AVAGO TECHNOLOGIES

Product Brief

Avago SAS 3216

PCIe® to 16-port, 12Gb/s SAS/SATA IOC



Applications

- Direct Attached SAS/SATA controller solutions for high-connectivity applications
- External storage controllers requiring high connectivity SAS/SATA interface for the host or drive side connect

Features

- High Performance IOP
  - PowerPC 476 @ 1.2GHz
  - 32KB L1 I/D caches
  - 512KB L2 caches
  - 6MB Internal RAM
- 12Gb/s SAS Interface
  - 16 port SAS+SATA controller
  - Supports 12, 6, and 3Gb/s SAS and 6, 3Gb/s SATA data transfer rates
  - Spread spectrum clocking
  - Supports SSP, SMP, STP and SATA protocols
  - SAS/SATA device support
  - Supports narrow and wide ports
  - T-10 End to End Data Protection (EEDP)
  - T-10 Optical Support
  - Supports DataBolt bandwidth aggregation Technology
- PCI Express 3.0 Host Interface
  - Supports x8, x4, x2, x1 PCIe lanes at a transfer rate up to 8.0 GT/s per lane, full duplex
  - Lane and polarity reversal
  - Supports End-to-End CRC (ECRC) and Advanced Error Reporting (AER)
  - PCI Express hot plug support
  - Variable PCIe bandwidth negotiation
- External memory interface support
  - 8-and 16-bit Flash/NVSRAM for Integrated Mirroring
  - Communication Interfaces
  - I2C interfaces for enclosure management services
  - UART and Ethernet interfaces
  - SFF-8485 Compliant, SGPIO
  - JTAG support
- Package 27mm

Extending RAID and SAS Technology Leadership, Avago Introduces 16-port 12Gb/s SAS/SATA IO Controller (IOC)

Avago Technologies products serve four primary target markets: wireless communications, wired infrastructure, enterprise storage, and industrial. Avago offers the industry's broadest portfolio of storage solutions, backed by decades of experience and trusted by the world's leading server and storage suppliers. Avago provides the building blocks for storage solutions that help customers understand, prioritize, store and protect critical data.

The Avago 12Gb/s SAS portfolio includes MegaRAID® controller cards, host bus adapters (HBAs), advanced software options, Syncro® shared DAS solutions and SAS storage ICs, including RAID-on-Chip (ROCs), I/O controllers and expanders.

Overview

The SAS 3216 is a fourth generation Serial Attached SCSI (SAS) IO Controller (IOC) device based on the leading Fusion-MPT™ (Message Passing Technology) architecture. The SAS 3216 integrates the latest enhancements in SAS and PCI Express technology.

The SAS 3216 supports 8 PCIe® lanes and complies with the PCI Express (PCIe) 3.0 specification that extends the PCIe data rates up to 8.0 GT/s per lane, and is backwards compatible to the 5.0/2.5 GT/s data rate supported by PCIe 2.x., 1.x. It also incorporates enhancements such as End-to-End CRC (ECRC) with Advanced Error Reporting (AER) and the latest advancements in lane and polarity reversal, power management, hot plug support, and MSI/MSI-X and legacy interrupt generation.

The sixteen-port IO controller device provides SAS data transfer rates of 12, 6, and 3Gb/s per lane and SATA data transfer rates of 6 and 3 Gb/s per lane. The device automatically negotiates between the speeds. Enhanced features are supported such as T-10 EEDP for early detection of and recovery from data corruption and Spread Spectrum-Clocking (SSC) for EMI reduction. Additional features include DataBolt™ Technology, allowing users to take advantage of 12Gb/s speeds while utilizing existing 6Gb/s drives and backplanes, and SATA FIS-based switching that provides improved performance with SATA drives.

The SAS 3216 is ideal for the host or drive side connect for external storage controllers requiring a SAS/SATA interface. The SAS 3216 can support up to 2,000 devices and 8,000 outstanding IOs without external RAM and can achieve up to 1 million plus IOs per second.

Avago provides a complete suite of industry standard operating system drivers. Avago also supports Virtual Operating Systems with device emulation and para-virtualization.

Fusion-MPT Architecture Overview

Fusion-MPT architecture marks the next generation of I/O architecture designed to deliver the highest performance available today while reducing time to market, integration, and certification time. Fusion-MPT devices are high performance, cost-effective protocol controllers that represent the newest system- level integration technology in intelligent I/O processors from Avago.

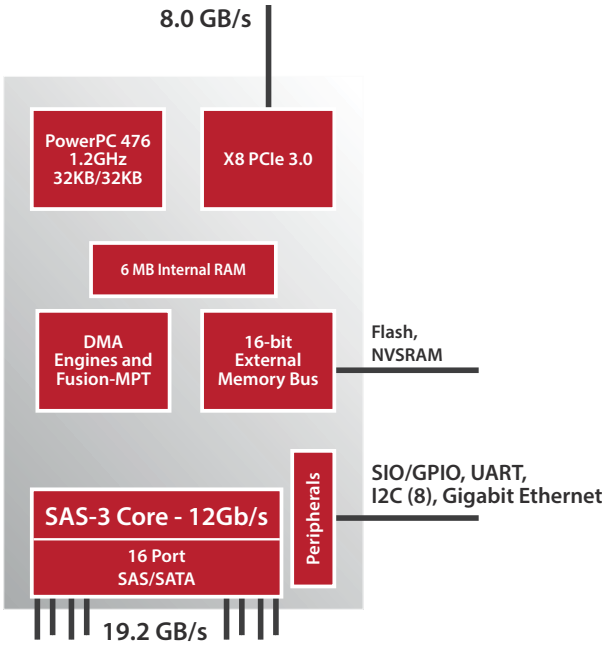


Figure 1: SAS 3216 Block Diagram

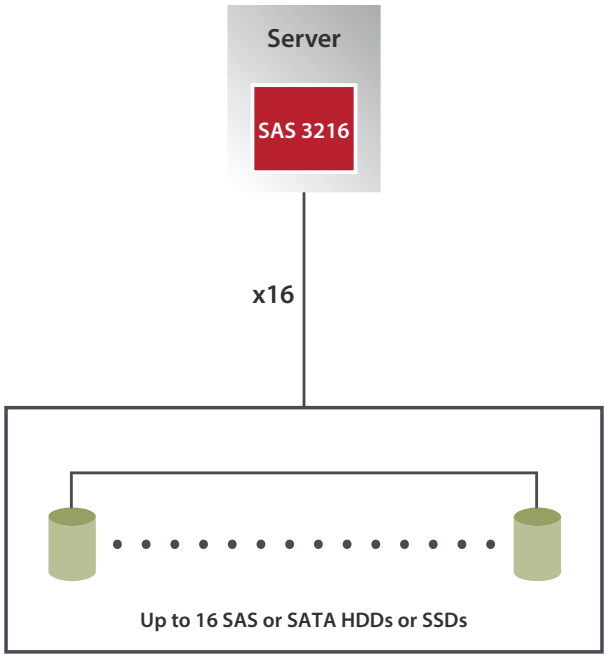


Figure 2: SAS 3216 Direct Attach



Figure 3: SAS 3216 Topology Diagram

Visit the Avago Server Storage website at: avagotech.com/server-storage

Avago Technologies, MegaRAID are trademarks of Avago Technologies. All other trademarks are the property of their respective owners.
Copyright ©2016 Avago Technologies. All rights reserved. > 01/06/16 AV00-0318EN