications, each possibly implemented with different workload characteristics. Utility computing represents the next generation of IT architecture, developed over the past few years to challenge mainframes and distributed-computing architectures. Utility computing uses the virtualization built into the server, storage, and networking environment to allow the enterprise to improve performance and reduce cost. Utility storage can reduce implementation costs through:

- Simplicity in ease-of-use;
- Improved efficiency in utilizing available devices;
- Increased scalability for hundreds of terabytes in a single system; and
- Assigning data to multiple tiers of storage and reassigning service levels in a single system, non-disruptively.

A utility storage system is one in which the data center staff can check off on a menu which levels of capacity, availability, and quality of service that the department needs and can pay for. The data center can then provision usable storage to the department, on-demand, charging for physical capacity only as it is written to (thin provisioning). If any department exceeds their limits, they can expect additional charge backs. Given the high levels of allocated, but unused, capacity in most organizations, *thin provisioning* will save the enterprise real dollars and improves the return on investment (ROI) of the utility storage array.

3PAR is one company with a real history in providing utility storage solutions to the open systems community. With the introduction of the first utility storage arrays in 2002, they have provided flexible, reliable data storage to the data center. The 3PAR *InSpire* Architecture, *InServ* Storage Server and *InForm* software were designed together to deliver high availability by isolating not just hardware, but also software, points of failure. The *Inform O/S* dramatically reduces storage administration and storage expenditures. In December 2006, 3PAR extended their support to HP *Serviceguard*, HP's high-

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<sup>1</sup> See **The Clipper Group Explorer** dated August 29, 2002, entitled *Tiered Storage Classes Save Money – Getting the Most Out Of Your Storage Infrastructure*, available at <http://www.clipper.com/research/TCG2002030.pdf>.

availability environment for *HP-UX*. Now, 3PAR has extended their reach into IBM data centers, with support for IBM's *System p High Availability Cluster Multi-Processing (HACMP)* environment.

### The 3PAR HACMP Solution

From a hardware standpoint, the 3PAR InServ<sup>2</sup> is a family of highly flexible storage arrays, ranging in size from the *E200*<sup>3</sup> with scalability to 128 drives and 63.1TBs of storage, to the *S800*, expandable to 2,560 drives and 384TBs. 3PAR targets the InServ E200 at the virtualization and consolidation of departmental and branch storage applications. The *S400* and *S800* support large enterprises and government agencies acting as internal service bureaus, as well as external service providers such as hosting and internet companies. The InServ S800 supports the largest enterprises with installations in the financial arena, for example, at Merrill Lynch and in the Internet world at companies like Priceline.com and MySpace.com. 3PAR is especially conscious of energy consumption, recently introducing a "Carbon Neutral" program that is designed to supplement the environmental effect of customers' use of thin provisioning. A fully loaded drive chassis only consumes 1,143 Watts and 3,900 BTUs/hour, reducing the total cost of ownership when compared to competitive systems. As with servers, however, the storage array is more than just hardware. 3PAR's real value is in the software that creates the framework for a total solution.

In 2006, 3PAR introduced their *Multipath I/O for IBM AIX*<sup>4</sup>. This enabled AIX data centers to avail themselves of 3PAR Utility Storage with load balancing and failover capabilities. By now supporting the AIX HACMP environment, 3PAR brings affordable, highly available utility storage to the mission-critical AIX data center. IBM HACMP has been the preferred solution for the AIX server community when high-availability UNIX applications are mandatory and any outage can result in lost revenue and disaffected customers. IBM normally complements the HACMP cluster with a highly-available storage array, such as its *DS4000* or *DS8000*. Unfortunately, these arrays can be complex to deploy and maintain and, therefore, expensive to implement. In order to comply with enterprise

budget limits, some CIOs have to compromise, installing less-costly dual-controller, mid-range storage solutions. **As a result, they face the risk of increased downtime and suspect availability.** With 3PAR InServ, the CIO does not have to compromise – he can get the best of both worlds – high availability with full HACMP functionality, such as robust remote replication capabilities via 3PAR *Remote Copy*, **and** low cost. Moreover, with 3PAR the AIX data center gets more.

One of the most significant features of a utility storage environment is the capability to do more with less. With *Thin Provisioning*, 3PAR improves the utilization of storage resources, allowing the data center staff to allocate, once, as much capacity as an application could ever require, upon deployment, **but not dedicating that resource to any application until it is actually needed.** Unused storage is kept in a common pool, drawn upon in an on-demand fashion. Thin provisioning could save the enterprise as much as 50% on required storage, at least deferring additional storage purchases until larger devices with lower cost become available. In addition, features such as *3PAR Virtual Copy* allow users to take hundreds of non-duplicative snapshots of mission-critical data sets, providing cost-effective access to many possible recovery points.

3PAR has created an efficient and reliable utility storage array, scalable to meet the needs of any size enterprise and simple enough to operate that the data center can free up resources needed to manage their high-availability servers.

### Conclusion

Every enterprise can take advantage of the savings available by implementing a utility storage environment. This is especially true for those with mission-critical applications that depend upon high-availability access such as those running under *HP-UX* and *AIX*. Data Centers that need to simplify their storage infrastructure have been taking advantage of the savings available to them through the implementation of consolidation in a utility storage framework. Those same savings are now available to the mission-critical, high availability UNIX community. The 3PAR InServ is especially well suited to complement IBM's HACMP clusters with cost-efficient, scalable storage. It can lower your TCO and provide an improved ROI.

If your enterprise is interested in reducing storage deployment times, overhead and complexity, while maintaining, or improving, reliability and performance, you now have a viable option from 3PAR.



<sup>2</sup> See **The Clipper Group Navigator** dated July 25, 2003, entitled *3PARdata's Utility Storage Takes a Unique Approach to Attacking Cost and Complexity*, available at <http://www.clipper.com/research/TCG2003032.pdf>.

<sup>3</sup> A finalist for the Storage Magazine's and Search-Storage.com's "Storage Products of the Year" awards in the Disk and Disk Subsystems category for 2006.

<sup>4</sup> In addition to HACMP and MPIO, 3PAR supports ODM, Remote Boot, Virtual I/O, GPFS, and Oracle 10G RAC in an AIX environment.

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