**Practical 10:-** Install Samba to share folders or files between Windows and Linux.

**Solution:-**

**Step1:- Installing Samba on Ubuntu**

Samba is available from the official Ubuntu repositories. To install it on your Ubuntu system follow the steps below:

Start by updating the apt packages index:

**# sudo apt update**

Install the Samba package with the following command:

**# sudo apt install samba**

```
rootclient@ubuntu:~$ sudo apt-get update
Hit:1 http://us.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://security.ubuntu.com/ubuntu bionic-security InRelease
Hit:3 http://us.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:4 http://us.archive.ubuntu.com/ubuntu bionic-backports InRelease
Reading package lists... Done
rootclient@ubuntu:~$ sudo apt-get install samba
Reading package lists... Done
Building dependency tree
Reading state information... Done
samba is already the newest version (2:4.7.6+dfsg~ubuntu-0ubuntu2.11).
0 upgraded, 0 newly installed, 0 to remove and 3 not upgraded.
rootclient@ubuntu:~$
```

Once the installation is completed, the Samba service will start automatically. To check whether the Samba server is running, type:

**# sudo systemctl status nmbd**

The output should look something like below indicating that Samba service is active and running:

```
rootclient@ubuntu:~$ sudo systemctl status nmbd
● nmbd.service - Samba NMB Daemon
   Loaded: loaded (/lib/systemd/system/nmbd.service; enabled; vendor preset: enabled)
   Active: active (running) since Sun 2019-09-15 11:05:28 PDT; 1h 12min ago
     Docs: man:nmbd(8)
           man:samba(7)
           man:smb.conf(5)
 Main PID: 962 (nmbd)
   Status: "nmbd: ready to serve connections..."
    Tasks: 1 (limit: 4668)
   CGroup: /system.slice/nmbd.service
           └─962 /usr/sbin/nmbd --foreground --no-process-group

Sep 15 11:05:26 ubuntu systemd[1]: Starting Samba NMB Daemon...
Sep 15 11:05:28 ubuntu systemd[1]: Started Samba NMB Daemon.
rootclient@ubuntu:~$
```

At this point, Samba has been installed and ready to be configured.

**Step 2:- Configuring firewall**

If you have a firewall running on your Ubuntu system you'll need to allow incoming UDP connections on ports 137 and 138 and TCP connections on ports 139 and 445.
Assuming you are using UFW to manage your firewall, you can open the ports by enabling the 'Samba' profile:

**# sudo ufw allow 'Samba'**

```
rootclient@ubuntu:~$ sudo ufw allow samba
Rules updated
Rules updated (v6)
rootclient@ubuntu:~$
```

**Step 3:- Creating Samba Users and Directory Structure**

For easier maintainability and flexibility instead of using the standard home directories (/home/user) all Samba directories and data will be located in the /samba directory.

To create the /samba directory type:

**# sudo mkdir /samba**

Set the group ownership to sambashare. This group is created during the Samba installation, later we will add all Samba users to this group.

**# sudo chgrp sambashare /samba**

Samba uses Linux users and group permission system but is has its own authentication mechanism separate from the standard Linux authentication.

**Step 5:- Creating Samba Users**

To create a new user named josh use the following command:

**# sudo useradd -M -d /samba/client -s /usr/sbin/nologin -G sambashare client**

The useradd options have the following meanings:

-M -do not create the user's home directory. We'll manually create this directory.

-d /samba/josh - set the user's home directory to /samba/josh.

-s /usr/sbin/nologin - disable shell access for this user.

-G sambashare - add the user to the sambashare group.

Create the user's home directory and set the directory ownership to user josh and group sambashare:

**#sudo mkdir /samba/client**

**#sudo chown client: sambashare /samba/client**

```
rootclient@ubuntu:~$ sudo useradd -M -d /samba/client -s /usr/sbin/nologin -G sambashare client
rootclient@ubuntu:~$ sudo mkdir /samba/client
rootclient@ubuntu:~$ sudo chown client:sambashare /samba/client
rootclient@ubuntu:~$
```

The following command will add the setgid bit to the **/samba/client** directory so the newly created files in this directory will inherit the group of the parent directory. For example, if you don't set the directory's permissions to 2770 and the sadmin user creates a new file the user client will not be able to read/write to this file.

**#sudo chmod 2770 /samba/client**

Add the client user account to the Samba database by setting the user password:

**#sudo smbpasswd -a client**

```
rootclient@ubuntu:~$ sudo chmod 2770 /samba/client
rootclient@ubuntu:~$ sudo smbpasswd -a client
New SMB password:
Retype new SMB password:
Added user client.
rootclient@ubuntu:~$ sudo smbpasswd -e client
Enabled user client.
rootclient@ubuntu:~$
```

Once the password is set to enable the Samba account run:

**#sudo smbpasswd -e client**

Enabled user josh.

**Step 4:- Configuring Global Samba Options**

Before making changes to the Samba configuration file, create a backup for future reference purposes:

**# sudo cp /etc/samba/smb.conf /etc/samba/smb.conf.bak**

The default configuration file that ships with the Samba package is configured for **standalone Samba server**. Open the file and make sure server role is set to standalone server

**# sudo nano /etc/samba/smb.confsudo**

By default, Samba listens on all interfaces. If you want to restrict access to the Samba server only from your internal network uncomment the following two lines and specify the **interfaces to bind to**:

```
  GNU nano 2.9.3                    /etc/samba/smb.conf                    Modified

# WINS Server - Tells the NMBD components of Samba to be a WINS Client
# Note: Samba can be either a WINS Server, or a WINS Client, but NOT both
;   wins server = w.x.y.z

# This will prevent nmbd to search for NetBIOS names through DNS.
   dns proxy = no

#### Networking ####

# The specific set of interfaces / networks to bind to
# This can be either the interface name or an IP address/netmask;
# interface names are normally preferred
;   interfaces = 127.0.0.0/8 eth0
# Only bind to the named interfaces and/or networks; you must use the
# 'interfaces' option above to use this.
# It is recommended that you enable this feature if your Samba machine is
# not protected by a firewall or is a firewall itself.  However, this
# option cannot handle dynamic or non-broadcast interfaces correctly.
;   bind interfaces only = yes
#### Debugging/Accounting ####
# This tells Samba to use a separate log file for each machine
# that connects
   log file = /var/log/samba/log.%m
# Cap the size of the individual log files (in KiB).
   max log size = 1000
# If you want Samba to only log through syslog then set the following
# parameter to 'yes'.
#   syslog only = no
# We want Samba to log a minimum amount of information to syslog. Everything
# should go to /var/log/samba/log.{smbd,nmbd} instead. If you want to log
# through syslog you should set the following parameter to something higher.
   syslog = 0
# Do something sensible when Samba crashes: mail the admin a backtrace
   panic action = /usr/share/samba/panic-action %d
####### Authentication #######
# Server role. Defines in which mode Samba will operate. Possible
# values are "standalone server", "member server", "classic primary
# domain controller", "classic backup domain controller", "active
# directory domain controller".
# Most people will want "standalone sever" or "member server".
# Running as "active directory domain controller" will require first
# running "samba-tool domain provision" to wipe databases and create a
# new domain.
   server role = standalone server
# If you are using encrypted passwords, Samba will need to know what
# password database type you are using.
```

Once done run the testparm utility to check the Samba configuration file for errors. If there are no syntax errors you will see loaded services file OK.

Finally, restart the Samba service with:

**# sudo systemctl restart nmbd**

**Step 5:- Configuring Samba Shares**

Open the Samba configuration file and append the sections:

**#sudo nano /etc/samba/smb.conf**

**# /etc/samba/smb.conf**

```
  GNU nano 2.9.3                          /etc/samba/smb.conf

;   browseable = no
;   create mask = 0600
;   directory mask = 0700

[printers]
   comment = All Printers
   browseable = no
   path = /var/spool/samba
   printable = yes
   guest ok = no
   read only = yes
   create mask = 0700

# Windows clients look for this share name as a source of downloadable
# printer drivers
[print$]
   comment = Printer Drivers
   path = /var/lib/samba/printers
   browseable = yes
   read only = yes
   guest ok = no
# Uncomment to allow remote administration of Windows print drivers.
# You may need to replace 'lpadmin' with the name of the group your
# admin users are members of.
# Please note that you also need to set appropriate Unix permissions
# to the drivers directory for these users to have write rights in it
;   write list = root, @lpadmin

[users]
path=/samba/users
browseable=yes
read only= no
force create mode=0660
force directory mode=2770
valid users=@sambashare @sadmin

[client]
path=/samba/client
browseable=no
read only=no
force create mode=0660
force directory mode=2770
valid  users =client@sadmin
```

The options have the following meanings:

**[users] and [client]** - The names of the shares that you will use when logging in.

**path -** The path to the share.

**browseable** - Whether the share should be listed in the available shares list. By setting to no other users will not be able to see the share.

**read only** - Whether the users specified in the valid users list are able to write to this share.

**force create mode** - Sets the permissions for the newly created files in this share.

**force directory mode** - Sets the permissions for the newly created directories in this share.

**valid users -** A list of users and groups that are allowed to access the share. Groups are prefixed with the @ symbol.

Once done, restart the Samba service with:

**#sudo systemctl restart nmbd**

**Step 6:- Connecting to a Samba Share from Linux**

Linux users can access the samba share from the command line, using the file manager or mount the Samba share.

**Using the smbclient client**

Sudo apt-get install smbclient is a tool that allows you to access Samba from the command line. The smbclient package is not pre-installed on most Linux distros so you will need to install it with your distribution package manager.

To install smbclient on Ubuntu and Debian run:

**# sudo apt install smbclient**

```
rootclient@ubuntu:~$ sudo apt-get install smbclient
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  cifs-utils heimdal-clients
The following NEW packages will be installed:
  smbclient
0 upgraded, 1 newly installed, 0 to remove and 3 not upgraded.
Need to get 352 kB of archives.
After this operation, 1,773 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu bionic-updates/main amd64 smbclient amd64 2:4.7.6+dfsg~ubunt
u-0ubuntu2.11 [352 kB]
Fetched 352 kB in 3s (131 kB/s)
Selecting previously unselected package smbclient.
(Reading database ... 165812 files and directories currently installed.)
Preparing to unpack .../smbclient_2%3a4.7.6+dfsg~ubuntu-0ubuntu2.11_amd64.deb ...
Unpacking smbclient (2:4.7.6+dfsg~ubuntu-0ubuntu2.11) ...
Setting up smbclient (2:4.7.6+dfsg~ubuntu-0ubuntu2.11) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
```

The syntax to access a Samba share is as follows:

**mbclient //samba_hostname_or_server_ip/share_name -U username**

For example to connect to a share named client  on a Samba server with IP address 192.168.171.130 as user client you would run:

**smbclient //192.168.171.130/client -U client**

You will be prompted to enter the user password.

Enter WORKGROUP\client's password:

```
rootclient@ubuntu:~$ smbclient //192.168.171.130/client
Enter WORKGROUP\rootclient's password:
```

Once you enter the password you will be logged into the Samba command line interface.

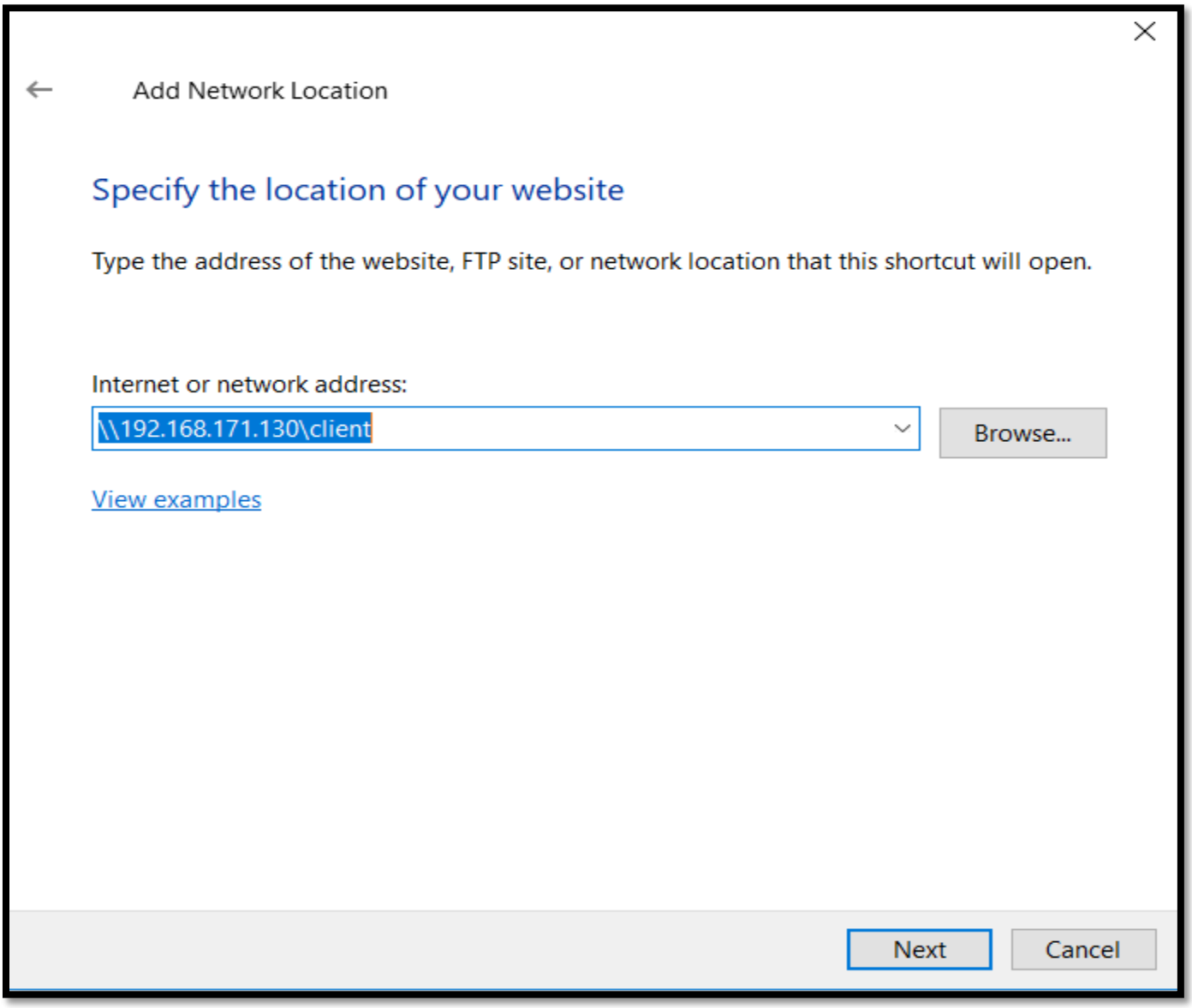
Try "help" to get a list of possible commands.

smb: \>

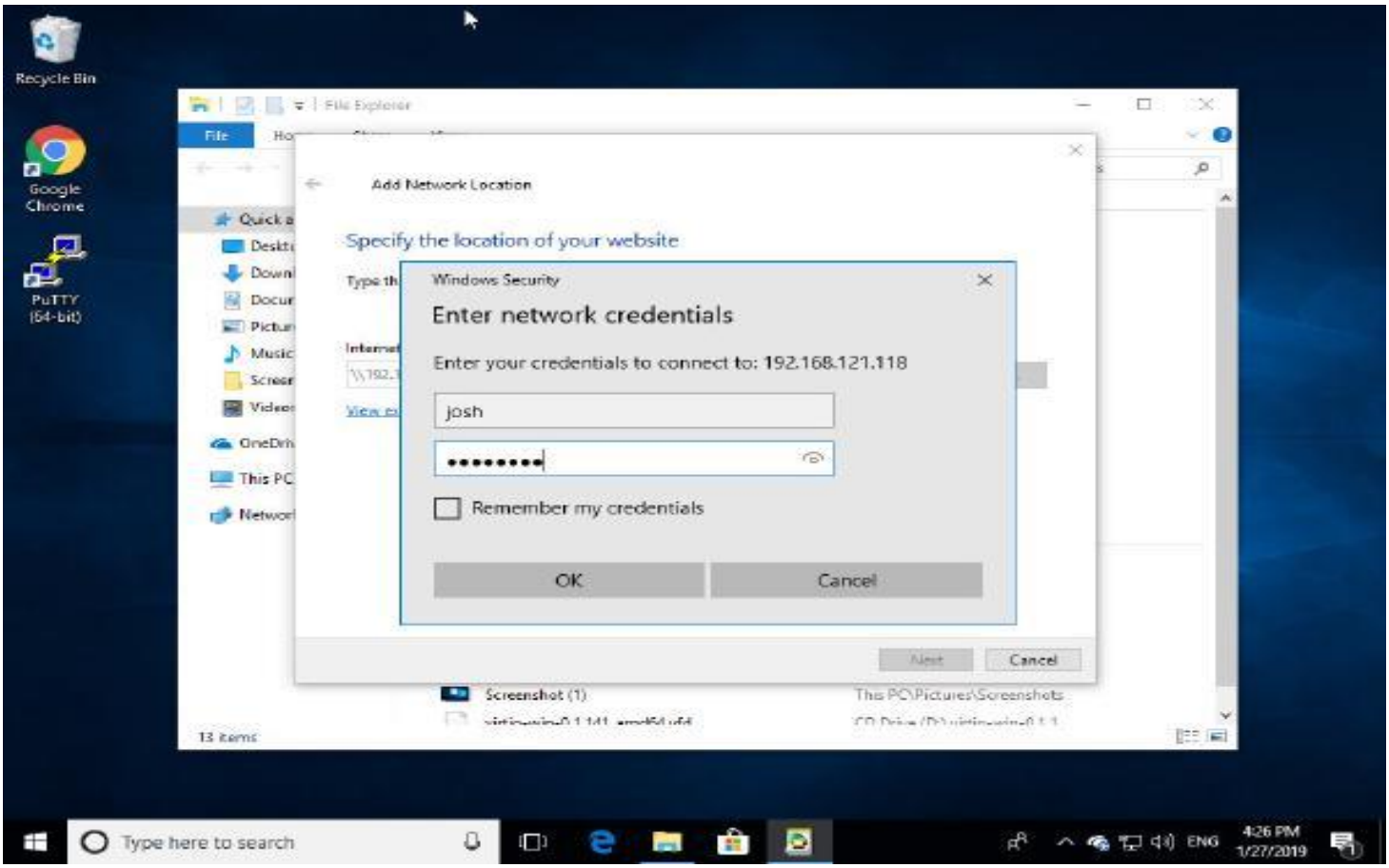
**Step 7: - Connecting to a Samba Share from Windows**

Windows users also have an option to connect to the Samba share from both command line and GUI. The steps below show how to access the share using the Windows File Explorer.

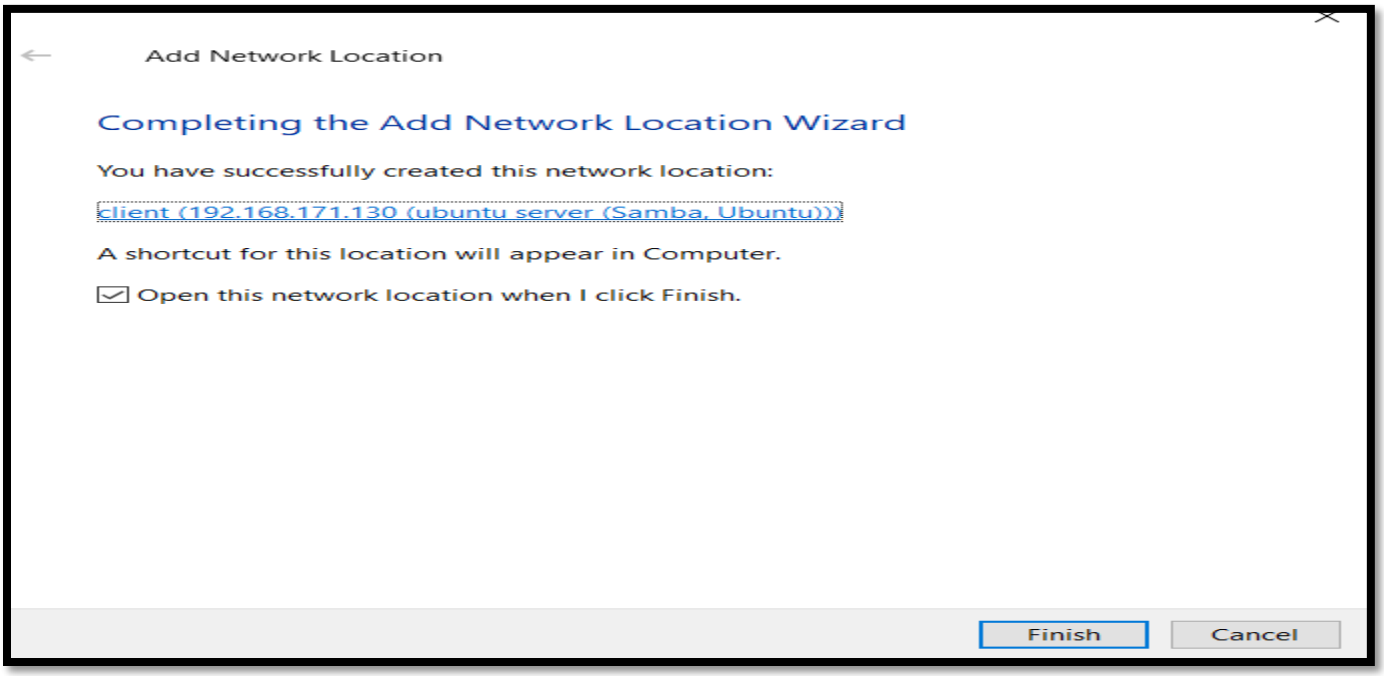
- Open up File Explorer and in the left pane right-click on “This PC”.
- Select “Choose a custom network location” and then click “Next”.
- In “Internet or network address”, enter the address of the Samba share in the following format \\samba_hostname_or_server_ip\sharename.



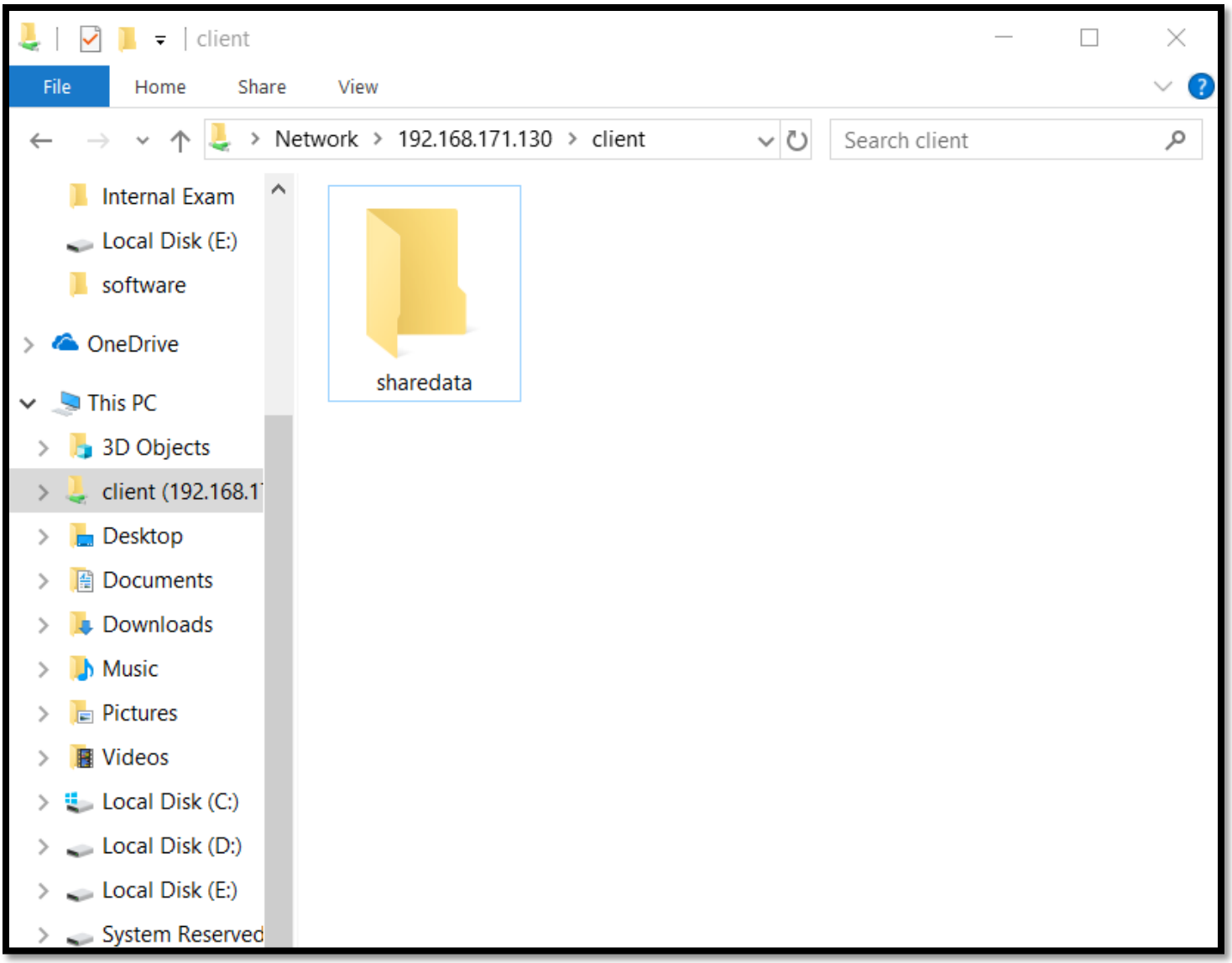

- Click “Next” and you will be prompted to enter the login credentials as shown below:




- In the next window you can type a custom name for the network location. The default one will be picked up by the Samba server.




- Click “Next” to move to the last screen of the connection setup wizard.
- Click “Finish” and the files on the Samba server will be shown.


client
File
Home
Share
View
Network
192.168.171.130
client
Search client
Internal Exam
Local Disk (E:)
software
OneDrive
This PC
3D Objects
client (192.168.1
Desktop
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Downloads
Music
Pictures
Videos
Local Disk (C:)
Local Disk (D:)
Local Disk (E:)
System Reserved
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