Republic of the Philippines
Bicol University
POLANGUI CAMPUS

IT123
FILE SYSTEMS AND STORAGE MANAGEMENT

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IT 123 - WEEK 4 LABORATORY

Lab Objectives

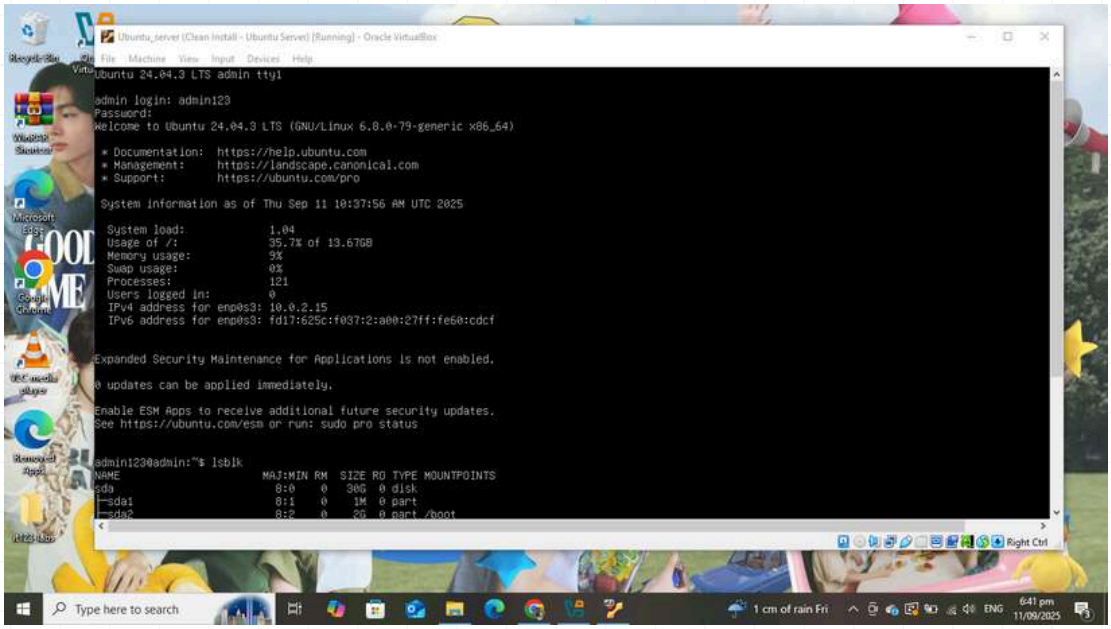
By the end of this lab, students will be able to:

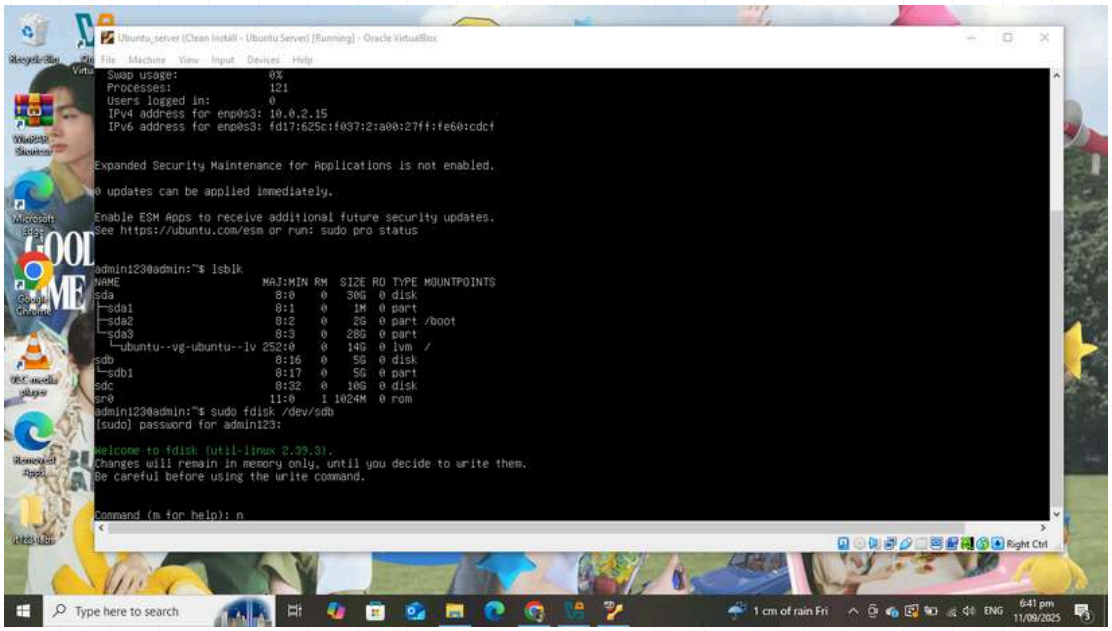
1. Identify and manage different file systems (NTFS, FAT32, ext4).
2. Perform disk partitioning, formatting, and mounting.
3. Configure folder/file permissions using both GUI and CLI.
4. Troubleshoot common storage and access issues.

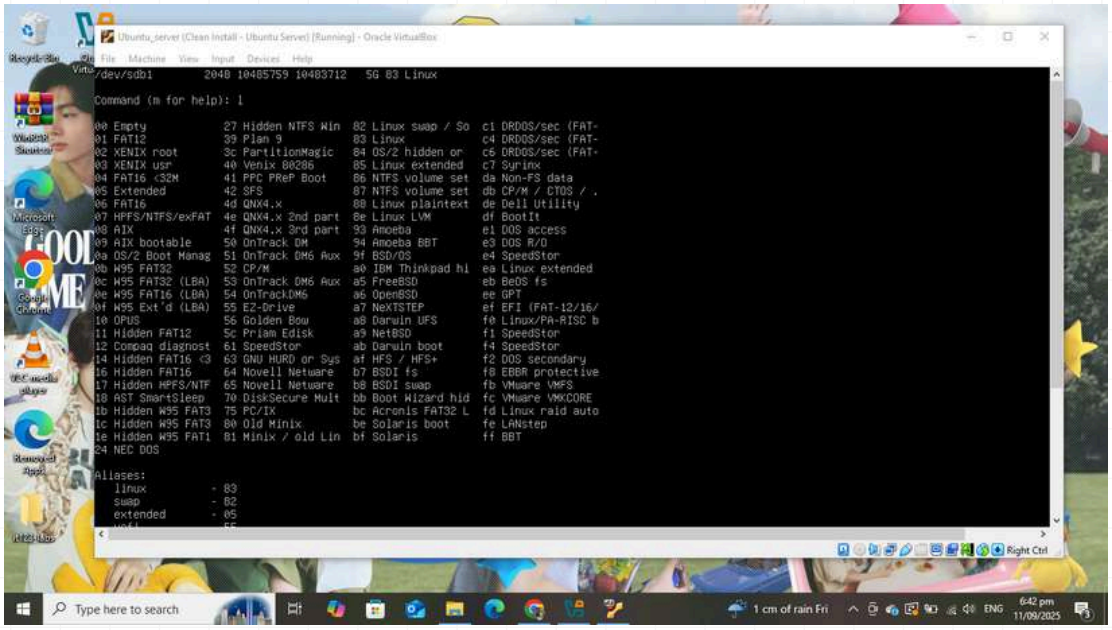
UBUNTU SERVER

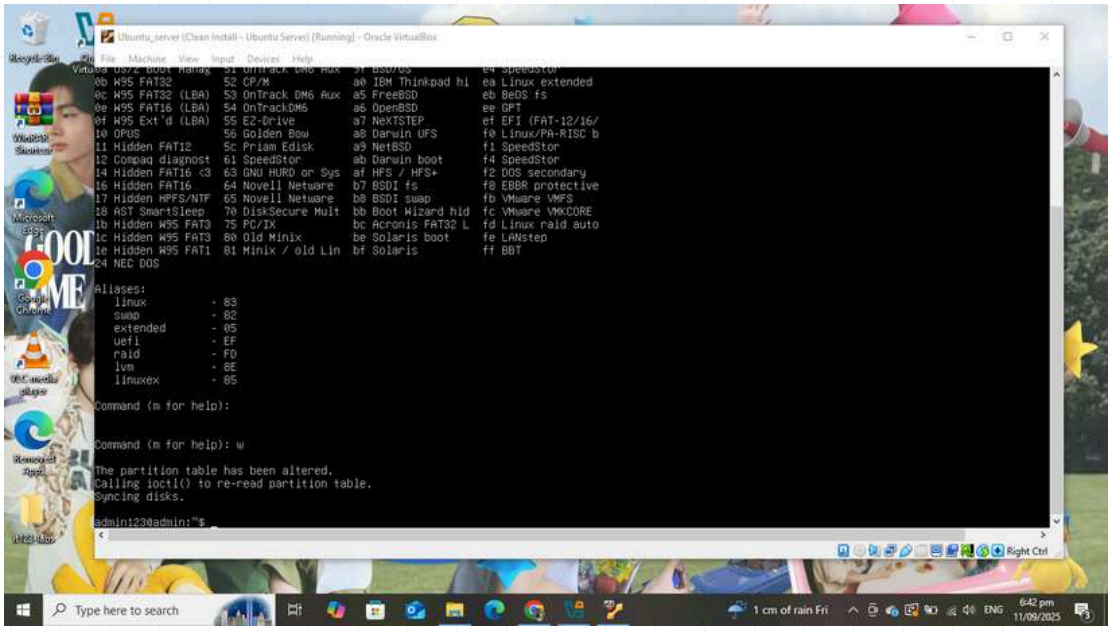
A. Partition & Mount

Device Name: /dev/sdb1
File System Type: ext4
Mount Point: /projectdata




Ubuntu_server (Clean Install - Ubuntu Server) [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Swap usage: 0%
Processes: 121
Users logged in: 0
IPv4 address for enp0s3: 10.0.2.15
IPv6 address for enp0s3: fd17:625c:f037:2:a00:27ff:fe60:cdcf
Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
admin123@admin:~$ lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINTS
sda 8:0 0 30G 0 disk
├─sda1 8:1 0 1M 0 part
├─sda2 8:2 0 2G 0 part /boot
└─sda3 8:3 0 28G 0 part
└─ubuntu--vg-ubuntu--lv 252:0 0 14G 0 lvm /
sdb 8:16 0 5G 0 disk
└─sdb1 8:17 0 5G 0 part
sdc 8:32 0 10G 0 disk
sr0 11:0 1 1024M 0 rom
admin123@admin:~$ sudo fdisk /dev/sdb
[sudo] password for admin123:
Welcome to fdisk (util-linux 2.39.3).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.
Command (m for help): n
Right Ctrl
Type here to search
1 cm of rain Fri
ENG
6:41 pm
11/09/2025


Ubuntu_server (Clean Install - Ubuntu Server) [Running] - Oracle VirtualBox
File Machine View Input Devices Help
/dev/sdb1 2048 10485759 10483712 5G 83 Linux
Command (m for help): l
00 Empty 27 Hidden NTFS Win 82 Linux swap / So c1 DRDOS/sec (FAT-
01 FAT12 39 Plan 9 83 Linux c4 DRDOS/sec (FAT-
02 XENIX root 3c PartitionMagic 84 OS/2 hidden or c6 DRDOS/sec (FAT-
03 XENIX usr 40 Venix 80286 85 Linux extended c7 Syrinx
04 FAT16 <32M 41 PPC PReP Boot 86 NTFS volume set da Non-FS data
05 Extended 42 SFS 87 NTFS volume set db CP/M / CTOS / .
06 FAT16 4d QNX4.x 88 Linux plaintext de Dell Utility
07 HPFS/NTFS/exFAT 4e QNX4.x 2nd part 8e Linux LVM df BootIt
08 AIX 4f QNX4.x 3rd part 93 Amoeba e1 DOS access
09 AIX bootable 50 OnTrack DM 94 Amoeba BBT e3 DOS R/O
0a OS/2 Boot Manag 51 OnTrack DM6 Aux 9f BSD/OS e4 SpeedStor
0b W95 FAT32 52 CP/M a0 IBM Thinkpad hi ea Linux extended
0c W95 FAT32 (LBA) 53 OnTrack DM6 Aux a5 FreeBSD eb BeOS fs
0e W95 FAT16 (LBA) 54 OnTrackDM6 a6 OpenBSD ee GPT
0f W95 Ext'd (LBA) 55 EZ-Drive a7 NeXTSTEP ef EFI (FAT-12/16/
10 OPUS 56 Golden Bow a8 Darwin UFS f0 Linux/PA-RISC b
11 Hidden FAT12 5c Priam Edisk a9 NetBSD f1 SpeedStor
12 Compaq diagnost 61 SpeedStor ab Darwin boot f4 SpeedStor
14 Hidden FAT16 <3 63 GNU HURD or Sys af HFS / HFS+ f2 DOS secondary
16 Hidden FAT16 64 Novell Netware b7 BSDI fs f8 EBBR protective
17 Hidden HPFS/NTF 65 Novell Netware b8 BSDI swap fb VMware VMFS
18 AST SmartSleep 70 DiskSecure Mult bb Boot Wizard hid fc VMware VMKCORE
1b Hidden W95 FAT3 75 PC/IX bc Acronis FAT32 L fd Linux raid auto
1c Hidden W95 FAT3 80 Old Minix be Solaris boot fe LANstep
1e Hidden W95 FAT1 81 Minix / old Lin bf Solaris ff BBT
24 NEC DOS
Aliases:
linux - 83
swap - 82
extended - 05
Right Ctrl
Type here to search
1 cm of rain Fri
ENG
6:42 pm
11/09/2025


Ubuntu_server (Clean Install - Ubuntu Server) [Running] - Oracle VirtualBox
File Machine View Input Devices Help
0b W95 FAT32 52 CP/M a0 IBM Thinkpad hi ea Linux extended
0c W95 FAT32 (LBA) 53 OnTrack DM6 Aux a5 FreeBSD eb BeOS fs
0e W95 FAT16 (LBA) 54 OnTrackDM6 a6 OpenBSD ee GPT
0f W95 Ext'd (LBA) 55 EZ-Drive a7 NeXTSTEP ef EFI (FAT-12/16/
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1e Hidden W95 FAT1 81 Minix / old Lin bf Solaris ff BBT
24 NEC DOS
Aliases:
linux - 83
swap - 82
extended - 05
uefi - EF
raid - FD
lvm - 8E
linuxex - 85
Command (m for help):
Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
admin123@admin:~$
Right Ctrl
Type here to search
1 cm of rain Fri
ENG
6:42 pm
11/09/2025

B. Directory Setup & Permissions

Directory Path: /projectdata

Group Assigned:

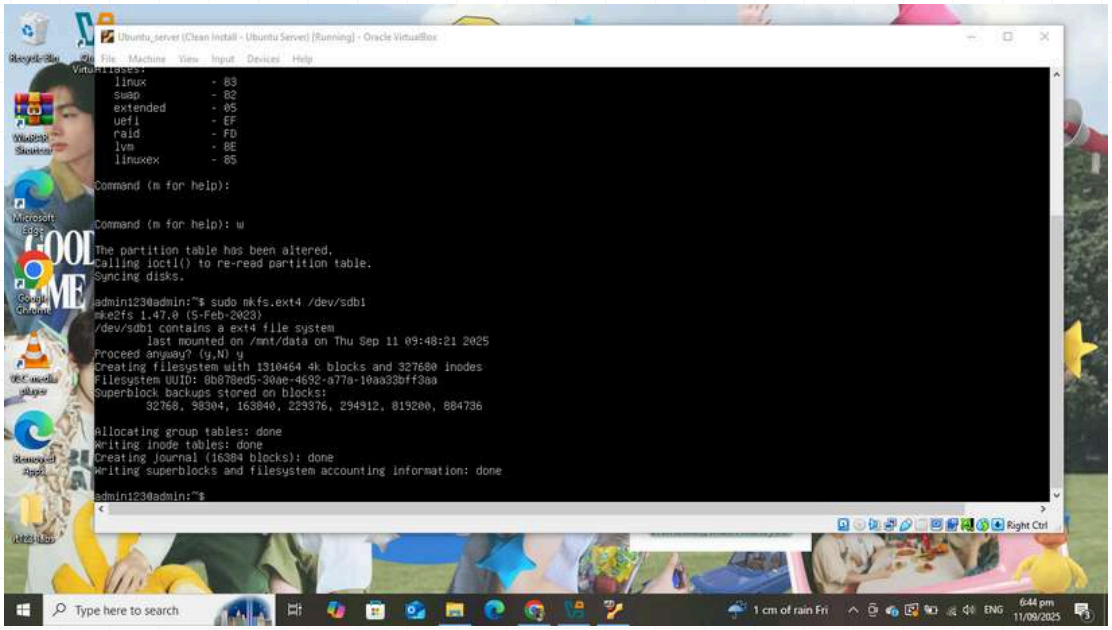
facultygrp → read & write

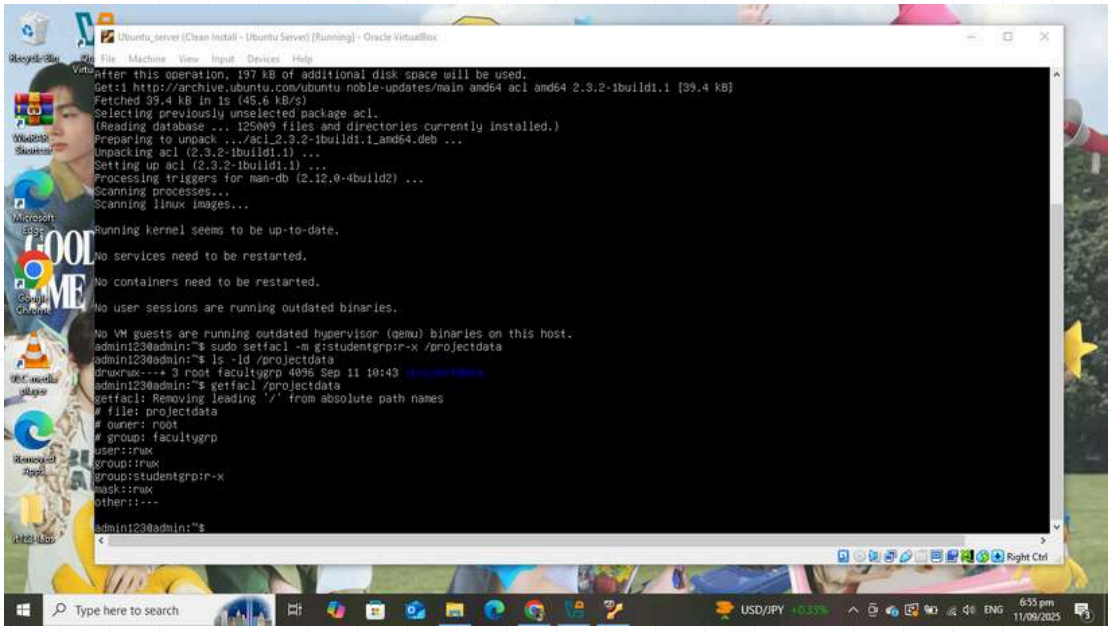
studentgrp → read-only

Permission Level:

Faculty: rwx

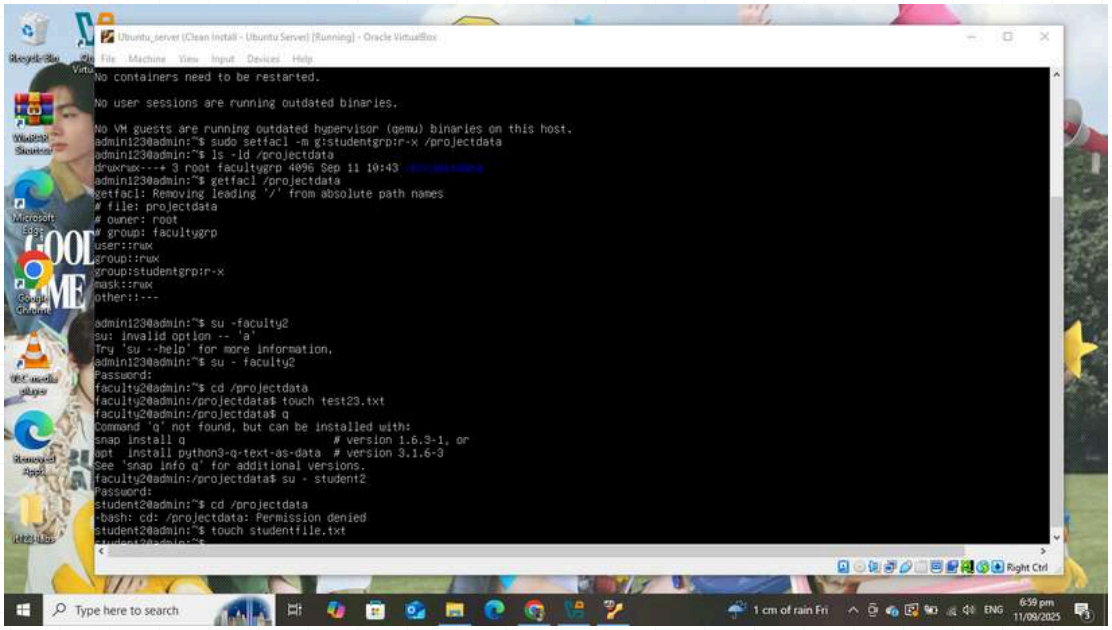
Students: r-x





C. Verification

- **Tested User Account: faculty2**
  - Access Allowed: [✓] Yes
  - Access Denied: [ ] No
  - (Faculty2 created test23.txt successfully)
- **Tested User Account: student2**
  - Access Allowed: [ ] Yes
  - Access Denied: [✓] No
  - (Student2 got Permission denied when entering /projectdata or creating files)



Reflection

1. One of the challenges I encountered was remembering the correct syntax for chown and setfacl. At first, I also confused colons and spaces when assigning groups. Another difficulty was verifying access properly, since I needed to switch users and test both read and write.
2. These skills are useful in real-world system administration because they ensure sensitive files are only accessible to authorized groups. Proper disk partitioning and permission management help secure data, organize resources, and prevent unauthorized changes in shared environments.