



# XCubeSAN Series Application Note

## Setup Apple Xsan



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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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# Setup Apple Xsan

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## 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>

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## 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.

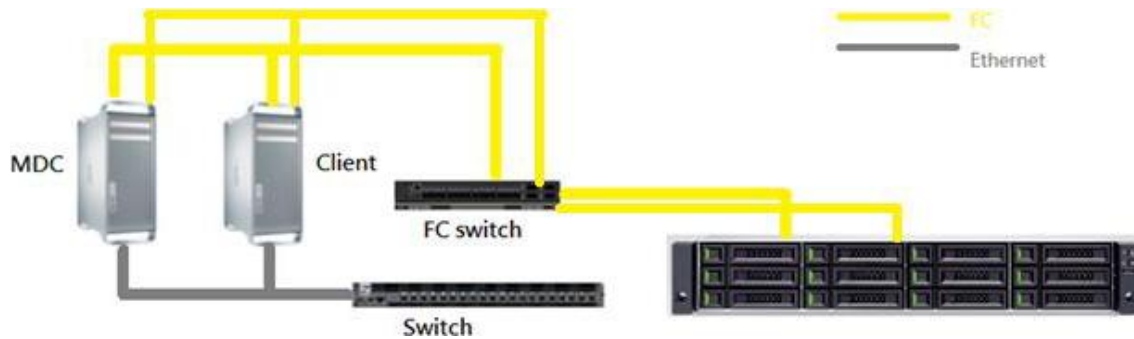


Figure 1 Xsan Topology

## Configuration

### MDC (MetaData Controller) Part

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

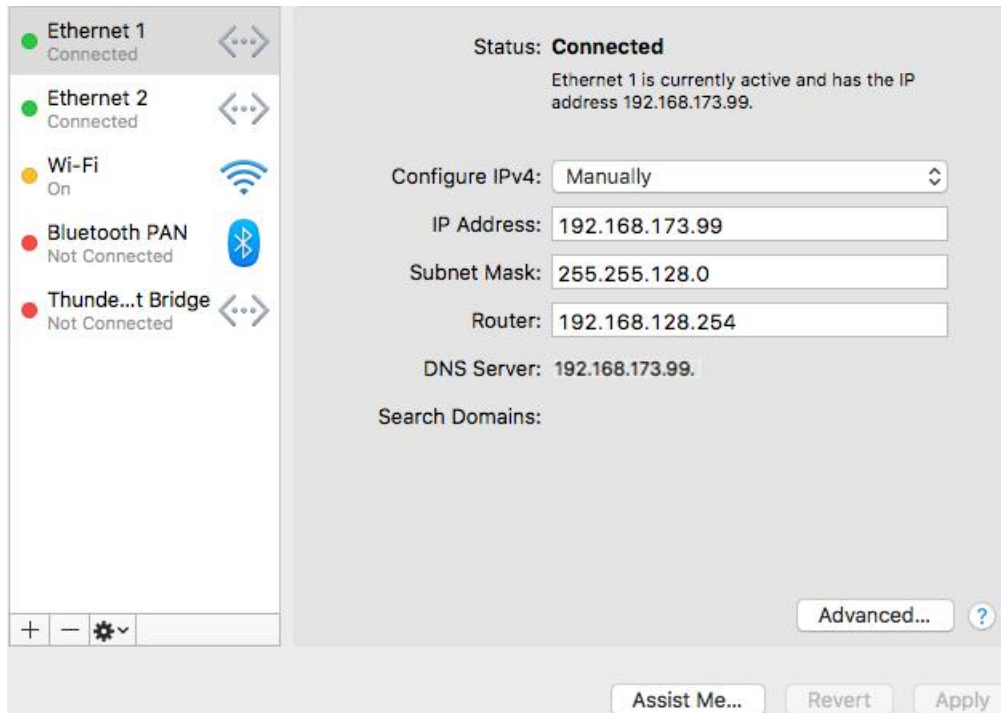


Figure 2 Configure Network Settings

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

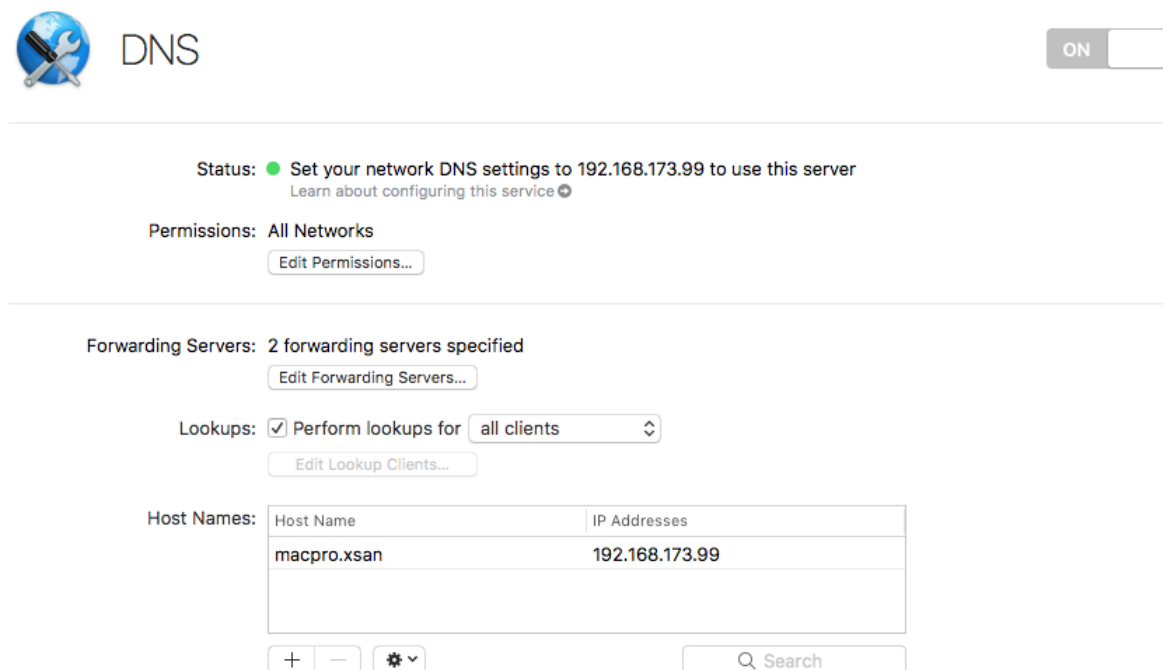



Figure 3 Configure DNS Settings


macpro.xsan

Host Name:

IP Addresses: 

+ -

Aliases: 

+ -

☐ Create an MX record for this host name

Cancel

Create

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.

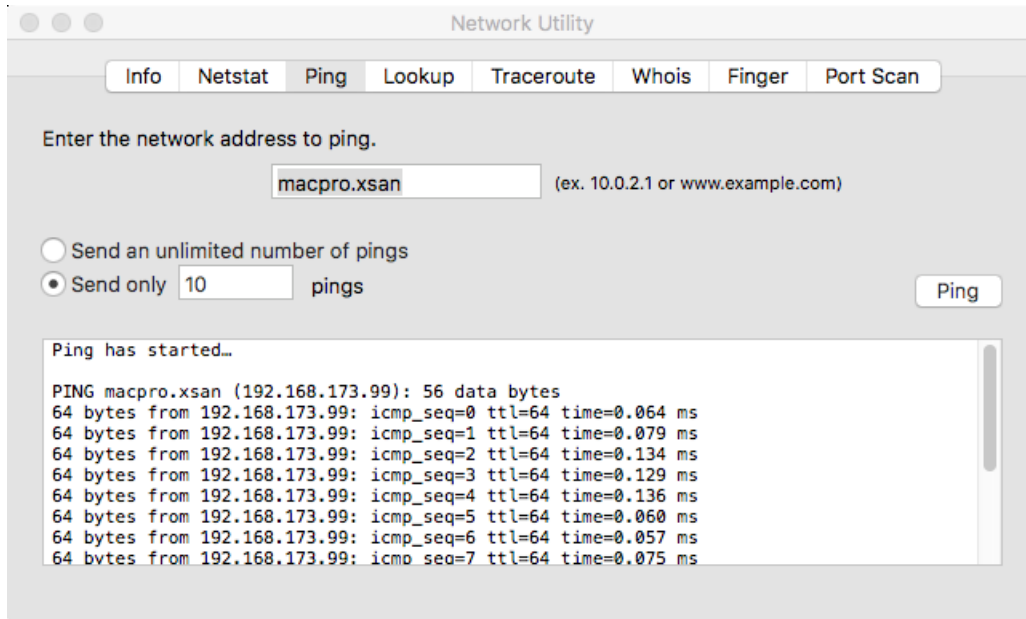


Figure 5 Ping the DNS Server

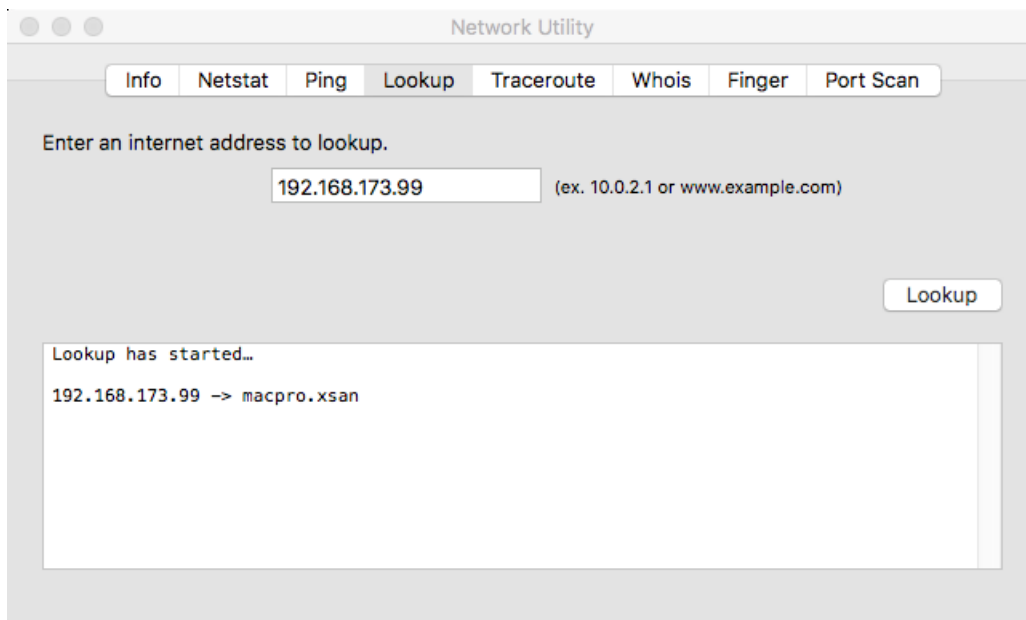


Figure 6 Lookup the IP Address

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

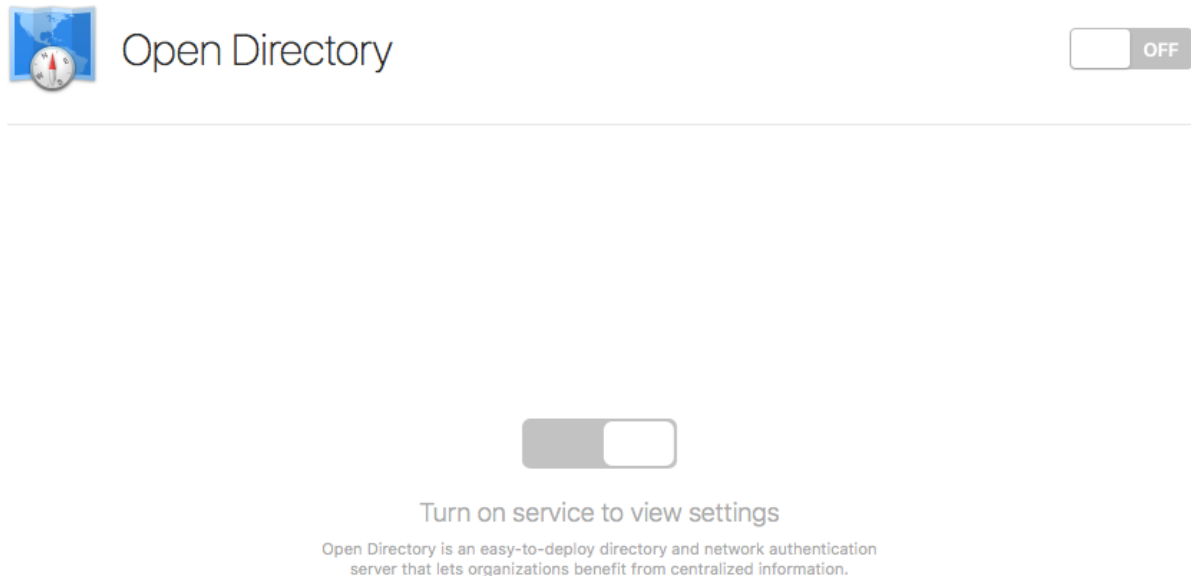


Figure 7 Turn on the Open Directory Service

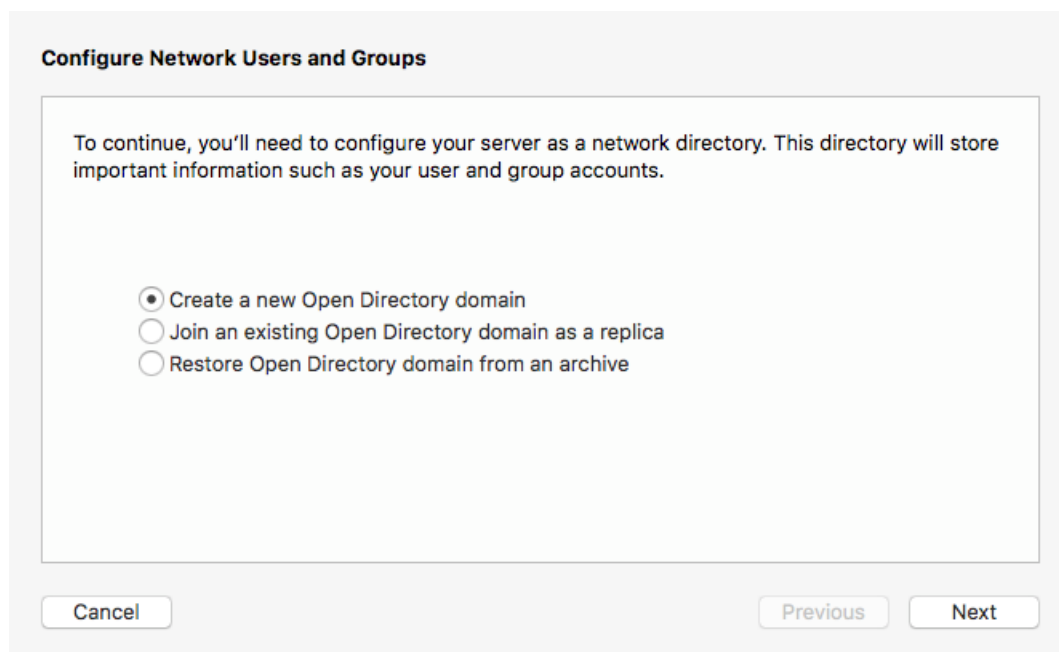


Figure 8 Configure Open Directory Step 1

**Directory Administrator**

Enter account information for the new directory administrator account. This user account will have administrative privileges for managing network users and groups.

Name:

Account Name:

Password:

Verify:

☒ Remember this password in my keychain

Figure 9 Configure Open Directory Step 2

**Organization Information**

Enter the name of your organization. This information will be shown to users to help them identify your server.

Organization Name:

Provide an email address that users can use to contact you. This will be used to verify your server's authenticity as well as for support.

Admin Email Address:

Figure 10 Configure Open Directory Step 3

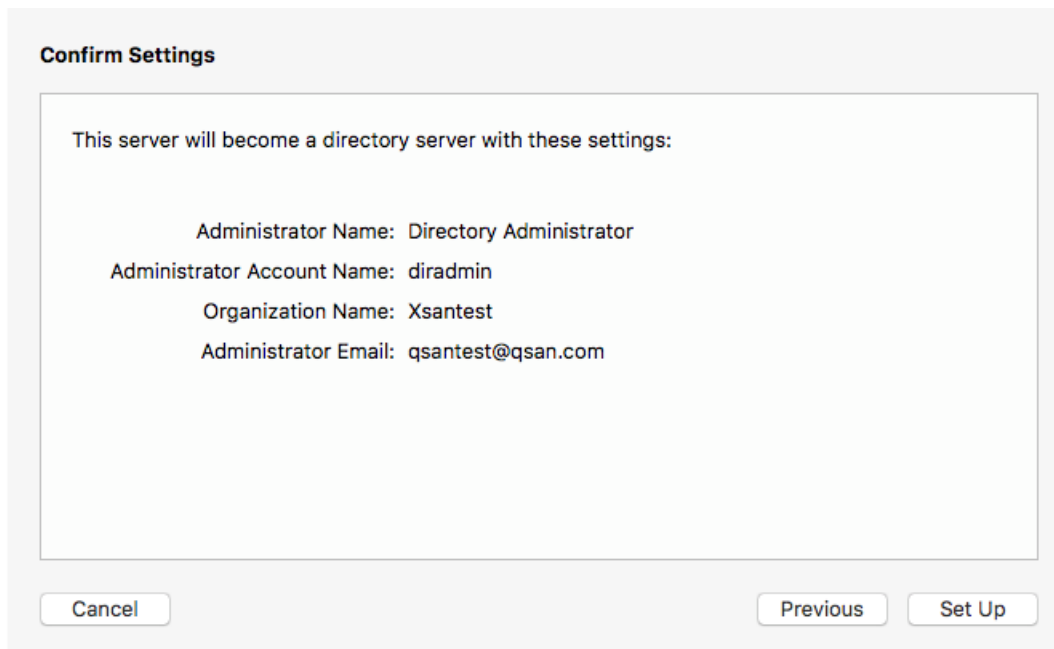


Figure 11 Configure Open Directory Step 4

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.

- 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.

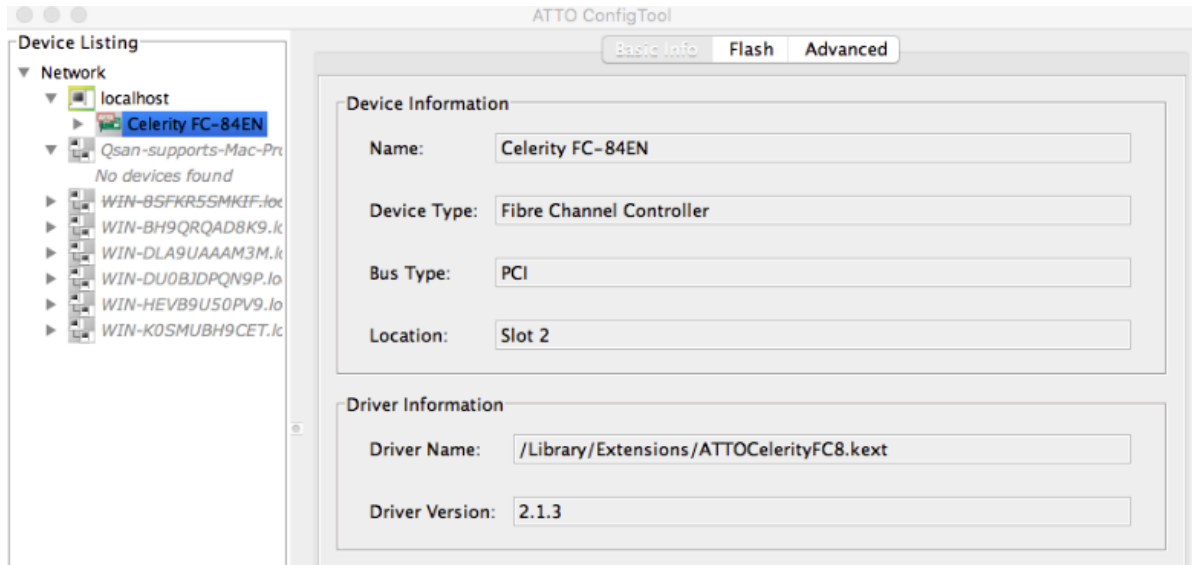


Figure 13 ATTO Configuration Tool

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

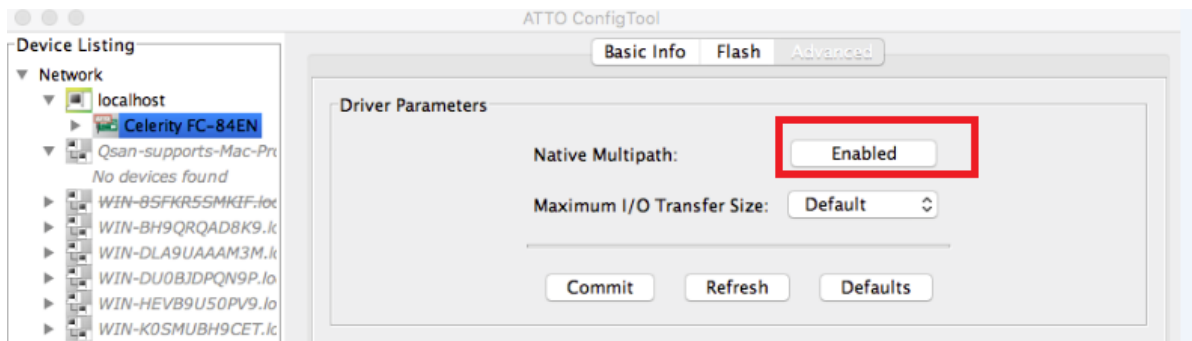


Figure 14 Enable Multipath



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**.

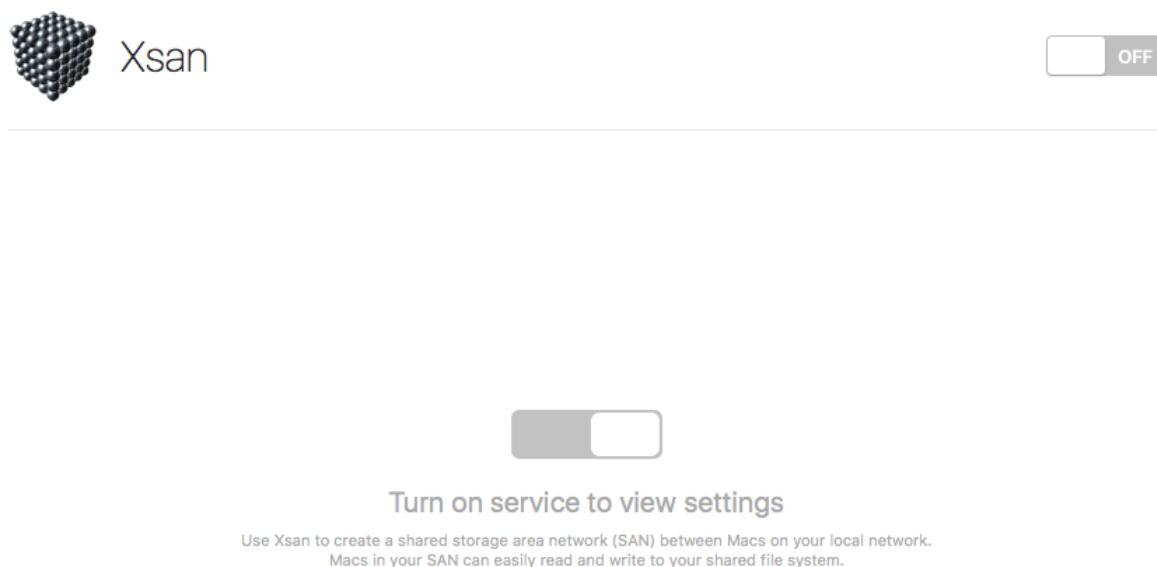
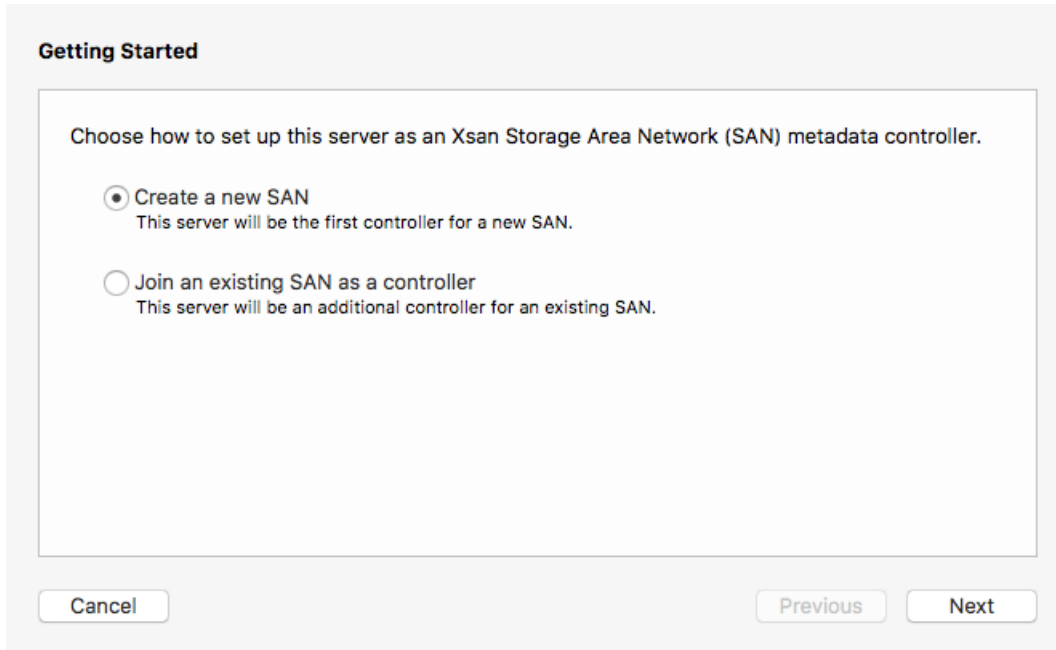


Figure 16 Turn on the **Xsan** Service

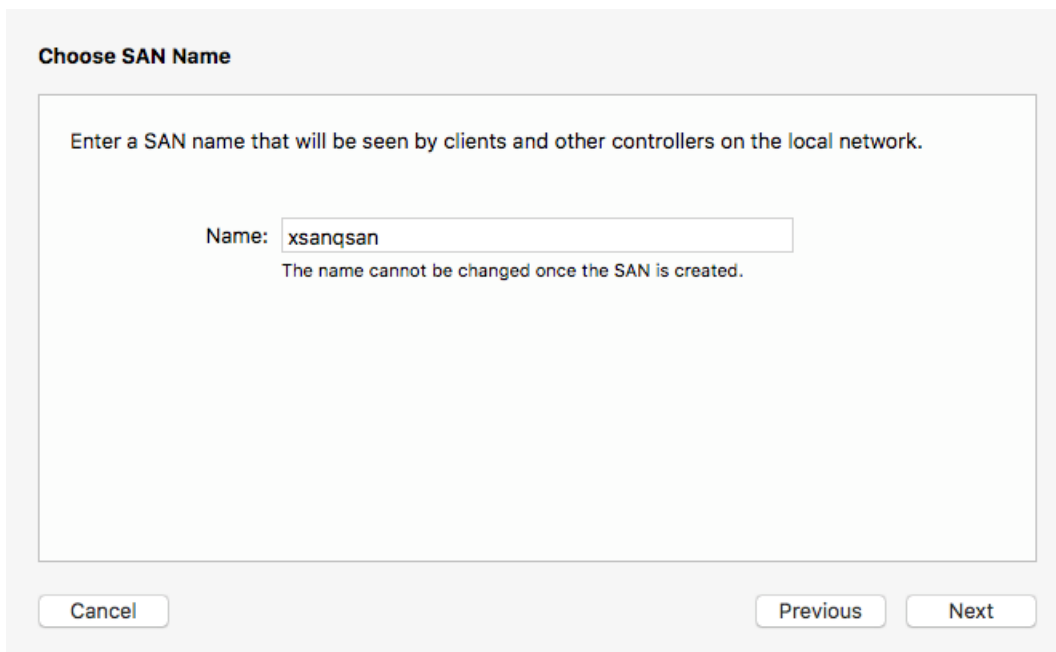
10. Select the **Create a new SAN** item and click the **Next** button.



The screenshot shows a dialog box titled "Getting Started". Inside, there is a text prompt: "Choose how to set up this server as an Xsan Storage Area Network (SAN) metadata controller." Below this, there are two radio button options. The first option, "Create a new SAN", is selected and includes the subtext "This server will be the first controller for a new SAN." The second option, "Join an existing SAN as a controller", is unselected and includes the subtext "This server will be an additional controller for an existing SAN." At the bottom of the dialog, there are three buttons: "Cancel" on the left, and "Previous" and "Next" on the right.

Figure 17 Create a new SAN Step 1

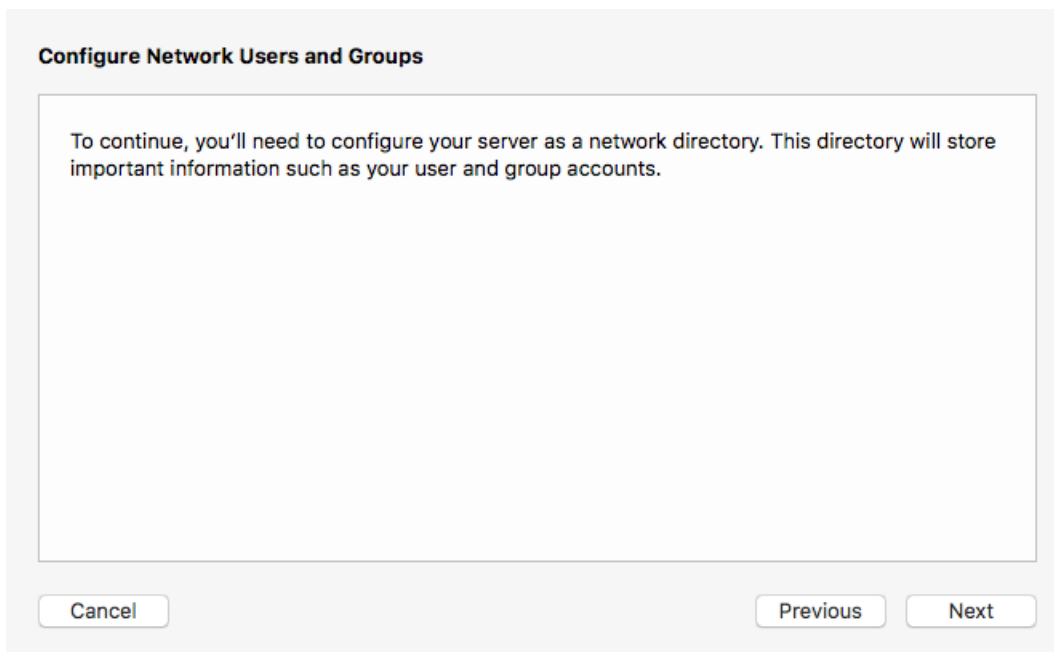
11. Enter a name for this SAN environment and then click the **Next** button.



The screenshot shows a dialog box titled "Choose SAN Name". Inside, there is a text prompt: "Enter a SAN name that will be seen by clients and other controllers on the local network." Below this, there is a text input field labeled "Name:" containing the text "xsanqsan". Underneath the input field, there is a note: "The name cannot be changed once the SAN is created." At the bottom of the dialog, there are three buttons: "Cancel" on the left, and "Previous" and "Next" on the right.

Figure 18 Create a new SAN Step 2

12. Click the **Next** button to continue.



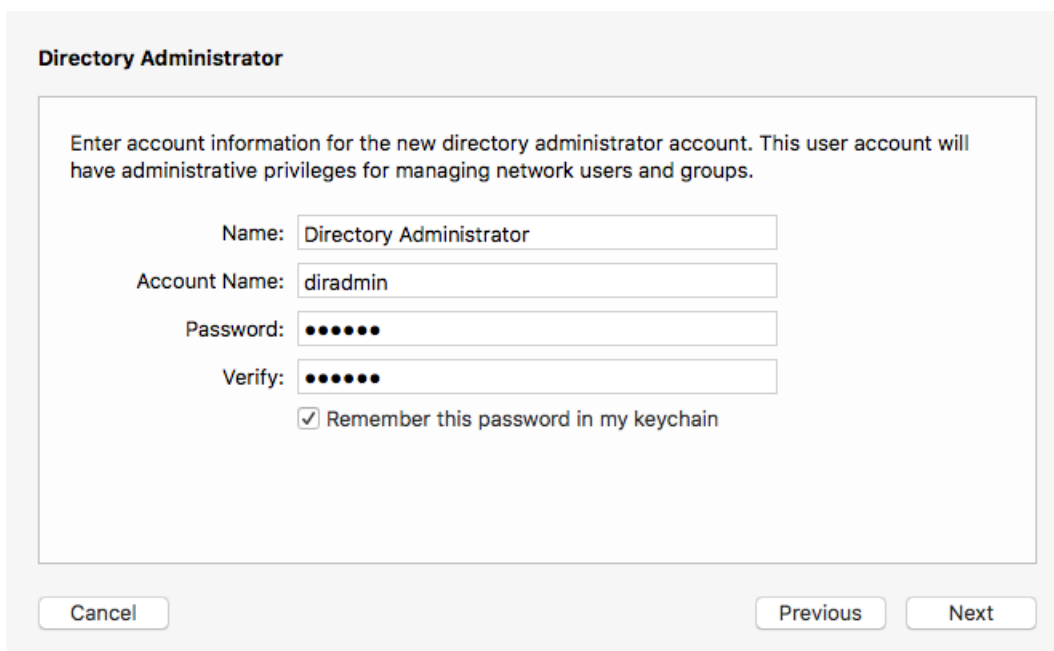
**Configure Network Users and Groups**

To continue, you'll need to configure your server as a network directory. This directory will store important information such as your user and group accounts.

Cancel Previous Next

Figure 19 Create a new SAN Step 3

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



**Directory Administrator**

Enter account information for the new directory administrator account. This user account will have administrative privileges for managing network users and groups.

Name: Directory Administrator

Account Name: diradmin

Password: ••••••

Verify: ••••••

☒ Remember this password in my keychain

Cancel Previous Next

Figure 20 Create a new SAN Step 4

14. Save the SAN configuration file by clicking the **Save Configuration Profile** button. It will be used by the **Client** in the future.

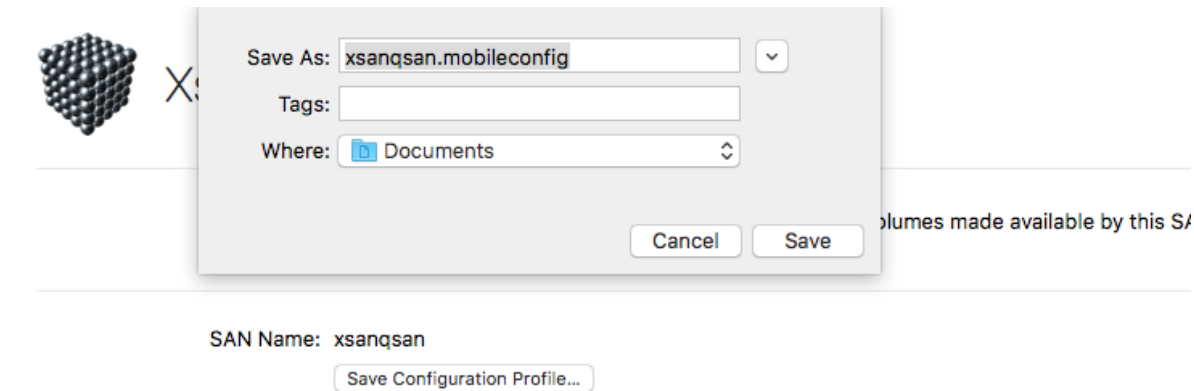


Figure 21 Create a new SAN Step 5

15. Next, configure the Xsan volume by clicking the **+** button.

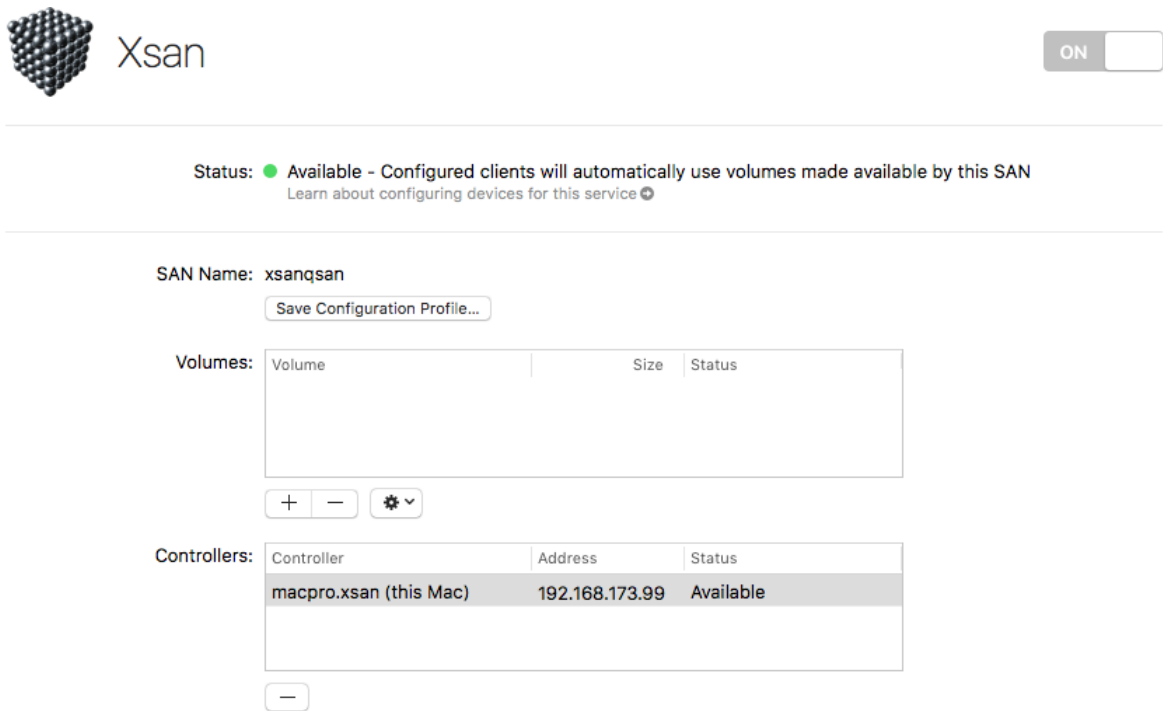



Figure 22 Create a new SAN Step 6

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.


vol1

---

Volume Name:

Status: ● Ready - click Create to initialize this volume

Size: 214.74 GB

Options: ☒ Use native extended attributes  
☒ Use access control lists  
☐ Ignore ownership  
☐ Use case sensitive file system

Windows ID Mapping:

Storage Pool	Size (Logical Drives)
MetadataAndJournal	10.73 GB (1 logical drive)
Data	214.74 GB (1 logical drive)

---

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.

17. Then, the **Xsan** volume is displayed in the **Server -> Xsan**.

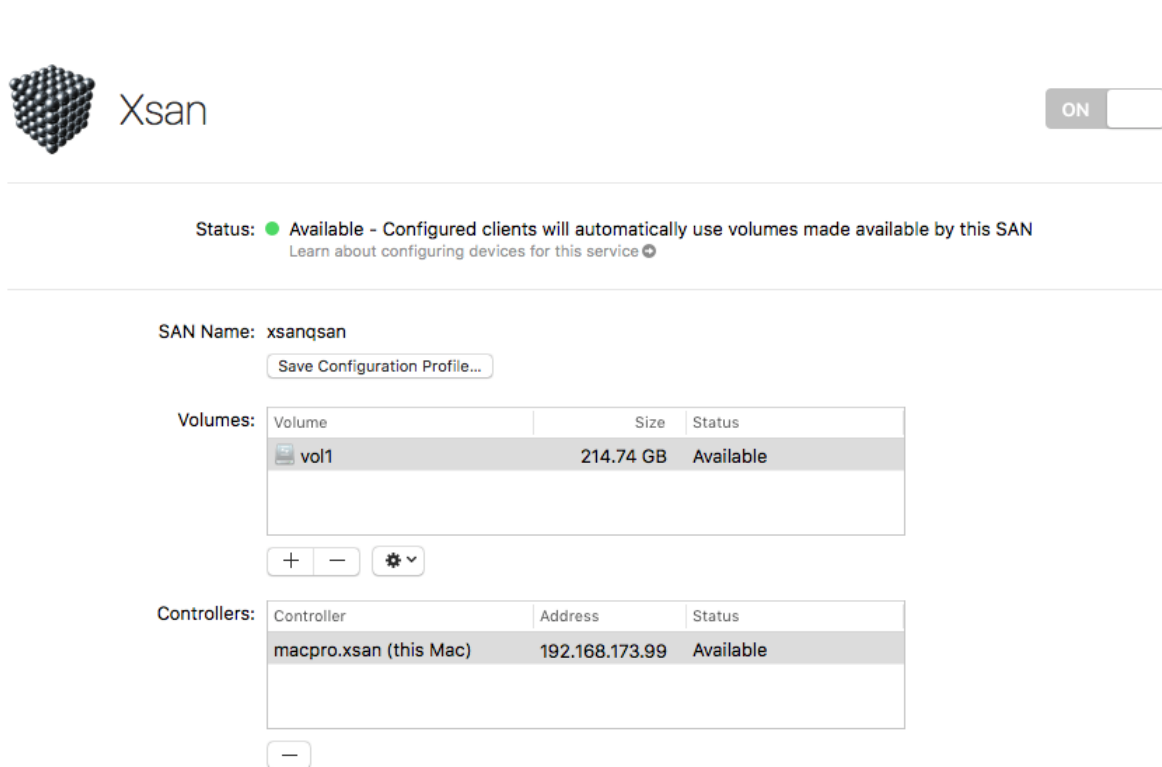


Figure 24 A SAN Volume is Created

18. An Xsan volume named vol1 appears on the MDC.

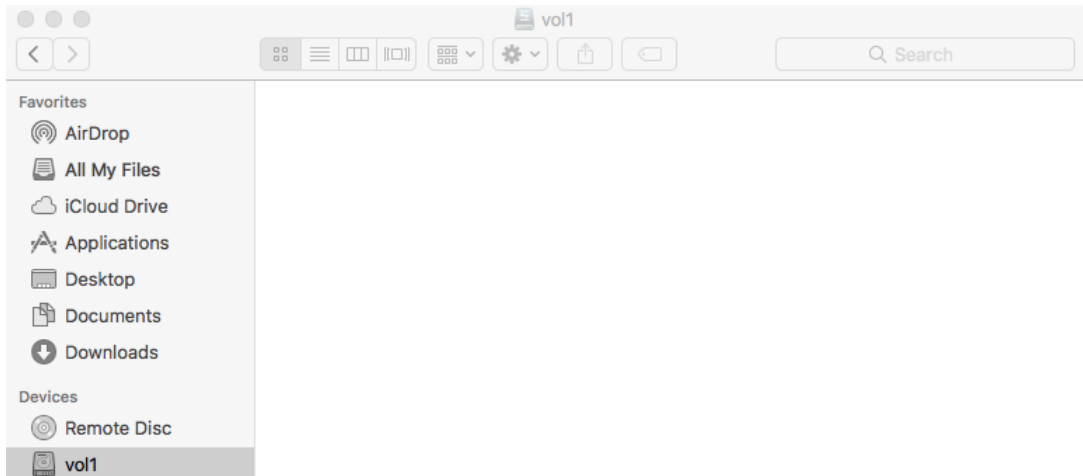


Figure 25 An Xsan Volume Appears on the MDC

## Client Part

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

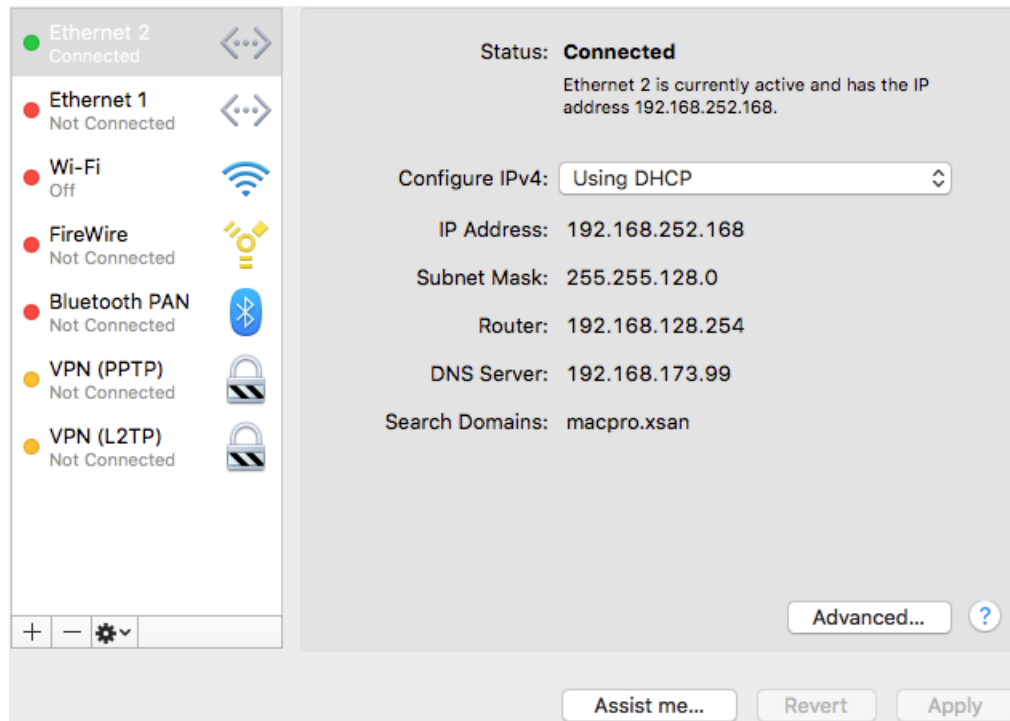


Figure 26 Network Settings

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

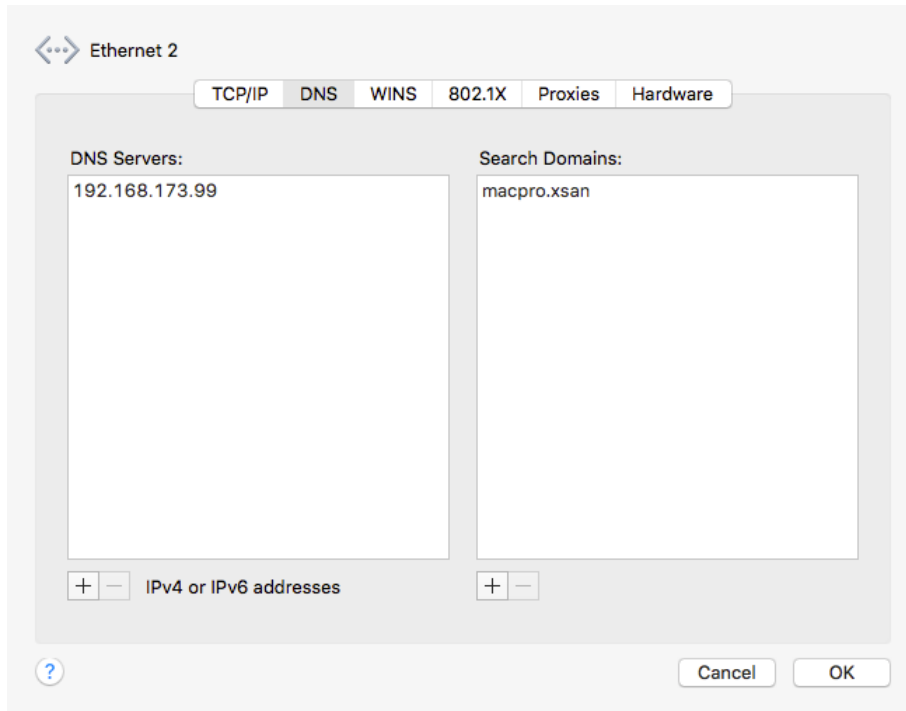


Figure 27 Set DSN IP Address

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



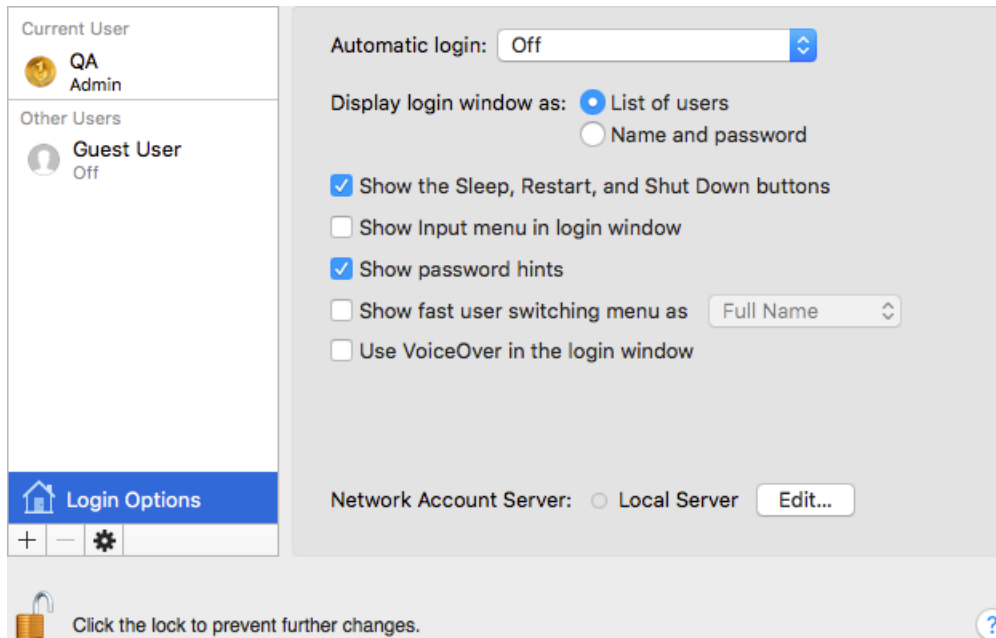


Figure 28 Join to the MDC Open Directory Step 1

4. Click the + button.

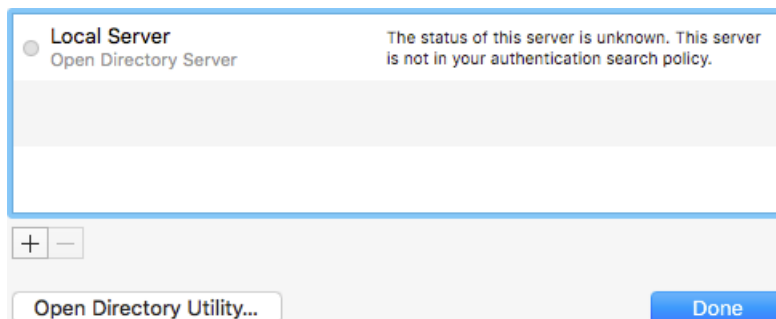


Figure 29 Join to the MDC Open Directory Step 2

5. Input the **MDC** IP address and click the **OK** button.

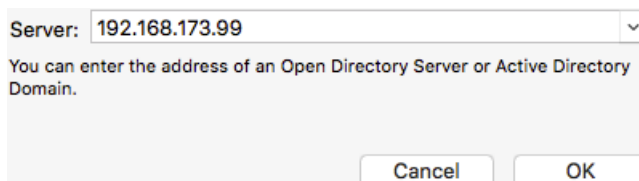


Figure 30 Join to the MDC Open Directory Step 3

6. Input the **Open Directory** account and password, then click the **OK** button

Figure 31 Join to the MDC Open Directory Step 4

7. A Open Directory Server is added.


Figure 32 Join to the MDC Open Directory Step 5

8. Copy the SAN configuration file to client which is from the MDC. You can refer to the step 14 of MDC part. Double click to execute it and follow the default setting to install the profile.

Figure 33 Install the Xsan Configuration Profile Step 1

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

Enter settings for "Xsan Configuration Profile":



## Xsan Configuration

A server administrator username and password are required to join SAN "xsanqsan".


Username:

Password:

Figure 34 Install the Xsan Configuration Profile Step 2

10. Done. There is a Xsan Configuration Profile.

Device Profiles



Xsan Configuration P...

1 setting

## Xsan Configuration Profile

**Unsigned**

Installed Dec 28, 2016, 14:14

Settings Xsan Configuration

DETAILS

### Xsan Configuration

Description SAN Configuration

SAN Name xsanqsan

Configuration Servers ldaps://macpro.xsan:389

Auth Method auth\_secret

Figure 35 Install the Xsan Configuration Profile Step 3

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

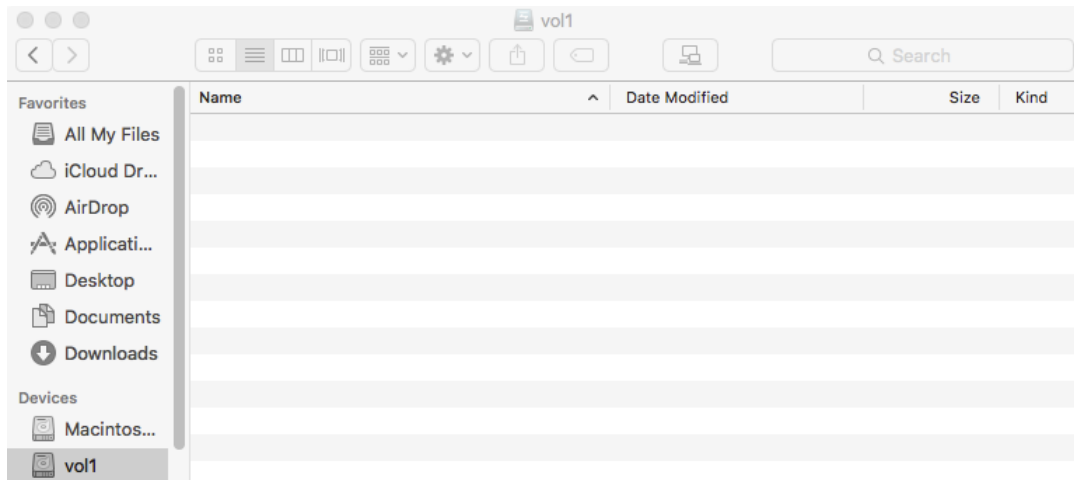


Figure 36 An Xsan Volume Appears on the Client

## 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.

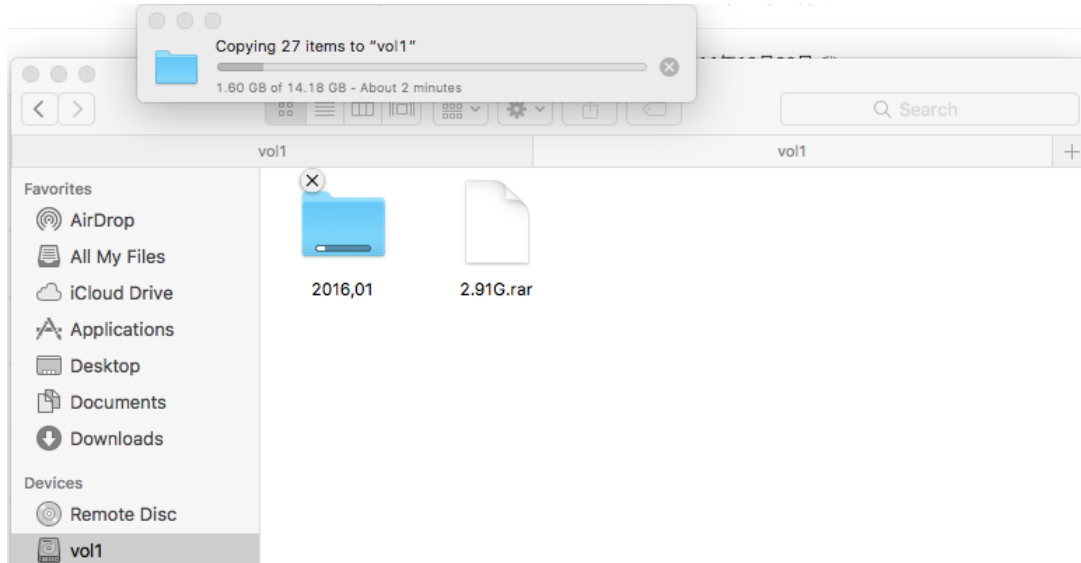


Figure 37 Verification Step 1

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.

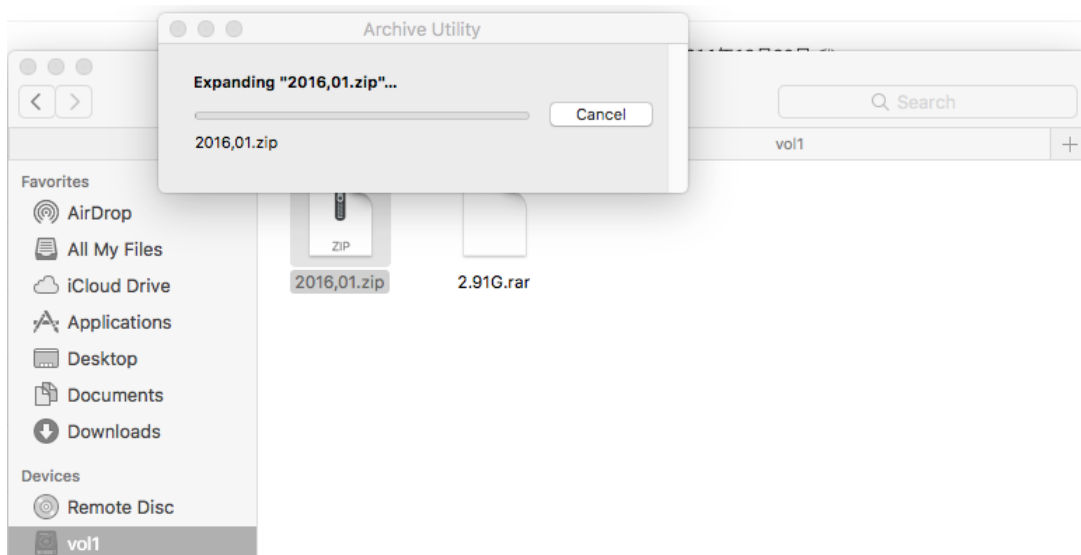


Figure 38 Verification Step 2

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

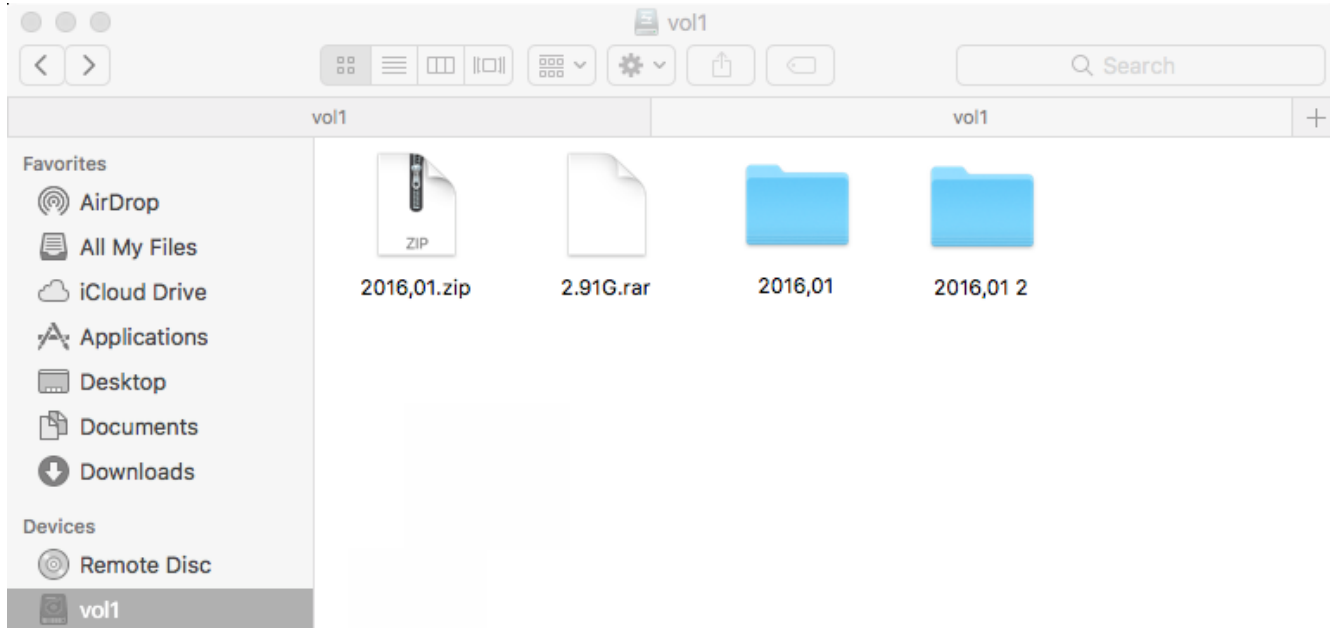


Figure 39 Verification Step 3

## 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

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### 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](#)

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- 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](mailto:support@qsan.com)