

College of Computer Training (CCT)

Module Title:

Operating Systems

Programme Title / Year

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Year ☒

☐ Year 2

☐

Year 3

DECLARATION

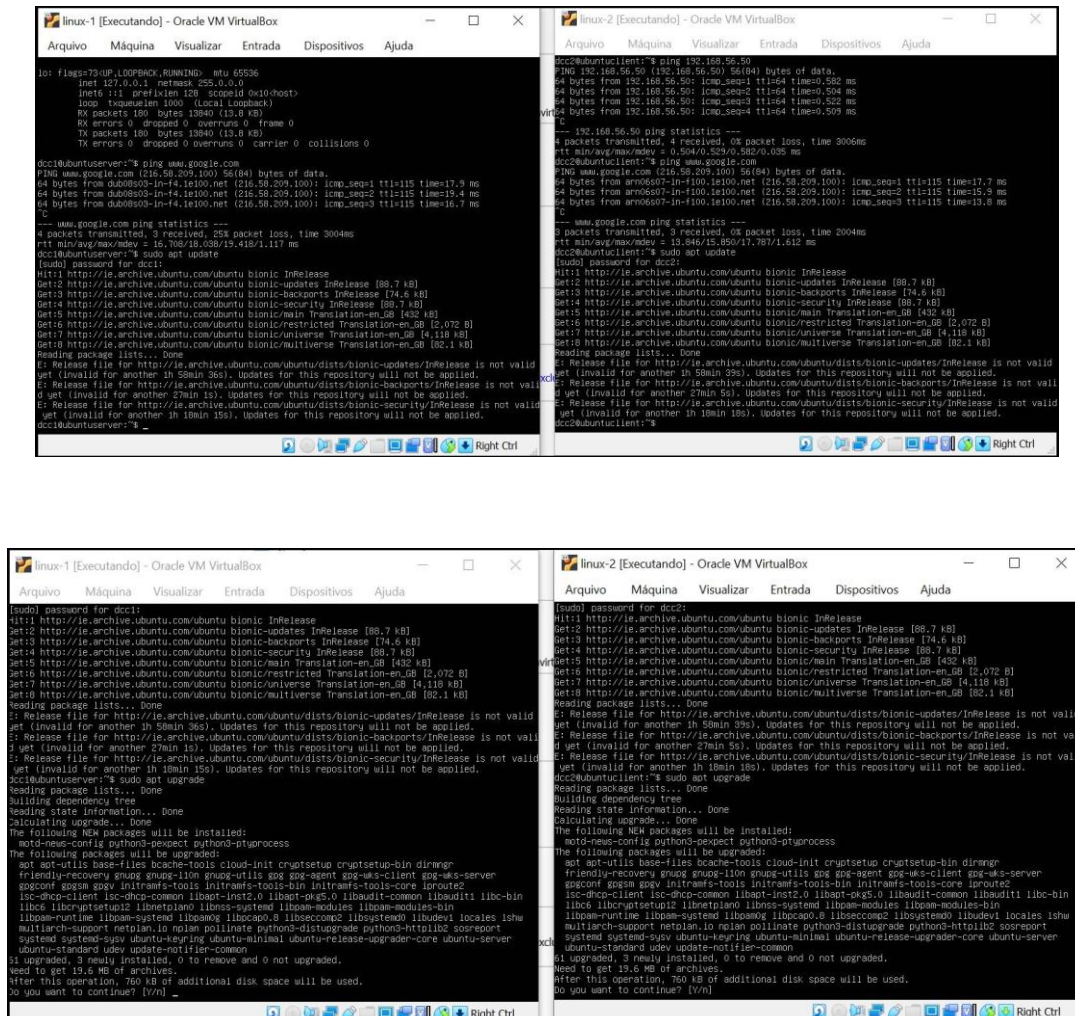
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CONSULT & CONNECT LTD

1.Installing Client/Server Web



```
linux-1 [Executando] - Oracle VM VirtualBox
Arquivo  Máquina  Visualizar  Entrada  Dispositivos  Ayuda

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 180 bytes 13840 (13.8 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 180 bytes 13840 (13.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dcd2ubuntuclient:~$ ping www.google.com
PING www.google.com (216.58.209.100) 56(84) bytes of data.
64 bytes from dcd2ubuntu03-in-f4.1e100.net: icmp_seq=1 ttl=115 time=17.9 ms
64 bytes from dcd2ubuntu03-in-f4.1e100.net: icmp_seq=2 ttl=115 time=19.4 ms
64 bytes from dcd2ubuntu03-in-f4.1e100.net: icmp_seq=3 ttl=115 time=16.7 ms
^C
--- www.google.com ping statistics ---
4 packets transmitted, 3 received, 25% packet loss, time 3004ms
rtt min/avg/max/mdev = 16.708/18.038/19.418/1.117 ms
dcd2ubuntuclient:~$ sudo apt update
[sudo] password for dcd2:
Hit:1 http://ie.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://ie.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://ie.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 http://ie.archive.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:5 http://ie.archive.ubuntu.com/ubuntu bionic/main Translation-en_GB [432 kB]
Get:6 http://ie.archive.ubuntu.com/ubuntu bionic/restricted Translation-en_GB [2,072 B]
Get:7 http://ie.archive.ubuntu.com/ubuntu bionic/universe Translation-en_GB [4,118 kB]
Get:8 http://ie.archive.ubuntu.com/ubuntu bionic/multiverse Translation-en_GB [82.1 kB]
Reading package lists... Done
E: Release file for http://ie.archive.ubuntu.com/ubuntu/dists/bionic-updates/InRelease is not valid
get (invalid for another 1h 58min 36s). Updates for this repository will not be applied.
E: Release file for http://ie.archive.ubuntu.com/ubuntu/dists/bionic-backports/InRelease is not valid
get (invalid for another 27min 15s). Updates for this repository will not be applied.
E: Release file for http://ie.archive.ubuntu.com/ubuntu/dists/bionic-security/InRelease is not valid
get (invalid for another 1h 10min 15s). Updates for this repository will not be applied.
dcd2ubuntuclient:~$ sudo apt upgrade
[sudo] password for dcd2:
Hit:1 http://ie.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://ie.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://ie.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 http://ie.archive.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:5 http://ie.archive.ubuntu.com/ubuntu bionic/main Translation-en_GB [432 kB]
Get:6 http://ie.archive.ubuntu.com/ubuntu bionic/restricted Translation-en_GB [2,072 B]
Get:7 http://ie.archive.ubuntu.com/ubuntu bionic/universe Translation-en_GB [4,118 kB]
Get:8 http://ie.archive.ubuntu.com/ubuntu bionic/multiverse Translation-en_GB [82.1 kB]
Reading package lists... Done
E: Release file for http://ie.archive.ubuntu.com/ubuntu/dists/bionic-updates/InRelease is not valid
get (invalid for another 1h 58min 36s). Updates for this repository will not be applied.
E: Release file for http://ie.archive.ubuntu.com/ubuntu/dists/bionic-backports/InRelease is not valid
get (invalid for another 27min 15s). Updates for this repository will not be applied.
E: Release file for http://ie.archive.ubuntu.com/ubuntu/dists/bionic-security/InRelease is not valid
get (invalid for another 1h 10min 15s). Updates for this repository will not be applied.
dcd2ubuntuclient:~$ sudo apt upgrade
[sudo] password for dcd2:
Hit:1 http://ie.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://ie.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://ie.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 http://ie.archive.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:5 http://ie.archive.ubuntu.com/ubuntu bionic/main Translation-en_GB [432 kB]
Get:6 http://ie.archive.ubuntu.com/ubuntu bionic/restricted Translation-en_GB [2,072 B]
Get:7 http://ie.archive.ubuntu.com/ubuntu bionic/universe Translation-en_GB [4,118 kB]
Get:8 http://ie.archive.ubuntu.com/ubuntu bionic/multiverse Translation-en_GB [82.1 kB]
Reading package lists... Done
E: Release file for http://ie.archive.ubuntu.com/ubuntu/dists/bionic-updates/InRelease is not valid
get (invalid for another 1h 58min 36s). Updates for this repository will not be applied.
E: Release file for http://ie.archive.ubuntu.com/ubuntu/dists/bionic-backports/InRelease is not valid
get (invalid for another 27min 15s). Updates for this repository will not be applied.
E: Release file for http://ie.archive.ubuntu.com/ubuntu/dists/bionic-security/InRelease is not valid
get (invalid for another 1h 10min 15s). Updates for this repository will not be applied.
dcd2ubuntuclient:~$ sudo apt upgrade
[sudo] password for dcd2:
Hit:1 http://ie.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://ie.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://ie.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 http://ie.archive.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:5 http://ie.archive.ubuntu.com/ubuntu bionic/main Translation-en_GB [432 kB]
Get:6 http://ie.archive.ubuntu.com/ubuntu bionic/restricted Translation-en_GB [2,072 B]
Get:7 http://ie.archive.ubuntu.com/ubuntu bionic/universe Translation-en_GB [4,118 kB]
Get:8 http://ie.archive.ubuntu.com/ubuntu bionic/multiverse Translation-en_GB [82.1 kB]
Reading package lists... Done
Building dependency tree
Calculating upgrade... Done
The following NEW packages will be installed:
  apt-get-libs base-files base-files cloud-init cryptsetup cryptsetup-bin dmidekg
  friendly-recovery gnupg gnupg-l10n gnupg-willis gpg-agent gpg-wks-client gpg-wks-server
  gpgconf gpgsm gpgv initramfs-tools initramfs-tools-bin initramfs-tools-core iproute2
  isc-dhcp-client isc-dhcp-common libapt-inst2.0 libapt-pkg5.0 libaudit-common libaudit1 libcc-bin
  libcc1 libcryptsetup1 libnetplan1 libnss-systemd libpam-modules libpam-modules-bin
  libpam-runtime libpam-systemd libpam0 libpcap0.8 libseccomp2 libsystemd0 libudev1 locales ishw
  multiarch-support netplan.io ntpd polkitd python3-distupgrade python3-httplib2 srsreport
  systemd systemd-sysv ubuntu-keyring ubuntu-minimal ubuntu-release-upgrader-core ubuntu-server
  ubuntu-standard udev update-notifier-common
3 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 19.6 MB of archives.
After this operation, 760 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

1.1. Ubuntu 18 was installed into two machines, and both were upgraded and updated using the commands **sudo apt upgrade/ sudo apt upgrade**, respectively.

```
linux-1 [Executando] - Oracle VM VirtualBox
Arquivo  Máquina  Visualizar  Entrada  Dispositivos  Ajuda

Inet 192.168.56.50 netmask 255.255.255.0 broadcast 192.168.56.255
Inet6 fe80::a00:27ff:fe3e:7149 prefixlen 64 scopeid 0x20<link>
ether 08:00:27:3e:71:49 txqueuelen 1000 (Ethernet)
RX packets 11 bytes 4404 (4.4 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 20 bytes 2552 (2.5 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
Inet 10.0.3.15 netmask 255.255.255.0 broadcast 10.0.3.255
Inet6 fe80::a00:27ff:fe3e:26cb prefixlen 64 scopeid 0x20<link>
ether 08:00:27:3e:26:cb txqueuelen 1000 (Ethernet)
RX packets 641 bytes 862577 (862.5 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 137 bytes 13085 (13.0 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
Inet 127.0.0.1 netmask 255.0.0.0
Inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 180 bytes 13840 (13.8 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 180 bytes 13840 (13.8 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dcc@ubuntu1server:~$ ping 192.168.56.60
PING 192.168.56.60 (192.168.56.60) 56(84) bytes of data:
64 bytes from 192.168.56.60: icmp_seq=1 ttl=64 time=1.24 ms
64 bytes from 192.168.56.60: icmp_seq=2 ttl=64 time=0.616 ms
64 bytes from 192.168.56.60: icmp_seq=3 ttl=64 time=0.531 ms
64 bytes from 192.168.56.60: icmp_seq=4 ttl=64 time=0.526 ms
^C
--- 192.168.56.60 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 0.526/0.729/1.246/0.302 ms
dcc@ubuntu1server:~$

linux-2 [Executando] - Oracle VM VirtualBox
Arquivo  Máquina  Visualizar  Entrada  Dispositivos  Ajuda

Inet 192.168.56.60 netmask 255.255.255.0 broadcast 192.168.56.255
Inet6 fe80::a00:27ff:fe3e:7149 prefixlen 64 scopeid 0x20<link>
ether 08:00:27:3e:71:49 txqueuelen 1000 (Ethernet)
RX packets 5 bytes 2166 (2.1 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 17 bytes 2086 (2.0 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
Inet 10.0.3.15 netmask 255.255.255.0 broadcast 10.0.3.255
Inet6 fe80::a00:27ff:fe3e:26cb prefixlen 64 scopeid 0x20<link>
ether 08:00:27:3e:26:cb txqueuelen 1000 (Ethernet)
RX packets 639 bytes 861588 (861.5 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 138 bytes 13145 (13.1 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
Inet 127.0.0.1 netmask 255.0.0.0
Inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 100 bytes 7920 (7.9 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 100 bytes 7920 (7.9 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dcc@ubuntu1client:~$ ping 192.168.56.50
PING 192.168.56.50 (192.168.56.50) 56(84) bytes of data:
64 bytes from 192.168.56.50: icmp_seq=1 ttl=64 time=0.582 ms
64 bytes from 192.168.56.50: icmp_seq=2 ttl=64 time=0.504 ms
64 bytes from 192.168.56.50: icmp_seq=3 ttl=64 time=0.522 ms
64 bytes from 192.168.56.50: icmp_seq=4 ttl=64 time=0.509 ms
^C
--- 192.168.56.50 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3006ms
rtt min/avg/max/mdev = 0.504/0.529/0.582/0.035 ms
dcc@ubuntu1client:~$
```

1.2. Both machines are working properly and pinging each other.

1.2.1. Configuring IP address: **sudo ifconfig enp0s3 (IP ADDRESS) netmask 255.255.255.0**

```
linux-2 [Executando] - Oracle VM VirtualBox
Arquivo  Máquina  Visualizar  Entrada  Dispositivos  Ajuda

Apache2 Ubuntu Default Page: It works (11 of 2)
Ubuntu Logo Apache2 Ubuntu Default Page
DCC Under Construction - Lais Santos/20200311

This is the default welcome page used to test the correct operation of the Apache2 server
after installation on Ubuntu systems. It is based on the equivalent page on Debian, from
which the Ubuntu Apache packaging is derived. If you can read this page, it means that the
Apache HTTP server installed at this site is working properly. You should replace this file
(located at /var/www/html/index.html) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this
probably means that the site is currently unavailable due to maintenance. If the problem
persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default
configuration, and split into several files optimized for interaction with Ubuntu tools.
The configuration system is fully documented in /usr/share/doc/apache2/README.Debian.gz.
Refer to this for the full documentation. Documentation for the web server itself can be
found by accessing the manual if the apache2-doc package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as
follows:
/etc/apache2/
-- apache2.conf
-- ports.conf
-- mods-enabled
|   |-- *.load
|   |-- *.conf
-- conf-enabled
|   |-- *.conf
-- sites-enabled
|   |-- *.conf

-- press space for next page --
Arrow keys: Up and Down to move. Right to follow a link; Left to go back.
H)elp O)ptions P)rint G)o M)ain screen Q)uit /s=search [delete]=history list
```

1.3.A Server machine was created by installing Apache, using the command **sudo apt install apache2**. Using the Client machine, the on the Ubuntu server could be accessed using the follow command **sudo lynx 192.168.56.60**.



1.4. The Apache can be accessed by a web browser.

1.4.1. For editing the Apache web page, the command **sudo nano/var/www/index/html** was used.

```

Prompt de Comando
Sufixo DNS específico de conexão. . . . . :
Endereço IPv6 de link local . . . . . : fe80::5612:d9c:987c:b81%2
Endereço IPv4. . . . . : 192.168.56.1
Máscara de Sub-rede . . . . . : 255.255.255.0
Gateway Padrão. . . . . :

Adaptador de Rede sem Fio Local Area Connection* 1:

Estado da mídia. . . . . : mídia desconectada
Sufixo DNS específico de conexão. . . . . :

Adaptador de Rede sem Fio Local Area Connection* 2:

Estado da mídia. . . . . : mídia desconectada
Sufixo DNS específico de conexão. . . . . :

Adaptador de Rede sem Fio Wi-Fi:

Sufixo DNS específico de conexão. . . . . :
Endereço IPv6 de link local . . . . . : fe80::a1bd:6a24:aec:edaa%8
Endereço IPv4. . . . . : 172.20.10.3
Máscara de Sub-rede . . . . . : 255.255.255.240
Gateway Padrão. . . . . : 172.20.10.1

Adaptador Ethernet Bluetooth Network Connection:

Estado da mídia. . . . . : mídia desconectada
Sufixo DNS específico de conexão. . . . . :

C:\Users\lsant>

```

```

Prompt de Comando
Microsoft Windows [versão 10.0.19042.928]
(c) Microsoft Corporation. Todos os direitos reservados.

C:\Users\lsant>ping 192.168.56.50

Disparando 192.168.56.50 com 32 bytes de dados:
Resposta de 192.168.56.50: bytes=32 tempo<1ms TTL=64
Resposta de 192.168.56.50: bytes=32 tempo<1ms TTL=64
Resposta de 192.168.56.50: bytes=32 tempo<1ms TTL=64
Resposta de 192.168.56.50: bytes=32 tempo<1ms TTL=64

Estatísticas do Ping para 192.168.56.50:
    Pacotes: Enviados = 4, Recebidos = 4, Perdidos = 0 (0% de
                perda),
    Aproximar um número redondo de vezes em milissegundos:
        Mínimo = 0ms, Máximo = 0ms, Média = 0ms

C:\Users\lsant>

```

| | | | | | | |
|---|----------|----------------|----------------|------|------------------------|------------------------------|
| 4 | 0.000662 | 192.168.56.105 | 192.168.56.1 | ICMP | 74 Echo (ping) reply | id=0x0001, seq=52/13312, ttl |
| 5 | 1.008338 | 192.168.56.1 | 192.168.56.105 | ICMP | 74 Echo (ping) request | id=0x0001, seq=53/13568, ttl |
| 6 | 1.008696 | 192.168.56.105 | 192.168.56.1 | ICMP | 74 Echo (ping) reply | id=0x0001, seq=53/13568, ttl |
| 7 | 2.015481 | 192.168.56.1 | 192.168.56.105 | ICMP | 74 Echo (ping) request | id=0x0001, seq=54/13824, ttl |

1.5. From the Host computer I have done the to the Server machine and the ICMP was identified using the Wireshark.

| Time | Source | Destination | Protocol | Length | Info |
|------|----------|----------------|----------------|--------|---|
| 10 | 0.021121 | 192.168.56.105 | 192.168.56.1 | TCP | 1514 80 → 50678 [ACK] Seq=1461 Ack=589 Win=64128 Len=146... |
| 11 | 0.021281 | 192.168.56.1 | 192.168.56.105 | TCP | 54 50678 → 80 [ACK] Seq=589 Ack=2921 Win=262656 Len=0 |
| 12 | 0.021555 | 192.168.56.105 | 192.168.56.1 | HTTP | 638 HTTP/1.1 200 OK (text/html) |
| 13 | 0.062202 | 192.168.56.1 | 192.168.56.105 | TCP | 54 50678 → 80 [ACK] Seq=589 Ack=3505 Win=262144 Len=0 |
| 14 | 5.021297 | 192.168.56.105 | 192.168.56.1 | TCP | 60 80 → 50678 [FIN, ACK] Seq=3505 Ack=589 Win=64128 Le... |

1.6. From the Host computer the Server was accessed using the browser and utilizing the Wireshark we can see the HTTP contents being transferred from the Server to the Client.

2. Installing The Open Secure Shell (SSH)

```

dcc1@web-server-311: ~
login as: dcc1
dcc1@192.168.56.100's password:
Welcome to Ubuntu 18.04.5 LTS (GNU/Linux 4.15.0-142-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Fri May  7 07:52:55 UTC 2021

System load:  0.11           Processes:           94
Usage of /:   42.4% of 8.79GB Users logged in:           1
Memory usage: 15%          IP address for enp0s3: 192.168.56.100
Swap usage:   0%            IP address for enp0s8: 10.0.3.15

New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Fri May  7 07:52:25 2021
dcc1@web-server-311:~$
```

2.1. The Open Secure Shell needs to be installed in the Server machine (sudo apt install openssh-server), enable the port 22 (sudo nano /etc/ssh/sshd_config). Host operating system logging into the server using SSH.

| No. | Time | Source | Destination | Protocol | Length | Info |
|-----|----------|----------------|----------------|----------|--------|--|
| 1 | 0.000000 | 192.168.56.105 | 192.168.56.1 | SSH | 182 | Server: Encrypted packet (len=128) |
| 2 | 0.041429 | 192.168.56.1 | 192.168.56.105 | TCP | 54 | 50354 → 22 [ACK] Seq=1 Ack=129 Win=8210 Len=0 |
| 3 | 1.023880 | 192.168.56.105 | 192.168.56.1 | SSH | 182 | Server: Encrypted packet (len=128) |
| 4 | 1.065252 | 192.168.56.1 | 192.168.56.105 | TCP | 54 | 50354 → 22 [ACK] Seq=1 Ack=257 Win=8210 Len=0 |
| 5 | 2.047876 | 192.168.56.105 | 192.168.56.1 | SSH | 182 | Server: Encrypted packet (len=128) |
| 6 | 2.088188 | 192.168.56.1 | 192.168.56.105 | TCP | 54 | 50354 → 22 [ACK] Seq=1 Ack=385 Win=8209 Len=0 |
| 7 | 3.071810 | 192.168.56.105 | 192.168.56.1 | SSH | 182 | Server: Encrypted packet (len=128) |
| 8 | 3.112588 | 192.168.56.1 | 192.168.56.105 | TCP | 54 | 50354 → 22 [ACK] Seq=1 Ack=513 Win=8209 Len=0 |
| 9 | 4.096267 | 192.168.56.105 | 192.168.56.1 | SSH | 182 | Server: Encrypted packet (len=128) |
| 10 | 4.096709 | 192.168.56.1 | 192.168.56.105 | SSH | 214 | Client: Encrypted packet (len=160) |
| 11 | 4.096896 | 192.168.56.105 | 192.168.56.1 | SSH | 102 | Server: Encrypted packet (len=48) |
| 12 | 4.136904 | 192.168.56.1 | 192.168.56.105 | TCP | 54 | 50354 → 22 [ACK] Seq=161 Ack=689 Win=8208 Len=0 |
| 13 | 5.120310 | 192.168.56.105 | 192.168.56.1 | SSH | 182 | Server: Encrypted packet (len=128) |
| 14 | 5.161044 | 192.168.56.1 | 192.168.56.105 | TCP | 54 | 50354 → 22 [ACK] Seq=161 Ack=817 Win=8207 Len=0 |
| 15 | 6.144601 | 192.168.56.105 | 192.168.56.1 | SSH | 182 | Server: Encrypted packet (len=128) |
| 16 | 6.184570 | 192.168.56.1 | 192.168.56.105 | TCP | 54 | 50354 → 22 [ACK] Seq=161 Ack=945 Win=8207 Len=0 |
| 17 | 7.168311 | 192.168.56.105 | 192.168.56.1 | SSH | 182 | Server: Encrypted packet (len=128) |
| 18 | 7.207865 | 192.168.56.1 | 192.168.56.105 | TCP | 54 | 50354 → 22 [ACK] Seq=161 Ack=1073 Win=8206 Len=0 |

2.2. Communication encrypted between the Client system and ubuntu server.

3. IP Address configuration and Hostname management

| linux-1 [Executando] - Oracle VM VirtualBox | linux-2 [Executando] - Oracle VM VirtualBox |
|--|--|
| Arquivo Máquina Visualizar Entrada Dispositivos Ajuda | Arquivo Máquina Visualizar Entrada Dispositivos Ajuda |
| command 'status' not found, did you mean: command 'statup' from snap statup (0.79.91) command 'qstatus' from deb gridengine-client command 'states' from deb enscript See 'snap info <snapname>' for additional versions. dcc1@ubuntuserver:~\$ ifconfig enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500 inet 192.168.56.100 netmask 255.255.255.0 broadcast 192.168.56.255 inet6 fe80::a00:27ff:fe3e:7149 prefixlen 64 scopeid 0x20<link> ether 08:00:27:9e:71:49 txqueuelen 1000 (Ethernet) RX packets 46 bytes 3572 (3.5 KB) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 589 bytes 44266 (44.2 KB) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 | loop txqueuelen 1000 (Local Loopback) RX packets 156 bytes 13507 (13.5 KB) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 156 bytes 13507 (13.5 KB) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 dcc2@ubuntucient:~\$ sudo ifconfig enp0s3 192.168.56.200 [sudo] password for dcc2: dcc2@ubuntucient:~\$ ifconfig enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500 inet 192.168.56.200 netmask 255.255.255.0 broadcast 192.168.56.255 inet6 fe80::a00:27ff:fe7f:5c5b prefixlen 64 scopeid 0x20<link> ether 08:00:27:f7:5c:5b txqueuelen 1000 (Ethernet) RX packets 1816 bytes 254842 (254.8 KB) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 1651 bytes 179415 (179.4 KB) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 |

linux-1 [Executando] - Oracle VM VirtualBox

Arquivo

Máquina

Visualizar

Entrada

Dispositivos

Ajuda

```

inet 192.168.56.100 netmask 255.255.255.0 broadcast 192.168.56.255
inet6 fe80::a00:27ff:fe3e:7149 prefixlen 64 scopeid 0x20<link>
ether 08:00:27:3e:71:49 txqueuelen 1000 (Ethernet)
RX packets 46 bytes 3572 (3.5 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 589 bytes 44266 (44.2 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 10.0.3.15 netmask 255.255.255.0 broadcast 10.0.3.255
inet6 fe80::a00:27ff:feac:26cb prefixlen 64 scopeid 0x20<link>
ether 08:00:27:ac:26:cb txqueuelen 1000 (Ethernet)
RX packets 2 bytes 1180 (1.1 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 15 bytes 1690 (1.6 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 907 bytes 70573 (70.5 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 907 bytes 70573 (70.5 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dcc1@ubuntu-server:~$ ping 192.168.56.200
PING 192.168.56.200 (192.168.56.200) 56(84) bytes of data.
64 bytes from 192.168.56.200: icmp_seq=1 ttl=64 time=0.429 ms
64 bytes from 192.168.56.200: icmp_seq=2 ttl=64 time=0.288 ms
64 bytes from 192.168.56.200: icmp_seq=3 ttl=64 time=0.334 ms
64 bytes from 192.168.56.200: icmp_seq=4 ttl=64 time=0.322 ms
^C
--- 192.168.56.200 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3055ms
rtt min/avg/max/mdev = 0.288/0.343/0.429/0.053 ms
dcc1@ubuntu-server:~$

```

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inet 192.168.56.200 netmask 255.255.255.0 broadcast 192.168.56.255
inet6 fe80::a00:27ff:fe7f:5c5b prefixlen 64 scopeid 0x20<link>
ether 08:00:27:f7:5c:5b txqueuelen 1000 (Ethernet)
RX packets 1816 bytes 254842 (254.8 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 1651 bytes 179415 (179.4 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 10.0.3.15 netmask 255.255.255.0 broadcast 10.0.3.255
inet6 fe80::a00:27ff:fe1b:1179 prefixlen 64 scopeid 0x20<link>
ether 08:00:27:1b:11:79 txqueuelen 1000 (Ethernet)
RX packets 24908 bytes 35415987 (35.4 MB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 2519 bytes 182329 (182.3 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 166 bytes 14577 (14.5 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 166 bytes 14577 (14.5 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dcc2@ubuntu-client:~$ ping 192.168.56.100
PING 192.168.56.100 (192.168.56.100) 56(84) bytes of data.
64 bytes from 192.168.56.100: icmp_seq=1 ttl=64 time=0.373 ms
64 bytes from 192.168.56.100: icmp_seq=2 ttl=64 time=0.261 ms
64 bytes from 192.168.56.100: icmp_seq=3 ttl=64 time=0.267 ms
64 bytes from 192.168.56.100: icmp_seq=4 ttl=64 time=0.425 ms
^C
--- 192.168.56.100 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3007ms
rtt min/avg/max/mdev = 0.261/0.331/0.425/0.072 ms
dcc2@ubuntu-client:~$

```

3.1. Configuring IP Address

3.1.1. cd /etc/netplan

Open a new file (**sudo nano 01-config-net.yaml**)

Type: network:

version: 2

renderer: networkd

ethernets:

enp0s3:

dhcp4: false

dhcp6: false

addresses: [192.168.56.100/24]

gateway4: 192.168.56.1

nameservers:

addresses: [192.168.56.1]

3.1.2. Activating the configuration

Sudo netplan apply

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dcc2@web-client-311:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 192.168.56.100 netmask 255.255.255.0 broadcast 192.168.56.255
inet6 fe80::a00:27ff:fe7f:5c5b prefixlen 64 scopeid 0x20<link>
ether 08:00:27:f7:5c:5b txqueuelen 1000 (Ethernet)
RX packets 45 bytes 5482 (5.4 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 498 bytes 38414 (38.4 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 10.0.3.15 netmask 255.255.255.0 broadcast 10.0.3.255
inet6 fe80::a00:27ff:fe1b:1179 prefixlen 64 scopeid 0x20<link>
ether 08:00:27:1b:11:79 txqueuelen 1000 (Ethernet)
RX packets 38 bytes 16805 (16.2 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 43 bytes 5117 (5.1 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 96 bytes 7516 (7.5 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 96 bytes 7516 (7.5 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dcc2@web-client-311:~$

```

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```

dcc1@web-server-311:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 192.168.56.100 netmask 255.255.255.0 broadcast 192.168.56.255
inet6 fe80::a00:27ff:fe3e:7149 prefixlen 64 scopeid 0x20<link>
ether 08:00:27:3e:71:49 txqueuelen 1000 (Ethernet)
RX packets 45 bytes 5482 (5.4 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 498 bytes 38414 (38.4 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 10.0.3.15 netmask 255.255.255.0 broadcast 10.0.3.255
inet6 fe80::a00:27ff:fe1b:1179 prefixlen 64 scopeid 0x20<link>
ether 08:00:27:1b:11:79 txqueuelen 1000 (Ethernet)
RX packets 2 bytes 1180 (1.1 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 15 bytes 1694 (1.6 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 740 bytes 58484 (58.4 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 740 bytes 58484 (58.4 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dcc1@web-server-311:~$

```

3.2. Renaming the Host

```
sudo vim /etc/hostname.  
(press I to edit) type the new name.  
sudo vim /etc/hosts.  
Change the host name.  
Reboot.
```

4. Firewall

```
To          Action      From  
--          -  
22/tcp      DENY         Anywhere  
80/tcp      DENY         Anywhere  
22/tcp (v6) DENY         Anywhere (v6)  
80/tcp (v6) DENY         Anywhere (v6)  
  
80/tcp      DENY OUT     Anywhere  
22/tcp      DENY OUT     Anywhere  
80/tcp (v6) DENY OUT     Anywhere (v6)  
22/tcp (v6) DENY OUT     Anywhere (v6)
```

4.1. SSH and HTTP traffic not being allowed:

For denying this traffics was used the commands:

```
sudo ufw deny in ssh  
sudo ufw deny out ssh  
sudo ufw deny in http  
sudo ufw deny out http
```

```
To          Action      From  
--          -  
22/tcp      ALLOW       Anywhere  
80/tcp      DENY        Anywhere  
22/tcp (v6) ALLOW       Anywhere (v6)  
80/tcp (v6) DENY        Anywhere (v6)  
  
80/tcp      DENY OUT    Anywhere  
22/tcp      ALLOW OUT   Anywhere  
80/tcp (v6) DENY OUT    Anywhere (v6)  
22/tcp (v6) ALLOW OUT   Anywhere (v6)
```

4.2. SSH traffic being allowed:

```
sudo ufw allow in ssh  
sudo ufw allow out ssh
```


5. Research

```
dcc1@web-server-311:~$ chmod a+x myscript.sh
dcc1@web-server-311:~$ ls myscript.sh
myscript.sh
dcc1@web-server-311:~$ ./myscript.sh
total 1853536
drwxr-xr-x  2 root root    4096 May  4 16:22 bin
drwxr-xr-x  4 root root    4096 May  4 16:24 boot
drwxr-xr-x  2 root root    4096 May  4 10:02 cdrom
drwxr-xr-x 19 root root   3940 May  6 21:38 dev
drwxr-xr-x 93 root root    4096 May  6 15:23 etc
drwxr-xr-x  3 root root    4096 May  4 10:30 home
lrwxrwxrwx  1 root root     34 May  4 10:09 initrd.img -> boot/initrd.img-4.15.0-142-generic
lrwxrwxrwx  1 root root     34 May  4 10:09 initrd.img.oid -> boot/initrd.img-4.15.0-142-generic
drwxr-xr-x 22 root root    4096 May  4 10:07 lib
drwxr-xr-x  2 root root    4096 May  4 12:58 lib64
drwx----- 2 root root  16384 May  4 10:02 lost+found
drwxr-xr-x  2 root root    4096 Aug  6 2020 media
drwxr-xr-x  2 root root    4096 Aug  6 2020 mnt
drwxr-xr-x  2 root root    4096 Aug  6 2020 opt
dr-xr-xr-x 102 root root     0 May  6 21:38 proc
drwx----- 4 root root    4096 May  4 16:57 root
drwxr-xr-x 26 root root    880 May  6 21:44 run
drwxr-xr-x  2 root root  12288 May  4 16:23/sbin
drwxr-xr-x  2 root root    4096 May  4 10:30 snap
drwxr-xr-x  2 root root    4096 Aug  6 2020 srv
-rw-----  1 root root 1897922560 May  4 10:09 swap.img
dr-xr-xr-x 13 root root     0 May  6 21:38 sys
drwxrwxrwt 10 root root    4096 May  6 21:39 tmp
drwxr-xr-x 11 root root    4096 May  4 12:58 usr
drwxr-xr-x 14 root root    4096 May  4 16:28 var
lrwxrwxrwx  1 root root     31 May  4 10:09 vmlinuz -> boot/vmlinuz-4.15.0-142-generic
lrwxrwxrwx  1 root root     31 May  4 10:09 vmlinuz.oid -> boot/vmlinuz-4.15.0-142-generic
dcc1@web-server-311:~$ _
```

5.1. Creating a Simple/Sample Linux Shell? Bash Script

A Shell script is an automated series of Linux commands stored for repeated Later use. The example above shows how it is after the step by step is done.

5.1.1. Steps:

Choose a text editor (vim)

Type **vim myscript.sh** to open the file

Type **i** to open the insertion

Type the commands:

cd /

ls -l and save it.

Type **chmod a+x myscript.sh** to give the permission

The file can be accessed using the command **./myscript.sh**