**Question 1**: Demonstrate about Linux security (e.g., iptables, ufw, and SELinux).

**Iptables**:- Iptables is a firewall program for Linux. It will monitor traffic from and to your server using tables. These tables contain sets of rules, called chains, that will filter incoming and outgoing data packets.

Iptables is a powerful tool for network security, allowing you to control and manipulate network traffic on a Linux system.

**Ufw**:- Uncomplicated Firewall

UFW is a front-end for managing iptables, the default packet filtering framework in Linux.

It simplifies the process of managing iptables rules, making it more accessible to users who may not be familiar with iptables syntax and concepts. It is commonly used on desktop systems and servers where a straightforward firewall configuration is sufficient.

**SELinux:-** SELinux, or Security-Enhanced Linux, is a part of the Linux security kernel that acts as a protective agent on servers.

SELinux is a security feature implemented in the Linux kernel to provide Mandatory Access Controls (MAC). SELinux can provide a strong additional layer of security, but it requires careful policy configuration. Troubleshooting and resolving issues with SELinux might involve examining the audit logs, adjusting file contexts, or creating custom policies.

**Question 2:** Demonstrate using text processing commands (e.g., grep, awk, sed, sort, cut, paste , tr ).

**Grep**:- Grep, short for “global regular expression print”, is a command used for searching and matching text patterns in files contained in the regular expressions.

[root@cloudethix ~]# vi vivek.txt

You have new mail in /var/spool/mail/root

[root@cloudethix ~]# grep "Linux" vivek.txt

Welcome to Linux !

Linux is a free and opensource Operating system that is mostly used by

and database servers. Linux has also made a name for itself in PCs.

Beginners looking to experiment with Linux can get started with friendlier linux.

**AWK**: is a powerful programming language and command-line utility in Unix and Unix-like operating systems. It is primarily used for pattern scanning and text processing.it processes files line by line, applying patterns and performing actions based on the patterns matched.

AWK print the data column wise

In this example print all data with lineno. $0=all print

[root@cloudethix ~]# awk '{print NR, $0}' 1.txt

1 1

2 2

3 3

4 4

5 5

6

[root@cloudethix ~]# **awk -F ':' '{print $1}' /etc/passwd**

-F is filed seprator

root

bin

daemon

adm

lp

sync

shutdown

halt

mail

operator

games

ftp

nobody

**SED**: stream editor

It performs editing operations on text coming from standard input or a file. edits line-by-line

[root@cloudethix ~]# sed -n '2,4p' vivek.txt

i am learning DevOps

Welcome to Linux !

Linux is a free and opensource Operating system that is mostly used by

[root@cloudethix ~]#

[root@cloudethix ~]# **sed 's/Linux/Cloudethix/g' vivek.txt**

HI my name is vivek

i am learning DevOps

Welcome to Cloudethix !

**Cloudethix** is a free and opensource Operating system that is mostly used by

developers and in production servers for hosting crucial components such as web

and database servers. Cloudethix has also made a name for itself in PCs.

Beginners looking to experiment with Cloudethix can get started with friendlier linux

distributions such as Ubuntu, Mint, Fedora and Elementary OS.

[root@cloudethix ~]#

**IN this example the LINUX word is replace with cloudethix.**

**Sort:-** SORT command is used to sort a file, arranging the records in a particular order.

[root@cloudethix ~]# cat sort.txt

1

3

2

12

5

6

[root@cloudethix ~]# sort sort.txt

1

12

2

3

5

6

**TR:-** used for translating or deleting characters. It can be used for a variety of text manipulation tasks, such as replacing characters, squeezing repeated characters, deleting characters, and more.

[root@cloudethix ~]# cat vivek.txt

HI my name is vivek

i am learning DevOps

Welcome to Linux !

Linux is a free and opensource Operating system that is mostly used by

developers and in production servers for hosting crucial components such as web

and database servers. Linux has also made a name for itself in PCs.

Beginners looking to experiment with Linux can get started with friendlier linux

distributions such as Ubuntu, Mint, Fedora and Elementary OS.

[root@cloudethix ~]# **cat vivek.txt | tr [a-z] [A-Z]**

**IN this example the letters are converted into upper letter.**

HI MY NAME IS VIVEK

I AM LEARNING DEVOPS

WELCOME TO LINUX !

LINUX IS A FREE AND OPENSOURCE OPERATING SYSTEM THAT IS MOSTLY USED BY

DEVELOPERS AND IN PRODUCTION SERVERS FOR HOSTING CRUCIAL COMPONENTS SUCH AS WEB

AND DATABASE SERVERS. LINUX HAS ALSO MADE A NAME FOR ITSELF IN PCS.

BEGINNERS LOOKING TO EXPERIMENT WITH LINUX CAN GET STARTED WITH FRIENDLIER LINUX

DISTRIBUTIONS SUCH AS UBUNTU, MINT, FEDORA AND ELEMENTARY OS.

**Cut:-** The **cut** command in Linux is used for cutting out sections from each line of a file.

[root@cloudethix ~]# **echo "abcdefgh" | cut -c 2-5**

**bcde**

You have new mail in /var/spool/mail/root

[root@cloudethix ~]# **cut -d':' -f7 /etc/passwd**

/bin/bash

/sbin/nologin

/sbin/nologin

/sbin/nologin

/sbin/nologin

/bin/sync

/sbin/shutdown

/sbin/halt

/sbin/nologin

/sbin/nologin

/sbin/nologin

/sbin/nologin

/sbin/nologin

/sbin/nologin

/sbin/nologin

/sbin/nologin

**Paste**:- The **paste** command in Linux is used to merge lines from multiple files.

[root@cloudethix ~]# cat 1.txt

1

2

3

4

5

[root@cloudethix ~]# cat 2.txt

ind

bak

thi

pak

ger

1

2

3

[root@cloudethix ~]# **paste 1.txt 2.txt**

1 ind

2 bak

3 thi

4 pak

5 ger

1

2

3

**Question 3:**Familiarize yourself with performance monitoring tools (e.g., iostat, vmstat, and sar). Enable it & demonstrate the same.

**Iostat**- is a command-line tool in Linux used to report Central Processing Unit (CPU) statistics and input/output statistics for devices, partitions, and network filesystems. It provides a summary of system performance, particularly focusing on I/O (Input/Output) statistics.

[root@cloudethix ~]# yum install sysstat –y

[root@cloudethix ~]# **iostat**

Linux 3.10.0-1160.el7.x86\_64 (cloudethix.com) 12/21/2023 \_x86\_64\_ (1 CPU)

avg-cpu: %user %nice %system %iowait %steal %idle

0.23 0.00 0.34 0.06 0.00 99.37

Device: tps kB\_read/s kB\_wrtn/s kB\_read kB\_wrtn

sda 4.61 128.92 8.46 251169 16480

sdb 0.14 3.54 2.10 6899 4096

sdc 0.08 3.37 1.05 6565 2048

**vmstat**- command in Linux is a system monitoring tool that provides information about virtual memory, system processes, CPU usage, and other related statistics. The name "vmstat" is short for "virtual memory statistics."

[root@cloudethix ~]# vmstat -w

procs -----------------------memory---------------------- ---swap-- -----io---- -system-- --------cpu--------

r b swpd free buff cache si so bi bo in cs us sy id wa st

2 0 0 3406524 2080 247564 0 0 112 13 37 73 0 0 99 0 0

**Sar**- It stands for "System Activity Reporter." The **sar** command can provide a wide range of system performance metrics, including CPU usage, memory usage, disk activity, network activity, and more.

[root@cloudethix ~]# sar

Linux 3.10.0-1160.el7.x86\_64 (cloudethix.com) 12/21/2023 \_x86\_64\_ (1 CPU)

**Question 4:**Demonstrate about system backup and recovery (e.g., rsync, dd , scp). Use multiple Linux machines.

**rsync**:- **rsync**or remote synchronization is a software utility for Unix-Like systems that efficiently sync files and directories between two hosts or machines. One is the source or the local-host from which the files will be synced, the other is the remote-host, on which synchronization will take place.

[root@cloudethix ~]# yum install rsync

nstalled: rsync.x86\_64 0:3.1.2-12.el7\_9

[root@cloudethix ~]# rsync -avzh dell.txt root@192.168.0.127:/root/home

root@192.168.56.103's password:

sending incremental file list dell sent 82 bytes received 35 bytes 26.00 bytes/sec total size is 0 speedup is 0.00

[root@cloudethix ~]# -----------------------------------------------

**Dd:-**

The **dd** command in Linux is a versatile command-line utility used for copying and converting data. Its primary purpose is to create disk images, copy data between devices, and perform various low-level operations on data.

[root@cloudethix ~]# echo "this is text file" > file-1.txt

[root@cloudethix ~]# dd if=file-1.txt of=file-2.txt

[root@cloudethix ~]# ll

total 16 -rw-r--r--. 1 root root 18 Nov 29 23:49 file-1.txt

-rw-r--r--. 1 root root 18 Nov 29 23:49 file-2.txt

**SCP:-**

The **scp** command in Linux is used for securely copying files between hosts over a network. It stands for "secure copy protocol" and relies on the SSH (Secure Shell) protocol to provide encryption and authentication.

[root@cloudethix ~]# scp –r 1.txt [root@192.168.0.127](mailto:root@192.168.0.127)

This file goes to remote machine.

**Question 5:** Print all common port numbers in Linux using echo command ? Demonstrate the same.

[root@cloudethix ~]# **cat /etc/services | less**

# /etc/services:

# $Id: services,v 1.55 2013/04/14 ovasik Exp $

# Network services, Internet style

# IANA services version: last updated 2013-04-10

# Note that it is presently the policy of IANA to assign a single well-known

# port number for both TCP and UDP; hence, most entries here have two entries

# even if the protocol doesn't support UDP operations.

# Updated from RFC 1700, ``Assigned Numbers'' (October 1994). Not all ports

# are included, only the more common ones.

# The latest IANA port assignments can be gotten from

# http://www.iana.org/assignments/port-numbers

# The Well Known Ports are those from 0 through 1023.

# The Registered Ports are those from 1024 through 49151

# The Dynamic and/or Private Ports are those from 49152 through 65535

#

# Each line describes one service, and is of the form:

#

# service-name port/protocol [aliases ...] [# comment]

tcpmux 1/tcp # TCP port service multiplexer

tcpmux 1/udp # TCP port service multiplexer

rje 5/tcp # Remote Job Entry

rje 5/udp # Remote Job Entry

echo 7/tcp

echo 7/udp

discard 9/tcp sink null

discard 9/udp sink null

systat 11/tcp users

systat 11/udp users

daytime 13/tcp

daytime 13/udp

qotd 17/tcp quote

qotd 17/udp quote

msp 18/tcp # message send protocol (historic)

:

[root@cloudethix ~]# port\_numbers="5 7 9 11 13 17 18 19 20"

[root@cloudethix ~]# echo "Common port numbers: $port\_numbers"

Common port numbers: 5 7 9 11 13 17 18 19 20

**Question 6:**  NIC Bonding or Teaming in Linux ? Demonstrate  the same. rpm -qa from.

[root@cloudethix ~]# modprobe bonding

[root@cloudethix ~]# lsmod | grep bonding

[root@cloudethix ~]# ifconfig

enp0s3: flags=4163 mtu 1500

inet 192.168.0.141 netmask 255.255.255.0 broadcast 192.168.0.255

inet6 fe80::5ef7:4663:1d94:2c85 prefixlen 64 scopeid 0x20

ether 08:00:27:f4:1c:3e txqueuelen 1000 (Ethernet)

RX packets 5696 bytes 581293 (567.6 KiB)

RX errors 0 dropped 0 overruns 0 frame 0

TX packets 237 bytes 68686 (67.0 KiB)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163 mtu 1500

inet 192.168.56.102 netmask 255.255.255.0 broadcast 192.168.56.255

inet6 fe80::e129:5e90:9ff0:77b5 prefixlen 64 scopeid 0x20

ether 08:00:27:b5:7e:ae txqueuelen 1000 (Ethernet)

RX packets 1079 bytes 110252 (107.6 KiB)

RX errors 0 dropped 0 overruns 0 frame 0

TX packets 659 bytes 81460 (79.5 KiB)

TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s9: flags=4163 mtu 1500

inet 192.168.0.139 netmask 255.255.255.0 broadcast 192.168.0.255

inet6 fe80::e980:f2bf:d59d:2450 prefixlen 64 scopeid 0x20

[root@cloudethix ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond0

[root@cloudethix ~]# vim /etc/sysconfig/network-scripts/ifcfg-bond0

[root@cloudethix ~]# cat /etc/sysconfig/network-scripts/ifcfg-bond0

DEVICE=bond0

BONDING\_OPTS="miimon=1 updelay=0 downdelay=0 mode=active-backup" TYPE=Bond BONDING\_MASTER=yes

BOOTPROTO=none

IPADDR=192.168.56.102

DEFROUTE=yes

NAME=bond0

ONBOOT=yes

[root@cloudethix network-scripts]# vi ifcfg-enp0s3

**Question 7:**  Add 2GBSwap in Linux from File ? Demonstrate it.

[root@cloudethix ~]# dd if=/dev/zero of=/swapfile bs=1M count=500

500+0 records in

500+0 records out

524288000 bytes (524 MB) copied, 4.93157 s, 106 MB/s

[root@cloudethix ~]# chmod 600 /swapfile

[root@cloudethix ~]#ll

-rw-------. 1 root root 524288000 Nov 21 14:07 swapfile

[root@cloudethix /]# mkswap /swapfile

Setting up swapspace version 1, size = 511996 KiB

[root@cloudethix /]# swapon /swapfile

[root@cloudethix /]# cat /etc/fstab

# /etc/fstab

# Created by anaconda on Wed Oct 18 15:00:56 2023

#

# Accessible filesystems, by reference, are maintained under '/dev/disk'

# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

#

/dev/mapper/centos\_cloudethix-root / xfs defaults 0 0

UUID=6fcb1d0a-ee96-40db-8a46-5268ba79c36e /boot xfs defaults 0 0

/dev/mapper/centos\_cloudethix-home /home xfs defaults 0 0

/dev/mapper/centos\_cloudethix-var /var xfs defaults 0 0

/dev/mapper/centos\_cloudethix-swap swap swap defaults 0 0

/dev/sdb1 data01 xfs defaults 0 0

/dev/sdb2 data02 xfs defaults 0 0

/dev/sdb3 data03 xfs defaults 0 0

/dev/sdb5 data05 xfs defaults 0 0

/dev/sdb6 data06 xfs defaults 0 0

/dev/sdb7 data07 xfs defaults 0 0

/dev/cloud/lvm1 data08 ext4 defaults 0 0

/dev/cloud1/lvm1 data09 ext4 defaults 0 0

/swapfile swap swap defaults 0 0

[root@cloudethix /]# mount -a

[root@cloudethix /]# free -h

total used free shared buff/cache available

Mem: 990M 209M 78M 19M 703M 618M

Swap: 1.4G 0B 1.4G

**Question 8:** Add LVM Disk, Resize LVM , Reduce LVM & Remove LVM ? Demonstrate it.

[root@cloudethix ~]# lsblk

NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT

sda 8:0 0 8G 0 disk

├─sda1 8:1 0 476M 0 part /boot

├─sda2 8:2 0 2.8G 0 part /

├─sda3 8:3 0 1.9G 0 part /home

├─sda4 8:4 0 1K 0 part

├─sda5 8:5 0 1.9G 0 part /var

└─sda6 8:6 0 953M 0 part [SWAP]

sdb 8:16 0 8G 0 disk

├─sdb1 8:17 0 4G 0 part /data01

└─sdb2 8:18 0 4G 0 part /data02

sdc 8:32 0 15.3G 0 disk

└─sdc1 8:33 0 15.3G 0 part /var/www/html

sdd 8:48 0 8G 0 disk

└─sdd1 8:49 0 8G 0 part

sr0 11:0 1 1024M 0 rom

Command (m for help): n

Partition type:

p primary (0 primary, 0 extended, 4 free)

e extended

Select (default p):

Using default response p

Partition number (1-4, default 1):

First sector (2048-16777215, default 2048):

Using default value 2048

Last sector, +sectors or +size{K,M,G} (2048-16777215, default 16777215):

Using default value 16777215

Partition 1 of type Linux and of size 8 GiB is set

**Command (m for help): t**

Selected partition 1

Hex code (type L to list all codes): **L**

Command (m for help): **w**

The partition table has been altered!

[root@cloudethix ~]# pvcreate /dev/sdd1

Physical volume "/dev/sdd1" successfully created

[root@cloudethix ~]# pvs

PV VG Fmt Attr PSize PFree

/dev/sda2 centos\_cloudethix lvm2 a-- <5.60g 4.00m

/dev/sdd1 lvm2 --- <8.00g <8.00g

/dev/sde1 lvm2 --- <8.00g <8.00g

[root@cloudethix ~]# pvdisplay

--- Physical volume ---

PV Name /dev/sda2

VG Name centos\_cloudethix

PV Size 5.60 GiB / not usable 4.00 MiB

Allocatable yes

PE Size 4.00 MiB

Total PE 1433

Free PE 1

Allocated PE 1432

PV UUID FbBPdt-DmZc-0f89-ALh6-hJz2-4xDu-DEUnvK

"/dev/sdd1" is a new physical volume of "<8.00 GiB"

--- NEW Physical volume ---

PV Name /dev/sdd1

VG Name

PV Size <8.00 GiB

Allocatable NO

PE Size 0

Total PE 0

Free PE 0

Allocated PE 0

PV UUID G07aYI-joJa-umEW-nIwj-3YFW-xKHc-1TmqKs

\* CREATE VG

=======================

[root@cloudethix ~]# vgcreate cloud /dev/sdd1

Volume group "cloud" successfully created

[root@cloudethix ~]# lvs

LV VG Attr LSize Pool Origin Data% Meta% Move Log Cpy%Sync Convert

home centos\_cloudethix -wi-ao---- 1.86g

root centos\_cloudethix -wi-ao---- 1.86g

swap centos\_cloudethix -wi-ao---- 956.00m

var centos\_cloudethix -wi-ao---- 956.00m

[root@cloudethix ~]# vgs

VG #PV #LV #SN Attr VSize VFree

centos\_cloudethix 1 4 0 wz--n- <5.60g 4.00m

cloud 1 0 0 wz--n- <8.00g <8.00g

cloud1 1 0 0 wz--n- <8.00g <8.00g

[root@cloudethix ~]#

\* CREATE LV

=========================

[root@cloudethix ~]# lvcreate -L 4G cloud

Logical volume "lvol0" created.

[root@cloudethix ~]# lvs

LV VG Attr LSize Pool Origin Data% Meta% Move Log Cpy%Sync Convert

home centos\_cloudethix -wi-ao---- 1.86g

root centos\_cloudethix -wi-ao---- 1.86g

swap centos\_cloudethix -wi-ao---- 956.00m

var centos\_cloudethix -wi-ao---- 956.00m

lvol0 cloud -wi-a----- 4.00g

lvol0 cloud1 -wi-a----- 4.00g

\* FORMATTING

===========================

[root@cloudethix ~]# mkfs.ext4 /dev/cloud/lvol0

mke2fs 1.42.9 (28-Dec-2013)

Filesystem label=

OS type: Linux

Block size=4096 (log=2)

Fragment size=4096 (log=2)

Stride=0 blocks, Stripe width=0 blocks

262144 inodes, 1048576 blocks

52428 blocks (5.00%) reserved for the super user

First data block=0

Maximum filesystem blocks=1073741824

32 block groups

32768 blocks per group, 32768 fragments per group

8192 inodes per group

Superblock backups stored on blocks:

32768, 98304, 163840, 229376, 294912, 819200, 884736

Allocating group tables: done

Writing inode tables: done

Creating journal (32768 blocks): done

Writing superblocks and filesystem accounting information: done

\* MAKE DIRECTORY

==========================

[root@cloudethix ~]# mkdir data01

[root@cloudethix ~]#

\* MOUNT

==========================

[root@cloudethix ~]# mount /dev/cloud/lvol0 data01

[root@cloudethix ~]#

\* ENTRY IN /etc/fstab

[root@cloudethix ~]# vi /etc/fstab

[root@cloudethix ~]# cat /etc/fstab

#

# /etc/fstab

# Created by anaconda on Wed Oct 18 15:00:56 2023

#

# Accessible filesystems, by reference, are maintained under '/dev/disk'

# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

#

/dev/mapper/centos\_cloudethix-root / xfs defaults 0 0

UUID=6fcb1d0a-ee96-40db-8a46-5268ba79c36e /boot xfs defaults 0 0

/dev/mapper/centos\_cloudethix-home /home xfs defaults 0 0

/dev/mapper/centos\_cloudethix-var /var xfs defaults 0 0

/dev/mapper/centos\_cloudethix-swap swap swap defaults 0 0

/dev/sdb1 data01 xfs defaults 0 0

/dev/sdb2 data02 xfs defaults 0 0

/dev/sdb3 data03 xfs defaults 0 0

/dev/sdb5 data05 xfs defaults 0 0

/dev/sdb6 data06 xfs defaults 0 0

/dev/sdb7 data07 xfs defaults 0 0

/dev/cloud/lvol0 data01 ext4 defaults 0 0

/dev/cloud1/lvol0 data02 ext4 defaults 0 0

[root@cloudethix ~]# mount -a

\* EXTEND SIZE OF LVM

===========================

[root@cloudethix ~]# lvdisplay /dev/cloud/lvol0

--- Logical volume ---

LV Path /dev/cloud/lvol0

LV Name lvol0

VG Name cloud

LV UUID opAFq8-FO4J-wEqI-ETOG-XRXF-yYUz-3eTEae

LV Write Access read/write

LV Creation host, time cloudethix, 2023-11-20 13:33:22 +0530

LV Status available

# open 1

LV Size 4.00 GiB

Current LE 1024

Segments 1

Allocation inherit

Read ahead sectors auto

- currently set to 8192

Block device 253:4

[root@cloudethix ~]# lvextend -L +1G /dev/cloud/lvol0

Size of logical volume cloud/lvol0 changed from 4.00 GiB (1024 extents) to 5.00 GiB (1280 extents).

Logical volume cloud/lvol0 successfully resized.

[root@cloudethix ~]#

[root@cloudethix ~]# lvdisplay /dev/cloud/lvol0

--- Logical volume ---

LV Path /dev/cloud/lvol0

LV Name lvol0

VG Name cloud

LV UUID opAFq8-FO4J-wEqI-ETOG-XRXF-yYUz-3eTEae

LV Write Access read/write

LV Creation host, time cloudethix, 2023-11-20 13:33:22 +0530

LV Status available

# open 1

LV Size 5.00 GiB

Current LE 1280

Segments 1

Allocation inherit

Read ahead sectors auto

- currently set to 8192

Block device 253:4

[root@cloudethix ~]# cat /etc/fstab

#

# /etc/fstab

# Created by anaconda on Wed Oct 18 15:00:56 2023

#

# Accessible filesystems, by reference, are maintained under '/dev/disk'

# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

#

/dev/mapper/centos\_cloudethix-root / xfs defaults 0 0

UUID=6fcb1d0a-ee96-40db-8a46-5268ba79c36e /boot xfs defaults 0 0

/dev/mapper/centos\_cloudethix-home /home xfs defaults 0 0

/dev/mapper/centos\_cloudethix-var /var xfs defaults 0 0

/dev/mapper/centos\_cloudethix-swap swap swap defaults 0 0

/dev/sdb1 data01 xfs defaults 0 0

/dev/sdb2 data02 xfs defaults 0 0

/dev/sdb3 data03 xfs defaults 0 0

/dev/sdb5 data05 xfs defaults 0 0

/dev/sdb6 data06 xfs defaults 0 0

/dev/sdb7 data07 xfs defaults 0 0

/dev/cloud/lvol0 data01 ext4 defaults 0 0

/dev/cloud1/lvol0 data02 ext4 defaults 0 0

[root@cloudethix ~]# umount /dev/cloud/lvol0

umount: /dev/cloud/lvol0: not mounted

[root@cloudethix ~]# mount -a

[root@cloudethix ~]#

[root@cloudethix ~]# mkdir data08

[root@cloudethix ~]# mkdir data09

[root@cloudethix ~]#

[root@cloudethix ~]# vi /etc/fstab

[root@cloudethix ~]# cat /etc/fstab

#

# /etc/fstab

# Created by anaconda on Wed Oct 18 15:00:56 2023

#

# Accessible filesystems, by reference, are maintained under '/dev/disk'

# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

#

/dev/mapper/centos\_cloudethix-root / xfs defaults 0 0

UUID=6fcb1d0a-ee96-40db-8a46-5268ba79c36e /boot xfs defaults 0 0

/dev/mapper/centos\_cloudethix-home /home xfs defaults 0 0

/dev/mapper/centos\_cloudethix-var /var xfs defaults 0 0

/dev/mapper/centos\_cloudethix-swap swap swap defaults 0 0

/dev/sdb1 data01 xfs defaults 0 0

/dev/sdb2 data02 xfs defaults 0 0

/dev/sdb3 data03 xfs defaults 0 0

/dev/sdb5 data05 xfs defaults 0 0

/dev/sdb6 data06 xfs defaults 0 0

/dev/sdb7 data07 xfs defaults 0 0

/dev/cloud/lvol0 data08 ext4 defaults 0 0

/dev/cloud1/lvol0 data09 ext4 defaults 0 0

\* REDUCE SIZE OF LVM

===========================

[root@cloudethix ~]# umount /dev/cloud/lvol0

[root@cloudethix ~]#

[root@cloudethix ~]# e2fsck -f /dev/myvg/lvol0

e2fsck 1.42.9 (28-Dec-2013)

e2fsck: No such file or directory while trying to open /dev/myvg/lvol0

Possibly non-existent device?

[root@cloudethix ~]# e2fsck -f /dev/cloud/lvol0

e2fsck 1.42.9 (28-Dec-2013)

Pass 1: Checking inodes, blocks, and sizes

Pass 2: Checking directory structure

Pass 3: Checking directory connectivity

Pass 4: Checking reference counts

Pass 5: Checking group summary information

/dev/cloud/lvol0: 11/262144 files (0.0% non-contiguous), 53326/1048576 blocks

[root@cloudethix ~]# resize2fs /dev/cloud/lvol0 10G

resize2fs 1.42.9 (28-Dec-2013)

The containing partition (or device) is only 1310720 (4k) blocks.

You requested a new size of 2621440 blocks.

[root@cloudethix ~]#

[root@cloudethix ~]# lvdisplay /dev/cloud/lvol0

--- Logical volume ---

LV Path /dev/cloud/lvol0

LV Name lvol0

VG Name cloud

LV UUID opAFq8-FO4J-wEqI-ETOG-XRXF-yYUz-3eTEae

LV Write Access read/write

LV Creation host, time cloudethix, 2023-11-20 13:33:22 +0530

LV Status available

# open 0

LV Size 5.00 GiB

Current LE 1280

Segments 1

Allocation inherit

Read ahead sectors auto

- currently set to 8192

Block device 253:5

[root@cloudethix ~]#

[root@cloudethix ~]# lvreduce -L -1G /dev/cloud/lvol0

WARNING: Reducing active logical volume to 4.00 GiB.

THIS MAY DESTROY YOUR DATA (filesystem etc.)

Do you really want to reduce cloud/lvol0? [y/n]: y

Size of logical volume cloud/lvol0 changed from 5.00 GiB (1280 extents) to 4.00 GiB (1024 extents).

Logical volume cloud/lvol0 successfully resized.

[root@cloudethix ~]# lvreduce -L -1G /dev/cloud1/lvol0

WARNING: Reducing active logical volume to 4.00 GiB.

THIS MAY DESTROY YOUR DATA (filesystem etc.)

[root@cloudethix ~]#

[root@cloudethix ~]# lvdisplay /dev/cloud/lvol0

--- Logical volume ---

LV Path /dev/cloud/lvol0

LV Name lvol0

VG Name cloud

LV UUID opAFq8-FO4J-wEqI-ETOG-XRXF-yYUz-3eTEae

LV Write Access read/write

LV Creation host, time cloudethix, 2023-11-20 13:33:22 +0530

LV Status available

# open 0

LV Size 4.00 GiB

Current LE 1024

Segments 1

Allocation inherit

Read ahead sectors auto

- currently set to 8192

Block device 253:5

[root@cloudethix ~]#

[root@cloudethix ~]# mount /dev/cloud/lvol0 /data08

mount: mount point /data08 does not exist

[root@cloudethix ~]# cat /etc/fstab

#

# /etc/fstab

# Created by anaconda on Wed Oct 18 15:00:56 2023

#

# Accessible filesystems, by reference, are maintained under '/dev/disk'

# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

#

/dev/mapper/centos\_cloudethix-root / xfs defaults 0 0

UUID=6fcb1d0a-ee96-40db-8a46-5268ba79c36e /boot xfs defaults 0 0

/dev/mapper/centos\_cloudethix-home /home xfs defaults 0 0

/dev/mapper/centos\_cloudethix-var /var xfs defaults 0 0

/dev/mapper/centos\_cloudethix-swap swap swap defaults 0 0

/dev/sdb1 data01 xfs defaults 0 0

/dev/sdb2 data02 xfs defaults 0 0

/dev/sdb3 data03 xfs defaults 0 0

/dev/sdb5 data05 xfs defaults 0 0

/dev/sdb6 data06 xfs defaults 0 0

/dev/sdb7 data07 xfs defaults 0 0

/dev/cloud/lvol0 data08 ext4 defaults 0 0

/dev/cloud1/lvol0 data09 ext4 defaults 0 0

[root@cloudethix ~]#

[root@cloudethix ~]# mount /dev/cloud/lvol0 data08

[root@cloudethix ~]#

[root@cloudethix ~]#

[root@cloudethix ~]# umount /dev/cloud/lvol0

[root@cloudethix ~]#

[root@cloudethix ~]# lsblk

NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT

sda 8:0 0 8G 0 disk

+-sda1 8:1 0 1.9G 0 part /boot

+-sda2 8:2 0 5.6G 0 part

+-centos\_cloudethix-root 253:0 0 1.9G 0 lvm /

+-centos\_cloudethix-swap 253:1 0 956M 0 lvm [SWAP]

+-centos\_cloudethix-home 253:3 0 1.9G 0 lvm /home

+-centos\_cloudethix-var 253:4 0 956M 0 lvm /var

sdb 8:16 0 20.1G 0 disk

+-sdb1 8:17 0 4G 0 part /root/data01

+-sdb2 8:18 0 4G 0 part /root/data02

+-sdb3 8:19 0 3G 0 part /root/data03

+-sdb4 8:20 0 1K 0 part

+-sdb5 8:21 0 3G 0 part /root/data05

+-sdb6 8:22 0 3G 0 part /root/data06

+-sdb7 8:23 0 3G 0 part /root/data07

sdc 8:32 0 20.1G 0 disk

sdd 8:48 0 8G 0 disk

+-sdd1 8:49 0 8G 0 part

+-cloud-lvol0 253:5 0 4G 0 lvm

sde 8:64 0 8G 0 disk

+-sde1 8:65 0 8G 0 part

+-cloud1-lvol0 253:2 0 4G 0 lvm

sr0 11:0 1 1024M 0 rom

[root@cloudethix ~]#

\* REMOVE LVM

========================

[root@cloudethix ~]# lvremove /dev/cloud/lvm1

Do you really want to remove active logical volume cloud/lvm1? [y/n]: y

Logical volume "lvm1" successfully removed

[root@cloudethix ~]#

[root@cloudethix ~]# lsblk

NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT

sda 8:0 0 8G 0 disk

+-sda1 8:1 0 1.9G 0 part /boot

+-sda2 8:2 0 5.6G 0 part

+-centos\_cloudethix-root 253:0 0 1.9G 0 lvm /

+-centos\_cloudethix-swap 253:1 0 956M 0 lvm [SWAP]

+-centos\_cloudethix-home 253:3 0 1.9G 0 lvm /home

+-centos\_cloudethix-var 253:4 0 956M 0 lvm /var

sdb 8:16 0 20.1G 0 disk

+-sdb1 8:17 0 4G 0 part /root/data01

+-sdb2 8:18 0 4G 0 part /root/data02

+-sdb3 8:19 0 3G 0 part /root/data03

+-sdb4 8:20 0 1K 0 part

+-sdb5 8:21 0 3G 0 part /root/data05

+-sdb6 8:22 0 3G 0 part /root/data06

+-sdb7 8:23 0 3G 0 part /root/data07

sdc 8:32 0 20.1G 0 disk

sdd 8:48 0 8G 0 disk

+-sdd1 8:49 0 8G 0 part

sde 8:64 0 8G 0 disk

+-sde1 8:65 0 8G 0 part

sr0 11:0 1 1024M 0 rom

**Question 9:** Set up a basic file server using NFS. Mount NFS on 2 Linux boxes. Partition should get mounted even after reboot.

[root@cloudethix ~]# yum install nfs-utils –y

[root@cloudethix ~]# systemctl start nfs-server

[root@cloudethix ~]# mkdir -p /home/nfs/server

[root@cloudethix ~]# vim /etc/exports

[root@cloudethix ~]# cat /etc/exports

/home/nfs/server \*(rw,sync,no\_root\_squash)

[root@cloudethix ~]# exportfs -a

[root@cloudethix ~]# systemctl restart nfs-server

[root@cloudethix ~]# systemctl status nfs-server

● nfs-server.service - NFS server and services

Loaded: loaded (/usr/lib/systemd/system/nfs-server.service; enabled; vendor preset: disabled)

Active: active (exited) since Thu 2023-11-30 11:33:43 IST; 13s ago

Process: 1954 ExecStopPost=/usr/sbin/exportfs -f (code=exited, status=0/SUCCESS)

Process: 1952 ExecStopPost=/usr/sbin/exportfs -au (code=exited, status=0/SUCCESS)

Process: 1951 ExecStop=/usr/sbin/rpc.nfsd 0 (code=exited, status=0/SUCCESS)

Process: 1981 ExecStartPost=/bin/sh -c if systemctl -q is-active gssproxy; then systemctl reload gssproxy

; fi (code=exited, status=0/SUCCESS)

Process: 1964 ExecStart=/usr/sbin/rpc.nfsd $RPCNFSDARGS (code=exited, status=0/SUCCESS)

Process: 1963 ExecStartPre=/usr/sbin/exportfs -r (code=exited, status=0/SUCCESS)

Main PID: 1964 (code=exited, status=0/SUCCESS)

CGroup: /system.slice/nfs-server.service

Nov 30 11:33:43 cloudethix systemd[1]: Starting NFS server and services...

Nov 30 11:33:43 cloudethix systemd[1]: Started NFS server and services.

CLIENT SERVER = 192.168.56.103

Setting Up NFS on Client Machine and Mounting an NFS Share

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Installing NFS Client Packages

[root@cloudethix ~]# yum install nfs-utils -y

Loaded plugins: fastestmirror

Installed:

Mounting the NFS File Share Temporarily

[root@cloudethix ~]# mkdir /ethix01/client

mkdir: cannot create directory ‘/ethix01/client’: No such file or directory

[root@cloudethix ~]# mkdir -p /ethix01/client

[root@cloudethix ~]#

[root@cloudethix ~]# mount -t nfs 192.168.56.102:/home/nfs/server /ethix01/client

[root@cloudethix ~]# vim /etc/fstab

[root@cloudethix ~]# cat /etc/fstab

#

# /etc/fstab

# Created by anaconda on Fri Nov 17 14:47:45 2023

#

# Accessible filesystems, by reference, are maintained under '/dev/disk'

# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

#

/dev/mapper/centos\_cloudethix-root / xfs defaults 0 0

UUID=95902e84-89f6-4a80-9361-a064ba624b42 /boot xfs defaults 0 0

/dev/mapper/centos\_cloudethix-swap swap swap defaults 0 0

192.168.56.102:/home/nfs/server /ethix01/client nfs defaults 0 0

[root@cloudethix ~]# mount -a

[root@cloudethix ~]# df -h

Filesystem Size Used Avail Use% Mounted on

devtmpfs 484M 0 484M 0% /dev

tmpfs 496M 0 496M 0% /dev/shm

tmpfs 496M 6.9M 489M 2% /run

tmpfs 496M 0 496M 0% /sys/fs/cgroup

/dev/mapper/centos\_cloudethix-root 6.2G 1.6G 4.6G 26% /

/dev/sda1 1014M 137M 878M 14% /boot

tmpfs 100M 0 100M 0% /run/user/0

192.168.56.102:/home/nfs/server 1.9G 33M 1.9G 2% /ethix01/client

**Question 10:** Create 1 AWS instance, SSH from Key, change permission of /home/ec2-user to chmod -R 777, Logout , try login , recover it by mounting the disk to another EC2 instance.