Comet SATA II 24 eU

Highlights

- **Two (2) SCSI-320 host channels** interfaced through four (4) dual-stacked VHDCI connectors
- Single RAID controller with full RAID functionality
- Support for 3.5-inch, 3Gbps SATA II disk drives
- Modular, passive backplane, high redundancy enclosure design
- Co-existing, flexible, multi-level RAID configurations
- Media Scan: Manual or scheduled scans to discover and repair media errors and data inconsistencies
- Optional, hot-swappable battery backup units (BBU)
- Dual-speed fan control for power efficiency and noise reduction
- Ease of management through an LCD keypad panel, RS-232C terminal, or an Ethernet link (TCP/IP) to a PC running Java-based RAIDWatch Manager software
- Real-time and remote event notifications by a variety of methods

Overview

The Comet SATA II 24eU provides unprecedented performance through full utilization of its 640MB/s host bandwidth with the computing power managing a massive capacity of 24 SATA disk drives. The subsystem handles the 12TB of raw capacity with ease, using the dual PCI-X, custom-built ASIC266 architecture that is renowned for its ample margins, flexible load-balancing, and multi-pathing algorithms. Boasting a 2GB internal bandwidth, the dedicated ASIC architecture makes the subsystem ideal for a wide range of applications such as data archiving, backup and restore, near-line DAS, and any environment where cost-effective, mass storage is required.

The Comet combines two SCSI-320 host channels with 24 drive bays in a smartly managed enclosure. This scalable, fault-tolerant storage subsystem is well-suited for clustered or direct-attached storage applications and has the flexibility to serve applications running different I/O characteristics. High throughput is guaranteed by segregating I/O traffic across the dual PCI-X buses, while IOPS performance is delivered through the internal buffer on the XOR engine and CPU using intelligent firmware algorithms.

Reliability

In addition to RAID protection against drive failure, the subsystem has ingenious means to deal with other challenges that may jeopardize data integrity. For example, hard disk drives wear down over time and drives may arrive from the manufacturer with inherent defects. Media Scan and Task Scheduler are among the DrvSmart utilities designed for mending these problems.

Media Scan performs the following tasks to ensure data integrity:

- Scans disk drives for bad blocks and data inconsistencies
- Retrieves inaccessible data from other member drives
- Attempts to rewrite onto the original disk blocks
- Distributes regenerated data to other healthy sectors if rewrites fail (i.e., the original disk sector is unreliable)

Combined with Media Scan, Task Scheduler arranges the scanning operation to a time when the subsystem is less stressed with daily service.

The subsystem is also equipped with error containment algorithms, known as the SysSmart functions. If a critical component fails, e.g., a battery module, the subsystem automatically disables write-back caching and assumes the conservative write-through mode. If the fault condition persists for an extended period of time, the subsystem enters an idle state. All of these precautions help ensure safe operation and distribution of data.

The Comet is powered by field-proven technologies that ensure data protection and performance to meet your various storage needs. Your data is secured by sophisticated, redundant components and advanced firmware developed through a decade of experience in RAID technology design. In addition to the choice of RAID levels, 0, 1(0+1), 3, 5, 10, 30, and 50, the subsystem protects your data with various high-availability algorithms ranging from predictive checking and self-healing rebuilds to system self-diagnostics.

To ensure a high level of system availability, critical components such as disk drives, power supplies, and cooling fans are all redundant and hot-swappable. Modules are integrated with the passive backplane via board-to-board connectors to eliminate points of failure. Assisted by GUI management software, system administrators can constantly monitor the operating status of all components through a console locally or remotely situated. The subsystem guarantees data integrity with selected, high MTBF components; a modular, fault-tolerant design; and a complete set of environmental monitoring and fault protection capabilities built in the firmware.

Serviceability

All critical modules are housed in separate, retrievable canisters. In the event of component failure, a hard disk drive, power supply, battery module, RAID controller, or cooling fan can be replaced within seconds. The modules are closely monitored using self-diagnostic features and the help of runtime utilities such as RAIDWatch. Spring screws, securing latches, and key-locks all provide easier access to the modules.

A variety of configuration and monitoring methods are available, either locally via the LCD keypad panel and the text-mode RS-232C terminal, or remotely through the Java-based GUI manager. All faulty conditions, including RAID configuration events, module failure, voltage and temperature readings, are instantly reported. A system administrator can select

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from the following notification methods to receive reports when away from the installation site: LAN broadcast, SNMP traps, email, fax, SMS, ICQ, and MSN Messenger. Even the notification utility can be installed redundantly on two different machines to avoid the chance of blind time. System configuration data and event logs are constantly updated on the disk drives' reserved space to minimize the effort required to recreate a fault scenario. An administrator may also manually retrieve data from a system drive or the array itself.

Caen's Smart Technologies

Derived from more than ten years of experience in RAID storage design, Caen's firmware features extremely compact protocol and rich varieties of algorithms to deal with the stringent requirements of storage applications. The technologies enhance I/O processing, drive handling, and system management.

IOSmart

The IOSmart technologies consist of specific functions and configuration options that control various I/O characteristics in order to meet the rapidly increasing requirements of today's applications. These functions include adaptable stripe size; write policy; optimizations modes; Guaranteed Latency I/O; and automatically adjusted, multi-threaded, predictive read-ahead, sorted, or group writes.

DrvSmart

DrvSmart is comprised of fault-preventive algorithms that ensure data integrity when hard drive imperfections occur. These mechanisms correct minor defects, increase reaction time, allow more time to prepare a rebuild, and help minimize performance impact. DrvSmart functions include Media Scan and Task Scheduler, hot-spare, drive roaming, SMART and manual cloning options, and more.

SysSmart

SysSmart combines enclosure monitoring and firmware management capabilities designed to minimize the chance of downtime caused by hardware failures. With SysSmart, Caen's subsystems are smartly managed and guarded against extreme operating conditions.

SysSmart functions include the event-triggered, adaptive write policy, auto-shutdown, dual-speed fan control, and the various monitoring utilities and approaches included in the powerful RAIDWatch Manager software.

Specifications

Subsystem Characteristics

- 600MHz RISC CPU, 512KB L2 cache
- ASIC266 RAID engine
- 2G DDR cache memory
- BBUs keypad panel
- LCD keypad panel
- 2 COM ports per controller
- 1 Ethernet port per controller
- Diagnostic LEDs on all FRUs

Drive Interface

- 24 disk trays
- Serial ATA II/I drive supported

Host Interface

- 4 VHDCI SCSI ports
- 320MBps Single controller bandwidth
- Tag command queuing
- Multiple target IDs

RAID Configurations

- RAID levels 0, 1(0+1), 3, 5, 10, 30, 50, JBOD
- Max. 16 logical drives
- Max. 128 LUNs
- Multiple array configurations
- Automatic background rebuild
- Caen Smart Technologies

High Availability

- Redundant, hot-swappable FRUs
- Subsystem self-diagnostics
- Dedicated and Global hot spare HDDs
- Li-ION battery backup module
- UPS support

Management Software

- RAIDWatch Manager software
- Terminal via RS-232C
- Telnet over Ethernet
- LCD keypad panel
- Event notification methods:
  - Email
  - Fax
  - LAN broadcast
  - SNMP traps
  - Cell phone message (SMS)
  - Instant messages (MSN/ICQ)

OS Support

- Microsoft Windows NT
- Microsoft Windows 2000 Server
- Microsoft Windows 2003 Server
- Sun Solaris ver. 8/9
- Red Hat Linux ver. 8/9, Enterprise ver. 3
- SUSE Linux ver. 8/9

Requirements

AC Input:
100VAC at 10A; 240VAC at 5A with PFC (auto-switching)
DC Output:
12V-32A; 5V-32A; 3.3V-30A
Relative Humidity:
5% to 95% non-condensing
Operating Temperature:
0C to 40C

Dimensions

4U, 19-inch rackmount chassis
Without handles:
446(W) x 176(H) x 490(D) mm
(17.6 x 6.9 x 19.3 inches)
With handles:
482(W) x 176(H) x 505(D) mm
(19 x 6.9 x 19.9 inches)

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