

SAS (Serial Attached SCSI)

Let MindShare Bring SAS to Life for You

MindShare's SAS Architecture course provides a comprehensive understanding of the Serial Attached SCSI interface. The course covers all aspects of the standard, primarily from a hardware perspective, and compares the usage model of SAS with other enterprise interface designs. Practical examples of the discovery process, transactions on the link, and error conditions help provide a great introduction for those new to this material. MindShare's established background in legacy platform design, coupled with a comprehensive understanding of the latest bus technologies, provides rich insight into the SAS design and results in a superior training experience. This course will provide the kind of in-depth information, example implementations, and practical guidance that will give your team a running start on working with SAS.

You Will Learn:

- The basics of the serial interface
- System topology considerations
- How connections are built and handled
- How the SAS infrastructure handles different protocols
- The responsibilities of each design layer
- How problems are reported and handled

Course Length: 3 Days

Who Should Attend?

Our target audience for this class is design or validation engineers working on an RTL-level, chip-level, system-level or system board-level design. Although the material is hardware oriented, software engineers can also benefit from seeing the big picture.

Course Contents:

- Background
 - SCSI
 - Fibre Channel (FC)
 - Serial ATA (SATA)
- Introduction to SAS
- Usage Model: Comparing SAS, SATA, and Fibre Channel
- Introduction to the Architectural Layers
 - Physical
 - Phy
 - Link
 - Port
 - Transport
- Expander Devices
- Application Layer Responsibilities
 - Discovery process
- Transport Layer Responsibilities
 - SSP and Error Handling
 - STP
 - SMP
- Port Layer Responsibilities
 - Call Center Routing Model
- Link Layer Responsibilities
 - Primitives
 - Serial Support
 - Connections

- Arbitration
- ACK/NAK Protocol
- Flow Control
- Phy Layer Responsibilities
 - Encoding, OOB, Initialization, Resets
- Physical Layer Responsibilities
 - Differential signaling
 - Inter-Symbol Interference and Compensation
- Enclosure Services Management

Recommended Prerequisites:

A basic understanding of SCSI is recommended but not required.

Course Material:

MindShare's **SAS Storage Architecture** textbook

Author: Mike Jackson

Publisher: MindShare Press

Available through the MindShare Store and major bookstore outlets.





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- ☞ Wireless USB
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- ☞ Serial Attached SCSI (SAS)
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- **Intro to IO Virtualization**
- **Intro to PCI Express 2.0 Updates**
- **PCI Express 2.0**
- **USB 2.0**
- **AMD Opteron Processor Architecture**
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