



**BICOL UNIVERSITY
POLANGUI**
Polangui, Albay



IT 123 – System Administration and Maintenance

1st Semester 2025-2026

Lab Report 4 – *File Systems and Storage Management*

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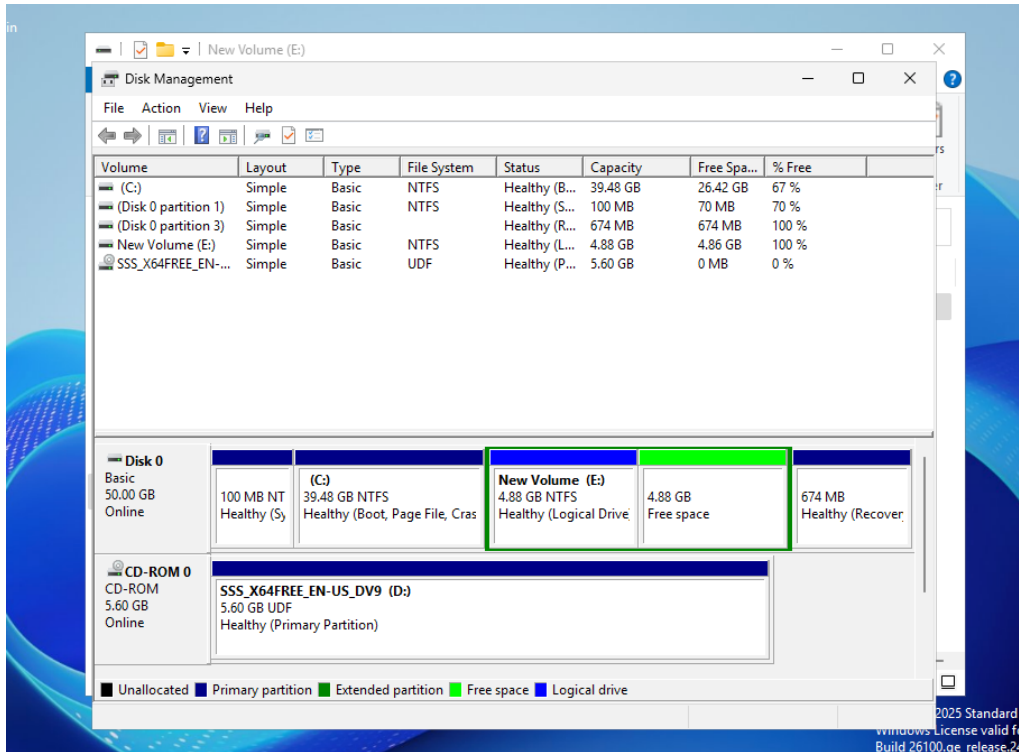
Part 1 – Windows Server

A. Partition Creation

Drive Letter: E:

File System: NTFS

Size: 5000 MB (~5 GB)



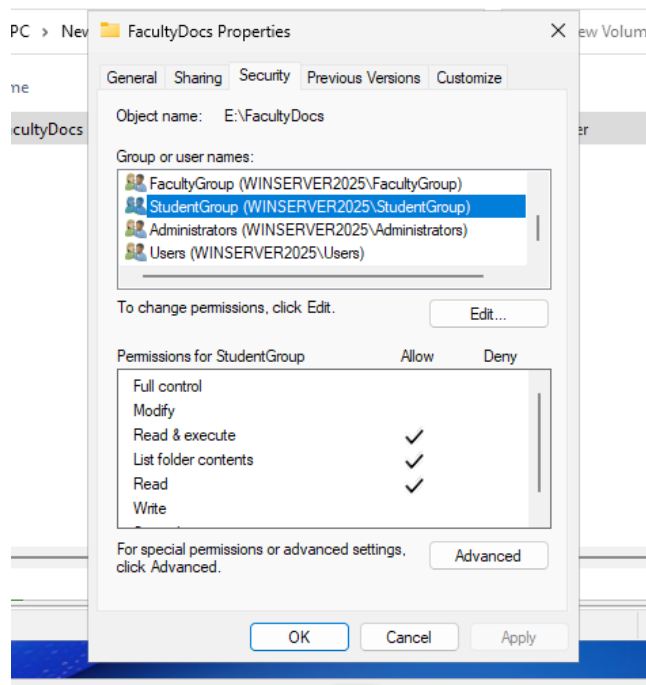
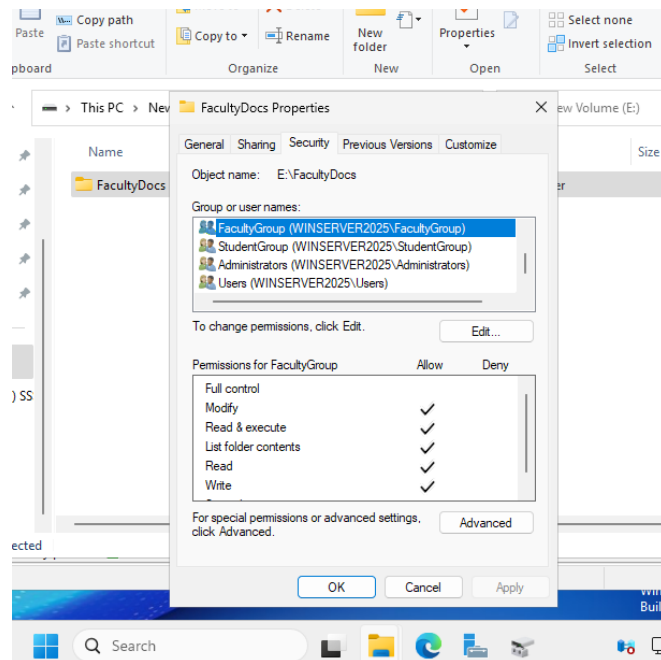
B. Folder Setup & Permissions

Folder Name: FacultyDocs

Group Assigned:

- FacultyGroup → Modify
- StudentGroup → Read & Execute

Permission Level: FacultyGroup = Modify, StudentGroup = Read & Execute



C. Verification

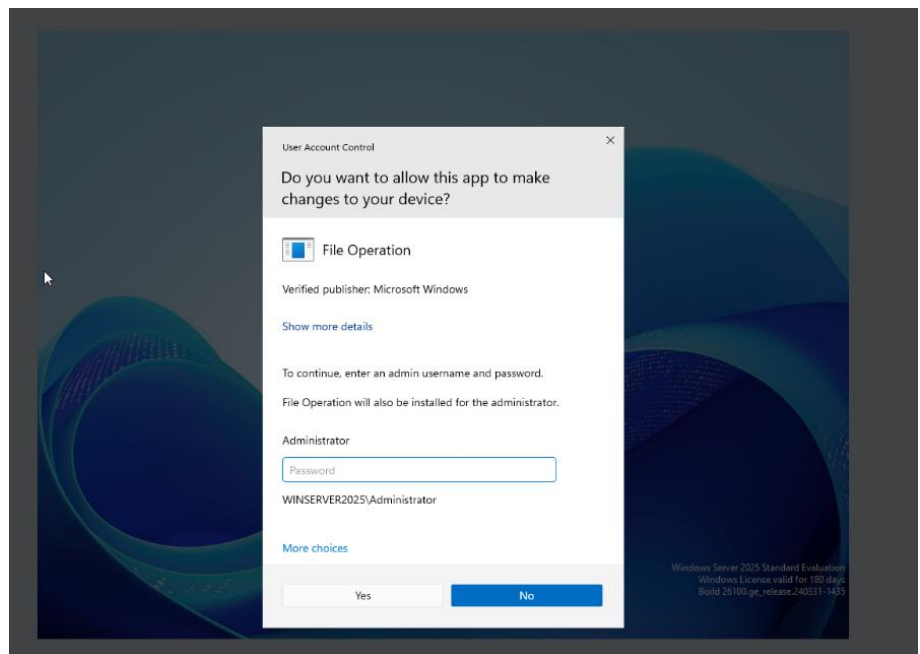
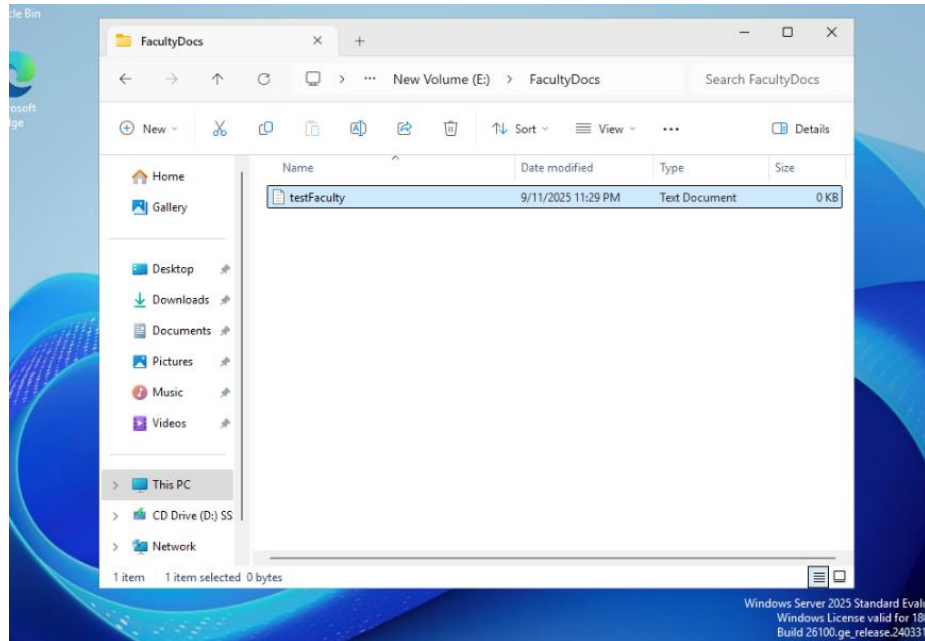
Tested User Account: faculty1

Access Allowed: [✓] Yes [] No

Tested User Account: student3

Access Allowed: [✓] Yes [] No

Access Denied: [✓] Yes [] No



Part 2 – Ubuntu Server

A. Partition & Mount

- **Device Name:** /dev/sdb1
- **File System Type:** ext4
- **Mount Point:** /mnt/data

Screenshot(s)/Command Outputs:

```
Ubuntu_Server [Running] - Oracle VirtualBox
File Machine View Input Devices Help

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

admin@UbuntuServer:~$ lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINTS
sda 8:0 0 300 0 disk
├─sda1 8:1 0 1M 0 part
├─sda2 8:2 0 300 0 part /
sdb 8:16 0 5G 0 disk
sr0 11:0 1 1024M 0 rom
admin@UbuntuServer:~$ sudo fdisk /dev/sdb
[sudo] password for admin:

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.

Device does not contain a recognized partition table.
Created a new DOS (MBR) disklabel with disk identifier 0x12741701.

Command (m for help): n
Partition type
  p   primary (0 primary, 0 extended, 4 free)
  e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-10485759, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-10485759, default 10485759):

Created a new partition 1 of type 'Linux' and of size 5 GiB.

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.

admin@UbuntuServer:~$ sudo mkfs.ext4 /dev/sdb1
mkfs.ext4 1.47.0 (5-Feb-2023)
Creating filesystem with 1310464 4k blocks and 327680 inodes
Filesystem UUID: f9fb3721-e2e9-4bb7-bec1-ce4352e952cd
Superblock backups stored on blocks:
    32768, 98304, 163840, 223936, 294912, 819200, 884736

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

admin@UbuntuServer:~$
```

```
admin@UbuntuServer:~$ sudo mkdir -p /mnt/data
admin@UbuntuServer:~$ sudo mount /dev/sdb1 /mnt/data
admin@UbuntuServer:~$
```

B. Directory Setup & Permissions

- **Directory Path:** /projectdata
- **Group Assigned:** facultygrp (faculty group)
studentgrp (student)
- **Permission Level:** faculty = read/write, student = read-only

Command Outputs:

```
admin@UbuntuServer:~$ q
Command 'q' not found, but can be installed with:
sudo snap install q # version 1.6.3-1, or
sudo apt install python3-q-text-as-data # version 3.1.6-3
See 'snap info q' for additional versions.
admin@UbuntuServer:~$ 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 30G 0 part /
sdb 8:16 0 10G 0 disk
├─sdb1 8:17 0 10G 0 part
sr0 11:0 1 1024M 0 rom
admin@UbuntuServer:~$ sudo mkfs.ext4 /dev/sdb1
mke2fs 1.47.0 (5-Feb-2023)
Creating filesystem with 2621184 4k blocks and 655360 inodes
Filesystem UUID: 2b655191-bcfa-4308-8c9e-cff7cf8348f6
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

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

admin@UbuntuServer:~$ sudo mkdir /projectdata
mkdir: cannot create directory '/projectdata': File exists
admin@UbuntuServer:~$ sudo mount /dev/sdb1 /projectdata
admin@UbuntuServer:~$ sudo chown :facultygrp /projectdata
admin@UbuntuServer:~$ sudo chmod 770 /projectdata
admin@UbuntuServer:~$ sudo setfacl -m g:studentgrp:rx /projectdata
admin@UbuntuServer:~$
```

```
student4@UbuntuServer:/projectdata$ ls -ld /projectdata
drwxrwx---+ 3 root facultygrp 4096 Sep 11 18:02 /projectdata
student4@UbuntuServer:/projectdata$ getfacl /projectdata
getfacl: Removing leading '/' from absolute path names
# file: /projectdata
# owner: root
# group: facultygrp
user::rwx
group::rwx
group:studentgrp:r-x
mask::rwx
other::---

student4@UbuntuServer:/projectdata$
```

C. Verification

Tested User Account: faculty2

Access Allowed: ☒ Yes ☐ No

Tested User Account: student4

Access Allowed: ☒ Yes ☐ No

Access Denied: ☐ Yes ☒ No

```
admin@UbuntuServer:~$ sudo mkdir /projectdata
mkdir: cannot create directory /projectdata: File exists
admin@UbuntuServer:~$ sudo mount /dev/sdb1 /projectdata
admin@UbuntuServer:~$ sudo chown :facultygrp /projectdata
admin@UbuntuServer:~$ sudo chmod 770 /projectdata
admin@UbuntuServer:~$ sudo setfacl -m g:studentgrp:rx /projectdata
admin@UbuntuServer:~$ su - faculty1
su: user faculty1 does not exist or the user entry does not contain all the required fields
admin@UbuntuServer:~$ su - faculty2
Password:
faculty2@UbuntuServer:~$ cd /projectdata
faculty2@UbuntuServer:/projectdata$ touch faculty_file.txt
faculty2@UbuntuServer:/projectdata$ su - student4
Password:
student4@UbuntuServer:~$ cd /projectdata
student4@UbuntuServer:/projectdata$ touch student_file.txt
touch: cannot touch 'student_file.txt': Permission denied
student4@UbuntuServer:/projectdata$ _
```

Part 3 – Reflection

(Answer briefly in 3–5 sentences)

- What challenges did you encounter in creating partitions and managing permissions?
- How can these skills be applied in real-world system administration duties?

Creating partitions and setting up permissions on both Windows and Ubuntu servers was challenging at first because we had to make sure the disks weren't in use and follow the correct steps for each system. We also had to learn how to assign groups different levels of access, especially using ACLs on Linux to give students read-only rights while faculty had full control. Testing with multiple user accounts helped us understand how permissions actually work and how important it is to configure them correctly. These skills are very useful in real-world system administration, as managing disk space and controlling access ensures data security and proper organization. Overall, the exercise helped us gain hands-on experience in both Windows and Linux environments.