Computer Science 328 -01
Lab Assignment 4

Due Date: Sunday, February 18, 2024 (before midnight)

Objectives:

1. **Learning File Backup**
2. **Learning Network File System (NFS)**
3. **Learning LAMP server setup**
4. **Learning Cloud File Storage Systems: Owncloud, Nextcloud**

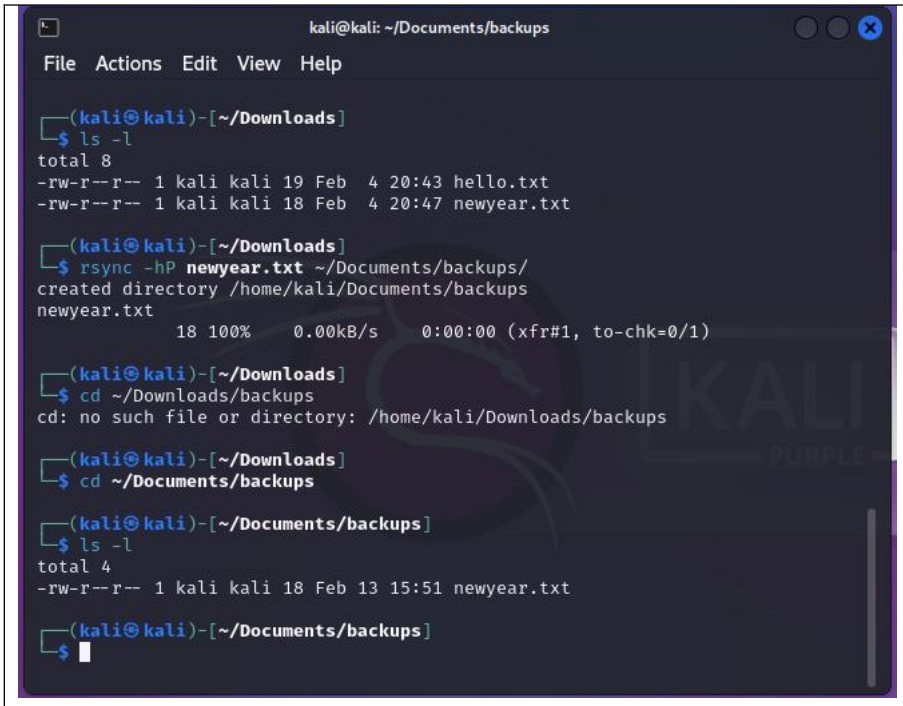
Task 1: File Backup

Please refer to the examples from the site below on how to use rsnyc command to do file/directory backup locally and remotely:
https://www.tecmint.com/rsync-local-remote-file-synchronization-commands/

Incremental backups with rsync command

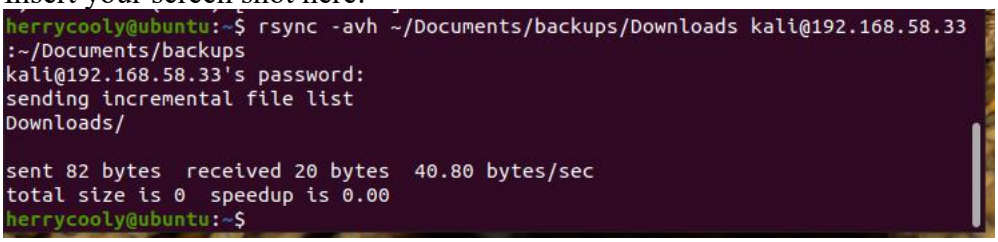
Run both Ubuntu VM1 and Kali VM => open a terminal in Ubuntu => create a couple non-empty text files or download something like a couple images into the **Downloads** folder=> use rsync command to backup the whole **Downloads** folder locally into **Documents/backups** folder (note: **backups** subfolder will be created automatically by the rsync command) => take screen shot of the terminal showing the successful backup operation.

Insert your screen shot here:



= > Next use rsync command to backup **/Documents/backups/Downloads** folder from Ubuntu VM into **/Documents/backups** folder of the remote Kali VM => take screen shot to show the successful backup operation

Insert your screen shot here:



= > Next use rsync command to backup **/Documents/backups/Downloads** folder from remote Kali VM into **/tmp** folder of Ubuntu VM => take a screen shot to show the successful backup operation.

Insert your screen shot here:

```
┌──(kali㉿kali)-[~/Documents/backups]
└─$ rsync -avh ~/Documents/backups/Downloads herrycooly@192.168.58.11:~/tmp
The authenticity of host '192.168.58.11 (192.168.58.11)' can't be established
.
ED25519 key fingerprint is SHA256:NAim4PSXtr9gjUdiYLX6rg1PNasUUoqJUXh7q6dI9qE
.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.58.11' (ED25519) to the list of known hos
ts.
herrycooly@192.168.58.11's password:
sending incremental file list
Downloads/

sent 70 bytes  received 20 bytes  16.36 bytes/sec
total size is 0  speedup is 0.00
herrycooly@ubuntu:~/tmp$ ls -l
total 4
drwxrwxr-x 2 herrycooly herrycooly 4096 Feb 13 13:01 Downloads
```

Task 2: Learning Network File System (NFS)

Please refer to "***How To Set Up an NFS Mount on Ubuntu.pdf***":

- Use Ubuntu VM1 as host server, and both Ubuntu VM2 and Kali VM as client servers.
- Follow the instructions from the PDF file with the first client using Ubuntu VM2 (192.168.13.22).
- Next set up the second client (Kali VM) the same way by adding Kali VM's ip address (192.168.13.33) as the second client into /etc/exports file:

```
  GNU nano 4.8                    /etc/exports                    Modified
# /etc/exports: the access control list for filesystems which may be exported
#               to NFS clients.  See exports(5).
#
# Example for NFSv2 and NFSv3:
# /srv/homes       hostname1(rw,sync,no_subtree_check) hostname2(ro,sync,no_s>
#
# Example for NFSv4:
# /srv/nfs4        gss/krb5i(rw,sync,fsid=0,crossmnt,no_subtree_check)
# /srv/nfs4/homes  gss/krb5i(rw,sync,no_subtree_check)
#

/var/nfs/general    192.168.13.22(rw,sync,no_subtree_check)
/var/nfs/general    192.168.13.33(rw,sync,no_subtree_check)
/home               192.168.13.22(rw,sync,no_root_squash,no_subtree_check)
/home               192.168.13.33(rw,sync,no_root_squash,no_subtree_check)
```

and by creating two new files with different names like "kaligeneral.test" under the shared /general directory and "kalihome.test" under the shared /home directory.

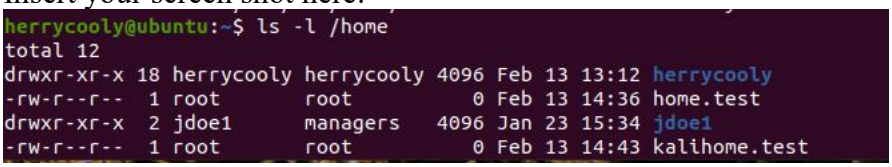
- At the end, go to host server (Ubuntu VM1), use a command like "ls -l /var/nfs/general" to list the contents of the exported directory. Take a screen shot of the terminal to show the two new files created by both clients.

Insert your screen shot here:

```
herrycooly@ubuntu:~$ ls -l /var/nfs/general
total 0
-rw-r--r-- 1 nobody nogroup 0 Feb 13 14:36 general.test
-rw-r--r-- 1 nobody nogroup 0 Feb 13 14:42 kaligeneral.test
```

- use the command " ls -l /home/nfs" to list the contents of the other exported directory. Take a screen of the terminal.

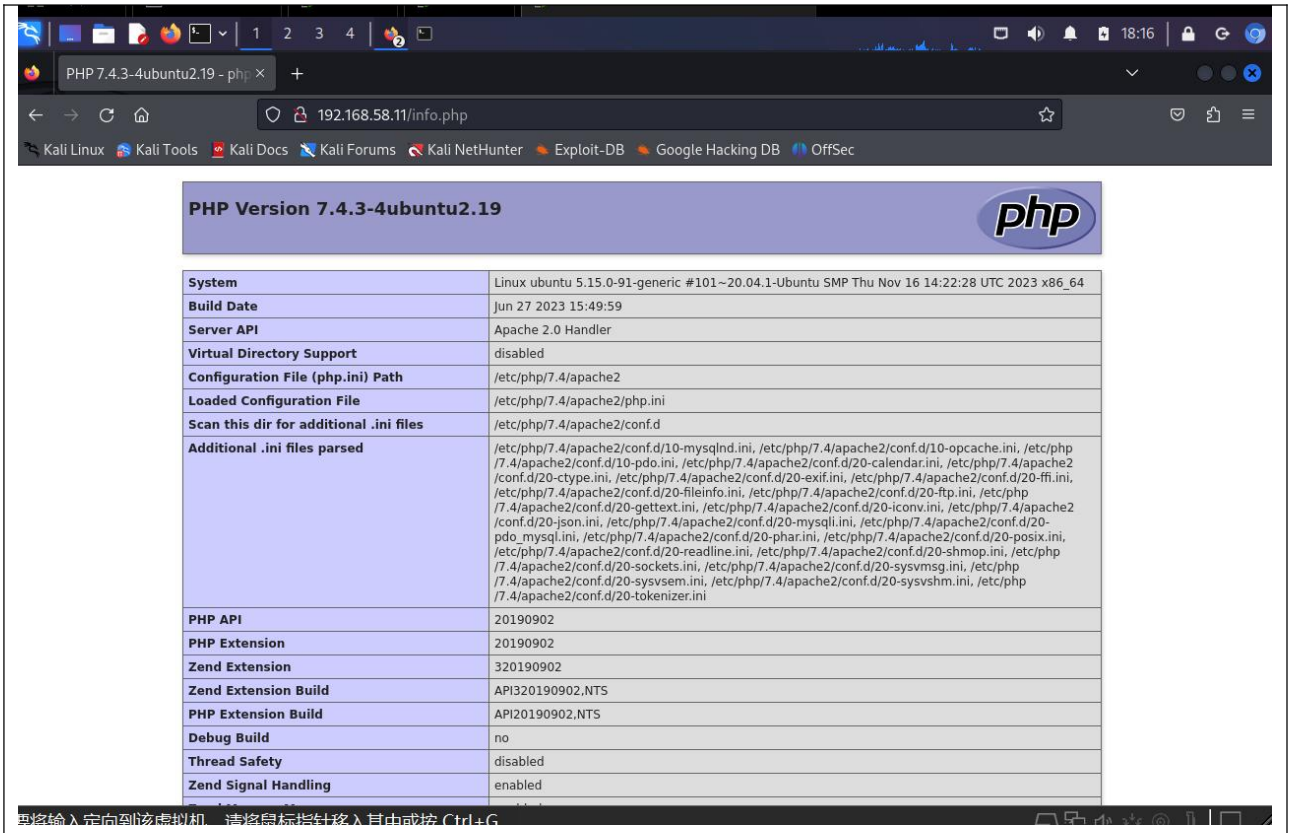
Insert your screen shot here:



Task 3: LAMP server setup

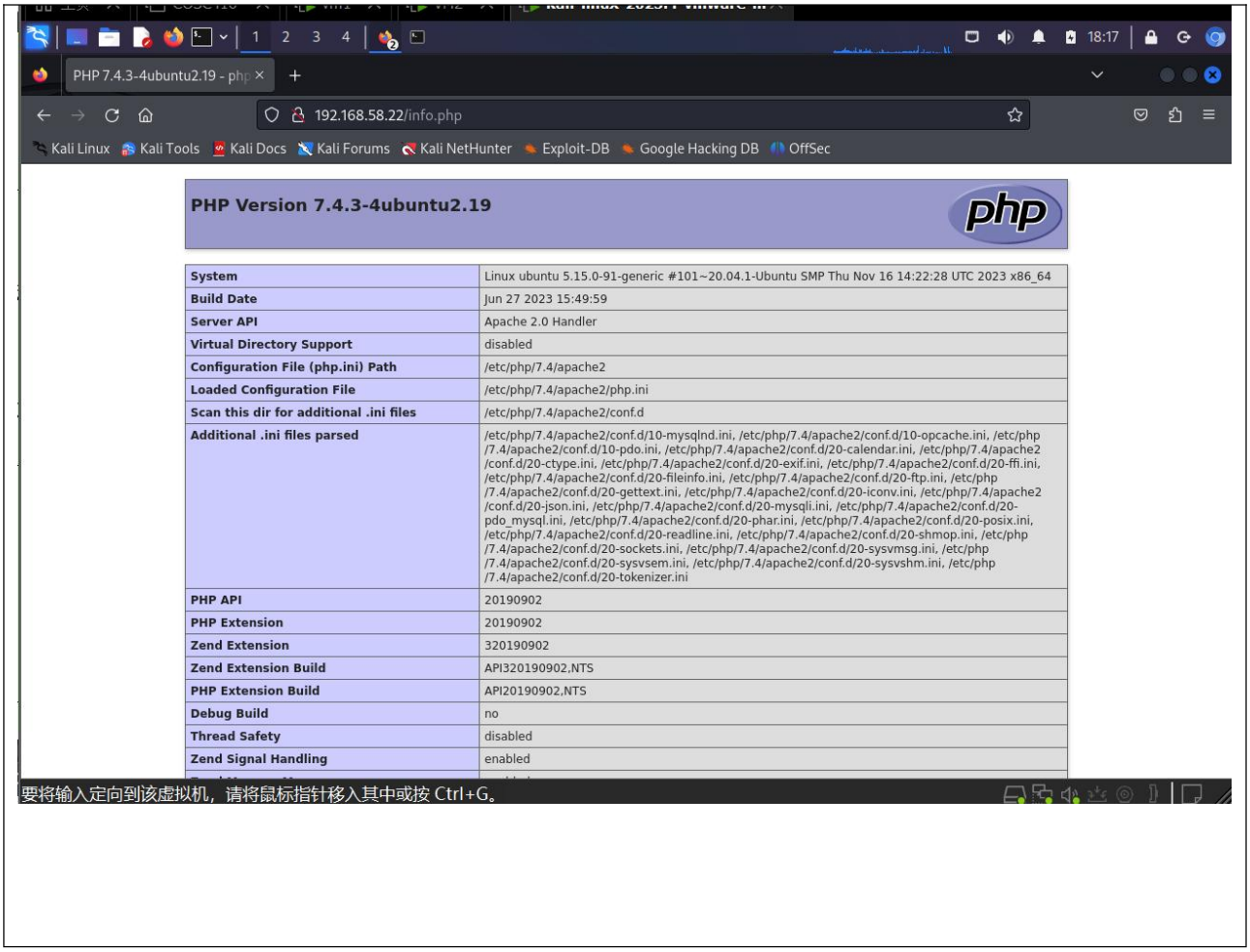
- Having a LAMP server setup is the prerequisite requirement for setting up Owncloud and Nextcloud servers in Task 4.
- Follow the steps from"Install LAMP server on Ubuntu 20.04.pdf" file to complete the LAMP server setup on both Ubuntu VM1 and Ubuntu VM2 respectively.
- Open a web browser in Kali VM to access the web server on Ubuntu VM1 by entering an URL: http://ubuntu-vm1-ip/phpinfo.php

  Take a screen shot of your Kali VM's web browser to show the result and insert the screenshot below:



- Use the same web browser in Kali VM to access the web server on Ubuntu VM2 by entering an URL: http://ubuntu-vm2-ip/phpinfo.php

  Take a screen shot of your Kali VM's web browser again to show the result and insert the screenshot below:



Task 4: Cloud File Storage Systems: Owncloud, Nextcloud

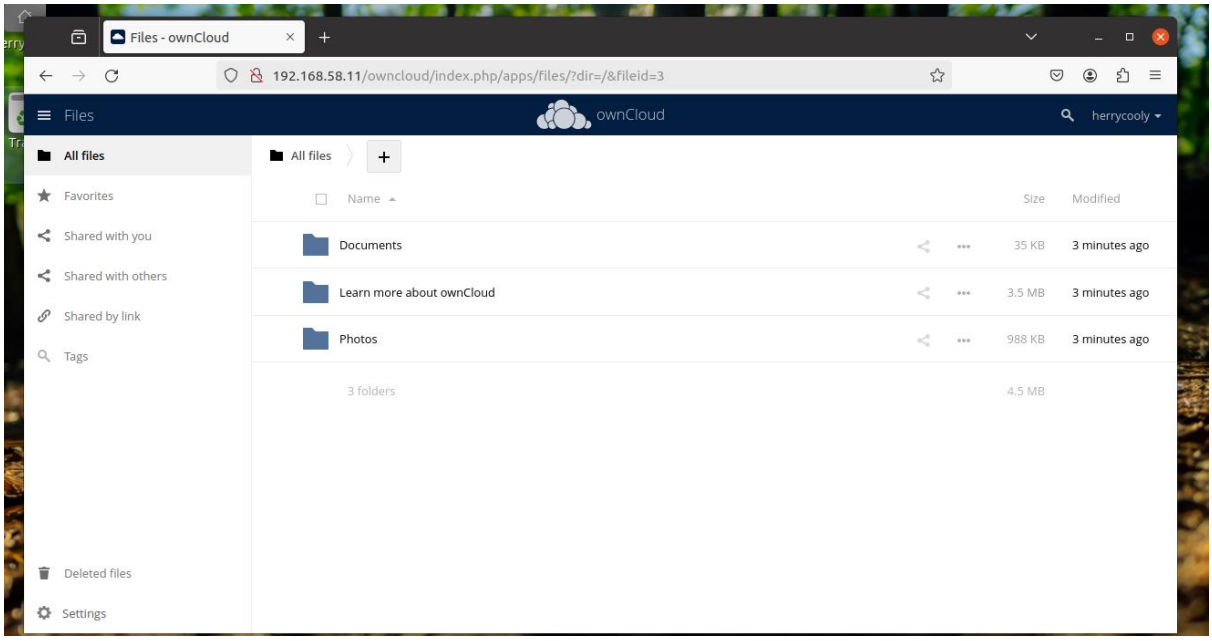
- Install and configure owncloud server software on Ubuntu VM1

- Follow the instructions from the link below:
  [How to Install and Configure ownCloud on Ubuntu 20.04 | Linode]

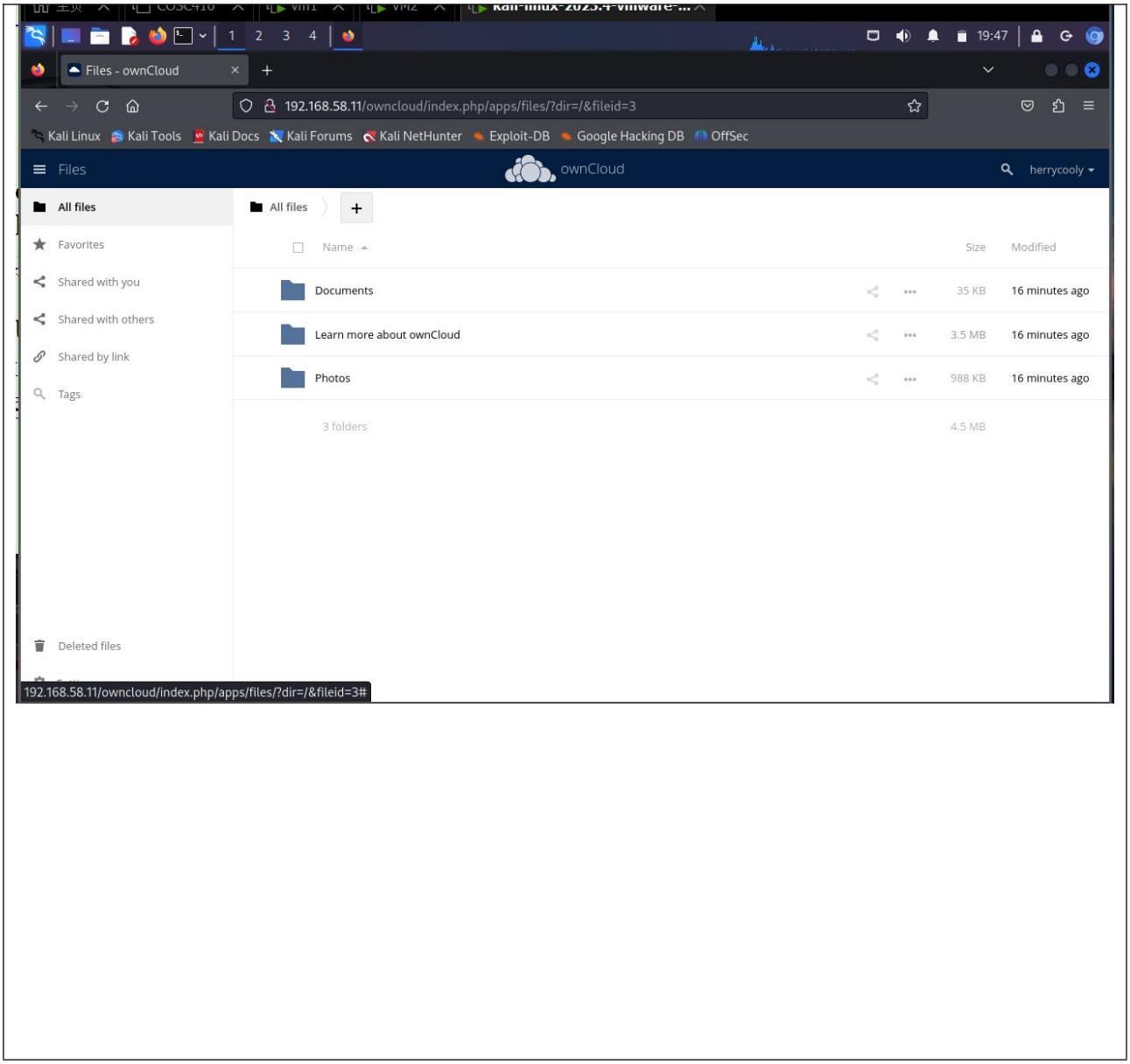
  Please note that LAMP stack should have already installed. So you should start from the step: "create your ownCloud database" with the following changes during the installation:
  * Step 3 during the database creation: the single "grant"statement should be replaced by two statements like these:
    >CREATE USER 'owncloduser'@'localhost' IDENTIFIED BY 'letmein';
    >GRANT ALL ON owncloud db.* TO ''owncloduser'@'localhost';

*The first line inside the ***owncloud.conf*** file has a typo:
`<VirtualHost \*:80>` should read `<VirtualHost *:80>` instead without the `\` character.

- When you finish the installation and configuration of owncloud server, using the host name (owncloud.cosc328.edu) to access your owncloud service with a browser. Take a screen shot of your web browser showing owncloud service, and insert your screen shot below:



- Log into Kali VM. Open a browser and use an URL like http://ubuntu-vm1-ip/owncloud/ to access the **owncloud** server from Ubuntu VM1. Take a screen shot of the browser showing owncloud service, and insert your screen shot below:



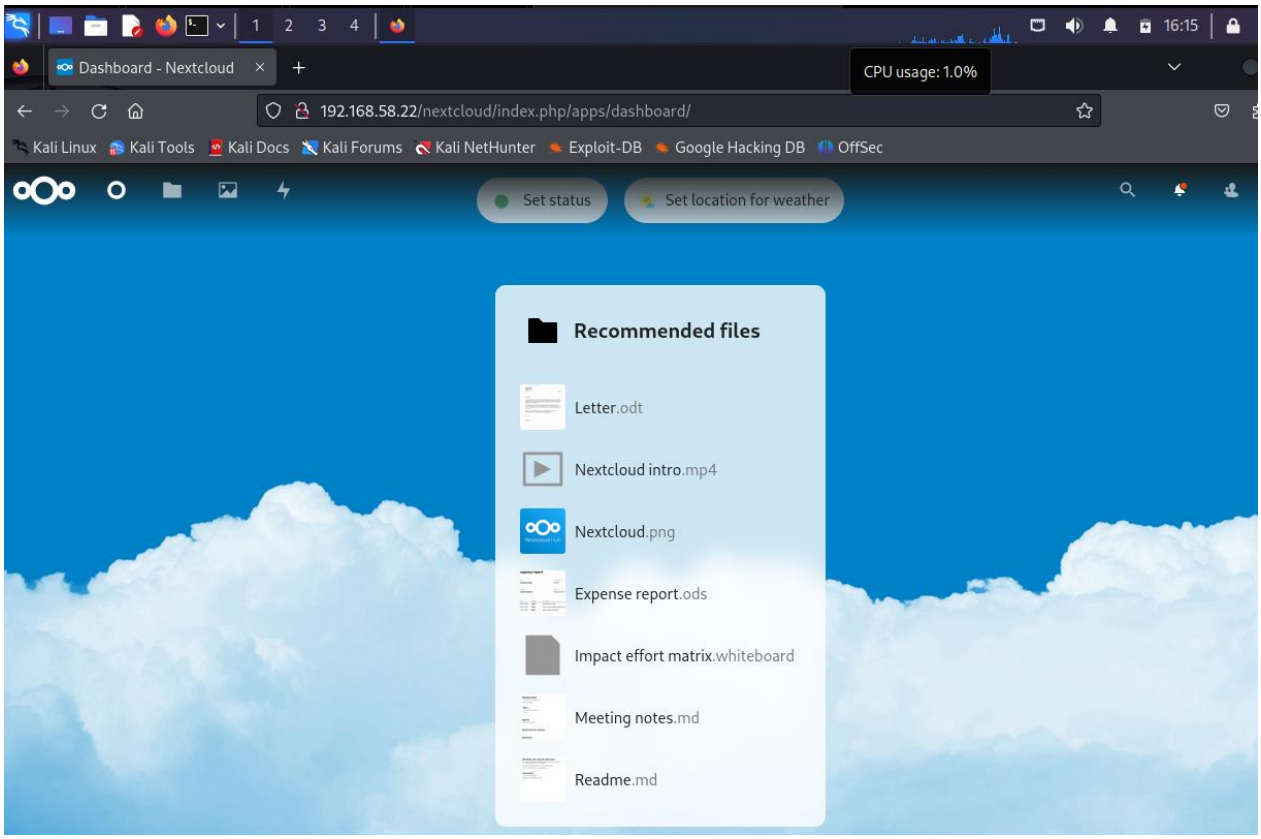
- Next install and configure **nextcloud** server software on Ubuntu VM2.
- Follow the same steps for installing and configuring owncloud server software with the following changes:

  - Download nextcloud using this url:
    `$ wget https://download.nextcloud.com/server/releases/nextcloud-21.0.1.zip`

  - Naming changes: owncloud => nextcloud

  When you finish the installation and configuration of nextcloud server, you can do a quick testing of your nextcloud service on the same VM with a web browser by entering an URL like http://localhost/nextcloud/ to access the nextcloud service. Make sure that it works!

- Next go into Kali VM. Open a browser and use an URL like http://ubuntu-vm2-ip/nextcloud/) to access the nextcloud server from Ubuntu VM2. Take a screen shot of the browser in Kali VM showing the nextcloud service, and insert your screen shot below:



Submitting your work:

Please export this Word document file with all your answers and embedded screen shots as a PDF file. Submit the PDF file via Lab 4 assignment tab on our Moodle course page by *Sunday, February 18, 2024 (by midnight).*