Tip: SSD and Linux. Enable TRIM and check if it works

What is TRIM?

On hard disks, with spinning magnetic platters, you don't care if a particular sector is being used by the operating system or not. If you want to use it again, just ask the controller to write into it, and the controller will just overwrite whatever was in that sector.

With SSD, if the sector already contains some information and you want to write into it, the old data needs to be deleted (zeroed out) first, and then the new data written. Zeroing out the old data takes considerable time, so it would make sense if we could tell the controller that the sector is no longer being used, allowing the controller to zero out the sector data in the background, and then when we need to use the sector again, it will be ready to be written into immediately, saving us a lot of time.

This is what the TRIM command does, it tells the controller that the sector is no longer used and can be zeroed out.

For the TRIM command to work, we need ext4 and the kernel to be 2.6.33 or higher. In this example we use Fedora.

Install Fedora

If you don't have it installed yet, or want to make sure that it's installed correctly for the TRIM command to work, here is a very brief guide.

Installing Fedora is very much a matter of clicking the Next button.

The only important step where you would not click the Next button straight away, is the storage step.

Select the Create Custom Layout option. The reason we are not going with the default here is because we can't use LVM with SSD.

Create two standard partitions, one swap and one ext4 (mounted as /). Don't use ext2 or ext3 as they don't support SSD either, particularly the TRIM command.
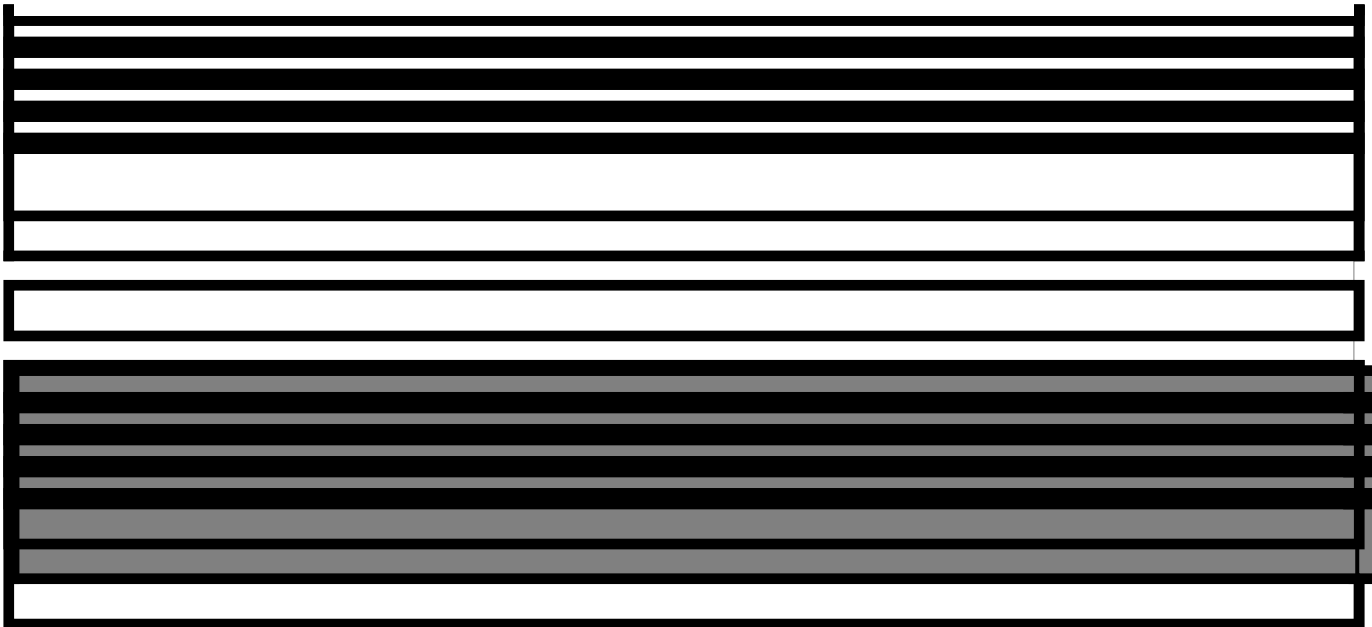
Enable TRIM

In default Fedora installation TRIM is not enabled by default. So let's enable it.

As root, edit the /etc/fstab file and add the "discard" option to the root line.
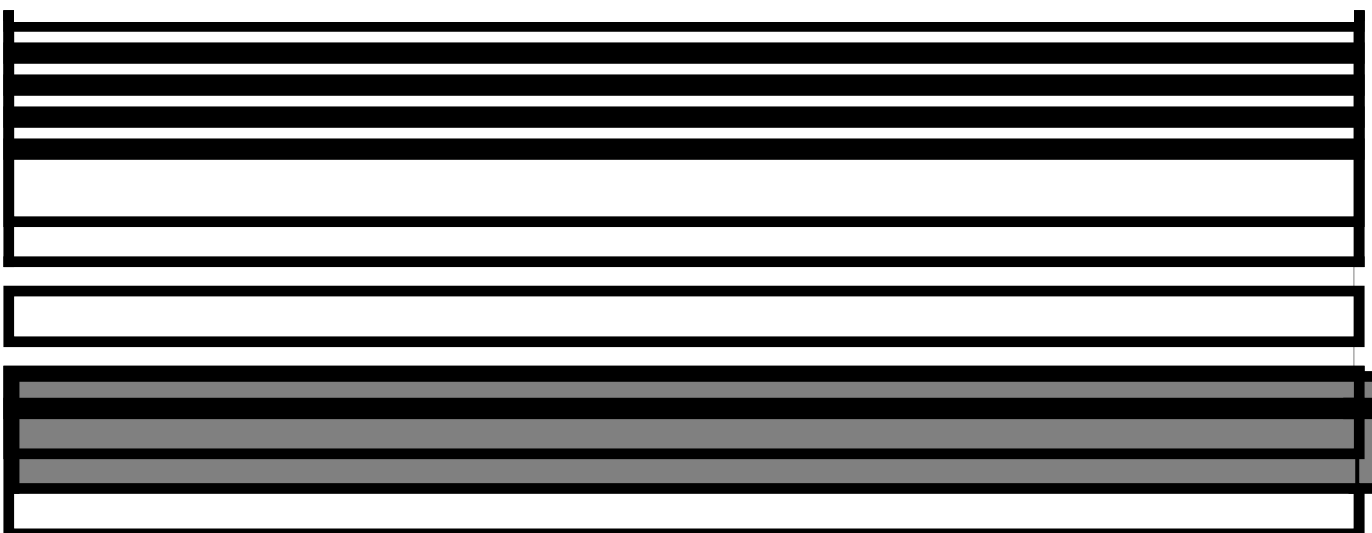
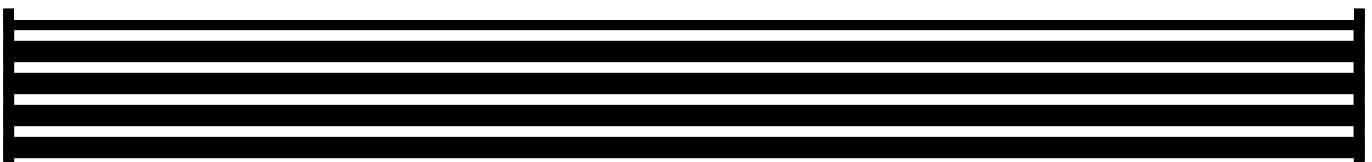Restard the machine. Check if / has been mounted with "discard".

Looks good. It is now time to test the TRIM functionality.

Check if TRIM works

We are going to create a file, check the sector data, then delete the file, and see if the sector data has been zeroed out.

We will be using the hdparm tool, so the following steps need to be done as root.
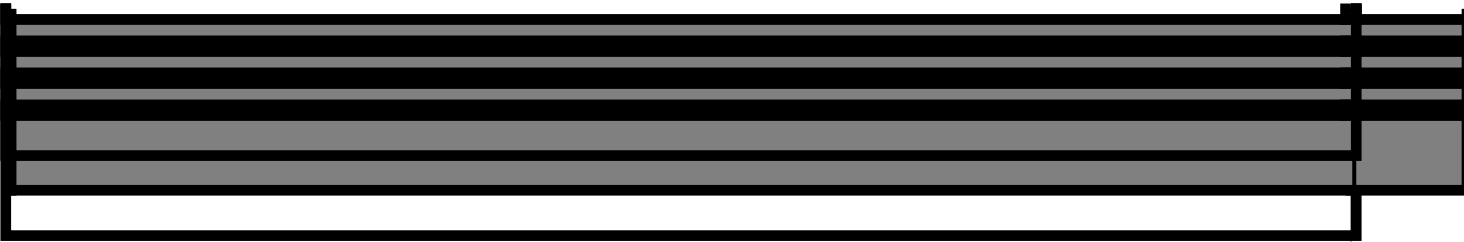
First, create a file.

This will create a file with 200 lines, about 4k in size. Now make sure it is flushed out to the disk.

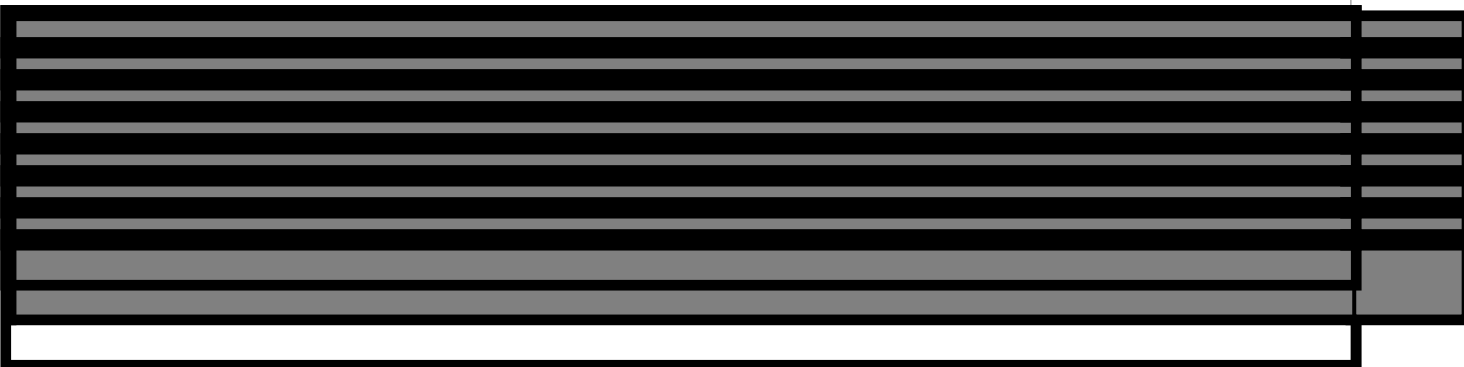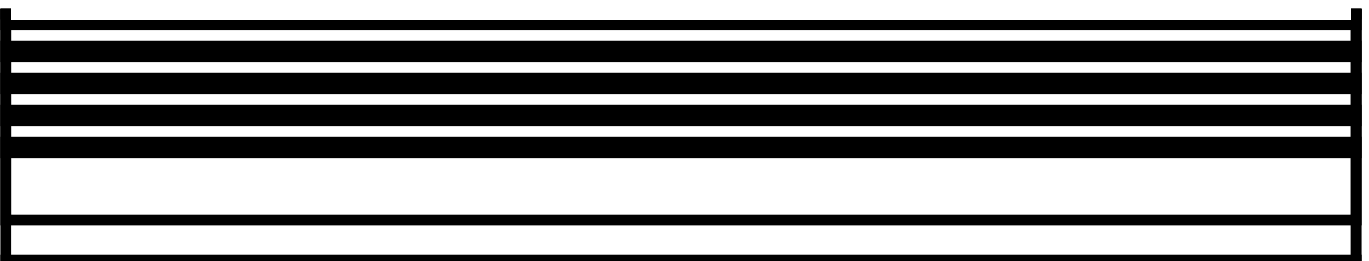Now let's find out where the file is physically stored on the disk.
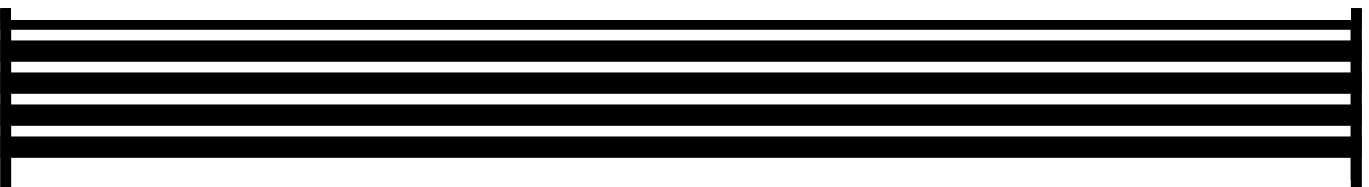
You can see the file starts at sector 14927624 and spans 8 sectors. Let's check what's in there.
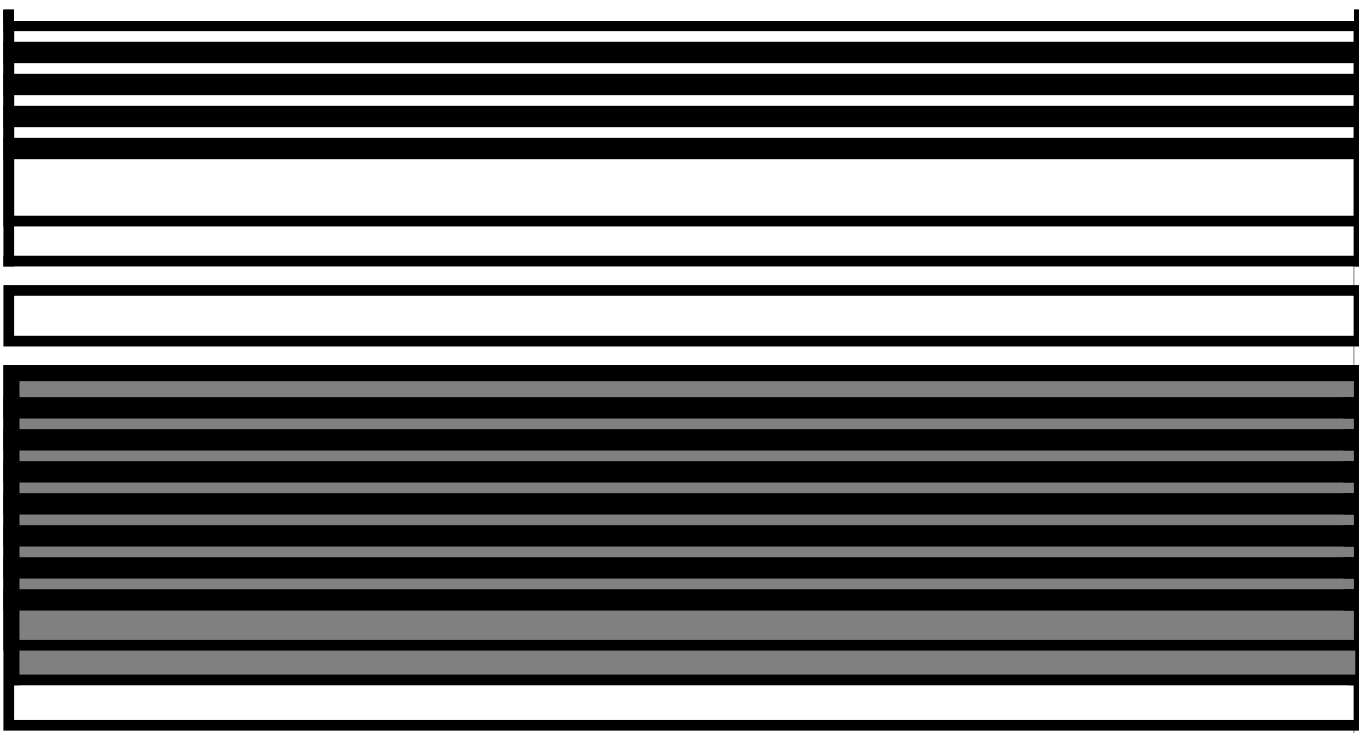
That's our sector. "3031 3030 2031 6574 7473 6c20 6e69 0a65″ is a hex representation of "10000 test line".

Now let's delete the file. Make sure the change is flushed to the disk.

We are now expecting the sector to contain nothing but zeroes.

Perfect, the TRIM command works in Fedora 15.

Recent releases of most popular distributions (Ubuntu, Mint, Sabayon, etc) should also be fine.

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