

Setup a Swap File on Linux

Learn how to set up a swap file on Linux to improve system performance and prevent crashes when RAM is insufficient. Step-by-step guide for beginners.

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Introduction

There will be times where you need to increase the responsiveness of your server to prevent out of memory issues. Out of memory issues happen when an application running on your server starts consuming a large amount of memory. Swap is designed as virtual memory, which uses your harddrive to store data that cannot be held in RAM. This tutorial will show you how to create a swap file, which should work under Ubuntu, CentOS, and Debian. This tutorial is not meant for any Custom ISO, but it is possible to follow along.

1. Verify that Swap Doesn't Exist

To prevent any issues during this tutorial, you will need to run the following to verify that a swap space is currently not active:

```
free -m
```

After running that command you should see something similar to this output:

total	used	free	shared	buffers	cached	
Mem:	1840	1614	226	15	36	1340
-/+ buffers/cache:		238	1602			
Swap:	0	0	0			

If you see a value of `0` in the `Swap` section, then you can proceed to step 2.

Alternatively, you can run the following command to see if there is a configured swap file:

```
swapon -s
```

If you do not see any output from `swapon`, then proceed to step 2.

2. Create Swap File

You will need to choose a location for your file. In this tutorial, it will be stored at the root of the server. We will create a 2GB swap file by running the following command:

```
dd if=/dev/zero of=/swapfile count=2048 bs=1M
```

The `dd` command will produce output in a similar format to:

```
2048+0 records in
2048+0 records out
2147483648 bytes (2.1 GB) copied, 10.5356 s, 204 MB/s
```

Next, verify that the file is located at the root of your Vultr VPS by running:

```
ls / | grep swapfile
```

Proceed if you see the `swapfile` file.

3. Activate the Swap File

Swap files are not recognized automatically. We will need to tell the server how to format the file and enable it so it can be used as a valid swap file. As a security measure, update the swapfile permissions to only allow R/W for root and no other users. Run:

```
chmod 600 /swapfile
```

The permission change can be verified by running the following command:

```
ls -lh /swapfile
```

You will see a file display:

```
-rw----- 1 root root 2.0G Oct  2 18:47 /swapfile
```

Next, tell the server to setup the swap file by running:

```
mkswap /swapfile
```

After running it, you will see the following output:

```
Setting up swappiness version 1, size = 2097148 KiB
no label, UUID=ff3fc469-9c4b-4913-b653-ec53d6460d0e
```

If everything is shown as above, you are now ready to move on to the next step.

4. Enable Swap

Once your file is ready to be used as swap, you need to enable it by running:

```
swapon /swapfile
```

You can verify that the swap file is active by running the `free` command again.

```
free -m

total        used        free        shared    buffers     cached
Mem:           1840           1754            86           16           23           1519
-/+ buffers/cache:           210           1630
Swap:           2047              0           2047
```

If `Swap` shows something other than `0`, then you have successfully setup swap.

5. Enable Swap on Reboot

By default, your server will not automatically enable this new swap file. To enable it on boot, you can update the `/etc/fstab` file. Any text editor will suffice. In this example, I will be using `nano`.

```
nano /etc/fstab
```

Add the following line at the end of the file:

```
/swapfile none swap sw 0 0
```

How to Expand a Swap File

If you have an existing swap file and need to expand it:

1. Assuming your swapfile is named `/swapfile`, disable it.

```
$ sudo swapoff /swapfile
```

2. Increase swap size. This will append 1024 blocks, 1 MB each (1 GB total) of zero bytes to the end of the existing swap file.

```
$ sudo dd if=/dev/zero of=/swapfile bs=1M count=1024 oflag=append conv=notrunc
```

3. Make the file a swap file.

```
$ sudo mkswap /swapfile
```

4. Enable swaping.

```
$ sudo swapon /swapfile
```



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