Random Ramblings

Random Ramblings of a Network Security Engineer

Saturday, July 6, 2013

Installing Slackware 14 on a Linux Software RAID 1 (MIRRORING)

This is beginners guide on how to install Slackware Linux 14 on a RAID 1 (mirrored) drive.

Boot the system with Slackware 14 ISO and then when prompted, choose the appropriate keyboard type. To login type root and press enter. The details related to the disks that are present in the machine can printed using the following command:

fdisk -1



In my system there are two identical SCSI disk, each of size 7516 MB. Two identical disks are needed for RAID 1 (mirroring) or else the size of the smallest disk will become the size of the final RAID array. The plan is to create two Linux software RAID 1 arrays. The first one will be used as the / (root) partition and the next one will be used as swap partition. The root partition on the first raid array will have the size of 7000 MB and the next RAID array which will be used as swap will be allocated the remaining Space. To achieve this we partition the first drive /dev/sda using the cfdisk utility. The steps are as follows :

- [1] Type cfdisk /dev/sda and press enter
- [2] Chose the Pri/Log Fress Space and chose [New] and press enter
- [3] Chose [Primary] and press enter
- [4] Enter the Size as 7000 MB (or whatever you think is suitable in your layout)
- [5] Chose Beginning and Press enter
- [6] Chose [Bootable] and press enter
- [7] Select [Type] while the new partition is highlighted and then press enter
- Enter the filesystem Type as FD (Linux Raid AutoDetect) and press Enter

Now you will have something like this:



[8] Now use the down arrow key to select the Free Space and make sure that [New] is highlighted and then press enter

About Me

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- [9] Select [Primary] and press enter [10] Accept the default size (in my case 516.48 MB) by pressing Enter
- [11] As before , change the type of this partition into FD (Linux Raid AutoDetect) {Similar to step 7 above }
- [12] Finally write the partition table onto the disk by selecting [Write] and by pressing enter [13] Type 'yes' and the press enter

[14] Select [Quit] and press Enter to quit the cfdisk utility

We can verify that the partition table of /dev/sda is written correctly by using the fdisk -I command.

root@slackware:≁	∕# fdisk -l	∕dev∕sda					
Disk /dev/sda: 7 255 heads, 63 se Units = sectors Sector size (log I/O size (minimo Disk identifier	7516 MB, 751 ectors/track of 1 * 512 gical/physic um/optimal): : 0x00000000	6192768 bytes , 913 cylinde = 512 bytes al): 512 byte 512 bytes /	s ers, total 1 es / 512 byt 512 bytes	468Ø es	1064 sectors		
Device Boot /dev/sda1 * /dev/sda2 root@slackware:/	Start 63 13671315 /#_	End 13671314 14680063	Blocks 6835626 504374+	Id fd fd	System Linux raid Linux raid	autodetect autodetect	

The next step is to copy the partition table of /dev/sda into /dev/sdb by using the sfdisk utility. This can be done using the following command :

sfdisk -d /dev/sda | sfdisk --force /dev/sdb

Now both the disk sda and sdb have identical partition table, which can be verified by using the following commands :

fdisk -I /dev/sda

fdisk -l /dev/sdb

root@slackware:∕# fdisk -l ∕	dev∕sda	Both disks	s nov	v have same p	partition layout		
Disk /dev/sda: 7516 MB, 7516192768 bytes 255 heads, 63 sectors/track, 913 cylinders, total 14680064 sectors Units = sectors of 1 * 512 = 512 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes Disk identifier: 0x00000000							
Device Boot Start ∕dev∕sda1 * 63 ⁄dev∕sda2 13671315 root@slackware:/# fdisk -l ∕	End 13671314 14680063 dev⁄sdb	Blocks 6835626 504374+	Id fd fd	System Linux raid Linux raid	autodetect autodetect		
Disk /dev/sdb: 7516 MB, 7516192768 bytes 255 heads, 63 sectors/track, 913 cylinders, total 14680064 sectors Units = sectors of 1 * 512 = 512 bytes Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes Disk identifier: 0x00000000							
Device Boot Start /dev/sdb1 * 63 /dev/sdb2 13671315 root@slackware:/# _	End 13671314 14680063	Blocks 6835626 504374+	Id fd fd	System Linux raid Linux raid	autodetect autodetect		

The cat /proc/mdstat command will show us that there are currently no RAID arrays present in the system :



The next step is to create the raid arrays using the mdadm utility. To create the first RAID array that will be used as / (root) partition we can use the following command :

mdadm --create /dev/md0 --level=1 -raid-devices=2 /dev/sda1 /dev/sdb1 --metadata=0.90

We can view the status of the newly created RAID device using the **cat /proc/mdstat** command:



Similarly, we can create the RAID device /dev/md1 which will be used as our swap partition using the following command:

mdadm --create /dev/mdl --level=1 -raid-devices=2 /dev/sdb2 /dev/sdb2 --metadata=0.90



As we can see from the above output /dev/md0 is fine and /dev/md1 is being synced. Now our raid arrays are in place. Before we being the installation of the Slackware using the setup command, we will format /dev/md1 as the swap partition.

mkswap /dev/md1

Now we can begin the installation of the Slackware Linux using the setup command:

setup

The steps are as follows :

[1] Choose the ADDSWAP option and press Enter. The /dev/md1 partition will be detected as swap. When prompted for "Check SWAP Partitions for BAD Blocks", chose NO. Then the swap space will be added into the /etc/fstab file.

	1 My 4100 00 4004
HELP	Read the Slackware Setup HELP file
KEYMAP	Remap your keyboard if you're not using a US one
ADDSWAP	Set up your swap partition(s)
TARGET	Set up your target partitions
SOURCE	Select source media
SELECT	Select categories of software to install
INSTALL	Install selected software
CONFIGURE	Reconfigure your Linux system
EXIT	Exit Slackware Linux Setup

on your system. These partitions have been preselected to be set up as swap space. If there are any swap partitions that you do not wish to use with this installation, please unselect them with the up and down arrows and spacebar. If you wish to use all of them (this is recommended), simply hit the ENTER key. I+1 /dev/md1 Linux swap partition, 504256KE	Slackware S	SWAP SPACE	DETECTED one or more swan partitions	1
L*1 dev/md1 Linux swap partition, 504256XB	on your sys to be set up partitions installation arrows and (this is red	tem. These partit p as swap space. that you do not wi n, please unselect spacebar. If you commended), simply	ions have been preselected If there are any swap sh to use with this them with the up and down wish to use all of them hit the ENTER key.	
		dev/md1 Linux swa	p partition, 504256KB	

Your swapspa be added to y	SWAP : ce has been con: your /etc/fstab	SPACE CONFIGURE figured. This i :	D nformation will		
∕dev∕md1	ѕмар	ѕмар	defaults	0	0
		<u>< 0</u> K >			

[2] In the next step we will chose /dev/md0 as the / (root) partition. We will choose to Format it and the EXT4 file system is chosen. After the formatting is complete the /etc/fstab file will be updated.

/dev/md0	Linux 6835520K
	(done adding partitions, continue with setup)
	(done adding partitions, continue with setup)
	(done adding partitions, continue with setup)
	(done adding partitions, continue with setur)
	97%

Adding this	information to) your ∕etc∕fstab	:	
/dev/md0	1	ext4	defaults	1 1
		<u>< О</u> Х >		

[3] Choose install Slackware from CD or DVD[4] Choose the packages and then begin the installation



[5] Supply root password and complete the Setup by installing Lilo bootloader.

After the installation is finished we drop to the install shell and then chroot to the newly installed Linux partition by using the following command:

chroot /mnt/ /bin/bash

We then backup the original lilo.conf file and replace it with the following :

mv /etc/lilo.conf /etc/lilo.conf.ori
vi /etc/lilo.conf

append=" vt.default_utf8=0"
boot = /dev/md0
raid-extra-boot="/dev/sda,/dev/sdb"
bitmap = /boot/slack.bmp
bmp-colors = 255,0,255,0,255,0
bmp-table = 60,6,1,16
bmp-timer = 65,27,0,255
prompt
timeout = 1200
change-rules
reset
vga = normal
<pre>image = /boot/vmlinuz</pre>
root = /dev/md0
label = Linux
read-only

Finally we , reinstall Lilo using the following command :

lilo -v

Now, the installation is complete , we can reboot the system using the following command :

reboot

After we have booted into the freshly installed Slackware, we can check the status of the raid array using the following commands:

root@slack-box:~# mdadm --detail /dev/md0

root@slack-box:~#	mdadmd	etail /dev/r	ndO			
/dev/md0:						
Version :	0.90					
Creation Time :	Fri Jul 5	21:02:13 20)13			
Raid Level :	raid1					
Array Size :	6835520 (6	.52 GiB 7.00) GB)			
Used Dev Size :	6835520 (6	.52 GiB 7.00) GB)			
Raid Devices :						
Total Devices :						
Preferred Minor :						
Persistence :	Superblock	is persiste	ent			
Update Time :	Sat Jul 6	21:51:30 20)13			
State :	clean					
Active Devices :						
Working Devices :						
Failed Devices :	0					
Spare Devices :						
IIIITD .				21-041-		
UUID :	0.20	CDCd60/:2080	absa:9e2.	30040		
Events :	0.20					
Number Majo:	r Minor	RaidDevice	State			
0 8			active s	ync	/dev/sda1	
1 8	17		active s	ync	/dev/sdb1	

root@slack-box:~# mdadm --detail /dev/md1

root@slack-box:~# mdadmdetail /dev/mdi
/dev/mdl:
Version : 0.90
Creation Time : Fri Jul 5 21:02:27 2013
Raid Level : raid1
Array Size : 504256 (492.52 MiB 516.36 MB)
Used Dev Size : 504256 (492.52 MiB 516.36 MB)
Raid Devices : 2
Total Devices : 2
Preferred Minor : 1
Persistence : Superblock is persistent
Update Time : Sat Jul 6 21:53:27 2013
State : clean
Active Devices : 2
Working Devices : 2
Failed Devices : 0
Spare Devices : 0
UUID : a0dab266:3372cc28:208cdb8d:9e23b04b
Events : 0.20
Number Major Minor RaidDevice State
0 8 2 0 active sync /dev/sda2
1 8 18 1 active sync /dev/sdb2
root@slack-box:~#

It is a good idea to generate the mdadm.conf file. We can do this by using the following command :

root@slack-box:~# mdadm --detail --scan > /etc/mdadm.conf

root@slack-box:~#	mdadmdetailscan
ARRAY /dev/md/0_0	metadata=0.90 UUID=d8afa21c:1cbcd607:208cdb8d:9e23b04b
ARRAY /dev/md/1_0	metadata=0.90 UUID=a0dab266:3372cc28:208cdb8d:9e23b04b
root@slack-box:~#	<pre>mdadmdetailscan > /etc/mdadm.conf</pre>
root@slack-box:~#	cat /etc/mdadm.conf
ARRAY /dev/md/0_0	metadata=0.90 UUID=d8afa21c:1cbcd607:208cdb8d:9e23b04b
ARRAY /dev/md/1_0	metadata=0.90 UUID=a0dab266:3372cc28:208cdb8d:9e23b04b
root@slack-box:~#	

Posted by Prithak at 3:59 PM

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