



The Xsan 2 Administration Exam Skills Assessment Guide

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The Xsan 2 Administration Exam (Prometric exam no. 9L0-622) is a computer-based test offered at Apple Authorized Training Centers.

The exam earns Xsan 2 Administration certification.

You may take up to two hours to complete the exam, which consists of 77 multiple-choice questions that are based on the objectives listed in this guide.

The score required to pass is 75 percent. 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. The primary reference source for this exam is the book: *Apple Training Series: Xsan 2 Administration* (Peachpit 2008).

You will not have access to any resources or references during the exam. Please note that the exam is based on Mac OS X and Mac OS X Server version 10.5.5, and Xsan version 2.1, which were the most current versions available at the time of publication. All references to Mac OS X, Mac OS X v10.5, Mac OS X Server, and Mac OS X Server v10.5 refer to version 10.5.5, and references to Xsan 2 refer to version 2.1.

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

Concepts

This topic has 11 items, drawn from the following objectives:

- Without references, identify the similarities and differences among various storage architectures, including direct-attached, network-attached, distributed, and SAN storage architectures, and describe several advantages specific to an Xsan file system, including concurrent access, high availability, and shared storage.
- Without references, identify the common hardware components of an Xsan storage area network, including types of targets and initiators, and Fibre Channel fabric switches.
- Without references, describe how the SAN hardware components work together to create an Xsan storage area network.
- Without references, identify the key features of the Xsan 2 version of Apple's Xsan software, including MultiSAN, Spotlight comments, and simplified administration tools.

Planning

This topic has 8 items, drawn from the following objectives:

- Without references, identify the recommended hardware for a basic Xsan deployment.
- Given a description of the hardware available for a basic Xsan deployment, identify the recommended software configuration for the deployment.
- Given a description of the amount of data to be stored or performance required, determine the amount of storage necessary for the deployment.
- Given the storage and performance characteristics for a specific storage solution, identify the best SAN volume type for the deployment.
- Given the storage and performance characteristics for a specific storage solution, determine the hardware requirements of the deployment.
- Given the storage and performance characteristics for a specific storage solution, determine the software requirements of the deployment.
- Given the storage and performance characteristics for a specific storage solution, identify the correct configuration for Apple Xserve RAID LUNs of the deployment.
- Given the storage and performance characteristics for a specific storage solution, identify the correct configuration for Promise RAID LUNs of the deployment.

Deployment

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

- Without references, describe the steps of the process of configuring a Fibre Channel network.
- Without references, describe the steps of the process of configuring a RAID array for use with Xsan.
- Without references, state the role of volume affinities during initial configuration of an Xsan volume.
- Without references, configure the Fibre Channel switch for a deployment.
- Without references, configure the public and metadata Ethernet network on an Xsan SAN.
- Given a list of DNS entries and IP addresses, configure a local DNS server with entries for Xsan controllers and clients.
- Given a description of the performance and storage requirements of a SAN, and the necessary hardware and software, configure an Xsan volume to meet those requirements.
- Given a functional Fibre Channel network, compatible Macintosh computers connected to that network, and the Xsan 2 software, configure several Xsan clients according to Apple best practices.
- Given a functional Fibre Channel network, compatible Macintosh computers connected to that network, and the Xsan 2 software, configure a primary metadata controller and directory services using Mac OS X Server Setup Assistant.
- Given a functional Fibre Channel network, compatible Macintosh computers connected to that network, and the Xsan 2 software, create a new Xsan SAN using Xsan Admin.
- Given a functional Ethernet network, and computers and a time server connected to that network, configure the computers to use the time server.

Client Management

This topic has 18 items, drawn from the following objectives:

- Without references, describe the steps of the process for moving a client system to a new SAN.
- Without references, describe the various methods used to control user access to information on Xsan volumes, including volume mounting with Xsan Admin, POSIX permissions, and ACLs.
- Without references, state the purpose of affinities in relation to controlling user access to information on SAN volumes, and how those affinities are implemented.
- Without references, describe how quotas are used in Xsan.
- Without references, describe the steps of the process for mapping Windows User and Group IDs.
- Without references, identify how Xsan metadata controllers communicate to implement failover.
- Without references, identify compatible versions of Xsan and Quantum's StorNext file system.
- Without references, describe the steps of the process for adding a Quantum client to an Xsan-controlled SAN.
- Given a functioning Xsan SAN and an available Xsan client, add the client system to the Xsan SAN using Xsan Admin.
- Given a functioning Xsan SAN and an available Xsan client, mount the Xsan volume on the Xsan client using Xsan Admin.
- Given a functioning Xsan SAN, add a user to the Xsan SAN using Xsan Admin.
- Given a functioning Xsan SAN, add a group using Xsan Admin.
- Given a functioning Xsan SAN, configure default permissions for a user on the Xsan volume using Xsan Admin.
- Given a functioning Xsan SAN, configure ACLs on the Xsan volume using Xsan Admin.
- Given a functioning Xsan SAN, configure quotas and permissions on the Xsan volume using Xsan Admin.
- Given a functioning Ethernet network, a Mac OS X v10.5 directory server, and a Macintosh client with Mac OS X Server administration tools installed, create a local home folder on the client for a network account using Workgroup Manager.
- Given a functioning Ethernet network, a Mac OS X v10.5 directory server, and a Macintosh client, create a portable home directory for a network account using Workgroup Manager.

Volume Management

This topic has 6 items, drawn from the following objectives:

- Without references, identify the different types of information provided by Xsan Admin for monitoring an Xsan volume, including volume status, available space, and network traffic.
- Without references, describe the steps of the process for changing the IP address of a metadata controller.

- Without references, identify the various tools provided by Apple and Promise for monitoring the performance of storage volumes.
- Given a functioning Xsan SAN, add a standby metadata controller using Xsan Admin.
- Given a functioning Xsan SAN, reconfigure the controller failover priority of the SAN volume using Xsan Admin.
- Given a functioning Xsan SAN, determine which controller is hosting the Xsan volume, using Xsan Admin or the `cvadmin` command-line tool.
- Given a functioning Xsan SAN, cause an Xsan volume to failover from the primary metadata controller to another metadata controller using Xsan Admin or the `cvadmin` command-line tool.
- Given a functioning Xsan SAN, control computers on the SAN using Xsan Admin.
- Given a functioning Xsan SAN, change the metadata controller's IP address using System Preferences or the `changeip` command-line tool.
- Given a functioning Xsan SAN, monitor the Xsan volume using Xsan Admin.
- Given a functioning Xsan volume comprised of Xserve RAID LUNs, monitor the Xserve RAID sets in the Xsan volume using RAID Admin.
- Given a functioning Xsan volume comprised of Promise RAID LUNs, monitor the Promise RAID sets in the Xsan volume using the Promise Web utility.
- Given a functioning Xsan SAN, customize Xsan status notifications using Xsan Admin.

Maintenance & Troubleshooting

This topic has 20 items, drawn from the following objectives:

- Without references, identify common SAN troubleshooting techniques, including verifying connections, reading log files, validating configurations, and using command-line tools.
- Without references, identify the role of `fsm` and `fsmpm` in an Xsan volume.
- Without references, describe the contents, function, and relationships of the files in the `/Library/Filesystems/Xsan/config` directory.
- Without references, identify the methods by which you can increase the storage on an Xsan SAN, including adding LUNs, storage pools, and volumes, and describe the steps of the process.
- Without references, describe the steps of the process of managing folder affinities.
- Without references, identify possible repercussions and advantages of modifying an Xsan 2 volume's advanced volume settings using Xsan Admin that is installed with Xsan 2, including repercussions such as performance issues, or corruption, and advantages, such as gaining the ability to customize volume settings.
- Without references, list the changes to an Xsan 2 volume that will cause a loss of data, including renaming a LUN, or storage pool, or changing a storage pool's stripe breadth, or changing the volume's block allocation size.
- Without references, list all the limits and capacities of an Xsan volume, including number of LUNs and storage pools, and volume name length.
- Without references, identify the steps of the process for destroying an Xsan volume using Xsan Admin.

- Without references, identify the steps of the process of repairing an Xsan volume using the `cvfsck` command-line tool.
- Without references, identify the backup solutions and strategies that are practical and compatible for use with Xsan, including `cvcp`, `rsync`, and Information Lifecycle Management.
- Without references, identify the location of all log files pertinent to the Xsan file system.
- Given a functioning Xsan SAN, add a LUN or a storage pool to the Xsan volume using Xsan Admin.
- Given a non-functioning Xsan 2 volume, troubleshoot and repair the volume using the `cvfsck` and `snfsdefrag` command-line tools.
- Given a functioning Xsan SAN, configure folder affinities on the Xsan volume using Xsan Admin.
- Given a functioning Xsan SAN, start and stop the Xsan file system using the `cvadmin` command-line tool.
- Given a functioning Xsan SAN, mount and unmount the Xsan volume using the `xsanctl` command-line tool.
- Given a Mac OS X v10.5.5 computer with Xsan 2.1 installed, view the `man` pages for the `cvcp` command using Terminal.
- Given a functioning Xsan SAN, copy files from the Xsan volume to an Xsan client's internal hard disk while preserving their extended attributes using the `cvcp` command-line tool.
- Given a functioning Xsan SAN, copy files from the Xsan volume to an Xsan client's internal hard disk while preserving their extended attributes using the `rsync` command-line tool.
- Given a functioning Xsan SAN, back up the configuration of the Xsan volume using the `cvgather` command-line tool.

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