

Steps:

Method 1 (Using partition): -

1. Show Swap partition using `swapon -s`-

```
[root@client1 /]# swapon -s
```

Filename	Type	Size	Used	Priority
/dev/dm-1	partition	2121724	0	-2

```
[root@client1 /]#
```

2. We can check swap space using `free` command-

```
[root@client1 /]# free
```

	total	used	free	shared	buff/cache	available
Mem:	1790604	380364	1214076	5752	196164	1252916
Swap:	2121724	0	2121724			

3. Check available disks & partitions using `lsblk`-

```
[root@client1 /]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
sda	8:0	0	10G	0	disk	
├─sda1	8:1	0	1G	0	part	
├─sda2	8:2	0	1G	0	part	
├─sda3	8:3	0	1G	0	part	
├─sda4	8:4	0	512B	0	part	
└─sda5	8:5	0	200M	0	part	
sdb	8:16	0	10G	0	disk	
├─sdb1	8:17	0	1G	0	part	
└─sdb2	8:18	0	1G	0	part	
sr0	11:0	1	1024M	0	rom	
nvme0n1	259:0	0	60G	0	disk	
├─nvme0n1p1	259:1	0	1G	0	part	/boot
├─nvme0n1p2	259:2	0	59G	0	part	
├─rhel-root	253:0	0	38.3G	0	lvm	/
├─rhel-swap	253:1	0	2G	0	lvm	[SWAP]
└─rhel-home	253:2	0	18.7G	0	lvm	/home

```
[root@client1 /]#
```

4. Create new swap partition of 1GB in size using `gdisk`-

```
[root@client1 /]# gdisk /dev/sdb
sdb  sdb1  sdb2
[root@client1 /]# gdisk /dev/sdb
GPT fdisk (gdisk) version 1.0.7

Partition table scan:
  MBR: protective
  BSD: not present
  APM: not present
  GPT: present

Found valid GPT with protective MBR; using GPT.
```

```

Command (? for help): n
Partition number (3-128, default 3): 3
First sector (34-20971486, default = 4196352) or {+-}size{KMGTP}:
Last sector (4196352-20971486, default = 20971486) or {+-}size{KMGTP}: +1G
Current type is 8300 (Linux filesystem)
Hex code or GUID (L to show codes, Enter = 8300): L
Type search string, or <Enter> to show all codes:
0700 Microsoft basic data          0701 Microsoft Storage Replica
0702 ArcaOS Type 1                 0c01 Microsoft reserved
2700 Windows RE                   3000 ONIE boot
3001 ONIE config                   3900 Plan 9
4100 PowerPC PReP boot             4200 Windows LDM data
4201 Windows LDM metadata          4202 Windows Storage Spaces
7501 IBM GPFS                      7f00 ChromeOS kernel
7f01 ChromeOS root                 7f02 ChromeOS reserved
8200 Linux swap                    8300 Linux filesystem
8301 Linux reserved                8302 Linux /home
8303 Linux x86 root (/)            8304 Linux x86-64 root (/)
8305 Linux ARM64 root (/)          8306 Linux /srv
8307 Linux ARM32 root (/)          8308 Linux dm-crypt
8309 Linux LUKS                    830a Linux IA-64 root (/)
830b Linux x86 root verity          830c Linux x86-64 root verity
830d Linux ARM32 root verity        830e Linux ARM64 root verity
830f Linux IA-64 root verity        8310 Linux /var
8311 Linux /var/tmp                 8312 Linux user's home
8313 Linux x86 /usr                 8314 Linux x86-64 /usr
8315 Linux ARM32 /usr               8316 Linux ARM64 /usr
8317 Linux IA-64 /usr              8318 Linux x86 /usr verity
Press the <Enter> key to see more codes, q to quit: q

Hex code or GUID (L to show codes, Enter = 8300): 8200
Changed type of partition to 'Linux swap'

```

Here Hex code **8200** is used for Linux Swap.

5. Now write to disk as shown-

```

Command (? for help): w

Final checks complete. About to write GPT data. THIS WILL OVERWRITE EXISTING
PARTITIONS!!

Do you want to proceed? (Y/N): Y
OK; writing new GUID partition table (GPT) to /dev/sdb.
The operation has completed successfully.
[root@client1 ~]#

```

6. Run **partprobe** command to get kernel knows about this partition.

7. Check the created partition-

```
[root@client1 ~]# lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda                                 8:0    0   10G  0 disk
├─sda1                             8:1    0    1G  0 part
├─sda2                             8:2    0    1G  0 part
├─sda3                             8:3    0    1G  0 part
├─sda4                             8:4    0   512B  0 part
└─sda5                             8:5    0   200M  0 part
sdb                                 8:16   0   10G  0 disk
├─sdb1                             8:17   0    1G  0 part
├─sdb2                             8:18   0    1G  0 part
└─sdb3                             8:19   0    1G  0 part
sr0                                11:0    1 1024M  0 rom
nvme0n1                            259:0   0    60G  0 disk
├─nvme0n1p1                        259:1   0    1G  0 part /boot
├─nvme0n1p2                        259:2   0    59G  0 part
├─rhel-root                        253:0   0 38.3G  0 lvm /
├─rhel-swap                        253:1   0    2G  0 lvm [SWAP]
└─rhel-home                        253:2   0 18.7G  0 lvm /home
[root@client1 ~]#
```

```
[root@client1 ~]# lsblk -f
NAME                                FSTYPE FSVER LABEL UUID                                 FSAVAIL FSUSE% MOUNTPOINTS
sda
├─sda1                             xfs
├─sda2                             ext4    1.0
├─sda3                             ext4    1.0
├─sda4                             ext4
└─sda5                             ext4    1.0
sdb
├─sdb1                             xfs
├─sdb2                             ext4    1.0
└─sdb3
```

It is still not assigned with any file system yet.

8. Mount it with swap file system & verify as shown-

```
[root@client1 ~]# mkswap /dev/sdb3
Setting up swapspace version 1, size = 1024 MiB (1073737728 bytes)
no label, UUID=4e6c60b3-d2d5-4e9a-bf48-907cdc6e2946
[root@client1 ~]#
```

```
[root@client1 ~]# lsblk -f
NAME                                FSTYPE FSVER LABEL UUID                                 FSAVAIL FSUSE% MOUNTPOINTS
sda
├─sda1                             xfs
├─sda2                             ext4    1.0
├─sda3                             ext4    1.0
├─sda4                             ext4
└─sda5                             ext4    1.0
sdb
├─sdb1                             xfs
├─sdb2                             ext4    1.0
└─sdb3                             swap     1
```

9. Now we have to enter its **UUID** (which can be obtained as shown in screenshot) & other details in `/etc/fstab` file-

```
[root@client1 ~]# blkid /dev/sdb3
/dev/sdb3: UUID="4e6c60b3-d2d5-4e9a-bf48-907cdc6e2946" TYPE="swap" PARTLABEL="Linux swap" PARTUUID="eadb5893-a9f6-4f04-acaa-77fc017ed7a8"
[root@client1 ~]# blkid /dev/sdb3 >> /etc/fstab
```

10. `vim /etc/fstab`

```
UUID=4e6c60b3-d2d5-4e9a-bf48-907cdc6e2946 swap swap defaults 0 0
```

11. To mount this newly created swap, use command as shown-

```
[root@client1 ~]# swapon -a
[root@client1 ~]#
```

12. Finally show the new swap partition & total size after adding 1GB swap-

```
[root@client1 ~]# swapon -s
Filename                                Type    Size    Used    Priority
/dev/dm-1                              partition 2121724 0        -2
/dev/sdb3                              partition 1048572 0        -3
[root@client1 ~]#
[root@client1 ~]#
[root@client1 ~]# free
              total        used        free      shared  buff/cache   available
Mem:           1790604       380316       1214076         5752       196212       1252964
Swap:           3170296           0       3170296
```

13. If we want to remove this increased 1GB swap space temporarily, use `swapoff` command as shown-

```
[root@client1 ~]# swapoff /dev/sdb3
[root@client1 ~]#
[root@client1 ~]# swapon -s
Filename                                Type    Size    Used    Priority
/dev/dm-1                              partition 2121724 0        -2
[root@client1 ~]#
[root@client1 ~]# free
              total        used        free      shared  buff/cache   available
Mem:           1790604       362424       1221480         5744       206700       1272124
Swap:           2121724           0       2121724
[root@client1 ~]#
```

14. To remount back, run `swapon -a`.

15. To remove permanently, delete its entry from `/etc/fstab` file.

Method 2 (Using Swap file): -

1. To check statistics of swap, we use vmstat. We need to install its package first-

```
[root@client1 ~]#  
[root@client1 ~]# yum install sysstat  
  
[root@client1 ~]# vmstat  
procs -----memory----- --swap-- -----io----- -system-- -----cpu-----  
r  b   swpd   free   buff  cache   si   so    bi    bo    in   cs  us  sy  id  wa  st  
0  0     0 1007940   2732 390816    0    0    56    19   89  254  1  1 98  1  0  
[root@client1 ~]#
```

2. Currently there are no additional swap mounted as shown-

```
[root@client1 ~]# df -h  
Filesystem                Size      Used Avail Use% Mounted on  
devtmpfs                   855M         0  855M   0% /dev  
tmpfs                      875M         0  875M   0% /dev/shm  
tmpfs                      350M   5.3M  345M   2% /run  
/dev/mapper/rhel-root      39G   11G   29G  27% /  
/dev/nvme0n1p1            1014M  221M  794M  22% /boot  
/dev/mapper/rhel-home      19G   247M   19G   2% /home  
192.168.78.140:/nfs        50G   13G   38G  26% /nfsmount  
//192.168.78.140/singh_share 50G   13G   38G  26% /samba_share  
tmpfs                      175M         0  175M   0% /run/user/0  
[root@client1 ~]#
```

3. Now we can create swap space using file. Make sure you have sufficient space in that partition where you are creating these swap file (In my case, I am using /). Now create & verify swap files as shown-

```
[root@client1 /]# fallocate -l 1G /swapfile  
[root@client1 /]#  
[root@client1 /]# ls -lh /swapfile  
-rw-r--r--. 1 root root 1.0G Nov 28 10:50 /swapfile  
[root@client1 /]#
```

```
[root@client1 /]# fallocate -l 1G /swapfile1  
[root@client1 /]#  
[root@client1 /]#  
[root@client1 /]# ls -lh /swapfile*  
-rw-r--r--. 1 root root 1.0G Nov 28 10:50 /swapfile  
-rw-r--r--. 1 root root 1.0G Nov 28 10:51 /swapfile1  
[root@client1 /]#
```

4. We have created two swap files of 1GB each. Change the permission to 600 to avoid giving access to other user-

```
[root@client1 /]# chmod 600 /swapfile*
[root@client1 /]#
[root@client1 /]# ls -lh /swapfile*
-rw-----. 1 root root 1.0G Nov 28 10:50 /swapfile
-rw-----. 1 root root 1.0G Nov 28 10:51 /swapfile1
[root@client1 /]#
```

5. Check swap size currently before creating these swap-

```
[root@client1 /]# free
              total        used         free       shared  buff/cache   available
Mem:      1790604        389464       1007476          5748       393664       1233244
Swap:      3170296           0        3170296
```

6. Create swap using swapfile created earlier & get their UUID-

```
[root@client1 /]# mkswap /swapfile
Setting up swspace version 1, size = 1024 MiB (1073737728 bytes)
no label, UUID=6848a365-15e9-4066-85bf-e5e2779827dd
[root@client1 /]#
[root@client1 /]# blkid swapfile
swapfile: UUID="6848a365-15e9-4066-85bf-e5e2779827dd" TYPE="swap"
[root@client1 /]#
[root@client1 /]# mkswap /swapfile1
Setting up swspace version 1, size = 1024 MiB (1073737728 bytes)
no label, UUID=f3b5fa8f-87fc-4a8a-b311-dc5123c9553d
[root@client1 /]#
[root@client1 /]# blkid swapfile*
swapfile: UUID="6848a365-15e9-4066-85bf-e5e2779827dd" TYPE="swap"
swapfile1: UUID="f3b5fa8f-87fc-4a8a-b311-dc5123c9553d" TYPE="swap"
[root@client1 /]#
```

7. If we check current disk partitions, we will not see these swapfiles there. The reason is, lsblk shows us only blocks, not files-

```
[root@client1 /]# lsblk
NAME                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda                  8:0    0   10G  0 disk
├─sda1               8:1    0    1G  0 part
├─sda2               8:2    0    1G  0 part
├─sda3               8:3    0    1G  0 part
├─sda4               8:4    0    1K  0 part
└─sda5               8:5    0   200M 0 part
sdb                  8:16   0   10G  0 disk
├─sdb1               8:17   0    1G  0 part
├─sdb2               8:18   0    1G  0 part
└─sdb3               8:19   0    1G  0 part [SWAP]
sr0                  11:0    1 1024M  0 rom
nvme0n1              259:0   0    60G  0 disk
├─nvme0n1p1          259:1   0    1G  0 part /boot
└─nvme0n1p2          259:2   0   59G  0 part
   └─rhel-root        253:0   0  38.3G  0 lvm /
       └─rhel-swap     253:1   0    2G  0 lvm [SWAP]
           └─rhel-home 253:2   0  18.7G  0 lvm /home
[root@client1 /]#
```

8. We can verify currently available swaps using command shown as-

```
[root@client1 /]# cat /proc/swaps
Filename                                Type              Size              Used              Priority
/dev/dm-1                              partition         2121724           0                 -2
/dev/sdb3                              partition         1048572           0                 -3
[root@client1 /]#
```

9. Make first file as swap & verify new available swaps as well as new swap space (Note: This method temporarily create these swap space)-

```
[root@client1 /]# swapon /swapfile -v
swapon: /swapfile: found signature [pagesize=4096, signature=swap]
swapon: /swapfile: pagesize=4096, swapspace=1073741824, devsize=1073741824
swapon /swapfile
[root@client1 /]#
```

```
[root@client1 /]# cat /proc/swaps
Filename                                Type              Size              Used              Priority
/dev/dm-1                              partition         2121724           0                 -2
/dev/sdb3                              partition         1048572           0                 -3
/swapfile                              file              1048572           0                 -4
[root@client1 /]#
```

```
[root@client1 /]# free
              total            used            free           shared  buff/cache   available
Mem:          1790604          387576          1006972             5756       396056      1235124
Swap:          4218868              0           4218868
[root@client1 /]#
```

10. Similarly, make second file as swap & verify new available swaps as well as new swap space –

```
[root@client1 /]# swapon /swapfile1 -v
swapon: /swapfile1: found signature [pagesize=4096, signature=swap]
swapon: /swapfile1: pagesize=4096, swapspace=1073741824, devsize=1073741824
swapon /swapfile1
[root@client1 /]#
[root@client1 /]# free -m
              total            used            free           shared  buff/cache   available
Mem:             1748             379             982              5           386          1205
Swap:            5143              0            5143
[root@client1 /]#
[root@client1 /]# cat /proc/swaps
Filename                                Type              Size              Used              Priority
/dev/dm-1                              partition         2121724           0                 -2
/dev/sdb3                              partition         1048572           0                 -3
/swapfile                              file              1048572           0                 -4
/swapfile1                             file              1048572           0                 -5
[root@client1 /]#
```

11. We can verify the same using top command-

```
[root@client1 /]# top
top - 10:56:37 up 2:00, 1 user, load average: 0.03, 0.03, 0.00
Tasks: 253 total, 1 running, 252 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.3 us, 0.3 sy, 0.0 ni, 99.0 id, 0.0 wa, 0.0 hi, 0.3 si, 0.0 st
MiB Mem : 1748.6 total, 982.4 free, 379.2 used, 387.0 buff/cache
MiB Swap: 5144.0 total, 5144.0 free, 0.0 used. 1205.4 avail Mem
```


12. Now remove these swaps, which was created using swap files & verify it-

```
[root@client1 /]# swapoff /swapfile -v
swapoff /swapfile
[root@client1 /]#
[root@client1 /]#
[root@client1 /]# free
              total                used              free              shared    buff/cache              available
Mem:           1790604             393084             1001152                5756           396368           1229544
Swap:          4218868                 0             4218868
```

```
[root@client1 /]# swapoff /swapfile1 -v
swapoff /swapfile1
[root@client1 /]#
[root@client1 /]#
[root@client1 /]# free
              total                used              free              shared    buff/cache              available
Mem:           1790604             393084             1001152                5756           396368           1229544
Swap:          3170296                 0             3170296
```

```
[root@client1 /]# cat /proc/swaps
Filename                                Type              Size              Used              Priority
/dev/dm-1                               partition         2121724           0                 -2
/dev/sdb3                               partition         1048572           0                 -3
```

13. To make it permanent we need to add their entry in /etc/fstab file-

```
/swapfile                                swap              swap              defaults          0 0
/swapfile1                              swap              swap              defaults          0 0
```

Swapiness: -

2. Check swapiness (If it is too low, swap will not be use & if it is high, max swap is used)-

```
[root@client1 ~]# cat /proc/sys/vm/swappiness
60
[root@client1 ~]#
```

3. We can change it temporarily as shown-

```
[root@client1 ~]# echo 50 > /proc/sys/vm/swappiness
[root@client1 ~]#
[root@client1 ~]# cat /proc/sys/vm/swappiness
50
[root@client1 ~]#
```


To change it permanently, we need to edit it in `/etc/sysctl.conf` file as shown-

```
[root@client1 ~]#  
[root@client1 ~]# vim /etc/sysctl.conf
```

```
# For more information, see sysctl.conf(5) and sysctl.d(5).  
vm.swapiness=40
```