



High Performance Storage Subsystem

Partitionable Multi-Host Storage Technology

A Range of High Performance Storage Solutions

Wang's High Performance Storage Subsystem (HPSS) for the VS is a family of advanced RAID storage options. Designed to meet performance, reliability and connectivity requirements of businesses well into the new millennium, these disk arrays provide storage solutions scaleable to multi-terabyte capacities. For VS processors, the standard HPSS offering provides 27, 45 or 63GB of usable, fully protected array storage in a desktop enclosure.

Price/Performance Leadership

The HPSS is an intelligent Storage Server offering exceptional performance, fault tolerance and unique configuration flexibility based upon an "Open Systems" standards based architecture. I/O bottlenecks between the VS host and its disks are effectively eliminated, allowing the VS to utilize existing system power and resources more effectively. As a result, the organization saves money by performing the same job in less time or with fewer resources. Depending upon the application and the current storage environment, VS users can expect to see a significant increase in application performance as well as a dramatic improvement in response time.

Partitionable Storage

The Wang HPSS can be viewed as a storage pool which can be partitioned to meet specific user needs. Each partition can be logically associated with a specific input port and SCSI target ID. This flexibility allows users to port traditional disk environments, with their volume naming conventions, directly to the HPSS, eliminating the need for software or procedure changes normally associated with storage consolidation.

When the HPSS is connected to multiple hosts, it is possible to switch a partition from one host to another, facilitating emergency fallback strategies and routine transfer of data. As requirements change, it is straightforward to repartition the storage pool to meet the new needs. The HPSS is provided with an easy to use PC based configuration utility.

Robust Multi-Host connectivity

The HPSS can be physically connected to SCSI controllers on one or more VS hosts. The product has been designed to allow individual ports to be connected to non-Wang hosts as well, allowing the sharing of the HPSS across multiple platforms. This capability will deliver cost effective high performance storage for multiple platforms and allow easy reallocation of storage capacity from one platform to another as needs change. Customers requiring multi-host connectivity should contact Wang for specifics on support for non-Wang hosts.

Investment Protection

In those VS environments where there plans for the migration of applications to Client/server environments, Wang HPSS provides the optimal solution. As IBM or HP UNIX systems, AS/400 systems, NT servers or many other hosts, are added to the installation, they will be able to share the same Storage Server as the VS hosts - allowing for easier management of data and reducing additional storage costs for new systems. This may require host hardware support. HPSS continues to provide full investment protection, even after migrating to an open systems environment, because its standards based architecture was designed to provide plug and play compatibility with any SCSI-based host system.

The modularity of HPSS design also ensures that it will be easily adaptable to future extensions to the SCSI standards, allowing easy upgrades and extending the potential useful life of the system almost indefinitely.

Maximum Reliability and High Data Availability

Most RAID implementations provide fault tolerant data storage at the expense of optimum performance. External caching devices, such as the Wang SCSI Accelerator can mask this performance penalty, but at a high cost. The totally integrated caching architecture of the HPSS provide the performance advantages of cache protection. In addition, the HPSS hardware has been built with fault tolerance in mind. HPSS units include redundant, hot swappable power supplies in addition to swappable disk drives. Power supplies are not user accessible. Arrays are always constructed with one parity drive. System managers can trade useable capacity for additional parity drives and/or hot standby drives.

UPS Recommended

The HPSS architecture does not include an embedded UPS. The user is better served if UPS protection is provided by the same unit that services a host computer. Wang recommends that the HPSS be UPS protected.

Advanced Storage Architecture

Wang's HPSS is a full featured implementation of the RAID 7® storage architecture. The core of the RAID 7® technology is the asynchronous server architecture. This unique architecture, based upon a control processor running a custom real-time event driven operating system, enables the HPSS RAID 7 to dramatically outperform traditional Raid-3 and Raid-5 architectures. Each host port and each drive connection have a private, high performance cache, and operations on any port are totally independent of operations on any other port. Common shared read and write caches are connected to the individual ports by an ultra-high speed system bus, allowing direct cache to cache transfers of data.

The multiple levels of caching and the asynchronous nature of the real-time embedded OS allow the HPSS to respond to high concurrent rates of activity on multiple SCSI ports. The architecture provides multiple levels of cache protection to user data.

Multiple Host Interfaces - Wang HPSS units can be configured with one, two or four host ports. Single Ended and Differential SCSI ports are available. Each port can be connected to a separate SCSI controller.

Selectable Mean Time to Repair (MTTR) rebuild modes allow the storage administrator to trade-off HPSS response against rapid recovery of fault tolerance. Modes include Dedicated Rebuild, where host access is denied until data security is achieved; Interleaved, where rebuild modes and host access share the HPSS, and Background rebuild where the HPSS rebuilds only when there is no host activity.

Selectable Write Acknowledge modes allow the storage administrator to select cache performance levels in trade-off risk of data loss. The modes differ in the time at which a write complete is returned to the host. Ultra Fast Write provides a write complete when the data is safely in the HPSS cache and Fast write, when the parity drive contents have been computed. Wang recommends that these modes be used only when the HPSS is protected by the UPS of the host computer or a stand-alone UPS. Safe Write mode returns completion only when the data and updated parity are written to the drives. Write and Verify mode actually verifies the success of the write before signaling completion to the host. These modes are selectable on a logical volume (partition) basis allowing the storage administrator to provide highest performance to work volumes and highest safety to mission critical data bases.

Standby Drives - Automatic Rebuild - The storage administrator can configure one or more drives as on-line Hot Standby drives. The HPSS software and hardware continuously monitor performance of all components. If a drive begins to experience errors, the HPSS will swap in a standby drive and transfer the data from the suspect drive. The HPSS will then take the suspect drive off-line and perform a low level reformat. This process normally resolves the problem without requiring drive replacement.

Expandability - Wang's HPSS system has been designed for expandability. A simple upgrade adds 18GB of usable storage to your 27GB or 45GB configurations. Custom upgrades to other capacities can be obtained.

Standard HPSS Configurations

Wang's standard HPSS configurations provide 27GB, 45GB or 63GB of usable storage and up to 4 host ports. These units can be expanded to up to 99GB of usable storage, at the expense of host ports.

Configuration data provided on this sheet refers specifically to Wang's standard HPSS desktop product. Wang can provide customized, multi-host configurations with larger amounts of storage (to 1.3 Terabytes) and up to 12 host ports on a Request for Quotation basis.

Installed and Fully Supported by Wang. HPSS storage solutions are installed and on-site maintenance is provided by Wang.

Warranty: The HPSS product have a 90 day on-site warranty. If the host to which it is connected is covered by a Wang maintenance contract, then Warranty service will be consistent with the service provided for other peripherals on the system. If the host is not covered by a Wang contract then warranty service response will be consistent with per-incident service.

Warranty and Service terms may vary in locations outside the United States.

Wang's Family of Storage Solutions The HPSS is one member of a Wang's family of high performance, high integrity SCSI storage solutions for the VS, including drives, RAID-1 mirror pairs and high performance tape backup products.

Raid 7® is a registered trademark of Storage Computer Corporation



290 Concord Road
Billerica MA 01821-4130 USA
(978) 967-5000

The material presented here is summary in nature, subject to change, and intended for general information only. Additional details and specifications concerning the operation and use of Wang products are available in the applicable technical literature

Wang Laboratories reserves the right to change specifications without notice. All Trademarks and registered trademarks are the property of their respective owners.

©1997, 1998, 1999 WANG LABORATORIES, INC. ALL RIGHTS RESERVED

VS97-014A

For sales in the United States 1-800-639-9264

WWW.WANG.COM