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Quality Training

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Storage Technology

313: SCSI Fundamentals

Duration: 2 Day(s)

This course offers a comprehensive presentation of parallel SCSI, covering software, firmware, hardware, and all the other aspects of SCSI.

OBJECTIVES

It provides not only a functional understanding of the SCSI specification, but also in-depth, practical, up-to-date information designed to optimize your SCSI related efforts.

- Fundamentals of SCSI
- How SCSI Works
- Connecting with SCSI Devices
- Troubleshooting a SCSI Installation
- SCSI-3 Explained
- Measuring Performance of SCSI Devices
- RAID Server Strategies
- Defect management
- Command queuing
- Messages
- Mode pages
- Signal interactions

316: Serial ATA (SATA) Fundamentals

Duration: 2 Day(s)

Serial ATA is an evolutionary replacement for the Parallel ATA physical storage interface. Serial ATA is scalable and will allow future enhancements to the computing platform.

This course provides the framework engineers and technicians need to get out in front of SATA I , II and future releases.

OBJECTIVES

Much more than an overview, this class provides a thorough understanding of the Serial ATA: its protocol, its core functionality, its evolution, how it emulates parallel ATA, the various options, interworking with Serial Attached SCSI (SAS), and error recovery strategies.

320: iSCSI Fundamentals

Duration: 2 Day(s)

This course provides a comprehensive summary of the current development of iSCSI (SCSI protocol over TCP/IP).

OBJECTIVES

This course exposes the student to the maze of information available and puts it all together, from making connections to how commands work. All the pieces of an iSCSI system are clearly summarized including what it takes to integrate iSCSI components into a working system. In class exercises help reinforce system concepts. We also look at the trend of the current iSCSI documents and examine iSCSI analyzer captures from some of the current products available.

322: Infiniband Fundamentals

Duration: 2 Day(s)

This course introduces the technical fundamentals of the InfiniBand architecture and features. Attendees will gain a working knowledge of the architecture and structure of InfiniBand.

InfiniBand, a switched fabric architecture with up to 30 Gigabits per second!, will consolidate the interconnects in a data center and will become the industry's next I/O standard.

OBJECTIVES

The course discuss InfiniBand Architecture fundamentals, including:

- InfiniBand Management
- Putting InfiniBand Architecture to Practice
- Protocol Layers
- Physical Layer Interface
- Link Layer
- Network Layer
- Transport Layer and more...

324: Storage Area Networks (SAN) Fundamentals

Duration: 2 Day(s)

SAN Fundamentals course provides attendees with an introduction to designing, implementing, maintaining, and administering storage area networks (SANs) using Fibre Channel switches. Through hands-on labs*, workshops* and interactive discussions, the course presents attendees with the opportunity to explore how a SAN implementation can benefit a variety of organizations. Key design considerations, installation, administration, and troubleshooting skills are addressed.

TOPICS COVERED:

- The evolution of the technology
- Overview of SANs Technology
- Killer applications for SANs
- Designing SANs
- Planning for SANs
- Installing and Deploying SANs
- Maintaining the SANs
- SAN Solutions and Future Directions
- Full coverage of storage networking
- Storage, network, and software components of storage networking workshops
- Issues for implementation and adoption

*Labs and workshops are available upon request with the 3-day course program.

OBJECTIVES

The course provides attendees with the technical skills they need to perform detailed planning and to design SAN

Discuss concepts of SANs, such as Fibre Channel, Fibre Channel topologies, SAN components, SAS, SATA and storage issues addressed by a SAN solution Design a SAN solution based on an analysis of specific business requirements Discuss SAN management in enterprise environments Clustering and backup requirements Install and test SAN hardware and software Administer changes, backups, and disaster recovery in a SAN environment Troubleshoot and manage the SAN environment

325: Serial Attached SCSI (SAS) Fundamentals

Duration: 2 Day(s)

Serial Attached SCSI is the logical evolution of SCSI, including its long-established software advantage and the Serial ATA electrical and physical connection interface. With enterprise storage requirements escalating and becoming more complex, factors such as larger capacity, greater density, security, scalability and accessibility are more critical than ever.

OBJECTIVES

This course explores why industry in defining a new serial point-to-point enterprise device attach interface, leveraging the SCSI protocol set and supporting a wide range of price/performance storage.

9005: Storage Networking and Engineering Training Boot Camp

Duration: 5 Day(s)

TONEX Storage Networking and Training Boot Camp is a comprehensive, vendor neutral exposure to storage and networking interfaces architectures, storage solutions and supporting technologies.

The Storage and Networking Training Boot Camp is a 5-day accelerated course by TONEX that provides comprehensive, vendor-neutral exposure to SAN solutions and supporting technologies, such as Fibre Channel, NAS, iSCSI, SATA, SAS and IP storage. Attendees learn about architecture, protocols, standards, management practices, performance, security, tools, and SAN-design and implementation considerations.

Class discussions cover a wide range of topics, including the capabilities and limitations of the various supporting technologies and SAN management in enterprise environments, while a hands-on lab allows students to apply their knowledge of the Fibre Channel protocol; gain experience with component installation and configuration; build a simple SAN fabric; and explore SAN management applications.

OBJECTIVES

WHAT YOU'LL LEARN

- Overview of iSCSI, Fibre Channel, GigE, Infiniband, IDE, SATA, SAS, USB and 1394
- Storage concepts and architecture covering storage subsystems, DAS, SAN, NAS, and CAS
- Overview of backup/recovery, disaster recovery/business continuity, and local and remote replication
- Emerging technologies such as IP SAN, storage virtualization and security
- Storage infrastructure's logical and physical components
- Core elements of a data center infrastructure
- Introduction to managing and monitoring in the data center
- Evolution of storage and storage environments

UPON COMPLETION OF THIS BOOT CAMP, THE ATTENDEES WILL BE ABLE TO

- Understand Basic Storage Technology
- Describe storage performance and data protection strategies including RAID, caching, and connectivity technology
- Differentiate between DAS, SAN, NAS, CAS and IP Storage environments
- Identify disk components (actuator, platter, head, sector, track, zone)
- Compare and contrast ATA/IDE, SATA (Serial ATA), SCSI and SAS (Serial Attached SCSI)
- Describe SCSI (architecture, connections, disks, tapes)
- Describe SCSI protocol (initiators, targets and logical units)
- Identify implementation parameters (Parallel, FC, iSCSI)
- Describe FC SAN general concepts (architecture and basic terms including port types, WWN, components (HBA, Hub, Bridge/Router, Switch, Director, Cable, GBICs, etc.)
- Identify advantages and disadvantages of using FC SAN (distance, speed, connectivity and scalability)
- Describe topologies (Point to Point, Arbitrated Loop, Switched Fabric)
- Describe FC Protocol (service classes, addressing)
- Describe switched fabric based services (virtualization, authentication, file sharing, replication, extension, FAIS)

- Describe IP Storage Networking general concepts (network storage, block, file,
- FCIP, iFCP, iSCSI, iSNS, components)
- Describe 10 Gigabit Ethernet
- Identify 10GbE Storage Applications
- Describe SONET/SDH and DWDM
- Describe iSCSI implementation concepts
- Identify Pros and Cons of using IP Storage Networking (distance, speed, connectivity, scalability, security)
- Describe NAS concepts (file access, components, O/S)
- Identify advantages and disadvantages of using NAS technology
- Compare and contrast NFS and CIFS protocols
- Compare storage virtualization approaches (host, network, storage device)
- Describe storage management components (capacity, configuration, LDM,
- Storage Network Managers, device managers, integration)
- Identify the advantages and disadvantages of effective storage management.
- Describe data management concepts (Backup & Recovery, Information Lifecycle)
- Compare storage virtualization approaches (host, network, storage device)
- Describe virtualization management strategies (in-band and out-of-band)
- Describe storage virtualization taxonomy elements (block, disk, tape, file system, file/record)
- Describe virtualization services (Snapshot, Copy, Replication)
- Describe virtualization services (snapshot, copy, replication)
- Describe Infiniband, Universal Serial Bus (USB), 1394 (FireWire), PCI and PCI-X

IO Buses

310: 1394 (FireWire) Fundamentals

Cost: \$1,499 | Duration: 2 Day(s)

This class provides a thorough understanding of the IEEE 1394, its protocol, its core functionality and, the various options. It includes 1394a/1394b protocols, SBP-2 and 61883/AVC mappings.

OBJECTIVES

Upon completion of this course, the participant will:

- Have a comprehensive system-wide knowledge of 1394a/b interface.
- Have an awareness of the existing and future 1394 applications.
- Be able to understand relevant information in the 1394 specifications.
- 1394 (FireWire) Protocol Overview and a good understanding of 1394a/b architecture, configurations, products, testing and Interoperabil, and vendors

318: Universal Serial Bus (USB) Fundamentals

Cost: \$1,499 | Duration: 2 Day(s)

This course provides you with a comprehensive foundation of USB

OBJECTIVES

- Introduction To USB Topology
- Introduction To Framing
- Introduction To Host Software
- Introduction To Device Software
- Introduction To Data Flow
- Introduction To Protocol Layer
- Introduction To Device Classes
- Introduction To Plug and Play
- Introduction To Electrical Interface
- Introduction To Mechanical Interface
- Introduction To Power Management

319: Advanced USB

Cost: \$1,499 | Duration: 2 Day(s)

This unique course goes beyond all the Universal Serial Bus (USB) (1.1 and 2.0) specifications overviews to provide designers with the expert knowledge and skills they need to design and implement USB I/O devices. Organized around a series of fully illustrtaed, real-world examples, this course is structured to serve as both a step-by-step tool for creating specific devices and a complete reference to USB. Design examples cover most USB classes, communications, audio, mass-storage, and hub; and provide insights into high-speed USB 2.0 devices, including a device driver for a vendor class called blockio.

OBJECTIVES

- USB Overview
- USB Architecture
- Device classes Differential signaling environment
- Device configuration
- Suspend/resume operations
- Device descriptors
- Device requests (commands)
- Transfer mechanisms
- USB transaction protocols
- and more...