Intro to Linux

Copying Files Between Systems Lab

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Copying Files Between Systems Materials

- Materials needed
  - Ubuntu Linux Machine
  - Kali Linux Machine
- Software Tools used
  - rsync
  - Secure Copy Protocol (scp)
  - netcat (nc)

Objectives Covered

- Linux+ Objectives (XKO-005)
  - Objective 1.2 - Given a scenario, manage files and directories.
    - rsync
    - scp
    - nc

Copying Files Between Systems Overview

1. Edit the sshd.config file to allow access
2. Create files to transfer/ backup between machines
3. Use rsync to backup files between machines
4. Use Secure Copy Protocol (SCP) to transfer a file
5. Use Netcat (nc) to move a file between machines

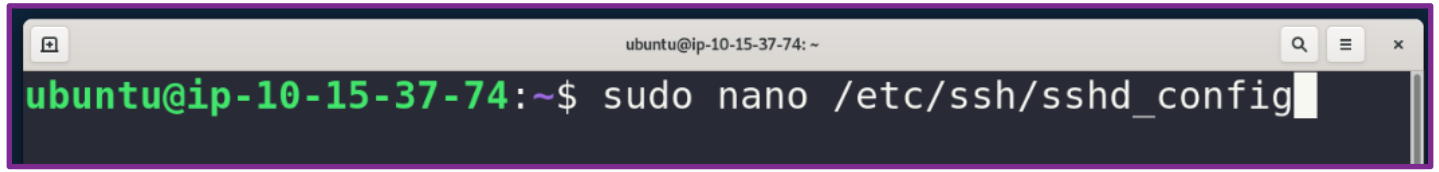
*Note this lab will be performed between two students using their Ubuntu Linux machines.

Setup Environments

- Log into your range
- Open the Ubuntu Linux Environment in one tab
  - You should be on your Ubuntu Linux Desktop
- Use **`hostname -I`** to take note of your IP address and pass it to your partner.

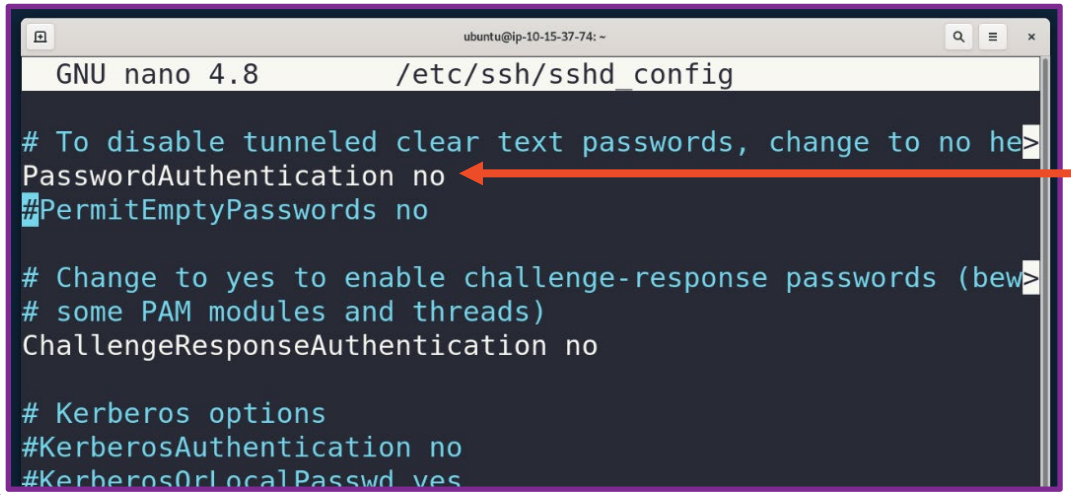
Opening the sshd.config for Ubuntu

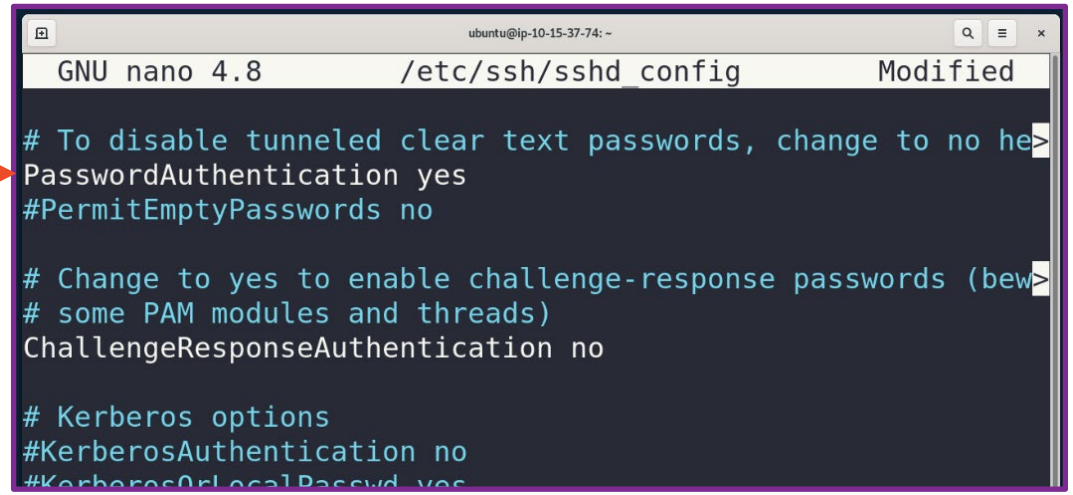
- Both student 1 and 2 need to complete this portion.
- Move to your Ubuntu machine.
- Open a terminal by clicking the white and black icon on the dashboard on the left.
- Open the sshd.config file with the nano editor.
- **`sudo nano /etc/ssh/sshd_config`**



Editing the sshd.config for Ubuntu

- Scroll down to the line that has “PasswordAuthentication no” and change “no” to “yes”
- Hit CTRL+X, Y, [Enter] to save the file changes
- Restart ssh: **`sudo service ssh restart`**





Transfer Files with rsync as Student 1

- Student 1:
- Create a directory to that can be transferred between machines.

  `mkdir rsync_backup`

- Navigate into the directory and create 100 empty files to serve as practice files to backup.

  `cd rsync_backup`

  `touch test{1..100}.txt`

  `ls` to view the files created.

```
ubuntu@ip-10-15-39-185:~$ mkdir rsync_backup
ubuntu@ip-10-15-39-185:~$ cd rsync_backup/
ubuntu@ip-10-15-39-185:~/rsync_backup$ touch test{1..100}.txt
ubuntu@ip-10-15-39-185:~/rsync_backup$ ls
test1.txt    test27.txt  test45.txt  test63.txt  test81.txt
test10.txt   test28.txt  test46.txt  test64.txt  test82.txt
test100.txt  test29.txt  test47.txt  test65.txt  test83.txt
test11.txt   test3.txt   test48.txt  test66.txt  test84.txt
test12.txt   test30.txt  test49.txt  test67.txt  test85.txt
test13.txt   test31.txt  test5.txt   test68.txt  test86.txt
test14.txt   test32.txt  test50.txt  test69.txt  test87.txt
test15.txt   test33.txt  test51.txt  test7.txt   test88.txt
test16.txt   test34.txt  test52.txt  test70.txt  test89.txt
test17.txt   test35.txt  test53.txt  test71.txt  test9.txt
test18.txt   test36.txt  test54.txt  test72.txt  test90.txt
test19.txt   test37.txt  test55.txt  test73.txt  test91.txt
```

Backup/ Transfer Files with rsync cont'd

- Return to the previous directory with **`cd ..`**
- Backup or transfer the files using rsync to your partner's machine.
- **`rsync -a /home/ubuntu/rsync_backup ubuntu@<Partner_IP>:/home/ubuntu/backup`**

rsync –a is used as a recursive option to include all the files as they are in the directory.

The full source path is needed for the source directory/file.

The full destination path is needed for the location. Note we included a new directory called "backup" at the end.

```
ubuntu@ip-10-15-39-185:~/rsync_backup$ cd ..
ubuntu@ip-10-15-39-185:~$ rsync -a /home/ubuntu/rsync_backup/ ubuntu@10
.15.55.123:/home/ubuntu/backup
The authenticity of host '10.15.55.123 (10.15.55.123)' can't be establi
shed.
ECDSA key fingerprint is SHA256:CiljuzfxItjY8JIwZAzbqixUcdd6VC82Bli9pgx
n7Ac.
Are you sure you want to continue connecting (yes/no/[fingerprint])? ye
s
Warning: Permanently added '10.15.55.123' (ECDSA) to the list of known
hosts.
ubuntu@10.15.55.123's password:
ubuntu@ip-10-15-39-185:~$
```

rsync Authentication

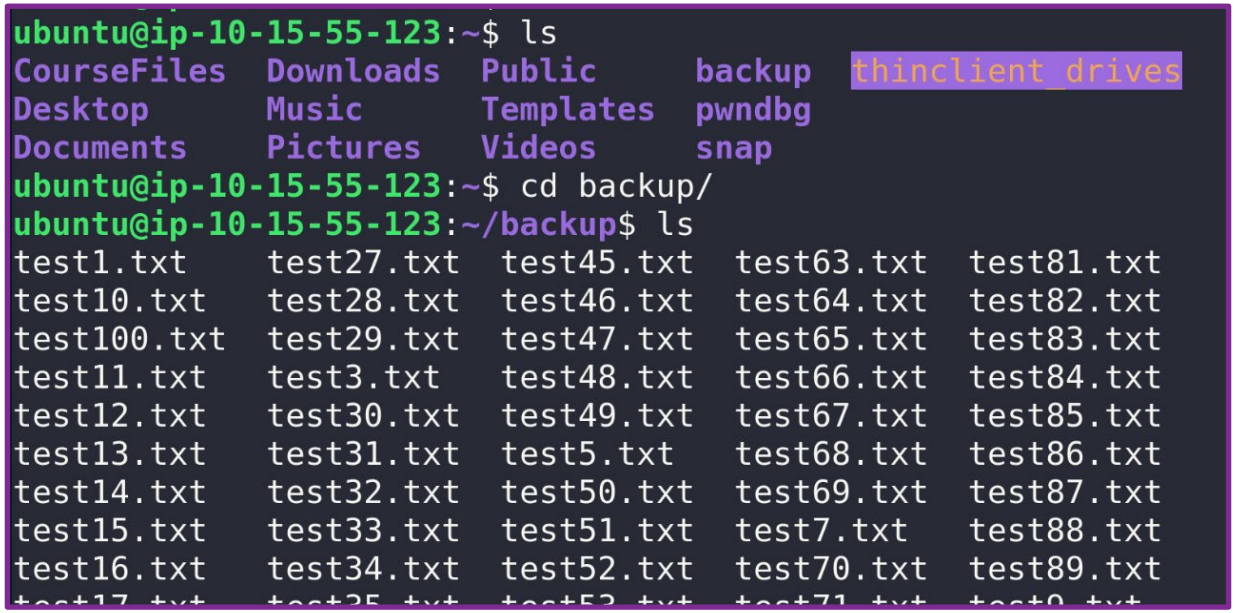
- Since this is the first time these machines would be connected, authentication is required.
- When asked if you are sure you want to connect, type out yes [Enter].
- Enter the password for the Ubuntu machine, which is simply “password” [Enter] but note it will appear as if nothing is being typed.
- After a few second the terminal prompt will reappear signifying the files were transferred.

```
ubuntu@ip-10-15-39-185:~/rsync_backup$ cd ..
ubuntu@ip-10-15-39-185:~$ rsync -a /home/ubuntu/rsync_backup/ ubuntu@10
.15.55.123:/home/ubuntu/backup
The authenticity of host '10.15.55.123 (10.15.55.123)' can't be establi
shed.
ECDSA key fingerprint is SHA256:CiljuzfxItjY8JIwZAzbqixUcdd6VC82Bli9pgx
n7Ac.
Are you sure you want to continue connecting (yes/no/[fingerprint])? ye
s
Warning: Permanently added '10.15.55.123' (ECDSA) to the list of known
hosts.
ubuntu@10.15.55.123's password:
ubuntu@ip-10-15-39-185:~$
```

View the rsync Files as Student 2

- Student 2:
- Use **`ls`** to view the files and you should see a directory called backup now.
- Change directories into the backup folder and view the files

```
cd backup/
ls
```



Create a File for SCP as Student 2

- Student 2:
- Return to the home directory with **`cd`**
- Create a new file to send via SCP

  `touch test_scp.txt`

  `nano test_scp.txt`
- Type in the following: “Example SCP text”
- Hit CTRL+X, Y, [Enter] to save the file changes

```
ubuntu@ip-10-15-55-123:~/backup$ cd
ubuntu@ip-10-15-55-123:~$ touch test_scp.txt
ubuntu@ip-10-15-55-123:~$ nano test_scp.txt
ubuntu@ip-10-15-55-123:~$
```

```
ubuntu@ip-10-15-55-123: ~
  GNU nano 4.8                    test_scp.txt
Example SCP Text.
```

Transfer a File for SCP as Student 2

- Transfer the file using SCP by listing the file and the destination host: directory location

  `scp test_scp.txt ubuntu@<Partner_IP>:/home/ubuntu/`

- You will have the same authentication message as student 1 where you will need to type ‘yes’ and [Enter]
- Enter the password at the prompt and you should see the status of the transfer immediately.

```
ubuntu@ip-10-15-55-123:~$ scp test_scp.txt ubuntu@10.15.39.185:/home/
ubuntu
The authenticity of host '10.15.39.185 (10.15.39.185)' can't be estab
lished.
ECDSA key fingerprint is SHA256:2Wnc8nZNAMJEs1q1lUYSiGlsG6m/17HhdXqee
AkFJ4w.
Are you sure you want to continue connecting (yes/no/[fingerprint])?
yes
Warning: Permanently added '10.15.39.185' (ECDSA) to the list of know
n hosts.
ubuntu@10.15.39.185's password:
test_scp.txt                      100%   18    24.6KB/s   00:00
ubuntu@ip-10-15-55-123:~$
```

View a File from SCP as Student 1

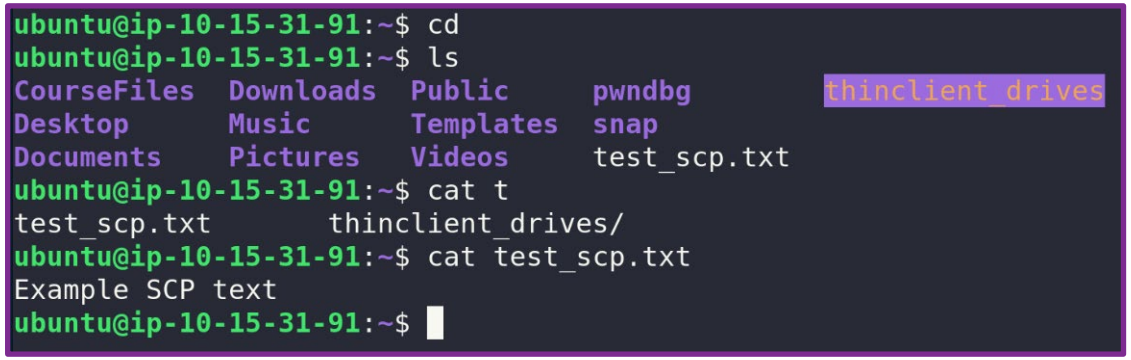
- Student 1:
- Make sure you are in the home directory and list the files

  `cd`

  `ls`

- You should see the scp test file, which you can view

  `cat test_scp.txt`



Transfer a File with Netcat (nc): Listener

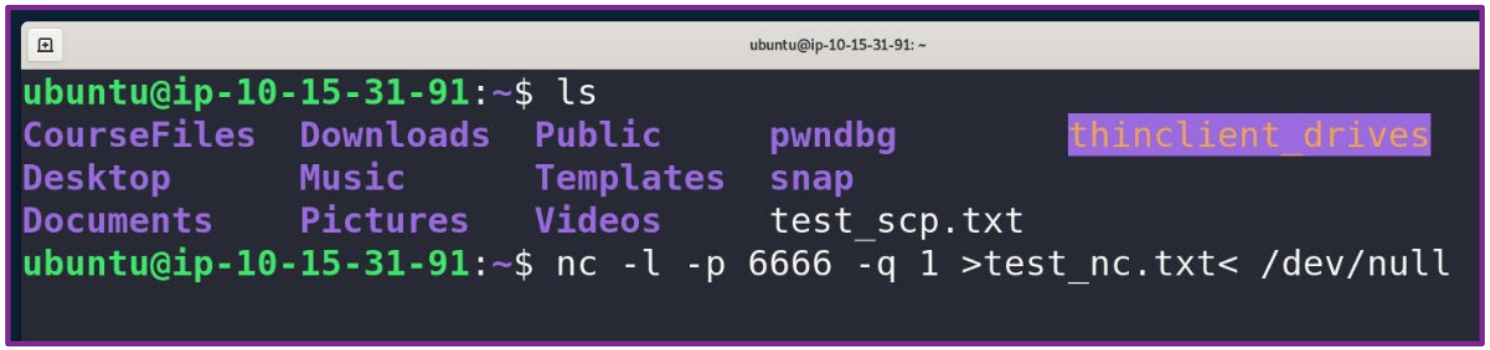
- Student 1:
- Netcat requires one machine to be a listener and one sender, which can only be setup one at a time.
- Use the following to setup Student 1 machine to listen:

```
nc -l -p 6666 -q 1 >test_nc.txt< /dev/null
```

Starts nc listening on port 6666 and sets it to close out

File that we are listening for

Ensures that the connection closes once the file is received



Transfer a File with Netcat (nc): Sender

- Student 2:
- Create a new file to send via nc

```
touch test_nc.txt
nano test_nc.txt
```

- Type in the following: “Example nc text”
- Use nc to send the file to the listener using the “|’ located above the [Enter] key, which will take the output from the first command and use it for the second command

```
cat test_nc.txt | netcat <Partner_IP> 6666
```

Reads or prints the contents of the file

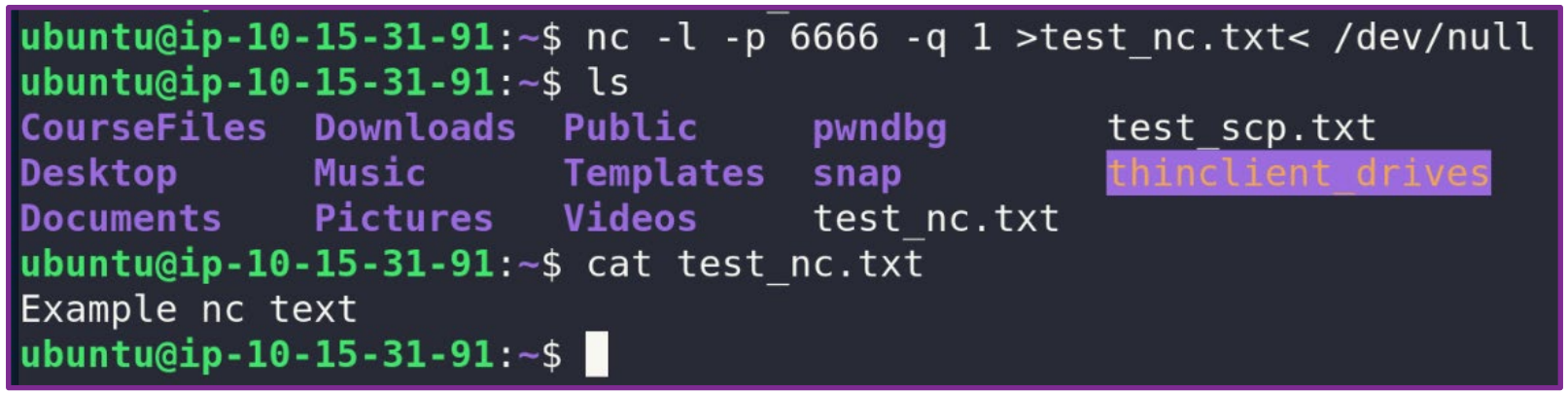
Sends that out put through netcat to the destination device

```
ubuntu@ip-10-15-21-222:~$ nano test_nc.txt
ubuntu@ip-10-15-21-222:~$ cat test_nc.txt | netcat 10.15.31.91 6666
```

View the File from Netcat (nc): Listener

- Student 1:
- List the files and view the nc file that was sent.

```
ls
cat test_nc.txt
```



Wrap-up

- rsync is a versatile tool that allows transferring and backing up files while maintaining the current file structure and transferring only the differences between the source and destination.
- scp is a pure copy/ transfer of files without considering similar files.
- nc can copy files and contains a ton of options, but it should be noted that it is not encrypted.
- You can view the manual for rsync, scp, and nc in the Ubuntu machine for additional options.