



INSTITUTO POLITÉCNICO DE BEJA

Escola Superior de Tecnologia e Gestão

Redes e Sistemas Informáticos



Nome do Projeto/Estágio

João Ribeiro

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Elaborado por:

João Ribeiro

Professores:

Armando Ventura

Mário Candeias

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1. Introdução

Pretende-se a elaboração de um projeto que visa a implementação de conhecimentos obtidos nas aulas de Administração de Sistemas Linux. O projeto consiste na instalação e configuração de serviços e realização de um ou mais scripts em servidor. Cada projeto deverá ser realizado individualmente.

2. PONTO 1

2.1. Exercício 1.3

Este paço foi feito na instalação do sistema operativo mas também pode ser feito pelo comando `passwd root` e depois escrever a passe



2.2. Exercício 1.4

Este paço foi feito na instalação do sistema operativo mas também pode ser feito pelo comando `adduser joaoribeiro`, `passwd joaoribeiro` e depois escrever a passe

2.3. Exercício 1.5

O servidor DNS/BackupServer pinga o FTPServer e o UserPC pois os três estão na mesma rede interna.

DNS/BackupServer:

```
root@localhost:~  
[root@localhost ~]# ip a  
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000  
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00  
    inet 127.0.0.1/8 scope host lo  
        valid_lft forever preferred_lft forever  
    inet6 ::1/128 scope host  
        valid_lft forever preferred_lft forever  
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000  
    link/ether 08:00:27:70:c8:4d brd ff:ff:ff:ff:ff:ff  
    inet 192.168.1.97/23 brd 192.168.1.255 scope global noprefixroute dynamic enp0s3  
        valid_lft 3126sec preferred_lft 3126sec  
    inet6 fe80::3742:cb8:c4c4:9283/64 scope link noprefixroute  
        valid_lft forever preferred_lft forever  
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000  
    link/ether 08:00:27:41:33:5d brd ff:ff:ff:ff:ff:ff  
[root@localhost ~]# ping 192.168.1.98  
PING 192.168.1.98 (192.168.1.98) 56(84) bytes of data.   
64 bytes from 192.168.1.98: icmp_seq=1 ttl=64 time=0.357 ms  
64 bytes from 192.168.1.98: icmp_seq=2 ttl=64 time=0.408 ms  
64 bytes from 192.168.1.98: icmp_seq=3 ttl=64 time=0.199 ms  
64 bytes from 192.168.1.98: icmp_seq=4 ttl=64 time=0.206 ms  
^C  
--- 192.168.1.98 ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3000ms  
rtt min/avg/max/mdev = 0.199/0.292/0.408/0.093 ms  
[root@localhost ~]# ping 192.168.1.94  
PING 192.168.1.94 (192.168.1.94) 56(84) bytes of data.   
64 bytes from 192.168.1.94: icmp_seq=1 ttl=64 time=0.178 ms  
64 bytes from 192.168.1.94: icmp_seq=2 ttl=64 time=0.226 ms  
64 bytes from 192.168.1.94: icmp_seq=3 ttl=64 time=0.207 ms  
64 bytes from 192.168.1.94: icmp_seq=4 ttl=64 time=0.216 ms  
^C  
--- 192.168.1.94 ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3006ms  
rtt min/avg/max/mdev = 0.178/0.206/0.226/0.025 ms  
[root@localhost ~]#
```

FTP Server

```
root@localhost:~  
[root@localhost ~]# ifconfig  
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 192.168.1.98 netmask 255.255.254.0 broadcast 192.168.1.255  
    inet6 fe80::53ec:d64b:819d:cf0 prefixlen 64 scopeid 0x20<link>  
    ether 08:00:27:23:7f:e4 txqueuelen 1000 (Ethernet)  
    RX packets 21431 bytes 24537465 (23.4 MiB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 3881 bytes 326617 (318.9 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    ether 08:00:27:3e:06:7d txqueuelen 1000 (Ethernet)  
    RX packets 329 bytes 112518 (109.8 KiB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 532 bytes 88056 (85.9 KiB)  
    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 0 bytes 0 (0.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 0 bytes 0 (0.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
[root@localhost ~]# ping 192.168.1.97  
PING 192.168.1.97 (192.168.1.97) 56(84) bytes of data.  
64 bytes from 192.168.1.97: icmp_seq=1 ttl=64 time=0.208 ms  
64 bytes from 192.168.1.97: icmp_seq=2 ttl=64 time=0.202 ms  
64 bytes from 192.168.1.97: icmp_seq=3 ttl=64 time=0.217 ms  
64 bytes from 192.168.1.97: icmp_seq=4 ttl=64 time=0.265 ms  
^C  
--- 192.168.1.97 ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3001ms  
rtt min/avg/max/mdev = 0.202/0.223/0.265/0.024 ms  
[root@localhost ~]# ping 192.168.1.94  
PING 192.168.1.94 (192.168.1.94) 56(84) bytes of data.  
64 bytes from 192.168.1.94: icmp_seq=1 ttl=64 time=0.198 ms  
64 bytes from 192.168.1.94: icmp_seq=2 ttl=64 time=0.198 ms  
64 bytes from 192.168.1.94: icmp_seq=3 ttl=64 time=0.156 ms  
64 bytes from 192.168.1.94: icmp_seq=4 ttl=64 time=0.215 ms  
^C  
--- 192.168.1.94 ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3002ms  
rtt min/avg/max/mdev = 0.156/0.191/0.215/0.027 ms  
[root@localhost ~]#
```

2.4. Exercício 1.6

Instale e configure o acesso por ssh, apenas ao utilizador “root”

Aceder ao ficheiro de configuração do ssh e negar o utilizador

```
root@localhost:~  
GNU nano 2.3.1 File: /etc/ssh/sshd_config  
  
#AllowAgentForwarding yes  
#AllowTcpForwarding yes  
#GatewayPorts no  
X11Forwarding yes  
#X11DisplayOffset 10  
#X11UseLocalhost yes  
#PermitTTY yes  
#PrintMotd yes  
#PrintLastLog yes  
#TCPKeepAlive yes  
#UseLogin no  
#UsePrivilegeSeparation sandbox  
#PermitUserEnvironment no  
#Compression delayed  
#ClientAliveInterval 0  
#ClientAliveCountMax 3  
#ShowPatchLevel no  
#UseDNS yes  
#PidFile /var/run/sshd.pid  
#MaxStartups 10:30:100  
#PermitTunnel no  
#ChrootDirectory none  
#VersionAddendum none  
  
# no default banner path  
#Banner none  
  
# Accept locale-related environment variables  
AcceptEnv LANG LC_CTYPE LC_NUMERIC LC_TIME LC_COLLATE LC_MONETARY LC_MESSAGES  
AcceptEnv LC_PAPER LC_NAME LC_ADDRESS LC_TELEPHONE LC_MEASUREMENT  
AcceptEnv LC_IDENTIFICATION LC_ALL LANGUAGE  
AcceptEnv XMODIFIERS  
  
# override default of no subsystems  
Subsystem sftp /usr/libexec/openssh/sftp-server  
  
# Example of overriding settings on a per-user basis  
#Match User anoncvs  
#    X11Forwarding no  
#    AllowTcpForwarding no  
#    PermitTTY no  
#    ForceCommand cvs server  
  
DenyUsers JoaoRibeiro  
DenyUsers joaoribeiro  
  
[root@localhost ~]# systemctl restart sshd
```

UserPC [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal jan 30 20:50

```
root@localhost:~  
joaoribeiro@joaoribeiro-VirtualBox:~$ sudo ssh joaoribeiro@192.168.137.105  
The authenticity of host '192.168.137.105 (192.168.137.105)' can't be established.  
ECDSA key fingerprint is SHA256:5ahdJwQcmMDKY/0fV4ySl99WvrTMBMM5SHtkWczYCZ8.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added '192.168.137.105' (ECDSA) to the list of known hosts.  
joaoribeiro@192.168.137.105's password:  
Permission denied, please try again.  
joaoribeiro@192.168.137.105's password:  
[3]+ Stopped sudo ssh joaoribeiro@192.168.137.105  
joaoribeiro@joaoribeiro-VirtualBox:~$ sudo ssh root@192.168.137.105  
root@192.168.137.105's password:  
Last login: Sun Jan 30 20:06:00 2022 from desktop-ect5bvp.mshome.net  
[root@localhost ~]#
```

Fiz o mesmo para o outro servidor

UserPC [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

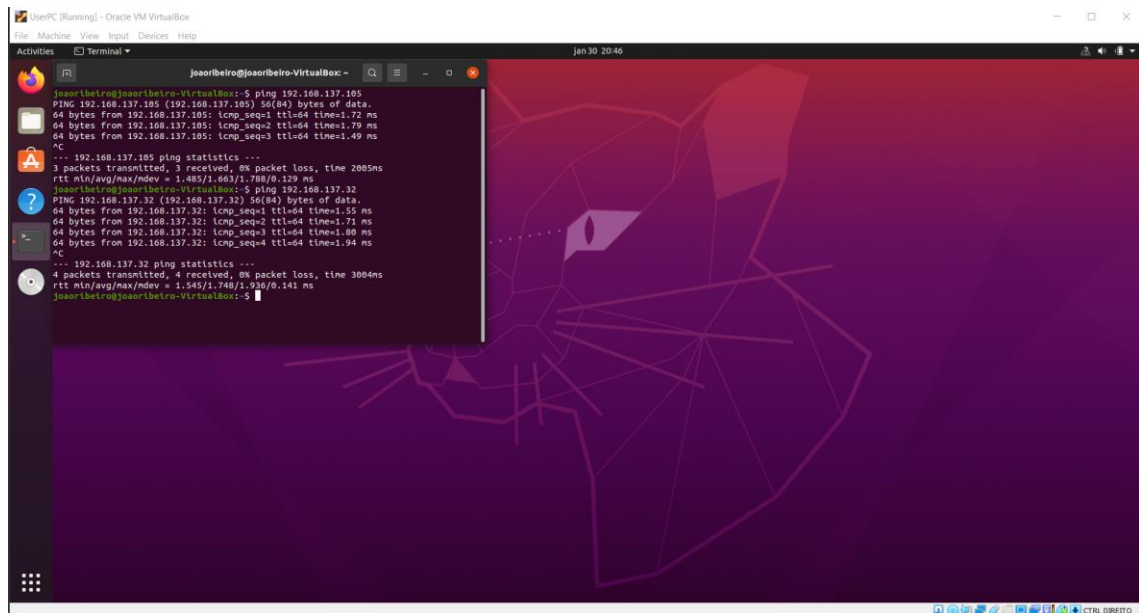
Activities Terminal jan 30 20:53

```
root@localhost:~  
joaoribeiro@joaoribeiro-VirtualBox:~$ sudo ssh joaoribeiro@192.168.137.32  
The authenticity of host '192.168.137.32 (192.168.137.32)' can't be established.  
ECDSA key fingerprint is SHA256:J51pN4hZHdmWaf69sw7kDT6y0ewXWL3TMbr0Ao5+snQ.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added '192.168.137.32' (ECDSA) to the list of known hosts.  
joaoribeiro@192.168.137.32's password:  
Permission denied, please try again.  
joaoribeiro@192.168.137.32's password:  
[4]+ Stopped sudo ssh joaoribeiro@192.168.137.32  
joaoribeiro@joaoribeiro-VirtualBox:~$ sudo ssh root@192.168.137.32  
root@192.168.137.32's password:  
Last login: Sun Jan 30 13:35:32 2022 from desktop-ect5bvp.mshome.net  
[root@localhost ~]#
```


3. PONTO 2

3.1. Exercício 2.3

Configure a rede de modo a existir comunicação entre todos os equipamentos:



4. PONTO 3

4.1. Exercício 3.1

Crie quatro utilizadores no ftp server, atribuindo a cada um a respetiva password.

NOTA IMPORTANTE, OS UTILIZADORES DEVERÃO TER AS SUAS HOME FOLDERS EM “/storage/home”, os nomes deverão ser usera; userb; userc; userd. Respetivas passwords (usera; userb; userc; userd)

Instalar o vsftpd

```
[root@localhost ~]# yum install vsftpd
```

Permitir e habilitar o vsftpd

```
[root@localhost ~]# systemctl start vsftpd
[root@localhost ~]# systemctl enable vsftpd
Created symlink from /etc/systemd/system/multi-user.target.wants/vsftpd.service to /usr/lib/systemd/system/vsftpd.service.
[root@localhost ~]#
```

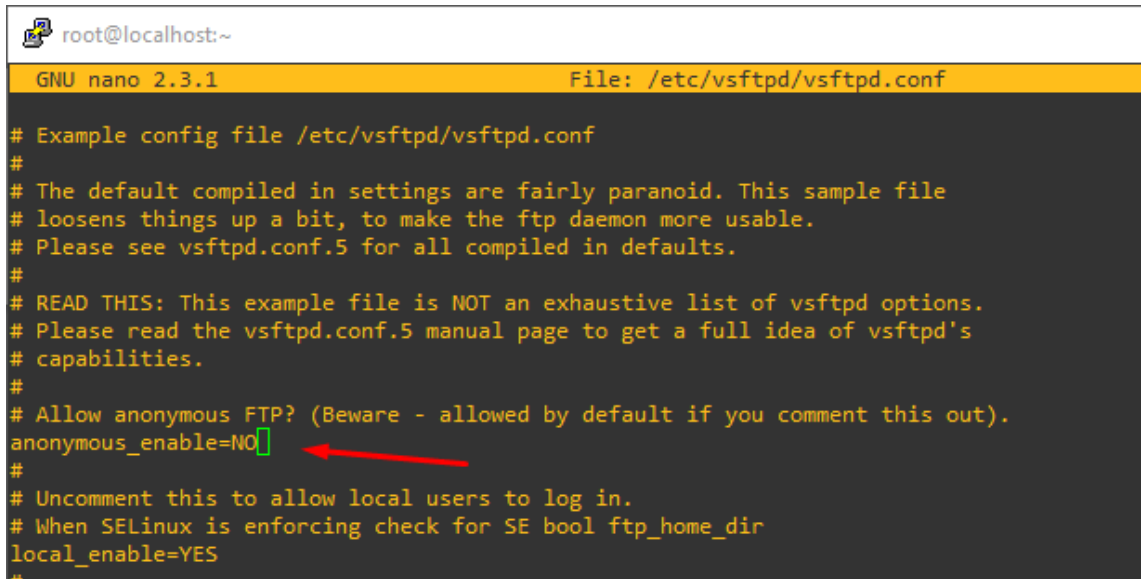
Permitir a firewall

```
[root@localhost ~]# firewall-cmd --zone=public --permanent --add-port=21/tcp
success
[root@localhost ~]# firewall-cmd --zone=public --permanent --add-service=ftp
success
[root@localhost ~]# firewall-cmd --reload
success
```

Fazer um backup do ficheiro de configuração do vsftpd

```
[root@localhost ~]# cp /etc/vsftpd/vsftpd.conf /etc/vsftpd/vsftpd.conf.orig
```

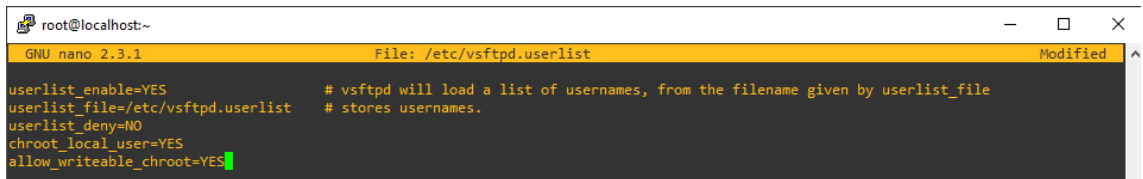
Bloquear o acesso ao ftp anonimamente



```
root@localhost:~
GNU nano 2.3.1 File: /etc/vsftpd/vsftpd.conf

# Example config file /etc/vsftpd/vsftpd.conf
#
# The default compiled in settings are fairly paranoid. This sample file
# loosens things up a bit, to make the ftp daemon more usable.
# Please see vsftpd.conf.5 for all compiled in defaults.
#
# READ THIS: This example file is NOT an exhaustive list of vsftpd options.
# Please read the vsftpd.conf.5 manual page to get a full idea of vsftpd's
# capabilities.
#
# Allow anonymous FTP? (Beware - allowed by default if you comment this out).
anonymous_enable=NO
#
# Uncomment this to allow local users to log in.
# When SELinux is enforcing check for SE bool ftp_home_dir
local_enable=YES
#
```

Editei o ficheiro de user do vsftpd



```
root@localhost:~
GNU nano 2.3.1 File: /etc/vsftpd.userlist Modified
userlist_enable=YES # vsftpd will load a list of usernames, from the filename given by userlist_file
userlist_file=/etc/vsftpd.userlist # stores usernames.
userlist_deny=NO
chroot_local_user=YES
allow_writeable_chroot=YES
```

Reinicei o serviço

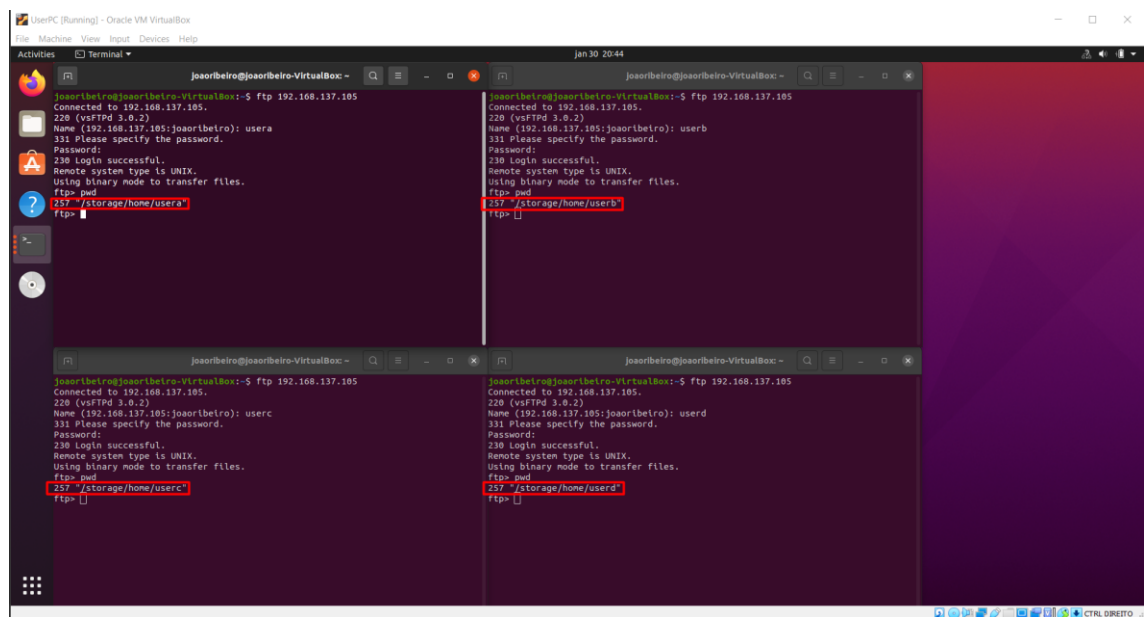
```
[root@localhost ~]# systemctl restart vsftpd
```

Criar a pasta, os users e definir as suas passwords

```
root@localhost:~  
userd  
[root@localhost ~]# cat /etc/vsftpd.userlist  
userlist_enable=YES          # vsftpd will load a list of usernames, from the file  
userlist_file=/etc/vsftpd.userlist # stores usernames.  
userlist_deny=NO  
chroot_local_user=YES  
allow_writeable_chroot=YES  
usera  
userb  
userc  
userd  
[root@localhost ~]# mkdir /storage/home/usera/ftp  
mkdir: impossível criar a pasta «/storage/home/usera/ftp»: No such file or directory  
[root@localhost ~]# mkdir /storage  
[root@localhost ~]# mkdir /storage/home  
[root@localhost ~]# userremove usera  
-bash: userremove: command not found  
[root@localhost ~]# userremove usera  
-bash: userremove: command not found  
[root@localhost ~]# useradd usera -d /storage/home/usera  
useradd: o utilizador 'usera' já existe  
[root@localhost ~]# userdel usera  
[root@localhost ~]# userdel userb  
[root@localhost ~]# userdel userc  
[root@localhost ~]# userdel userf  
userdel: o utilizador 'userf' não existe  
[root@localhost ~]# userdel userd  
[root@localhost ~]# useradd usera -d /storage/home/usera  
Criar ficheiro mailbox: File exists  
[root@localhost ~]# useradd userb -d /storage/home/usera  
useradd: aviso: o directório home já existe.  
Não irá copiar quaisquer ficheiros o directório skel para lá.  
Criar ficheiro mailbox: File exists  
[root@localhost ~]# useradd userb -d /storage/home/userb  
useradd: o utilizador 'userb' já existe  
[root@localhost ~]# userdel userb  
[root@localhost ~]# useradd userb -d /storage/home/userb  
Criar ficheiro mailbox: File exists  
[root@localhost ~]# useradd userc -d /storage/home/userc  
Criar ficheiro mailbox: File exists  
[root@localhost ~]# useradd userd -d /storage/home/userd  
Criar ficheiro mailbox: File exists  
[root@localhost ~]# passwd usera  
A modificar a senha do utilizador usera.  
Nova senha:  
MÁ SENHA: A senha é mais pequena que 8 caracteres  
Digite novamente a nova senha:  
passwd: todos os itens de autenticação foram actualizados com sucesso.  
[root@localhost ~]# passwd userb  
A modificar a senha do utilizador userb.  
Nova senha:  
MÁ SENHA: A senha é mais pequena que 8 caracteres  
Digite novamente a nova senha:  
passwd: todos os itens de autenticação foram actualizados com sucesso.  
[root@localhost ~]# passwd userc  
A modificar a senha do utilizador userc.  
Nova senha:  
MÁ SENHA: A senha é mais pequena que 8 caracteres  
Digite novamente a nova senha:  
passwd: todos os itens de autenticação foram actualizados com sucesso.  
[root@localhost ~]# passwd userd  
A modificar a senha do utilizador userd.  
Nova senha:  
MÁ SENHA: A senha é mais pequena que 8 caracteres  
Digite novamente a nova senha:  
passwd: todos os itens de autenticação foram actualizados com sucesso.  
[root@localhost ~]# cat /etc/vsftpd.userlist
```

Adicionar os user à pasta dos user e ver o que está dentro da pasta dos users

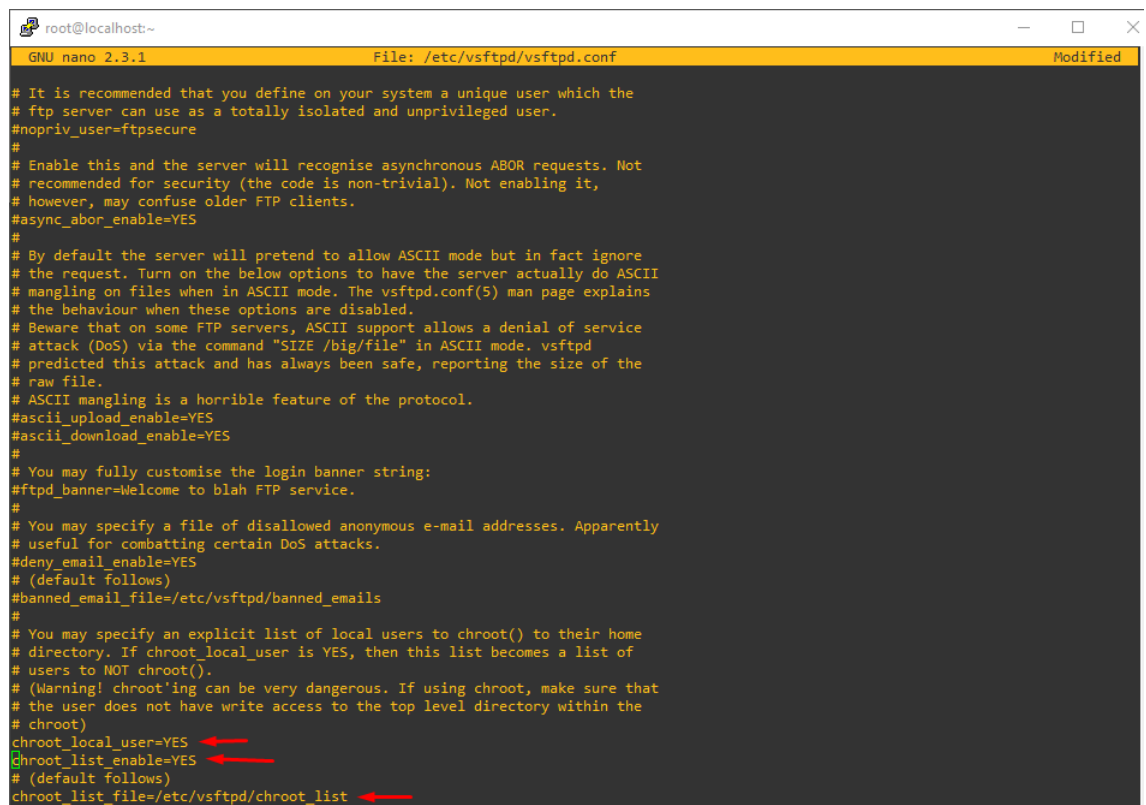
```
[root@localhost ~]# echo "usera" | tee -a /etc/vsftpd.userlist  
usera  
[root@localhost ~]# echo "userb" | tee -a /etc/vsftpd.userlist  
userb  
[root@localhost ~]# echo "userc" | tee -a /etc/vsftpd.userlist  
userc  
[root@localhost ~]# echo "userd" | tee -a /etc/vsftpd.userlist  
userd  
[root@localhost ~]# cat /etc/vsftpd.userlist  
userlist_enable=YES          # vsftpd will load a list of usernames, from the filename given by userlist_file  
userlist_file=/etc/vsftpd.userlist # stores usernames.  
userlist_deny=NO  
chroot_local_user=YES  
allow_writeable_chroot=YES  
usera  
userb  
userc  
userd  
[root@localhost ~]#
```



4.2. Exercício 3.2

“Configure o serviço de FTP para permitir conexões remotas através dos utilizadores criados anteriormente. Enjaule as conexões de FTP apenas aos utilizadores usera e userb.”

Descomentar as linhas marcadas



Aceder à chroot list e adicionar os user que se vai aplicar o jail

```
root@localhost:~  
GNU nano 2.3.1 File: /etc/vsftpd/chroot_list  
Usera  
userb
```

5. PONTO 4

“Crie um raid 1 + 1 disco Hotspare para segurança no armazenamento da informação. Deverá introduzir o nome da diretoria a montar a nova drive. NOTA: Deverá adicionar os discos necessários previamente no virtualbox de tamanho igual a 10 Gbytes para a criação deste tipo de raid.”

Instalar o mdadm

```
[root@localhost ~]# yum install mdadm -y
```

Selecionar 2 discos para o raid e 1 para o hot-spare

```
[root@localhost ~]# mdadm --create --verbose --level=1 --metadata=1.2 --raid-devices=2 /dev/md/backup /dev/sdb /dev/sdc --spare-device  
s=1 /dev/sdd  
mdadm: size set to 10476544K  
mdadm: array /dev/md/backup started.
```

```
root@localhost ~]# lsblk  
NAME        MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINT  
da           8:0    0   10G  0 disk  
├─sda1        8:1    0    1G  0 part  /boot  
├─sda2        8:2    0    9G  0 part  
│ └─centos-root 253:0    0    8G  0 lvm    /  
│ └─centos-swap 253:1    0    1G  0 lvm    [SWAP]  
db           8:16    0   10G  0 disk  
├─md127       9:127   0   10G  0 raid1  
├─dc           8:32    0   10G  0 disk  
├─md127       9:127   0   10G  0 raid1  
├─dd           8:48    0   10G  0 disk  
├─md127       9:127   0   10G  0 raid1  
└─r0          11:0    1 1024M  0 rom  
root@localhost ~]#
```

Adicionar a ultima linha ao /etc/fstab

```
GNU nano 2.3.1 File: /etc/fstab  
  
#  
# /etc/fstab  
# Created by anaconda on Fri Jan 28 14:16:31 2022  
#  
# Accessible filesystems, by reference, are maintained under '/dev/disk'  
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info  
#  
/dev/mapper/centos-root / xfs defaults 0 0  
UUID=54a8d0c9-28d4-4740-802b-9a67d51e3cac /boot xfs defaults 0 0  
/dev/mapper/centos-swap swap swap defaults 0 0  
/dev/md127 /disk1 ext4 defaults 0 0
```

```
[root@localhost ~]# mdadm --detail /dev/md127
/dev/md127:
  Version : 1.2
  Creation Time : Fri Jan 28 23:25:02 2022
  Raid Level : raid1
  Array Size : 10476544 (9.99 GiB 10.73 GB)
  Used Dev Size : 10476544 (9.99 GiB 10.73 GB)
  Raid Devices : 2
  Total Devices : 3
  Persistence : Superblock is persistent

  Update Time : Fri Jan 28 23:25:54 2022
  State : clean
  Active Devices : 2
  Working Devices : 3
  Failed Devices : 0
  Spare Devices : 1

Consistency Policy : resync

    Name : localhost.localdomain:backup (local to host localhost.localdomain)
    UUID : cc14ecd4:e667234c:84bfa321:63a7e0fe
    Events : 17

   Number Major Minor RaidDevice State
     0         8      16         0 active sync /dev/sdb
     1         8      32         1 active sync /dev/sdc
     2         8      48         - spare   /dev/sdd

[root@localhost ~]#
```

6. PONTO 5

6.1. Exercício 5.1

“Crie dois utilizadores no Linux com as características descritas abaixo.”

```
[root@localhost ~]# groupadd users
groupadd: o grupo 'users' já existe
[root@localhost ~]# useradd asuser1 -G users
[root@localhost ~]# useradd asuser2 -G users
[root@localhost ~]# passwd asuser1
A modificar a senha do utilizador asuser1.
Nova senha:
MÁ SENHA: A senha contém o nome do utilizador em alguma forma
Digite novamente a nova senha:
passwd: todos os itens de autenticação foram actualizados com sucesso.
[root@localhost ~]# passwd asuser2
A modificar a senha do utilizador asuser2.
Nova senha:
MÁ SENHA: A senha contém o nome do utilizador em alguma forma
Digite novamente a nova senha:
passwd: todos os itens de autenticação foram actualizados com sucesso.
[root@localhost ~]#
```

6.2. Exercício 5.2

“Configure o Servidor Apache de modo que cada utilizador tenha de criar uma diretoria com o nome de “homepage” na sua diretoria home para poder exibir a sua página pessoal.”

Instalar o Apache

```
[root@localhost ~]# yum install httpd*
```

Mudar a diretoria para “homepage”

```
root@localhost:~  
GNU nano 2.3.1 File: /etc/httpd/conf.d/userdir.conf  
#  
# UserDir: The name of the directory that is appended onto a user's home  
# directory if a ~user request is received.  
#  
# The path to the end user account 'public_html' directory must be  
# accessible to the webserver user. This usually means that ~userid  
# must have permissions of 711, ~userid/public_html must have permissions  
# of 755, and documents contained therein must be world-readable.  
# Otherwise, the client will only receive a "403 Forbidden" message.  
#  
<IfModule mod_userdir.c>  
#  
# UserDir is disabled by default since it can confirm the presence  
# of a username on the system (depending on home directory  
# permissions).  
#  
# UserDir homepage  
#  
# To enable requests to ~user/ to serve the user's public_html  
# directory, remove the "UserDir disabled" line above, and uncomment  
# the following line instead:  
#  
#UserDir public_html  
</IfModule>  
#  
# Control access to UserDir directories. The following is an example  
# for a site where these directories are restricted to read-only.  
#  
<Directory "/home/*/homepage">  
    AllowOverride FileInfo AuthConfig Limit Indexes  
    Options MultiViews Indexes SymLinksIfOwnerMatch IncludesNoExec  
    Require method GET POST OPTIONS  
</Directory>
```

Reiniciar o apache

```
[root@localhost ~]# systemctl restart httpd
```

Entrar dentro da pasta dos dois “asuser” e criar o pasta homepage

```
[root@localhost ~]# su asuser1  
[asuser1@localhost root]$ ls  
ls: impossível abrir a pasta .: Permission denied  
[asuser1@localhost root]$ cd /home/asuser1  
[asuser1@localhost ~]$ ls  
[asuser1@localhost ~]$ pwd  
/home/asuser1  
[asuser1@localhost ~]$ mkdir homepage  
[asuser1@localhost ~]$ ls  
homepage  
[asuser1@localhost ~]$ exit  
exit  
[root@localhost ~]# su asuser2  
[asuser2@localhost root]$ cd /home/asuser2  
[asuser2@localhost ~]$ mkdir homepage  
[asuser2@localhost ~]$ ls  
homepage  
[asuser2@localhost ~]$
```

Dar as permissões

```
[root@localhost home]# chmod 755 asuser1 -R  
[root@localhost home]# chmod 755 asuser2 -R
```

6.3. Exercício 5.3

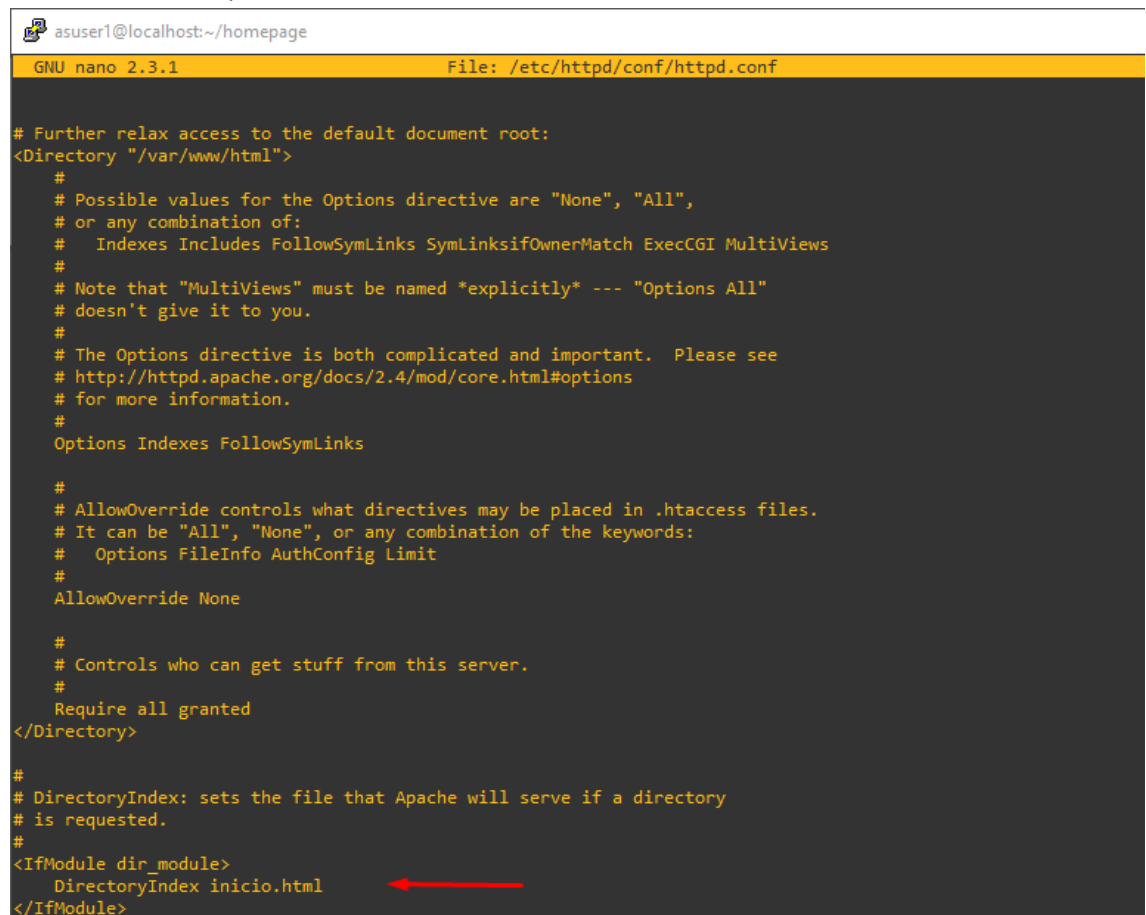
“Efetue uma pequena página em html (inicio.html) para cada utilizador. Sendo o ficheiro colocado dentro da diretoria “homepage” de cada utilizador. 4 A página apenas deverá mostrar o nome de cada utilizador. NOTA: O servidor apache deverá carregar automaticamente páginas com o ficheiro “inicio.html””

Criar os ficheiros inicio.html dentro da pasta homepage, dentro do inicio.html está o nome dos “asusers”

```
[asuser1@localhost root]$ cd /home/asuser1/homepage
[asuser1@localhost homepage]$ nano inicio.html
```

```
[root@localhost home]# su asuser2
[asuser2@localhost home]$ cd home/asuser2/homepage
bash: cd: home/asuser2/homepage: No such file or directory
[asuser2@localhost home]$ cd /home/asuser2/homepage
[asuser2@localhost homepage]$ nano inicio.html
```

Trocar index.html para inicio.html



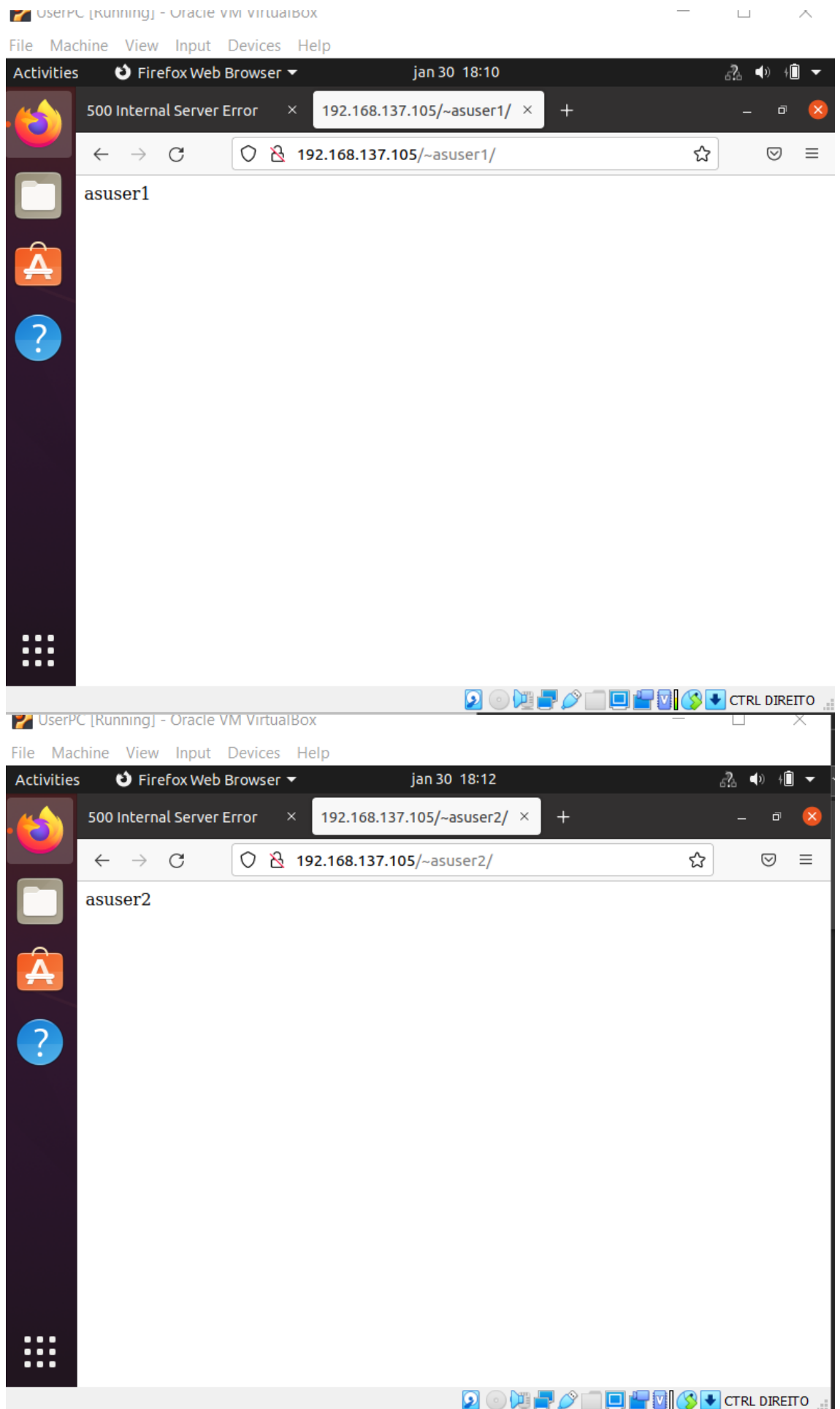
```
asuser1@localhost:~/homepage
GNU nano 2.3.1 File: /etc/httpd/conf/httpd.conf

# Further relax access to the default document root:
<Directory "/var/www/html">
#
# Possible values for the Options directive are "None", "All",
# or any combination of:
#   Indexes Includes FollowSymLinks SymLinksifOwnerMatch ExecCGI MultiViews
#
# Note that "MultiViews" must be named *explicitly* --- "Options All"
# doesn't give it to you.
#
# The Options directive is both complicated and important. Please see
# http://httpd.apache.org/docs/2.4/mod/core.html#options
# for more information.
#
Options Indexes FollowSymLinks

#
# AllowOverride controls what directives may be placed in .htaccess files.
# It can be "All", "None", or any combination of the keywords:
#   Options FileInfo AuthConfig Limit
#
AllowOverride None

#
# Controls who can get stuff from this server.
#
Require all granted
</Directory>

#
# DirectoryIndex: sets the file that Apache will serve if a directory
# is requested.
#
<IfModule dir_module>
    DirectoryIndex inicio.html
</IfModule>
```

6.4. Exercício 5.4

“Os utilizadores asuser1 e asuser2 deverão ter uma diretoria com o nome “private” onde esta deverá ter autenticação através do apache para a listagem do seu conteúdo.”

Colocar autenticação

```
root@localhost:/home
GNU nano 2.3.1 File: /etc/httpd/conf/httpd.conf

# The directives in this section set up the values used by the 'main'
# server, which responds to any requests that aren't handled by a
# <VirtualHost> definition. These values also provide defaults for
# any <VirtualHost> containers you may define later in the file.
#
# All of these directives may appear inside <VirtualHost> containers,
# in which case these default settings will be overridden for the
# virtual host being defined.
#
#
# ServerAdmin: Your address, where problems with the server should be
# e-mailed. This address appears on some server-generated pages, such
# as error documents. e.g. admin@your-domain.com
#
ServerAdmin root@localhost
#
# ServerName gives the name and port that the server uses to identify itself.
# This can often be determined automatically, but we recommend you specify
# it explicitly to prevent problems during startup.
#
# If your host doesn't have a registered DNS name, enter its IP address here.
#
#ServerName www.example.com:80
#
# Deny access to the entirety of your server's filesystem. You must
# explicitly permit access to web content directories in other
# <Directory> blocks below.
#
<Directory />
    AllowOverride AuthConfig ←
    Require all denied
</Directory>
#
# Note that from this point forward you must specifically allow
# particular features to be enabled - so if something's not working as
# you might expect, make sure that you have specifically enabled it
# below.
#
```

Criar as pastas “private”

```
[root@localhost home]# nano /etc/httpd/conf/httpd.conf
[root@localhost home]# cd /home/asuser1/homepage/
[root@localhost homepage]# mkdir private
[root@localhost homepage]# cd /home/asuser2/homepage/
[root@localhost homepage]# mkdir private
[root@localhost homepage]#
```

Criei um ficheiro inicio.html dentro das “private” dos user, dentro do inicio.html está o nome do respetivo utilizador

```
[root@localhost homepage]# cd /home/asuser2/homepage/private/
[root@localhost private]# nano inicio.html
[root@localhost private]# cd /home/asuser1/homepage/private/
[root@localhost private]# nano inicio.html
[root@localhost private]#
```

Dentro da pasta “private”, criar e configurar o ficheiro “.htaccess”

```
root@localhost:/home/asuser1/homepage/private
GNU nano 2.3.1 File: .htaccess
AuthName "Diretorio Privado - Nome Utilizador"
AuthType Basic
AuthUserFile /home/asuser1/homepage/private/.user_passwd
require valid-user
```

6.5. Exercício 5.5

“Permita que dois utilizadores listem a diretoria privada do utilizador asuser1, através dos seguintes users:

user: private pass: 123 / user: privado pass: 123”

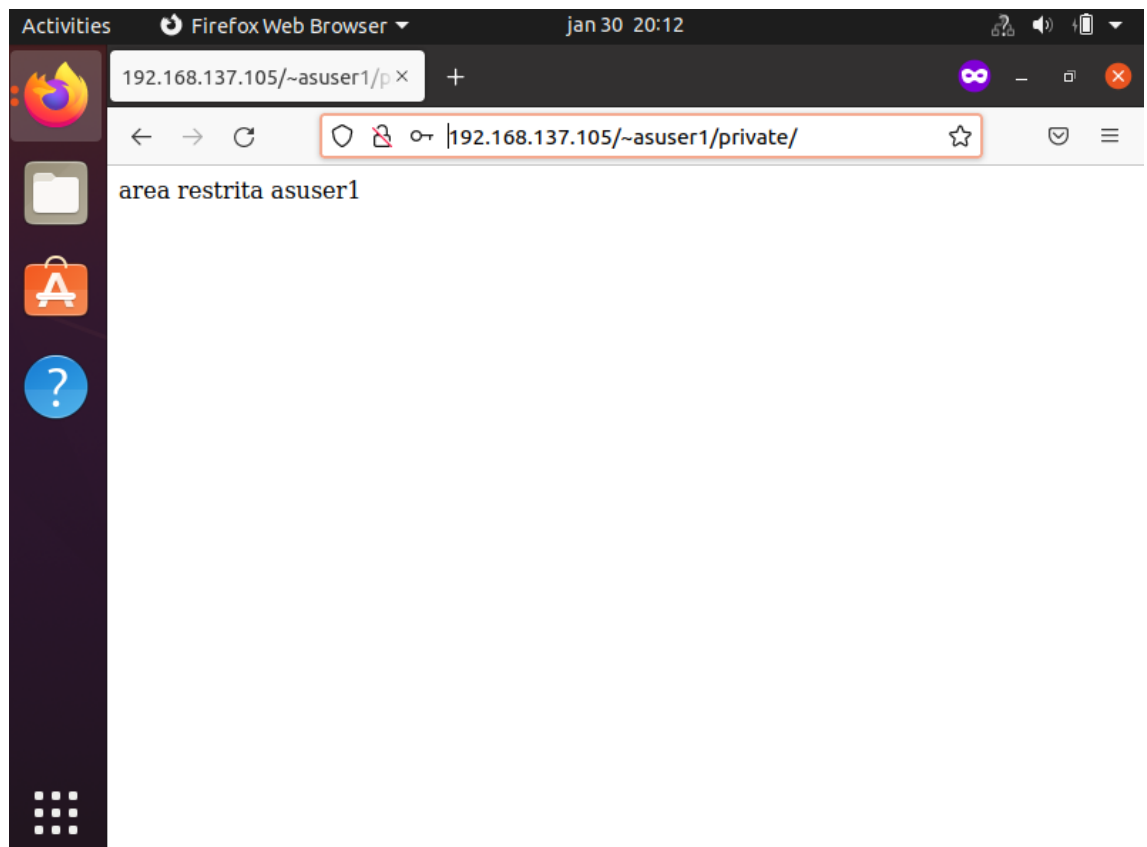
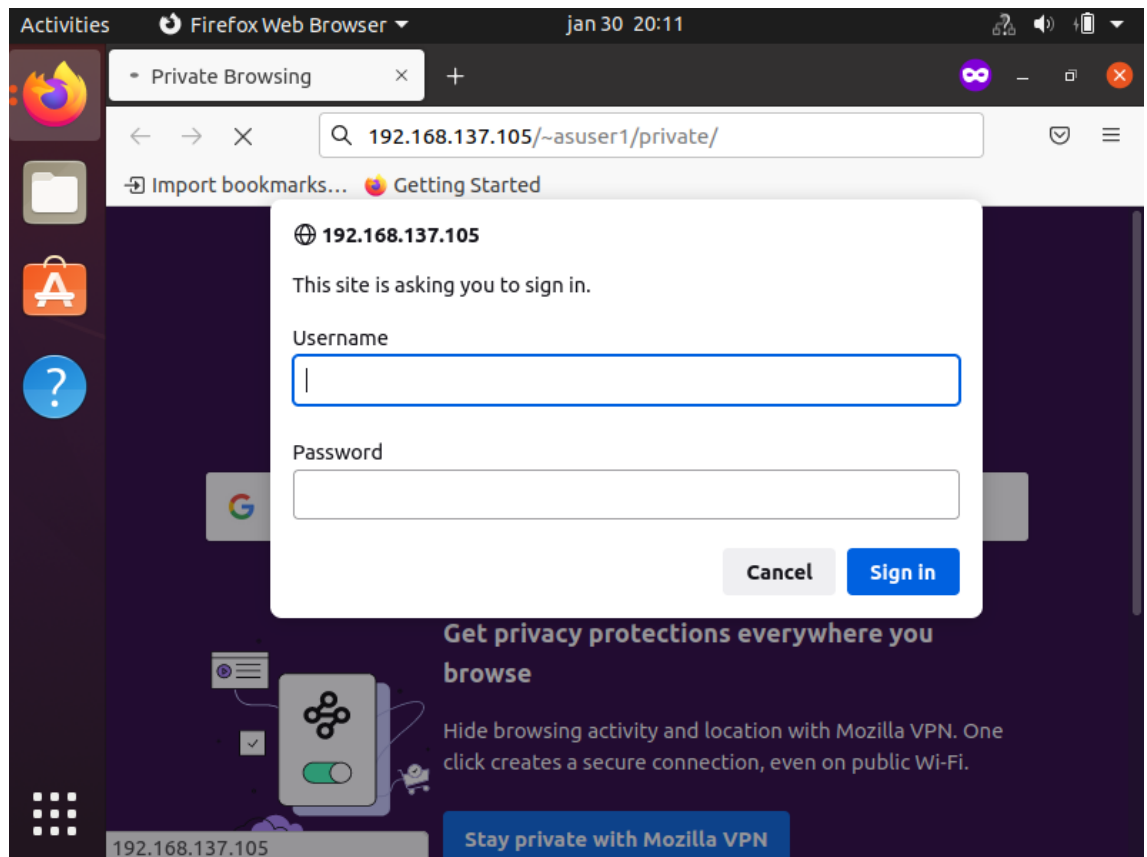
Adicionar o user: private e a pass: 123

```
[root@localhost home]# htpasswd -c /home/.user_passwd private
New password:
Re-type new password:
Adding password for user private
[root@localhost home]#
```

Adicionar o usuário “privado” e a passe 123

```
[root@localhost home]# htpasswd /home/.user_passwd privado
New password:
Re-type new password:
Adding password for user privado
```

```
[root@localhost home]# cat .user_passwd
private:$apr1$tQtPLCpk$fIOrd.ZznV.KLFAjPdNXR0
privado:$apr1$4XNW8GMW$LOOpUjPprbLAVHB3gLhuW.
[root@localhost home]#
```



7. Ponto 6

7.1. Exercício 6.1

“Defina no servidor DNS a possibilidade de receber os backups de ficheiros e configurações cruciais a ambos os servidores”

Fazer o update à cache e instalar o tftp

```
[root@localhost ~]# yum makecache
```

```
[root@localhost ~]# yum install tftp tftp-server
```

Copiar os ficheiros por segurança

```
[root@localhost ~]# sudo cp -v /usr/lib/systemd/system/tftp.socket /etc/systemd/system/tftp-server.socket  
«/usr/lib/systemd/system/tftp.socket» -> «/etc/systemd/system/tftp-server.socket»  
[root@localhost ~]# sudo cp -v /usr/lib/systemd/system/tftp.service /etc/systemd/system/tftp-server.service  
«/usr/lib/systemd/system/tftp.service» -> «/etc/systemd/system/tftp-server.service»
```

Editar o ficheiro de configuração tftp-server.service

```
root@localhost:~  
GNU nano 2.3.1 File: /etc/systemd/system/tftp-server.service  
[Unit]  
Description=Tftp Server  
Requires=server.socket  
Documentation=man:in.tftpd  
[Service]  
ExecStart=/usr/sbin/in.tftpd -c -p -s /var/lib/tftpboot  
StandardInput=socket  
[Install]  
WantedBy=multi-user.target  
Also=tftp-server.socket
```

Editar o ficheiro de configuração tftp-server.socket

```
root@localhost:~  
GNU nano 2.3.1 File: /etc/systemd/system/tftp-server.socket  
[Unit]  
Description=Tftp Server Activation Socket  
[Socket]  
ListenDatagram=69  
BindIPv6Only=both  
[Install]  
WantedBy=sockets.target
```

Instalar o policycoreutils-python

```
[root@localhost ~]# yum install policycoreutils-python
```

```
[root@localhost ~]# sudo setsebool -P tftp_anon_write 1
```

```
[root@localhost ~]# sudo systemctl start tftp-server
[root@localhost ~]# systemctl status tftp-server
● tftp-server.service - Tftp Server
   Loaded: loaded (/etc/systemd/system/tftp-server.service; enabled; vendor preset: disabled)
   Active: active (running) since Sáb 2022-01-29 19:43:24 WET; 17s ago
     Docs: man:in.tftpd
   Main PID: 9751 (in.tftpd)
    CGroup: /system.slice/tftp-server.service
            └─9751 /usr/sbin/in.tftpd -c -p -s /var/lib/tftpboot

Jan 29 19:43:24 localhost.localdomain systemd[1]: Started Tftp Server.
[root@localhost ~]#
```

Dar permissões na pasta

```
[root@localhost ~]# sudo chmod 777 /var/lib/tftpboot
```

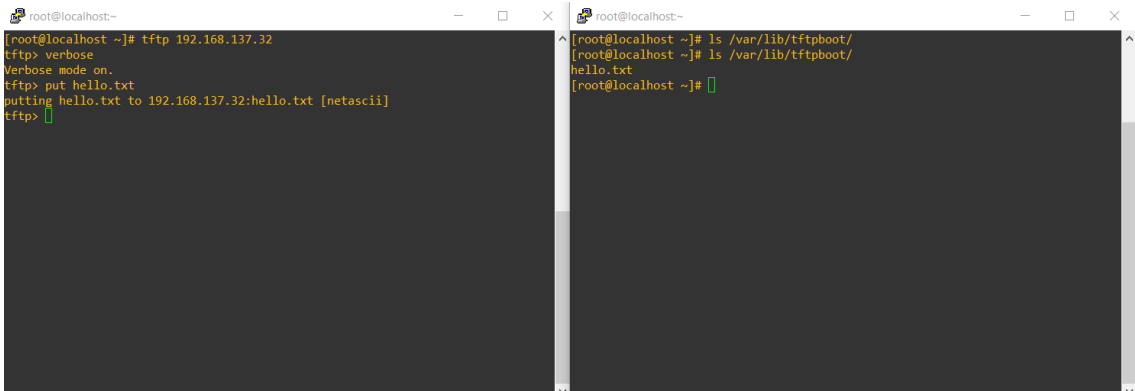
Criar o ficheiro hello.txt

 FTPServer 1 [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

```
[root@localhost ~]# systemctl stop firewalld
[root@localhost ~]# touch hello.txt
[root@localhost ~]# ls
anaconda-ks.cfg  hello.txt
[root@localhost ~]#
```

Aceder ao servidor DNS/BackupServer via tftp e colocar



```
root@localhost:~
tftp> verbose
Verbose mode on.
tftp> put hello.txt
putting hello.txt to 192.168.137.32:hello.txt [netascii]
tftp>

root@localhost ~]# ls /var/lib/tftpboot/
hello.txt
root@localhost ~]#
```

7.2. Exercício 6.2

8. Ponto 7

8.1. Exercício 7.1

“No servidor de DNS crie 3 zonas master (IPV4) para o domínio gules.org, 300emfrente.eu e then.com com os seguintes registos do tipo A:”

Instalar o DNS

```
[root@localhost ~]# yum -y install bind-utils
```

Permitir a firewall

```
[root@localhost ~]# firewall-cmd --permanent --add-port=53/udp
success
[root@localhost ~]# firewall-cmd --reload
success
```

Alterar os IPs



```
GNU nano 2.3.1 File: /etc/named.conf Modified
//
// named.conf
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only nameserver (as a localhost DNS resolver only).
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//
// See the BIND Administrator's Reference Manual (ARM) for details about the
// configuration located in /usr/share/doc/bind-{version}/Bv9ARM.html

options {
    listen-on port 53 { 127.0.0.1; any; };
    listen-on-v6 port 53 { ::1; };
    directory "/var/named";
    dump-file "/var/named/data/cache_dump.db";
    statistics-file "/var/named/data/named_stats.txt";
    memstatistics-file "/var/named/data/named_mem_stats.txt";
    recursing-file "/var/named/data/named.recursing";
    secroots-file "/var/named/data/named.secreots";
    allow-query { localhost; any; };

    /*
     - If you are building an AUTHORITATIVE DNS server, do NOT enable recursion.
     - If you are building a RECURSIVE (caching) DNS server, you need to enable
       recursion.
     - If your recursive DNS server has a public IP address, you MUST enable access
       control to limit queries to your legitimate users. Failing to do so will
       cause your server to become part of large scale DNS amplification
       attacks. Implementing BCP38 within your network would greatly
       reduce such attack surface
    */
    recursion no;

    dnssec-enable yes;
    dnssec-validation yes;

    /* Path to ISC DLV key */
    bindkeys-file "/etc/named.root.key";

    managed-keys-directory "/var/named/dynamic";

    pid-file "/run/named/named.pid";
    session-keyfile "/run/named/session.key";

^G Get Help      ^O WriteOut     ^R Read File    ^Y Prev Page    ^K Cut Text      ^C Cur Pos
^X Exit          ^J Justify      ^W Where Is     ^V Next Page    ^U UnCut Text   ^T To Spell
```

root@localhost:~

GNU nano 2.3.1 File: /etc/named.conf

```
};

logging {
    channel default_debug {
        file "data/named.run";
        severity dynamic;
    };
};

zone "." IN {
    type hint;
    file "named.ca";
};

zone "gules.org" IN {
    type master;
    file "/var/named/gules.org.db";
};

zone "300emfrente.eu" IN {
    type master;
    file "/var/named/300emfrente.eu.db";
};

zone "then.com" IN {
    type master;
    file "/var/named/then.com.db";
};
```

```
[root@localhost ~]# systemctl restart named
```


8.2. Exercício 7.2

“O servidor responsável para receber os mails dos 3 domínios é o servidor com o nome de as-smtp.300emfrente.eu, adicione os registos que considere necessário para o correcto funcionamento em cada domínio.”

Configurar para cada server

 root@localhost:~

```
GNU nano 2.3.1 File: /var/named/gules.org.db

@ IN SOA ns1.gules.org. root.gules.org. (
                                1001 ;Serial
                                3H   ;Refresh
                                15M   ;Retry
                                1W    ;Expire
                                1D    ;Minimum TTL
                                )

;Name Server Information
@ IN NS ns1.gules.org.

;IP address of Name Server
ns1 IN A 192.168.137.142

;Mail exchanger
gules.org IN MX 10 as-smtp.300emfrente.eu.

;A - Record HostName To IP Address
gules.org. IN A 8.3.2.14
ftp IN A 8.3.2.15
webmail IN A 8.3.2.16
```

root@localhost:~

```
GNU nano 2.3.1 File: /var/named/300emfrente.eu.db

@ IN SOA ns1.300emfrente.eu. root.300emfrente.eu. (
                                1001 ;Serial
                                3H   ;Refresh
                                15M   ;Retry
                                1W    ;Expire
                                1D    ;Minimum TTL
                                )

;Name Server Information
@ IN NS ns1.300emfrente.eu.

;IP address of Name Server
ns1 IN A 192.168.137.142

;Mail exchanger
300emfrente.eu IN MX 10 as-smtp.300emfrente.eu.

;A - Record HostName To IP Address
300emfrente.eu. IN A 14.21.1.14
www IN A 77.8.90.1
webmail IN A 11.21.1.16
as-smtp IN A 11.0.0.1
```

root@localhost:~

```
GNU nano 2.3.1 File: /var/named/then.com.db

@ IN SOA ns1.then.com. root.then.com. (
                                1001 ;Serial
                                3H   ;Refresh
                                15M   ;Retry
                                1W    ;Expire
                                1D    ;Minimum TTL
                                )

;Name Server Information
@ IN NS ns1.then.com.

;IP address of Name Server
ns1 IN A 192.168.137.142


;Mail exchanger
then.com IN MX 10 as-smtp.300emfrente.eu.

;A - Record HostName To IP Address
webmail IN A 194.168.22.16
@ IN A 191.200.22.14
ftp IN A 92.147.45.1
```

8.3. Exercício 7.3

“Crie as zonas reverse do domínio then.com para todos os registos existentes na zona forward em IPV4.”

Adicionar as 3 zonas reversas

 root@localhost:~

```
GNU nano 2.3.1 File: /etc/named.conf

    file "/var/named/300emfrente.eu.db";
};

zone "then.com" IN {

    type master;

    file "/var/named/then.com.db";
};

zone "1.22.200.191.in-addr.arpa" IN {

    type master;

    file "/var/named/14.22.200.191.db";

    allow-update { none; };
};

zone "1.45.147.92.in-addr.arpa" IN {

    type master;

    file "/var/named/1.45.147.92.db";

    allow-update { none; };
};

zone "16.22.168.194.in-addr.arpa" IN {

    type master;

    file "/var/named/16.22.168.194.db";

    allow-update { none; };
};
```

root@localhost:~

GNU nano 2.3.1

File: /var/named/14.22.200.191.db

```
@ IN SOA      ns1.then.com. root.then.com. (
                                           1001    ;Serial
                                           3H      ;Refresh
                                           15M     ;Retry
                                           1W      ;Expire
                                           1D      ;Minimum TTL
                                           )

;Name Server Information
@ IN NS       ns1.then.com.

;PTR Record IP address to HostName
@           IN PTR  then.com.
```

root@localhost:~

GNU nano 2.3.1

File: /var/named/1.45.147.92.db

```
@ IN SOA      ns1.ftp.then.com. root.ftp.then.com. (
                                           1001    ;Serial
                                           3H      ;Refresh
                                           15M     ;Retry
                                           1W      ;Expire
                                           1D      ;Minimum TTL
                                           )

;Name Server Information
@ IN NS       ns1.then.com.

;PTR Record IP address to HostName
@           IN PTR  ftp.then.com.
```

root@localhost:~

GNU nano 2.3.1

File: /var/named/16.22.168.194.db

```
@ IN SOA      ns1.webmail.then.com. root.webmail.then.com. (
                                           1001    ;Serial
                                           3H      ;Refresh
                                           15M     ;Retry
                                           1W      ;Expire
                                           1D      ;Minimum TTL
                                           )

;Name Server Information
@ IN NS       ns1.then.com.

;PTR Record IP address to HostName
@           IN PTR  webmail.then.com.
```

Prova que o site 300emfrente está a funcionar

```
[root@localhost ~]# dig 300emfrente.eu

; <<>> DiG 9.11.4-P2-RedHat-9.11.4-26.P2.el7_9.8 <<>> 300emfrente.eu
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 20643
;; flags: qr aa rd; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;300emfrente.eu.                IN      A

;; ANSWER SECTION:
300emfrente.eu.                86400   IN      A      14.21.1.14

;; AUTHORITY SECTION:
300emfrente.eu.                86400   IN      NS      ns1.300emfrente.eu.

;; ADDITIONAL SECTION:
ns1.300emfrente.eu.           86400   IN      A      192.168.137.32

;; Query time: 0 msec
;; SERVER: 192.168.137.32#53(192.168.137.32)
;; WHEN: Dom Jan 30 03:15:42 WET 2022
;; MSG SIZE rcvd: 93
```

```
[root@localhost ~]# dig gules.org

; <<>> DiG 9.11.4-P2-RedHat-9.11.4-26.P2.el7_9.8 <<>> gules.org
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 59613
;; flags: qr aa rd; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;gules.org.                     IN      A

;; ANSWER SECTION:
gules.org.                     86400   IN      A      8.3.2.14

;; AUTHORITY SECTION:
gules.org.                     86400   IN      NS      ns1.gules.org.

;; ADDITIONAL SECTION:
ns1.gules.org.                 86400   IN      A      192.168.137.32

;; Query time: 0 msec
;; SERVER: 192.168.137.32#53(192.168.137.32)
;; WHEN: Dom Jan 30 03:17:18 WET 2022
;; MSG SIZE rcvd: 88
```

9. Ponto 8

9.1. Exercício 8.1

“O seu servidor necessita de alojar 3 domínios sendo eles: allow.org; circle360.pt; festas.pt. Crie os VirtualHosts na porta tcp 25000 e 28000 para que todos estes domínios respondam corretamente.”


Instalar o apache

```
[root@localhost ~]# yum install httpd
```

Permitir na firewall

```
[root@localhost ~]# sudo firewall-cmd --permanent --zone=public --add-service=http
success
[root@localhost ~]# sudo firewall-cmd --permanent --zone=public --add-service=https
success
[root@localhost ~]# sudo firewall-cmd --reload
success
[root@localhost ~]#
```

Trocar o nameserver do servidor

 root@localhost:~

```
GNU nano 2.3.1 File: /etc/resolv.conf

# Generated by NetworkManager
search mshome.net
#nameserver 192.168.137.1
nameserver 192.168.137.32
```

Criar as zonas

root@localhost:~

```
GNU nano 2.3.1 File: /etc/named.conf

    file "/var/named/1.45.147.92.db";

    allow-update { none; };
};

zone "16.22.168.194.in-addr.arpa" IN {

    type master;

    file "/var/named/16.22.168.194.db";

    allow-update { none; };
};

zone "allow.org" IN {
    type master;

    file "/var/named/allow.org";

    allow-update { none; };
};

zone "circle360.pt" IN {

    type master;

    file "/var/named/circle360.pt";

    allow-update { none; };
};

zone "festas.pt" IN {

    type master;

    file "/var/named/festas.pt";

    allow-update { none; };
};

include "/etc/named.rfc1912.zones";
include "/etc/named.root.key";
```

Configurar o virtual host do site allow.org

root@localhost:~

```
GNU nano 2.3.1 File: /etc/httpd/conf.d/allow.org.conf

<VirtualHost *:25000 *:28000>
    ServerName allow.org
    ServerAlias www.allow.org
    ServerAdmin webmaster@allow.org
    DocumentRoot /var/www/allow.org/public_html

    <Directory /var/www/allow.org/public_html>
        Options -Indexes +FollowSymLinks
        AllowOverride All
    </Directory>

    ErrorLog /var/log/httpd/allow.org.log
    CustomLog /var/log/httpd/allow.org-access.log combined
</VirtualHost>
```

Adicionar as portas referidas no enunciado

root@localhost:~

```
GNU nano 2.3.1 File: /etc/httpd/conf/httpd.conf

#
# This is the main Apache HTTP server configuration file. It contains the
# configuration directives that give the server its instructions.
# See <URL:http://httpd.apache.org/docs/2.4/> for detailed information.
# In particular, see
# <URL:http://httpd.apache.org/docs/2.4/mod/directives.html>
# for a discussion of each configuration directive.
#
# Do NOT simply read the instructions in here without understanding
# what they do. They're here only as hints or reminders. If you are unsure
# consult the online docs. You have been warned.
#
# Configuration and logfile names: If the filenames you specify for many
# of the server's control files begin with "/" (or "drive:/" for Win32), the
# server will use that explicit path. If the filenames do *not* begin
# with "/", the value of ServerRoot is prepended -- so 'log/access_log'
# with ServerRoot set to '/www' will be interpreted by the
# server as '/www/log/access_log', where as '/log/access_log' will be
# interpreted as '/log/access_log'.
#
# ServerRoot: The top of the directory tree under which the server's
# configuration, error, and log files are kept.
#
# Do not add a slash at the end of the directory path. If you point
# ServerRoot at a non-local disk, be sure to specify a local disk on the
# Mutex directive, if file-based mutexes are used. If you wish to share the
# same ServerRoot for multiple httpd daemons, you will need to change at
# least PidFile.
#
ServerRoot "/etc/httpd"
#
# Listen: Allows you to bind Apache to specific IP addresses and/or
# ports, instead of the default. See also the <VirtualHost>
# directive.
#
# Change this to Listen on specific IP addresses as shown below to
# prevent Apache from glomming onto all bound IP addresses.
#
#Listen 12.34.56.78:80
Listen 80
Listen 25000
Listen 28000
```


Configurar o ficheiro mencionado do site allow.org na criação das zonas

root@localhost:~

```
GNU nano 2.3.1 File: /var/named/allow.org

@ IN SOA ns1.allow.org. root.allow.org. (
                                1001 ;Serial
                                3H   ;Refresh
                                15M   ;Retry
                                1W    ;Expire
                                1D    ;Minimum TTL
                                )

;Name Server Information
@ IN NS ns1.allow.org.

;IP address of Name Server
ns1 IN A 192.168.137.32

;A - Record HostName To IP Address
allow.org. IN A 192.168.137.32
```

Criar a pasta do site circle360.pt e configurar o index.html

```
[root@localhost ~]# mkdir -p /var/www/circle360.pt/public_html/
[root@localhost ~]# nano /var/www/circle360.pt/public_html/index.html
```

Dar permissões na pasta do site

```
[root@localhost ~]# chown -R apache: /var/www/circle360.pt/
```

Configurar o ficheiro definido na criação das zonas do site circle360.pt

```
GNU nano 2.3.1 File: /var/named/circle360.pt

@ IN SOA ns1.circle360.pt. root.circle360.pt. (
                                1001 ;Serial
                                3H   ;Refresh
                                15M   ;Retry
                                1W    ;Expire
                                1D    ;Minimum TTL
                                )

;Name Server Information
@ IN NS ns1.circle360.pt.

;IP address of Name Server
ns1 IN A 192.168.137.32

;A - Record HostName To IP Address
circle360.pt. IN A 192.168.137.32
```


Configurar a virtual host do site circle360.pt

```
GNU nano 2.3.1 File: /etc/httpd/conf.d/circle360.pt.conf
<VirtualHost *:25000 *:28000>
  ServerName circle360.pt
  ServerAlias www.circle360.pt
  ServerAdmin webmaster@circle360.pt
  DocumentRoot /var/www/circle360.pt/public_html

  <Directory /var/www/circle360.pt/public_html>
    Options -Indexes +FollowSymLinks
    AllowOverride All
  </Directory>

  ErrorLog /var/log/httpd/circle360.pt.log
  CustomLog /var/log/httpd/circle360.pt-access.log combined
</VirtualHost>
```

Configurar o virtual host do site festas.pt

 root@localhost:~

```
GNU nano 2.3.1 File: /etc/httpd/conf.d/festas.pt.conf
<VirtualHost *:25000 *:28000>
  ServerName festas.pt
  ServerAlias www.festas.pt
  ServerAdmin webmaster@festas.pt
  DocumentRoot /var/www/festas.pt/public_html

  <Directory /var/www/allow.org/public_html>
    Options -Indexes +FollowSymLinks
    AllowOverride All
  </Directory>

  ErrorLog /var/log/httpd/festas.pt-error.log
  CustomLog /var/log/httpd/festas.pt-access.log combined
</VirtualHost>
```

 root@localhost:~

```
GNU nano 2.3.1 File: /var/named/festas.pt
@ IN SOA ns1.festas.pt. root.festas.pt. (
                                1001 ;Serial
                                3H   ;Refresh
                                15M   ;Retry
                                1W    ;Expire
                                1D    ;Minimum TTL
                                )

;Name Server Information
@ IN NS ns1.festas.pt.

;IP address of Name Server
ns1 IN A 192.168.137.32

;A - Record HostName To IP Address
festas.pt. IN A 192.168.137.32
```

```
[root@localhost ~]# semanage port -a -t http_port_t -p tcp 25000
[root@localhost ~]# semanage port -a -t http_port_t -p tcp 28000
[root@localhost ~]# sudo systemctl restart httpd
-bash: sudo: command not found
[root@localhost ~]# systemctl restart httpd
[root@localhost ~]# systemctl start httpd
[root@localhost ~]# systemctl enable httpd
[root@localhost ~]# sudo firewall-cmd --zone=public --add-port=25000/tcp --permanent
success
[root@localhost ~]# sudo firewall-cmd --zone=public --add-port=28000/tcp --permanent
success
[root@localhost ~]# systemctl restart httpd
[root@localhost ~]# firewall-cmd --reload
success
```

9.2. Exercício 8.2

“Crie páginas html em cada um dos domínios a dizer o nome do próprio domínio.”

Criar a pasta do site allow.org

```
[root@localhost ~]# mkdir -p /var/www/allow.org/public_html/
```

Configurar o ficheiro index.html do site allow.org

 root@localhost:~

```
GNU nano 2.3.1 File: /var/www/allow.org/public_html/index.html
<body> allow.org </body>
```

```
[root@localhost ~]# chown -R apache: /var/www/allow.org/
```

Criar a pasta do site circle360.pt

```
[root@localhost ~]# mkdir -p /var/www/circle360.pt/public_html/  
[root@localhost ~]# nano /var/www/circle360.pt/public_html/index.html
```

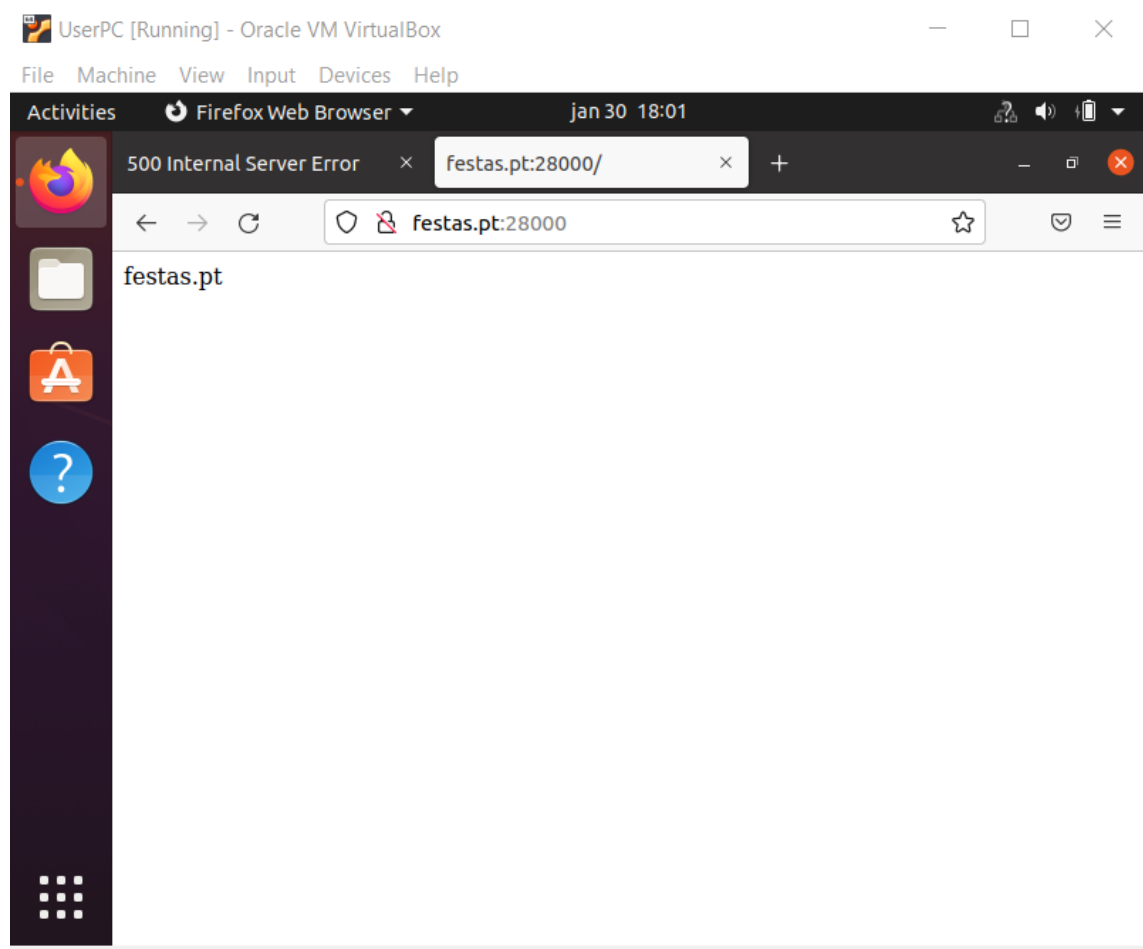
Configurar o ficheiro index.html do circle360.pt

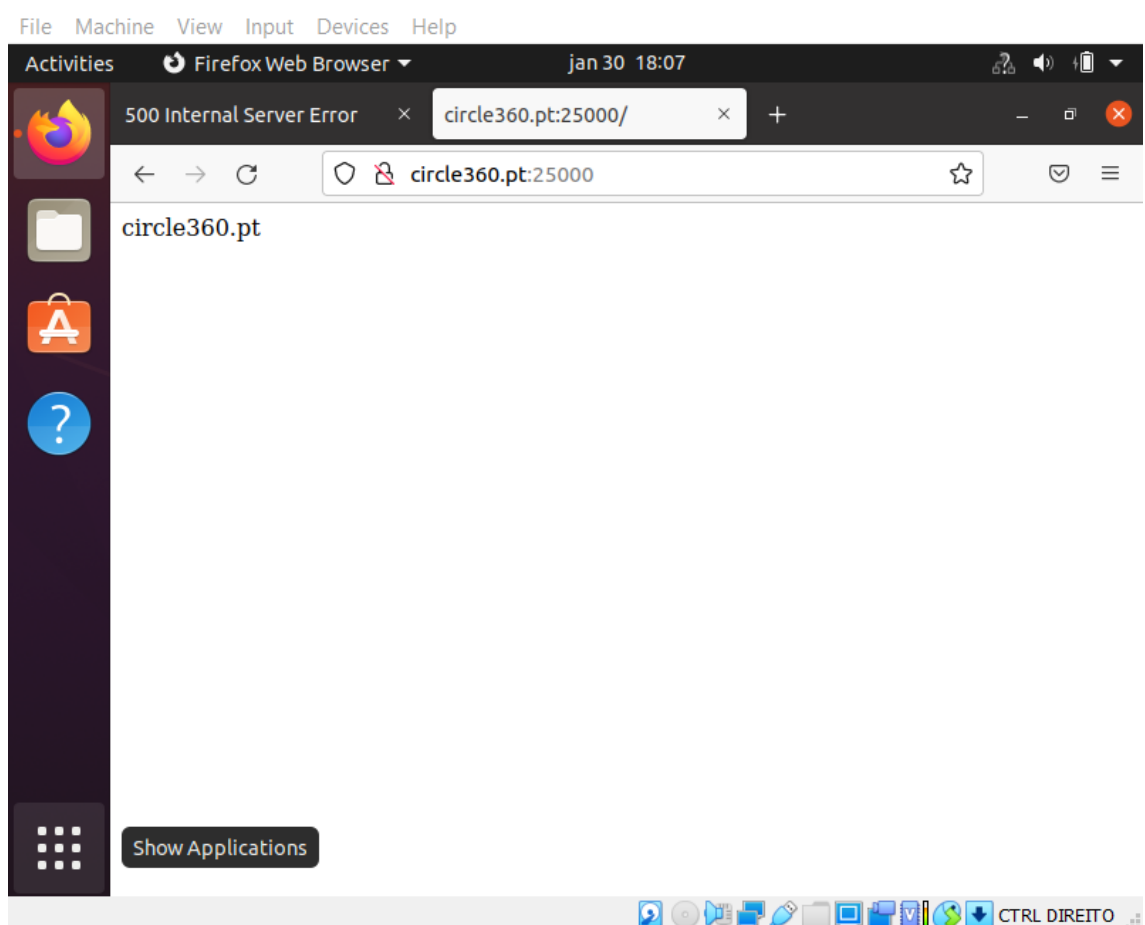
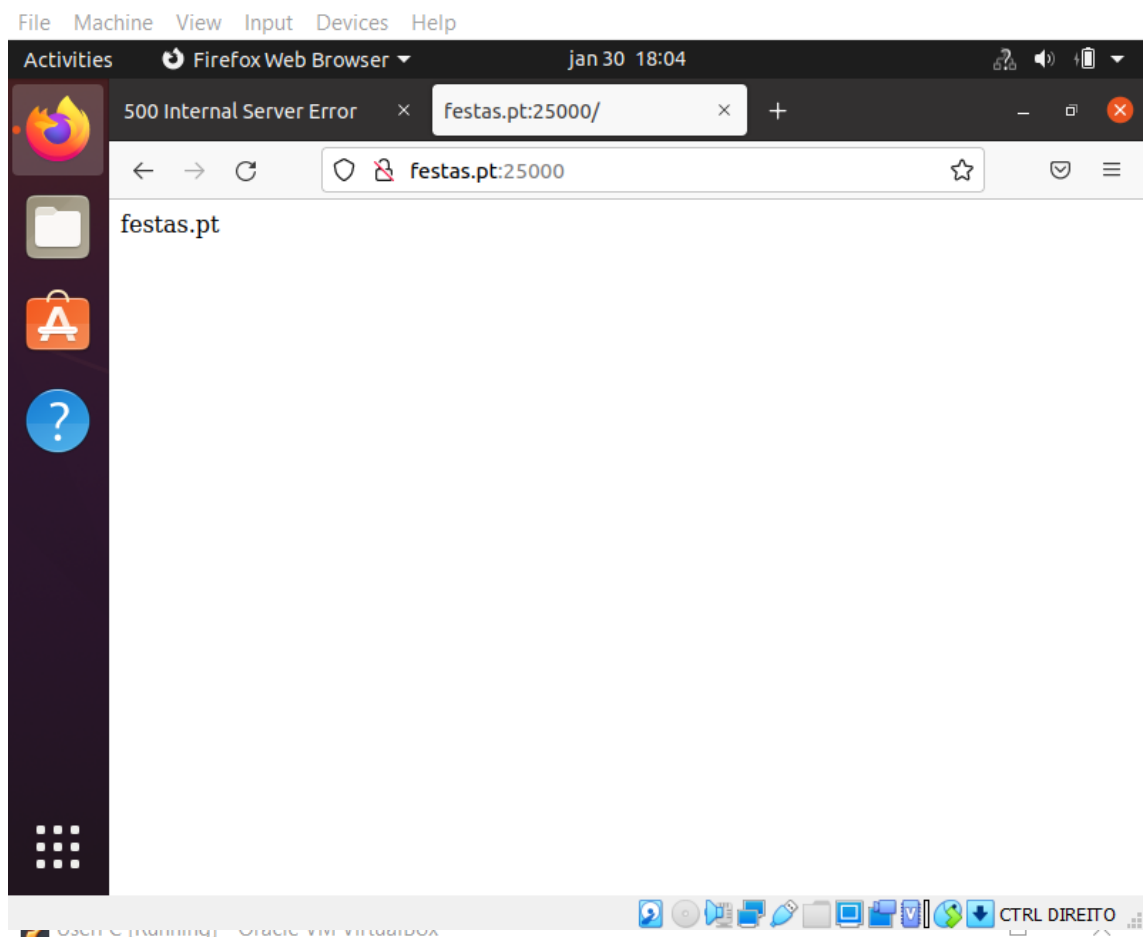
```
GNU nano 2.3.1      File: /var/www/circle360.pt/public_html/index.html  
  
<body> circle360.pt </body>
```

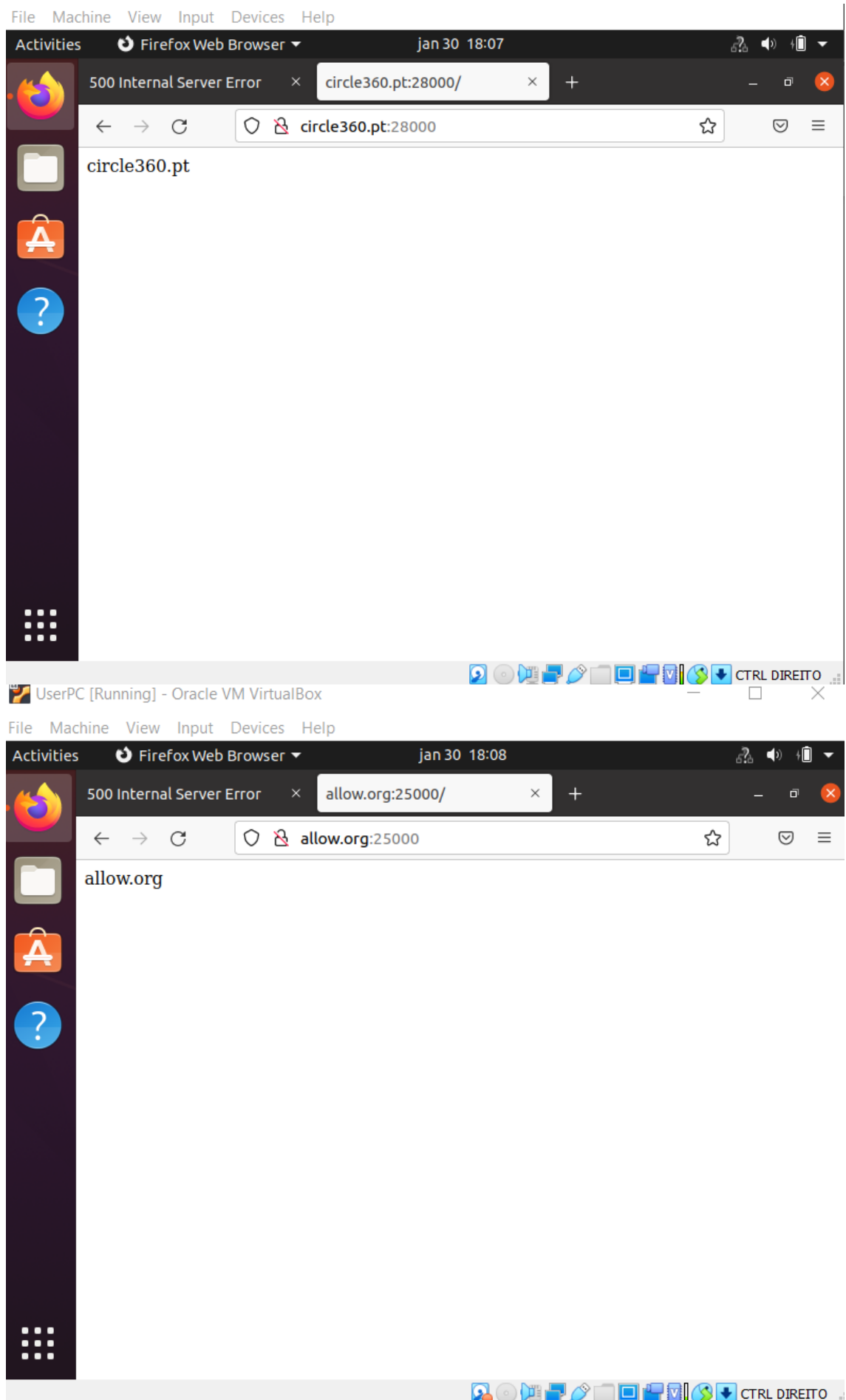
Criar a pasta do site festas.pt

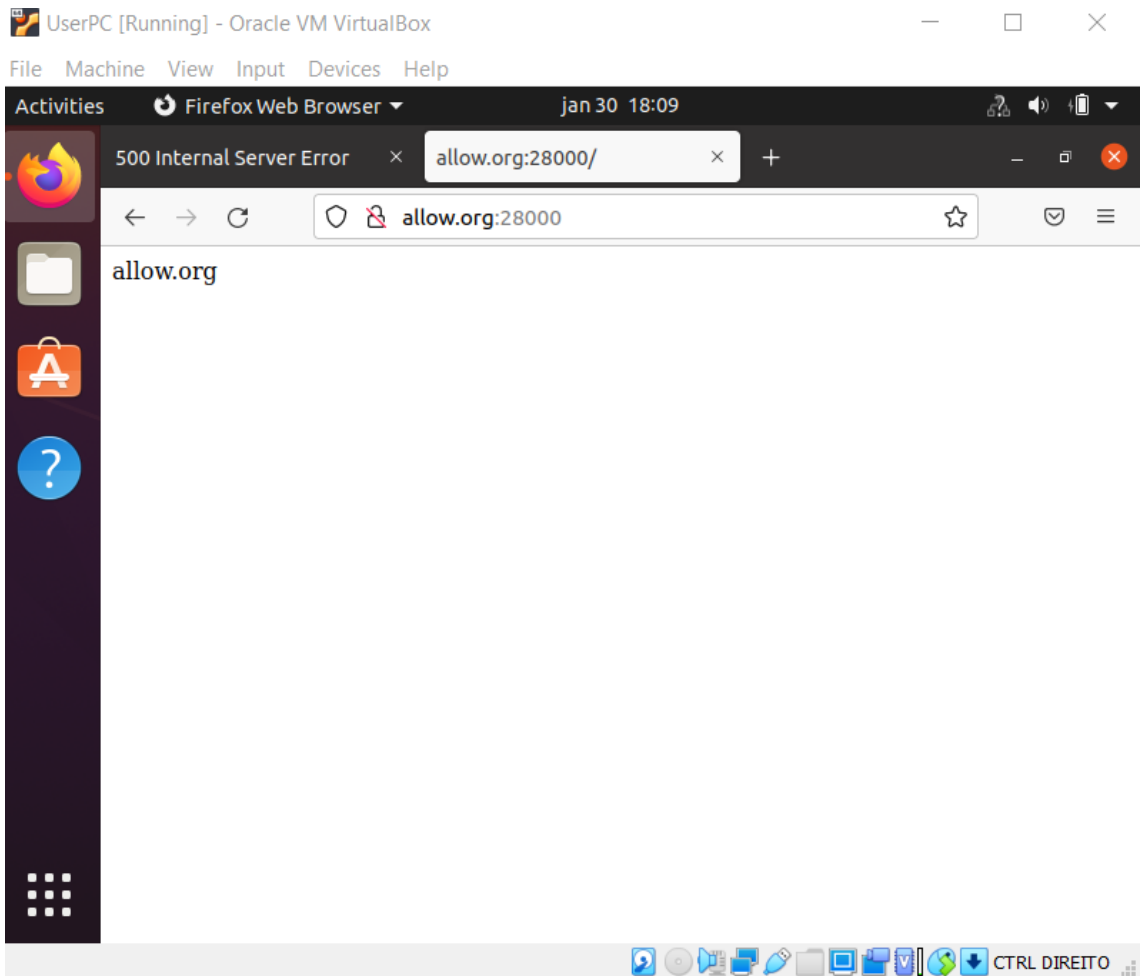
Configurar o ficheiro index.html do festas.pt

```
[root@localhost ~]# mkdir -p /var/www/festas.pt/public_html/   
[root@localhost ~]# nano /var/festas.pt/public_html/index.html   
[root@localhost ~]# nano /var/www/festas.pt/public_html/index.html   
[root@localhost ~]# cat /var/www/festas.pt/public_html/index.html   
<body> festas.pt </body>  
[root@localhost ~]#
```









10. Conclusões

Com este trabalho fui capaz de instalar alguns serviços que costumam estar em Data Centers de empresas nomeadamente DNS, FTP, APACHE, SSH... Também fui capaz de criar um raid com mais um disco Hotspare.

Após a conclusão do trabalho refleti sobre o que foi feito e cheguei na conclusão que este trabalho foi uma mais valia para mim pois enquadra-se 100% na área do curso e ensina-me e prepara-me bastante não só para próximos trabalhos de escola como trabalhos a nível profissional.