



Xsan Administration v1.4 Exam Skills Assessment Guide

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The Xsan Administration v1.4 Exam (Prometric exam no. 9L0-616) is a computer-based test offered at Authorized Prometric Testing Centers.

The exam is an elective in the Apple Certified System Administrator (ACSA) track. Successful completion of the exam earns Xsan Administration 1.4 certification and also contributes 3 credits towards ACSA certification.

The exam lasts two hours and consists of 76 multiple-choice questions that are based on the knowledge-area objectives listed in this guide.

The score required to pass is 77 percent (59 items out of 76). Eight demographic questions are presented but are not scored.

To prepare for the exam, read through the objectives in this guide to determine which areas you need to review. Primary reference sources for this exam are:

- *Xsan Administrator's Guide for Xsan 1.4* (Apple 2006)—available online at www.apple.com/support/manuals/xsan/
- *Xsan Administration Student Guide* (Apple 2006)—provided as part of the student materials for Apple Training's Xsan Administration v1.4 leader-led training.

You will not have access to any resources or references during the exam. Please note that the exam is based on Xsan version 1.4.

The number of test questions drawn from each knowledge area is indicated below. Please note that although this guide divides the objectives into nine knowledge areas, questions are presented randomly during the exam. Also note that UNIX commands and processes are shown in monospace font in the exam.

Xsan Concepts

This topic has 9 items, drawn randomly from the following objectives:

- Explain the benefits of storage networking
- Differentiate between available storage architectures
- List features of Fibre Channel
- Define a Fibre Channel node, port, and link
- Describe the protocols, ports, and cabling characteristics of switched fabric Fibre Channel topology
- Compare and contrast channels and networks
- Define WWNN and WWPN
- Describe the addressing scheme used in a switched fabric topology

- Describe the benefits of Fibre Channel fabric switches
- Describe how a cluster file system takes advantage of a SAN storage architecture
- Describe the basic structure of an Xsan volume

Xsan Components & Connections

This topic has 9 items, drawn randomly from the following objectives:

- Identify the system requirements for Xsan
- Compare and contrast Fibre Channel hubs and switches
- Identify the Fibre Channel cables and connector types supported by Apple HBAs and Xserve RAID
- List the features of the Apple Fibre Channel HBA
- Describe how to use Fibre Channel Utility to configure the Apple Fibre Channel HBA
- List features of the Apple Xserve RAID
- Use the RAID Admin Utility to configure the RAID controller for Xsan
- Use the Server Admin tools to monitor an Xserve controller

Xsan Configuration

This topic has 16 items, drawn randomly from the following objectives:

- Describe how to set up a simple Xsan volume
- Describe array-based virtualization
- List the RAID levels supported by the Xserve RAID, and describe their characteristics
- Describe how RAID 5 makes use of parity to create redundancy
- Describe how to use RAID Admin to create a new RAID array

Xsan Metadata

This topic has 5 items, drawn randomly from the following objectives:

- Define metadata
- Differentiate file-system metadata from other types of metadata
- Describe and give examples of:
 - local file systems
 - network file systems
 - distributed file systems
 - cluster file systems
- Define an Xsan storage pool
- Describe virtualization as it relates to creating an Xsan volume
- Describe Xsan's asymmetric metadata architecture
- Describe how to use Xsan Admin to configure an Xsan metadata controller
- Describe how to configure redundant metadata controllers
- Describe how to use Xsan Admin to configure an Xsan client

Xsan Volumes

This topic has 10 items, drawn randomly from the following objectives:

- Describe the role of fsm and fsmpr in an Xsan volume
- Describe how Xsan metadata controllers communicate to implement failover
- Describe how to cause one Xsan metadata controller to fail over to another metadata controller
- Describe version compatibility between Xsan and ADIC's StorNext file system, including compatibility with access control lists (ACLs)
- Describe the purpose and implementation of affinities
- Describe how to create an affinity in Xsan Admin
- Define block allocation size, stripe breadth, and allocation strategy
- Describe how to add a LUN or a storage pool to an existing Xsan volume

Xsan Data Management

This topic has 15 items, drawn randomly from the following objectives:

- Describe how to configure user accounts for use with an Xsan volume
- Describe how to configure default permissions for a user on an Xsan volume
- Describe how to configure quotas and permissions on an Xsan volume
- Describe the benefits of using Directory Services with Xsan
- Describe how to enable, configure, and troubleshoot access control lists (ACLs) on an Xsan volume
- Describe how to configure affinities on an Xsan volume
- Explain the concepts behind information life-cycle management
- Name backup techniques available on a SAN
- List third-party tape drives and libraries supported by Xsan

Xsan Maintenance & Troubleshooting

This topic has 9 items, drawn randomly from the following objectives:

- Given a block size, stripe breadth, and number of LUNs, describe the write characteristics of an Xsan storage pool
- Describe the performance implications of:
 - having multiple storage pools per volume
 - having multiple LUNs per RAID controller
 - expanding a volume by adding LUNs to a storage pool
 - expanding a volume by adding storage pools to the volume
- Compare and contrast using multiple storage pools for a single volume with using the same number of storage pools for two volumes
- List changes to Xsan volumes that will cause a loss of data
- List limitations of Xsan volumes (such as maximum number of LUNs)
- Describe how to use RAID Admin to monitor the RAID sets in an Xsan volume

Planning Xsan Deployments

This topic has 1 item, drawn randomly from the following objectives:

- Describe how to plan these elements of an Xsan deployment strategy:
 - storage requirements
 - performance requirements
 - workflow requirements
 - availability requirements
 - security requirements
- Describe how to use the elements listed above to design:
 - a component structure
 - a connections structure
- Describe how to document an Xsan deployment design using the Xsan Design Template

Xsan Appendices

This topic has 2 items, drawn randomly from the following objectives:

- List port types encountered when connecting Fibre Channel switches with hubs and other switches
- Describe how to configure:
 - options for QLogic switches
 - components in an Xsan environment that includes QLogic switches
- Recognize symptoms of a SAN failure in a QLogic switch

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