

# NAS Smackdown

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# What is NAS?

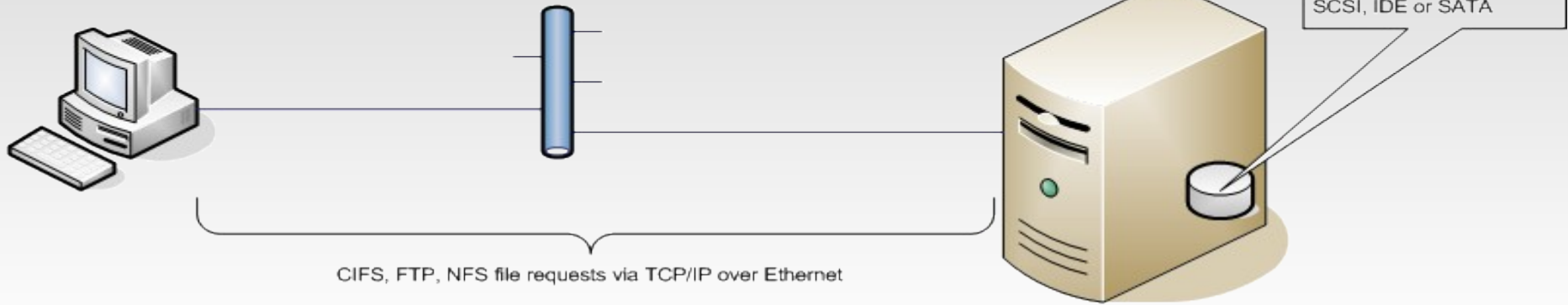
A self-contained computer connected to a network, with the sole purpose of supplying file-based data storage services to other devices on the network

# Then What's "SAN"?

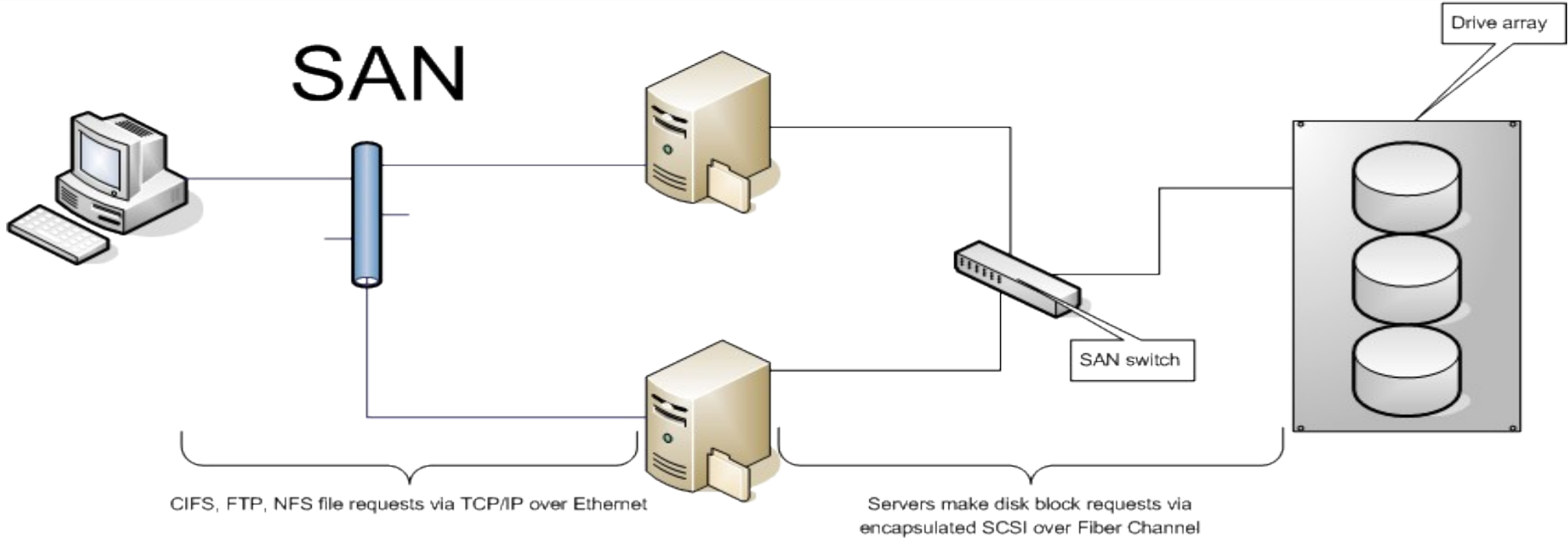
An architecture to attach remote storage to a server in such a way that the devices appear to the server OS to be locally attached

# NAS vs SAN

## NAS



## SAN



# Overview

Why use NAS?

Two different approaches/products which implement Network Attached Storage

Demos!

# Why Use NAS?

- Relatively easy management (Web/GUI)
- Can be a low-cost way to add lots of storage
- Higher reliability and availability
- Low maintenance
- No per-user licenses
- Client-OS-independent access
- Repurpose older hardware
- Consolidate storage



# What is FreeNAS ?

Embedded OS purpose built for NAS services  
& released under the BSD License

Based on m0n0wall, upgraded to FreeBSD 6.2  
with the firewall features replaced with NAS  
features.



# FreeNAS is maintained by a (very) small international team

Project leader: Olivier Cochard-Labbé

Developers : Olivier Cochard-Labbé & Volker  
Theile

FAQs & Documentation: Dan Merschi & Bob  
Jaggard

Beta tester and Manual writer: Bob Jaggard

# Why I ♥ FreeNAS

OS Independent Storage (AFP, CIFS, NFS)

Simple interface for the management of (potentially) complicated services

Green technology - practical way to extend the lifespan of old systems

Centralized storage leads to easier backups

# System Requirements

96 MB of RAM – 128 MB recommended

A FreeBSD supported NIC card

PATA/SATA/SCSI/USB/Firewire/iSCSI hard drives for storage

i.e. => typical retired Win98 PC

# Installation Options

Install to flash memory  
(64 MB USB Key, Compact Flash Card)

Install to hard disk  
(PATA/SATA/SCSI/USB/Firewire/iSCSI drives)

Run from LiveCD  
(Config saved to floppy or flash memory)

# Management Features

Uses the m0n0wall Web GUI

Single XML configuration file

Save/backup configuration file





OS Upgradeable from WebGUI

# FreeNAS

## The Free NAS server



### System information

<b>Name</b>	freenas.home.kelweb.ca
<b>Version</b>	<b>0.686.3</b> (revision 3011) built on Thu Mar 13 19:20:49 CET 2008
<b>OS Version</b>	FreeBSD 6.2-RELEASE-p11 (revision 199506)
<b>Platform</b>	i386-livecd on AMD Sempron(tm) 2400+ running at 1662 MHz
<b>Date</b>	Wed May 7 22:32:14 CDT 2008
<b>Uptime</b>	23:53
<b>Last config change</b>	Tue May 6 22:37:45 CDT 2008
<b>Memory usage</b>	 19% of 927MB
<b>Load averages</b>	0.02, 0.03, 0.00 [ <a href="#">show process information</a> ]
<b>Disk space usage</b>	200 GB Non-Raid Data Share  0% of 180GB 300 GB Data Share  54% of 289GB 500 GB Data Share  34% of 451GB

# Storage Features

RAID 0, 1 & 5

Advanced RAID: 1+0, 0+1, 5+1  
(experimental!)

JBOD (just a bunch of disks)

Disk encryption

## Disks: Software RAID: RAID1: Manage RAID

JBOD RAID 0 **RAID 1** RAID 5 Geom Vinum (unstable)

**Manage RAID** Tools Information

Volume Name	Type	Size	Status
array1	1	305246MB	COMPLETE
array2	1	476941MB	COMPLETE



### Note:

Optional configuration step: Configuring a virtual RAID disk using your [previously configured disk](#).  
Wait for the 'COMPLETE' status before format and mount it!

### Info:

FreeNAS uses GEOM Mirror to create RAID1 arrays.



## Status: Disks

Disk	Size	Description	Temperature	Status
ad0	305246MB	WDC WD3200JB-00KFAQ/08.05J08	25 C	ONLINE
ad1	190783MB	ST3200827A/3.AAE	31 C	ONLINE
ad2	305246MB	WDC WD3200JB-00KFAQ/08.05J08	25 C	ONLINE
ad4	476941MB	ST3500630A/3.AAF	34 C	ONLINE
ad6	476941MB	ST3500630A/3.AAE	31 C	ONLINE
array2	476941MB	Software RAID	31 C	COMPLETE
array1	305246MB	Software RAID	31 C	COMPLETE

# Protocol Support

NFS

CIFS with Samba

FTP with Pure-FTPd

RSYNC: server, client and local (disk to disk)

SSH

Unison

AFP with NetaTalk

UPnP

MS-AD integration

iSCSI target and initiator

Zeroconf with mDNSResponder

## Access: Active Directory

### Active Directory

Enable

**AD server name**

AD or PDC name.

**AD server IP**

IP address of MS Active Directory server.

**Domain name**

Domain name in old format.

**Administrator name**

Username of a domain administrator account.

**Administration password**

(Confirmation)

Password of domain administrator account, enter it here twice.

**Save**

## Services: RSYNC: Client: Add

Server Client **Local**

### Local share

 ...

Path to be shared.

### Remote RSYNC Server

IP address of remote RSYNC server

### Remote module name

### Synchronization Time

minutes	hours	days	months	week days
<input type="radio"/> All <input checked="" type="radio"/> Selected ..	<input type="radio"/> All <input checked="" type="radio"/> Selected ..	<input type="radio"/> All <input checked="" type="radio"/> Selected ..	<input type="radio"/> All <input checked="" type="radio"/> Selected ..	<input type="radio"/> All <input checked="" type="radio"/> Selected ..
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	January February March April May June July August September October November December	Sunday Monday Tuesday Wednesday Thursday Friday Saturday

Note: Ctrl-click (or command-click on the Mac) to select and de-select minutes, hours, days and months.

### RSYNC Options

Delete files that don't exist on sender.

### Description

Save

# Other Features

DDNS client

E-Mail status reports

Scheduled reboots/shutdowns

Automatic firmware update checks

**DEMO**



**N E X E N T A**

# What is NexentaStor?

- Software turns x86 (32/64-bit) commodity hardware (if supported by OpenSolaris) into NAS appliance
- Based on OpenSolaris (Nevada b85ish)
- GNU userland



# Feature Set (1)

CIFS

NFS

FTP

RSYNC

WebDAV

SSH

# Feature set (2)

Snapshot backups

ZFS!

Search

Management via GUI

Management via CLI

# Feature set (3)

iSCSI

RAID 0, 1, 5, 6 and combinations

Safe or live upgrades

Integration with AD/LDAP

Or workgroup mode

# Backup?

Disk-to-disk

Auto-Tier (RSYNC with snapshots)

Auto-Sync (RSYNC a volume)

Auto-CDP (Continuous Data Protection)

a.k.a. block-level online replication

# Cost?

Developer edition - free, 1 TB limit

Basic edition - \$290 annually

Enterprise edition - \$1500 and up (perpetual  
license)

\$3500 for Thumper

Plus 20% annual 'maintenance'

# Requirements

HW supported by OpenSolaris  
x86\_64/AMD64  
2 GB+ RAM (for production use)  
Dual core, probably  
Several disks  
VMware image available

# Cons

Cost (if lots of data)

No easy extensibility

Needs lots of disks

They really don't want you doing your own thing

Beefy hardware requirements

Little on-line support unless you pay

Not for low-power environments

What's up with RSYNC?

# Pros

ZFS!

Nice interface

Easy to set up

Mail notifier

Manage multiple appliances

Pretty reports!

RsyncShare for Windows



**DEMO**

**Questions?**

# Summary

Summary text here

# Support Open Source Projects

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# Links

FreeNAS Website:

[www.freenas.org](http://www.freenas.org)

FreeNAS online demo:

<http://demo.freenas.org/>

Complete FreeNAS presentation:

[www.bsdcn.org/2007/schedule/attachments/5-FreeNAS\\_Olivier\\_Cochard-Labbe.pdf](http://www.bsdcn.org/2007/schedule/attachments/5-FreeNAS_Olivier_Cochard-Labbe.pdf)

m0n0wall Project:

<http://m0n0.ch/wall/>

SAN-NAS Comparison:

<http://www.nas-san.com/differ.html>