

## Assignment – 7

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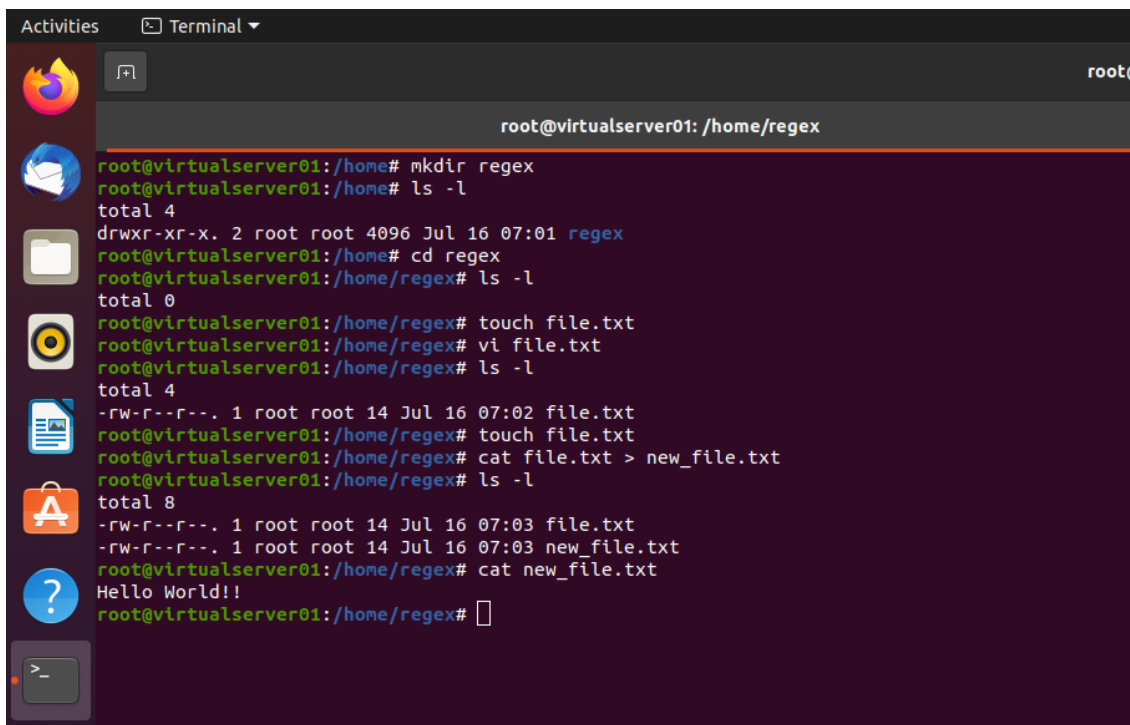
ID: SIRSS1114

1. Create a file via touch and update that file and also verify the timestamp and output will be redirected to another file.

- The touch command is a standard command used in UNIX/Linux operating system which is used to update the timestamp of a file or if file does not exist, it creates with current timestamp.

In terminal enter command: `touch file.txt`

- This creates a new file named file.txt and we use editor vi to edit the file and add text to it. Command: `vi file.txt`
- Press key i to change mode to insert mode and enter the data, after adding data press ESC key and :wq and press enter to save and exit the editor
- We can view the details of the file by using command: `ls -l`
- Using touch command again on file `file.txt` updates its timestamp to the current one.
- We can use cat command to see the content of the file directly from the terminal without opening any editor. Command: `cat file.txt`
- We use `>` operator to direct the output of cat command to create a new file which here create `new_file.txt` with data similar to file.txt



```
Activities  Terminal
root@virtualserver01: /home/regex

root@virtualserver01:/home# mkdir regex
root@virtualserver01:/home# ls -l
total 4
drwxr-xr-x. 2 root root 4096 Jul 16 07:01 regex
root@virtualserver01:/home# cd regex
root@virtualserver01:/home/regex# ls -l
total 0
root@virtualserver01:/home/regex# touch file.txt
root@virtualserver01:/home/regex# vi file.txt
root@virtualserver01:/home/regex# ls -l
total 4
-rw-r--r--. 1 root root 14 Jul 16 07:02 file.txt
root@virtualserver01:/home/regex# touch file.txt
root@virtualserver01:/home/regex# cat file.txt > new_file.txt
root@virtualserver01:/home/regex# ls -l
total 8
-rw-r--r--. 1 root root 14 Jul 16 07:03 file.txt
-rw-r--r--. 1 root root 14 Jul 16 07:03 new_file.txt
root@virtualserver01:/home/regex# cat new_file.txt
Hello World!!
root@virtualserver01:/home/regex#
```



root@virtualserver01: /home/regex

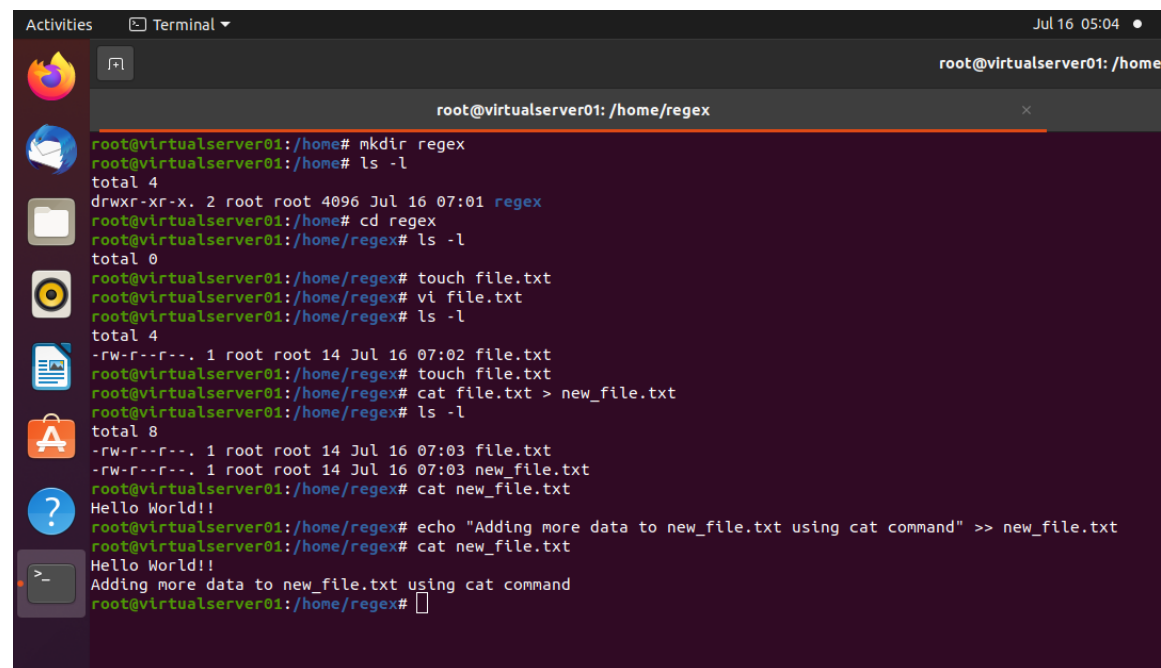
Hello World!!



:wq

## 2. Add some of the data as per your choice and append that data via echo command in the same file

- The `echo` command is somewhat similar to print command in python or cout in C/C++ which print values or value of variable whichever is passed to it.
- We use echo command and direct its output to append in `new_file.txt` that we created earlier.
- `>>` operator is used to append data while `>` operator is used to write data to a file (if data is already present in file, it overwrites it).
- We can see that data is appended to `new_file.txt`



The screenshot shows a terminal window titled 'Terminal' with the prompt 'root@virtualserver01: /home'. The user has created a directory named 'regex' and navigated into it. They have created a file named 'file.txt' and then 'new\_file.txt' using the 'cat' command. The terminal output shows the following commands and their results:

```
root@virtualserver01:/home# mkdir regex
root@virtualserver01:/home# ls -l
total 4
drwxr-xr-x. 2 root root 4096 Jul 16 07:01 regex
root@virtualserver01:/home# cd regex
root@virtualserver01:/home/regex# ls -l
total 0
root@virtualserver01:/home/regex# touch file.txt
root@virtualserver01:/home/regex# vi file.txt
root@virtualserver01:/home/regex# ls -l
total 4
-rw-r--r--. 1 root root 14 Jul 16 07:02 file.txt
root@virtualserver01:/home/regex# touch file.txt
root@virtualserver01:/home/regex# cat file.txt > new_file.txt
root@virtualserver01:/home/regex# ls -l
total 8
-rw-r--r--. 1 root root 14 Jul 16 07:03 file.txt
-rw-r--r--. 1 root root 14 Jul 16 07:03 new_file.txt
root@virtualserver01:/home/regex# cat new_file.txt
Hello World!!
root@virtualserver01:/home/regex# echo "Adding more data to new_file.txt using cat command" >> new_file.txt
root@virtualserver01:/home/regex# cat new_file.txt
Hello World!!
Adding more data to new_file.txt using cat command
root@virtualserver01:/home/regex#
```

## 3. Install httpd and set up your own web server

- Installing httpd service (hypertext transfer protocol daemon)
- Command: `yum install <service-name>`
- We run command `yum install httpd` to install httpd service to setup our own http webserver
- Transfer files in folder `/var/www/html` to make them accessible from other devices.

```

root@virtualserver01:/home/regex# yum install -y httpd
Last metadata expiration check: 0:02:59 ago on Fri 16 Jul 2021 07:02:25 AM CDT.
Dependencies resolved.
=====
Package                Architecture      Version                                Repository      Size
=====
Installing:
httpd                  x86_64            2.4.37-39.module_el8.4.0+778+c97deab  appstream      1.4 M
Installing dependencies:
apr                    x86_64            1.6.3-11.el8                          appstream      125 k
apr-util              x86_64            1.6.1-6.el8                            appstream      185 k
centos-logos-httpd    noarch            85.8-1.el8                             basesos         75 k
httpdfilesystem       noarch            2.4.37-39.module_el8.4.0+778+c97deab  appstream      38 k
httpd-tools            x86_64            2.4.37-39.module_el8.4.0+778+c97deab  appstream      166 k
mailcap               noarch            2.1.48-3.el8                           basesos         39 k
mod_http2             x86_64            1.15.7-3.module_el8.4.0+778+c97deab  appstream      154 k
Installing weak dependencies:
apr-util-bdb          x86_64            1.6.1-6.el8                            appstream      25 k
apr-util-openssl      x86_64            1.6.1-6.el8                            appstream      27 k
Enabling module streams:
httpd                 2.4
=====
Transaction Summary
=====
Install 10 Packages
Total download size: 2.1 M
Installed size: 5.6 M
Downloading Packages:
(1/10): apr-util-bdb-1.6.1-6.el8.x86_64.rpm                5.3 MB/s | 25 kB  00:00
(2/10): apr-util-1.6.1-6.el8.x86_64.rpm                   15 MB/s | 185 kB  00:00
(3/10): apr-util-openssl-1.6.1-6.el8.x86_64.rpm           12 MB/s | 27 kB  00:00
(4/10): apr-1.6.3-11.el8.x86_64.rpm                       14 MB/s | 125 kB  00:00
(5/10): httpdfilesystem-2.4.37-39.module_el8.4.0+778+c97deab.noarch.rpm  15 MB/s | 38 kB  00:00
(6/10): httpd-tools-2.4.37-39.module_el8.4.0+778+c97deab.x86_64.rpm      29 MB/s | 166 kB  00:00
(7/10): centos-logos-httpd-85.8-1.el8.noarch.rpm          31 MB/s | 75 kB  00:00
(8/10): mod_http2-1.15.7-3.module_el8.4.0+778+c97deab.x86_64.rpm        28 MB/s | 154 kB  00:00
(9/10): mailcap-2.1.48-3.el8.noarch.rpm                   15 MB/s | 39 kB  00:00
(10/10): httpd-2.4.37-39.module_el8.4.0+778+c97deab.x86_64.rpm          49 MB/s | 1.4 MB  00:00
-----
Total
warning: /var/cache/dnf/appstream-e641110565df5421/packages/apr-1.6.3-11.el8.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID 8483c65d: NOKEY
CentOS Linux 8 - AppStream
Importing GPG key 0x8483c65d:
Userid : "CentOS (CentOS Official Signing Key) <security@centos.org>"
Fingerprint: 990B 70FA E1D7 CE22 7FB6 4882 0585 5583 8483 C65D
From : /etc/pki/rpm-gpg/RPM-GPG-KEY-centosofficial
Key imported successfully
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction

```

```

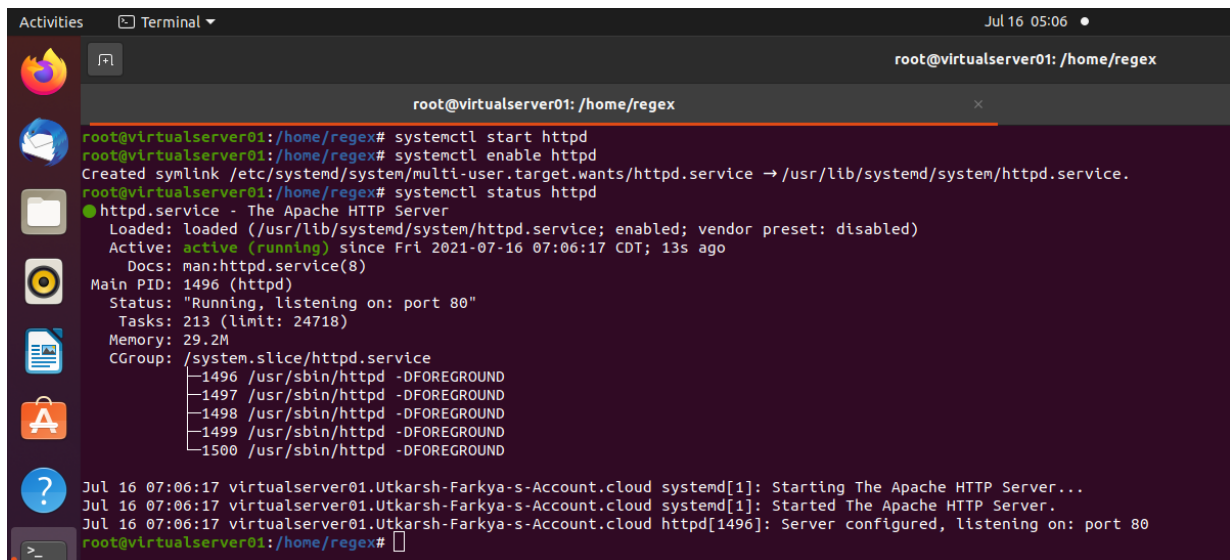
(6/10): httpd-tools-2.4.37-39.module_el8.4.0+778+c97deab.x86_64.rpm      29 MB/s | 166 kB  00:00
(7/10): centos-logos-httpd-85.8-1.el8.noarch.rpm                        31 MB/s | 75 kB  00:00
(8/10): mod_http2-1.15.7-3.module_el8.4.0+778+c97deab.x86_64.rpm        28 MB/s | 154 kB  00:00
(9/10): mailcap-2.1.48-3.el8.noarch.rpm                                  15 MB/s | 39 kB  00:00
(10/10): httpd-2.4.37-39.module_el8.4.0+778+c97deab.x86_64.rpm          49 MB/s | 1.4 MB  00:00
-----
Total
warning: /var/cache/dnf/appstream-e641110565df5421/packages/apr-1.6.3-11.el8.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID 8483c65d: NOKEY
CentOS Linux 8 - AppStream
Importing GPG key 0x8483c65d:
Userid : "CentOS (CentOS Official Signing Key) <security@centos.org>"
Fingerprint: 990B 70FA E1D7 CE22 7FB6 4882 0585 5583 8483 C65D
From : /etc/pki/rpm-gpg/RPM-GPG-KEY-centosofficial
Key imported successfully
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing                : apr-1.6.3-11.el8.x86_64                                1/10
  Running scriptlet        : apr-1.6.3-11.el8.x86_64                                1/10
  Installing               : apr-util-bdb-1.6.1-6.el8.x86_64                        2/10
  Installing               : apr-util-openssl-1.6.1-6.el8.x86_64                    3/10
  Installing               : apr-util-1.6.1-6.el8.x86_64                           4/10
  Running scriptlet        : apr-util-1.6.1-6.el8.x86_64                           4/10
  Installing               : httpd-tools-2.4.37-39.module_el8.4.0+778+c97deab.x86_64 5/10
  Installing               : mailcap-2.1.48-3.el8.noarch                           6/10
  Installing               : centos-logos-httpd-85.8-1.el8.noarch                    7/10
  Running scriptlet        : httpdfilesystem-2.4.37-39.module_el8.4.0+778+c97deab.noarch 8/10
  Installing               : httpdfilesystem-2.4.37-39.module_el8.4.0+778+c97deab.noarch 8/10
  Installing               : mod_http2-1.15.7-3.module_el8.4.0+778+c97deab.x86_64    9/10
  Installing               : httpd-2.4.37-39.module_el8.4.0+778+c97deab.x86_64     10/10
  Running scriptlet        : httpd-2.4.37-39.module_el8.4.0+778+c97deab.x86_64     10/10
  Verifying                : apr-1.6.3-11.el8.x86_64                                1/10
  Verifying                : apr-util-1.6.1-6.el8.x86_64                           2/10
  Verifying                : apr-util-bdb-1.6.1-6.el8.x86_64                       3/10
  Verifying                : apr-util-openssl-1.6.1-6.el8.x86_64                   4/10
  Verifying                : httpd-2.4.37-39.module_el8.4.0+778+c97deab.x86_64      5/10
  Verifying                : httpdfilesystem-2.4.37-39.module_el8.4.0+778+c97deab.noarch 6/10
  Verifying                : httpd-tools-2.4.37-39.module_el8.4.0+778+c97deab.x86_64 7/10
  Verifying                : mod_http2-1.15.7-3.module_el8.4.0+778+c97deab.x86_64   8/10
  Verifying                : centos-logos-httpd-85.8-1.el8.noarch                   9/10
  Verifying                : mailcap-2.1.48-3.el8.noarch                           10/10

Installed:
apr-1.6.3-11.el8.x86_64                                apr-util-1.6.1-6.el8.x86_64                                apr-util-bdb-1.6.1-6.el8.x86_64
apr-util-openssl-1.6.1-6.el8.x86_64                    centos-logos-httpd-85.8-1.el8.noarch                        httpd-2.4.37-39.module_el8.4.0+778+c97deab.x86_64
httpdfilesystem-2.4.37-39.module_el8.4.0+778+c97deab.noarch httpd-tools-2.4.37-39.module_el8.4.0+778+c97deab.x86_64
mod_http2-1.15.7-3.module_el8.4.0+778+c97deab.x86_64  mailcap-2.1.48-3.el8.noarch

Complete!
root@virtualserver01:/home/regex#

```

- After installing httpd, we start the service using **systemctl** command and check for its status which shows that our server is running and ready for use.



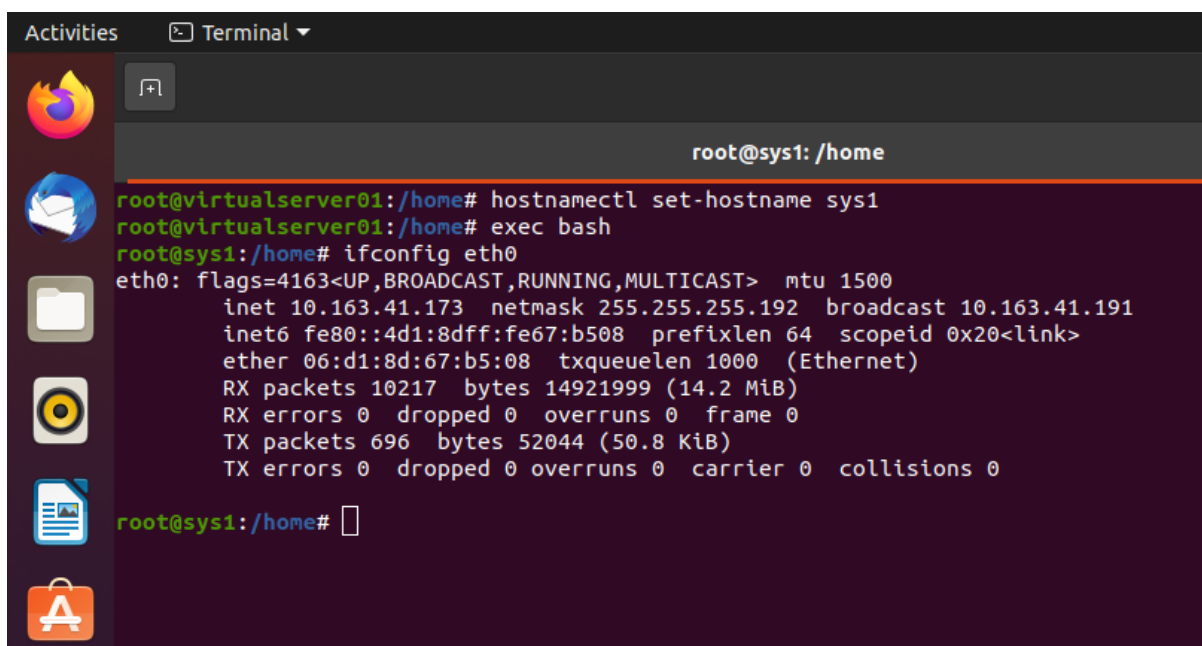
```
root@virtualserver01: /home/regex

root@virtualserver01: /home/regex# systemctl start httpd
root@virtualserver01: /home/regex# systemctl enable httpd
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service → /usr/lib/systemd/system/httpd.service.
root@virtualserver01: /home/regex# systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)
   Active: active (running) since Fri 2021-07-16 07:06:17 CDT; 13s ago
     Docs: man:httpd.service(8)
   Main PID: 1496 (httpd)
   Status: "Running, listening on: port 80"
    Tasks: 213 (limit: 24718)
   Memory: 29.2M
   CGroup: /system.slice/httpd.service
           └─1496 /usr/sbin/httpd -DFOREGROUND
             └─1497 /usr/sbin/httpd -DFOREGROUND
               └─1498 /usr/sbin/httpd -DFOREGROUND
                 └─1499 /usr/sbin/httpd -DFOREGROUND
                   └─1500 /usr/sbin/httpd -DFOREGROUND

Jul 16 07:06:17 virtualserver01.Utkarsh-Farkya-s-Account.cloud systemd[1]: Starting The Apache HTTP Server...
Jul 16 07:06:17 virtualserver01.Utkarsh-Farkya-s-Account.cloud systemd[1]: Started The Apache HTTP Server.
Jul 16 07:06:17 virtualserver01.Utkarsh-Farkya-s-Account.cloud httpd[1496]: Server configured, listening on: port 80
root@virtualserver01: /home/regex#
```

#### 4. Copy some files from one Linux host to another Linux host via SCP

- Firstly, change the hostname properties of both the machines
- SCP is a tool used to securely transfer files between two machines that might be in local network or different networks. It requires the authentication details of the destination machine which is going to receive/send the file and its IP address.



```
root@sys1: /home

root@virtualserver01: /home# hostnamectl set-hostname sys1
root@virtualserver01: /home# exec bash
root@sys1: /home# ifconfig eth0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
    inet 10.163.41.173  netmask 255.255.255.192  broadcast 10.163.41.191
    inet6 fe80::4d1:8dff:fe67:b508  prefixlen 64  scopeid 0x20<link>
    ether 06:d1:8d:67:b5:08  txqueuelen 1000  (Ethernet)
    RX packets 10217  bytes 14921999 (14.2 MiB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 696  bytes 52044 (50.8 KiB)
    TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

root@sys1: /home#
```

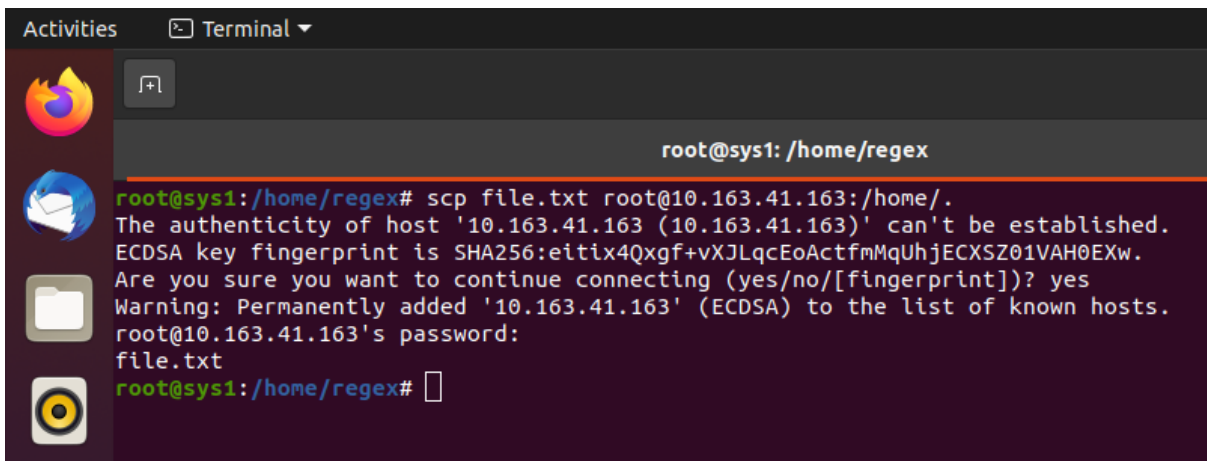
```

[root@centos ~]# hostnamectl set-hostname sys2
[root@centos ~]# exec bash
[root@sys2 ~]# ifconfig eth0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
    inet 10.163.41.163  netmask 255.255.255.192  broadcast 10.163.41.191
    inet6 fe80::454:8eff:fe5b:dcb1  prefixlen 64  scopeid 0x20<link>
    ether 06:54:8e:5b:dc:b1  txqueuelen 1000  (Ethernet)
    RX packets 7  bytes 496 (496.0 B)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 17  bytes 1174 (1.1 KiB)
    TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

[root@sys2 ~]#

```

- We use scp to transfer file.txt from machine sys1 to machine sys2.



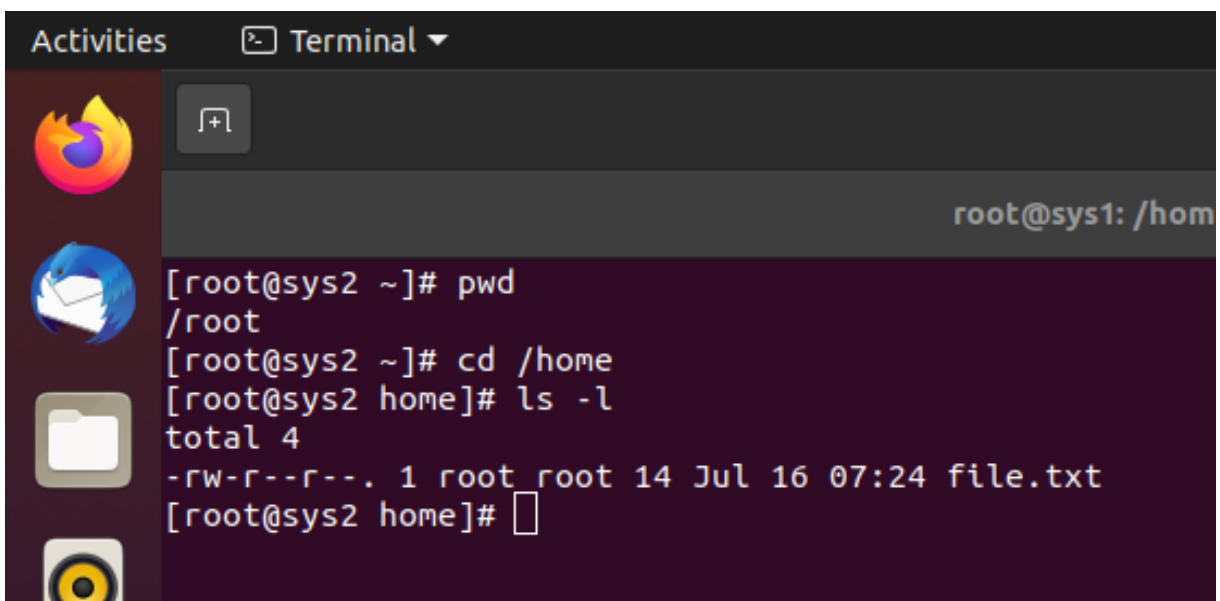
A terminal window titled 'Terminal' with a dark background. The prompt is 'root@sys1: /home/regex'. The user enters 'scp file.txt root@10.163.41.163:/home/'. The terminal shows a warning about the host's authenticity and asks for confirmation to continue. The user responds 'yes'. The terminal then shows the file being transferred: 'file.txt'.

```

root@sys1: /home/regex
root@sys1:/home/regex# scp file.txt root@10.163.41.163:/home/.
The authenticity of host '10.163.41.163 (10.163.41.163)' can't be established.
ECDSA key fingerprint is SHA256:eitix4Qxgf+vXJLqcEoActfmMqUhjECXSZ01VAH0EXw.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.163.41.163' (ECDSA) to the list of known hosts.
root@10.163.41.163's password:
file.txt
root@sys1:/home/regex#

```

- We can see in machine sys2's home directory that it received the file file.txt



A terminal window titled 'Terminal' with a dark background. The prompt is 'root@sys2 ~'. The user enters 'pwd', which returns '/root'. The user then enters 'cd /home', which returns '[root@sys2 home]'. The user then enters 'ls -l', which shows the file 'file.txt' with permissions '-rw-r--r--', size '1', owner 'root', group 'root', date '14 Jul 16 07:24', and filename 'file.txt'.

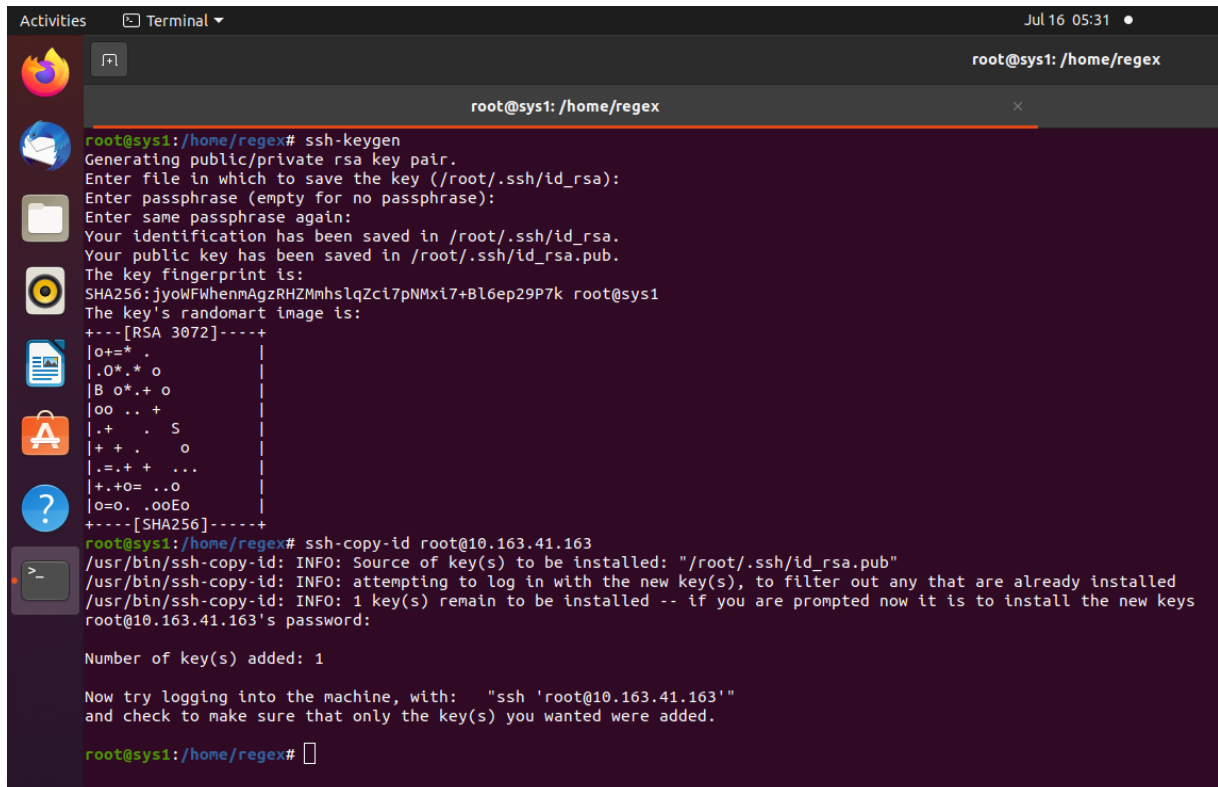
```

[root@sys2 ~]# pwd
/root
[root@sys2 ~]# cd /home
[root@sys2 home]# ls -l
total 4
-rw-r--r--. 1 root root 14 Jul 16 07:24 file.txt
[root@sys2 home]#

```

## 5. Create another VM and setup password less authentication

- Create another Linux VM of any type for which we will establish password less authentication.
- Generate ssh key pair which will be used to establish permanent authentication between the two machines.
- Use command: `ssh-keygen`
- Then use `ssh-copy-id <destination-machine-username@IP>` to start the authentication process and the key generated earlier will be used to establish password less authentication. If successfully completely it will not ask for credentials anymore, if changed otherwise.



```
Activities Terminal Jul 16 05:31
root@sys1: /home/regex

root@sys1: /home/regex# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:jyowFWHenmAgzRHZMMhslqZci7pNMxi7+B16ep29P7k root@sys1
The key's randomart image is:
+---[RSA 3072]-----+
|o+=* .|
|.O*.* o|
|B o*..+ o|
|oo .. +|
|.+. . S|
|+ + . o|
|..+. + ...|
|+.+o= ..o|
|o=o. .ooEo|
+---[SHA256]-----+
root@sys1:/home/regex# ssh-copy-id root@10.163.41.163
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
root@10.163.41.163's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@10.163.41.163'"
and check to make sure that only the key(s) you wanted were added.

root@sys1:/home/regex#
```