ASSESSMENT - 4

Advanced Linux and Shell Scripting

1. **What is the size of MBR and what does it contain?**

ANS : The MBR (Master Boot Record) is 512 bytes.

1. 446 bytes Bootloader
2. 64 bytes (4 * 16 bytes) Partition Tables
3. 2 bytes Magic Number

The Master Boot Record (MBR) is the information in the first sector of any hard disk that identifies how and where an operating system is located so that it can be loaded into the computer's main storage.

2. **In which file you can write commands which you want to run whenever Linux system starts/restarts?**

ANS :

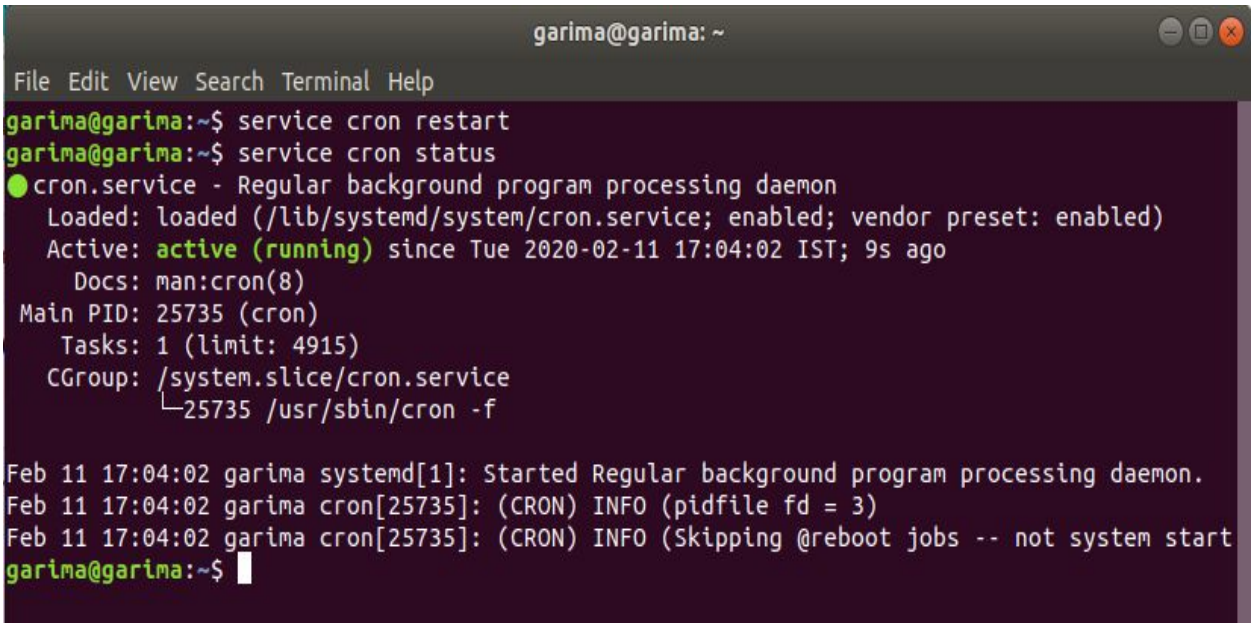
We will make an entry in rc.local file to execute the commands every time when our system starts.

3. **Reboot the system using runlevel.**

ANS : init 6

4. **Restart cron service.**

ANS :



5. Create an ext4 filesystem.

ANS : $ mkfs.ext4 /dev/sdb1

6. Mount the created filesystem on /partition directory.

ANS :
$ mkdir test
$ mount /dev/sdb1 /test

7. Difference between LVM and RAID.

ANS:

S.No.	RAID	LVM
1.	RAID is used for redundancy.	LVM is a way in which you partition the hard disk logically.
2.	A RAID device is a physical grouping of disk devices in order to create a logical presentation of one device to an Operating System for redundancy.	LVM is a logical layer that can be manipulated in order to create and, or expand a logical presentation of a disk device to an Operating System.
3.	RAID is NOT any kind of Data backup solution. Its a solution to prevent disk failure.	LVM is a disk management approach that allows us to create, extend, reduce, delete or resize the volume groups or logical volumes.

8. Create a LVM(Slide 13)

ANS :
1. Select physical storage device :
   pvcreate /dev/sda2 /dev/sda3
2. Create the volume group:
   vgcreate vol_grp1 /dev/sda2 /dev/sda3
3. Create logical volume:
   lvcreate -l 20 -n logical_vol1 vol_grp1

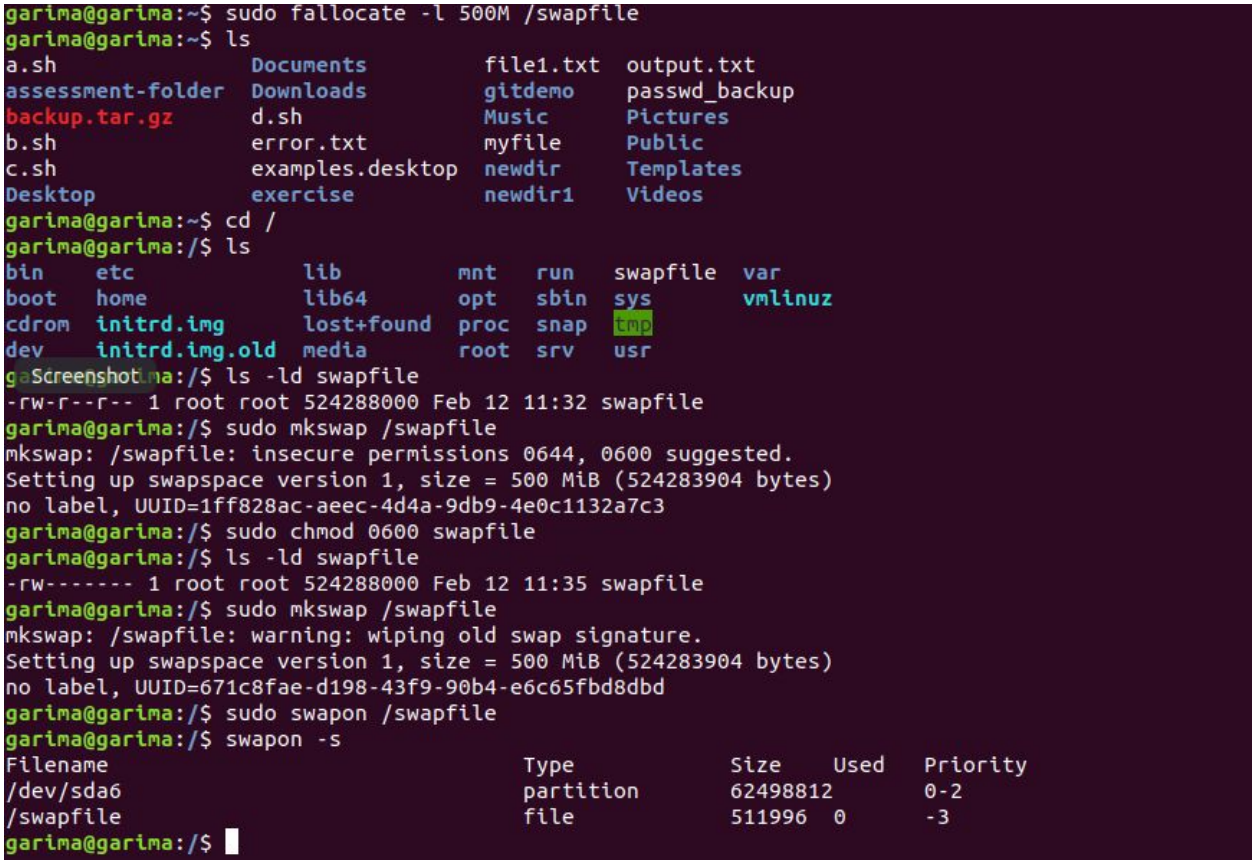
9. Create a RAID1 device(Slide 19)

ANS :

1. Installation : apt-get install mdadm rsync initramfs-tools
2. Creating Partitions : using fdisk on say /dev/sdb and /dev/sdc
3. Verifying the changes : mdadm -E /dev/sd[b-c]
4. Create RAID1 device
   mdadm --create /dev/md0 --level=mirror --raid-devices=2 /dev/sd[b-c]1
   cat /proc/mdstat
5. Check the raid devices type:
   mdadm -E /dev/sd[b-c]1
   mdadm --detail /dev/md0
6. Create file system and mount
   mkfs.ext4 /dev/md0
   mkdir /mnt/raid1
   mount /dev/md0 /mnt/raid1/

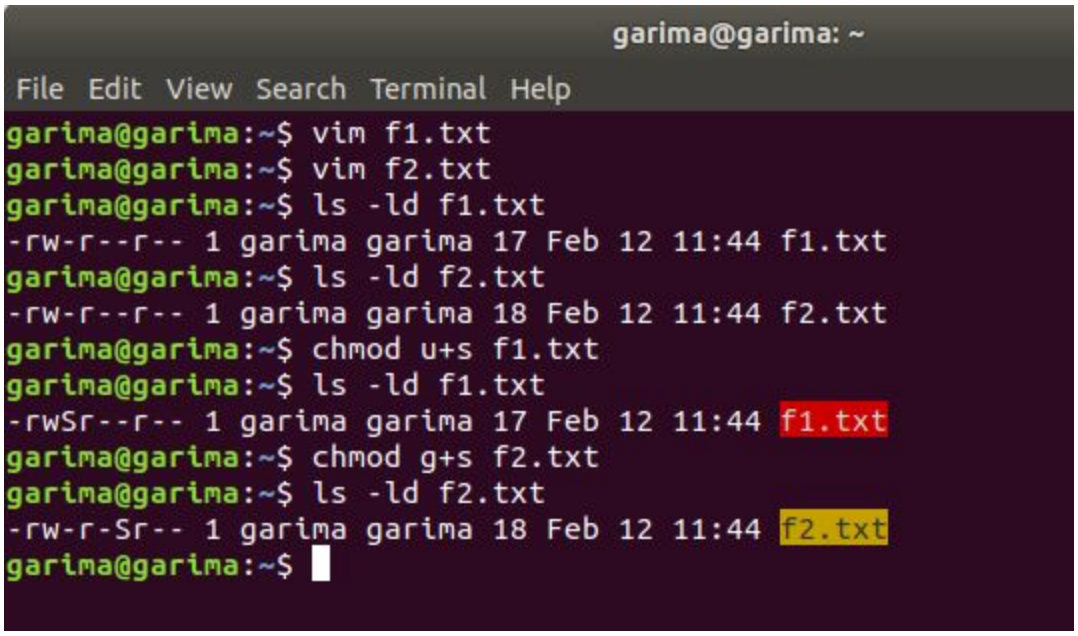
10. Create a swapfile of 500Mb(slide20)

ANS :



11. Set setuid and setgid on two different file.

ANS :

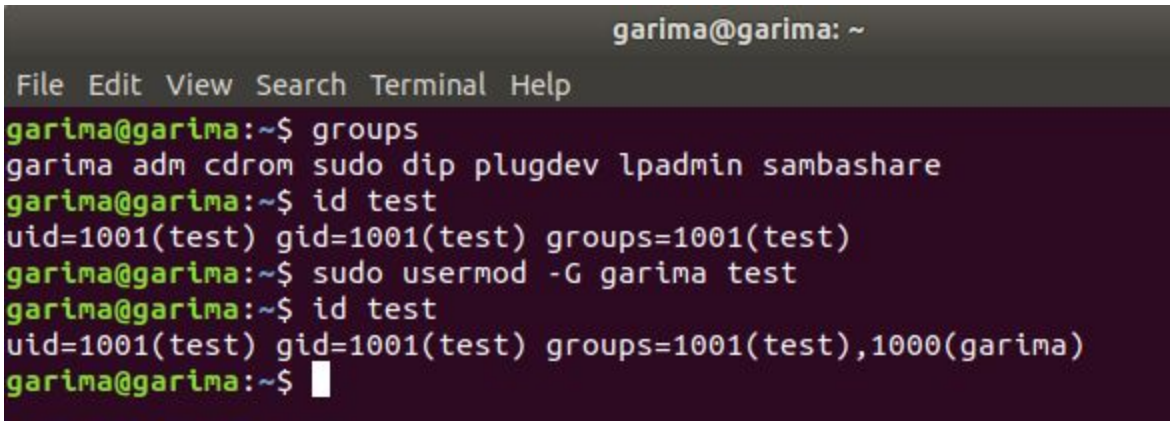


12. What is the use of Sticky bit.

ANS : A Sticky bit is a permission bit that is set on a file or a directory that lets only the owner of the file/directory or the root user to delete or rename the file. No other user is given privileges to delete the file created by some other user.

13. Create a user and add it to one secondary group.

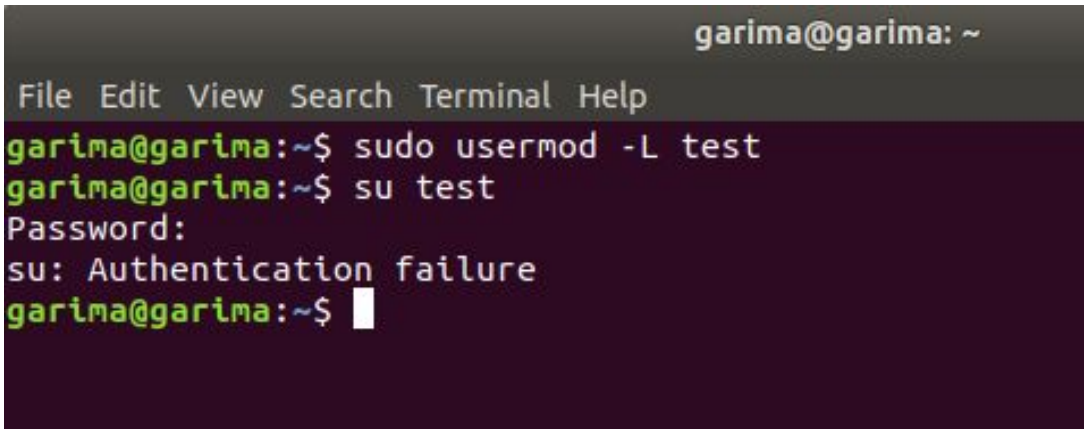
ANS :



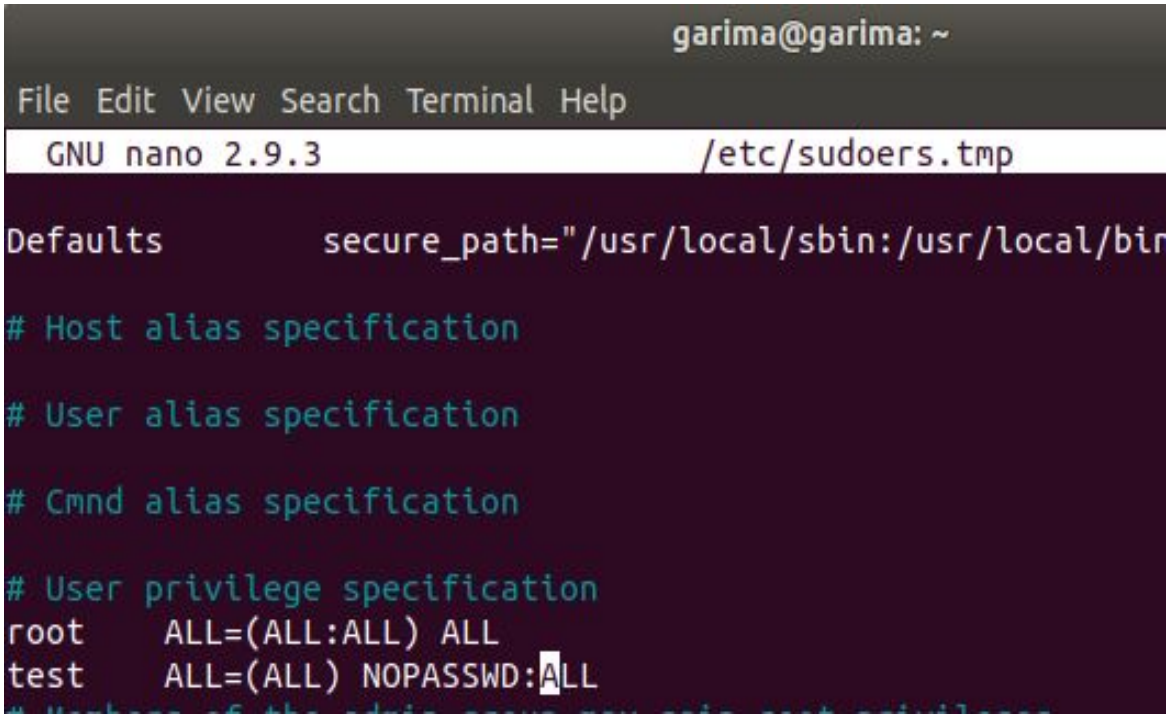
OR we could have also used sudo adduser test garima

14. Lock this user.

ANS :



15. Give this user full access (without password).



```
garima@garima:~$ sudo visudo
garima@garima:~$ su test
Password:
test@garima:/home/garima$ cd
test@garima:~$ sudo adduser newuser
Adding user `newuser' ...
Adding new group `newuser' (1002) ...
Adding new user `newuser' (1002) with group `newuser' ...
Creating home directory `/home/newuser' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
```

16. Delete the create user after taking backup of it home directory.

ANS :

```
garima@garima: ~
File  Edit  View  Search  Terminal  Help
garima@garima:~$ pwd
/home/garima
garima@garima:~$ sudo tar -czf backup.tar.gz /home/test/ .
tar: Removing leading `/' from member names
tar: ./backup.tar.gz: file changed as we read it
tar: ./.cache/google-chrome/Default/Cache: file changed as we read it
```

```
garima@garima: ~
File  Edit  View  Search  Terminal  Help
garima@garima:~$ sudo userdel -r test
userdel: test mail spool (/var/mail/test) not found
garima@garima:~$
```

17. **Create a file with some content. Change all lower case letter to upper case letter and save output to another file using redirections.**

ANS :

```
garima@garima:~$ vim newfile
garima@garima:~$ cat newfile
hello everyone
garima@garima:~$ tr '[:lower:]' '[:upper:]' < newfile > output.txt
garima@garima:~$ cat output.txt
HELLO EVERYONE
garima@garima:~$ vim oldfile
garima@garima:~$ sed -e 's/\(.*\)/\U\1/' oldfile > outputs.txt
garima@garima:~$ cat outputs.txt
HELLO EVERYONE
garima@garima:~$
```

18. **Set nice value of a process to -1.**

ANS :

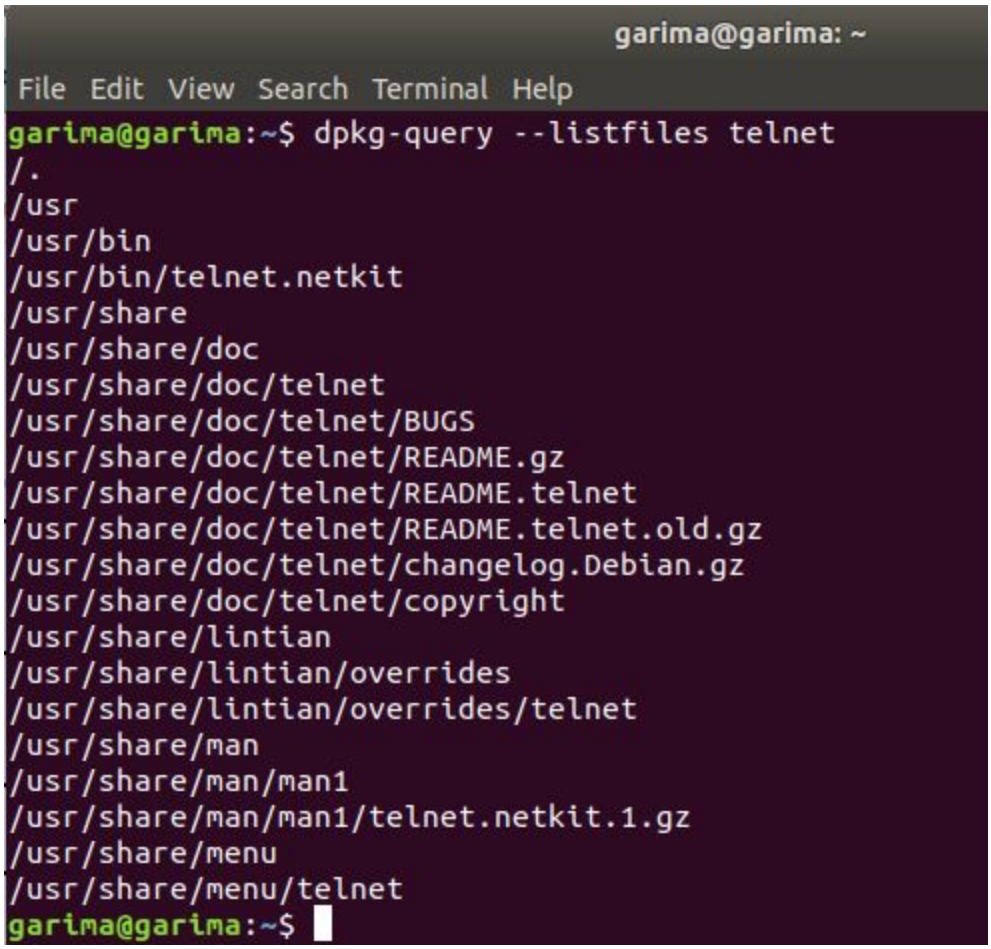
```
  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
20145 garima    20   0  924752 174456  98352 S   1.3  1.1   1:44.76 chrome
```

```
garima@garima:~$ renice -1 -p 20145
renice: failed to set priority for 20145 (process ID): Permission denied
garima@garima:~$ sudo !!
sudo renice -1 -p 20145
[sudo] password for garima:
20145 (process ID) old priority 0, new priority -1
```

```
  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
20145 garima    19  -1  924752 171772  98356 S   1.7  1.1   1:51.78 chrome
```

19. Get a list of all files used by “telnet”.

ANS :



20. Check if port 22 is listening using netstat and telnet command.

ANS :

```
garima@garima:~$ telnet 10.1.225.28 22
Trying 10.1.225.28...
Connected to 10.1.225.28.
Escape character is '^]'.
SSH-2.0-OpenSSH_7.6p1 Ubuntu-4ubuntu0.3
Connection closed by foreign host.
garima@garima:~$
```

21. Create a cron job which runs once a week at 23:45.

ANS : 45 23 * * 1

eg:

```
garima@garima:~$ crontab -e

crontab: installing new crontab
garima@garima:~$ service cron restart
garima@garima:~$ cat abc.txt
hello
hello
garima@garima:~$ crontab -l
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h  dom mon dow   command

* * * * * echo "hello" >> abc.txt
garima@garima:~$
```

22. Difference between dig and traceroute.

```
garima@garima:~$ dig www.google.com

; <<>> DiG 9.11.3-1ubuntu1.11-Ubuntu <<>> www.google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 63272
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;www.google.com.                        IN      A

;; ANSWER SECTION:
www.google.com.         233     IN      A       172.217.31.196

;; Query time: 73 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Wed Feb 12 16:20:52 IST 2020
;; MSG SIZE  rcvd: 59
```

```
garima@garima:~$ traceroute www.google.com
traceroute to www.google.com (172.217.31.196), 30 hops max, 60 byte packets
 1  _gateway (10.1.224.1)  7.357 ms  7.313 ms  7.269 ms
 2  nsg-static-185.160.71.182.airtel.in (182.71.160.185)  13.427 ms  13.420 ms  13.399 ms
 3  182.79.149.182 (182.79.149.182)  13.621 ms  13.570 ms  13.567 ms
 4  72.14.217.194 (72.14.217.194)  9.474 ms  9.451 ms  9.429 ms
 5  * * *
 6  172.253.67.84 (172.253.67.84)  9.273 ms 72.14.233.166 (72.14.233.166)  10.706 ms *
 7  108.170.251.108 (108.170.251.108)  10.638 ms 74.125.243.98 (74.125.243.98)  7.739 ms *
```