Maranti CoreSTOR
Delivers Storage as a Service

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Management Summary

The way you look at something affects how you handle it. When mariners believed the earth was flat, they were afraid of sailing in uncharted waters for fear of falling off the edge. So they stayed close to home. When distance runners thought the four-minute mile was an unassailable barrier, nobody broke it until Roger Bannister did in the 1950s. Then it became commonplace. **It often takes a change in perspective to go beyond the known and the status quo – to new and better places.**

Similarly, there is a better way to view storage that will help enterprises more effectively meet their information needs. Many view storage as just a box to manage. It has to be backed up, stay online, and keep up with data growth. This is the "back room" or infrastructure perspective. **A better way is to view storage primarily as a service – from the perspective of the users and applications that experience and consume it.** This approach adds clarity, accountability, and efficiency to both the delivery and consumption of storage. It also represents where the industry is headed technically and how internal best practices for storage are evolving.

To do it, you need an infrastructure sophisticated enough to treat storage as a service. A basic RAID array is not enough. Maranti Networks has introduced a next-generation product called *CoreSTOR* with such capabilities. It is an intelligent, director-class storage services platform that delivers tiered service levels to the applications. CoreSTOR resides in the storage area network (SAN), in between servers and storage, and consolidates heterogeneous environments.

Benefits include:

- **Lower storage acquisition costs** through virtualization and tiered service levels,

- **Lower operating costs** through centralized storage and data management, and

- **More productive applications and better support for business processes** through more precise and better-managed storage services.

Because of the critical role of storage and information access in day-to-day operations, Maranti CoreSTOR can have a positive impact on the business and bottom line. It offers a better way to architect the storage infrastructure. Read on for details.

Storage as a Service

Managing storage as a service is the most precise and cost-effective way to meet business requirements. In fact, storage is not primarily a technical issue; it is a business issue with technical ramifications. **Looking at it from the users' perspective, in terms of service levels[1], brings to bear the broader business context.** Enterprise objectives, business processes, and application requirements (in that order) determine storage requirements. In fact, the active participation of both IT and business (e.g., functional personnel, executives) is needed to define service levels in the first place because no one group has a full sense of what can or ought to be done. This is more natural and appropriate than the bottom-up, infrastructure approach, which is like trying to drive by looking in the rearview mirror.[2]

Storage as a service also promotes:

- More precise resource delivery and better utilization,

- Accountability for responsible service consumption and consistent delivery, and

- Optimal reliability, performance, and total cost of ownership of storage resources.

In short, it is a better way to "do" storage. However, the infrastructure itself must be capable of provisioning and managing as a service. Basic storage systems are not enough, though they may be part of a more sophisticated architecture. Intelligence and advanced features like virtualization, adaptability, openness and heterogeneity, centralized management, and automation are also necessary for a complete "storage utility"[3] that deals in services.

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[1] A storage service level contains particular user-level characteristics and requirements, such as performance, availability, recoverability, quantity, and cost.

[2] For details, see *Storage Is Not Just a Box Anymore – Managing the Data Path* in **The Clipper Group Explorer** dated April 7, 2003, at http://www.clipper.com/research/TCG2003013.pdf.

[3] See *Shining the Light on Utility Computing – A Business Perspective* in **The Clipper Group Explorer** dated October 31, 2003, at http://www.clipper.com/research/TCG2003057.pdf.

CoreSTOR Solution

Maranti Networks' *CoreSTOR* **solution has advanced capabilities for beginning to deliver storage as a service.** CoreSTOR is an intelligent, director-class network controller[4] that interconnects storage and servers. It unifies multiple, heterogeneous storage systems and presents them to servers as a single pool with differentiated service levels. Advanced features include virtualization, storage classification and quality of service (QoS), replication, data movement, and centralized management. CoreSTOR is intended to be the foundation of a next-generation SAN.

Hardware

The hardware platform is a director-class network controller that supports Fibre Channel and iSCSI and routes traffic between the two. It comes in two versions: the 3000 model with up to 128 ports and the smaller 2000 model with up to 16. (*See chart below for a summary.*) Each port has cut-through packet processing with minimal latency (< 40 μs) and very high throughput (100k IOPS), so the platform does not become a bottleneck in the SAN. It also has several features to ensure high availability:

- Redundant controllers, power, fans,

- Hot-pluggable components,

- Active-active multi-pathing with failover, and

- Non-disruptive code load.

Enterprises can deploy dual platforms and configure multi-path to run through each one for the highest availability.

Storage Services (Software)

On the CoreSTOR hardware platform runs a software suite whose capabilities can be applied to any storage traffic through the platform, which implies any attached storage array and/or server. This centralized approach avoids the management and

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[4] See *Intelligent Storage Networking – Poised for Broad Adoption* in **The Clipper Group Explorer** dated October 16, 2003, at http://www.clipper.com/research/TCG2003054.pdf.

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procurement complexity of running this kind of software on multiple, disparate servers or storage arrays. CoreSTOR software features include:

- **Virtualization** – This is a means to pool and consolidate multiple storage devices into a single, dynamic resource. Virtualization simplifies management and provisioning and improves storage capacity utilization. CoreSTOR creates logical volumes from one or more physical LUNs within an array or among multiple, even heterogeneous arrays. It also has a pass-through mode for existing physical LUNs that administrators do not wish to virtualize.

- **Storage classification** – CoreSTOR discovers and classifies LUNs into different tiers or classes, forming the basis for managing storage as a service. The classes can be based on the type/brand of storage array (high-end, midrange, low-cost), RAID level, port speed, and array multi-pathing capabilities – characteristics that influence performance and availability.

- **Storage QoS** – Administrators can then define policies for specific QoS levels, which they can be assigned to individual applications. The QoS characteristics include a storage class, data protection scheme, and SAN traffic priority. The data protection scheme can be any of CoreSTOR's mirroring and point-in-time copy capabilities. (See box in next column.) CoreSTOR can also enforce SAN traffic priorities at the application level in real time. For instance, if a priority-one application for transaction processing needs to access disk, but a backup job with lower priority is in progress, CoreSTOR will throttle the backup job at the source and let the other go. This would only occur if there were competition for a data path; otherwise, all applications have free access. Storage QoS encapsulates CoreSTOR's ability to deliver specific storage service levels to applications.

Maranti CoreSTOR at a Glance

In general

Protocol support:
- FC (1-2 Gbps, auto-sensing)
- iSCSI (1 Gbps)

Virtual IOPS/port: 100K
Switch latency: $< 40\ \mu s$
Storage services:
- Virtualization (volume management)
- Multi-protocol routing
- Storage classification and QoS
- Mirroring, synchronous and asynchronous
- Point-in-time copy
- Non-disruptive data movement

CoreSTOR 3000

Max ports: 128
Virtual IOPS: 6.4M

CoreSTOR 2000

Max ports: 16
Virtual IOPS: 800K

- **Asynchronous mirroring** – It can replicate data asynchronously to a remote site for business continuance purposes. The source and target storage systems can be different, allowing for the use of lower-cost storage at the remote site. This removes the constraints of most array-based replication solutions, which require the same vendor/model at both ends.

- **Synchronous mirroring and point-in-time copy** (*SnapVolume*) – CoreSTOR can synchronously mirror a logical LUN to up to three targets simultaneously – with automatic failover if the source goes offline. Targets can also be split to make point-in-time copies for non-disruptive backup, data warehouse loading, application development and testing, etc. This feature is also available across multiple, heterogeneous platforms.

- **Data movement (*Volume Copy*)** – Data movement can be painfully disruptive and time-consuming without the right tools. Fortunately, CoreSTOR can move volumes between arrays (e.g., legacy and new) behind the scenes without affecting production applications. This is useful for the initial installation of CoreSTOR and ongoing change management.

- **Centralized management (*STORIAN Manager*)** – The interface for centrally managing storage resources through CoreSTOR is called STORIAN Manager. Its functions include defining storage QoS and classification policies, secure provisioning, inventory management, role-based access control, and fault management.

    List prices start at $35K for the CoreSTOR 2000 and $80K for the 3000 model.

Benefits to the Enterprise

Deploying a storage infrastructure and SAN based on CoreSTOR and moving toward a service-based approach deliver business benefits:

- **Lower storage acquisition costs** – Poor utilization of storage resources is a widespread problem in enterprise data centers, and it's a waste of money. Virtualization gives administrators much greater visibility and control over storage capacity, and putting it in the network maximizes its scope. This eliminates the problem of disconnected islands of storage that cause the poor use of resources. Another problem is blanketing a group of applications and data with a higher service level than all of them need, and thus overspending on storage. A multi-tiered, service-based approach gives everyone precisely what they need – no more and no less – and cuts out wastefulness.

- **Lower storage operating costs** – Ongoing management costs, especially skilled labor, are by far the largest component of storage total cost of ownership. This includes activities from maintenance to adding or reallocating capacity to coordinating backups, mirrors, and restores. Instead of deploying and managing multiple, possibly different software suites for multiple server operating systems and/or storage models, one super-instance in the network offers much more leverage. A centralized function with a single point of management that encompasses diverse enterprise infrastructure will save management time and costs.

- **More productive applications and better support for business processes** – Business applications need access to storage to function, and business processes depend on the applications. Storage may reside in the back room, but its impact is felt in the front office. A storage infrastructure that can provide the right service levels to the right applications at the right time will ultimately do a better job of supporting the whole business.

Conclusion

All enterprises should be thinking about managing storage as a service. It is where the industry is headed, and it makes business sense. **The Maranti CoreSTOR storage services platform is worth considering for enterprises that want to take a serious step in that direction.**
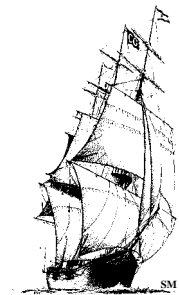
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