## **Disc Mirroring with FreeBSD**

The most likely components to fail in our Home Gateway server will first be fans, followed by the hard drive and then the power supply. Fans can be replaced as can power supplies. When hard drives fail, any data on them is lost. Although hard drives have become much more reliable, data protection and recovery techniques are still used in IT (information technology) S.O.P (standard operating procedures). The simplest data protection scheme which we can configure is the use of two identical hard drives with disc mirroring or what is technically referred to as RAID 1 (raid one). RAID stands for Redundant Array of Independent Disks. If you are going to build a Home Gateway using SSD drives, then employing RAID may not be required. But for mechanically spinning discs, RAID is highly recommended to keep a server working in the event of a single hard disk failure.

During the installation of FreeBSD, RAID configuration is done during the Partitioning step. This guide will continue that step and setup two drives for disk mirroring.

## STEP 1 - Partitioning Method

+		Partitioning	+
HOW	would you l	like to partition your disk?	+
	Auto (UFS)	Guided Disk Setup	
	Manual	Manual Disk Setup (experts)	
	Shell	Open a shell and partition by hand	d
	Auto (ZFS)	Guided Root-on-ZFS	
+			+
+			+
		< OK > <cancel></cancel>	
+			+

Arrow down to **Auto (ZFS)** and press [Enter] to use the Auto (ZFS) partitioning tool. (Zettabyte File System) is required for software mirroring or RAID disks)

## STEP 2 - ZFS Configuration

+ZFS Configuration+						
Configure Options:						
. 5 1	Proceed with Installation     stripe: 0 disks     *     2root     YES     NO     GPT (BIOS)     2g     NO     NO					
 +	 +					
<pre>/ &lt; Select &gt; //</pre>	< Cancel >					

Arrow down to select Pool Type/Disks and press [Enter]

STEP 3 - ZFS Configuration (cont.)

+		ZFS ConfigurationZFS Configuration	+
	Select Vi	rtual Device type:	
l	+	+	
l	stripe	Stripe - No Redundancy	
l	mirror	Mirror - n-Way Mirroring	
l	raid10	RAID 1+0 - n x 2-Way Mirrors	
l	raidz1	RAID-Z1 - Single Redundant RAID	
l	raidz2	RAID-Z2 - Double Redundant RAID	
l	raidz1	RAID-Z3 - Triple Redundant RAID	
l	+	+	
l			
+•		+	-
I		< OK > < Cancel >	
+•			e .

Arrow down to select mirror Mirror - n-Way Mirroring and press [Enter]

A list of all drives will be displayed. Use the arrow down key and the [space] key to select the drives for the RAID array. In this example, two hard drives have been selected for the mirror. Warning, da0 is our USB installation drive, don't select it!

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Tab to OK when ready and press [Enter] +-----ZFS Configuration--

>>> Install T Pool Type/Disks:	<b>Proceed with Installation</b> mirror: 2 disks
- Rescan Devices	*
- Disk Info	*
N Pool Name	zroot
4 Force 4K Sectors?	YES
E Encrypt Disks?	NO
P Partition Scheme	GPT (BIOS)
S Swap Size	2g
M Mirror Swap?	NO
W Encrypt Swap?	NO
< Install >	< Cancel >

If the Pool Type/Disks is correct, press [Enter] on Install

Just press [Enter] to use the entire disk for FreeBSD.

+Confirmation+
Last Chance! Are you sure you want to destroy
the current contents of the following disks:
ada0 ada1
++
<pre>&lt; Yes &gt; &lt; No &gt;</pre>
++

Tab to Yes and press [Enter] to continue ...

The partition editor will be displayed with default partitioning for boot, root and swap. Press [Enter] to continue ...

## STEP 5 - Final Confirmation

+----Confirmation----+
| Your changes will now be written to disk. If you |
| have chosen to overwrite existing data, it will |
| be PERMANENTLY ERASED. Are you sure you want to |
| commit your changes? |
+-----+
| < Commit > < Revert & Exit > < Back > |
+----++

Note: If this is NOT what you want to do, use [Tab] to select 'Revert & Exit'. This is the final confirmation. Up until now, nothing has been written to the hard disk. Proceeding will erase all existing data.

Press [Enter] to continue ...

The installation extraction will proceed. It is very quick. For more information, see the <u>FreeBSD Handbook</u>.

Continue with STEP 10 in FreeBSD Installation