Hitachi's Adaptable Modular Storage 2000 family further extends mid-range storage

Carl Greiner

October 2008

Hitachi's Adaptable Modular Storage 2000 family further extends mid-range storage

Hitachi continues to deliver traditional high-end storage functionality in its mid-range storage solutions. The announcement of the Hitachi Adaptable Modular Storage (AMS) 2000 family introduces new functionality, design, scalability, performance and ease of use beyond its existing AMS offerings addressing the ongoing need for flexibility and simplicity in the mid-range storage market. Data centers require storage solutions that effectively address and support growing business needs while reducing operating costs including power consumption. Hitachi continues to enable high-end and ease-of-use capabilities to address these requirements.

Ovum view

The new AMS 2100/2300/2500 family resets the meaning of advanced mid-range storage and addresses the requirements of not only mid-range businesses but also large enterprises. The family builds on Hitachi's current robust mid-range AMS (100, 500, 1000) solutions that offer flexible performance, scalability, RAID 6, logical cache partitioning, host storage domains, virtual port, power savings, role-based security access and many other capabilities.

In conjunction with the Hitachi Universal Storage Platform (USP) VM, all enterprise-class storage functionality is enabled on attached AMS platforms. In addition, the AMS family introduces a new design and technology base that offers additional functionality, ease-of-use and environmentally-friendly capabilities and effectiveness not usually associated with mid-range solutions. Included are a symmetric active-active controller design with dynamic load balancing (eliminating the need for load balancing/path management software solutions), a serial attached SCSI (SAS) point-to-point backplane-enhancing performance and drive intermix capability, enhanced power conservation capabilities and simplified management capabilities. Hitachi also reaffirmed its intent to make dynamic (thin) provisioning ubiquitous and will be supported natively on the AMS 2000 family next year, addressing more economical storage utilization. With the USP VM fronting an AMS, dynamic provisioning is available today for environments desiring this functionality and efficiency.

This announcement more than solidifies the industry trend to provide robust mid-range solutions that enable functionality traditionally reserved

for only the enterprise-class solutions for all environments. The Hitachi AMS family continues to deserve 'short-list' consideration for robust mid-range storage.

New models

Hitachi introduced three new AMS 2000 family members.

The AMS 2100 supports 4-8 GB of cache, fibre channel and iSCSI host attachment, a mix of 120 SAS and SATA II disks giving up to 118TB SATA/47TB SAS capacity, up to 50 RAID groups, up to 2048 LUNs (60TB maximum size), 512 virtual ports for attached hosts and 16 3Gb/second SAS backend links.

The AMS 2300 extends the cache size to 8-16GB, 240 maximum drive intermix, capacity up to 236TB SATA/94TB SAS, up to 75 RAID groups, up to 4096 LUNs and 1024 virtual ports for attached hosts.

The AMS 2500 further extends cache to 16-32GB, drive intermix to 480, capacity to 472TB SATA/188TB SAS, up to 100 RAID groups, 2048 virtual ports for attached hosts, and 32 3Gb/second SAS backend links.

All AMS family members support the following drive intermix options:

- SAS – 146GB 15K RPM, 300GB 15K RPM, 400GB 10K RPM
- SATA II – 500GB 7.2K RPM, 1TB 7200 RPM.

Active-active controller design

All new models feature a pair of symmetric active-active controllers that automatically assign LUN ownership and eliminate the need for preferred path selection and rebalancing traditionally provided by path management software. This function, dynamic load balancing (DLB), in conjunction with the active-active controller design, allows any host port to access any LUN without a performance penalty and rebalancing is automated. It also provides seamless access to data from either controller (even when one is not operational) and supports effective non-disruptive microcode updates. DLB is extremely useful in eliminating hot spots and utilization imbalances found in traditional asymmetric controller designs while assisting DBAs in optimizing their environments, including maintaining response times during heavy and shifting patterns of access typical of databases and Exchange. In addition, the controller functionality eliminates concerns for VMotion users by accepting I/Os to a LUN through any host port, reducing set-up time and performance bottlenecks.

SAS Backplane designed for performance

The controllers' backend includes a full duplex 3Gb/second SAS interface in a point-to-point switch design providing greater speeds and bandwidth when compared to traditional arbitrated loop fibre channel designs. The

total backend bandwidth delivers up to 9600MB/second and 32 concurrent I/O operations from controller to disk tray. In addition, the SAS backend enables both SAS and SATA drives to be intermixed in the same drive trays, providing increased flexibility with storage tiers. For redundancy there are eight SAS links to every drive tray – all of which would need to fail before access to data is lost, providing a unique level of operational resilience

Enhanced management software

Hitachi continues to leverage its entry-level Simple Modular Storage solution (also supports active-active) and its user-friendly management capability by making the AMS management software more intuitive than previous models and enabling storage to be easily installed, configured and managed from a single pane of glass. The Hitachi Storage Navigator Modular 2 management software supports wizard-based installation and configuration capabilities and GUI with matching CLI functions that are both compliant with the Hitachi Command Suite, all aimed at improving storage administrators' efficiency and flexibility. Management capabilities include host attachment, LUN management, cache partitioning, cache residency, LU migration, replication setup and management, SNMP support, system maintenance, advanced feature management and multiple system management.

Some of the advanced management features supported in the AMS 2000 family include the following:

- Online RAID group expansion, where one or more drives can be added to an existing RAID group non-disruptively, enabling a cost-effective way to add capacity to existing RAID protection groups, expanding the capacity of individual LUNs. Data is automatically re-striped for better performance
- LUN grow/LUN shrink assists storage administrators in optimizing storage utilization by supporting the ability to increase LUN capacity to a maximum size of 60TB
- Global sparing with hard disk drive roaming enables spare drives to be located anywhere in the system. No RAID group rebuild (often a lengthy procedure and can affect performance) is required after failed drive is replaced (it becomes a spare)
- Modular volume migration enables non-disruptive data movement to the most appropriate disk as workload requirements change and without requiring the server to remount the volume. It is also tuneable to give preference to migration or I/O activity
- Cache partitioning allows cache to be resized and allocated to applications according to requirements, in order to improve utilization, throughput for mixed workloads and cache hit rates

- Cache residency allows realtime locking and unlocking of data into cache, enabling more flexible and efficient data access performance and availability.

Power efficiency

The AMS 2000 family offers multiple new capabilities to effectively address storage power conservation. RAID group spin-down capability is offered for infrequently accessed drives, including shadow image drive groups involved in backup to tape, VTL drive groups involved in backups, local internal backup copy data, drive groups within archive storage and unused drive groups. In addition all SATA II drives take advantage of up to seven power modes and will park heads when idle for two hours or more, plus smart algorithms to minimise drive-busy time.

Lastly, the system constantly monitors cooling requirements and will dynamically adjust cooling fan speeds when safe to do so. The ongoing goal is to reduce electrical power consumption and reduce cooling requirements related to heat generated by hard drives, enabling saved resources to be applied to new computing requirements.

Value

The new AMS 2000 family of mid-range storage options continues to blur the feature and function differences with high-end enterprise solutions. The entire suite of Hitachi advanced enterprise functionality is available when the USP VM front-ends the AMS with its industry-leading virtualization, management and common services capabilities. Beyond delivering enhanced scale, performance and connectivity capability, new functionality (including dynamic load balancing, ease-of-use, energy efficiency, I/O flexibility, cache partitioning, and dynamic provisioning) continues to make this a serious platform for storage consolidations and is designed to meet most storage requirements from medium-sized businesses to large enterprises.

Client re-use disclaimer

- This is a verbatim reproduction of independent material that has previously been published by Ovum within the last 6 months
- Ovum operates under an Independence Charter. For full details please see www.ovum.com/about/charter.asp
- Ovum may have been paid by the client for the right to re-use the material
- Ovum may have a deal with the client to supply research or consultancy. However, no other relationship exists between the 2 companies (e.g. shareholdings, loans, non-executive directorships etc)
- While we take every care to ensure the accuracy of the information contained in this material, the facts estimates and opinions stated are based on information and sources which, while we believe them to be reliable, are not guaranteed. In particular, it should not be relied upon as the sole source of reference in relation to the subject matter. No liability can be accepted by Ovum, its directors or employees for any loss occasioned to any person or entity acting or failing to act as a result of anything contained in or omitted from the content of this material, or our conclusions as stated
- This material is the copyright of Ovum Europe Ltd.