

Logical Volume Verification (lsblk)

The lsblk command output confirms the configured disks, partitions, volume groups, and logical volumes, along with their associated mount points on the CentOS Stream 9 system.

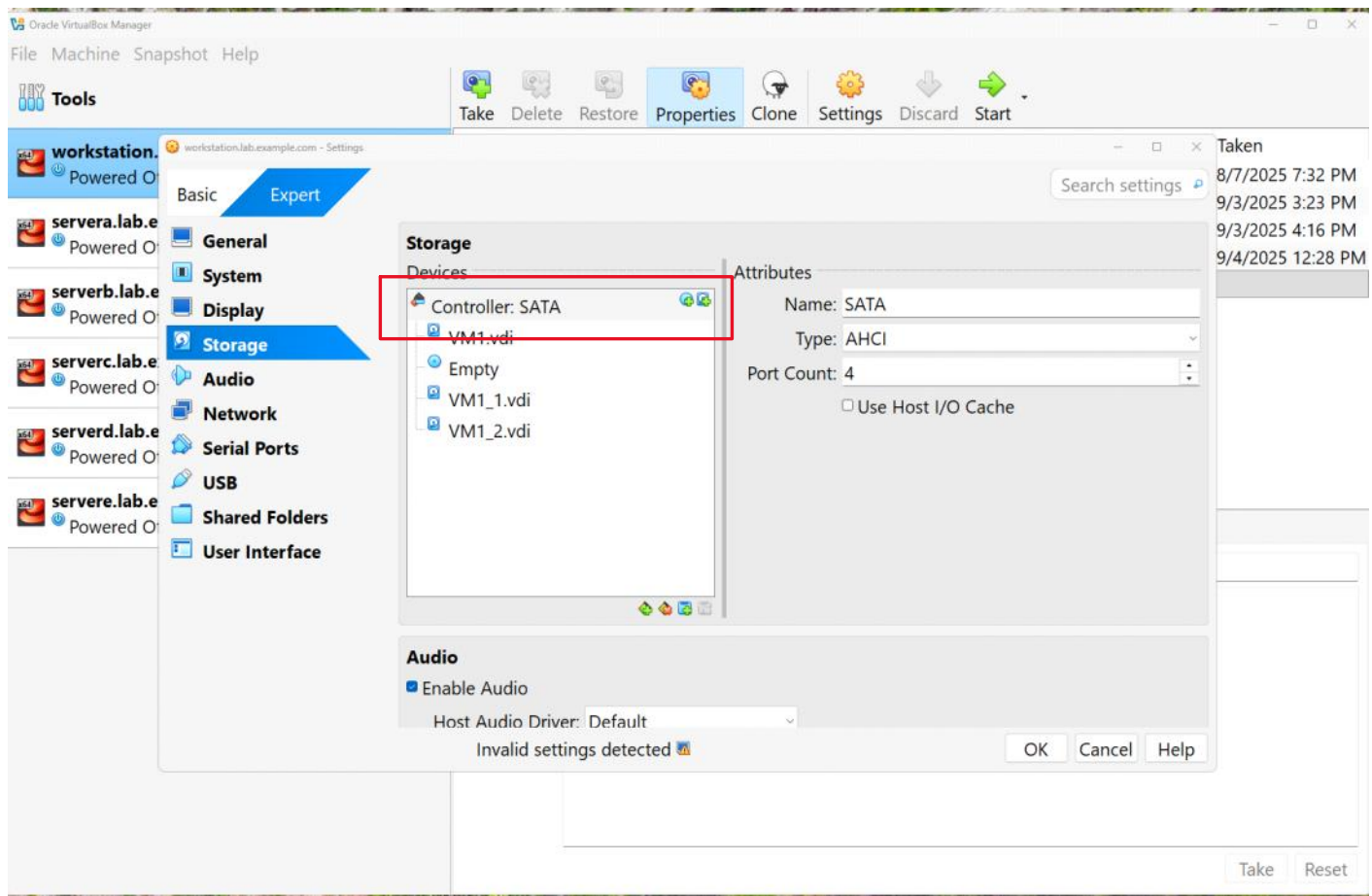
```
CentOS Stream 9
Kernel 5.14.0-565.el9.x86_64 on an x86_64

workstation login: root
Password:
Last login: Mon Jan 12 10:51:44 on tty1
[root@workstation ~]# lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda                                  8:0    0   80G  0 disk
├─sda1                              8:1    0  600M  0 part /boot/efi
├─sda2                              8:2    0    1G  0 part /boot
└─sda3                              8:3    0  78.4G  0 part
   ├─cs_vbox-root                    253:0    0   50G  0 lvm /
   ├─cs_vbox-swap                    253:1    0   3.9G  0 lvm [SWAP]
   └─cs_vbox-home                    253:6    0  24.4G  0 lvm /home
sdb                                  8:16    0   20G  0 disk
├─sdb1                              8:17    0  900M  0 part
│   └─vg1-lv1                        253:5    0  800M  0 lvm /GOT
├─sdb2                              8:18    0  504M  0 part
│   └─vg2-lv2                        253:4    0  500M  0 lvm
└─sdb3                              8:19    0  204M  0 part
sdc                                  8:32    0   10G  0 disk
├─sdc1                              8:33    0  804M  0 part
│   └─vg3-lv3                        253:3    0  800M  0 lvm
├─sdc2                              8:34    0    3G  0 part
│   └─vg-lv4                         253:2    0  700M  0 lvm /targaryen
└─sdc3                              8:35    0  804M  0 part
   ├─vgsummer-lvmsummer              253:7    0  400M  0 lvm /opt/summertime
   └─vgsummer-SUMMERTIME              253:8    0  296M  0 lvm /mnt/pool
sr0                                  11:0    1 1024M  0 rom

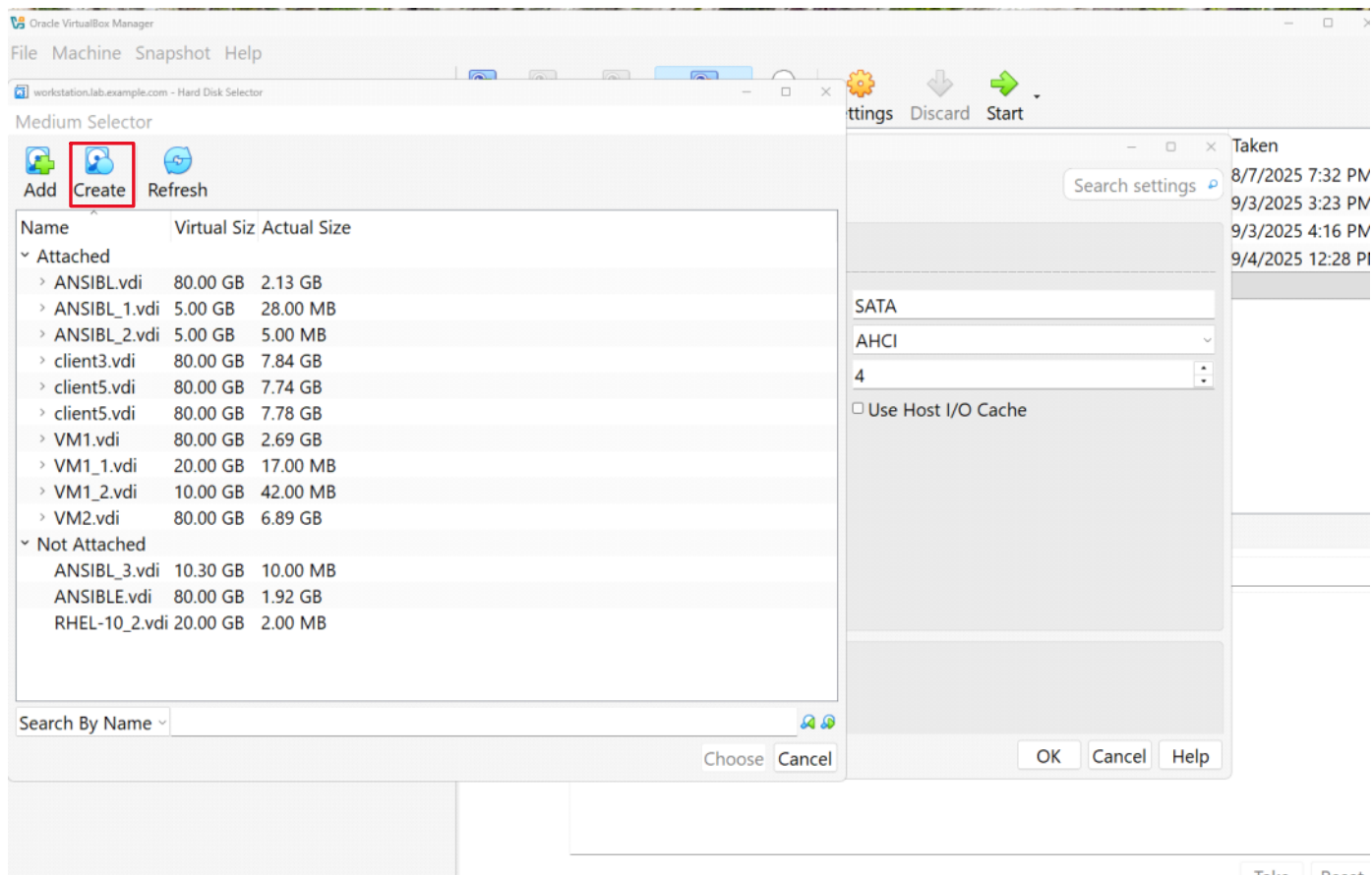
[root@workstation ~]# _
```

Virtual Disk Configuration (VirtualBox)

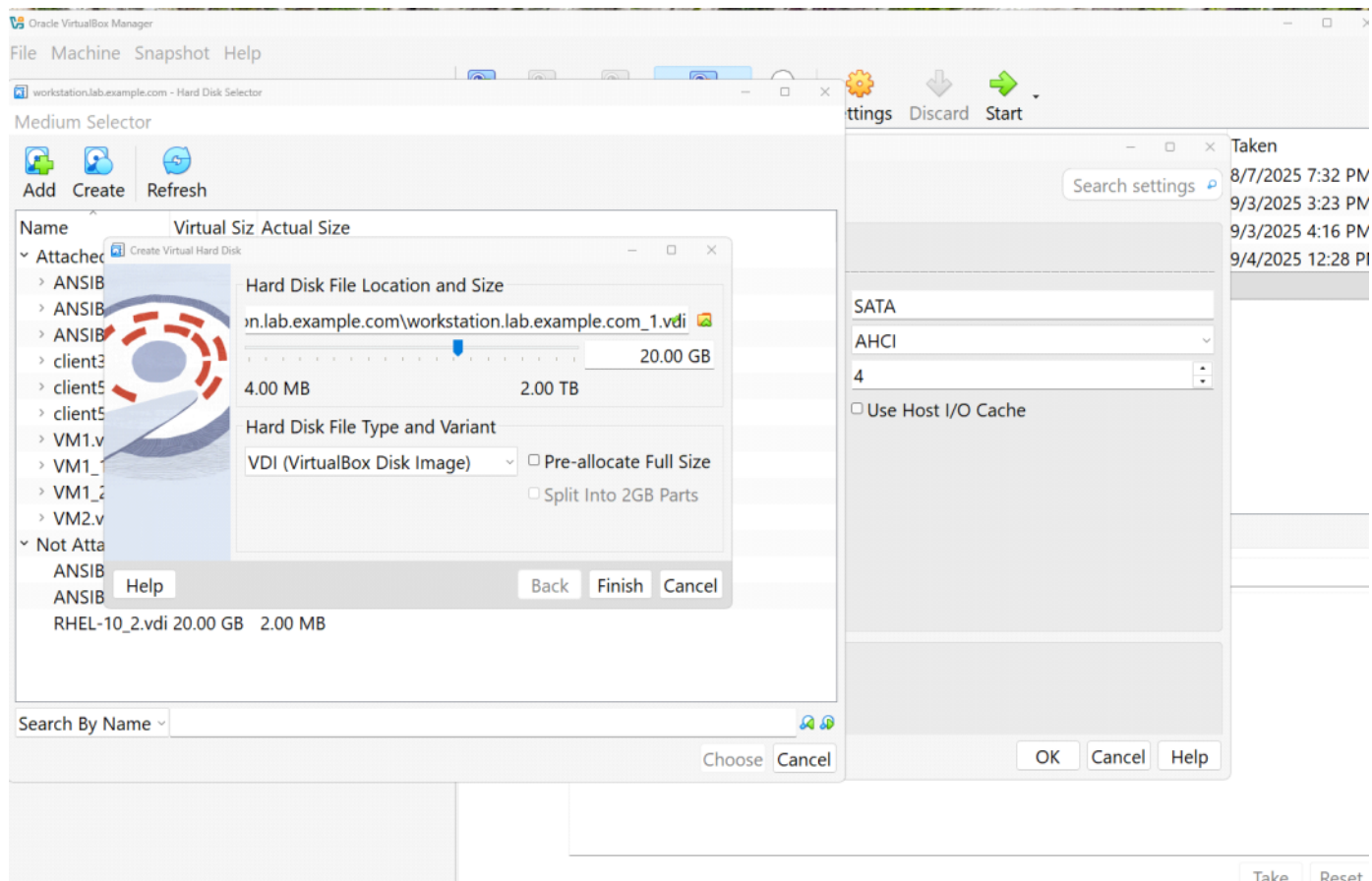
Multiple virtual disks are attached to the VM using a SATA controller to support logical volume management configuration.



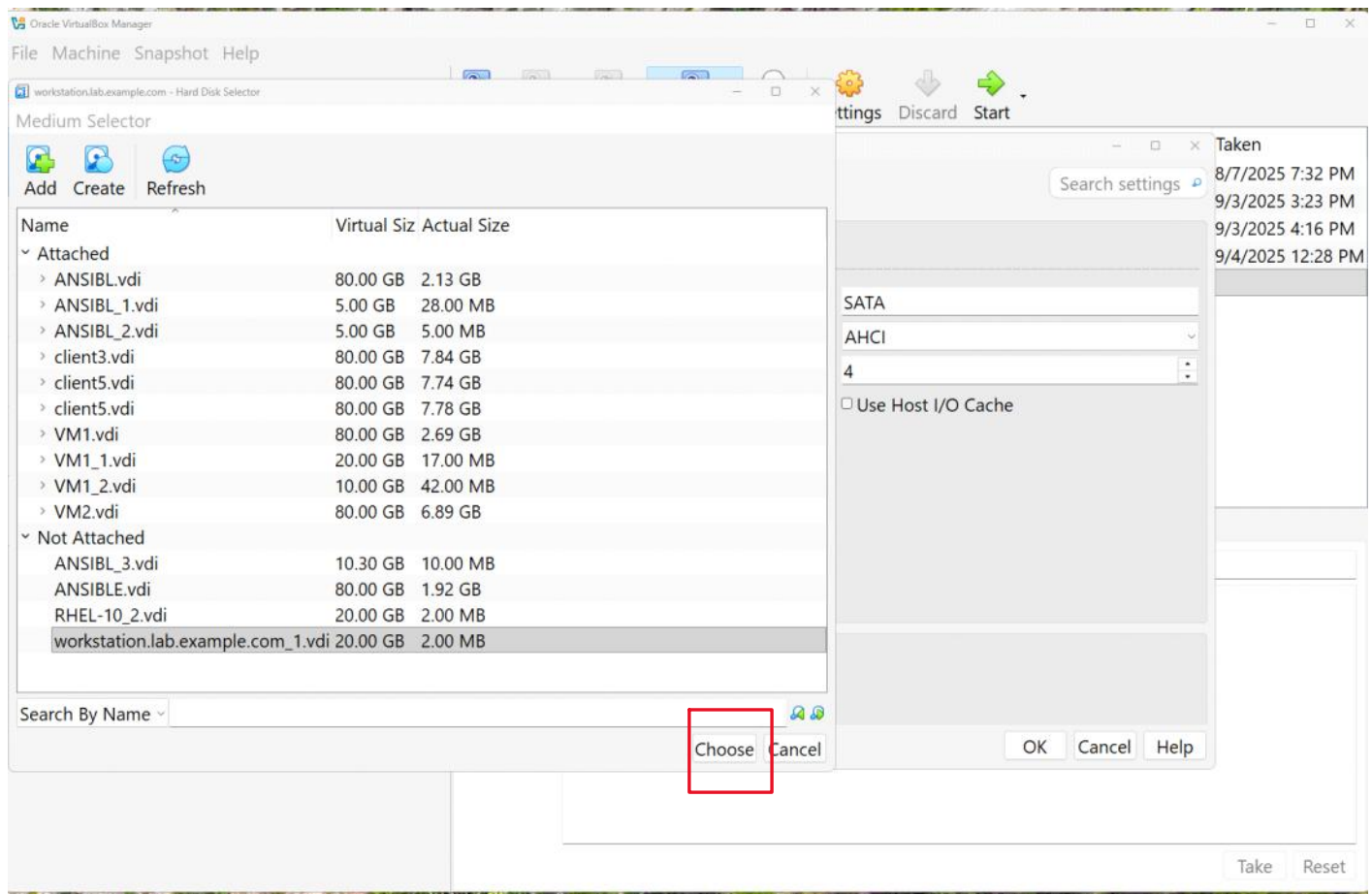
The **Create** button is used to add new virtual disks, which are attached to the virtual machine for LVM configuration.



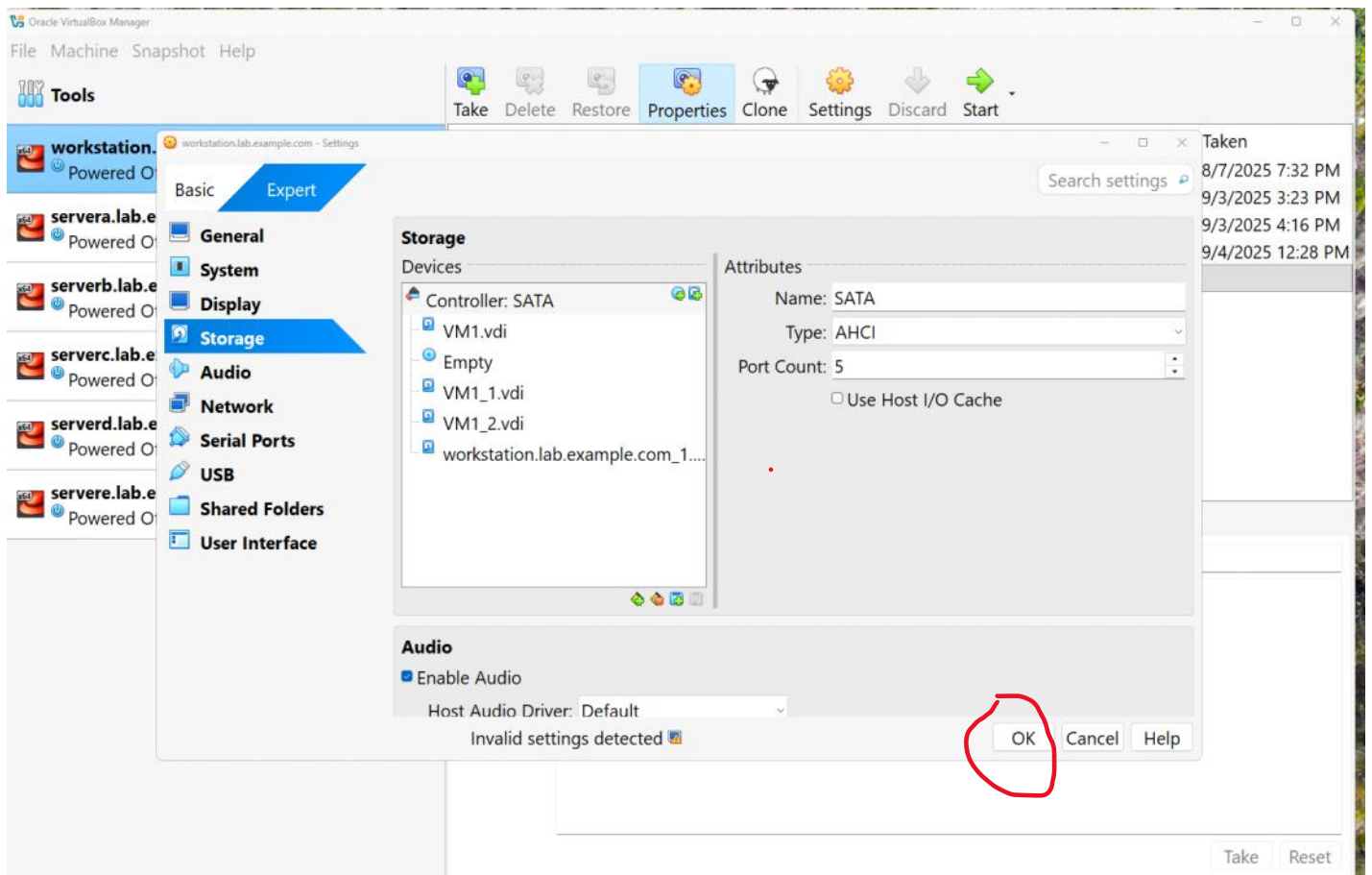
Created a new 20 GB virtual disk in VirtualBox to use as dedicated storage for an LVM configuration.



Selected the newly created 20 GB virtual disk and clicked **Choose** to attach it to the virtual machine for LVM use.



Confirmed the storage configuration by clicking **OK**, finalizing the attachment of the new disk to the virtual machine.



Verified the newly attached disk using lsblk, confirming the system detects additional storage devices available for LVM configuration.

```
workstationlab.example.com (ssh) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

CentOS Stream 9
Kernel 5.14.0-565.el9.x86_64 on an x86_64

workstation login: root
Password:
Last login: Wed Jan 14 11:15:12 on tty1
[root@workstation ~]# lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda                                  8:0      0   80G  0 disk
├─sda1                              8:1      0  600M  0 part /boot/efi
├─sda2                              8:2      0    1G  0 part /boot
├─sda3                              8:3      0  78.4G  0 part
│   └─cs_vbox-root                  253:0    0   50G  0 lvm /
│       └─cs_vbox-swap              253:1    0   3.9G  0 lvm [SWAP]
│           └─cs_vbox-home          253:4    0  24.4G  0 lvm /home
sdb                                  8:16     0   20G  0 disk
├─sdb1                              8:17     0  900M  0 part
│   └─└vg1-lv1                     253:2    0  800M  0 lvm /GOT
├─sdb2                              8:18     0  504M  0 part
│   └─└vg2-lv2                     253:3    0  500M  0 lvm
├─sdb3                              8:19     0  204M  0 part
sdc                                  8:32     0   10G  0 disk
├─sdc1                              8:33     0  804M  0 part
│   └─└vg3-lv3                     253:5    0  800M  0 lvm
├─sdc2                              8:34     0    3G  0 part
│   └─└vg-lv4                      253:8    0  700M  0 lvm /targaryen
├─sdc3                              8:35     0  804M  0 part
│   └─└vgsummer-lvmsummer          253:6    0  400M  0 lvm /opt/summertime
│       └─vgsummer-SUMMERTIME      253:7    0  296M  0 lvm /mnt/pool
sdd                                  8:48     0    20G  0 disk
sr0                                 11:0     1 1024M  0 rom
[root@workstation ~]# _
```

Initialized the new disk as a Physical Volume using pvcreate and verified it with pvs, confirming the 20 GB disk is ready for LVM use.



```
workstation.lab.example.com [ssh] [Running] - Oracle VirtualBox
File Machine View Input Devices Help
sda1      8:1      0 600M 0 part /boot/efi
sda2      8:2      0 1G 0 part /boot
sda3      8:3      0 78.4G 0 part
├─cs_vbox-root      253:0      0 50G 0 lvm /
├─cs_vbox-swap      253:1      0 3.9G 0 lvm [SWAP]
└─cs_vbox-home      253:4      0 24.4G 0 lvm /home
sdb       8:16     0 20G 0 disk
├─sdb1      8:17     0 900M 0 part
│   └─vg1-lv1      253:2      0 800M 0 lvm /GOT
├─sdb2      8:18     0 504M 0 part
│   └─vg2-lv2      253:3      0 500M 0 lvm
├─sdb3      8:19     0 204M 0 part
└─sdc       8:32     0 10G 0 disk
    ├─sdc1      8:33     0 804M 0 part
    │   └─vg3-lv3      253:5      0 800M 0 lvm
    ├─sdc2      8:34     0 3G 0 part
    │   └─vg-lv4      253:8      0 700M 0 lvm /targaryen
    ├─sdc3      8:35     0 804M 0 part
    │   └─vgsummer-lvmsummer      253:6      0 400M 0 lvm /opt/summertime
    │       └─vgsummer-SUMMERTIME      253:7      0 296M 0 lvm /mnt/pool
    └─sdd       8:48     0 20G 0 disk
sr0       11:0     1 1024M 0 rom
[root@workstation ~]# pvcreate /dev/sdd
Physical volume "/dev/sdd" successfully created.
[root@workstation ~]# pvs
PV          VG          Fmt Attr PSize  PFree
/dev/sda3   cs_vbox      lvm2 a-- 78.41g 0
/dev/sdb1   vg1          lvm2 a-- 896.00m 96.00m
/dev/sdb2   vg2          lvm2 a-- 500.00m 0
/dev/sdc1   vg3          lvm2 a-- 800.00m 0
/dev/sdc2   vg           lvm2 a-- <3.00g 2.31g
/dev/sdc3   vgsummer     lvm2 a-- 800.00m 104.00m
/dev/sdd    lvm2        --- 20.00g 20.00g
[root@workstation ~]#
```

Created a new volume group named `vg_simple` from the physical volume and verified its available space using `vgs`.

```
workstation.lab.example.com [ssh] [Running] - Oracle VirtualBox
File Machine View Input Devices Help
[root@workstation ~]# vgcreate vg_simple /dev/sdd
Volume group "vg_simple" successfully created
[root@workstation ~]# vgs
VG          #PV #LV #SN Attr   VSize  VFree
cs_vbox     1  3  0 wz--n- 78.41g 0
vg          1  1  0 wz--n- <3.00g 2.31g
vg1         1  1  0 wz--n- 896.00m 96.00m
vg2         1  1  0 wz--n- 500.00m 0
vg3         1  1  0 wz--n- 800.00m 0
vg_simple   1  0  0 wz--n- <20.00g <20.00g
vgsummer    1  2  0 wz--n- 800.00m 104.00m
[root@workstation ~]#
```



Created a 5 GB logical volume named lv\_test within the vg\_simple volume group and verified it using lvs.

```
workstation.lab.example.com (ssh) [Running] - Oracle VirtualBox
File Machine View Input Devices Help
[root@workstation ~]# lvcreate -L 5G -n lv_test vg_simple
Logical volume "lv_test" created.
[root@workstation ~]# lvs
LV          VG          Attr      LSize   Pool Origin Data%  Meta%  Move Log Cpy%Sync
Convert
home        cs_vbox     -wi-ao---- 24.43g
root        cs_vbox     -wi-ao---- <50.05g
swap        cs_vbox     -wi-ao---- <3.93g
lv4         vg          -wi-ao---- 700.00m
lv1         vg1         -wi-ao---- 800.00m
lv2         vg2         -wi-a----- 500.00m
lv3         vg3         -wi-a----- 800.00m
lv_test     vg_simple   -wi-a----- 5.00g
SUMMERTIME vgsummer    -wi-ao---- 296.00m
lvmsummer   vgsummer    -wi-ao---- 400.00m
[root@workstation ~]#
```

Formatted the logical volume lv\_test with the ext4 filesystem, preparing it for mounting and data storage.

```
workstation.lab.example.com (ssh) [Running] - Oracle VirtualBox
File Machine View Input Devices Help
[root@workstation ~]# mkfs.ext4 /dev/vg_simple/lv_test
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 1310720 4k blocks and 327680 inodes
Filesystem UUID: f6a6a1d4-21b4-4b14-ae26-d5b9b5ff8bba
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736

Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done

[root@workstation ~]# _
```

Retrieved the UUID of the logical volume and added it to /etc/fstab to enable persistent mounting across reboots.

```
workstation.lab.example.com (ssh) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
[root@workstation ~]# blkid | grep vg_simple-lv_test
/dev/mapper/vg_simple-lv_test: UUID="f6a6a1d4-21b4-4b14-ae26-d5b9b5ff8bba" TYPE="ext4"
[root@workstation ~]# blkid | grep vg_simple-lv_test >> /etc/fstab
[root@workstation ~]# _
```

Added the logical volume vg\_simple-lv\_test to /etc/fstab to ensure it mounts automatically at /mnt/lvm\_test on system boot.

```
workstation.lab.example.com (ssh) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
#
# /etc/fstab
# Created by anaconda on Sat Jul  5 23:52:18 2025
#
# 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.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
/dev/mapper/cs_vbox-root / xfs defaults 0 0
UUID=97868956-9866-470e-8d39-ebbcee2657bb /boot xfs defaults
0 0
UUID=AAD3-B2C7 /boot/efi vfat umask=0077,shortname=winnt 0
2
/dev/mapper/cs_vbox-home /home xfs defaults 0 0
/dev/mapper/cs_vbox-swap none swap defaults 0 0
/dev/mapper/vg1-lv1 /GOT ext4 defaults 0 0
/dev/vg2/lv2 /GOT xfs defaults 0 0
/dev/vg3/lv3 /GOT ext4 defaults 0 0
/dev/vg/lv4 /targaryen xfs defaults 0 0
/dev/vgsummer/lvmsummer /opt/summertime ext4 defaults 0 0
/dev/vgsummer/SUMMERTIME /mnt/pool xfs defaults 0 0
/dev/mapper/vg_simple-lv_test /mnt/lvm_test ext4 defaults _ 0
~
~
```

Ran `mount -a` to apply the `/etc/fstab` configuration and verified that the new logical volume is mounted successfully using `df -Th`.

```
workstation.lab.example.com [ssh] [Running] - Oracle VirtualBox
File Machine View Input Devices Help
[root@workstation ~]# mount -a
[ 1452.300724] XFS (dm-3): Mounting V5 Filesystem 76953528-0a80-4a80-9c52-d1fb12733e5
9
[ 1452.335568] XFS (dm-3): Ending clean mount
mount: (hint) your fstab has been modified, but systemd still uses
the old version; use 'systemctl daemon-reload' to reload.
[ 1452.389990] EXT4-fs (dm-5): mounted filesystem 7ac4bfdf-59c9-451f-a6b9-aa112bd0f6b
8 r/w with ordered data mode. Quota mode: none.
[ 1452.414157] EXT4-fs (dm-9): mounted filesystem f6a6a1d4-21b4-4b14-ae26-d5b9b5ff8bb
a r/w with ordered data mode. Quota mode: none.
[root@workstation ~]# df -Th
Filesystem                                Type      Size  Used Avail Use% Mounted on
devtmpfs                                 devtmpfs   4.0M    0   4.0M   0% /dev
tmpfs                                    tmpfs      1.8G    0   1.8G   0% /dev/shm
tmpfs                                    tmpfs      728M   8.8M  719M   2% /run
efivarfs                                 efivarfs   256K  110K  142K  44% /sys/firmware/efi/efi
vars
/dev/mapper/cs_vbox-root                  xfs        50G   4.4G   46G   9% /
/dev/sda2                                 xfs        960M  228M  733M  24% /boot
/dev/sda1                                 vfat       599M   7.5M  592M   2% /boot/efi
/dev/mapper/cs_vbox-home                  xfs        25G   207M   25G   1% /home
/dev/mapper/vgsummer-SUMMERTIME           xfs        291M   18M  274M   6% /mnt/pool
/dev/mapper/vg-lv4                        xfs        636M   37M  600M   6% /targaryen
/dev/mapper/vgsummer-lvmsummer            ext4       365M   14K  341M   1% /opt/summertime
/dev/mapper/vg3-lv3                      ext4       770M   24K  714M   1% /GOT
tmpfs                                    tmpfs      364M    0   364M   0% /run/user/0
/dev/mapper/vg_simple-lv_test             ext4       4.9G   24K   4.6G   1% /mnt/lvm_test
[root@workstation ~]# _
```

Verified the complete LVM setup with `lsblk`, confirming the logical volume `vg_simple-lv_test` is created from the new disk and mounted at `/mnt/lvm_test`.

```
workstation.lab.example.com [ssh] [Running] - Oracle VirtualBox
File Machine View Input Devices Help
[root@workstation ~]# lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda                                 8:0      0   80G  0 disk
├─sda1                             8:1      0   600M  0 part /boot/efi
├─sda2                             8:2      0    1G  0 part /boot
├─sda3                             8:3      0  78.4G  0 part
└─cs_vbox-root                     253:0    0   50G  0 lvm /
```

```
[root@workstation ~]# lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda                                8:0      0   80G  0 disk
├─sda1                            8:1      0  600M  0 part /boot/efi
├─sda2                            8:2      0    1G  0 part /boot
├─sda3                            8:3      0  78.4G  0 part
│   ├─cs_vbox-root                 253:0     0   50G  0 lvm  /
│   ├─cs_vbox-swap                 253:1     0   3.9G  0 lvm  [SWAP]
│   └─cs_vbox-home                 253:4     0  24.4G  0 lvm  /home
sdb                                8:16     0   20G  0 disk
├─sdb1                            8:17     0   900M  0 part
│   └─vg1-lv1                     253:2     0   800M  0 lvm  /GOT
├─sdb2                            8:18     0   504M  0 part
│   └─vg2-lv2                     253:3     0   500M  0 lvm  /GOT
└─sdb3                            8:19     0   204M  0 part
sdc                                8:32     0   10G  0 disk
├─sdc1                            8:33     0   804M  0 part
│   └─vg3-lv3                     253:5     0   800M  0 lvm  /GOT
├─sdc2                            8:34     0    3G  0 part
│   └─vg-lv4                     253:8     0   700M  0 lvm  /targaryen
├─sdc3                            8:35     0   804M  0 part
│   └─vgsummer-lvmsummer          253:6     0   400M  0 lvm  /opt/summertime
│   └─vgsummer-SUMMERTIME         253:7     0   296M  0 lvm  /mnt/pool
sdd                                8:48     0    20G  0 disk
└─vg_simple-lv_test              253:9     0    5G  0 lvm  /mnt/lvm_test
sr0                               11:0     1 1024M  0 rom

[root@workstation ~]#
```