Create a RAID 10 Array Using FreeNAS

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Date: 25th February 2010

UMENT

This document explains how to create a RAID10 array using a FreeNAS Open source NAS\SAN box. This can be either a physical or virtual node. The example here utilises a VMWare ESX4i virtual machine. This array may then be presented over iSCSI transport to build a Windows 2003 or Windows 2008 cluster. For the purposes of this document the following apply

RAID	Redundant Array of Inexpensive Disks
OS	Operating System
Node	A host computer

1.1 AUDIENCE

The document is intended for engineers wishing to discover more about storage and RAID arrays. It is not expected that the reader is familiar with the FreeNAS OS or storage arrays but expects that FreeNAS is already installed and configured.

2 STORAGE ARRAY TYPES

RAID arrays are sets of redundant disks, hence the name RAID (Redundant Array of Inexpensive Disks). RAID comes in various forms which have expanded since the appearance of more intelligent disk controllers. Common arrays are;

RAID 0 striped

Data is striped across disks, no fault tolerance.

RAID 1 mirrored

Data on disk is mirrored to a second disk

RAID 4 Striping with parity

One disk is dedicated for the parity bits, data is striped data across the remaining disks in the array.

RAID 5 Striping with parity

Stripes data including the parity bits across all disks in the array (distributed parity)

RAID6 Striping with Parity (dual parity)

Extra parity redundancy over RAID5

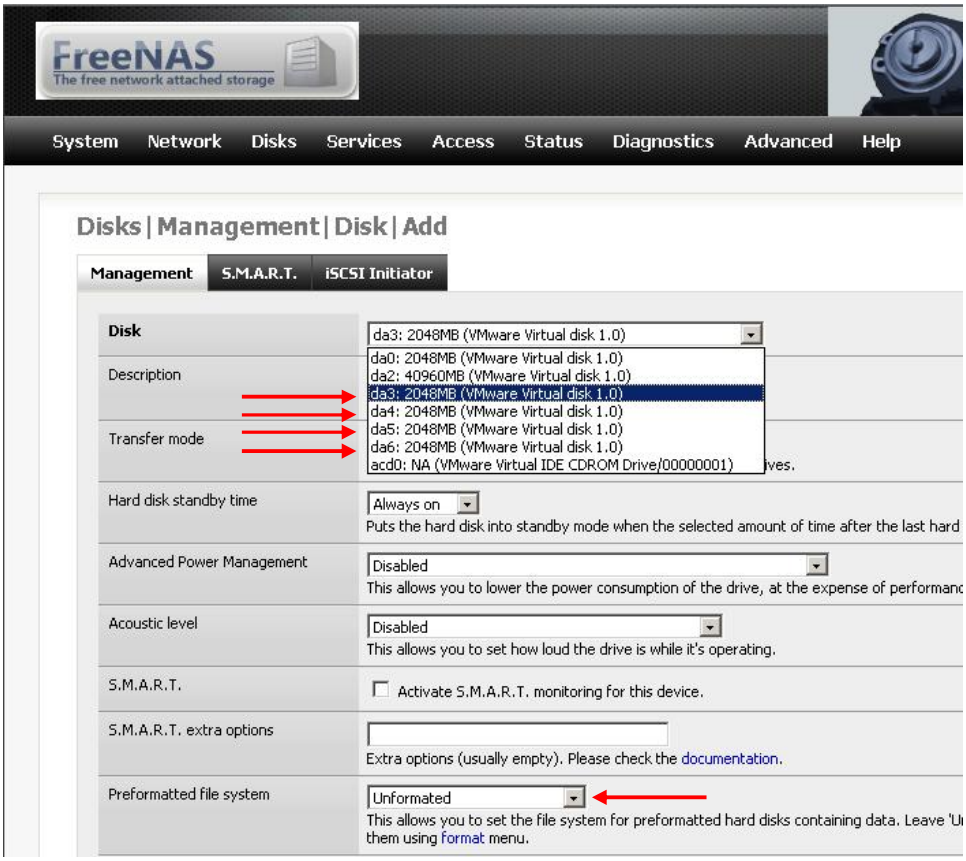
RAID 0+1 Striping with mirror

Striped set which is then mirrored

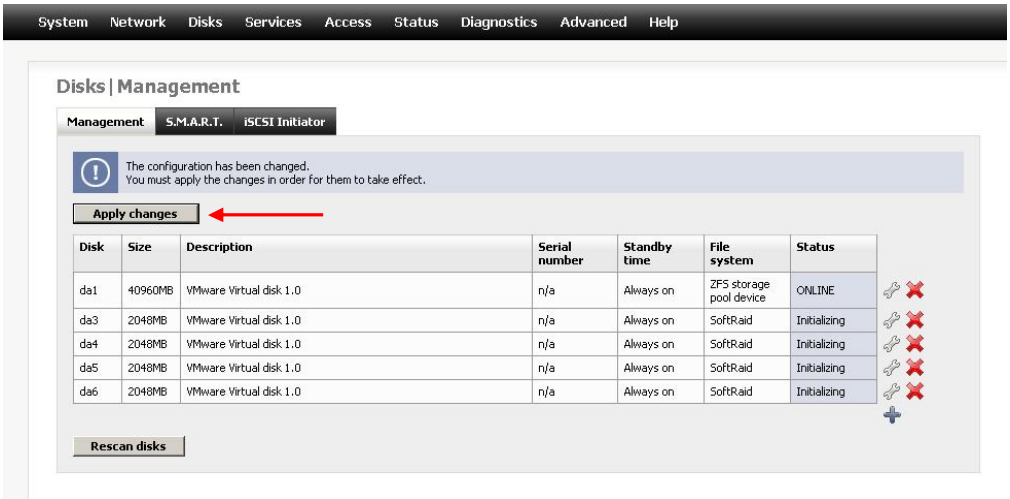
RAID 1+0 Mirror with striping

Mirrored disks which are then striped

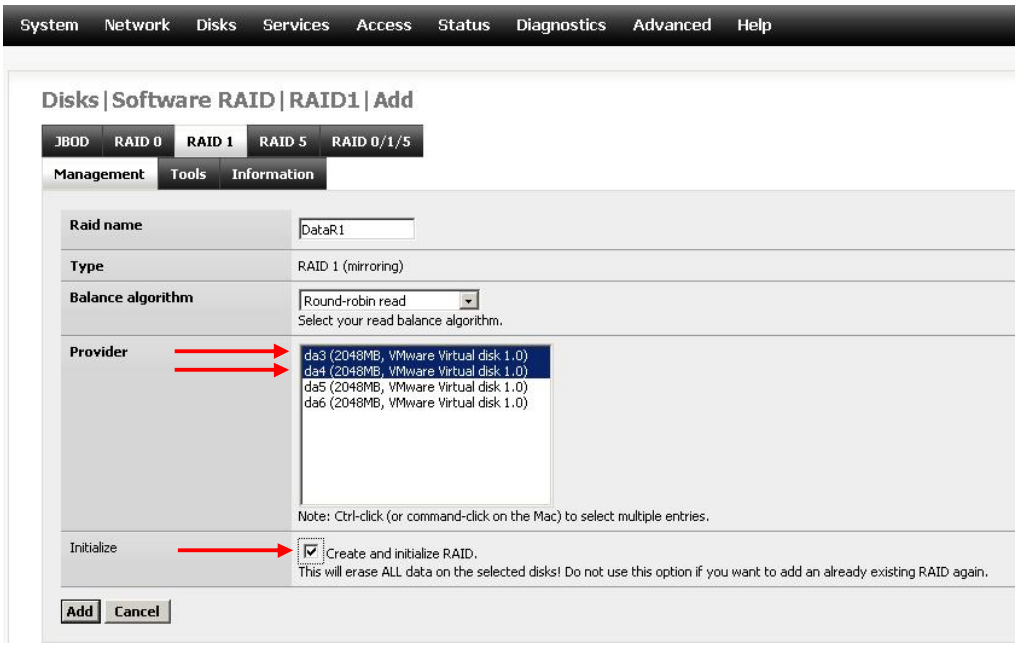
Open the FreeNAS management page and go to Disk Management as shown below. We are going to be using the 4 disks 2GB in size.



Add each disk in turn and be sure to click the drop down list box ñPreformatted file systemòand select ñSoftware RAIDòas the format type. Click ñApply changesò

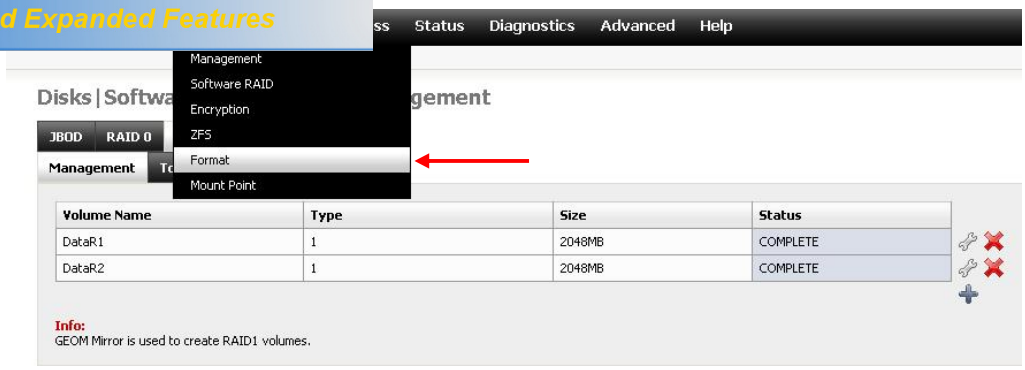


ed, create the 2 RAID1 arrays (remember RAID10 triped). Shown below is the first RAID1 array, alize the arrayò Click ñApply changesòbefore continuing.

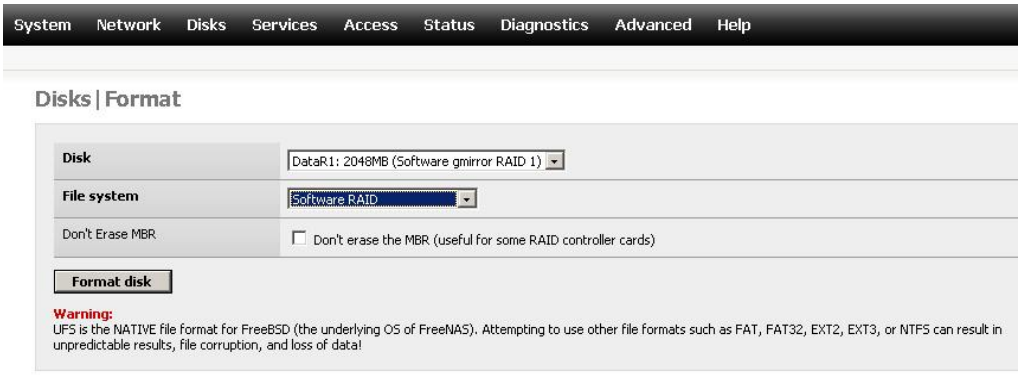


RAID1 arrays created! Both arrays should show the ñCOMPLETEò status.

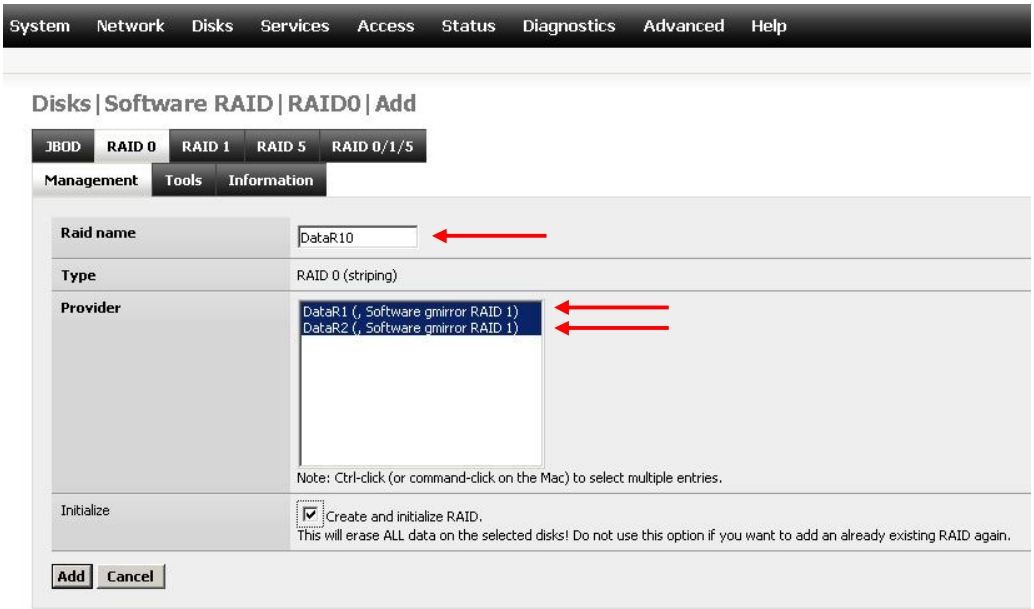
ays from the ñFormatòmenu shown below.



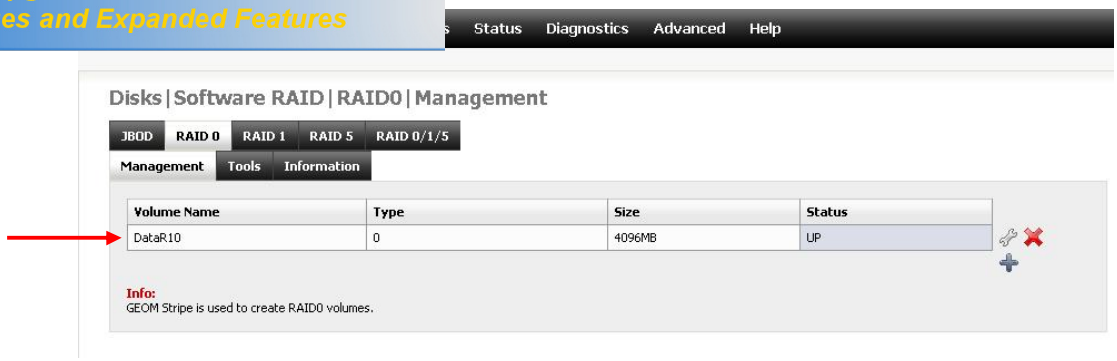
Format them as ñSoftware RAIDòas shown below.



Now go to ñDisksòthen ñSoftware RAIDòfrom the menu and select ñRAID0òas shown below. You will see the two RAID1 arrays previously created. Now we need to create a stripe across these arrays.



cking ñApply changesòyou should see the following.



Now format your new array with the appropriate file system (UFS or ZFS). Add this as an iSCSI target and present to your cluster node!