XCubeSAN Series Application Note

Setup Apple Xsan

QSAN Technology, Inc.
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This edition applies to QSAN XCubeSAN series. QSAN believes the information in this publication is accurate as of its publication date. The information is subject to change without notice.

Notices

This XCubeSAN series white paper is applicable to the following XCubeSAN models:

XCubeSAN Storage System 4U 19” Rack Mount Models

Model Name	Controller Type	Form Factor, Bay Count, and Rack Unit
XS5224D	Dual Controller	LFF 24-disk 4U Chassis
XS3224D	Dual Controller	LFF 24-disk 4U Chassis
XS3224S	Single Controller	LFF 24-disk 4U Chassis
XS1224D	Dual Controller	LFF 24-disk 4U Chassis
XS1224S	Single Controller	LFF 24-disk 4U Chassis

XCubeSAN Storage System 3U 19” Rack Mount Models

Model Name	Controller Type	Form Factor, Bay Count, and Rack Unit
XS5216D	Dual Controller	LFF 16-disk 3U Chassis
XS3216D	Dual Controller	LFF 16-disk 3U Chassis
XS3216S	Single Controller	LFF 16-disk 3U Chassis
XS1216D	Dual Controller	LFF 16-disk 3U Chassis
XS1216S	Single Controller	LFF 16-disk 3U Chassis

XCubeSAN Storage System 2U 19” Rack Mount Models

Model Name	Controller Type	Form Factor, Bay Count, and Rack Unit
XS5212D	Dual Controller	LFF 12-disk 2U Chassis
XS5212S	Single Controller	LFF 12-disk 2U Chassis
XS3212D	Dual Controller	LFF 12-disk 2U Chassis
XS3212S	Single Controller	LFF 12-disk 2U Chassis
XS1212D	Dual Controller	LFF 12-disk 2U Chassis
XS1212S	Single Controller	LFF 12-disk 2U Chassis
XS5226D	Dual Controller	SFF 26-disk 2U Chassis
XS5226S	Single Controller	SFF 26-disk 2U Chassis
XS3226D	Dual Controller	SFF 26-disk 2U Chassis
XS3226S	Single Controller	SFF 26-disk 2U Chassis
XS1226D	Dual Controller	SFF 26-disk 2U Chassis

XS1226S	Single Controller	SFF 26-disk 2U Chassis

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This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products.

All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

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Setup Apple Xsan

Executive Summary

Xsan is Apple Inc.'s SAN (Storage Area Network) or clustered file system for macOS. Xsan enables multiple Mac desktop and Xserve systems to access shared block storage over a Fibre Channel network. With the Xsan file system installed, these computers can read and write to the same storage volume at the same time. Xsan is a complete SAN solution that includes the metadata controller software, the file system client software, and integrated setup, management and monitoring tools. This application note provides technical guidance for setup Apple Xsan with QSAN XCubeSAN series product.

Audience

This document is applicable for QSAN customers and partners who are interested in learning about Apple Xsan software. It assumes the reader is familiar with QSAN products and has general IT experience, including knowledge as a system or network administrator. If there is any question, please refer to the user manuals of products, or contact QSAN support for further assistance.

Overview

Xsan has all the normal features to be expected in an enterprise shared disk file system, including support for large files and file systems, multiple mounted file systems, meta data controller failover for fault tolerance, and support for multiple operating systems.

This document is used for guiding user to setup Xsan topology step by step.

INFORMATION:
Xsan is a powerful and scalable solution for storage and consolidation, for more information, please refer to: https://support.apple.com/xsan

Prerequisites

Please check the Xsan version and macOS version. You can refer to the link below for compatibility.

- https://support.apple.com/en-us/HT200135
- https://support.apple.com/en-us/HT200111

Xsan Software

The following demonstration uses Xsan version 5 included in macOS Server 5.x, which you can purchase and install from the App Store.

- https://itunes.apple.com/us/app/os-x-server/id883878097

Environment

- MDC (MetaData Controller)
  - Model: Mac Pro (6-Core, 16GB)
  - FC (Fibre Channel) HBA: ATTO Celerity FC-84EN
  - OS: macOS Sierra version 10.12.2 and installed macOS server app
- Client
  - Model: Mac Pro (4-Core, 8GB)
  - FC HBA: ATTO Celerity FC-84EN
  - OS: X El Capitan version 10.11.6
- FC Switch
  - Model: Brocade 6505 (24 ports)
- Storage
  - Model: XCubeSAN XS3212D
    Memory: 8GB (2 x 4GB in bank 1 & 3) per controller
    Firmware 1.2.2
    HDD: 12 x Seagate Constellation ES, ST500NM0001, 500GB, SAS 6Gb/s
  - HDD Pool: RAID 5 Pool with 12 x NL-SAS HDDs in Controller 1
  - HDD Volume: 100GB in Pool

Topology

The following is a topology diagram. MDC and client with FC HBAs connect to the FC switch. XCubeSAN with FC host card also connect to the FC switch.

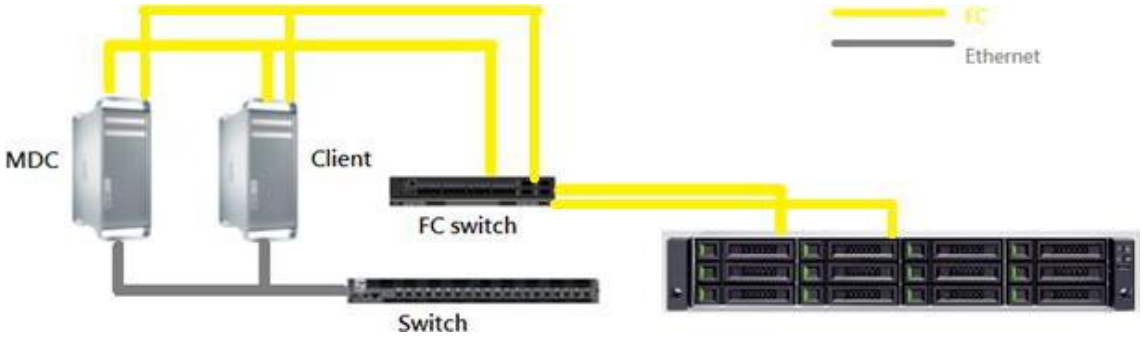

Figure 1 Xsan Topology

Configuration

MDC (MetaData Controller) Part

1. First, configure the network setting in the System Preferences -> Network. DNS Server adds itself as the IP address.

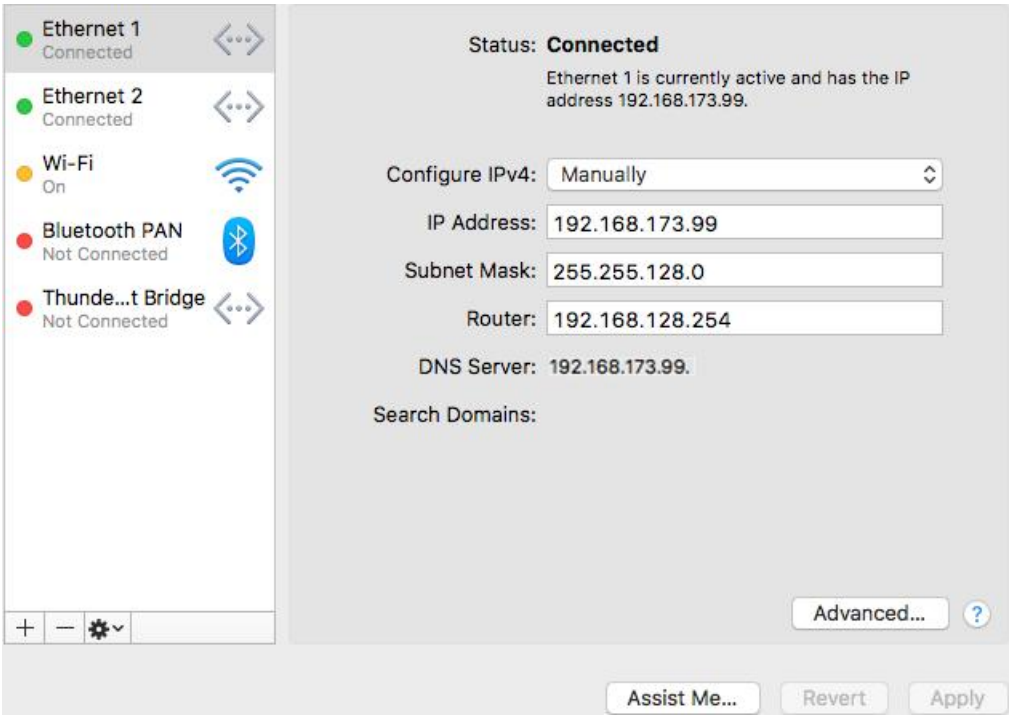

Figure 2 Configure Network Settings

2. Configure the DNS server and add a Host Name in the Server -> DNS. This feature is included in the macOS server app.

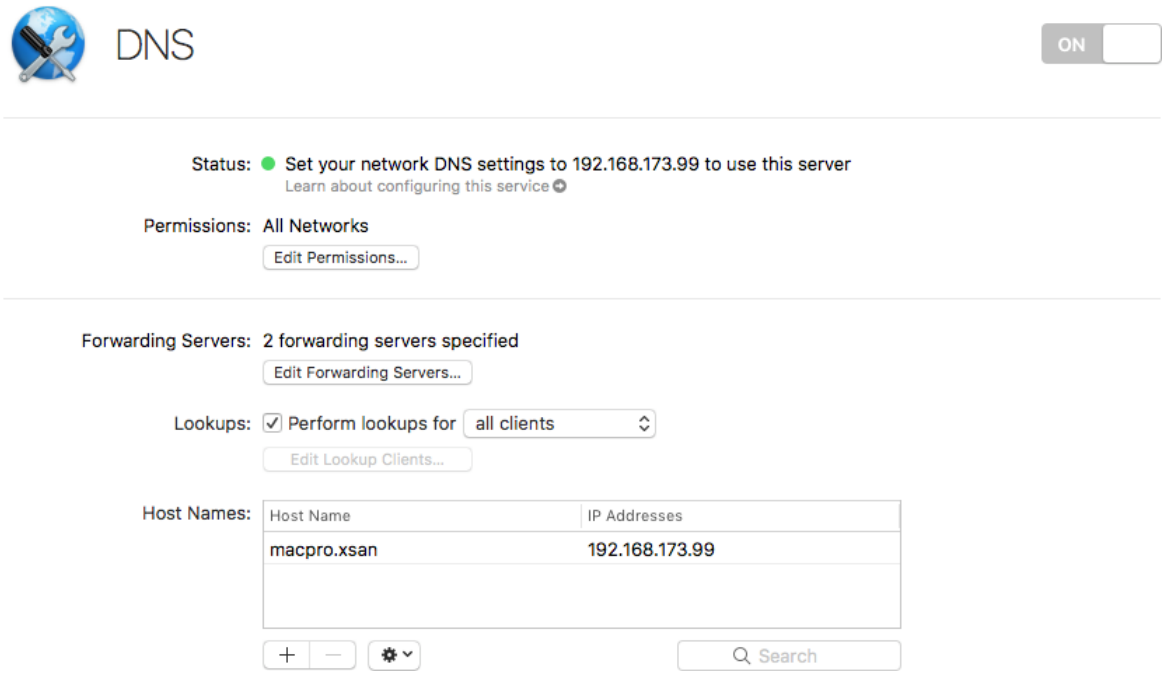

Figure 3 Configure DNS Settings

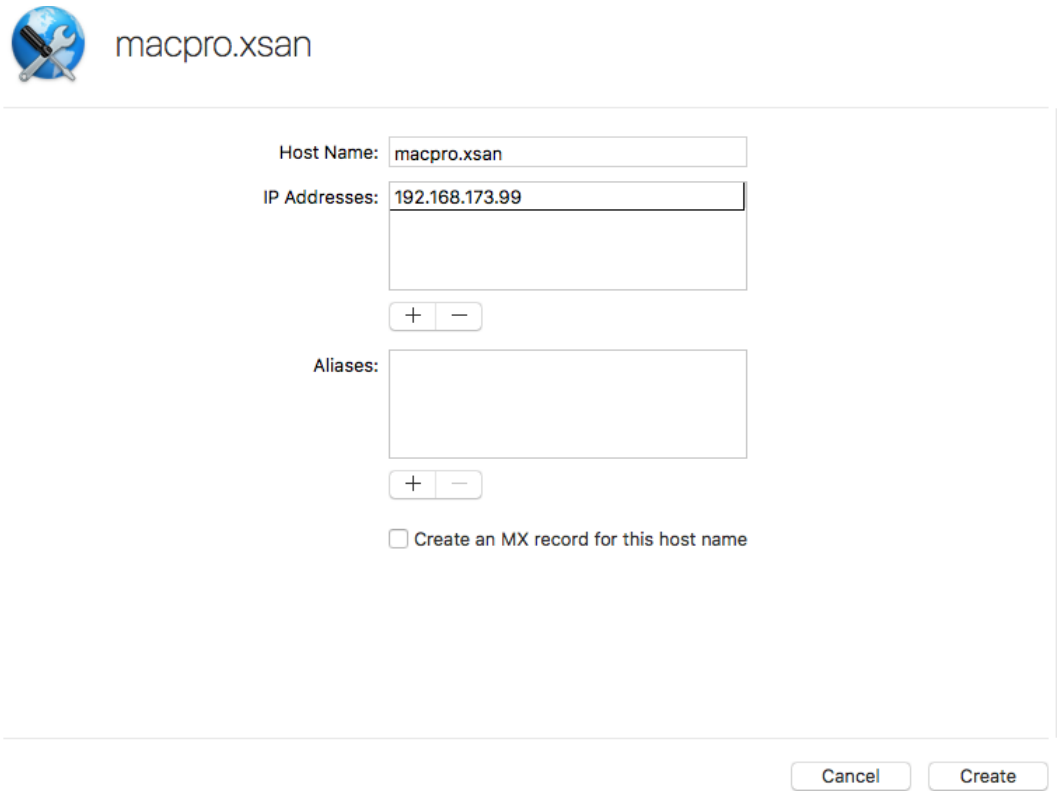

Figure 4 Add a Host Name in DNS Setting

3. Use the Network Utility in the Applications -> Utilities to check if the network settings are correct.

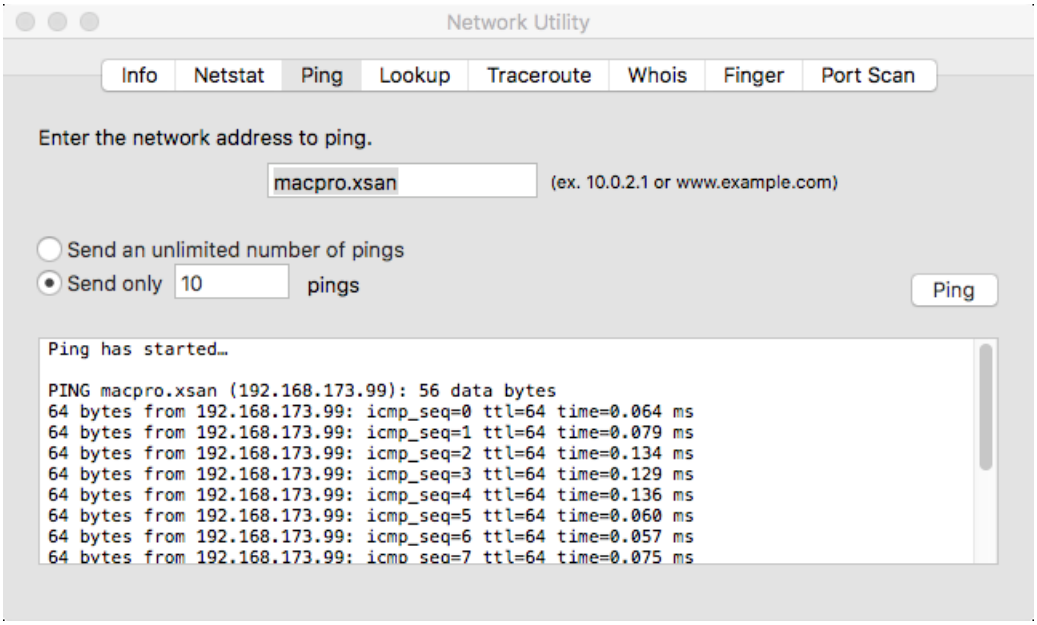

Figure 5 Ping the DNS Server

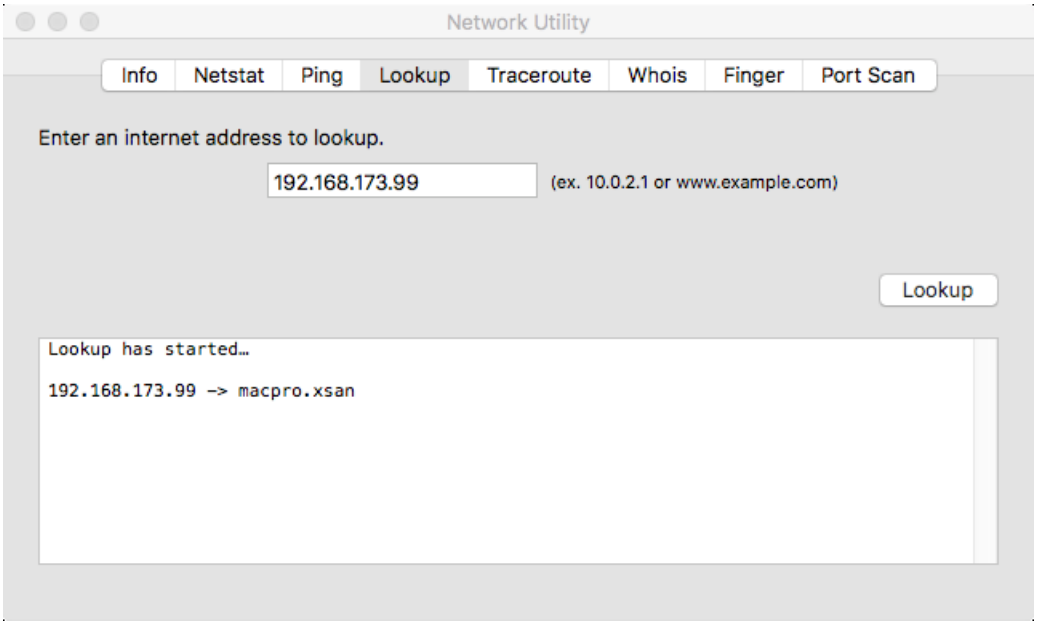

Figure 6 Lookup the IP Address

4. Turn on the Open Directory service and follow the instructions to configure it in the Server -> Open Directory.

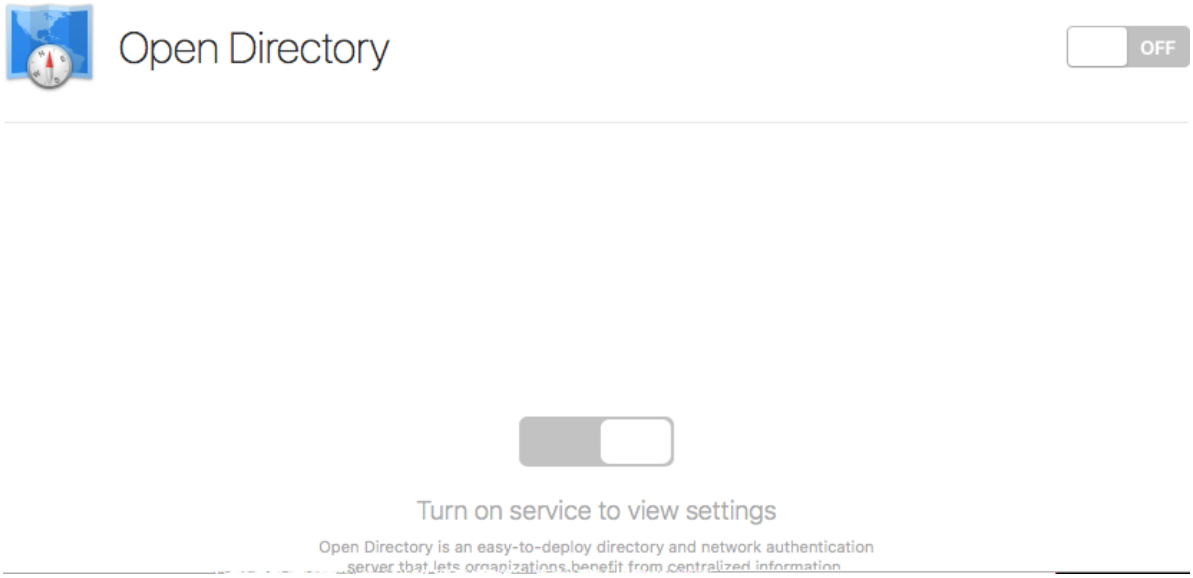

Figure 7 Turn on the Open Directory Service

Figure 8 Configure Open Directory Step 1

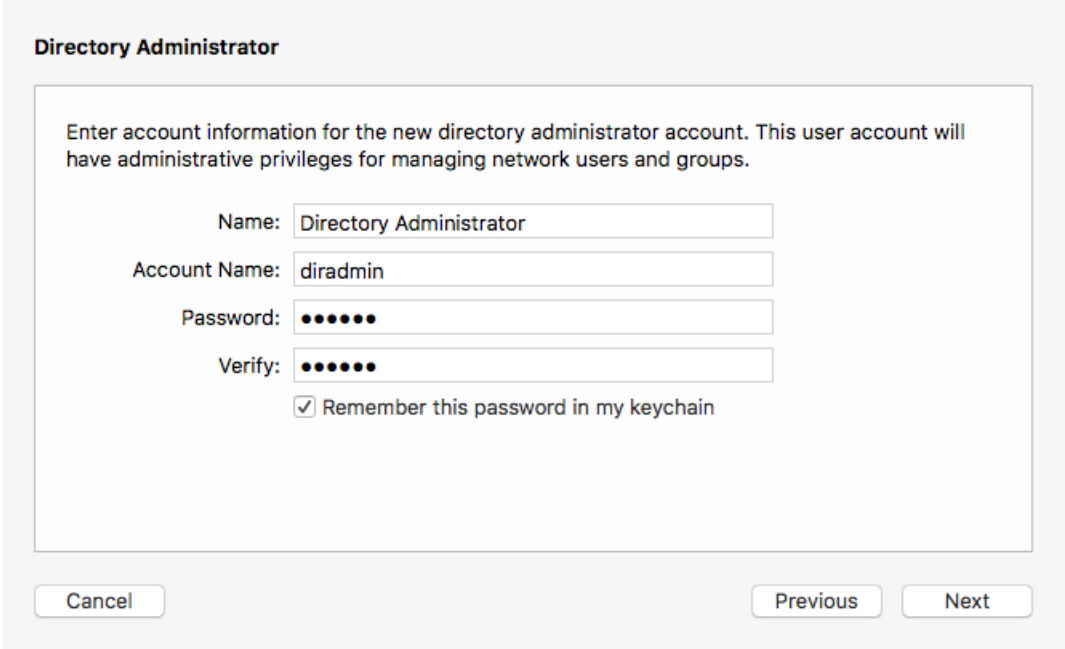

Figure 9 Configure Open Directory Step 2

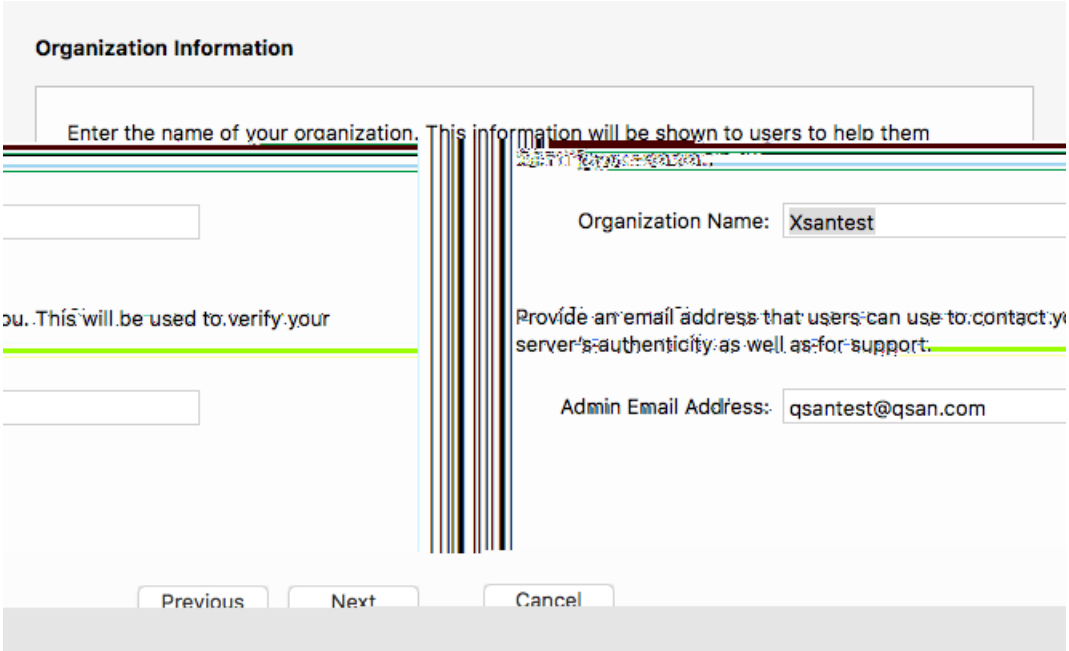

Figure 10 Configure Open Directory Step 3

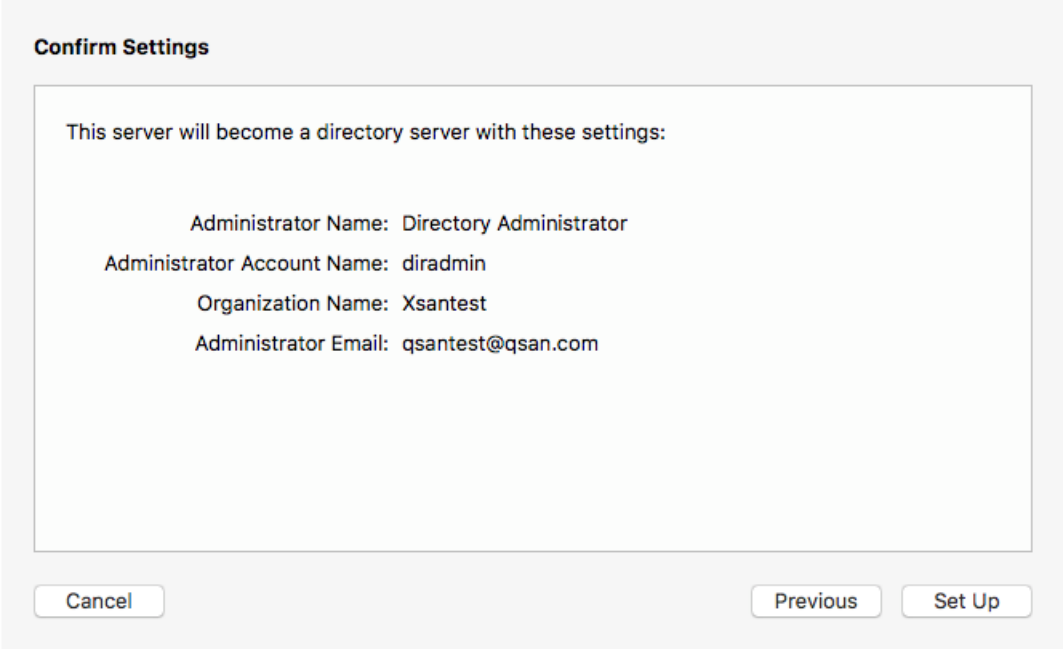

Figure 11 Configure Open Directory Step 4

5. Continue to configure the Xsan service. Make sure you have connected the FC volumes to this MDC host and you will be able to enable the Xsan service. When connecting the FC volume, you will see a pop-up window as shown below, then just click the Ignore button and leave it blank.

Figure 12 Connect to the FC Volume

TIP:
Please do not use partitions and do not erase the FC volumes when connecting to the Mac server. If you do that, the volume will no longer be part of the Xsan LUN.

6. This is an option to configure the MPIO (MultiPath I/O) service, please check the FC HBA driver settings. Here is an example of ATTO Celerity FC-84EN. You can download its configuration tool from their website.

Figure 13 ATTO Configuration Tool

7. Then navigate to the Advanced function tab to check if it is Enabled.

Figure 14 Enable Multipath

8. After connecting two FC cables to the controller 1 and 2 of the storage system, the same LUN information will be seen on both Fibre Channel Domains. The system identifies the same LUNs as one automatically.

Figure 15 MPIO on Both Fibre Channel Domains

9. Next, turn on the Xsan service in the Server -> Xsan.

*Figure 16 Turn on the **Xsan** Service*

10. Select the Create a new SANitem and click the Next button.

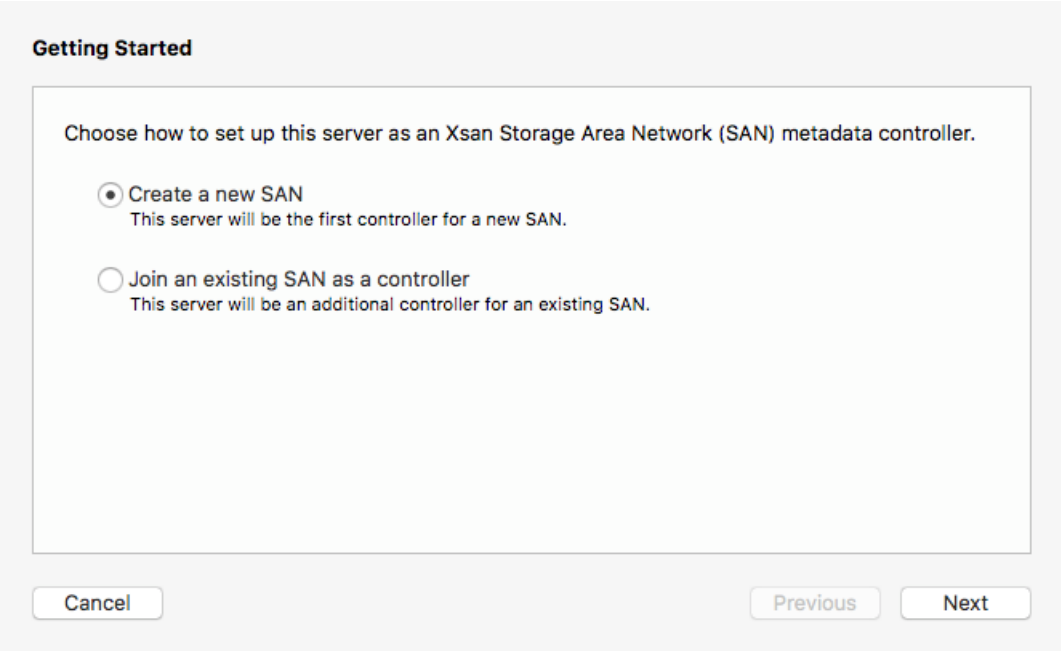

Figure 17 Create a new SAN Step 1

11. Enter a name for this SAN environment and then click the Next button.

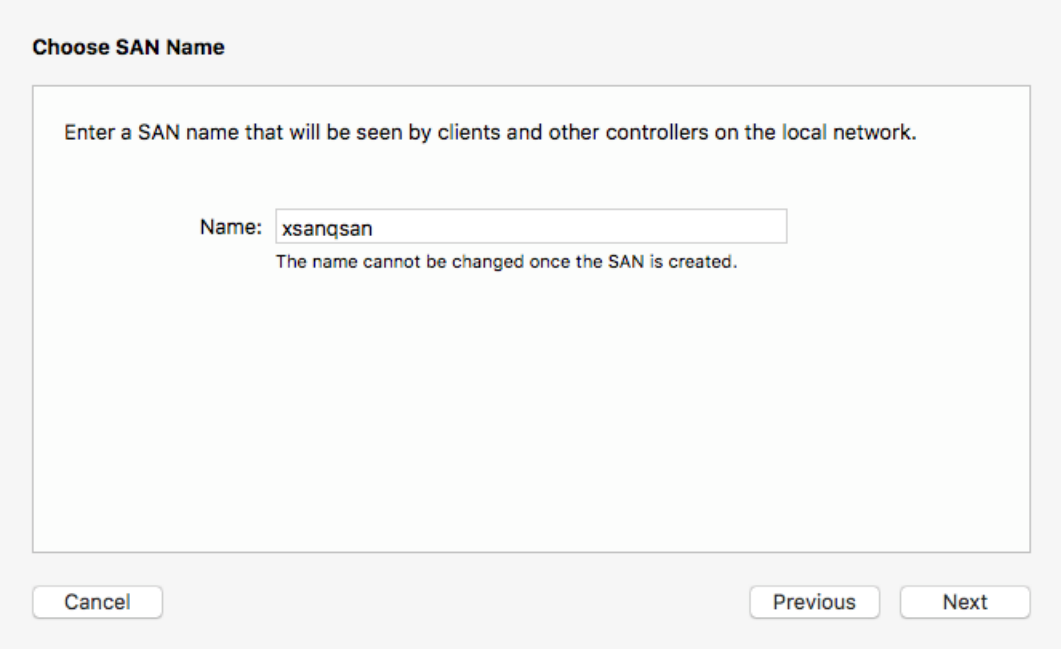

Figure 18 Create a new SAN Step 2

12. Click the Next button to continue.

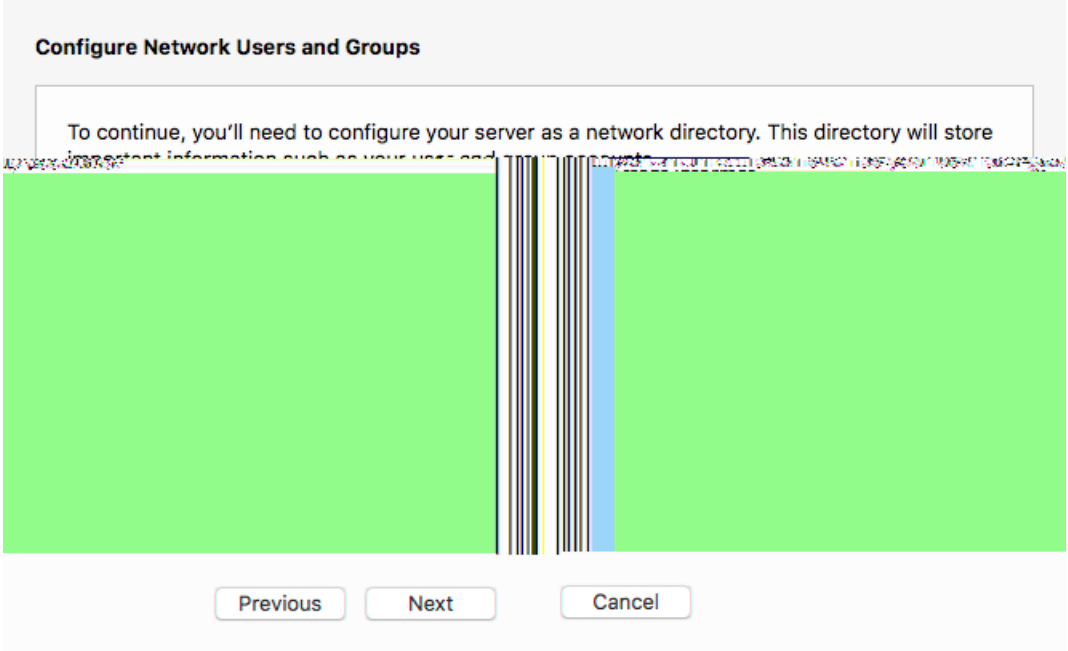

Figure 19 Create a new SAN Step 3

13. Enter the password which you setup on the Open Directory , then click the Next button.

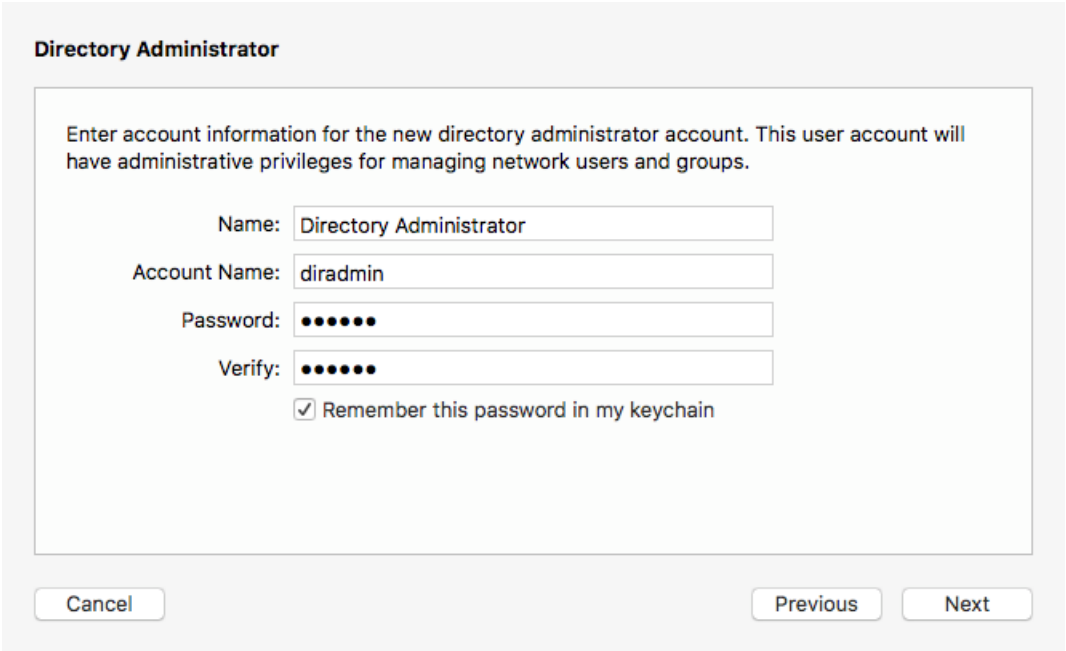

Figure 20 Create a new SAN Step 4

16. Enter a Volume Name. At least two storage pools are required. One is for metadata and the other is for storing data in each Xsan volume. Click the + button to add storage pools.

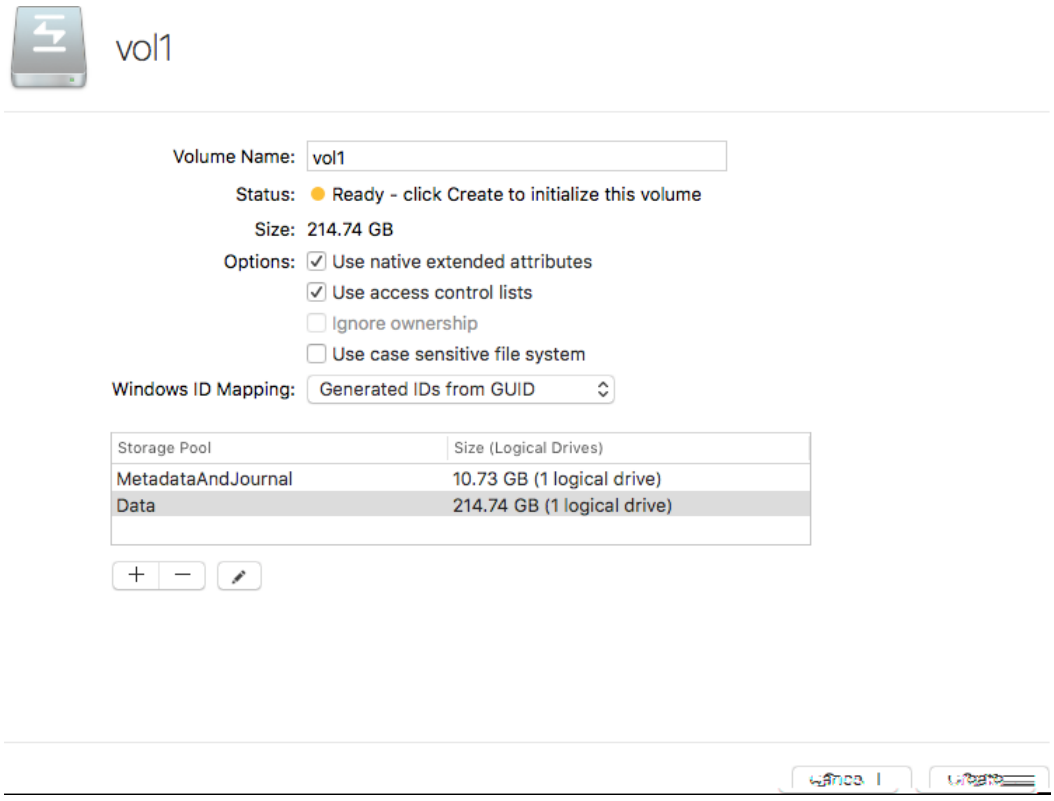

Figure 23 Create a new SAN Step 7

TIP:
The FC volume (LUN) needs to be changed a name before it is assigned to the Xsan volume. The keyword meta is a reserved term which you cannot use.

TIP:
If you will add more LUNs to this Xsan volume to extend the capacity, suggest separating Metadata and Journal into different LUNs.

Client Part

1. Check the network setting that can communicate with the MDC in the System Preferences -> Network

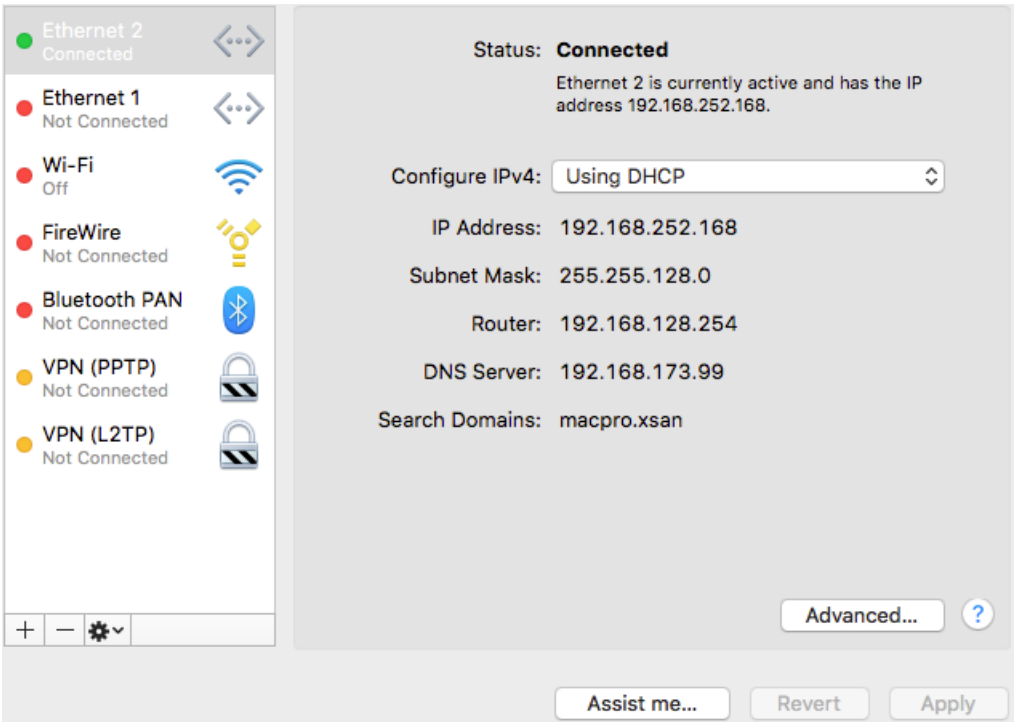

Figure 26 Network Settings

2. Click the Advanced to set the DNS IP address. Please add it as the same DNS IP address as the MDC.

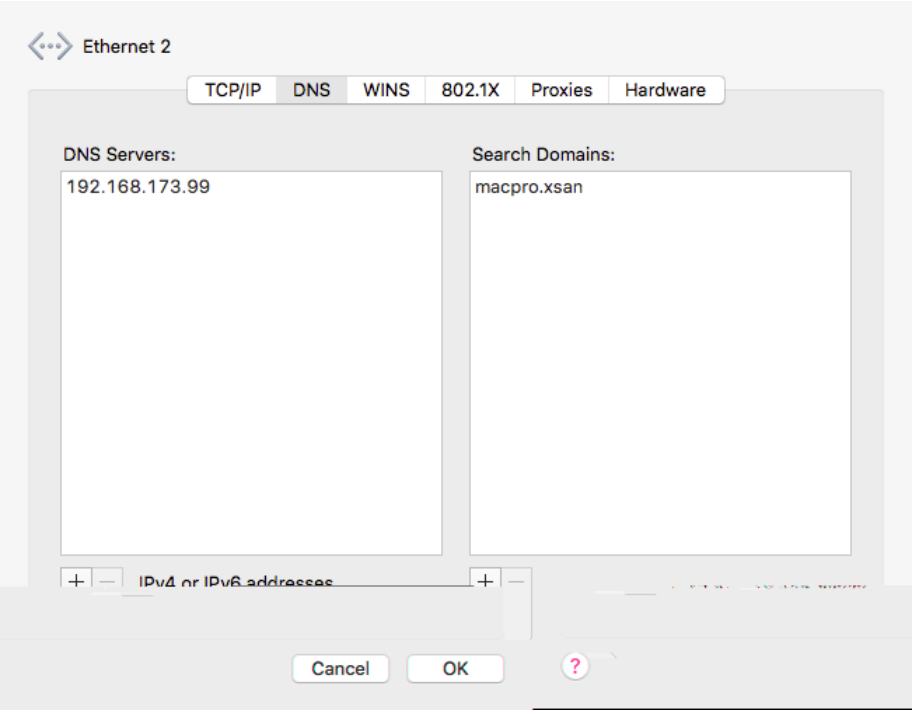

Figure 27 Set DSN IP Address

3. Join to the MDC Open Directory. Click the System Preferences -> Users & Groups, and then click the Edit button.

6.

9. Enter the MDC server administrator account and password, and then click the Install button.

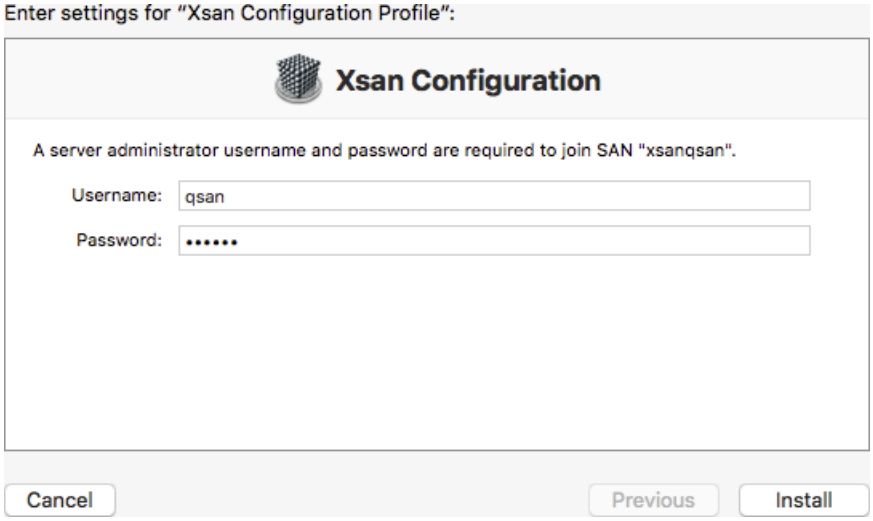

Figure 34 Install the Xsan Configuration Profile Step 2

10. Done. There is a Xsan Configuration Profile.

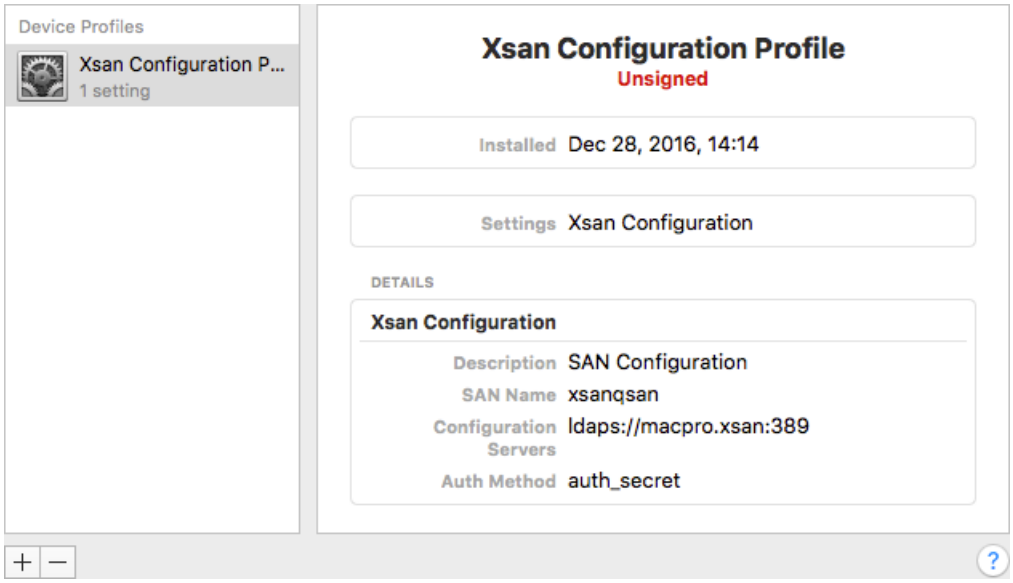

Figure 35 Install the Xsan Configuration Profile Step 3

11. An Xsan volume named vol1 appears on the Client.

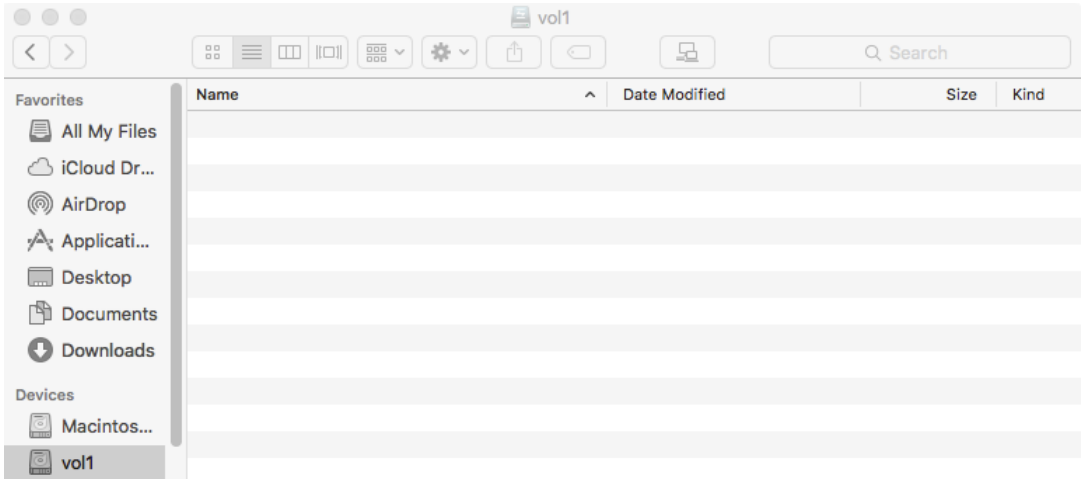

Figure 36 An Xsan Volume Appears on the Client

Verification

Now we will verify the data integrity in Xsan. We will copy zipped files in Xsan volume simultaneously on both MDC and Client. Next, try to unzip it at the same time to check if the data is affected.

1. Copy a 15GB zipped file to the Xsan volume (vol1) on MDC. Copy another 2.9GB zipped file to the same Xsan volume (vol1) on the Client at the same time.

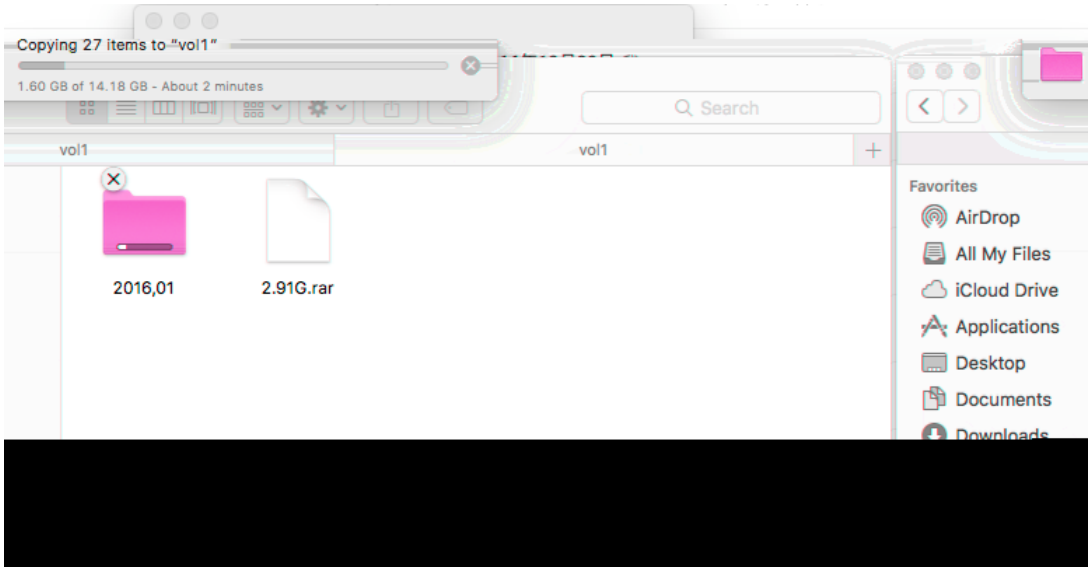

Figure 37 Verification Step 1

2. Wait for the copy process to complete. Then, try to unzip the 15GB zipped file on both MDC and Client at the same time.

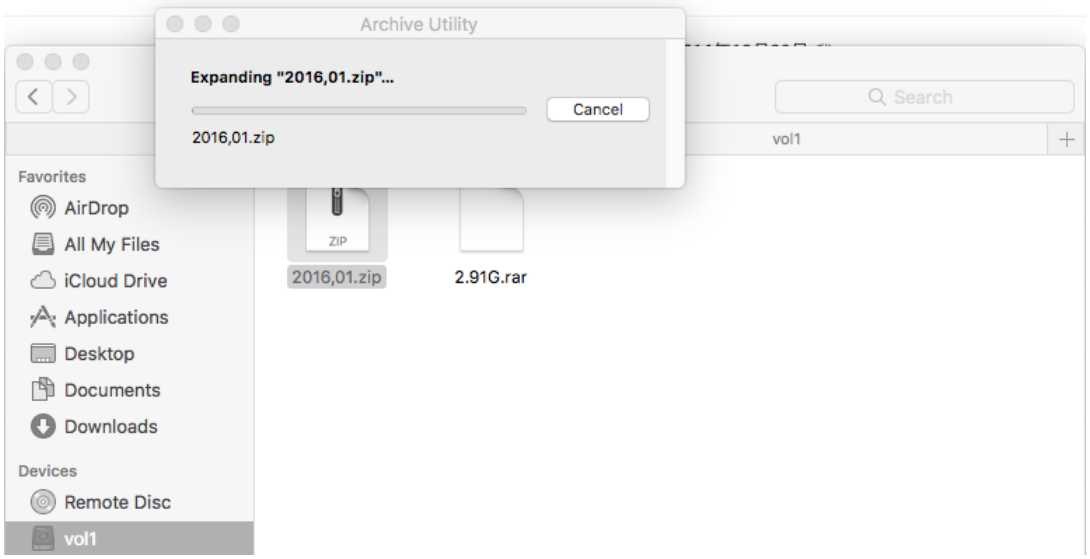

Figure 38 Verification Step 2

3. Check data integrity. These two files are unzipped successfully; the data can be executed without problems.

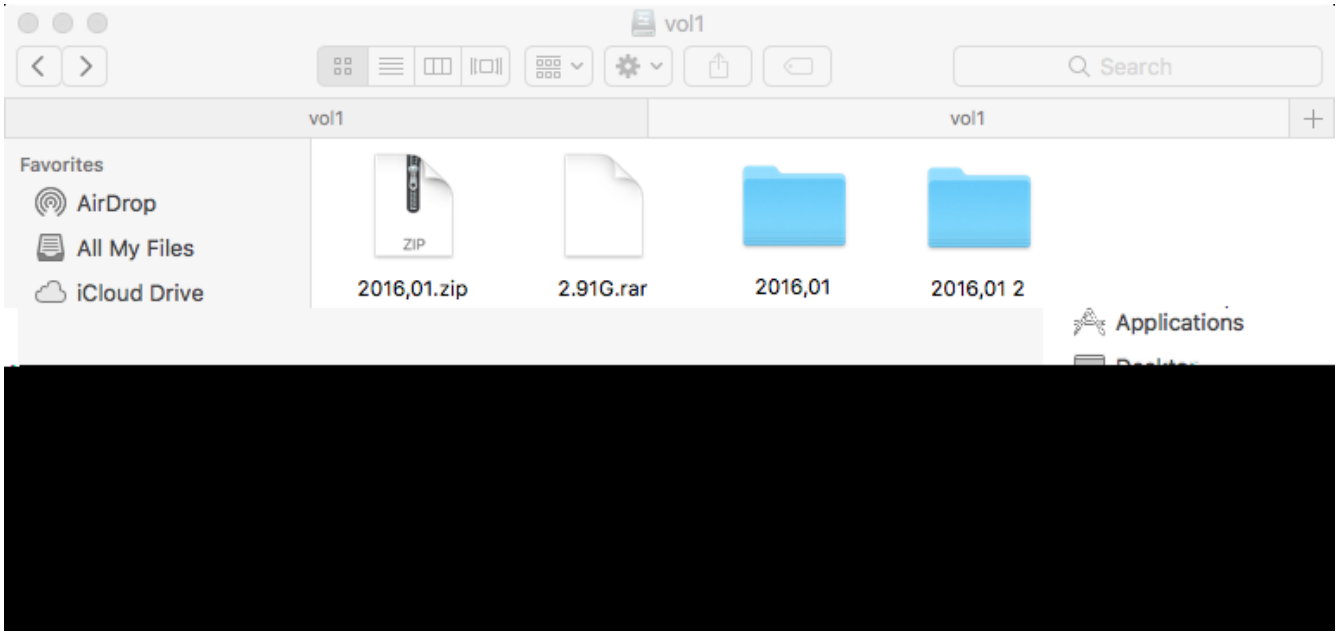

Figure 39 Verification Step 3

Conclusion

Xsan enables multiple Mac desktop and Xserve systems to access shared block storage over a Fibre Channel network. With the Xsan file system installed, these computers can read and write to the same storage volume at the same time.

What we done here is just a simple test about compatibility between our storage and Xsan, and configuration. Therefore, there is no MetaData controller failover for redundancy. You can find more detail settings on Apple Xsan website if need.

Apply To

- XCubeSAN XS5200 / XS3200 / XS1200 FW 1.2.2 and later

Reference

Apple Xsan

- https://support.apple.com/xsan

XCubeSAN SANOS 4.0 User's Manual

- XCubeSAN SANOS 4.0 User's Manual

Appendix

Related Documents

There are related documents which can be downloaded from the website.

- All XCubeSAN Documents
- XCubeSAN QIG (Quick Installation Guide)
- XCubeSAN Hardware Owner's Manual
- XCubeSAN Configuration Worksheet
- XCubeSAN SANOS 4.0 User's Manual
- Compatibility Matrix
- White Papers
- Application Notes

Technical Support

Do you have any questions or need help trouble-shooting a problem? Please contact QSAN Support, we will reply to you as soon as possible.

- Via the Web: https://qsan.com/support
- Via Telephone: +886-2-7720-2118 extension 136
  (Service hours: 09:30 - 18:00, Monday - Friday, UTC+8)
- Via Skype Chat, Skype ID: qsan.support
  (Service hours: 09:30 - 02:00, Monday - Friday, UTC+8, Summer time: 09:30 - 01:00)
- Via Email: support@qsan.com

