Practical 8 Guidelines

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Definition

Create 1GB swap area in your linux partition and free it. Check the allocation of swap space.

Execute following commands to monitor swap space in linux.

a. Swapon
b. use of /proc/swaps
c. free
d. top
e. atop
f. htop
g. glances
h. vmstat

Create swap area step by step

Step 1: Check the System for Swap Information

- Check if system has any configured swap area

Sudo swapon --show

- If you don’t get back any output, this means your system does not have swap space available currently.
- You can verify that there is no active swap using the free utility:

Free -h

Question: What is meaning of negative priority?

Step 2: Check Available Space on the Hard Drive Partition

- The most common way of allocating space for swap is to use a separate partition devoted to the task. However, altering the partitioning scheme is not always possible. We can just as easily create a swap file that resides on an existing partition.
- check the current disk usage: df -h

  (Find out your current partition and check available space)

3. Create a swap file

- Create a swapfile in /root directory.
- Create a swap file using the ***fallocate*** program. This command creates a file of a preallocated size instantly.
- Create 1 GB of swap area if memory is available otherwise create for 512MB.

  fallocate -l 1G /swapfile

- Verify correct amount of space reserved:

  ls -lh /swapfile

4. Enabling the swap file

- Now we will turn this file in swap space.
- First, we need to lock down the permissions of the file so that only the users with root privileges can read the contents. This prevents normal users from being able to access the file, which would have significant security implications.

  chmod 600 /swapfile

- Verify the permissions change by typing:

  ls -lh /swapfile

4. Enabling the swap file (Continue…)

- now mark the file as swap space:

  sudo mkswap /swapfile

- After marking the file, we can enable the swap file, allowing our system to start utilizing it

  sudo swapon /swapfile

- We can verify that the swap is available by typing:

  sudo swapon --show

- Check with ***free -h***

5. Make the Swap File Permanent

- Our recent changes have enabled the swap file for the current session.

  However, if we reboot, the server will not retain the swap settings automatically. We can change this by adding the swap file to our /etc/fstab file.
- Back up the /etc/fstab file in case anything goes wrong:

  sudo cp /etc/fstab /etc/fstab.bak
- You can add the swap file information to the end of your /etc/fstab file by typing:

  /swapfile swap swap 0 0

6. adjust the swappiness value

- Swappiness is a Linux kernel property that defines how often the system will use the swap space. Swappiness can have a value between 0 and 100. A low value will make the kernel to try to avoid swapping whenever possible while a higher value will make the kernel to use the swap space more aggressively.
- The default swappiness value is 60. Check the current swappiness value by typing the following command:

```
cat /proc/sys/vm/swappiness
```

- set the swappiness value to 10

sudo sysctl vm.swappiness=10

7. Remove the swap space (swap file)

- First, deactivate the swap by typing:

  `sudo swapoff -v /swapfile`

- Remove the swap file entry `/swapfile swap swap defaults 0 0` from the `/etc/fstab` file.
- Finally delete the actual swapfile file using the `‘rm’` command:

  `sudo rm /swapfile`

Understanding different commands related to swap area

1. Swapon

- This command helps you ***to specify the devices*** on which paging and swapping will be done.
- To view all devices marked as swap in the /etc/fstab file you can use the `--all` option. Though devices that are already working as swap space are skipped.

  Swapon --all

- If you want to view a summary of swap space usage by device

  Swapon --summary

2. Using /proc/swaps which is equivalent to swapon

/proc / swap

3. Free

- The free command is used to display the amount of free and used system memory. Using the free command with -h option, which displays output in a human readable format.

  Free

  Free -h

4. top

- The top command displays processor activity of your Linux system, tasks managed by kernel in real-time.
- To check swap space usage with the help of ‘top’ command run the following command.

Top

- Check meaning of various fields from

https://www.geeksforgeeks.org/top-command-in-linux-with-examples/

5. atop

- The atop command is a system monitor that reports about activities of various processes. But importantly it also shows information about free and used memory space.

  atop

6. htop

- The htop command is used to view processes in an interactive mode and also displays information about memory usage.

  htop

7. Glances

- This is a cross-platform system monitoring tool that displays information about running processes, cpu load, storage space usage, memory usage, swap space usage and many more.

  glances

8. vmstat

- This command is used to display information about virtual memory statistics.

  vmstat