Publication date : 01/23/2024

Course : Storage area networks, SAN/NAS

Synthesis course - 2d - 14h00 - Ref. SAN
Price : 2020 CHF E.T.

This course presents the fundamental principles involved in setting up and administering a storage area network. It covers the key points in all phases of a SAN/NAS implementation project: gathering the storage requirements of the company's applications, choosing a supplier, defining the architecture, migrating applications to the SAN, and finally administration. The course focuses on both technical and organizational aspects. Technological developments are assessed from the point of view of their use by the company.

Teaching objectives

At the end of the training, the participant will be able to:

- Discover the key points of storage network management
- Understand the different components of a storage area network
- Define a storage type for a specific application
- Managing a SAN/NAS implementation project
- Organize the administration of a storage area network

Intended audience

Project manager, architect, production manager, storage manager.

Prerequisites

Basic knowledge of enterprise data storage issues.

Course schedule

PARTICIPANTS

Project manager, architect, production manager, storage manager.

PREREQUISITES

Basic knowledge of enterprise data storage issues.

TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS

The trainer evaluates each participant’s academic progress throughout the training using multiple choice, scenarios, hands-on work and more.
Participants also complete a placement test before and after the course to measure the skills they’ve developed.

1 Which storage for which application?

- Storage as a new paradigm.
- Application storage requirements.
- How are SAN and NAS different from each other?
- Which applications are candidates for SAN migration?
- Which applications are designed for the NAS?
- Can RDBMS data be integrated on a NAS?
- What applications for SAN and NAS?
- Advantages and disadvantages of SAN and NAS.
- What is ROI and TCO?
- Can the cost of a storage area network be justified?

2 Storage area network components

- Fibre Channel protocol basics.
- Why switch from SCSI to Fibre Channel?
- Description of SCSI limitations.
- How does Fibre channel represent an advance on SCSI?
- Fibre Channel terminology.
- Choosing and building an ISCSI storage network.
- Ethernet hardware evolution towards 10 Gb, specific architecture and configuration for ISCSI.
- The price/performance gap between Fibre Channel and ISCSI, depending on the architectures and hardware used.
- Backup architectures: traditional backup client. Lanfree and Serverfree Backup.

3 Hardware components of a storage area network

- Cables: description of different single-mode and multi-mode types, and maximum distances.
- GBICS: optical converters and the new generation (SFP).
- HBA: Host Bus Adapters and the dual path for fail-over and load balancing.
- Switch: aggregated bandwidth. FSPF path optimization protocols and limits. Monitor inter-switch links.
- Network topologies/arbitrated loop and switched fabric.
- Why choose one director over many departmental switches?
- Storage bays: comparison of the main internal architectures, main operating principles.
- How do the latest developments meet application needs?
- NAS head: main features of a NAS head, SAN/NAS convergence architecture.

4 Software components of a storage area network

- Business Continuity Volume: operating mode, data consistency constraints, types of use.
- Suitability of applications with BCVs.
- Snapshots: how they work, advantages and disadvantages.
- Snapclones: how it works.
- Continuous Data Protection: management of volume rollback.
- Data replication between racks: synchronous/asynchronous mechanisms, choice of environments.
- How far can data be replicated?
- High availability. Data deduplication. Impact on application performance.
- New asynchronous technologies. Storage virtualization.
- Add flexibility and mobility to your data, on one site or between sites.

TEACHING AIDS AND TECHNICAL RESOURCES

• The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
• At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
• A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.

5 Fibre Channel protocol

- Fibre Channel layers: list of their functions.
- Classes of service: Buffer to Buffer, credit and main uses.
- Naming and addressing convention (WWN).
- Conversion to internal address.
- Arbitrated loop: description of topology and arbitration procedure.
- Factory: description of a logical network.
- How can redundancy be introduced into the SAN?
- FCoE (Fibre Channel over Ethernet) standard, CNA (Converged Network Adapter).

6 Implementation

- Inventory and requirements gathering.
- Criteria for selecting candidate machines.
- Evaluate the volume required.
- Should IO load be calculated? How detailed should architecture components be?
- Specifications: what needs to be included?
- Choosing a supplier: pitfalls to avoid.
- SAN/NAS architecture definition process.
- Migration: different migration options.

7 Administrative organization

- In-band and out-band administration: administration outside the storage area network and in Fibre Channel.
- Alert devices: Snmp, Http, Telnet, call-home.
- When should a surveillance system be installed? Safety issues.
- Add servers or volumes: Zoning, Lun Masking, Persistent Binding.
- Monitor SAN performance.
- Conduct a performance audit, key elements to monitor depending on the components.
- Data distribution modes. Analysis of the consequences of reduced access density.
- Quality of service concepts.
- Set up a team of Storage Managers: define processes and procedures, Service Level Objectives.
- Attribute-based storage management and different service levels.

Dates and locations

REMOTE CLASS
2026 : 19 Mar., 28 May, 8 Sep., 15 Dec.