



Additional configuration information.

The virtual machine's network configuration should look like this:

- Hostname: station1.example.com
- IP address: 192.168.8.151
- Subnet mask: 255.255.255.0
- Gateway 192.168.8.1
- Name Service: 192.168.8.150
- The default target need to be set to multi-user
- Root password need to be change to password123



↓ <ESC> y pulsamos 'e'



```
insmod part_msdos
insmod xfs
set root='hd0,msdos1'
if [ $feature_platform_search_hint = xy ]; then
    search --no-floppy --fs-uuid --set-root --hint-bios=hd0,msdos1 --hint-hd
    t-fcfd0,msdos1 --hint-baremetal=hd0,msdos1 --hint=hd0,msdos1' 34c89b3e-28
Zce-4fc7-8313-3f7fc61c2a
else
    search --no-floppy --fs-uuid --set-root 34c89b3e-22ca-4fc7-8313-a97c
af61c2a
fi
linux16 /vmlinuz-3.10.0-693.21.1.el7.x86_64 root=/dev/mapper/centos-ros
t ro rd.lvm.lv=centos root.rw.lvm.lv=centos swap rhgb quiet LANG=es_ES.UTF-8 \
console=tty0 rd.break enforcing=0
initrd16 /initramfs-3.10.0-693.21.1.el7.x86_64.img
```

↳ En la línea 'linux16' <FIN> y añadimos: **console=tty0 enforcing=0 rd.break** ↳ <CTRL>+x

↳ Comandos introducidos:

```
mount -o remount,rw /sysroot/  
chroot /sysroot/  
passwd  
touch / autorelabel
```

→ Podemos configurar la red dentro de la jaula, como se muestra a continuación.



```
sh-4.2# touch /.autorelabel
sh-4.2# cat /etc/sysconfig/network-scripts/ifcfg-ens3
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=dhcp
DEFROUTE=yes
IPV4_FAILURE_FATAL=no
IPV4INIT=yes
IPV4NEIGH_SUPP=yes
IPV6_DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=stable-privacy
MACADDR=e8:39:73:54:a1:49
UUID=e8:39:73:54:a1:4982-9b82-9d5adf641f31
DEVICE=ens3s3
ONBOOT=yes
IPADDR=192.168.0.151
PREFIX=24
GATEWAY=192.168.0.1
DNS1=207.68.222.222
DNS2=8.8.8.8
HOSTNAME=station1.example.com
sh-4.2# _
```

```
sh-4.2# exit
exit
switch_root:/# exit
logout
```

[exit](#) [exit](#)



```
sh-4.2# exit
exit
switch root:/# exit
logout
[ OK ] Started Terminate Plymouth Boot Screen.
[ OK ] Started Wait for Plymouth Boot Screen to Quit.
[ OK ] Started Getty on tty1...
Starting getty on tty1...
[ OK ] Reached target Login Prompts.
[ OK ] Started Firewall - dynamic firewall daemon.
[ OK ] Reached target Network (Pre).
Starting Network Manager...
[ OK ] Started Network Manager.
Starting Network Manager Wait Online...
Starting Network Manager Script Dispatcher Service...
[ OK ] Started Network Manager Script Dispatcher Service.
[ OK ] Started Hostname Service.
-
```

↳ [El sistema reinicia normalmente.](#)

[redhat@hp ~]\$ ssh root@192.168.8.151

Password:

Last login: Tue Apr 3 13:22:15 2018

Bienvenido a station1

[root@station1 ~]# getenforce

Enforcing

[root@station1 ~]# vim /etc/sysconfig/network-scripts/ifcfg-enp0s3

TYPE="Ethernet"

PROXY_METHOD="none"

BROWSER_ONLY="no"

BOOTPROTO=none

DEFROUTE="yes"

IPV4_FAILURE_FATAL="no"

IPV6INIT="yes"

IPV6_AUTOCONF="yes"

IPV6_DEFROUTE="yes"

IPV6_FAILURE_FATAL="no"

IPV6_ADDR_GEN_MODE="stable-privacy"

NAME="enp0s3"

UUID="2e4ab323-cbd6-46a6-93ab-595c81fc15a5"

DEVICE="enp0s3"

ONBOOT="yes"

IPADDR=192.168.8.151

PREFIX=24

GATEWAY=192.168.8.1



DNS1=192.168.8.150

```
[root@station1 ~]# vim /etc/hosts
192.168.8.150 server1.example.com    server1
192.168.8.151 station1.example.com   station1
[root@server1 ~]# vim /etc/hosts
192.168.8.150 server1.example.com    server1
192.168.8.151 station1.example.com   station1
```

```
[root@station1 ~]# cat /etc/resolv.conf
# Generated by NetworkManager
search example.com
nameserver 192.168.8.150
```

```
[root@station1 ~]# systemctl get-default
multi-user.target
```

1. Configuration SELinux

Description: Linux must be running in Enforcing mode

```
[root@station1 yum.repos.d]# vi /etc/selinux/config
# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#   enforcing - SELinux security policy is enforced.
#   permissive - SELinux prints warnings instead of enforcing.
#   disabled - No SELinux policy is loaded.
SELINUX=enforcing
# SELINUXTYPE= can take one of three two values:
#   targeted - Targeted processes are protected,
#   minimum - Modification of targeted policy. Only selected processes are protected.
#   mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

2. Configure this as your system's default repository.

Description: YUM's repository source is
ftp://server1.example.com/pub/repos/rhel7

```
[root@station1 yum.repos.d]# vim centos.repo
[centos]
name=centos
baseurl=ftp://server1.example.com/pub/repos/rhel7
enabled=1
gpgcheck=0
[root@station1 yum.repos.d]# yum clean all
[root@station1 yum.repos.d]# yum repolist
[root@station1 yum.repos.d]# yum update
```

3. Adjust the size of the logical volume



Description:

Increase the logical volume root and its file system size by 500 MB. Make sure that the contents of the file system remain intact.

[root@station1 ~]# lsblk

```
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda       8:0   0 15G  0 disk
└─sda1    8:1   0 1G   0 part /boot
└─sda2    8:2   0 14G  0 part
  └─centos-root 253:0 0 12,5G 0 lvm /
  └─centos-swap 253:1 0 1,5G 0 lvm [SWAP]
```

sdb 8:16 0 1G 0 disk

sr0 11:0 1 1024M 0 rom

[root@station1 ~]# pvs

```
PV      VG  Fmt Attr PSize PFree
/dev/sda2 centos lvm2 a-- <14,00g  0
```

[root@station1 ~]# vgs

```
VG #PV #LV #SN Attr VSize VFree
centos 1 2 0 wz--n- <14,00g  0
```

[root@station1 ~]# lvs

```
LV VG Attr  LSize Pool Origin Data% Meta% Move Log Cpy%Sync Convert
root centos -wi-ao---- <12,50g
swap centos -wi-ao---- 1,50g
```

Buscamos si existe espacio adicional en lo actual, para aprovechar todo el espacio. Vemos que no hay, y creamos mas espacio con un nuevo disco → **sdb 8:16 0 1G 0 disk**

Por si acaso **la creamos lógica**, no sea que nos fastidien a posteriori con mas particiones, y no tengamos recursos (límite 8):

[root@station1 ~]# lsblk

```
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda       8:0   0 15G  0 disk
└─sda1    8:1   0 1G   0 part /boot
└─sda2    8:2   0 14G  0 part
  └─centos-root 253:0 0 12,5G 0 lvm /
  └─centos-swap 253:1 0 1,5G 0 lvm [SWAP]
sdb       8:16  0 1G  0 disk
```

sr0 11:0 1 1024M 0 rom

[root@station1 ~]# fdisk /dev/sdb

Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Orden (m para obtener ayuda): n

Partition type:



p primary (0 primary, 0 extended, 4 free)
e extended

Select (default p): **e**

Número de partición (1-4, default 1): 1

Primer sector (2048-2097151, valor predeterminado 2048):

Se está utilizando el valor predeterminado 2048

Last sector, +sectors or +size{K,M,G} (2048-2097151, valor predeterminado 2097151):

Se está utilizando el valor predeterminado 2097151

Partition 1 of type Extended and of size 1023 MiB is set

Orden (m para obtener ayuda): p

Disk /dev/sdb: 1073 MB, 1073741824 bytes, 2097152 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Identificador del disco: 0xc644f6e1

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
/dev/sdb1	2048	2097151	1047552	5	Extended	

Orden (m para obtener ayuda): n

Partition type:

p primary (0 primary, 1 extended, 3 free)
l logical (numbered from 5)

Select (default p): **l**

Adding logical partition 5

Primer sector (4096-2097151, valor predeterminado 4096):

Se está utilizando el valor predeterminado 4096

Last sector, +sectors or +size{K,M,G} (4096-2097151, valor predeterminado 2097151): +500M

Partition 5 of type Linux and of size 500 MiB is set

Orden (m para obtener ayuda): t

Número de partición (1,5, default 5): **5**

Hex code (type L to list all codes): **8e**

Changed type of partition 'Linux' to 'Linux LVM'

Orden (m para obtener ayuda): p

Disk /dev/sdb: 1073 MB, 1073741824 bytes, 2097152 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Identificador del disco: 0xc644f6e1

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
/dev/sdb1	2048	2097151	1047552	5	Extended	



```
/dev/sdb5      4096  1028095  512000  8e Linux LVM
```

Orden (m para obtener ayuda): w
¡Se ha modificado la tabla de particiones!

Llamando a ioctl() para volver a leer la tabla de particiones.

Se están sincronizando los discos.

```
[root@station1 ~]# partprobe /dev/sdb5
```

```
[root@station1 ~]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	15G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	14G	0	part	
└─centos-root	253:0	0	12,5G	0	lvm	/
└─centos-swap	253:1	0	1,5G	0	lvm	[SWAP]
sdb	8:16	0	1G	0	disk	
└─sdb1	8:17	0	1K	0	part	
└─sdb5	8:21	0	500M	0	part	
sr0	11:0	1	1024M	0	rom	

```
[root@station1 ~]# pvs
```

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0

```
[root@station1 ~]# pvcreate /dev/sdb5
```

Physical volume "/dev/sdb5" successfully created.

```
[root@station1 ~]# pvs
```

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5		lvm2	---	500,00m	500,00m

```
[root@station1 ~]# vgextend centos /dev/sdb5
```

Volume group "centos" successfully extended

```
[root@station1 ~]# vgs
```

VG	#PV	#LV	#SN	Attr	VSize	VFree
centos	2	2	0	wz--n-	14,48g	496,00m

```
[root@station1 ~]# pvs
```

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5	centos	lvm2	a--	496,00m	496,00m

```
[root@station1 ~]# vgs
```

VG	#PV	#LV	#SN	Attr	VSize	VFree
centos	2	2	0	wz--n-	14,48g	496,00m

```
[root@station1 ~]# lvextend /dev/centos/root -l +100%FREE ==> OJO AL +
```

Size of logical volume centos/root changed from <12,50 GiB (3199 extents) to 12,98 GiB (3323 extents).

Logical volume centos/root successfully resized.

```
[root@station1 ~]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	15G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot



```
└─sda2      8:2  0 14G 0 part
    └──centos-root 253:0  0 13G 0 lvm /
        └─centos-swap 253:1  0 1,5G 0 lvm [SWAP]
sdb       8:16 0 1G 0 disk
└─sdb1     8:17 0 1K 0 part
└─sdb5     8:21 0 500M 0 part
    └──centos-root 253:0  0 13G 0 lvm /
sr0      11:0 1 1024M 0 rom

[root@station1 ~]# df -h /dev/mapper/centos-root
S.ficheros      Tamaño Usados Disp Uso% Montado en
/dev/mapper/centos-root  13G  1,1G  12G  9% /
[root@station1 ~]# xfs_growfs /dev/mapper/centos-root
meta-data=/dev/mapper/centos-root isize=512  agcount=4, agsize=818944 blks
              =           sectsz=512  attr=2, projid32bit=1
              =           crc=1    finobt=0 spinodes=0
data   =           bsize=4096  blocks=3275776, imaxpct=25
              =           sunit=0    swidth=0 blks
naming  =version 2          bsize=4096  ascii-ci=0 ftype=1
log    =internal           bsize=4096  blocks=2560, version=2
              =           sectsz=512  sunit=0 blks, lazy-count=1
realtime =none            extsz=4096  blocks=0, rtextents=0
data blocks changed from 3275776 to 3402752
```

[root@station1 ~]# lsblk -f

NAME	FSTYPE	LABEL	UUID	MOUNTPOINT
sda				
└─sda1	xfs		349dfbe5-307e-4feb-bc27-51a0f8d79f1b	/boot
└─sda2	LVM2_member		JWL0ix-FrTt-Y1bp-nr0S-Rv2V-JOGV-TlcKWc	
└──centos-root	xfs		c80c43a5-630f-4c23-917a-7e156dff8c18	/
└──centos-swap	swap		94607b03-c3d0-48a2-8bfd-fd30a7b758ae	[SWAP]
sdb				
└─sdb1				
└─sdb5	LVM2_member		pWE8PB-A9Zv-7tKM-t8FG-AQTK-XJab-La67xS	
└──centos-root	xfs		c80c43a5-630f-4c23-917a-7e156dff8c18	/
sr0				

4. Create a user account

Description: Create the following user, group, and group membership:

- A group named adminuser
- A user named woody, which belongs to the adminuser, this group is the user's subordinate group
- A user named buzz, belonging to the adminuser, is a subordinate group for the user
- A user named sid, which has no interactive shell in the system and is not a member of the adminuser group
- Users woody, buzz, and sid the password should be set to password321

[root@station1 ~]# groupadd adminuser

[root@station1 ~]# cat /etc/group



...
adminuser:x:**1000**: ==> OJO AL GRUPO SUBORDINADO POSTERIOR.

```
[root@station1 ~]# for i in in woody buzz; do useradd -g 1000 $i;done
```

```
[root@station1 ~]# useradd -s /sbin/nologin sid
```

```
[root@station1 ~]# cat /etc/group
```

...
adminuser:x:**1000**:
sid:x:1003:

```
[root@station1 ~]# cat /etc/passwd
```

...
woody:x:1001:**1000**::/home/woody:/bin/bash
buzz:x:1002:**1000**::/home/buzz:/bin/bash
sid:x:1003:1003::/home/sid:/sbin/nologin

```
[root@station1 ~]# for i in woody buzz sid; do echo password321|passwd --stdin $i;done
```

Cambiando la contraseña del usuario woody.

passwd: todos los símbolos de autenticación se actualizaron con éxito.
Cambiando la contraseña del usuario buzz.

passwd: todos los símbolos de autenticación se actualizaron con éxito.
Cambiando la contraseña del usuario sid.

passwd: todos los símbolos de autenticación se actualizaron con éxito.

5. Configure a file /var/tmp/fstab permissions

Description: Copy the file /etc/fstab to /var/tmp/fstab. Permissions for the configuration file /var/tmp/fstab

>User woody can read and write access to /var/tmp/fstab

User buzz can not read, write, or execute access to /var/tmp/fstab

```
[root@station1 ~]# cp /etc/fstab /var/tmp/
```

```
[root@station1 ~]# ll /var/tmp/
```

total 4

...
-rw-r--r--. 1 root root 670 mar 27 10:35 fstab

```
[root@station1 ~]# cd /var/tmp/
```

```
[root@station1 tmp]# ll
```

total 4

-rw-r--r--. 1 root root 670 mar 27 10:35 fstab

```
[root@station1 tmp]# getfacl fstab
```

file: fstab

owner: root

group: root

user::rw-

group::r--



other::r--

```
[root@station1 tmp]# setfacl -m u:woody:rw,u:buzz:0 fstab  
[root@station1 tmp]# getfacl fstab
```

```
# file: fstab  
# owner: root  
# group: root  
user::rw-  
user:woody:rw-  
user:buzz:---  
group::r--  
mask::rw-  
other::r--
```

```
[root@station1 tmp]# su - woody
```

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```
[woody@station1 ~]$ echo "Escribe Woody, ...." >> /var/tmp/fstab  
[woody@station1 ~]$ tail -1 /var/tmp/fstab
```

Escribe Woody,

```
[woody@station1 ~]$ exit
```

logout

```
[root@station1 tmp]# su - buzz
```

Último inicio de sesión:mar mar 27 09:53:14 CEST 2018de 192.168.8.102en pts/1

```
[buzz@station1 ~]$ echo "Escribe Buzz" >> /var/tmp/fstab  
-bash: /var/tmp/fstab: Permiso denegado
```

6. Configure a cron task

Description: The user woody must be configured with a scheduled task to execute the command every day at 14:23 local time.

/bin/echo hiya

```
[root@station1 ~]# crontab -h
```

Usage:

```
crontab [options] file  
crontab [options]  
crontab -n [hostname]
```

Options:

```
-u <user> define user  
-e      edit user's crontab  
-l      list user's crontab  
-r      delete user's crontab  
-i      prompt before deleting  
-n <host> set host in cluster to run users' crontabs  
-c      get host in cluster to run users' crontabs  
-s      selinux context  
-x <mask> enable debugging
```

```
[root@station1 ~]# crontab -e -u woody
```



```
# Example of job definition:  
# ----- minute (0 - 59)  
# | ----- hour (0 - 23)  
# | | ----- day of month (1 - 31)  
# | | | ----- month (1 - 12) OR jan,feb,mar,apr ...  
# | | | | ----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat  
# | | | |  
# * * * * * user-name command to be executed  
# Para usuarios normales ==> No hace falta especificar user-name  
23 14 * * * /bin/echo hija
```

[root@station1 ~]# crontab -l -u woody

```
# Example of job definition:  
# ----- minute (0 - 59)  
# | ----- hour (0 - 23)  
# | | ----- day of month (1 - 31)  
# | | | ----- month (1 - 12) OR jan,feb,mar,apr ...  
# | | | | ----- day of week (0 - 6) (Sunday=0 or 7) OR sun,mon,tue,wed,thu,fri,sat  
# | | | |  
# * * * * * user-name command to be executed  
# Para usuarios ==> No hace falta especificar user-name  
23 14 * * * /bin/echo hija
```

[root@station1 ~]# vim /etc/cron.allow
woody

7. Create a shared directory

Description: Creates a shared directory /home/admins with the following characteristics:

- The group ownership of the /home/admins directory is adminuser
- Members of the adminuser group have read, write, and execute permissions on the directory.
- All other users do not have any privileges (root users can access all the files and directories on the system)
- The files that are created in the /home/admins directory have their group ownership automatically set to belong to the adminuser group

```
[root@station1 ~]# mkdir -p /home/admins  
[root@station1 ~]# chown :adminuser -R /home/admins/  
[root@station1 ~]# ls -ld /home/admins/  
drwxr-xr-x. 2 root adminuser 6 mar 27 13:24 /home/admins/
```

[root@station1 ~]# getfacl /home/admins/

```
getfacl: Eliminando '/' inicial en nombres de ruta absolutos  
# file: home/admins/  
# owner: root  
# group: adminuser  
user::rwx  
group::r-x
```



other::r-x

```
[root@station1 ~]# setfacl -m g:adminuser:rwx /home/admins/  
[root@station1 ~]# getfacl /home/admins/
```

getfacl: Eliminando '/' inicial en nombres de ruta absolutos
file: home/admins/
owner: root
group: adminuser
user::rwx
group::r-x
group:adminuser:rwx
mask::rwx
other::r-x

```
[root@station1 ~]# setfacl -m o::0 /home/admins/
```

```
[root@station1 ~]# getfacl /home/admins/
```

getfacl: Eliminando '/' inicial en nombres de ruta absolutos
file: home/admins/
owner: root
group: adminuser
user::rwx
group::r-x
group:adminuser:rwx
mask::rwx
other::---

==> Probamos Todo:

→ El grupo propietario del directorio /home/admins es **adminuser**.

```
[root@station1 ~]# ls -ld /home/admins/  
drwxrwx---+ 2 root adminuser 6 mar 27 13:24 /home/admins/ ==> OK
```

→ Miembros del grupo **adminuser** pueden **rwx** en el directorio. ==> OK

```
[root@station1 ~]# getent group |grep adminuser
```

adminuser:x:1000:

```
[root@station1 ~]# getent passwd |grep 1000
```

in:x:1000:1000::/home/in:/bin/bash

woody:x:1001:1000::/home/woody:/bin/bash

buzz:x:1002:1000::/home/buzz:/bin/bash

Probamos:

```
[root@station1 ~]# su - woody
```

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```
[woody@station1 ~]$ ls /home/admins/
```

```
[woody@station1 ~]$ touch /home/admins/woody.test
```

```
[woody@station1 ~]$ exit
```

logout

```
[root@station1 ~]# su - buzz
```

Último inicio de sesión:mar mar 27 11:52:42 CEST 2018en pts/0

```
[buzz@station1 ~]$ ls /home/admins/
```



```
woody.test
[buzz@station1 ~]$ touch /home/admins/buzz.test
[buzz@station1 ~]$ ls /home/admins/
buzz.test woody.test
```

→ El resto de usuarios no tiene privilegios salvo root. ==> **OK menos paz.**

```
[root@station1 ~]# useradd paz
[root@station1 ~]# su - paz
[paz@station1 ~]$ ls /home/admins/
```

ls: no se puede abrir el directorio /home/admins/: Permiso denegado

→ Lo que se cree en este directorio → **/home/admins**, debe ser automáticamente del grupo **adminuser** ==> **OK**.

Pregunta trampa, solo puede crear **root**, **woody** o **buzz**. **NO HAY QUE HACER NADA.**

```
[root@station1 ~]# ls -l /home/admins/
total 0
-rw-r--r--. 1 buzz adminuser 0 mar 27 18:05 buzz.test
-rw-r--r--. 1 woody adminuser 0 mar 27 18:05 woody.test
→ Lo que crea buzz o woody es de ellos, pero el grupo es adminuser en este directorio.
```

8. Upgrade the kernel

Description: Upgrading the correct kernel from the repository

ftp://server1.example.com/pub/repos/updates

Requires the following:

- When the system restarts after the kernel to upgrade as the default kernel
- The original kernel to be retained, and can still start normally

```
[root@station1 user-files]# cd /etc/yum.repos.d/
[root@station1 yum.repos.d]# vim centos-kernel.repo
[centoskernel]
name=centos kernel
baseurl=ftp://SERVER_NAME.example.com/pub/repos/updates
enabled=1
gpgcheck=0
```

```
[root@station1 yum.repos.d]# yum clean all
[root@station1 yum.repos.d]# yum repolist
[root@station1 yum.repos.d]# yum update
[root@station1 yum.repos.d]# yum install kernel -y
```

9. Bound to the external authentication service

Description: The system server1.example.com provides an LDAP authentication service. Your system needs to be:

- Bind to this service in accordance with the following requirements:
 - The base DN of the authentication server is: dc=example, dc=com.
 - Account information and authentication information are provided by LDAP.
 - When the configuration is done correctly, user ldapuser{1..5} should be able to log in to your system, without home directory
 - Use TLS encrypt connections



- LDAP CA certificate: <ftp://server1.example.com/pub/ca.crt>
- The password for user `ldapuser{1..5}` is `password`

→ Documentación para la Instalación Servidor IPA → <http://www.cadilinea.com/blog/wp-content/uploads/2017/03/01-ipa-server.example.com-Instalaci%C3%B3n-PARTE-1-1.pdf>

==> PARTE server1:

[root@server1 ~]# yum install ipa-server

[root@server1 ~]# ipa-server-install

The log file for this installation can be found in /var/log/ipaserver-install.log

=====

This program will set up the IPA Server.

This includes:

- * Configure a stand-alone CA (dogtag) for certificate management
- * Configure the Network Time Daemon (ntpd)
- * Create and configure an instance of Directory Server
- * Create and configure a Kerberos Key Distribution Center (KDC)
- * Configure Apache (httpd)
- * Configure the KDC to enable PKINIT

To accept the default shown in brackets, press the Enter key.

Do you want to configure integrated DNS (BIND)? [no]:

Enter the fully qualified domain name of the computer
on which you're setting up server software. Using the form
<hostname>.<domainname>

Example: master.example.com.

Server host name [server1.example.com]:

The domain name has been determined based on the host name.

Please confirm the domain name [example.com]:

The kerberos protocol requires a Realm name to be defined.
This is typically the domain name converted to uppercase.

Please provide a realm name [EXAMPLE.COM]:

Certain directory server operations require an administrative user.
This user is referred to as the Directory Manager and has full access
to the Directory for system management tasks and will be added to the
instance of directory server created for IPA.

The password must be at least 8 characters long.

Directory Manager password:



Password (confirm):

The IPA server requires an administrative user, named 'admin'.
This user is a regular system account used for IPA server administration.

IPA admin password:

Password (confirm):

The IPA Master Server will be configured with:

Hostname: server1.example.com

IP address(es): 192.168.8.150

Domain name: example.com

Realm name: EXAMPLE.COM

Continue to configure the system with these values? [no]: yes

The following operations may take some minutes to complete.
Please wait until the prompt is returned.

Configuring NTP daemon (ntpd)

[1/4]: stopping ntpd

[2/4]: writing configuration

[3/4]: configuring ntpd to start on boot

[4/4]: starting ntpd

Done configuring NTP daemon (ntpd).

Configuring directory server (dirsrv). Estimated time: 30 seconds

[1/45]: creating directory server instance

[2/45]: enabling ldapi

[3/45]: configure autbind for root

[4/45]: stopping directory server

[5/45]: updating configuration in dse.ldif

[6/45]: starting directory server

[7/45]: adding default schema

[8/45]: enabling memberof plugin

[9/45]: enabling winsync plugin

[10/45]: configuring replication version plugin

[11/45]: enabling IPA enrollment plugin

[12/45]: configuring uniqueness plugin

[13/45]: configuring uuid plugin

[14/45]: configuring modrdn plugin

[15/45]: configuring DNS plugin

[16/45]: enabling entryUSN plugin

[17/45]: configuring lockout plugin

[18/45]: configuring topology plugin

[19/45]: creating indices

[20/45]: enabling referential integrity plugin

[21/45]: configuring certmap.conf

[22/45]: configure new location for managed entries



[23/45]: configure dirsrv ccache
[24/45]: enabling SASL mapping fallback
[25/45]: restarting directory server
[26/45]: adding sasl mappings to the directory
[27/45]: adding default layout
[28/45]: adding delegation layout
[29/45]: creating container for managed entries
[30/45]: configuring user private groups
[31/45]: configuring netgroups from hostgroups
[32/45]: creating default Sudo bind user
[33/45]: creating default Auto Member layout
[34/45]: adding range check plugin
[35/45]: creating default HBAC rule allow_all
[36/45]: adding entries for topology management
[37/45]: initializing group membership
[38/45]: adding master entry
[39/45]: initializing domain level
[40/45]: configuring Posix uid/gid generation
[41/45]: adding replication acis
[42/45]: activating sidgen plugin
[43/45]: activating extdom plugin
[44/45]: tuning directory server
[45/45]: configuring directory to start on boot

Done configuring directory server (dirsrv).

Configuring Kerberos KDC (krb5kdc)

[1/10]: adding kerberos container to the directory
[2/10]: configuring KDC
[3/10]: initialize kerberos container
[4/10]: adding default ACIs
[5/10]: creating a keytab for the directory
[6/10]: creating a keytab for the machine
[7/10]: adding the password extension to the directory
[8/10]: creating anonymous principal
[9/10]: starting the KDC
[10/10]: configuring KDC to start on boot

Done configuring Kerberos KDC (krb5kdc).

Configuring kadmin

[1/2]: starting kadmin
[2/2]: configuring kadmin to start on boot

Done configuring kadmin.

Configuring certificate server (pki-tomcatd). Estimated time: 3 minutes

[1/29]: configuring certificate server instance
[2/29]: exporting Dogtag certificate store pin
[3/29]: stopping certificate server instance to update CS.cfg
[4/29]: backing up CS.cfg
[5/29]: disabling nonces
[6/29]: set up CRL publishing
[7/29]: enable PKIX certificate path discovery and validation
[8/29]: starting certificate server instance



[9/29]: configure certmonger for renewals
[10/29]: requesting RA certificate from CA
[11/29]: setting up signing cert profile
[12/29]: setting audit signing renewal to 2 years
[13/29]: restarting certificate server
[14/29]: publishing the CA certificate
[15/29]: adding RA agent as a trusted user
[16/29]: authorizing RA to modify profiles
[17/29]: authorizing RA to manage lightweight CAs
[18/29]: Ensure lightweight CAs container exists
[19/29]: configure certificate renewals
[20/29]: configure Server-Cert certificate renewal
[21/29]: Configure HTTP to proxy connections
[22/29]: restarting certificate server
[23/29]: updating IPA configuration
[24/29]: enabling CA instance
[25/29]: migrating certificate profiles to LDAP
[26/29]: importing IPA certificate profiles
[27/29]: adding default CA ACL
[28/29]: adding 'ipa' CA entry
[29/29]: configuring certmonger renewal for lightweight CAs

Done configuring certificate server (pki-tomcatd).

Configuring directory server (dirsrv)

[1/3]: configuring TLS for DS instance
[2/3]: adding CA certificate entry
[3/3]: restarting directory server

Done configuring directory server (dirsrv).

Configuring ipa-otpd

[1/2]: starting ipa-otpd
[2/2]: configuring ipa-otpd to start on boot

Done configuring ipa-otpd.

Configuring ipa-custodia

[1/5]: Generating ipa-custodia config file
[2/5]: Making sure custodia container exists
[3/5]: Generating ipa-custodia keys
[4/5]: starting ipa-custodia
[5/5]: configuring ipa-custodia to start on boot

Done configuring ipa-custodia.

Configuring the web interface (httpd)

[1/22]: stopping httpd
[2/22]: setting mod_nss port to 443
[3/22]: setting mod_nss cipher suite
[4/22]: setting mod_nss protocol list to TLSv1.0 - TLSv1.2
[5/22]: setting mod_nss password file
[6/22]: enabling mod_nss renegotiate
[7/22]: disabling mod_nss OCSP
[8/22]: adding URL rewriting rules
[9/22]: configuring httpd
[10/22]: setting up httpd keytab



[11/22]: configuring Gssproxy
[12/22]: setting up ssl
[13/22]: configure certmonger for renewals
[14/22]: importing CA certificates from LDAP
[15/22]: publish CA cert
[16/22]: clean up any existing httpd ccaches
[17/22]: configuring SELinux for httpd
[18/22]: create KDC proxy config
[19/22]: enable KDC proxy
[20/22]: starting httpd
[21/22]: configuring httpd to start on boot
[22/22]: enabling oddjobd

Done configuring the web interface (httpd).

Configuring Kerberos KDC (krb5kdc)

[1/1]: installing X509 Certificate for PKINIT

Done configuring Kerberos KDC (krb5kdc).

Applying LDAP updates

Upgrading IPA:. Estimated time: 1 minute 30 seconds

[1/9]: stopping directory server
[2/9]: saving configuration
[3/9]: disabling listeners
[4/9]: enabling DS global lock
[5/9]: starting directory server
[6/9]: upgrading server
[7/9]: stopping directory server
[8/9]: restoring configuration
[9/9]: starting directory server

Done.

Restarting the KDC

ipa : ERROR unable to resolve host name server1.example.com. to IP address, ipa-ca DNS record will be incomplete

Please add records in this file to your DNS system: /tmp/ipa.system.records.MUNEFB.db

Configuring client side components

Using existing certificate '/etc/ipa/ca.crt'.

Client hostname: server1.example.com

Realm: EXAMPLE.COM

DNS Domain: example.com

IPA Server: server1.example.com

BaseDN: dc=example,dc=com

Skipping synchronizing time with NTP server.

New SSSD config will be created

Configured sudoers in /etc/nsswitch.conf

Configured /etc/sssd/sssd.conf

trying https://server1.example.com/ipa/json

[try 1]: Forwarding 'schema' to json server 'https://server1.example.com/ipa/json'

trying https://server1.example.com/ipa/session/json

[try 1]: Forwarding 'ping' to json server 'https://server1.example.com/ipa/session/json'

[try 1]: Forwarding 'ca_is_enabled' to json server 'https://server1.example.com/ipa/session/json'



Systemwide CA database updated.

Adding SSH public key from /etc/ssh/ssh_host_rsa_key.pub

Adding SSH public key from /etc/ssh/ssh_host_ecdsa_key.pub

Adding SSH public key from /etc/ssh/ssh_host_ed25519_key.pub

[try 1]: Forwarding 'host_mod' to json server 'https://server1.example.com/ipa/session/json'

Could not update DNS SSHFP records.

SSSD enabled

Configured /etc/openldap/ldap.conf

Configured /etc/ssh/ssh_config

Configured /etc/ssh/sshd_config

Configuring example.com as NIS domain.

Client configuration complete.

The ipa-client-install command was successful

=====

=====

Setup complete

Next steps:

1. You must make sure these network ports are open:

TCP Ports:

- * 80, 443: HTTP/HTTPS
- * 389, 636: LDAP/LDAPS
- * 88, 464: kerberos

UDP Ports:

- * 88, 464: kerberos
- * 123: ntp

2. You can now obtain a kerberos ticket using the command: 'kinit admin'

This ticket will allow you to use the IPA tools (e.g., ipa user-add) and the web user interface.

Be sure to back up the CA certificates stored in /root/cacert.p12

These files are required to create replicas. The password for these files is the Directory Manager password

```
[root@server1 ~]# firewall-cmd --permanent --add-port={80/tcp,443/tcp,389/tcp,636/tcp,88/tcp,464/tcp,53/tcp,88/udp,464/udp,53/udp,123/udp}
```

success

```
[root@server1 ~]# firewall-cmd --reload
```

success



Identity Management - Mozilla Firefox

03-ipa-client01.exam... X Identity Management +

https://server1.example.com/ipa/ui/

Google webmail-cadlinea

Username * admin

Password * *****

Login Using Certificate Sync OTP Token Login

To login with **username and password**, enter them in the corresponding fields, then click **Login**.
 To login with **Kerberos**, please make sure you have valid tickets (obtainable via kinit) and **configured** the browser correctly, then click **Login**.
 To login with **Certificate**, please make sure you have valid personal certificate.

Identity Management - Mozilla Firefox

03-ipa-client01.exam... X Identity Management +

https://server1.example.com/ipa/ui/#/e/user/search

Google webmail-cadlinea

Añadir Usuario

Ingreso de usuario: idapuser1

Nombre *: idapuser1

Apellido *: idapuser1

Clase:

No private group:

GID:

Nueva Contraseña: *****

Administrator

Identity Management - Mozilla Firefox

03-ipa-client01.exam... X Identity Management +

https://server1.example.com/ipa/ui/#/e/user/search

Google webmail-cadlinea

Usuario añadido con éxito

Administrator

	Nombre	Apellido	Estatus	UID	Dirección de correo electrónico	Número de teléfono	Cargo
<input type="checkbox"/> admin	Administrator		✓ Habilitado	1954800000			
<input type="checkbox"/> idapuser1	idapuser1	idapuser1	✓ Habilitado	1954800001	idapuser1@example.com		
<input type="checkbox"/> idapuser2	idapuser2	idapuser2	✓ Habilitado	1954800003	idapuser2@example.com		
<input type="checkbox"/> idapuser3	idapuser3	idapuser3	✓ Habilitado	1954800004	idapuser3@example.com		
<input type="checkbox"/> idapuser4	idapuser4	idapuser4	✓ Habilitado	1954800005	idapuser4@example.com		
<input type="checkbox"/> idapuser5	idapuser5	idapuser5	✓ Habilitado	1954800006	idapuser5@example.com		

Mostrando 1 a 6 de 6 entradas.



[root@server1 ~]# kadmin.local

Authenticating as principal root/admin@EXAMPLE.COM with password.

kadmin.local: list_principals

admin@EXAMPLE.COM

K/M@EXAMPLE.COM

krbtgt/EXAMPLE.COM@EXAMPLE.COM

ldap/server1.example.com@EXAMPLE.COM

kadmin/admin@EXAMPLE.COM

kadmin/changepw@EXAMPLE.COM

kiprop/server1.example.com@EXAMPLE.COM

ldap/server1.example.com@EXAMPLE.COM

host/server1.example.com@EXAMPLE.COM

WELLKNOWN/ANONYMOUS@EXAMPLE.COM

dogtag/server1.example.com@EXAMPLE.COM

HTTP/server1.example.com@EXAMPLE.COM

ldapuser1@EXAMPLE.COM

ldapuser2@EXAMPLE.COM

ldapuser3@EXAMPLE.COM

ldapuser4@EXAMPLE.COM

ldapuser5@EXAMPLE.COM

[root@server1 ~]# getent passwd ldapuser{1..5}

ldapuser1:*:1954800001:1954800001:ldapuser1 ldapuser1:/home/ldapuser1:/bin/sh

ldapuser2:*:1954800003:1954800003:ldapuser2 ldapuser2:/home/ldapuser2:/bin/sh

ldapuser3:*:1954800004:1954800004:ldapuser3 ldapuser3:/home/ldapuser3:/bin/sh

ldapuser4:*:1954800005:1954800005:ldapuser4 ldapuser4:/home/ldapuser4:/bin/sh

ldapuser5:*:1954800006:1954800006:ldapuser5 ldapuser5:/home/ldapuser5:/bin/sh

==> PARTE station1:

»» Método-1 con → ipa-client-install

[root@station1 ~]# yum install ipa-client ipa-admintools

[root@station1 ~]# firewall-cmd --permanent --add-port=123/tcp

success

[root@station1 ~]# firewall-cmd --reload

success

[root@station1 ~]# ipa-client-install --force-ntp

DNS discovery failed to determine your DNS domain

Provide the domain name of your IPA server (ex: example.com):

Provide the domain name of your IPA server (ex: example.com): server1.example.com

Provide your IPA server name (ex: ipa.example.com): server1.example.com

The failure to use DNS to find your IPA server indicates that your resolv.conf file is not properly configured.

Autodiscovery of servers for failover cannot work with this configuration.

If you proceed with the installation, services will be configured to always access the discovered server for all operations and will not fail over to other servers in case of failure.

Proceed with fixed values and no DNS discovery? [no]:

The ipa-client-install command failed. See /var/log/ipaclient-install.log for more information



[root@station1 ~]# ipa-client-install --force-ntp

DNS discovery failed to determine your DNS domain

Provide the domain name of your IPA server (ex: example.com): server1.example.com

Provide your IPA server name (ex: ipa.example.com): server1.example.com

The failure to use DNS to find your IPA server indicates that your resolv.conf file is not properly configured.

Autodiscovery of servers for failover cannot work with this configuration.

If you proceed with the installation, services will be configured to always access the discovered server for all operations and will not fail over to other servers in case of failure.

Proceed with fixed values and no DNS discovery? [no]: yes

Client hostname: station1.example.com

Realm: EXAMPLE.COM

DNS Domain: server1.example.com

IPA Server: server1.example.com

BaseDN: dc=example,dc=com

Continue to configure the system with these values? [no]: yes

Synchronizing time with KDC...

Attempting to sync time using ntpd. Will timeout after 15 seconds

Unable to sync time with NTP server, assuming the time is in sync. Please check that 123 UDP port is opened.

User authorized to enroll computers: admin

Password for admin@EXAMPLE.COM:

Successfully retrieved CA cert

Subject: CN=Certificate Authority,O=EXAMPLE.COM

Issuer: CN=Certificate Authority,O=EXAMPLE.COM

Valid From: 2018-04-01 08:02:47

Valid Until: 2038-04-01 08:02:47

Enrolled in IPA realm EXAMPLE.COM

Created /etc/ipa/default.conf

New SSSD config will be created

Configured sudoers in /etc/nsswitch.conf

Configured /etc/sssd/sssd.conf

Configured /etc/krb5.conf for IPA realm EXAMPLE.COM

trying https://server1.example.com/ipa/json

[try 1]: Forwarding 'schema' to json server 'https://server1.example.com/ipa/json'

trying https://server1.example.com/ipa/session/json

[try 1]: Forwarding 'ping' to json server 'https://server1.example.com/ipa/session/json'

[try 1]: Forwarding 'ca_is_enabled' to json server 'https://server1.example.com/ipa/session/json'

Systemwide CA database updated.

Hostname (station1.example.com) does not have A/AAAA record.

Failed to update DNS records.

Missing A/AAAA record(s) for host station1.example.com: 192.168.8.151.

Missing reverse record(s) for address(es): 192.168.8.151.

Adding SSH public key from /etc/ssh/ssh_host_rsa_key.pub

Adding SSH public key from /etc/ssh/ssh_host_ecdsa_key.pub

Adding SSH public key from /etc/ssh/ssh_host_ed25519_key.pub

[try 1]: Forwarding 'host_mod' to json server 'https://server1.example.com/ipa/session/json'



Could not update DNS SSHFP records.

SSSD enabled

Configured /etc/openldap/ldap.conf

No SRV records of NTP servers found. IPA server address will be used

NTP enabled

Configured /etc/ssh/sshd_config

Configured /etc/ssh/sshd_config

Configuring server1.example.com as NIS domain.

Client configuration complete.

The ipa-client-install command was successful

The screenshot shows a Mozilla Firefox browser window titled "Identity Management - Mozilla Firefox". The address bar displays the URL "https://server1.example.com/ipa/ui/#/host/search". The page header includes the freeIPA logo and navigation links for "Identity Management", "Identity", "Authentication", "Network Services", and "Servidor IPA". Below the header, there are tabs for "Usuarios" and "Equipos", with "Equipos" currently selected. A search bar labeled "Búsqueda" is present. The main content area displays a table with two entries:

Nombre del equipo	Descripción	Enrolled
server1.example.com		Verdad
station1.example.com		Verdad

At the bottom of the table, it says "Mostrando 1 a 2 de 2 entradas."



The screenshot shows the freeIPA Identity Management interface in Mozilla Firefox. The URL is https://server1.example.com/ipa/ui/#/e/user/details/ldapuser1. The top navigation bar includes 'Identity', 'Política', 'Authentication', 'Network Services', 'Servidor IPA', 'Administrador', and tabs for 'Usuarios', 'Equipos', 'Servicios HBAC', 'Grupos', 'ID Views', and 'Automember'. Below this, a breadcrumb trail shows 'Active users > ldapuser1'. A confirmation message '✓ Usuario: ldapuser1' is displayed, stating 'ldapuser1 es un miembro de:'. Below this, there are tabs for 'Configuración' (selected), 'Grupos de usuarios', 'Grupos de red', 'Roles', 'Reglas HBAC', and 'Reglas Sudo'. Action buttons include 'Actualizar', 'Revert', 'Save', and 'Actions'. The main area is divided into two sections: 'Configuración de identidad' and 'Configuración de la cuenta'. The 'Configuración de identidad' section contains fields for 'Nombre' (ldapuser1), 'Apellido' (ldapuser1), 'Nombre y apellidos' (ldapuser1 ldapuser1), 'Mostrar nombre' (ldapuser1 ldapuser1), 'Iniciales' (ll), 'GECOS' (ldapuser1 ldapuser1), and 'Clase'. The 'Configuración de la cuenta' section contains fields for 'Ingreso de usuario' (ldapuser1), 'Contraseña' (*****), 'Caducidad de la contraseña' (2018-04-01 08:20:19Z), 'UID' (1954800001), 'GID' (1954800001), 'Principal alias' (ldapuser1@EXAMPLE.COM), 'Kerberos principal expiration' (YYYY-MM-DD), 'Shelf de ingreso' (ññññ), 'Directorio principal' (/home/ldapuser1), 'SSH public keys' (Agregar), 'Certificados' (Agregar), and 'Certificate mapping data' (Aregar). There are also buttons for 'Eliminar' (Delete) and 'Agregar' (Add).

↓↓ Método-2:

Empezamos de nuevo, restauramos la VM station1 a su estado anterior, y reconfiguramos en modo comando con → authconfig.

root@station1 ~]# yum install authconfig sssd krb5-workstation -y

↓ Seleccionamos contextos para habilitar:

```
[root@station1 ~]# for i in ldap home sssd krb5; do authconfig --help |grep $i; done
--enableldap      habilitar por defecto LDAP para la información del usuario
--disableldap    inhabilitar por defecto LDAP para la información del usuario
--enableldapauth   habilitar por defecto LDAP para la autenticación
--disableldapauth  inhabilitar por defecto LDAP para la autenticación
--ldapserver=<servidor>
  --ldapbasedn=<dn>    DN de base LDAP por defecto
  --enableldaptls, --enableldapstarttls
  --disableldaptls, --disableldapstarttls
--ldaploadcacert=<URL>
  --winbindtemplatemedir=</home/%D/%U>
  --enablemkhomedir   crear el directorio principal de usuarios en su primer inicio de sesión
  --disablemkhomedir  no crear directorios principales de usuarios en el primer inicio de sesión
--enablesssd      habilitar por defecto SSSD para la información del usuario con el manejo
                  manual de la configuración
--disablesssd     inhabilitar por defecto SSSD para la información de usuario (todavía
                  utilizado para configuraciones soportadas)
--enablesssdauth   habilitar por defecto SSSD para la autenticación con el manejo manual de la
                  configuración
--disablesssdauth  inhabilita SSSD para la autenticación por defecto (todavía se usa para las
```



configuraciones soportadas)

--enablekrb5	habilitar la autenticación con Kerberos por defecto
--disablekrb5	inhabilitar la autenticación con Kerberos por defecto
--krb5kdc=<servidor>	KDC predeterminado de Kerberos
--krb5adminserver=<servidor>	
--krb5realm=<entorno>	
--enablekrb5kdcdns	habilitar el uso de DNS para hallar los KDC de Kerberos
--disablekrb5kdcdns	inhabilitar el uso del DNS para hallar los KDC de Kerberos
--enablekrb5realmDNS	habilitar el uso del DNS para hallar los entornos de Kerberos
--disablekrb5realmDNS	
--enablewinbindkrb5	Winbind usará Kerberos 5 para autenticación
--disablewinbindkrb5	Winbind usará el método de autenticación predeterminado

```
[root@station1 ~]# authconfig --enableldap --enableldapauth  
--ldapserver=ldap://server1.example.com --ldapbasedn='dc=example,dc=com' --enableldaptls  
--enablemkhomedir --enablesssd --update
```

→ Nos falta → **--ldaploadcacert=<URL>**

```
[root@station1 ~]# ssh ldapuser1@server1.example.com
```

The authenticity of host 'server1.example.com (192.168.8.150)' can't be established.
ECDSA key fingerprint is SHA256:9ieWmR3Fs1rxx/ly79atqcvbxqirLNhJ02I6MnBc2pw.
ECDSA key fingerprint is MD5:0a:bd:aa:3c:73:a2:03:cd:ab:66:6a:26:b5:6f:a8:37.

Are you sure you want to continue connecting (yes/no)? yes

Warning: Permanently added 'server1.example.com,192.168.8.150' (ECDSA) to the list of known hosts.

Password:

Bienvenido a server1

Could not chdir to home directory /home/ldapuser1: No such file or directory

-sh-4.2\$ exit

```
[root@station1 ~]# authconfig --enableldap --enableldapauth
```

```
--ldapserver=ldap://server1.example.com --ldapbasedn='dc=example,dc=com' --enableldaptls  
--enablemkhomedir --enablesssd --update
```

```
[root@station1 ~]# yum install realmd -y
```

```
[root@station1 ~]# realm --help
```

realm discover -v [realm-name]

Discover available realm

realm join -v [-U user] realm-name

Enroll this machine in a realm

realm leave -v [-U user] [realm-name]

Unenroll this machine from a realm

realm list



List known realms

```
realm permit [-ax] [-R realm] user ...
  Permit user logins
```

```
realm deny --all [-R realm]
  Deny user logins
```

```
[root@station1 ~]# realm discover server1.example.com -v
```

```
* Resolving: _ldap._tcp.server1.example.com
* Resolving: server1.example.com
* Performing LDAP DSE lookup on: 192.168.8.150
* Successfully discovered: example.com
example.com
  type: kerberos
  realm-name: EXAMPLE.COM
  domain-name: example.com
  configured: no
  server-software: ipa
  client-software: sssd
  required-package: ipa-client
  required-package: oddjob
  required-package: oddjob-mkhomedir
  required-package: sssd
```

```
[root@station1 ~]# realm join server1.example.com -v
```

```
* Resolving: _ldap._tcp.server1.example.com
* Resolving: server1.example.com
* Performing LDAP DSE lookup on: 192.168.8.150
* Successfully discovered: example.com
Contraseña para admin:
* Couldn't find file: /usr/sbin/ipa-client-install
* Required files: /usr/sbin/ipa-client-install, /usr/sbin/oddjobd, /usr/libexec/oddjob/mkhomedir,
/usr/sbin/sssd
* Resolving required packages
! PackageKit not available: The name org.freedesktop.PackageKit was not provided by any .service
files
! Necessary packages are not installed: ipa-client, oddjob, oddjob-mkhomedir, sssd
realm: No se pudo unir al reino: Necessary packages are not installed: ipa-client, oddjob, oddjob-mkhomedir, sssd
```

```
[root@station1 ~]# yum install ipa-client
```

```
[root@station1 ~]# realm discover server1.example.com -v
```

```
* Resolving: _ldap._tcp.server1.example.com
* Resolving: server1.example.com
* Performing LDAP DSE lookup on: 192.168.8.150
* Successfully discovered: example.com
example.com
  type: kerberos
```



```
realm-name: EXAMPLE.COM
domain-name: example.com
configured: no
server-software: ipa
client-software: sssd
required-package: ipa-client
required-package: oddjob
required-package: oddjob-mkhomedir
required-package: sssd
[root@station1 ~]# realm join server1.example.com -v
* Resolving: _ldap._tcp.server1.example.com
* Resolving: server1.example.com
* Performing LDAP DSE lookup on: 192.168.8.150
* Successfully discovered: example.com
Contraseña para admin:
* Required files: /usr/sbin/ipa-client-install, /usr/sbin/oddjobd, /usr/libexec/oddjob/mkhomedir,
/usr/sbin/sssd
* LANG=C /usr/sbin/ipa-client-install --domain example.com --realm EXAMPLE.COM
--mkhomedir --enable-dns-updates --unattended --force-join --server server1.example.com --fixed-
primary --principal admin -W --force-ntp
Client hostname: station1.example.com
Realm: EXAMPLE.COM
DNS Domain: example.com
IPA Server: server1.example.com
BaseDN: dc=example,dc=com
Synchronizing time with KDC...
Attempting to sync time using ntpd. Will timeout after 15 seconds
Unable to sync time with NTP server, assuming the time is in sync. Please check that 123 UDP port
is opened.
Successfully retrieved CA cert
Subject: CN=Certificate Authority,O=EXAMPLE.COM
Issuer: CN=Certificate Authority,O=EXAMPLE.COM
Valid From: 2018-04-01 08:02:47
Valid Until: 2038-04-01 08:02:47

Enrolled in IPA realm EXAMPLE.COM
Created /etc/ipa/default.conf
Configured sudoers in /etc/nsswitch.conf
Configured /etc/sssd/sssd.conf
Configured /etc/krb5.conf for IPA realm EXAMPLE.COM
trying https://server1.example.com/ipa/json
[try 1]: Forwarding 'schema' to json server 'https://server1.example.com/ipa/json'
trying https://server1.example.com/ipa/session/json
[try 1]: Forwarding 'ping' to json server 'https://server1.example.com/ipa/session/json'
[try 1]: Forwarding 'ca_is_enabled' to json server 'https://server1.example.com/ipa/session/json'
Systemwide CA database updated.
Hostname (station1.example.com) does not have A/AAAA record.
Failed to update DNS records.
Missing A/AAAA record(s) for host station1.example.com: 192.168.8.151.
```



Missing reverse record(s) for address(es): 192.168.8.151.
Adding SSH public key from /etc/ssh/ssh_host_rsa_key.pub
Adding SSH public key from /etc/ssh/ssh_host_ecdsa_key.pub
Adding SSH public key from /etc/ssh/ssh_host_ed25519_key.pub
[try 1]: Forwarding 'host_mod' to json server 'https://server1.example.com/ipa/session/json'
Could not update DNS SSHFP records.
SSSD enabled
Configured /etc/openldap/ldap.conf
No SRV records of NTP servers found. IPA server address will be used
NTP enabled
Configured /etc/ssh/ssh_config
Configured /etc/ssh/sshd_config
Configuring example.com as NIS domain.
Client configuration complete.

The ipa-client-install command was successful

```
* /usr/bin/systemctl enable sssd.service
* /usr/bin/systemctl restart sssd.service
* /usr/bin/sh -c /usr/sbin/authconfig --update --enablesssd --enablesssdauth --enablemkhomedir
--nostart && /usr/bin/systemctl enable oddjobd.service && /usr/bin/systemctl start oddjobd.service
Created symlink from /etc/systemd/system/multi-user.target.wants/oddjobd.service to
/usr/lib/systemd/system/oddjobd.service.
* Successfully enrolled machine in realm
```

ssh ldapuser1@station1.example.com

Password:

Creating home directory for ldapuser1.

Bienvenido a station1

[root@station1 ~]# ssh ldapuser1@station1.example.com

Password:

Last login: Sun Apr 1 18:25:25 2018 from station1.example.com

Bienvenido a station1

-sh-4.2\$ exit

[root@station1 ~]# ssh ldapuser1@server1.example.com

Password:

Last failed login: Sun Apr 1 18:27:58 CEST 2018 from station1.example.com on ssh:notty

There was 1 failed login attempt since the last successful login.

Last login: Sun Apr 1 18:01:18 2018 from station1.example.com

Bienvenido a server1

Could not chdir to home directory /home/ldapuser1: No such file or directory

-sh-4.2\$ getent passwd ldapuser{1..5}

ldapuser1:*:1954800001:1954800001:ldapuser1 ldapuser1:/home/ldapuser1:/bin/sh

ldapuser2:*:1954800003:1954800003:ldapuser2 ldapuser2:/home/ldapuser2:/bin/sh

ldapuser3:*:1954800004:1954800004:ldapuser3 ldapuser3:/home/ldapuser3:/bin/sh

ldapuser4:*:1954800005:1954800005:ldapuser4 ldapuser4:/home/ldapuser4:/bin/sh

ldapuser5:*:1954800006:1954800006:ldapuser5 ldapuser5:/home/ldapuser5:/bin/sh

-sh-4.2\$ exit



10. Configure NTP to configure your system

Description: Let's serve as an NTP client for server1.example.com

==> Parte servidor1:

[root@server1 ~]# chronyc sources -v

210 Number of sources = 4

```
.-- Source mode '^' = server, '=' = peer, '#' = local clock.  
/ .- Source state '*' = current synced, '+' = combined , '-' = not combined,  
| / '?' = unreachable, 'x' = time may be in error, '~' = time too variable.  
||          .- xxxx [ yyyy ] +/- zzzz  
||  Reachability register (octal) -. | xxxx = adjusted offset,  
||  Log2(Polling interval) --. | | yyyy = measured offset,  
||          \ | | zzzz = estimated error.  
||          | | |\  
MS Name/IP address      Stratum Poll Reach LastRx Last sample  
=====
```

MS Name/IP address	Stratum	Poll	Reach	LastRx	Last sample
^+ ns3.intendia.com	2	6	377	36	-1718us[-8670us] +/- 81ms
^* elv06.icfo.es	2	6	377	38	-3716us[-11ms] +/- 47ms
^- ntp.redimadrid.es	2	6	377	37	-3484us[-3484us] +/- 78ms
^- bjaaland.red.uv.es	2	6	377	34	-1912us[-1912us] +/- 74ms

[root@server1 ~]# systemctl restart chronyd.service

[root@server1 ~]# systemctl status chronyd.service

● chronyd.service - NTP client/server

 Loaded: loaded (/usr/lib/systemd/system/chronyd.service; enabled; vendor preset: enabled)

 Active: active (running) since vie 2018-03-30 18:59:30 CEST; 25s ago

 Docs: man:chronyd(8)

 man:chrony.conf(5)

 Process: 1481 ExecStartPost=/usr/libexec/chrony-helper update-daemon (code=exited, status=0/SUCCESS)

 Process: 1478 ExecStart=/usr/sbin/chronyd \$OPTIONS (code=exited, status=0/SUCCESS)

 Main PID: 1480 (chronyd)

 CGroup: /system.slice/chronyd.service

 └─1480 /usr/sbin/chronyd

mar 30 18:59:30 server1.example.com systemd[1]: Starting NTP client/server...

mar 30 18:59:30 server1.example.com chronyd[1480]: chronyd version 3.1 starting (+CMDMON +NTP +REFCLOCK +RTC +PRIVDROP +SCFILTER +SECHASH +SIGND +ASYNCNS +IPV6 +DEBUG)

mar 30 18:59:30 server1.example.com chronyd[1480]: Frequency 5.873 +/- 47.507 ppm read from /var/lib/chrony/drift

mar 30 18:59:30 server1.example.com systemd[1]: Started NTP client/server.

[root@station1 ~]# timedatectl

Local time: vie 2018-03-30 19:12:06 CEST



Universal time: vie 2018-03-30 17:12:06 UTC

RTC time: vie 2018-03-30 17:12:04

Time zone: Europe/Madrid (CEST, +0200)

NTP enabled: yes

NTP synchronized: no

==> Sincroniza con → chrony

RTC in local TZ: no

DST active: yes

Last DST change: DST began at

dom 2018-03-25 01:59:59 CET

dom 2018-03-25 03:00:00 CEST

Next DST change: DST ends (the clock jumps one hour backwards) at

dom 2018-10-28 02:59:59 CEST

dom 2018-10-28 02:00:00 CET

→ Cambio de sincronización de Chrony a NTP:

[root@server1 ~]# timedatectl set-ntp true

[root@server1 ~]# systemctl restart chronyd.service

[root@server1 ~]# timedatectl

Local time: vie 2018-03-30 19:17:21 CEST

Universal time: vie 2018-03-30 17:17:21 UTC

RTC time: vie 2018-03-30 17:17:19

Time zone: Europe/Madrid (CEST, +0200)

NTP enabled: yes

NTP synchronized: yes

==> Sincroniza con NTP

RTC in local TZ: no

DST active: yes

Last DST change: DST began at

dom 2018-03-25 01:59:59 CET

dom 2018-03-25 03:00:00 CEST

Next DST change: DST ends (the clock jumps one hour backwards) at

dom 2018-10-28 02:59:59 CEST

dom 2018-10-28 02:00:00 CET

==> Parte station1:

[root@station1 ~]# vi /etc/chrony.conf

Use public servers from the pool.ntp.org project.

Please consider joining the pool (<http://www.pool.ntp.org/join.html>).

#server 0.centos.pool.ntp.org iburst

#server 1.centos.pool.ntp.org iburst

#server 2.centos.pool.ntp.org iburst

#server 3.centos.pool.ntp.org iburst

server server1.example.com iburst

...

[root@station1 ~]# systemctl restart chronyd.service

[root@station1 ~]# chronyc sources -v

210 Number of sources = 1

.-- Source mode '^' = server, '=' = peer, '#' = local clock.



```
/ .- Source state '*' = current synced, '+' = combined , '-' = not combined,  
| / '?' = unreachable, 'x' = time may be in error, '~' = time too variable.  
|| .- xxxx [ yyyy ] +/- zzzz  
|| Reachability register (octal) -. | xxxx = adjusted offset,  
|| Log2(Polling interval) --. | yyyy = measured offset,  
|| \ | | zzzz = estimated error.  
|| | | |\  
MS Name/IP address   Stratum Poll Reach LastRx Last sample  
=====  
=====  
^? server1.example.com      0 7 0 - +0ns[ +0ns] +/- 0ns
```

11. Configure a user account

Description: Creates a user with a UID of 2000 and the user name is jack.

```
[root@station1 ~]# useradd -u 2000 jack  
[root@station1 ~]# getent passwd jack  
jack:x:2000:2000::/home/jack:/bin/bash  
[root@station1 ~]# getent group jack  
jack:x:2000:
```

12. Extend the swap partition

Description: Increase SWAP partition by 300MB, boot automatically

```
[root@station1 ~]# free  
total used free shared buff/cache available  
Mem: 2027728 99412 1803400 8532 124916 1775040  
Swap: 1572860 0 1572860  
[root@station1 ~]# swapon -s  
Filename Type Size Used Priority  
/dev/dm-1 partition 1572860 0 -1  
[root@station1 ~]# dd if=/dev/zero of=/root/swap2 bs=300M count=1  
1+0 registros leídos  
1+0 registros escritos  
314572800 bytes (315 MB) copiados, 0,309035 s, 1,0 GB/s  
[root@station1 ~]# ls -lh /root/swap2  
-rw-r--r--. 1 root root 300M mar 26 19:52 /root/swap2  
[root@station1 ~]# mkswap /root/swap2  
Setting up swapspace version 1, size = 307196 KiB  
no label, UUID=08ba48d0-755d-4791-95e6-29ddaa4137e2  
[root@station1 ~]# swapon /root/swap2  
swapon: /root/swap2: insecure permissions 0644, 0600 suggested.  
[root@station1 ~]# free  
total used free shared buff/cache available  

```



```
Filename           Type      Size  Used  Priority
/dev/dm-1         partition 1572860   0    -1
/root/swap2        file     307196   0    -2
```

```
[root@station1 ~]# chmod 0600 /root/swap2
```

```
[root@station1 ~]# vi /etc/fstab
[root/swap2 swap swap defaults,pri=33 0 0
```

```
[root@station1 ~]# free
total       used       free     shared  buff/cache available
Mem:  2027728  99808  1484712    8540  443208  1753584
Swap: 1880056      0  1880056
```

```
[root@station1 ~]# swapon -s
```

```
Filename           Type      Size  Used  Priority
/dev/dm-1         partition 1572860   0    -1
/root/swap2        file     307196   0    33
```

```
[root@station1 ~]# ls -lh /root/swap2
-rw-----. 1 root root 300M mar 26 19:53 /root/swap2
```

13. Find the file.

Description: Find files belonging to the user woody and copies them into the /user-files directory.

```
[root@station1 ~]# mkdir /user-files
[root@station1 ~]# cd /user-files
[root@station1 user-files]# find / -type f -user woody -exec cp -p {} /user-files/ \;
```

```
[root@station1 user-files]# ll
```

```
total 0
-rw-rw----. 1 woody mail    0 mar 27 09:45 woody
-rw-r--r--. 1 woody adminuser 0 mar 27 18:05 woody.test
-rw-r--r--. 1 woody adminuser 0 mar 27 11:41 woody.txt
```

14. Find a string

Description: View all the lines in the /usr/share/dict/words file that contain the seismic keyword and write the found lines to the /root/file-list file.

```
[root@station1 user-files]# vi /usr/share/dict/words
```

```
El seismic es un ejemplo.  
No hay aqui nada  
Mas seismic.  
Nada tampoco.  
Otro seismic.
```

```
[root@station1 user-files]# cat /usr/share/dict/words |grep -n seismic > /root/file-list
[root@station1 user-files]# cat /root/file-list
```

1:El seismic es un ejemplo.

3:Mas seismic.



5: Otro seismic.

15. Create an archive

Description: The /etc directory is packaged into a compressed package placed in /root/backup.tar.bz2.

Compression options:

- a, --auto-compress
use archive suffix to determine the compression program
- I, --use-compress-program=PROG
filter through PROG (must accept -d)
- j, --bzip2
filter the archive through bzip2
- J, --xz
filter the archive through xz
- lzip filter the archive through lzip
- lzma filter the archive through lzma
- lzop
- no-auto-compress
do not use archive suffix to determine the compression program
- z, --gzip, --gunzip, --ungzip
filter the archive through gzip
- Z, --compress, --uncompress
filter the archive through compress

```
[root@station1 user-files]# yum install bzip2 gzip      ==> OJO INSTALAR.  
[root@station1 user-files]# tar cvjf /root/backup.tar.bz2 /etc/  
[root@station1 user-files]# tar cvzf /root/backup.tar.gz /etc/  
[root@station1 user-files]# ls /root/  
anaconda-ks.cfg backup.tar.bz2 backup.tar.gz file-list swap2
```

```
[root@station1 user-files]# tar tfv /root/backup.tar.bz2  
[root@station1 user-files]# tar tfv /root/backup.tar.gz
```

16. Create a logical volume

Description: Create a logical volume named database, with the volume group



named datastore.

- The logical volume size is 160MB and the PE size of the group is 16M.
- Requires automatic mount after reboot on /mnt/database
- Mount the new logical volume using the UUID
- File system of this partition need to be set as xfs

[root@station1 ~]# fdisk /dev/sdb

Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Orden (m para obtener ayuda): p

Disk /dev/sdb: 1073 MB, 1073741824 bytes, 2097152 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Identificador del disco: 0xa0ee30a2

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
/dev/sdb1	2048	2097151	1047552	5	Extended	
/dev/sdb5	4096	1028095	512000	8e	Linux LVM	

Orden (m para obtener ayuda): n

Partition type:

p primary (0 primary, 1 extended, 3 free)

l logical (numbered from 5)

Select (default p): l

Adding logical partition 6

Primer sector (1030144-2097151, valor predeterminado 1030144):

Se está utilizando el valor predeterminado 1030144

Last sector, +sectors or +size{K,M,G} (1030144-2097151, valor predeterminado 2097151): +200M

Partition 6 of type Linux and of size 160 MiB is set

Orden (m para obtener ayuda): t

Número de partición (1,5,6, default 6): 6

Hex code (type L to list all codes): 8e

Changed type of partition 'Linux' to 'Linux LVM'

Orden (m para obtener ayuda): p

Disk /dev/sdb: 1073 MB, 1073741824 bytes, 2097152 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos



Identificador del disco: 0xa0ee30a2

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
/dev/sdb1	2048	2097151	1047552	5	Extended	
/dev/sdb5	4096	1028095	512000	8e	Linux LVM	
/dev/sdb6	1030144	1357823	163840	8e	Linux LVM	

Orden (m para obtener ayuda): w
¡Se ha modificado la tabla de particiones!

Llamando a ioctl() para volver a leer la tabla de particiones.

WARNING: Re-reading the partition table failed with error 16: Dispositivo o recurso ocupado.
The kernel still uses the old table. The new table will be used at
the next reboot or after you run partprobe(8) or kpartx(8)
Se están sincronizando los discos.

[root@station1 ~]# partprobe /dev/sdb

[root@station1 ~]# lsblk

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	15G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	14G	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─centos-swap	253:1	0	1,5G	0	lvm	[SWAP]
sdb	8:16	0	1G	0	disk	
└─sdb1	8:17	0	512B	0	part	
└─sdb5	8:21	0	500M	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─sdb6	8:22	0	200M	0	part	
sr0	11:0	1	1024M	0	rom	

[root@station1 ~]# pvcreate /dev/sdb6

Physical volume "/dev/sdb6" successfully created.

[root@station1 ~]# pvs

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5	centos	lvm2	a--	496,00m	0
/dev/sdb6		lvm2	---	200,00m	200,00m

[root@station1 ~]# pvs

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5	centos	lvm2	a--	496,00m	0
/dev/sdb6		lvm2	---	200,00m	200,00m

[root@station1 ~]# vgcreate datastore -s 16 /dev/sdb6

Volume group "datastore" successfully created

[root@station1 ~]# vgdisplay



```
[root@station1 ~]# vgdisplay datastore
```

```
--- Volume group ---
VG Name          datastore
System ID
Format          lvm2
Metadata Areas   1
Metadata Sequence No  1
VG Access        read/write
VG Status         resizable
MAX LV           0
Cur LV            0
Open LV           0
Max PV            0
Cur PV            1
Act PV            1
VG Size          192,00 MiB
PE Size          16,00 MiB
Total PE         12
Alloc PE / Size  0 / 0
Free PE / Size   12 / 192,00 MiB
VG UUID          mmcNZo-MU0Y-3243-nkV8-m8Py-uyAH-VZmwbn
```

```
[root@station1 ~]# vgs
```

```
VG #PV #LV #SN Attr  VSize  VFree
centos  2  2  0 wz--n- 14,48g    0
datastore 1  0  0 wz--n- 192,00m 192,00m
```

```
[root@station1 ~]# lvcreate datastore -n database -L 160M
```

```
Logical volume "database" created.
```

```
[root@station1 ~]# lvs
```

```
LV   VG     Attr   LSize  Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
root centos -wi-ao---- 12,98g
swap  centos -wi-ao---- 1,50g
database datastore -wi-a---- 160,00m
```

```
[root@station1 ~]# lsblk
```

```
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda        8:0    0  15G  0 disk
└─sda1     8:1    0   1G  0 part /boot
└─sda2     8:2    0  14G  0 part
  └─centos-root 253:0  0 13G  0 lvm /
    └─centos-swap 253:1  0 1,5G  0 lvm [SWAP]
sdb        8:16   0   1G  0 disk
└─sdb1     8:17   0 512B 0 part
└─sdb5     8:21   0 500M 0 part
  └─centos-root 253:0  0 13G  0 lvm /
└─sdb6     8:22   0 200M 0 part
  └─datastore-database 253:2  0 160M 0 lvm
sr0       11:0   1 1024M 0 rom
```



```
[root@station1 ~]# mkdir -p /mnt/database
[root@station1 ~]# mkfs.xfs /dev/mapper/datastore-database
meta-data=/dev/mapper/datastore-database isize=512    agcount=4, agsize=10240 blks
          =           sectsz=512  attr=2, projid32bit=1
          =           crc=1    finobt=0, sparse=0
data     =           bsize=4096   blocks=40960, imaxpct=25
          =           sunit=0    swidth=0 blks
naming   =version 2      bsize=4096  ascii-ci=0 ftype=1
log      =internal log    bsize=4096   blocks=855, version=2
          =           sectsz=512  sunit=0 blks, lazy-count=1
realtime =none            extsz=4096   blocks=0, rtextents=0
```

```
[root@station1 ~]# lsblk -f
```

NAME	FSTYPE	LABEL	UUID	MOUNTPOINT
sda				
└─sda1	xfs	349dfbe5-307e-4feb-bc27-51a0f8d79f1b	/boot	
└─sda2	LVM2_member	JWL0ix-FrTt-Y1bp-nr0S-Rv2V-JOGV-TlcKWc		
└─centos-root	xfs	c80c43a5-630f-4c23-917a-7e156dff8c18	/	
└─centos-swap	swap	94607b03-c3d0-48a2-8bfd-fd30a7b758ae	[SWAP]	
sdb				
└─sdb1				
└─sdb5	LVM2_member	pWE8PB-A9Zv-7tKM-t8FG-AQTK-XJab-La67xS		
└─centos-root	xfs	c80c43a5-630f-4c23-917a-7e156dff8c18	/	
└─sdb6	LVM2_member	6g9Aoq-9Wi4-swJS-YmUG-tBOP-jGoN-SvdV2a		
└─datastore-database	xfs	d13b95d6-5003-4c1f-bab4-fc736cff0af1		
sr0				

```
[root@station1 ~]# vim /etc/fstab
```

```
UUID=d13b95d6-5003-4c1f-bab4-fc736cff0af1 /mnt/database xfs defaults 0 0
```

```
[root@station1 ~]# mount -a
```

```
[root@station1 ~]# mount
```

```
...
```

```
/dev/mapper/datastore-database on /mnt/database type xfs
(rw,relatime,seclabel,attr2,inode64,noquota)
```

```
[root@station1 ~]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	15G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	14G	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─centos-swap	253:1	0	1,5G	0	lvm	[SWAP]
sdb	8:16	0	1G	0	disk	
└─sdb1	8:17	0	512B	0	part	
└─sdb5	8:21	0	500M	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─sdb6	8:22	0	200M	0	part	
└─datastore-database	253:2	0	160M	0	lvm	/mnt/database
sr0	11:0	1	1024M	0	rom	



17. Create a new partition

Description: Create a new partition, and mounted using the label “my-ext”, the size of this new partition need to be 200MB. And mounted automatically on /data. The file system of this partition need to set as ext3.

```
[root@station1 ~]# mkdir /data  
[root@station1 ~]# fdisk /dev/sdb
```

Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Orden (m para obtener ayuda): p

Disk /dev/sdb: 1073 MB, 1073741824 bytes, 2097152 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Identificador del disco: 0xa0ee30a2

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
/dev/sdb1	2048	2097151	1047552	5	Extended	
/dev/sdb5	4096	1028095	512000	8e	Linux LVM	
/dev/sdb6	1030144	1439743	204800	8e	Linux LVM	

Orden (m para obtener ayuda): n

Partition type:

p primary (0 primary, 1 extended, 3 free)

l logical (numbered from 5)

Select (default p): l

Adding logical partition 7

Primer sector (1441792-2097151, valor predeterminado 1441792):

Se está utilizando el valor predeterminado 1441792

Last sector, +sectors or +size{K,M,G} (1441792-2097151, valor predeterminado 2097151): +200M

Partition 7 of type Linux and of size 200 MiB is set

Orden (m para obtener ayuda): p

Disk /dev/sdb: 1073 MB, 1073741824 bytes, 2097152 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Identificador del disco: 0xa0ee30a2

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
-----------	--------	----------	-----	---------	----	---------



```
/dev/sdb1      2048  2097151  1047552  5 Extended  
/dev/sdb5      4096  1028095  512000  8e Linux LVM  
/dev/sdb6    1030144  1439743  204800  8e Linux LVM  
/dev/sdb7    1441792  1851391  204800  83 Linux
```

Orden (m para obtener ayuda): w
¡Se ha modificado la tabla de particiones!

Llamando a ioctl() para volver a leer la tabla de particiones.

WARNING: Re-reading the partition table failed with error 16: Dispositivo o recurso ocupado.
The kernel still uses the old table. The new table will be used at
the next reboot or after you run partprobe(8) or kpartx(8)
Se están sincronizando los discos.

[root@station1 ~]# partprobe /dev/sdb

```
[root@station1 ~]# mkfs.ext3 -L my-ext /dev/sdb7  
mke2fs 1.42.9 (28-Dec-2013)  
Etiqueta del sistema de ficheros=my-ext  
OS type: Linux  
Tamaño del bloque=1024 (bitácora=0)  
Tamaño del fragmento=1024 (bitácora=0)  
Stride=0 blocks, Stripe width=0 blocks  
51200 inodes, 204800 blocks  
10240 blocks (5.00%) reserved for the super user  
Primer bloque de datos=1  
Número máximo de bloques del sistema de ficheros=67371008  
25 bloque de grupos  
8192 bloques por grupo, 8192 fragmentos por grupo  
2048 nodos-i por grupo  
Respaldo del superbloque guardado en los bloques:  
     8193, 24577, 40961, 57345, 73729
```

Allocating group tables: hecho
Escribiendo las tablas de nodos-i: hecho
Creating journal (4096 blocks): hecho
Escribiendo superbloques y la información contable del sistema de ficheros: hecho

```
[root@station1 ~]# e2label /dev/sdb7  
my-ext  
[root@station1 ~]# e2label /dev/sdb7  
my-ext  
[root@station1 ~]# lsblk -f  
NAME      FSTYPE   LABEL UUID                                     MOUNTPOINT  
sda  
└─sda1      xfs      349dfbe5-307e-4feb-bc27-51a0f8d79f1b  /boot  
└─sda2      LVM2_member  JWL0ix-FrTt-Y1bp-nr0S-Rv2V-JOGV-TlcKWc  
└─centos-root  xfs      c80c43a5-630f-4c23-917a-7e156dff8c18  /  
└─centos-swap  swap     94607b03-c3d0-48a2-8bfd-fd30a7b758ae [SWAP]
```



```
sdb
└─sdb1
└─sdb5      LVM2_member    pWE8PB-A9Zv-7tKM-t8FG-AQTK-XJab-La67xS
  └─centos-root  xfs        c80c43a5-630f-4c23-917a-7e156dff8c18  /
└─sdb6      LVM2_member    6g9Aoq-9Wi4-swJS-YmUG-tBOP-jGoN-SvdV2a
  └─datastore-database xfs        d13b95d6-5003-4c1f-bab4-fc736cff0af1 /mnt/database
└─sdb7      ext3        my-ext b17758fd-fb9d-4b58-aa5c-477524cd8f5a
sr0
```

```
[root@station1 ~]# vim /etc/fstab
```

```
...
LABEL=my-ext /data ext3 defaults 0 0
```

```
[root@station1 ~]# mount -a
```

```
[root@station1 ~]# mount
```

```
...
```

```
/dev/mapper/datastore-database on /mnt/database type xfs
(rw,relatime,seclabel,attr2,inode64,noquota)
/dev/sdb7 on /data type ext3 (rw,relatime,seclabel,data=ordered)
```

```
[root@station1 ~]# lsblk -f
```

NAME	FSTYPE	LABEL	UUID	MOUNTPOINT
sda				
└─sda1	xfs	349dfbe5-307e-4feb-bc27-51a0f8d79f1b	/boot	
└─sda2	LVM2_member	JWL0ix-FrTt-Y1bp-nr0S-Rv2V-JOGV-TlcKwC		
└─centos-root	xfs	c80c43a5-630f-4c23-917a-7e156dff8c18	/	
└─centos-swap	swap	94607b03-c3d0-48a2-8bfd-fd30a7b758ae	[SWAP]	
sdb				
└─sdb1				
└─sdb5	LVM2_member	pWE8PB-A9Zv-7tKM-t8FG-AQTK-XJab-La67xS		
└─centos-root	xfs	c80c43a5-630f-4c23-917a-7e156dff8c18	/	
└─sdb6	LVM2_member	6g9Aoq-9Wi4-swJS-YmUG-tBOP-jGoN-SvdV2a		
└─datastore-database	xfs	d13b95d6-5003-4c1f-bab4-fc736cff0af1	/mnt/database	
└─sdb7	ext3	my-ext b17758fd-fb9d-4b58-aa5c-477524cd8f5a	/data	

```
sr0
```

18. Mount user's home directory

Description: The server server1.example.com is exporting the user's home directories for the ldap users. Mount the resources using nfs version 3 on /home/ldap on your station. The path of the resources on the server is server1.example.com:/home/ldap/ldapuser{1..5}

→ [/etc/fstab](#)

nfsvers=2 or **nfsvers=3** — Specifies which version of the NFS protocol to use. This is useful for hosts that run multiple NFS servers. If no version is specified, NFS uses the highest supported version by the kernel and `mount` command. This option is not supported with NFSv4 and should not be used.



19. Create another logical volume

Description: Create a new partition, and mounted using the UUID, the size of this new partition is 20 LE (logical extend); named the logical volume “lv_services”. And mounted automatically on /share. Named the volume group “services”, and the size of the PE (physical extend) is 16MB. The file system of this partition need to set as ext4.

Cálculo de espacio necesario => 20 LE x 16 MB = 320 MB necesitaremos.

```
[root@station1 ~]# lsblk
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda        8:0    0 15G  0 disk
└─sda1     8:1    0 1G   0 part /boot
└─sda2     8:2    0 14G  0 part
  └─centos-root 253:0  0 13G  0 lvm /
  └─centos-swap 253:1  0 1,5G 0 lvm [SWAP]
sdb        8:16   0 1G   0 disk
└─sdb1     8:17   0 1K   0 part
└─sdb5     8:21   0 500M 0 part
  └─centos-root 253:0  0 13G  0 lvm /
└─sdb6     8:22   0 200M 0 part
  └─datastore-database 253:2  0 160M 0 lvm /mnt/database
└─sdb7     8:23   0 200M 0 part /data
sdc        8:32   0 300M 0 disk
sr0       11:0   1 1024M 0 rom
```

En **sda** → No hay espacio.

En **sdb** → Nos sobran aproximadamente 100 MB excasos.

En **sdc** → disponemos de 300 MB.

Podemos hacerlo, pero hay que tener cuidado con esto. Estamos en el límite de espacio y particiones.

Utilizaremos todo el espacio y después ajustaremos el lógical volumen a lo solicitado:

==> Comenzamos con sdb:

```
[root@station1 ~]# fdisk /dev/sdb
```

Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Orden (m para obtener ayuda): p

Disk /dev/sdb: 1073 MB, 1073741824 bytes, 2097152 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes



Disk label type: dos

Identificador del disco: 0xa0ee30a2

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
/dev/sdb1	2048	2097151	1047552	5	Extended	
/dev/sdb5	4096	1028095	512000	8e	Linux LVM	
/dev/sdb6	1030144	1439743	204800	8e	Linux LVM	
/dev/sdb7	1441792	1851391	204800	83	Linux	

Orden (m para obtener ayuda): n

Partition type:

p primary (0 primary, 1 extended, 3 free)
l logical (numbered from 5)

Select (default p): p

Número de partición (2-4, default 2):

No hay disponible ningún sector libre

Orden (m para obtener ayuda): n

Partition type:

p primary (0 primary, 1 extended, 3 free)
l logical (numbered from 5)

Select (default p): l

Adding logical partition 8

Primer sector (1853440-2097151, valor predeterminado 1853440):

Se está utilizando el valor predeterminado 1853440

Last sector, +sectors or +size{K,M,G} (1853440-2097151, valor predeterminado 2097151):

Se está utilizando el valor predeterminado 2097151

Partition 8 of type Linux and of size 119 MiB is set

Orden (m para obtener ayuda): t

Número de partición (1,5-8, default 8):

Hex code (type L to list all codes): 8e

Changed type of partition 'Linux' to 'Linux LVM'

Orden (m para obtener ayuda): p

Disk /dev/sdb: 1073 MB, 1073741824 bytes, 2097152 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Identificador del disco: 0xa0ee30a2

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
/dev/sdb1	2048	2097151	1047552	5	Extended	
/dev/sdb5	4096	1028095	512000	8e	Linux LVM	
/dev/sdb6	1030144	1439743	204800	8e	Linux LVM	
/dev/sdb7	1441792	1851391	204800	83	Linux	
/dev/sdb8	1853440	2097151	121856	8e	Linux LVM	



Orden (m para obtener ayuda): w
¡Se ha modificado la tabla de particiones!

Llamando a ioctl() para volver a leer la tabla de particiones.

WARNING: Re-reading the partition table failed with error 16: Dispositivo o recurso ocupado.
The kernel still uses the old table. The new table will be used at
the next reboot or after you run partprobe(8) or kpartx(8)
Se están sincronizando los discos.

[root@station1 ~]# partprobe /dev/sdb

[root@station1 ~]# lsblk

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	15G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	14G	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─centos-swap	253:1	0	1,5G	0	lvm	[SWAP]
sdb	8:16	0	1G	0	disk	
└─sdb1	8:17	0	512B	0	part	
└─sdb5	8:21	0	500M	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─sdb6	8:22	0	200M	0	part	
└─datastore-database	253:2	0	160M	0	lvm	/mnt/database
└─sdb7	8:23	0	200M	0	part	/data
└─sdb8	8:24	0	119M	0	part	
sdc	8:32	0	300M	0	disk	
sr0	11:0	1	1024M	0	rom	

[root@station1 ~]# pvs

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5	centos	lvm2	a--	496,00m	0
/dev/sdb6	datastore	lvm2	a--	192,00m	32,00m

[root@station1 ~]# pvcreate /dev/sdb8

Physical volume "/dev/sdb8" successfully created.

[root@station1 ~]# pvs

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5	centos	lvm2	a--	496,00m	0
/dev/sdb6	datastore	lvm2	a--	192,00m	32,00m
/dev/sdb8		lvm2	---	119,00m	119,00m

==> Seguimos con sdc:

[root@station1 ~]# fdisk /dev/sdc

Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.



Be careful before using the write command.

Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0xa8234c53.

Orden (m para obtener ayuda): n

Partition type:

p primary (0 primary, 0 extended, 4 free)
e extended

Select (default p): p

Número de partición (1-4, default 1):

Primer sector (2048-614399, valor predeterminado 2048):

Se está utilizando el valor predeterminado 2048

Last sector, +sectors or +size{K,M,G} (2048-614399, valor predeterminado 614399):

Se está utilizando el valor predeterminado 614399

Partition 1 of type Linux and of size 299 MiB is set

Orden (m para obtener ayuda): p

Disk /dev/sdc: 314 MB, 314572800 bytes, 614400 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Identificador del disco: 0xa8234c53

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
/dev/sdc1	2048	614399	306176	83	Linux	

Orden (m para obtener ayuda): t

Selected partition 1

Hex code (type L to list all codes): 8e

Changed type of partition 'Linux' to 'Linux LVM'

Orden (m para obtener ayuda): p

Disk /dev/sdc: 314 MB, 314572800 bytes, 614400 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos

Identificador del disco: 0xa8234c53

Disposit.	Inicio	Comienzo	Fin	Bloques	Id	Sistema
/dev/sdc1	2048	614399	306176	8e	Linux	LVM

Orden (m para obtener ayuda): w

;Se ha modificado la tabla de particiones!



Llamando a ioctl() para volver a leer la tabla de particiones.

Se están sincronizando los discos.

```
[root@station1 ~]# partprobe /dev/sdc
```

==> Comprobamos espacio y configuramos según el enunciado:

```
[root@station1 ~]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	15G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	14G	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─centos-swap	253:1	0	1,5G	0	lvm	[SWAP]
sdb	8:16	0	1G	0	disk	
└─sdb1	8:17	0	512B	0	part	
└─sdb5	8:21	0	500M	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─sdb6	8:22	0	200M	0	part	
└─datastore-database	253:2	0	160M	0	lvm	/mnt/database
└─sdb7	8:23	0	200M	0	part	/data
└─sdb8	8:24	0	119M	0	part	
sdc	8:32	0	300M	0	disk	
└─sdc1	8:33	0	299M	0	part	
sr0	11:0	1	1024M	0	rom	

```
[root@station1 ~]# pvs
```

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5	centos	lvm2	a--	496,00m	0
/dev/sdb6	datastore	lvm2	a--	192,00m	32,00m
/dev/sdb8		lvm2	---	119,00m	119,00m

```
[root@station1 ~]# pvcreate /dev/sdc1
```

Physical volume "/dev/sdc1" successfully created.

```
[root@station1 ~]# pvs
```

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5	centos	lvm2	a--	496,00m	0
/dev/sdb6	datastore	lvm2	a--	192,00m	32,00m
/dev/sdb8		lvm2	---	119,00m	119,00m
/dev/sdc1		lvm2	---	299,00m	299,00m

```
[root@station1 ~]# vgcreate services -s 16 /dev/sdb8 /dev/sdc1
```

Volume group "services" successfully created

```
[root@station1 ~]# pvs
```

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5	centos	lvm2	a--	496,00m	0
/dev/sdb6	datastore	lvm2	a--	192,00m	32,00m
/dev/sdb8	services	lvm2	---	119,00m	119,00m
/dev/sdc1	services	lvm2	---	299,00m	299,00m



```
/dev/sdb8 services lvm2 a-- 112,00m 112,00m  
/dev/sdc1 services lvm2 a-- 288,00m 288,00m
```

[root@station1 ~]# vgs

VG	#PV	#LV	#SN	Attr	VSize	VFree
centos	2	2	0	wz--n-	14,48g	0
datastore	1	1	0	wz--n-	192,00m	32,00m
services	2	0	0	wz--n-	400,00m	400,00m

[root@station1 ~]# vgdisplay services

--- Volume group ---	
VG Name	services
System ID	
Format	lvm2
Metadata Areas	2
Metadata Sequence No	1
VG Access	read/write
VG Status	resizable
MAX LV	0
Cur LV	0
Open LV	0
Max PV	0
Cur PV	2
Act PV	2
VG Size	400,00 MiB
PE Size	16,00 MiB
Total PE	25
Alloc PE / Size	0 / 0
Free PE / Size	25 / 400,00 MiB
VG UUID	W6zgHY-N8Tk-Optq-c9Jf-ehHn-J5go-fF1YHA

[root@station1 ~]# lvcreate services -n lv_services -l 20

Logical volume "lv_services" created.

[root@station1 ~]# lvs

LV	VG	Attr	LSize	Pool	Origin	Data%	Meta%	Move	Log	Cpy%	Sync	Convert
root	centos	-wi-ao----	12,98g									
swap	centos	-wi-ao----	1,50g									
database	datastore	-wi-ao----	160,00m									
lv_services	services	-wi-a----	320,00m									

[root@station1 ~]# lsblk

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	15G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	14G	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─centos-swap	253:1	0	1,5G	0	lvm	[SWAP]
sdb	8:16	0	1G	0	disk	
└─sdb1	8:17	0	512B	0	part	
└─sdb5	8:21	0	500M	0	part	
└─centos-root	253:0	0	13G	0	lvm	/



```
|---sdb6      8:22 0 200M 0 part
|   |--datastore-database 253:2 0 160M 0 lvm /mnt/database
|---sdb7      8:23 0 200M 0 part /data
|---sdb8      8:24 0 119M 0 part
|   \--services-lv_services 253:3 0 320M 0 lvm
sdc      8:32 0 300M 0 disk
|---sdc1     8:33 0 299M 0 part
|   \--services-lv_services 253:3 0 320M 0 lvm
sr0     11:0 1 1024M 0 rom
```

[root@station1 ~]# mkdir /share

[root@station1 ~]# mkfs.ext4 /dev/mapper/services-lv_services -L services

mke2fs 1.42.9 (28-Dec-2013)

Etiqueta del sistema de ficheros=services

OS type: Linux

Tamaño del bloque=1024 (bitácora=0)

Tamaño del fragmento=1024 (bitácora=0)

Stride=0 blocks, Stripe width=0 blocks

81920 inodes, 327680 blocks

16384 blocks (5.00%) reserved for the super user

Primer bloque de datos=1

Número máximo de bloques del sistema de ficheros=33947648

40 bloque de grupos

8192 bloques por grupo, 8192 fragmentos por grupo

2048 nodos-i por grupo

Respaldo del superbloque guardado en los bloques:

8193, 24577, 40961, 57345, 73729, 204801, 221185

Allocating group tables: hecho

Escribiendo las tablas de nodos-i: hecho

Creating journal (8192 blocks): hecho

Escribiendo superbloques y la información contable del sistema de ficheros: hecho

[root@station1 ~]# e2label /dev/mapper/services-lv_services

services

[root@station1 ~]# lsblk -f

NAME	FSTYPE	LABEL	UUID	MOUNTPOINT
sda				
sda1	xfs		349dfbe5-307e-4feb-bc27-51a0f8d79f1b	/boot
sda2	LVM2_member		JWL0ix-FrTt-Y1bp-nr0S-Rv2V-JOGV-TlcKwC	
centos-root	xfs	c80c43a5-630f-4c23-917a-7e156dff8c18		/
centos-swap	swap	94607b03-c3d0-48a2-8bfd-fd30a7b758ae		[SWAP]
sdb				
sdb1				
sdb5	LVM2_member		pWE8PB-A9Zv-7tKM-t8FG-AQTK-XJab-La67xS	
centos-root	xfs	c80c43a5-630f-4c23-917a-7e156dff8c18		/
sdb6	LVM2_member		6g9Aoq-9Wi4-swJS-YmUG-tBOP-jGoN-SvdV2a	



```
| └─datastore-database xfs          d13b95d6-5003-4c1f-bab4-fc736cff0af1 /mnt/database
└─sdb7           ext3    my-ext  b17758fd-fb9d-4b58-aa5c-477524cd8f5a /data
└─sdb8           LVM2_member      hPG1Lc-MxBT-Fyhq-uXkQ-PRZQ-MiKD-pJQe1h
└──services-lv_services ext4    services dc5758dd-744f-4a69-9fa0-709ee3e9a3c9
sdc
└─sdc1           LVM2_member      pMU2n1-mU7A-e2uz-A46E-Rbhc-3oFx-IRbJBb
└──services-lv_services ext4    services dc5758dd-744f-4a69-9fa0-709ee3e9a3c9
sr0
```

[root@station1 ~]# vim /etc/fstab

...

LABEL=services /share ext4 defaults 0 0

[root@station1 ~]# mount -a

[root@station1 ~]# lsblk

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	15G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	14G	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─centos-swap	253:1	0	1,5G	0	lvm	[SWAP]
sdb	8:16	0	1G	0	disk	
└─sdb1	8:17	0	512B	0	part	
└─sdb5	8:21	0	500M	0	part	
└─centos-root	253:0	0	13G	0	lvm	/
└─sdb6	8:22	0	200M	0	part	
└─datastore-database	253:2	0	160M	0	lvm	/mnt/database
└─sdb7	8:23	0	200M	0	part	/data
└─sdb8	8:24	0	119M	0	part	
└─services-lv_services	253:3	0	320M	0	lvm	/share
sdc	8:32	0	300M	0	disk	
└─sdc1	8:33	0	299M	0	part	
└─services-lv_services	253:3	0	320M	0	lvm	/share
sr0	11:0	1	1024M	0	rom	

[root@station1 ~]# pvs

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda2	centos	lvm2	a--	<14,00g	0
/dev/sdb5	centos	lvm2	a--	496,00m	0
/dev/sdb6	datastore	lvm2	a--	192,00m	32,00m
/dev/sdb8	services	lvm2	a--	112,00m	80,00m
/dev/sdc1	services	lvm2	a--	288,00m	0

[root@station1 ~]# vgs

VG	#PV	#LV	#SN	Attr	VSize	VFree
centos	2	2	0	wz--n-	14,48g	0
datastore	1	1	0	wz--n-	192,00m	32,00m
services	2	1	0	wz--n-	400,00m	80,00m

[root@station1 ~]# lvs



```
LV      VG     Attr   LSize  Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
root    centos -wi-ao---- 12,98g
swap    centos -wi-ao---- 1,50g
database datastore -wi-ao---- 160,00m
lv_services services -wi-ao---- 320,00m
```

20. Set ACL

Description: Create a directory named /restricted and set the following characteristics:

- Do not change regular permissions on the directory
- Member of the group adminuser can read and write on the directory.
- User woody who is member of the adminuser group can not read nor write in the directory.

```
[root@station1 ~]# mkdir /restricted
[root@station1 ~]# ls -ld /restricted/
drwxr-xr-x. 2 root root 6 mar 27 11:01 /restricted/
```

```
[root@station1 ~]# getfacl /restricted/
getfacl: Eliminando '/' inicial en nombres de ruta absolutos
# file: restricted/
# owner: root
# group: root
user::rwx
group::r-x
other::r-x
```

```
[root@station1 ~]# setfacl -m g:adminuser:rwx /restricted/
[root@station1 ~]# getfacl /restricted/
getfacl: Eliminando '/' inicial en nombres de ruta absolutos
# file: restricted/
# owner: root
# group: root
user::rwx
group::r-x
group:adminuser:rwx
mask::rwx
other::r-x
```

```
[root@station1 ~]# su - woody
Último inicio de sesión:mar mar 27 10:46:44 CEST 2018en pts/0
[woody@station1 ~]$ touch /restricted/woody.txt
[woody@station1 ~]$ exit
logout
[root@station1 ~]# su - buzz
Último inicio de sesión:mar mar 27 11:35:41 CEST 2018en pts/0
[buzz@station1 ~]$ touch /restricted/buzz.txt
[buzz@station1 ~]$ ls /restricted/
buzz.txt woody.txt
```



```
[buzz@station1 ~]$ exit
```

```
logout
```

```
[root@station1 ~]# setfacl -m u:woody:0 /restricted/
```

```
[root@station1 ~]# getfacl /restricted/
```

```
getfacl: Eliminando '/' inicial en nombres de ruta absolutos
# file: restricted/
# owner: root
# group: root
user::rwx
user:woody:---
group::r-x
group:adminuser:rwx
mask::rwx
other::r-x
```

```
[root@station1 ~]# su - woody
```

```
Último inicio de sesión:mar mar 27 11:40:57 CEST 2018en pts/0
```

```
[woody@station1 ~]$ touch /restricted/woody2.txt
```

```
touch: no se puede efectuar `touch' sobre «/restricted/woody2.txt»: Permiso denegado
```

```
[woody@station1 ~]$ exit
```

```
logout
```

```
[root@station1 ~]# su - buzz
```

```
Último inicio de sesión:mar mar 27 11:41:32 CEST 2018en pts/0
```

```
[buzz@station1 ~]$ touch /restricted/buzz2.txt
```

```
[buzz@station1 ~]$ ls -ls /restricted/
```

```
total 0
```

```
0 -rw-r--r--. 1 buzz adminuser 0 mar 27 11:52 buzz2.txt
```

```
0 -rw-r--r--. 1 buzz adminuser 0 mar 27 11:41 buzz.txt
```

```
0 -rw-r--r--. 1 woody adminuser 0 mar 27 11:41 woody.txt
```

21. Mount cifs file system

Description: The server is sharing a directory via Samba. The share name is "data"

Mount the share on /mnt/smb using the following:

- Server name server1.example.com

- Credentials: user=sambauser1 ; password=password

- The share file system need to be mounted automatically after each reboot without user intervention

==> PARTE server1:

```
[root@server1 ~]# yum install samba -y
```

```
[root@server1 ~]# yum provides */semanage
```

```
...
```

```
policycoreutils-python-2.5-17.1.el7.x86_64 : SELinux policy core python utilities
```

```
[root@server1 ~]# yum install policycoreutils-python -y
```

```
[root@server1 ~]# mkdir /data
```



[root@server1 ~]# vim /etc/samba/smb.conf.example ==> Vemos ejemplos de contextos SELinux.

```
...
# Set SELinux labels only on files and directories you have created. Use the
# chcon command to temporarily change a label:
# chcon -t samba_share_t /path/to/directory
...
[root@server1 ~]# getsebool -a |grep samba
samba_create_home_dirs --> off
samba_domain_controller --> off
samba_enable_home_dirs --> off
samba_export_all_ro --> off
samba_export_all_rw --> off
samba_load_libgfapi --> off
samba_portmapper --> off
samba_run_unconfined --> off
samba_share_fusefs --> off
samba_share_nfs --> off
sanlock_use_samba --> off
tmpreaper_use_samba --> off
use_samba_home_dirs --> off
virt_use_samba --> off
[root@server1 ~]# getsebool -a |grep smbd
smbd_anon_write --> off
```

→ Procedemos con contextos y booleans:

```
[root@server1 ~]# semanage fcontext -a -t samba_share_t '/data(.*)?'
[root@server1 ~]# restorecon -RFvv /data
restorecon reset /data context unconfined_u:object_r:default_t:s0-
>system_u:object_r:samba_share_t:s0
[root@server1 ~]# ls -lZd /data/
drwxr-xr-x. root root system_u:object_r:samba_share_t:s0 /data/
```

```
[root@server1 ~]# setsebool -P smbd_anon_write on
[root@server1 ~]# setsebool -P samba_enable_home_dirs on
```

```
[root@server1 ~]# vim /etc/samba/smb.conf
[global]
```

```
    workgroup = SAMBA
    security = user
    passdb backend = tdbsam
```

```
[homes]
```

```
    comment = Home Directories
    valid users = %S, %D%w%S
    browseable = No
    read only = No
```



inherit acls = Yes

[data]

path = /data

writable = yes

valid users = sambauser1

```
[root@server1 ~]# useradd -s /sbin/nologin sambauser1  
[root@server1 ~]# smbpasswd -a sambauser1
```

New SMB password:

Retype new SMB password:

Added user sambauser1.

```
[root@server1 ~]# firewall-cmd --permanent --add-service=samba
```

success

```
[root@server1 ~]# firewall-cmd --reload
```

success

```
[root@server1 ~]# systemctl enable nmb.service smb.service
```

Created symlink from /etc/systemd/system/multi-user.target.wants/nmb.service to /usr/lib/systemd/system/nmb.service.

Created symlink from /etc/systemd/system/multi-user.target.wants/smb.service to /usr/lib/systemd/system/smb.service.

```
[root@server1 ~]# systemctl start nmb.service smb.service
```

```
[root@server1 ~]# systemctl status nmb.service smb.service
```

==> PARTE station1:

```
[root@station1 ~]# yum install cifs-utils -y
```

```
[root@station1 ~]# mkdir -p /mnt/smb
```

```
[root@station1 ~]# vim /root/credenciales.samba
```

username=sambauser1

password=password

```
[root@station1 ~]# vim /etc/fstab
```

```
//server1/data /mnt/smb cifs credentials=/root/credenciales.samba 0 0
```

```
[root@station1 ~]# mount -a
```

```
[root@station1 ~]# mount
```

...

//server1/data on /mnt/smb type cifs

(rw,relatime,vers=1.0,cache=strict,username=sambauser1,domain=SERVER1,uid=0,noforceuid,gid=0,noforcegid,addr=192.168.8.150,unix,posixpaths,serverino,mapposix,acl,rsize=1048576,wszie=65536,echo_interval=60,actimeo=1)

==> Probamos:

```
[root@server1 ~]# touch /data/Prueba_server1-samba.txt
```

```
[root@station1 ~]# ls -ld /mnt/smb/
```

drwxr-xr-x. 2 root root 0 mar 30 14:11 /mnt/smb/



```
[root@station1 ~]# touch /mnt/smb/Prueba_station1-samba.txt  
touch: no se puede efectuar `touch' sobre «/mnt/smb/Prueba_station1-samba.txt»: Permiso denegado
```

```
[root@server1 ~]# chmod -R 2775 /data/  
[root@server1 ~]# chown -R :sambauser1 /data/
```

```
[root@station1 ~]# touch /mnt/smb/Prueba_station1-samba.txt  
[root@station1 ~]# ls /mnt/smb/  
Prueba_server1-samba.txt Prueba_station1-samba.txt  
[root@server1 ~]# ls /data/  
Prueba_server1-samba.txt Prueba_station1-samba.txt
```

22. Mount nfs file system

Description: The server is exporting a directory via NFS.

- Path to the share server1.example.com:/srv/nfs
- Mount the share on /mnt/public
- The share file system need to be mounted automatically after each reboot without user intervention

==> PARTE server1:

```
[root@server1 ~]# yum install nfs-utils -y  
[root@server1 ~]# systemctl start nfs-server.service  
[root@server1 ~]# systemctl enable nfs-server.service  
[root@server1 ~]# systemctl status nfs-server.service
```

```
[root@server1 ~]# firewall-cmd --permanent --add-service=nfs  
success  
[root@server1 ~]# firewall-cmd --reload  
success
```

```
[root@server1 ~]# mandb  
[root@server1 ~]# rpm -qc nfs-utils  
/etc/gssproxy/24-nfs-server.conf  
/etc/modprobe.d/lockd.conf  
/etc/nfs.conf  
/etc/nfsmount.conf  
/etc/request-key.d/id_resolver.conf  
/etc/sysconfig/nfs  
/var/lib/nfs/etab  
/var/lib/nfs/rmtab  
/var/lib/nfs/state  
/var/lib/nfs/xtab
```

```
[root@server1 ~]# getent services nfs  
nfs 2049/tcp nfsd shilp
```



```
[root@server1 ~]# mkdir /srv/nfs  
[root@server1 ~]# chown nfsnobody /srv/nfs/  
[root@server1 ~]# ls -ld /srv/nfs/  
drwxr-xr-x. 2 nfsnobody root 6 mar 28 18:56 /srv/nfs/
```

```
[root@server1 ~]# vim /etc/exports  
    /srv/nfs    station1(rw)  
[root@server1 ~]# exportfs -r
```

==> PARTE station1:

```
[root@station1 ~]# mkdir /mnt/public
```

```
[root@station1 ~]# vim /etc/fstab  
server1:/srv/nfs    /mnt/public    nfs    defaults    0    0
```

```
[root@station1 ~]# yum install nfs-utils rpcbind
```

```
[root@station1 ~]# systemctl start nfs.service rpcbind.service  
[root@station1 ~]# systemctl enable nfs.service rpcbind.service  
[root@station1 ~]# systemctl status nfs.service rpcbind.service
```

```
[root@station1 ~]# vim /etc/fstab  
    server1:/srv/nfs    /mnt/nfs    nfs    defaults    0    0
```

```
[root@station1 ~]# mount -a  
[root@station1 ~]# mount
```

```
...  
server1:/srv/nfs on /mnt/nfs type nfs4  
(rw,relatime,vers=4.1,rsize=262144,wsize=262144,namlen=255,hard,proto=tcp,port=0,timeo=6  
00,retrans=2,sec=sys,clientaddr=192.168.8.151,local_lock=none,addr=192.168.8.150)
```

==> Probamos de forma bidireccional:

```
[root@station1 ~]# touch /mnt/nfs/Test-station1.txt
```

```
[root@server1 ~]# touch /srv/nfs/Test-server1.txt  
[root@server1 ~]# ls -ls /srv/nfs/  
total 0  
0 -rw-r--r--. 1 root    root    0 mar 29 11:42 Test-server1.txt  
0 -rw-r--r--. 1 nfsnobody nfsnobody 0 mar 29 11:41 Test-station1.txt
```

```
[root@station1 ~]# ls -ls /mnt/nfs  
total 0  
0 -rw-r--r--. 1 root    root    0 mar 29 11:42 Test-server1.txt  
0 -rw-r--r--. 1 nfsnobody nfsnobody 0 mar 29 11:41 Test-station1.txt
```



==> “autofs” (bonus pack):

Deshacemos el montaje nfs, via → `/etc/fstab` en **station1**, para hacer el nuevo ejemplo:

```
[root@station1 ~]# vim /etc/fstab  
...  
#server1:/srv/nfs      /mnt/nfs      nfs    defaults      0      0  
[root@station1 ~]# umount /mnt/nfs/  
[root@station1 ~]# rm -fr /mnt/nfs/
```

```
[root@station1 ~]# yum install autofs -y
```

*==> Método Indirecto:

```
[root@station1 ~]# vim /etc/auto.master.d/auto.autofs  
      /mnt  /etc/auto.indirecto  
[root@station1 ~]# vi /etc/auto.indirecto  
*      -rw   server1:/srv/&
```

```
[root@station1 ~]# systemctl enable autofs.service  
[root@station1 ~]# systemctl start autofs.service  
[root@station1 ~]# systemctl status autofs.service
```

*==> Probamos Método Indirecto:

```
[root@station1 ~]# cd /mnt/nfs/  
[root@station1 nfs]# touch Prueba_station1-autofs-indirecto.txt
```

```
[root@server1 ~]# ls /srv/nfs/  
Prueba_station1-autofs-indirecto.txt
```

**==> Método Directo:

```
[root@station1 ~]# vi /etc/auto.master.d/auto.autofs  
      #/mnt  /etc/auto.indirecto  
      /-    /etc/auto.directo  
[root@station1 ~]# vi /etc/auto.directo  
      /mnt/nfs-directo      -rw   server1:/srv/nfs  
[root@station1 ~]# systemctl restart autofs.service  
[root@station1 ~]# mount  
...  
/etc/auto.directo on /mnt/nfs-directo type autofs  
(rw,relatime,fd=19,pgrp=1697,timeout=300,minproto=5,maxproto=5,direct,pipe_ino=22062)
```

**==> Probamos Método Directo:

```
[root@station1 ~]# touch /mnt/nfs-directo/Prueba_station1-autofs-directo.txt
```

```
[root@server1 ~]# ls /srv/nfs/  
Prueba_station1-autofs-directo.txt
```

23. Apache Web Server

Description: The Apache Web Server is installed on the server.



- The web page should be load on <http://localhost>
- If this does not work, Fix It!
- Do NOT make any change inside the index.html file
- Do NOT change the document root where Apache is loading the Web.

```
[root@server1 ~]# yum install httpd -y  
[root@server1 ~]# yum install elinks -y
```

```
[root@server1 ~]# systemctl status httpd.service
```

- httpd.service - The Apache HTTP Server
- Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
Active: inactive (dead)
Docs: man:httpd(8)
man:apachectl(8)

```
[root@server1 ~]# systemctl enable httpd.service
```

Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.

```
[root@server1 ~]# ^enable^start
```

systemctl start httpd.service

```
[root@server1 ~]# ^start^status
```

systemctl status httpd.service

- httpd.service - The Apache HTTP Server
- Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)
Active: active (running) since mar 2018-03-27 12:33:37 CEST; 17s ago
Docs: man:httpd(8)
man:apachectl(8)

Main PID: 1230 (httpd)

Status: "Total requests: 0; Current requests/sec: 0; Current traffic: 0 B/sec"

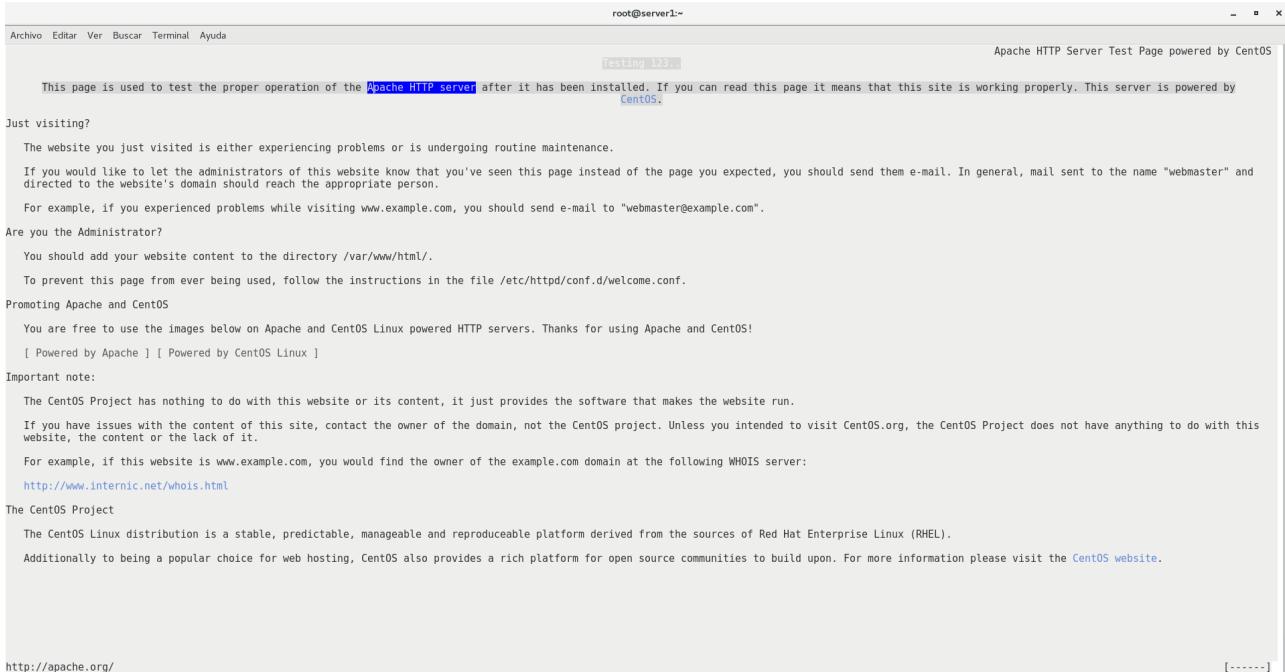
CGroup: /system.slice/httpd.service

```
└─1230 /usr/sbin/httpd -DFOREGROUND  
  └─1231 /usr/sbin/httpd -DFOREGROUND  
  └─1232 /usr/sbin/httpd -DFOREGROUND  
  └─1233 /usr/sbin/httpd -DFOREGROUND  
  └─1234 /usr/sbin/httpd -DFOREGROUND  
  └─1235 /usr/sbin/httpd -DFOREGROUND
```

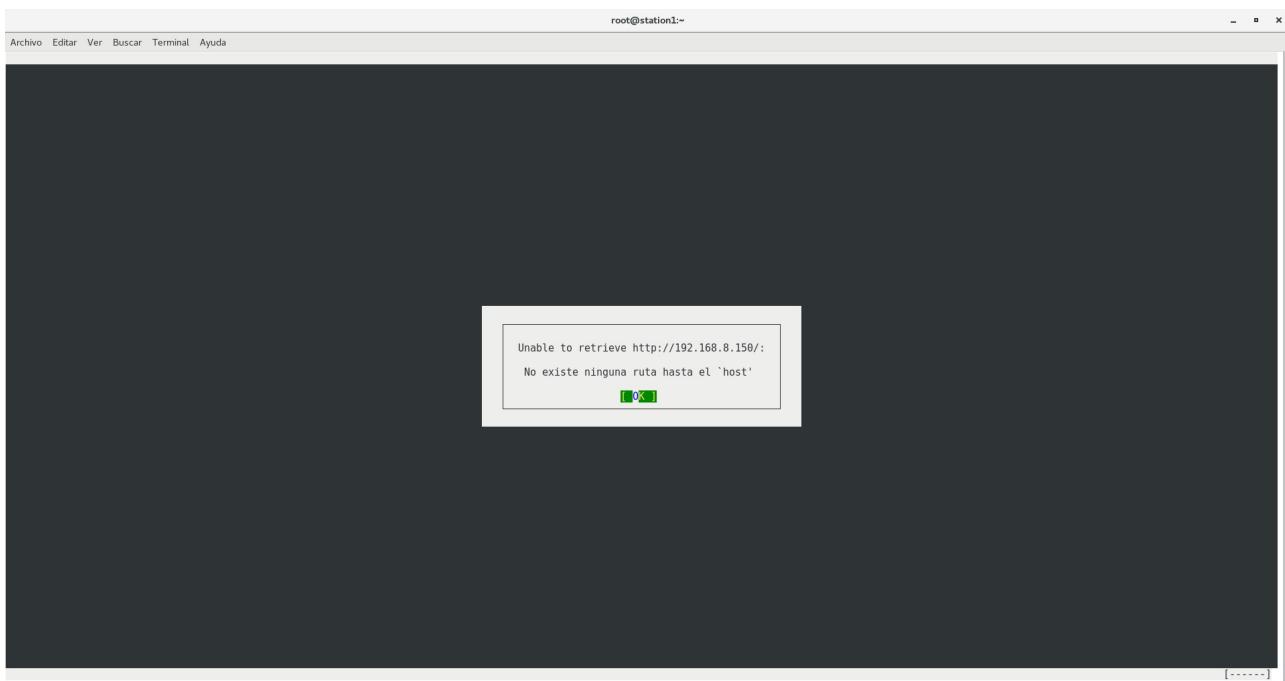
mar 27 12:33:30 server1.example.com systemd[1]: Starting The Apache HTTP Server...

mar 27 12:33:37 server1.example.com systemd[1]: Started The Apache HTTP Server.

```
[root@server1 ~]# elinks http://localhost
```



[root@station1 ~]# elinks <http://192.168.8.150>



[root@server1 ~]# firewall-cmd --permanent --add-service=http

SUCCESS

[root@server1 ~]# firewall-cmd --reload

SUCCESS

[root@server1 ~]# firewall-cmd --get-active-zones

public

[root@server1 ~]# firewall-cmd --list-services --zone=public

ssh dhcpcv6-client http



[root@station1 ~]# elinks <http://192.168.8.150>

root@station1:~

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Apache HTTP Server Test Page powered by CentOS

This page is used to test the proper operation of the [Apache HTTP server](#) after it has been installed. If you can read this page it means that this site is working properly. This server is powered by [CentOS](#).

Just visiting?

The website you just visited is either experiencing problems or is undergoing routine maintenance.

If you would like to let the administrators of this website know that you've seen this page instead of the page you expected, you should send them e-mail. In general, mail sent to the name "webmaster" and directed to the website's domain should reach the appropriate person.

For example, if you experienced problems while visiting www.example.com, you should send e-mail to "webmaster@example.com".

Are you the Administrator?

You should add your website content to the directory `/var/www/html/`.

To prevent this page from ever being used, follow the instructions in the file `/etc/httpd/conf.d/welcome.conf`.

Promoting Apache and CentOS

You are free to use the images below on Apache and CentOS Linux powered HTTP servers. Thanks for using Apache and CentOS!

[Powered by Apache] [Powered by CentOS Linux]

Important note:

The CentOS Project has nothing to do with this website or its content, it just provides the software that makes the website run.

If you have issues with the content of this site, contact the owner of the domain, not the CentOS project. Unless you intended to visit CentOS.org, the CentOS Project does not have anything to do with this website, the content or the lack of it.

For example, if this website is www.example.com, you would find the owner of the example.com domain at the following WHOIS server:

<http://www.internic.net/whois.html>

The CentOS Project

The CentOS Linux distribution is a stable, predictable, manageable and reproducible platform derived from the sources of Red Hat Enterprise Linux (RHEL).

Additionally to being a popular choice for web hosting, CentOS also provides a rich platform for open source communities to build upon. For more information please visit the [CentOS website](#).

<http://apache.org/> [-----]

24. systemd.tmpfiles. Ejemplos:

[root@station1 ~]# systemctl status systemd-tmpfiles-setup.service

● systemd-tmpfiles-setup.service - Create Volatile Files and Directories

 Loaded: loaded (/usr/lib/systemd/system/systemd-tmpfiles-setup.service; static; vendor preset: disabled)

 Active: active (exited) since sáb 2018-03-31 09:58:14 CEST; 26min ago

 Docs: [man:tmpfiles.d\(5\)](#)

[man:systemd-tmpfiles\(8\)](#)

 Process: 639 ExecStart=/usr/bin/systemd-tmpfiles --create --remove --boot --exclude-prefix=/dev (code=exited, status=0/SUCCESS)

 Main PID: 639 (code=exited, status=0/SUCCESS)

 CGroup: /system.slice/systemd-tmpfiles-setup.service

mar 31 09:58:14 station1.example.com systemd[1]: Starting Create Volatile Files and Directories...
mar 31 09:58:14 station1.example.com systemd[1]: Started Create Volatile Files and Directories.

[root@station1 ~]# man tmpfiles.d

...

The configuration format is one line per path containing type, path, mode, ownership, age, and argument fields:

```
#Type Path      Mode UID  GID  Age Argument
d  /run/user  0755 root root 10d -
L  /tmp/foobar -  -  -  -  /dev/null
```



Type

The type consists of a single letter and optionally an exclamation mark.

The following line types are understood:

f

Create a file if it does not exist yet. If the argument parameter is given, it will be written to the file.

F

Create or truncate a file. If the argument parameter is given, it will be written to the file.

w

Write the argument parameter to a file, if the file exists. Lines of this type accept shell-style globs in place of normal path names. The argument parameter will be written without a trailing newline. C-style backslash escapes are interpreted.

d

Create a directory if it does not exist yet.

D

Create or empty a directory.

e

Clean directory contents based on the age argument. Lines of this type accept shell-style globs in place of normal path names.

v

Create a subvolume if the path does not exist yet and the file system supports this (btrfs). Otherwise create a normal directory, in the same way as d.

p, p⁺

Create a named pipe (FIFO) if it does not exist yet. If suffixed with + and a file already exists where the pipe is to be created, it will be removed and be replaced by the pipe.

L, L⁺

Create a symlink if it does not exist yet. If suffixed with + and a file already exists where the symlink is to be created, it will be removed and be replaced by the symlink. If the argument is omitted, symlinks to files with the same name residing in the directory /usr/share/factory/ are created. Note that permissions and ownership on symlinks are ignored.

...

[root@station1 ~]# systemctl status systemd-tmpfiles-clean.timer

● systemd-tmpfiles-clean.timer - Daily Cleanup of Temporary Directories

Loaded: loaded (/usr/lib/systemd/system/systemd-tmpfiles-clean.timer; static; vendor preset: disabled)

 Active: active (waiting) since sáb 2018-03-31 09:58:17 CEST; 31min ago

 Docs: man:tmpfiles.d(5)



man:systemd-tmpfiles(8)

mar 31 09:58:17 station1.example.com systemd[1]: Started Daily Cleanup of Temporary Directories.

mar 31 09:58:17 station1.example.com systemd[1]: Starting Daily Cleanup of Temporary Directories.

[root@station1 ~]# cat /usr/lib/systemd/system/systemd-tmpfiles-clean.timer

This file is part of systemd.

#

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the Free Software Foundation; either version 2.1 of the License, or

(at your option) any later version.

[Unit]

Description=Daily Cleanup of Temporary Directories

Documentation=man:tmpfiles.d(5) man:systemd-tmpfiles(8)

[Timer]

OnBootSec=15min

OnUnitActiveSec=1d

[root@station1 ~]# systemctl status systemd-tmpfiles-setup.service

● systemd-tmpfiles-setup.service - Create Volatile Files and Directories

 Loaded: loaded (/usr/lib/systemd/system/systemd-tmpfiles-setup.service; static; vendor preset: disabled)

 Active: active (exited) since sáb 2018-03-31 09:58:14 CEST; 33min ago

 Docs: man:tmpfiles.d(5)

 man:systemd-tmpfiles(8)

 Process: 639 ExecStart=/usr/bin/systemd-tmpfiles --create --remove --boot --exclude-prefix=/dev (code=exited, status=0/SUCCESS)

 Main PID: 639 (code=exited, status=0/SUCCESS)

 CGroup: /system.slice/systemd-tmpfiles-setup.service

mar 31 09:58:14 station1.example.com systemd[1]: Starting Create Volatile Files and Directories...

mar 31 09:58:14 station1.example.com systemd[1]: Started Create Volatile Files and Directories.

[root@station1 ~]# cat /usr/lib/systemd/system/systemd-tmpfiles-setup.service

This file is part of systemd.

#

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under the terms of the GNU Lesser General Public License as published by

the Free Software Foundation; either version 2.1 of the License, or

(at your option) any later version.

[Unit]

Description>Create Volatile Files and Directories

Documentation=man:tmpfiles.d(5) man:systemd-tmpfiles(8)

DefaultDependencies=no



```
Conflicts=shutdown.target
After=systemd-readahead-collect.service systemd-readahead-replay.service local-fs.target systemd-
sysusers.service
Before=sysinit.target shutdown.target
RefuseManualStop=yes
```

```
[Service]
Type=oneshot
RemainAfterExit=yes
ExecStart=/usr/bin/systemd-tmpfiles --create --remove --boot --exclude-prefix=/dev
```

==> Prioridad si el fichero de configuración tiene el mismo nombre:

- 1 → /etc/tmpfiles.d/*.conf
- 2 → /run/tmpfiles.d/*.conf
- 3 → /usr/lib/tmpfiles.d/*.conf

Ejemplo:

```
[root@station1 ~]# cp /usr/lib/tmpfiles.d/tmp.conf /etc/tmpfiles.d/tmp-prueba.conf
[root@station1 ~]# vim /etc/tmpfiles.d/tmp-prueba.conf
# This file is part of systemd.
#
# systemd is free software; you can redistribute it and/or modify it
# under the terms of the GNU Lesser General Public License as published by
# the Free Software Foundation; either version 2.1 of the License, or
# (at your option) any later version.

# See tmpfiles.d(5) for details

# Clear tmp directories separately, to make them easier to override
v /tmp 1777 root root 10d
v /var/tmp 1777 root root 30d

# Exclude namespace mountpoints created with PrivateTmp=yes
x /tmp/systemd-private-%b-*
X /tmp/systemd-private-%b-*/tmp
x /var/tmp/systemd-private-%b-*
X /var/tmp/systemd-private-%b-*/tmp
```

Crear directorio, y eliminarlo cada 30 segundos:

d /tmp/tmp-files-prueba 1777 root root 30s -

[root@station1 ~]# systemd-tmpfiles --clean tmp-prueba.conf ==> Validamos Configuración.

[root@station1 ~]# systemd-tmpfiles --create tmp-prueba.conf



```
[root@station1 ~]# ls /tmp/tmp-files-prueba/  
[root@station1 ~]# touch /tmp/tmp-files-prueba/fichero.txt  
[root@station1 ~]# ls /tmp/tmp-files-prueba/  
fichero.txt
```

→ Esperamos los 30 segundos despues del arranque, o lo forzamos para hacer la prueba y no tener que reiniciar, de la forma o formas:

```
[root@station1 ~]# systemctl restart systemd-tmpfiles-clean.service  
[root@station1 ~]# systemd-tmpfiles --clean tmp-prueba.conf
```

```
[root@station1 ~]# ls /tmp/tmp-files-prueba/  
Comprobamos que ha sido eliminado.
```

25. logging y journald persistente. Ejemplos:

==> **Bitácora → rsyslog.**

```
[root@station1 ~]# systemctl status rsyslog.service
```

- rsyslog.service - System Logging Service
 - Loaded: loaded (/usr/lib/systemd/system/rsyslog.service; enabled; vendor preset: enabled)
 - Active: active (running) since sáb 2018-03-31 18:59:06 CEST; 26min ago

Docs: [man:rsyslogd\(8\)](#)
<http://www.rsyslog.com/doc/>
Main PID: 664 (rsyslogd)
CGroup: /system.slice/rsyslog.service
└─664 /usr/sbin/rsyslogd -n

```
mar 31 18:59:05 station1.example.com systemd[1]: Starting System Logging Service...  
mar 31 18:59:06 station1.example.com rsyslogd[664]: [origin software="rsyslogd"  
swVersion="8.24.0" x-pid="664" x-info="http://www.rsyslog.com"] start  
mar 31 18:59:06 station1.example.com systemd[1]: Started System Logging Service.
```

```
[root@station1 ~]# rpm -qc rsyslog
```

```
/etc/logrotate.d/syslog  
/etc/rsyslog.conf  
/etc/sysconfig/rsyslog
```

```
[root@station1 ~]# man 5 rsyslog.conf
```

...
The **priority** is one of the following keywords, in ascending order: debug, info, notice, warning, warn (same as warning), err, error (same as err), crit, alert, emerg, panic (same as emerg).

The keywords error, warn and panic are deprecated and should not be used anymore. The priority defines the severity of the message.

...

Esquema → facility.priority

==> **Rotaciones:**



```
[root@station1 ~]# vim /etc/logrotate.conf
```

```
# see "man logrotate" for details
# rotate log files weekly
weekly

# keep 4 weeks worth of backlogs
rotate 4

# create new (empty) log files after rotating old ones
create

# use date as a suffix of the rotated file
dateext

# uncomment this if you want your log files compressed
#compress

# RPM packages drop log rotation information into this directory
include /etc/logrotate.d

# no packages own wtmp and btmp -- we'll rotate them here
/var/log/wtmp {
    monthly
    create 0664 root utmp
    minsize 1M
    rotate 1
}

/var/log/btmp {
    missingok
    monthly
    create 0600 root utmp
    rotate 1
}

# system-specific logs may be also be configured here.
```

==> Ejemplo de Monitorización:

```
[root@station1 ~]# vim /etc/rsyslog.d/ejemplo.conf
```

```
### Ejemplo de RULE de Monitorización:
```

```
*.debug      /var/log/rsyslog_ejemplo
```

```
[root@station1 ~]# systemctl restart rsyslog.service
```

```
[root@station1 ~]# logger -p user.debug -t "TAG" "Prueba de logging"
```

```
[root@station1 ~]# cat /var/log/rsyslog_ejemplo |grep TAG
```

```
Mar 31 19:54:17 station1 TAG: Prueba de logging
```



==> **Bitácora → journalctl.**

```
[root@station1 ~]# journalctl |grep TAG
```

```
mar 31 20:06:28 station1.example.com TAG[1205]: Prueba de logging
```

```
[root@station1 ~]# journalctl -n 2
```

```
.... Logs begin at sáb 2018-03-31 20:00:56 CEST, end at sáb 2018-03-31 20:06:28 CEST. --
mar 31 20:05:23 station1.example.com sshd[1163]: pam_unix(sshd:session): session opened for
user root by (uid=0)
```

```
mar 31 20:06:28 station1.example.com TAG[1205]: Prueba de logging
```

```
[root@station1 ~]# journalctl -p debug -n5
```

```
-- Logs begin at sáb 2018-03-31 20:00:56 CEST, end at sáb 2018-03-31 20:06:28 CEST. --
mar 31 20:05:23 station1.example.com systemd-logind[661]: New session 1 of user root.
mar 31 20:05:23 station1.example.com systemd[1]: Started Session 1 of user root.
mar 31 20:05:23 station1.example.com systemd[1]: Starting Session 1 of user root.
mar 31 20:05:23 station1.example.com sshd[1163]: pam_unix(sshd:session): session opened for
user root by (uid=0)
```

```
mar 31 20:06:28 station1.example.com TAG[1205]: Prueba de logging
```

```
[root@station1 ~]# journalctl -t TAG
```

```
-- Logs begin at sáb 2018-03-31 20:00:56 CEST, end at sáb 2018-03-31 20:16:37 CEST. --
mar 31 20:06:28 station1.example.com TAG[1205]: Prueba de logging
```

```
[root@station1 ~]# journalctl -o verbose
```

```
[root@station1 ~]# journalctl _PID=1
```

==> **Persistencia de logs → journald:**

```
[root@station1 ~]# mkdir -p /var/log/journal
```

```
[root@station1 ~]# cat /etc/group |grep journal
```

```
systemd-journal:x:190:
```

```
[root@station1 ~]# chown root:systemd-journal /var/log/journal/
```

```
[root@station1 ~]# chmod 2755 /var/log/journal/
```

```
[root@station1 ~]# yum provides */killall      ==> Instalar killall.
```

```
...
```

```
psmisc-22.20-15.el7.x86_64 : Utilities for managing processes on your system
```

```
Repositorio      : @base
```

```
Resultado obtenido desde:
```

```
Nombre del archivo  : /usr/bin/killall
```

```
[root@station1 ~]# yum -y install psmisc
```

```
[root@station1 ~]# killall -USR1 systemd-journald      ==> OJO A LA 'd' FINAL
```

```
[root@station1 ~]# ls -l /var/log/journal/
```

```
total 0
```

```
drwxr-sr-x. 2 root systemd-journal 28 mar 31 21:02 a75a86cd7c7a4f6e90d6e59a5f14d544
```

```
[root@station1 ~]# ls /var/log/journal/a75a86cd7c7a4f6e90d6e59a5f14d544/
```

```
system.journal
```



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