



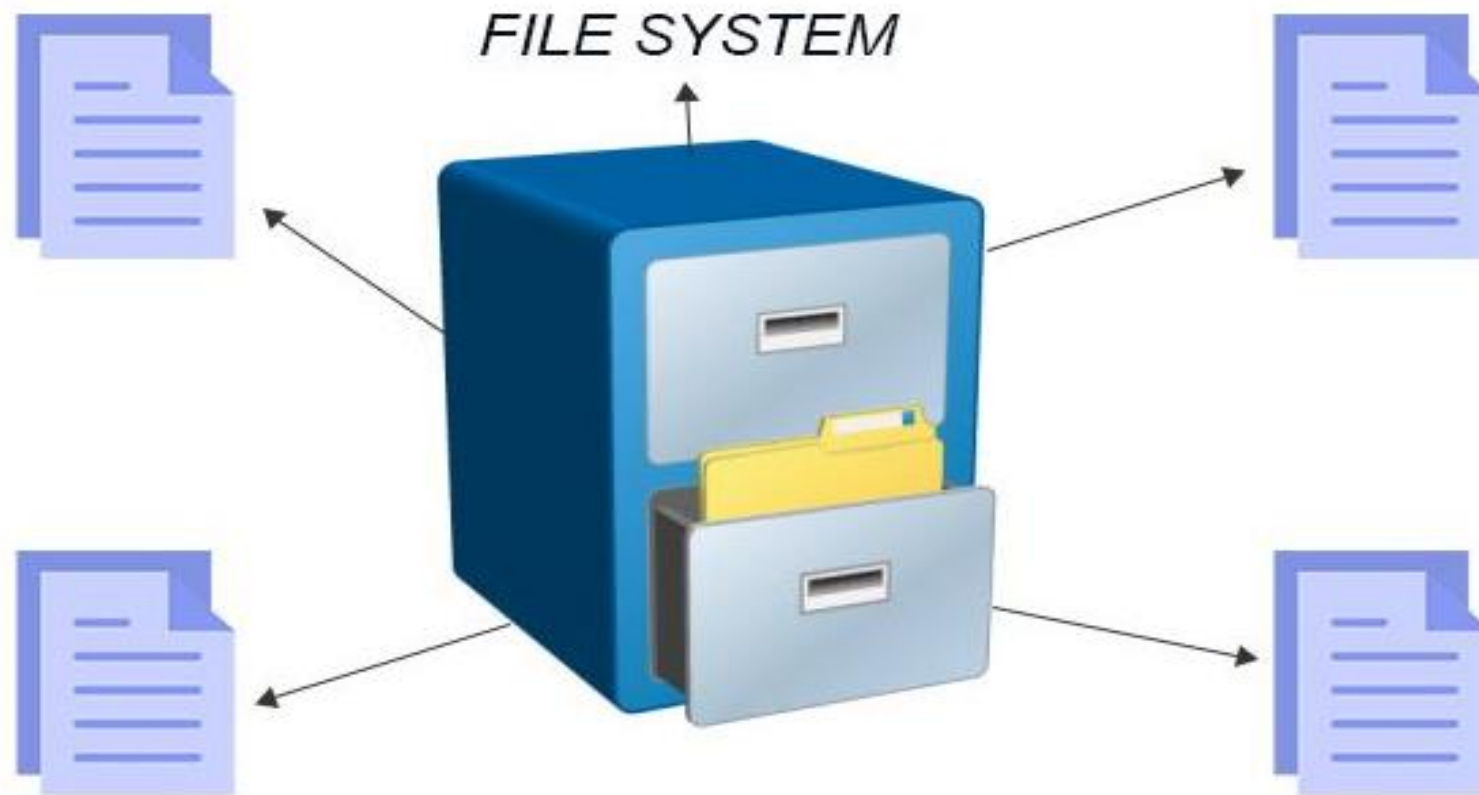
LINUX

T..

LIFE IS FOR SHARING.

Administración Linux Red Hat

File Systems, Carpetas, Archivos.



File Characteristics

```
$ ls -l
-rw-r--r-- 1 user3 class 37 Jul 24 11:06 f1
-rwxr-xr-x 1 user3 class 52 Jul 24 11:08 f2
drwxr-xr-x 2 user3 class 1024 Jul 24 12:03 memo
```

Diagram illustrating the components of the `ls -l` output:

- File Type (points to the first character of the permissions)
- Permissions (points to the full permission string)
- Links (points to the link count)
- Owner (points to the owner name)
- Group (points to the group name)
- Size (points to the file size)
- Timestamp (points to the date and time)
- Name (points to the file name)



Administración Linux Red Hat

Permisos

r	w	x	#	Descripción
0	0	0	0	NINGÚN PERMISO
0	0	1	1	solo ejecución
0	1	0	2	solo escritura
0	1	1	3	escritura y ejecución NO LECTURA
1	0	0	4	solo lectura
1	0	1	5	lectura y ejecución NO ESCRITURA
1	1	0	6	lectura y escritura NO EJECUCIÓN
1	1	1	7	lectura, escritura y ejecución

Sticky bit

Por un lado tendríamos el **sticky bit**; que se trata de un permiso especial que puede ser asignado tanto a ficheros como directorios. Este permiso puede ser muy útil en ficheros de cierta relevancia tales como los ficheros de log o ficheros importantes, ya que lo que permite es leer y escribir en el fichero y/o directorio en cuestión, pero no se podría ni renombrar ni borrar por nadie a excepción de dos usuarios: El creador de éste y root;

Para añadir el permiso sticky bit:

```
chmod +t fichero
```

Para quitar el permiso sticky bit:

```
chmod -t fichero
```

Administración Linux Red Hat

Permisos especiales

SUID

Por otro lado tendríamos el **SUID** o "*Set Owner ID up on execution*", cuya función sería que el usuario que ejecute el archivo, tendría exactamente los mismos permisos que el dueño de éste. Esto puede parecer algo simple pero no lo es; si por ejemplo tuviésemos un archivo con permisos de ejecución (para todos) y tuviese dicho SUID, cualquiera que lo ejecute lo estaría ejecutando como si fuese el dueño del script, lo que es muy útil y muy peligroso al mismo tiempo

```
chmod u+s test
```

```
chmod u-s test
```



Administración Linux Red Hat

Permisos especiales

SGID

Es extremadamente parecido al SUID con la diferencia de que en este caso el **SGID** o "*Set Group ID on execution*" tomaría los permisos del grupo, no del usuario en sí. Aún así, si el grupo fuese root o uno grupo con privilegios de administrador, este permiso podría ser usado en favor de la escalada de privilegios.

Para añadir el SGID habría que escribir:

```
chmod g+s fichero
```

Mientras que para quitarlo sería:

```
chmod g-s fichero
```



Administración Linux Red Hat

Permisos especiales

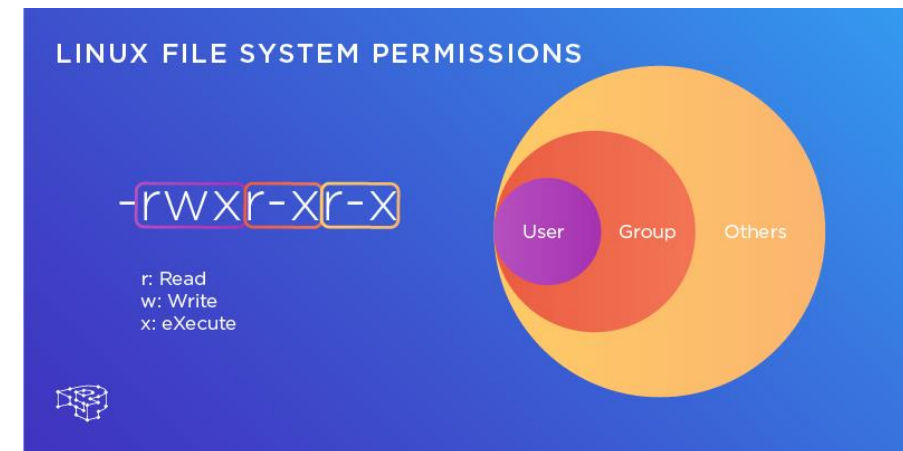
Número	Binario	SUID	SGID	Sticky bit
0	000	✗	✗	✗
1	001	✗	✗	✓
2	010	✗	✓	✗
3	011	✗	✓	✓
4	100	✓	✗	✗
5	101	✓	✗	✓
6	110	✓	✓	✗
7	111	✓	✓	✓

Administración Linux Red Hat

Permisos

permissions defines the permissions for the owner of the file (the "user"), members of the group who owns the file (the "group"), and anyone else ("others"). There are two ways to represent these permissions: with symbols (alphanumeric characters), or with octal numbers (the digits **0** through **7**).

- the **user** can **read**, **write**, and **execute** it
- members of your **group** can **read** and **execute** it
- **others** may only **read** it.



Administración Linux Red Hat

Permisos

```
chmod u=rwx,g=rx,o=r myfile
```

This example uses symbolic permissions notation. The letters **u**, **g**, and **o** stand for "**user**", "**group**", and "**other**". The equals sign ("=") means "set the permissions exactly like this," and the letters "**r**", "**w**", and "**x**" stand for "read", "write", and "execute", respectively. The commas separate the different classes of permissions, and there are no spaces in between them.

Administración Linux Red Hat

Permisos

```
chmod 754 myfile
```

Here the digits **7**, **5**, and **4** each individually represent the permissions for the user, group, and others, in that order. Each digit is a combination of the numbers **4**, **2**, **1**, and **0**:

- ➡ **4** stands for "read",
- ➡ **2** stands for "write",
- ➡ **1** stands for "execute", and
- ➡ **0** stands for "no permission."

So **7** is the combination of permissions **4+2+1** (read, write, and execute), **5** is **4+0+1** (read, no write, and execute), and **4** is **4+0+0** (read, no write, and no execute).



Administración Linux Red Hat

Permisos

An asterisk in a wildcard

The asterisk represents a [wildcard or wild character](#) with computers. For example, when typing *.TXT in a search or find field, the computer would look for any file ending with .TXT.



Administración Linux Red Hat

Commands: chmod & chown

`chown [OPTION] [OWNER] : [GROUP] FILE`

`-R, --recursive`

operate on files and directories recursively

EXAMPLES

`chown root /u`

Change the owner of /u to "root".

`chown root:staff /u`

Likewise, but also change its group to "staff".

`chown -R root /u`

Change the owner of /u and subfiles to "root".

Administración Linux Red Hat

Commands: chmod & chown

`chmod [OPTION] FILE`

`-R, --recursive`

operate on files and directories recursively

EXAMPLES

`chown root /u`

Change the owner of /u to "root".

`chown root:staff /u`

Likewise, but also change its group to "staff".

`chown -R root /u`

Change the owner of /u and subfiles to "root".



Administración Linux Red Hat

Users & Groups



Users and Groups

Files

<code>/etc/passwd</code>	system password file
<code>/etc/shadow</code>	system file contain users' encrypted passwords and related information
<code>/etc/group</code>	system file containing group definitions

System

<code>/etc/default/useradd</code>	Default values for account creation
<code>/etc/login.defs</code>	Password aging controls



LIFE IS FOR SHARING.

Users and Groups

Comands ¿?

id

sudo

passwd -S

env

echo



LIFE IS FOR SHARING.

Users and Groups

Sudo

MAKE ME A SANDWICH.

SUDO MAKE ME
A SANDWICH.



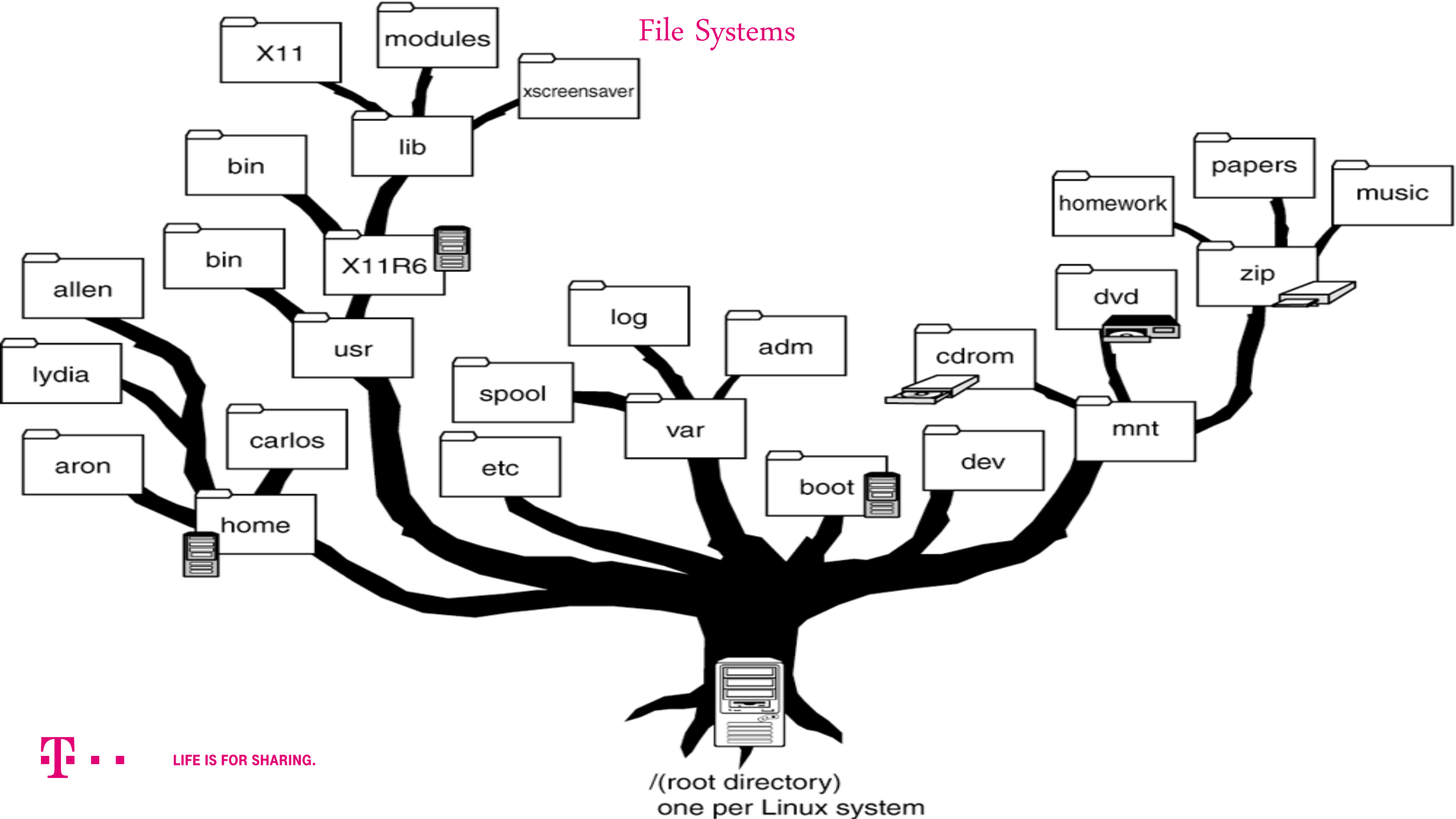
WHAT? MAKE
IT YOURSELF.

OKAY.



LIFE IS FOR SHARING.

File Systems



LIFE IS FOR SHARING.

Administración Linux Red Hat

FS – DF command

Tipo de FS

DESCRIPTION

The df utility displays the amount of disk space occupied by mounted or unmounted file systems, the amount of used and available space, and how much of the file system's total capacity has been used. The file system is specified by device, or by referring to a file or directory on the specified file system.

follows:

```
$ df -T
```

Output:

Filesystem	Type	1K-blocks	Used	Available	Use%	Mounted on
/dev/hdb1	ext3	19228276	14737848	3513680	81%	/
tmpfs	tmpfs	383960	4	383956	1%	/dev/shm

Lista de FS

```
[jacardos@q4ushosys0152 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/mapper/VolGroup00-LogVol00
                28G   16G   11G   60% /
/dev/sda1        99M   15M   80M   16% /boot
tmpfs            329M    0   329M    0% /dev/shm
[jacardos@q4ushosys0152 ~]$
```



Administración Linux Red Hat

FS like tree

tree -a -s -L 2

```
dcplnx23070311:~ # cd /var
dcplnx23070311:/var # tree -a -s -L 2
.
|-- [      171] .dcsflags
|-- [       10] .exclude.AppCom
|-- [    4096] .snapshot
|   |-- [    4096] sv_nightly.0
|   |-- [    4096] sv_nightly.1
|   |-- [    4096] sv_nightly.2
|   |-- [    4096] sv_nightly.3
|   |-- [    4096] sv_nightly.4
|-- [      163] .updated
|-- [    4096] AppCom
|   |-- [    4096] bin
|   |-- [    4096] boot
|   |-- [    4096] etc
|   |-- [    4096] swap
|-- [    4096] adm
|   |-- [    4096] SuSEconfig
|   |-- [    4096] autoinstall
|   |-- [    4096] backup
|   |-- [         0] crypsetup.fstab.noauto_converted
|   |-- [    4096] fillup-templates
|   |-- [    4096] mount
|   |-- [    4096] netconfig
|   |-- [    4096] perl-modules
|   |-- [         0] postfix.configured
|   |-- [    4096] sec.cache
|   |-- [        17] seclog.log -> ../log/seclog.log
|   |-- [    4096] update-messages
|   |-- [    4096] update-scripts
```

```
dcplnx23070311:~ # tree -a -s -L 2
.
|-- [    10821] .bash_history
|-- [       173] .bashrc
|-- [    4096] .config
|   |-- [    4096] mc
|-- [       154] .dcsflags
|-- [    4096] .mc
|   |-- [        35] Tree
|   |-- [    2767] ini
|-- [    4096] .snapshot
|   |-- [    4096] sv_nightly.0
|   |-- [    4096] sv_nightly.1
|   |-- [    4096] sv_nightly.2
|   |-- [    4096] sv_nightly.3
|   |-- [    4096] sv_nightly.4
|-- [   4475] .viminfo
|-- [        89] .vimrc
|-- [    4096] bin

10 directories, 7 files
```




```
/dev/hda2    /                ext2 defaults        1 1
/dev/hdb1    /home            ext2 defaults        1 2
/dev/cdrom    /media/cdrom      auto ro,noauto,user,exec 0 0
/dev/fd0      /media/floppy     auto rw,noauto,user,sync 0 0
proc         /proc            proc defaults        0 0
/dev/hda1     swap             swap pri=42           0 0
```

1st and 2nd columns: Device and default mount point

3rd column: Filesystem type

4th column: Mount options

ro Mount the file system read-only.

rw Mount the file system read-write

5th and 6th columns: Dump and fsck options

The 5th column in /etc/fstab is the dump option. Dump checks it and uses the number to decide if a file system should be backed up. If it's zero, dump will ignore that file system. If you take a look at the example fstab, you'll notice that the 5th column is zero in most cases.

The 6th column is a fsck option. fsck looks at the number in the 6th column to determine in which order the file systems should be checked.

If it's zero, fsck won't check the file system.



NFS Server

- Exported directories are defined in `/etc/exports`
- Each entry specifies the hosts to which the filesystem is exported plus associated permissions and options
 - options should be specified
 - default options: **(ro,sync,root_squash)**
 - `root` mapped to `nfsnobody`

NFS utilities

- `exportfs -v`
- `showmount -e hostname`
- `rpcinfo -p hostname`

Filesystems to be exported via NFS are defined in `/etc/exports`. Here is an example:

```
/var/ftp/pub          *.example.com(ro, sync)      ↗  
bigserver.redhat.com(rw, sync)  
/root/presentations  server2.example.com(rw, sync)  
/data                192.168.10.0/255.255.255.0(sync)
```

exportfs -v is used to view the exports and their options on the local machine.

showmount -e *hostname* is used to display the exports from remote machines (or localhost).

rpcinfo -p *hostname* is used to probe the portmapper on *hostname* and print a list of all registered RPC services.

NFS server Configuration

There are three ways to configure an NFS server under Red Hat Enterprise Linux:

using the NFS Server Configuration Tool (redhat-config-nfs),
manually editing its configuration file (/etc/exports), or
using the /usr/sbin/exportfs command.

```
[root@q4ushosys0152 ~]# cat /etc/exports
/media *(ro,sync)
```

```
[root@q4ushosys0152 ~]# exportfs
/media <world>
[root@q4ushosys0152 ~]# exportfs -v
/media <world>(ro,wdelay,root_squash,no_subtree_check,anonuid=65534,anongid=65534)
```

EXAMPLES

The following adds all directories listed in /etc/exports to /var/lib/nfs/xtab and pushes the resulting export entries into the kernel:

```
# exportfs -a
```

To export the /usr/tmp directory to host djando, allowing asynchronous writes, one would do this:

```
# exportfs -o async djando:/usr/tmp
```



File Systems – Checking the Size of Directories

- Display the size of one or more directories, subdirectories, and files by using the `du` command. Sizes are displayed in 512-byte blocks.

```
$ du [-as] [directory ...]
```

`du`

Displays the size of each directory that you specify, including each subdirectory beneath it.

`-a`

Displays the size of each file and subdirectory, and the total number of blocks that are contained in the specified directory.

`-s`

Displays the total number of blocks that are contained in the specified directory.

`-h`

Displays the size of each directory in 1024-byte blocks.

`-H`

Displays the size of each directory in 1000-byte blocks.

`[directory ...]`

Identifies one or more directories that you want to check. Separate multiple directories in the command-line syntax with spaces.

```
/var/adm
-bash-3.00# du -sk * . | sort -rn
237722  .
227615  wtmpx
3790    sulog
1788    messages.2
1499    messages.0
1466    messages.1
1219    messages.3
307     messages
10      acct
8       lastlog
2       utmpx
2       streams
2       sm.bin
2       sa
2       log
2       exacct
0       spellhist
0       loginlog
0       aculog
-bash-3.00#
```

```
dcplnx22939703:~ # df -h /usr/sap/trans
Filesystem                                Size  Used Avail Use% Mounted on
dcsvssvit1010-02-2af:/vol/dcsvssvit1010_zglvto01/vit_zglvto01_fs1/usr_sap_trans/ECC1 700G  142G  559G  21% /usr/sap/trans
dcplnx22939703:~ #
```

```
dcplnx22939703:~ # df -h /usr/sap/trans
Filesystem                                Size  Used Avail Use% Mounted on
dcsvssvit1010-02-2af:/vol/dcsvssvit1010_zglvto01/vit_zglvto01_fs1/usr_sap_trans/ECC1 700G  142G  559G  21% /usr/sap/trans
dcplnx22939703:~ #
```



Variables Ambiente



LIFE IS FOR SHARING.

Variables Ambiente

\$ env (me listará todas las variables definidas en el sistema)

Algunas variables importantes:

SHELL=/bin/bash (el tipo de shell en uso)

TERM=xterm (el programa de terminal por defecto)

USER=pepito (el nombre de usuario)

PWD=/home/pepito (la ruta por defecto del usuario)

LANG=es_ES.utf8 (el juego de caracteres de idioma)

DESKTOP_SESSION=xfce (el entorno de escritorio)

PATH=/usr/local/bin:/usr/bin:/bin:/usr/local/sbin:/usr/sbin:/sbin



Variables Ambiente

Variable del entorno	Descripción
\$ARCH	Contiene la descripción de la arquitectura del equipo.
\$DISPLAY	Contiene la identificación del terminal de visualización que se utilizará en el administrador de ventanas (x11).
\$HOME	Muestra la ruta de acceso al directorio actual del usuario.
\$HOST	Muestra el nombre del equipo.
\$LANG	Muestra el código del idioma predeterminado.
\$PATH	Muestra una lista de rutas de acceso a los directorios que contienen archivos ejecutables, separadas por punto y coma.
\$PRINTER	Contiene el nombre de la impresora predeterminada.
\$SHELL	Indica la ruta del intérprete de comandos utilizado.
\$USER	Muestra la identificación del usuario actual.



¿Cómo configuramos una variable de entorno permanente?

Tendremos que configurar el `export` que establece la variable de entorno al inicio, editando alguno de los scripts de inicio que se ejecutan de forma predeterminada.

Para ello, disponemos de los siguientes scripts que se cargan al inicio:

Para todos los usuarios:

```
/etc/profile
```

Para un usuario específico:

```
~/.bash_profile
```

```
~/.bash_login
```

```
~/.profile
```



NETWORK



```
[root@q4ushosys0152 ~]# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:50:56:BC:7F:5B
          inet addr:64.43.46.12  Bcast:64.43.46.63  Mask:255.255.255.192
          inet6 addr: fe80::250:56ff:febc:7f5b/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:80496088 errors:30 dropped:0 overruns:0 frame:0
          TX packets:2125294074 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2788692960 (2.5 GiB)  TX bytes:1217039043 (1.1 GiB)
          Interrupt:177 Base address:0x1424

eth1      Link encap:Ethernet  HWaddr 00:50:56:BC:33:55
          inet addr:192.168.15.12  Bcast:192.168.15.255  Mask:255.255.255.0
          inet6 addr: fe80::250:56ff:febc:3355/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:403814455 errors:14 dropped:0 overruns:0 frame:0
          TX packets:761405062 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3530192707 (3.2 GiB)  TX bytes:3549201377 (3.3 GiB)
          Interrupt:185 Base address:0x14a4

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:2210046 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2210046 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1545556439 (1.4 GiB)  TX bytes:1545556439 (1.4 GiB)
```

```
dcplnx22773056:~ # ip -o a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue state UNKNOWN \    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
1: lo    inet 127.0.0.1/8 brd 127.255.255.255 scope host lo
1: lo    inet 127.0.0.2/8 brd 127.255.255.255 scope host secondary lo
1: lo    inet6 ::1/128 scope host \        valid_lft forever preferred_lft forever
2: vl477sto: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 9000 qdisc mq state UP qlen 1000\    link/ether 00:50:56:a3:28:ef brd ff:ff:ff:ff:ff:ff
2: vl477sto    inet 164.22.48.66/20 brd 164.22.63.255 scope global vl477sto:0
2: vl477sto    inet 164.22.48.64/20 brd 164.22.63.255 scope global secondary vl477sto:0
2: vl477sto    inet 164.22.48.67/20 brd 164.22.63.255 scope global secondary vl477sto:0
2: vl477sto    inet 164.22.48.65/20 brd 164.22.63.255 scope global secondary vl477sto:0
2: vl477sto    inet6 2a00:da9:2:11dd:111:0:200:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
2: vl477sto    inet6 2a00:da9:2:11dd:111:0:1603:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
2: vl477sto    inet6 2a00:da9:2:11dd:111:0:1501:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
2: vl477sto    inet6 2a00:da9:2:11dd:111:0:100:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
2: vl477sto    inet6 2a00:da9:2:11dd:1fd:0:2277:3056/64 scope global \        valid_lft forever preferred_lft forever
2: vl477sto    inet6 fe80::250:56ff:fea3:28ef/64 scope link \        valid_lft forever preferred_lft forever
3: vl478adm: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP qlen 1000\    link/ether 00:50:56:a3:35:00 brd ff:ff:ff:ff:ff:ff
3: vl478adm    inet6 2a00:da9:2:21de:111:0:200:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
3: vl478adm    inet6 2a00:da9:2:21de:111:0:1603:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
3: vl478adm    inet6 2a00:da9:2:21de:111:0:1501:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
3: vl478adm    inet6 2a00:da9:2:21de:111:0:100:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
3: vl478adm    inet6 2a00:da9:2:21de:1fd:0:2277:3056/64 scope global \        valid_lft forever preferred_lft forever
3: vl478adm    inet6 fe80::250:56ff:fea3:3500/64 scope link \        valid_lft forever preferred_lft forever
4: vl479cus: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP qlen 1000\    link/ether 00:50:56:a3:52:7e brd ff:ff:ff:ff:ff:ff
4: vl479cus    inet 172.21.3.50/24 brd 172.21.3.255 scope global vl479cus
4: vl479cus    inet 172.21.3.61/24 brd 172.21.3.255 scope global secondary vl479cus:0
4: vl479cus    inet 172.21.3.59/24 brd 172.21.3.255 scope global secondary vl479cus:0
4: vl479cus    inet 172.21.3.62/24 brd 172.21.3.255 scope global secondary vl479cus:0
4: vl479cus    inet 172.21.3.60/24 brd 172.21.3.255 scope global secondary vl479cus:0
4: vl479cus    inet6 fd00:da9:2:1df:111:0:200:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
4: vl479cus    inet6 fd00:da9:2:1df:111:0:1603:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
4: vl479cus    inet6 fd00:da9:2:1df:111:0:1501:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
4: vl479cus    inet6 fd00:da9:2:1df:111:0:100:27/64 scope global deprecated \        valid_lft forever preferred_lft forever
4: vl479cus    inet6 fd00:da9:2:1df:1fd:0:2277:3056/64 scope global \        valid_lft forever preferred_lft forever
4: vl479cus    inet6 fe80::250:56ff:fea3:527e/64 scope link \        valid_lft forever preferred_lft forever
dcplnx22773056:~ #
```

Interfaz	Descripción
lo	Interfaz virtual para pruebas (tiene asignada la dirección IP 127.0.0.1).
eth	Dispositivos Ethernet (también se usa en dispositivos ADSL y Ethernet inalámbrica).
tr	Redes en anillo de tipo Token Ring.
ppp	Conexión mediante módem o RDSL.

/etc/sysconfig/network	
Descripción:	Establece los valores de las variables básicas para el servicio de red (nombre, dominio, dirección del <i>encaminador</i> , etc).
Formato:	<i>Variable=Valor</i> ...
/etc/sysconfig/network-scripts/ifup-Interfaz	
Descripción:	Establece los valores de las variables de red específicas para cada interfaz de red (recogida de valores de red mediante DHCP, BOOTP o local), dirección IP, máscara de red, dirección de difusión, etc.
Formato:	<i>Variable=Valor</i> ...
/etc/hosts	
Descripción:	Almacena la asociación entre dirección IP, nombre y alias de ordenadores conocidos. Siempre debe estar presente la dirección 127.0.0.1.
Formato:	<i>DirecciónIP Nombre [Alias ...]</i> ...

<code>/etc/resolv.conf</code>	
Descripción:	Establece las bases para la resolución de nombres, indicando dominio del ordenador, dirección de los servidores de nombres y otros dominios de interés.
Formato:	<code>domain Dominio</code> <code>nameserver IPServidorDNS</code> <code>...</code> <code>[search DominioBúsqueda ...]</code>
<code>/etc/nsswitch.conf</code>	
Descripción:	Indica el orden de búsqueda para ficheros de red.
Formato:	<code>TipoFichero TipoBúsqueda ...</code> <code>...</code>
Tipos de búsqueda:	<code>files:</code> archivos locales. <code>nis:</code> NIS. <code>nisplus:</code> NIS+. <code>ldap:</code> servicio de directorios. <code>dns:</code> servicio de nombres.
<code>/etc/services</code>	
Descripción:	Indica el protocolo y el puerto utilizado por cada servicio de comunicaciones (este fichero no debe modificarse, ya que suele estar bien configurado).
Formato:	<code>Servicio Puerto/Protocolo [Alias ...]</code> <code>...</code>

Administración Linux Red Hat

Schedule

Administración Linux Red Hat

Scheduling systems tasks

Cron

Creating and Editing `crontab` Files (Task Map)

Task	Description	For Instructions
Create or edit a <code>crontab</code> file.	Use the <code>crontab -e</code> command to create or edit a <code>crontab</code> file.	How to Create or Edit a <code>crontab</code> File
Verify that a <code>crontab</code> file exists.	Use the <code>ls -l</code> command to verify the contents of the <code>/var/spool/cron/crontabs</code> file.	How to Verify That a <code>crontab</code> File Exists
Display a <code>crontab</code> file.	Use the <code>ls -l</code> command to display the <code>crontab</code> file.	How to Display a <code>crontab</code> File
Remove a <code>crontab</code> file.	The <code>crontab</code> file is set up with restrictive permissions Use the <code>crontab -r</code> command, rather than the <code>rm</code> command to remove a <code>crontab</code> file.	How to Remove a <code>crontab</code> File
Deny <code>crontab</code> access.	To deny users access to <code>crontab</code> commands, add user names to the <code>/etc/cron.d/cron.deny</code> file by editing this file.	How to Deny <code>crontab</code> Command Access
Limit <code>crontab</code> access to specified users.	To allow users access to the <code>crontab</code> command, add user names to the <code>/etc/cron.d/cron.allow</code> file.	How to Limit <code>crontab</code> Command Access to Specified Users

Command	What It Schedules	Location of Files	Files That Control Access
<code>crontab</code>	Multiple system tasks at regular intervals	<code>/var/spool/cron/crontabs</code>	<code>/etc/cron.d/cron.allow</code> and <code>/etc/cron.d/cron.deny</code>
<code>at</code>	A single system task	<code>/var/spool/cron/atjobs</code>	<code>/etc/cron.d/at.deny</code>



Administración Linux Red Hat

Scheduling systems tasks

Cron

To verify if a specific user can access the `crontab` command, use the `crontab -l` command while you are logged into the user account.

```
$ crontab -l
```

If the user can access the `crontab` command, and already has created a `crontab` file, the file is displayed. Otherwise, if the user can access the `crontab` command but no `crontab` file exists, a message similar to the following message is displayed:

1.

```
crontab: can't open your crontab file
```

Either this user either is listed in the `cron.allow` file (if the file exists), or the user is not listed in the `cron.deny` file.

where *username* specifies the name of the user's account for which you want to create or edit a `crontab` file. You can create your own `crontab` file without superuser privileges, but you must have superuser privileges to creating or edit a `crontab` file for `root` or another user.



Caution - If you accidentally type the `crontab` command with no option, press the interrupt character for your editor. This character allows you to quit without saving changes. If you instead saved changes and exited the file, the existing `crontab` file would be overwritten with an empty file.

2. **Add command lines to the `crontab` file.**

Follow the syntax described in [Syntax of crontab File Entries](#). The `crontab` file will be placed in the `/var/spool/cron/crontabs` directory.

3. **Verify your `crontab` file changes.**

```
# crontab -l [username]
```

Example 14-1 Creating a `crontab` File

The following example shows how to create a `crontab` file for another user.

```
# crontab -e jones
```



LIFE IS FOR SHARING.

Administración Linux Red Hat

Scheduling systems tasks

Cron

To verify if a specific user can access the `crontab` command, use the `crontab -l` command while you are logged into the user account.

```
$ crontab -l
```

If the user can access the `crontab` command, and already has created a `crontab` file, the file is displayed. Otherwise, if the user can access the `crontab` command but no `crontab` file exists, a message similar to the following message is displayed:

```
crontab: can't open your crontab file
```

Either this user either is listed in the `cron.allow` file (if the file exists), or the user is not listed in the `cron.deny` file.

The following define the time when the job is to be run:

- » **minute** — any integer from 0 to 59
- » **hour** — any integer from 0 to 23
- » **day** — any integer from 1 to 31 (must be a valid day if a month is specified)
- » **month** — any integer from 1 to 12 (or the short name of the month such as `jan` or `feb`)
- » **day of week** — any integer from 0 to 7, where 0 or 7 represents Sunday (or the short name of the week such as `sun` or `mon`)

```
T bash-3.00# crontab -e | grep core
21 * * * * /usr/bin/rm /var/core/core.* >/dev/null 2>&1
bash-3.00#
```

Administración Linux Red Hat

At command

Starting and Stopping the At Service

To determine if the service is running, use the command:

`service atd status.`

```
[root@q4ushosys0152 ~]# service atd status
atd (pid 27343) is running...
[root@q4ushosys0152 ~]#
```

To schedule a one-time job for a specific time with the At utility, do the following:

1.- On the command line, type the command `at TIME` (where TIME is the time when the command is to be executed)

The TIME argument can be defined in any of the following formats:

HH:MM specifies the exact hour and minute; For example, 04:00 specifies 4:00 a.m.

midnight specifies 12:00 a.m.

noon specifies 12:00 p.m.

teatime specifies 4:00 p.m.

MONTHDAYYEAR format; For example, January 15 2012 specifies the 15th day of January in the year 2012. The year value is optional

```
root@rncadm001 [13:10:12 /] at now
at> /opt/SUNWexplo/bin/explorer
at> <EOT>
commands will be executed using /bin/bash
job 1405973415.a at Mon Jul 21 13:10:15 2014
root@rncadm001 [13:10:26 /] ps -fea | grep -i explo
  root 10510 10509   0 13:10:26 ?           0:00 /bin/ksh -p /opt/SUNWexplo/bin/explorer
  root 10909   9003   0 13:10:31 pts/11      0:00 grep -i explo
  root 10802 10510   0 13:10:27 ?           0:00 ksh -p /opt/SUNWexplo/tools/pkg
root@rncadm001 [13:10:31 /]
```

2.- Once finished, press Ctrl+D on an empty line to exit the prompt.



LIFE IS FOR SHARING.

To view the list of pending jobs, use the `atq` command

Administración Linux Red Hat

Nohup and &

[comando] & = Ejecuta un comando en segundo plano

nohup [comando] & = Ejecuta un comando de forma que si cerramos la terminal siga ejecutandose

2.- Once finished, press Ctrl+D on an empty line to exit the prompt.



LIFE IS FOR SHARING.

To view the list of pending jobs, use the atq command

Administración Linux Red Hat

System Log Files

Read error messages

```
[root@q4ushosys0152 ~]# tail -10 /var/log/messages
Apr  5 23:01:10 q4ushosys0152 xinetd[24806]: warning: /etc/hosts.allow, line 6: missing ":" separator
Apr  5 23:01:10 q4ushosys0152 xinetd[4388]: START: vnetd pid=24806 from=192.168.15.1
Apr  5 23:01:10 q4ushosys0152 xinetd[4388]: EXIT: vnetd status=0 pid=24806 duration=0(sec)
Apr  5 23:01:10 q4ushosys0152 xinetd[4388]: EXIT: vnetd status=0 pid=24805 duration=0(sec)
Apr  5 23:01:26 q4ushosys0152 xinetd[24944]: warning: /etc/hosts.allow, line 6: missing ":" separator
Apr  5 23:01:26 q4ushosys0152 xinetd[4388]: START: vnetd pid=24944 from=192.168.15.1
Apr  5 23:01:26 q4ushosys0152 xinetd[24945]: warning: /etc/hosts.allow, line 6: missing ":" separator
Apr  5 23:01:26 q4ushosys0152 xinetd[4388]: START: vnetd pid=24945 from=192.168.15.1
Apr  5 23:01:26 q4ushosys0152 xinetd[4388]: EXIT: vnetd status=0 pid=24945 duration=0(sec)
Apr  5 23:01:26 q4ushosys0152 xinetd[4388]: EXIT: vnetd status=0 pid=24944 duration=0(sec)
[root@q4ushosys0152 ~]# tail -f /var/log/messages
Apr  5 23:01:10 q4ushosys0152 xinetd[24806]: warning: /etc/hosts.allow, line 6: missing ":" separator
Apr  5 23:01:10 q4ushosys0152 xinetd[4388]: START: vnetd pid=24806 from=192.168.15.1
Apr  5 23:01:10 q4ushosys0152 xinetd[4388]: EXIT: vnetd status=0 pid=24806 duration=0(sec)
Apr  5 23:01:10 q4ushosys0152 xinetd[4388]: EXIT: vnetd status=0 pid=24805 duration=0(sec)
Apr  5 23:01:26 q4ushosys0152 xinetd[24944]: warning: /etc/hosts.allow, line 6: missing ":" separator
Apr  5 23:01:26 q4ushosys0152 xinetd[4388]: START: vnetd pid=24944 from=192.168.15.1
Apr  5 23:01:26 q4ushosys0152 xinetd[24945]: warning: /etc/hosts.allow, line 6: missing ":" separator
Apr  5 23:01:26 q4ushosys0152 xinetd[4388]: START: vnetd pid=24945 from=192.168.15.1
Apr  5 23:01:26 q4ushosys0152 xinetd[4388]: EXIT: vnetd status=0 pid=24945 duration=0(sec)
Apr  5 23:01:26 q4ushosys0152 xinetd[4388]: EXIT: vnetd status=0 pid=24944 duration=0(sec)
```



Administración Linux Red Hat

Viewing System Processes

The `ps` command allows you to display information about running processes. It produces a static list, that is, a snapshot of what is running when you execute the command.

```
[root@q4ushosys0152 ~]# ps -fea | grep -i ssh
root      4376      1  0   2014 ?        00:00:15 /usr/sbin/sshd
root      4698  4633  0   2014 ?        00:00:02 /usr/bin/ssh-agent /usr/bin/dbus-launch --exit-with-session /etc/X11/xinit/Xclients
```

Using the top Command

The `top` command displays a real-time list of processes that are running on the system. It also displays additional information about the system uptime, current CPU and memory usage, or total number of running processes, and allows you to perform actions such as sorting the list or killing a process

For each listed process, the `top` command displays the process ID (PID), the effective user name of the process owner (USER), the priority (PR), the nice value (NI), the amount of virtual memory the process uses (VIRT), the amount of non-swapped physical memory the process uses (RES), the amount of shared memory the process uses (SHR), the process status field S), the percentage of the CPU (%CPU) and memory (%MEM) usage, the accumulated CPU time (TIME+), and the name of the executable file (COMMAND).



Administración Linux Red Hat

top

```
~]$ top
top - 02:19:11 up 4 days, 10:37, 5 users, load average: 0.07, 0.13, 0.09
Tasks: 160 total, 1 running, 159 sleeping, 0 stopped, 0 zombie
Cpu(s): 10.7%us, 1.0%sy, 0.0%ni, 88.3%id, 0.0%wa, 0.0%hi, 0.0%si, 0.0%st
Mem: 760752k total, 644360k used, 116392k free, 3988k buffers
Swap: 1540088k total, 76648k used, 1463440k free, 196832k cached

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
14401 jhradile  20   0  313m  10m 5732  S   5.6   1.4   6:27.29 gnome-system-mo
 1764 root      20   0  133m  23m 4756  S   5.3   3.2   6:32.66 Xorg
13865 jhradile  20   0 1625m 177m 6628  S   0.7  23.8   0:57.26 java
   20 root      20   0    0    0    0  S   0.3   0.0   4:44.39 ata/0
 2085 root      20   0 40396  348  276  S   0.3   0.0   1:57.13 udisks-daemon
    1 root      20   0 19404  832  604  S   0.0   0.1   0:01.21 init
    2 root      20   0    0    0    0  S   0.0   0.0   0:00.01 kthreadd
    3 root      RT   0    0    0    0  S   0.0   0.0   0:00.00 migration/0
    4 root      20   0    0    0    0  S   0.0   0.0   0:00.02 ksoftirqd/0
    5 root      RT   0    0    0    0  S   0.0   0.0   0:00.00 migration/0
    6 root      RT   0    0    0    0  S   0.0   0.0   0:00.00 watchdog/0
    7 root      20   0    0    0    0  S   0.0   0.0   0:01.00 events/0
    8 root      20   0    0    0    0  S   0.0   0.0   0:00.00 cpuset
    9 root      20   0    0    0    0  S   0.0   0.0   0:00.00 khelper
   10 root      20   0    0    0    0  S   0.0   0.0   0:00.00 netns
   11 root      20   0    0    0    0  S   0.0   0.0   0:00.00 async/mgr
   12 root      20   0    0    0    0  S   0.0   0.0   0:00.00 pm

[output truncated]
```

Command	Description
Enter, Space	Immediately refreshes the display.
h, ?	Displays a help screen.
k	Kills a process. You are prompted for the process ID and the signal to send to it.
n	Changes the number of displayed processes. You are prompted to enter the number.
u	Sorts the list by user.
M	Sorts the list by memory usage.
p	Sorts the list by CPU usage.
q	Terminates the utility and returns to the shell prompt.

Administración Linux Red Hat

Mem

The `free` command allows you to display the amount of free and used memory on the system. To do so, type the following at a shell prompt:

```
free
```

The `free` command provides information about both the physical memory (Mem) and swap space (Swap). It displays the total amount of memory (`total`), as well as the amount of memory that is in use (`used`), free (`free`), shared (`shared`), in kernel buffers (`buffers`), and cached (`cached`). For example:

```
~]$ free
```

	total	used	free	shared	buffers	cached
Mem:	760752	661332	99420	0	6476	317200
-/+ buffers/cache:		337656	423096			
Swap:	1540088	283652	1256436			

By default, `free` displays the values in kilobytes. To display the values in megabytes, supply the `-m` command-line option:

```
free -m
```



CPU

```
[root@OracleVM ~]# lscpu
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                2
On-line CPU(s) list:   0,1
Thread(s) per core:    1
Core(s) per socket:    2
Socket(s):             1
NUMA node(s):         1
Vendor ID:             GenuineIntel
CPU family:            6
Model:                45
Stepping:              7
CPU MHz:               2892.157
BogoMIPS:              5784.31
L1d cache:             32K
L1d cache:             32K
L2d cache:             6144K
NUMA node0 CPU(s):    0,1
```

Administración Linux Red Hat

CPU

```
[root@OracleVM ~]# cat /proc/cpuinfo
processor       : 0
vendor_id     : GenuineIntel
cpu family    : 6
model         : 45
model name    : Intel(R) Xeon(R) CPU E5-2690 0 @ 2.90GHz
stepping      : 7
cpu MHz       : 2892.157
cache size    : 6144 KB
physical id   : 0
siblings      : 2
core id       : 0
cpu cores     : 2
apicid        : 0
initial apicid : 0
fpu           : yes
fpu_exception : yes
cpuid level   : 5
wp            : yes
flags         : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht
               ni ssse3 lahf_lm
bogomips      : 5784.31
clflush size  : 64
cache_alignment : 64
address sizes  : 46 bits physical, 48 bits virtual
power management:
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

Uptime Command

In Linux **uptime** command shows since how long your system is running and the number of users are currently logged in and also displays load average for **1,5** and **15** minutes intervals

```
# uptime

08:16:26 up 22 min,  1 user,  load average: 0.00, 0.03, 0.22
```

W Command and who

It will displays users currently logged in and their process along-with shows load averages.

also shows the login name, tty name, remote host, login time, idle time, JCPU, PCPU, command and processes .

```
[root@q4ushosys0152 ~]# w
15:32:18 up 418 days, 18:59,  6 users,  load average: 0.22, 0.13, 0.09
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
iarriaga pts/2     160.118.200.7    Sun22    7:02m  0.10s  0.10s -bash
iarriaga pts/3     160.118.200.7    00:24    7:02m  0.09s  0.09s -bash
jacardos pts/4     160.118.200.2    09:49    0.00s  0.59s  0.03s sshd: jacardos [priv]
dbernaló pts/5     160.118.200.24   10:01    10:03  0.11s  0.02s sshd: dbernaló [priv]
jperezpi pts/6     160.118.200.8    13:45    1:13m  0.09s  0.09s -bash
edclemen pts/7     160.118.200.10   11:02    9:30   1.06s  1.06s -bash
[root@q4ushosys0152 ~]#
```

who command simply return **user name**, **date**, **time** and **host information**. Unlike **w** command **who** doesn't print what users are doing

```
[root@q4ushosys0152 ~]# who
iarriaga pts/2     2015-04-05 22:50 (160.118.200.7)
iarriaga pts/3     2015-04-06 00:24 (160.118.200.7)
jacardos pts/4     2015-04-06 09:49 (160.118.200.2)
dbernaló pts/5     2015-04-06 10:01 (160.118.200.24)
jperezpi pts/6     2015-04-06 13:45 (160.118.200.8)
edclemen pts/7     2015-04-06 11:02 (160.118.200.10)
```

Who command Options

- **-b** : Displays last system reboot date and time.
- **-r** : Shows current runlet.
- **-a, -all** : Displays all information in cumulatively.

Administración Linux Red Hat

Useful Linux Commands for System Administrators

Is Command

- l use a long listing format
- r, reverse order while sorting
- t sort by modification time
- a, --all do not ignore entries starting with .
- A, --almost-all do not list implied . and ..

```
# ls -ltr

total 40
-rw-r--r--. 1 root root 6546 Sep 17 18:42 install.log.syslog
-rw-r--r--. 1 root root 22435 Sep 17 18:45 install.log
-rw-----. 1 root root 1003 Sep 17 18:45 anaconda-ks.cfg
```

Crontab Command

List schedule jobs for current user with **crontab** command and **-l** option and **-u** for user crontab
Edit your **crontab** with **-e** option

```
# crontab -l

00 10 * * * /bin/ls >/ls.txt
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

Less Command

less command allows quickly view file. You can page up and down. Press 'q' to quit from less window

```
# less install.log

Installing setup-2.8.14-10.el6.noarch
warning: setup-2.8.14-10.el6.noarch: Header V3 RSA/SHA256 Signature, key ID c105b9de: NO
KEY
Installing filesystem-2.4.30-2.1.el6.i686
Installing ca-certificates-2010.63-3.el6.noarch
Installing xml-common-0.6.3-32.el6.noarch
Installing tzdata-2010l-1.el6.noarch
Installing iso-codes-3.16-2.el6.noarch
```

More Command

more command allows quickly view file and shows details in percentage.

You can page up and down. Press 'q' to quit out from more window.

```
# more install.log

Installing setup-2.8.14-10.el6.noarch
warning: setup-2.8.14-10.el6.noarch: Header V3 RSA/SHA256 Signature, key ID c105b9de: NO
KEY
Installing filesystem-2.4.30-2.1.el6.i686
Installing ca-certificates-2010.63-3.el6.noarch
Installing xml-common-0.6.3-32.el6.noarch
Installing tzdata-2010l-1.el6.noarch
Installing iso-codes-3.16-2.el6.noarch
--More-- (10%)
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

CP Command

Copy file from source to destination preserving same mode

-R, -r, --recursive copy directories recursively

-p same as --preserve=mode,ownership,timestamps, preserve the specified attributes

```
# cp -p fileA fileB
```

MV Command

Rename **fileA** to **fileB**. -i options prompt before overwrite. Ask for confirmation if exist already

```
# mv -i fileA fileB
```

Cat Command

cat command used to view multiple file at the same time

You combine **more** and **less** command with cat command to view file contain if that doesn't fit in single screen / page.

```
# cat install.log | less
```

```
# cat install.log | more
```

Cd command (change directory)

with cd command (change directory) it will goes to **fileA** directory.



```
[root@q4ushosys0152 ~]#  
[root@q4ushosys0152 ~]# cd /var/tmp  
[root@q4ushosys0152 tmp]#
```

Administración Linux Red Hat

Useful Linux Commands for System Administrators

pwd command (print working directory)

pwd command return with present working directory.

```
[root@q4ushosys0152 tmp]# pwd
/var/tmp
[root@q4ushosys0152 tmp]#
```

VI Command

Vi is a most popular text editor available most of the **UNIX-like OS**.

Below examples open file in read only with **-R** option. Press **':q'** to quit from vi window

```
# vi -R /etc/shadows
```

SSH Command (Secure Shell)

SSH command is used to login into remote host.

For example the below ssh command will connect to remote host (**192.168.50.2**) using user as **narad**

```
# ssh narad@192.168.50.2
```

Service Command

Service command call script located at **/etc/init.d/** directory and execute the script.

There are two ways to start the any service

```
# service httpd start
OR
# /etc/init.d/httpd start
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

Free command

Free command shows free, total and swap memory information in bytes

Free with **-t** options shows **total memory** used and available to use in bytes.

```
# free -t
              total        used        free      shared    buffers     cached
Mem:      1030800       736096       294704          0        51720       547704
-/+ buffers/cache:      136672       894128
Swap:      2064376          0       2064376
Total:     3095176       736096       2359080
```

Top Command

top command displays processor activity of your system and also displays tasks managed by kernel in real-time.

It'll show processor and memory are being used. Use top command with 'u' option this will display specific User process details.

Press 'O' (uppercase letter) to sort as per desired by you. Press 'q' to quit from top screen

```
[root@q4ushosys0152 tmp]# top -u jacardos
top - 16:06:36 up 418 days, 19:33,  6 users,  load average: 0.08, 0.14, 0.08
Tasks: 119 total,  2 running, 117 sleeping,  0 stopped,  0 zombie
Cpu(s):  0.0%us,  0.7%sy,  0.0%ni, 99.3%id,  0.0%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:   672572k total,  623304k used,  49268k free,  196720k buffers
Swap: 1638392k total,    96k used, 1638296k free,  217644k cached
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
28382	jacardos	15	0	10368	2432	1392	R	0.0	0.4	0:00.78	sshd
28391	jacardos	15	0	5312	2224	1300	S	0.0	0.3	0:00.15	bash
28393	jacardos	24	0	9868	1592	1056	S	0.0	0.2	0:00.00	sshd
28428	jacardos	22	0	6484	1500	1160	S	0.0	0.2	0:00.07	sftp-server



Administración Linux Red Hat

Useful Linux Commands for System Administrators

Tar Command

tar command is used to compress files and folders in Linux.

For example the below command will create a archive for /home directory with file name as archive-name.tar.

```
# tar -cvf archive-name.tar /home
```

To extract tar archive file

```
# tar -xvf archive-name.tar
```

Grep Command

grep search for a given string in a file. Only **tecmin**t user displays from **/etc/passwd** file.
we can use **-i** option for ignoring case sensitive.

```
# grep tecmint /etc/passwd
```

```
tecmin:x:500:500::/home/tecmin:/bin/bash
```

Find Command

Find command used to search **files**, **strings** and **directories**.

The below example of find command search **tecmin**t word in **/** partition and return the output.

```
# find / -name tecmint
```

```
/var/spool/mail/tecmin
```

```
/home/tecmin
```

```
/root/home/tecmin
```

Administración Linux Red Hat

Useful Linux Commands for System Administrators

last command

With last command we can watch user's activity in the system. This command can execute normal user also. It will display complete user's info like terminal, time, date, system reboot or boot and kernel version. Useful command to troubleshoot.

```
# last

tecmint pts/1      192.168.50.1      Tue Sep 18 08:50   still logged in
tecmint pts/0      192.168.50.1      Tue Sep 18 07:59   still logged in
reboot  system boot  2.6.32-279.el6.i Tue Sep 18 07:54 - 11:38 (03:43)
root    pts/1      192.168.50.1      Sun Sep 16 10:40 - down (03:53)
root    pts/0      :0.0              Sun Sep 16 10:36 - 13:09 (02:32)
root    tty1       :0                Sun Sep 16 10:07 - down (04:26)
reboot  system boot  2.6.32-279.el6.i Sun Sep 16 09:57 - 14:33 (04:35)
narad   pts/2      192.168.50.1      Thu Sep 13 08:07 - down (01:15)
```

You can use **last** with **username** to know for specific user's activity

```
# last tecmint

tecmint pts/1      192.168.50.1      Tue Sep 18 08:50   still logged in
tecmint pts/0      192.168.50.1      Tue Sep 18 07:59   still logged in
tecmint pts/1      192.168.50.1      Thu Sep 13 08:07 - down (01:15)
tecmint pts/4      192.168.50.1      Wed Sep 12 10:12 - 12:29 (02:17)
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

ps command

ps command displays about processes running in the system

```
# ps -ef | grep init

root      1      0   0 07:53 ?        00:00:04 /sbin/init
root     7508   6825   0 11:48 pts/1    00:00:00 grep init
```

kill command

Use **kill** command to terminate process. First find process **id** with **ps** command as shown below and kill process with **kill -9** command

```
# ps -ef | grep init
root      1      0   0 07:53 ?        00:00:04 /sbin/init
root     7508   6825   0 11:48 pts/1    00:00:00 grep init

# kill- 9 7508
```

rm command

rm command used to remove or delete a file without prompting for confirmation
Using **-i** option to get confirmation before removing it. Using options **-r** and **-f** will remove the file forcefully without confirmation.

```
# rm -i test.txt

rm: remove regular file `test.txt'?
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

mkdir command

mkdir command is used to create directories under Linux
-p, --parents no error if existing, make parent directories as needed

```
# mkdir directoryname
```

/etc/redhat-release

```
[root@q4ushosys0152 tmp]# cat /etc/redhat-release  
Red Hat Enterprise Linux Server release 5.2 (Tikanga)
```

```
[root@q4ushosys0152 tmp]# uname -a  
Linux q4ushosys0152 2.6.18-92.el5 #1 SMP Tue Apr 29 13:16:12 EDT 2008 i686 athlon i386 GNU/Linux
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

date command

date - print or set the system date and time

```
[root@q4ushosys0152 tmp]# date  
Mon Apr  6 16:30:04 CDT 2015
```

Env

Set each NAME to VALUE in the environment and run COMMAND

Ejemplo:

JAVA_HOME=/usr/lib64/jvm/jre

LANG=en_US.UTF-8

DISPLAY=localhost:11.0

```
jacardos@saptest01:~> env | grep LANG  
LANG=en_US.UTF-8  
jacardos@saptest01:~> █
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

ps tree = Muestra los procesos en curso en forma de arbol

```
dcplnx23070311:~ # ps tree
+- 00001 root /usr/lib/systemd/systemd
|   --- 03755 root chdiskd /dev/sda
|   --- 05321 root /usr/sbin/haveged -w 1024 -v 0 -F
|   --- 05325 root /usr/lib/systemd/systemd-journald
|   --- 05378 root /usr/lib/systemd/systemd-udev
|   --- 05439 root /usr/sbin/rpc.idmapd
|   --- 05494 root /usr/bin/VGAAuthService -s
|   --- 05495 messageb /bin/dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation
|   --- 05575 root /usr/lib/wicked/bin/wickedd-auto4 --systemd --foreground
|   --- 05576 root /usr/sbin/irqbalance --foreground
|   --- 05581 root /usr/lib/wicked/bin/wickedd-dhcp4 --systemd --foreground
|   --- 05583 root /usr/lib/wicked/bin/wickedd-dhcp6 --systemd --foreground
|   --- 05629 nsd /usr/sbin/nsd
|   --- 05637 root /usr/sbin/wickedd --systemd --foreground
|   --- 05652 root /usr/sbin/wickedd-nanny --systemd --foreground
+- 05665 root /usr/sbin/sss -D -f
|   |   --- 05721 root /usr/lib/sss/sss_be --domain LDAPS --uid 0 --gid 0 --debug-to-files
|   |   --- 05741 root /usr/lib/sss/sss_nss --uid 0 --gid 0 --debug-to-files
|   |   --- 05742 root /usr/lib/sss/sss_pam --uid 0 --gid 0 --debug-to-files
|   |   --- 05743 root /usr/lib/sss/sss_sudo --uid 0 --gid 0 --debug-to-files
|   \--- 05744 root /usr/lib/sss/sss_ssh --uid 0 --gid 0 --debug-to-files
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

`ps -axjf` (que mostrará un árbol jerárquico con la ruta del programa al que pertenece el proceso)

```
  1 17361 17359 17359 ?          -1 S    50011   0:00 /bin/sh /usr/sap/toolbox/JavaAgent/bin/JavaAgent.sh -sid FT1-99-FT -id 99
17361 17364 17359 17359 ?          -1 Sl    50011   0:02 \_ java -showversion -Xms32M -Xmx64M -Dsun.net.client.defaultConnectTimeout=60000 -Dsun.net.client.defaultReadTimeout=300000
  1 18708 18706 18706 ?          -1 S    50009   0:00 /bin/sh /usr/sap/toolbox/JavaAgent/bin/JavaAgent.sh -sid SF1-99-GS -id 98
18708 18711 18706 18706 ?          -1 Sl    50009   0:02 \_ java -showversion -Xms32M -Xmx64M -Dsun.net.client.defaultConnectTimeout=60000 -Dsun.net.client.defaultReadTimeout=300000
  1 19383 19381 19381 ?          -1 S    50010   0:00 /bin/sh /usr/sap/toolbox/JavaAgent/bin/JavaAgent.sh -sid SR1-99-SR -id 97
19383 19386 19381 19381 ?          -1 Sl    50010   0:02 \_ java -showversion -Xms32M -Xmx64M -Dsun.net.client.defaultConnectTimeout=60000 -Dsun.net.client.defaultReadTimeout=300000
  1 23537 23537 23537 ?          -1 Ss     0   0:00 /usr/sbin/sshd -D
23537 23767 23767 23767 ?          -1 Ss     0   0:00 \_ sshd: root@pts/0
23767 23772 23772 23772 pts/0    23772 Ss+   0   0:00 | \_ \_ -bash
23537 7517 7517 7517 ?          -1 Ss     0   0:00 | \_ sshd: jacardos [priv]
7517 7519 7517 7517 ?          -1 S    38811   0:00 | | \_ sshd: jacardos@pts/1
7519 7520 7520 7520 pts/1    8837 Ss    38811   0:00 | | | \_ -ksh
7520 8837 8837 7520 pts/1    8837 S+     0   0:00 | | | | \_ ./surroot
8837 8838 8837 7520 pts/1    8837 S+     0   0:00 | | | | | \_ sudo rootsh -i -u root
8838 8839 8837 7520 pts/1    8837 S+     0   0:00 | | | | | | \_ rootsh -i -u root
8839 8840 8840 8840 pts/4    10893 Ss     0   0:00 | | | | | | \_ su - root
8840 8841 8841 8840 pts/4    10893 S     0   0:00 | | | | | | | \_ -bash
8841 10893 10893 8840 pts/4    10893 R+     0   0:00 | | | | | | | \_ ps -axjf
23537 8708 8708 8708 ?          -1 Ss     0   0:00 | \_ sshd: osvrodri [priv]
8708 8711 8708 8708 ?          -1 S    32753   0:00 | | \_ sshd: osvrodri@pts/2
8711 8712 8712 8712 pts/2    8738 Ss    32753   0:00 | | | \_ -ksh
8712 8738 8738 8712 pts/2    8738 S+    32753   0:00 | | | | \_ ./dosu
8738 8739 8738 8712 pts/2    8738 S+     0   0:00 | | | | | \_ sudo rootsh -i -u root
8739 8740 8738 8712 pts/2    8738 S+     0   0:00 | | | | | | \_ rootsh -i -u root
8740 8741 8741 8741 pts/3    8804 Ss     0   0:00 | | | | | | \_ su - root
8741 8742 8742 8741 pts/3    8804 S     0   0:00 | | | | | | | \_ -bash
8742 8803 8803 8741 pts/3    8804 S     0   0:00 | | | | | | | \_ su - ftladm
8803 8804 8804 8741 pts/3    8804 S+    50011   0:00 | | | | | | | \_ -csh
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

fuser -v [archivo] = Muestra los procesos que están usando un archivo o directorio

```
dcplnx23070311:~ # fuser
No process specification given
Usage: fuser [-fMuvw] [-a|-s] [-4|-6] [-c|-m|-n SPACE] [-k [-i] [-SIGNAL]] NAME...
        fuser -l
        fuser -V
Show which processes use the named files, sockets, or filesystems.

-a,--all                display unused files too
-i,--interactive        ask before killing (ignored without -k)
-k,--kill               kill processes accessing the named file
-l,--list-signals       list available signal names
-m,--mount              show all processes using the named filesystems or block device
-M,--ismountpoint       fulfill request only if NAME is a mount point
-n,--namespace SPACE   search in this name space (file, udp, or tcp)
-s,--silent             silent operation
-SIGNAL                send this signal instead of SIGKILL
-u,--user               display user IDs
-v,--verbose            verbose output
-w,--writeonly          kill only processes with write access
-V,--version            display version information
-4,--ipv4               search IPv4 sockets only
-6,--ipv6               search IPv6 sockets only
-                       reset options

udp/tcp names: [local_port][,[rmt_host][,[rmt_port]]]
```



Administración Linux Red Hat

Useful Linux Commands for System Administrators

lsf = Lista los ficheros abiertos por los procesos

lsf -c [comando] = Lista los ficheros abiertos por un proceso

lsf +D [Directorio] = Lista los procesos que estan usando el directorio

lsf -i :60627 = Muestra los procesos que se encuentren detras del puerto 60627

```
dcplnx23070311:~ # lsf
COMMAND      PID    TID      USER    FD      TYPE          DEVICE  SIZE/OFF      NODE NAME
systemd       1      1        root    cwd      DIR           0,20     500          7493 /
systemd       1      1        root    rtd      DIR           0,20     500          7493 /
systemd       1      1        root    txt      REG           7,9    1589216      57253 /usr/lib/systemd/systemd
systemd       1      1        root    mem      REG           7,9      18672      96548 /usr/lib64/libuuid.so.1.3.0
systemd       1      1        root    mem      REG           7,9    269480      94687 /usr/lib64/libblkid.so.1.1.0
systemd       1      1        root    mem      REG           7,9    100312      94663 /usr/lib64/libaudit.so.1.0.0
systemd       1      1        root    mem      REG           7,9     18712      94987 /usr/lib64/libdl-2.22.so
systemd       1      1        root    mem      REG           7,9    452976      96084 /usr/lib64/libpcre.so.1.2.7
systemd       1      1        root    mem      REG           7,9    1916856      94805 /usr/lib64/libc-2.22.so
systemd       1      1        root    mem      REG           7,9    135952      96186 /usr/lib64/libpthread-2.22.so
systemd       1      1        root    mem      REG           7,9    301608      95803 /usr/lib64/libmount.so.1.1.0
```



Administración Linux Red Hat

IPCs

Different Types of IPCS

There are various IPC's which allows a process to communicate with another processes, either in the same computer or different computer in the same network.

- **Pipes** – Provides a way for processes to communicate with each another by exchanging messages. Named pipes provide a way for processes running on different computer systems to communicate over the network.
- **Shared Memory** – Processes can exchange values in the shared memory. One process will create a portion of memory which other process can access.
- **Message Queue** – It is a structured and ordered list of memory segments where processes store or retrieve data.
- **Semaphores** – Provides a synchronizing mechanism for processes that are accessing the same resource. No data is passed with a semaphore; it simply coordinates access to shared resources.



Administración Linux Red Hat

IPCs

```
# ipcs -a
```

```
----- Shared Memory Segments -----
```

key	shmid	owner	perms	bytes	nattch	status
0xc616cc44	1056800768	oracle	660	4096	0	
0x0103f577	323158020	root	664	966	1	
0x0000270f	325713925	root	666	1	2	

```
----- Semaphore Arrays -----
```

key	semid	owner	perms	nsems
0x0103eefd	0	root	664	1
0x0103eefe	32769	root	664	1
0x4b0d4514	1094844418	oracle	660	204

```
----- Message Queues -----
```

key	msqid	owner	perms	used-bytes	messages
0x000005a4	32768	root	644	0	0



Administración Linux Red Hat

IPCs

`ipcs` with option `-q`, lists only message queues for which the current process has read access.

```
$ ipcs -q
```

```
----- Message Queues -----
```

key	msqid	owner	perms	used-bytes	messages
0x000005a4	32768	root	644	0	0



Administración Linux Red Hat

IPCs

`ipcs -s` option is used to list the accessible semaphores.

```
# ipcs -s
```

```
----- Semaphore Arrays -----
```

key	semid	owner	perms	nsems
0x0103eefd	0	root	664	1
0x0103eefe	32769	root	664	1
0x4b0d4514	1094844418	oracle	660	204



Administración Linux Red Hat

IPCs

`ipcs -m` option with `ipcs` command lists the shared memories.

```
# ipcs -m
```

```
----- Shared Memory Segments -----
```

key	shmid	owner	perms	bytes	nattch	status
0xc616ccc44	1056800768	oracle	660	4096	0	
0x0103f577	323158020	root	664	966	1	
0x0000270f	325713925	root	666	1	2	



Administración Linux Red Hat

IPCs

`ipcs -c` option lists creator **userid and groupid and owner userid and group id**. This option can be combined with `-m`, `-s` and `-q` to view the creator details for specific IPC facility.

```
# ipcs -m -c
```

```
----- Shared Memory Segment Creators/Owners -----
```

shmid	perms	cuid	cgid	uid	gid
1056800768	660	oracle	oinstall	oracle	oinstall
323158020	664	root	root	root	root
325713925	666	root	root	root	root



Administración Linux Red Hat

IPCs

`ipcs -p` option displays creator id, and process id which accessed the corresponding ipc facility very recently.

```
# ipcs -m -p
```

```
----- Shared Memory Creator/Last-op -----
```

shmid	owner	cpid	lpid
1056800768	oracle	16764	5389
323158020	root	2354	2354
325713925	root	20666	20668



Administración Linux Red Hat

IPCs

`ipcs -t` option displays last operation time in each ipc facility. This option can also be combined with `-m`, `-s` or `-q` to print for specific type of ipc facility. For message queue, `-t` option displays last sent and receive time, for shared memory it displays last attached (portion of memory) and detached timestamp and for semaphore it displays last operation and changed time details.

```
# ipcs -s -t
```

```
----- Semaphore Operation/Change Times -----
```

semid	owner	last-op	last-changed
0	root	Thu Aug 5 12:46:52 2010	Tue Jul 13 10:39:41 2010
32769	root	Thu Aug 5 11:59:10 2010	Tue Jul 13 10:39:41 2010
1094844418	oracle	Thu Aug 5 13:52:59 2010	Thu Aug 5 13:52:59 2010



Administración Linux Red Hat

IPCs

ipcs with -u command displays **current usage** for all the IPC facility. This option can be combined with a specific option to display the status for a particular IPC facility.

```
# ipcs -u

----- Shared Memory Status -----
segments allocated 30
pages allocated 102
pages resident 77
pages swapped 0
Swap performance: 0 attempts      0 successes

----- Semaphore Status -----
used arrays = 49
allocated semaphores = 252

----- Messages: Status -----
allocated queues = 1
used headers = 0
used space = 0 bytes
```



Administración Linux Red Hat

IPCs

`ipcs -l` option gives the system **limits** for each ipc facility.

```
# ipcs -m -l
```

```
----- Shared Memory Limits -----
```

```
max number of segments = 4096
```

```
max seg size (kbytes) = 67108864
```

```
max total shared memory (kbytes) = 17179869184
```

```
min seg size (bytes) = 1
```

`ipcs` with `-u` command displays current **usage** for all the IPC facility. This option can be combined with a specific option to display the status for a particular IPC facility.

```
# ipcs -u
```

```
----- Shared Memory Status -----
```

```
segments allocated 30
```

```
pages allocated 102
```

```
pages resident 77
```

```
pages swapped 0
```

```
Swap performance: 0 attempts      0 successes
```



Procesos por puerto

1) Linux: Qué proceso usa un puerto: fuser

El comando fuser nos permite saber qué proceso usa un puerto.

En distribuciones RedHat/CentOS, encontraremos este comando dentro del paquete psmisc.

Para instalarlo, podremos ejecutar:

```
yum install psmisc -y
```

Ejemplo de funcionamiento:

```
fuser 25/tcp
```

```
[root@SYSADMIN ~]#  
[root@SYSADMIN ~]#  
[root@SYSADMIN ~]# fuser 25/tcp  
25/tcp:                2054  
[root@SYSADMIN ~]#  
[root@SYSADMIN ~]#  
[root@SYSADMIN ~]# ls -l /proc/2054/exe  
lrwxrwxrwx 1 root root 0 Jun 23 22:37 /proc/2054/exe -> /usr/libexec/postfix/master  
[root@SYSADMIN ~]#
```

fuser 25/tcp: Nos muestra el número de proceso asociado al puerto 25

ls -l /proc/2054/exe: Nos muestra la ruta completa a la que va asociado el proceso.

En este caso el número de proceso es el 2054 y el nombre del proceso es el postfix.



Procesos por puerto

2) Linux: Qué proceso usa un puerto: netstat

Otra forma para saber qué proceso usa un puerto es utilizar el comando netstat.

Por ejemplo, si ejecutamos:

```
netstat -tulpn | grep :80
```

Veremos el servicio que está enlazado al puerto 80 del interfaz de red.

Vista ejecución:

```
[root@SYSADMIT ~]#  
[root@SYSADMIT ~]#  
[root@SYSADMIT ~]# netstat -tulpn | grep :80  
tcp        0      0 0.0.0.0:80          0.0.0.0:*          LISTEN     1690/httpd  
[root@SYSADMIT ~]#  
[root@SYSADMIT ~]#  
[root@SYSADMIT ~]# ls -l /proc/1690/exe  
lrwxrwxrwx 1 root root 0 Jun 23 22:37 /proc/1690/exe -> /usr/sbin/httpd  
[root@SYSADMIT ~]#  
[root@SYSADMIT ~]#
```

Igual que con el ejemplo anterior, con el comando ls, podemos mostrar la ruta completa del proceso.



Procesos por puerto

3) Linux: Qué proceso usa un puerto: lsof

El comando lsof (List Open Files) está diseñado para obtener una lista de los ficheros abiertos del equipo.

También dispone del parámetro -i al que le podemos indicar un número de puerto.

Este sería un método válido para obtener el proceso que utiliza un puerto.

Ejemplo:

```
[root@SYSADMIN ~]#  
[root@SYSADMIN ~]# lsof -i :25 |grep LISTEN  
master  2054 root    12u  IPv4  11936      0t0  TCP *:smtp (LISTEN)  
[root@SYSADMIN ~]#  
[root@SYSADMIN ~]# ls -l /proc/2054/exe  
lrwxrwxrwx 1 root root 0 Jun 23 22:37 /proc/2054/exe -> /usr/libexec/postfix/master  
[root@SYSADMIN ~]#
```

Con:

```
lsof -i :25 |grep LISTEN
```

Obtenemos el proceso asociado al puerto 25.

Con ls, obtenemos la ruta del proceso.



Procesos por puerto

4) Linux: Qué proceso usa un puerto: ss

Otra opción para saber el proceso que utiliza un puerto es haciendo uso del comando ss.

El comando ss es la versión moderna del comando netstat.

```
[root@SYSADMIT ~]#  
[root@SYSADMIT ~]# ss -lptn 'sport = :25'  
State      Recv-Q Send-Q           Local Address:Port      Peer Address:Port  
LISTEN      0      128                *:25                      *:*  
users:((("master",2054,12))  
[root@SYSADMIT ~]#  
[root@SYSADMIT ~]#  
[root@SYSADMIT ~]# ls -l /proc/2054/exe  
lrwxrwxrwx 1 root root 0 Jun 23 22:37 /proc/2054/exe -> /usr/libexec/postfix/master  
[root@SYSADMIT ~]#
```

Con:

```
ss -lptn 'sport = :25'
```

Obtenemos el proceso asociado al puerto 25.



DCS3

SERVICE SCRIPTS

WHERE THE (RO!) CONFIG RESIDES TODAY

Config files are received from the central repository (eCMDB) and managed by the local CMDB:

```
ddorra@dcplnx19788573:/opt/ds4s/osindep/lcmdb> ls -al
total 48
drwxr-xr-x 2 sapadm sapsys 4096 Mar 28 17:22 .
drwxr-xr-x 6 sapadm sapsys 4096 Mar 14 12:25 ..
-rw-r--r-- 1 sapadm sapsys  172 Mar 24 15:21 ipv4networks.config
-rw-r--r-- 1 sapadm sapsys  935 Mar 24 15:21 landscape.xml
-rw-r--r-- 1 sapadm sapsys  282 Mar 24 14:58 mach:dcplnx19788573.xml
-rw-r--r-- 1 sapadm sapsys  282 Mar 24 15:00 mach:dcplnx19788576.xml
-rw-r--r-- 1 sapadm sapsys 1963 Mar 28 17:22 serv:lcm_06_ci.xml
-rw-r--r-- 1 sapadm sapsys 2774 Mar 28 17:18 serv:lcm_06_db.xml
-rw-r--r-- 1 sapadm sapsys 1967 Mar 24 15:26 serv:lco_05_ap.xml
-rw-r--r-- 1 sapadm sapsys 3960 Mar 25 08:18 serv:lco_05_db.xml
-rw-r--r-- 1 sapadm sapsys 1047 Mar 24 15:18 serv:lco_45_ac.xml
-rw-r--r-- 1 sapadm sapsys 1047 Mar 24 15:18 serv:lco_55_jc.xml
```

In DCS3, the directory "/usr/sap/adaptive/scripts" does not exist anymore. All files of the SAP plug have been moved to the location **/opt/ds4s** (the abbreviation for "optional software", then "dynamic services for SAP").



DCS3

SERVICE SCRIPTS SAMPLE CONFIG (CI)

```
ddorra@dcplnx19788573:/opt/ds4s/osindep/lcldb> cat serv:lcm_06_ci.xml
<?xml version="1.0" encoding="UTF-8"?>
<ds4sapplications>
  <tAppl Sid="LCM" ScclName="gsacon" LandscapeId="0x02d" DcpId="MUC1"
    Desc="Dummy" DbFamily="sdb" ApplSeqNo="1" Timezone="DEFAULT">
    <tInstance InstanceId="LCM_06_CI" Desc="Dummy" Sysno="06" InstanceType="CI"
      OsFamily="lnx" CpowerDemand="200" PhostMode="0" PhostModeReason="" PhostRO=""
      PhostPL="dcplnx19788576" PhostHA="" PhostDR="" PhostTMP="" PhostTMPEpiry="">
      <tInstFs Mpoint="/sapdb/clients/LCM" Export="dcsvssgs1011-01-02d:/vol/dcsvssgs1011/gs_lcm_db/LCM_client"
        QtreeId="gs_lcm_db" SiteId="Dummy" SizeGBreqd="200" FsType="nfs" Others="" .../>
      <tInstFs Mpoint="/sapmnt/LCM" Export="dcsvssgs1011-01-02d:/vol/dcsvssgs1011/gs_lcm_sapmnt/LCM_sapmnt"
        QtreeId="gs_lcm_sapmnt" SiteId="Dummy" SizeGBreqd="200" FsType="nfs" Others="" .../>
      <tInstFs Mpoint="/usr/sap/LCM" Export="dcsvssgs1011-01-02d:/vol/dcsvssgs1011/gs_lcm_sapmnt/LCM_usr_sap"
        QtreeId="gs_lcm_sapmnt" SiteId="Dummy" SizeGBreqd="200" FsType="nfs" Others="" .../>
      <tInstFs Mpoint="/usr/sap/interfaces" Export="dcsvssgs1011-01-02d:/vol/dcsvssgs1011/gs_gsa..."
        QtreeId="gs_gsacon_usrsap" SiteId="Dummy" SizeGBreqd="200" FsType="nfs" Others="" .../>
      <tInstFs Mpoint="/usr/sap/put" Export="dcsvssgs1011-01-02d:/vol/dcsvssgs1011/gs_gsacon_us..."
        QtreeId="gs_gsacon_usrsap" SiteId="Dummy" SizeGBreqd="200" FsType="nfs" Others="" .../>
      <tInstFs Mpoint="/usr/sap/trans" Export="dcsvssgs1011-01-02d:/vol/dcsvssgs1011/gs_gsacon..."
        QtreeId="gs_gsacon_usrsap" SiteId="Dummy" SizeGBreqd="200" FsType="nfs" Others="" .../>
      <tInstPort PortId="3206/tcp" PortUsage="sapdpLCMCI06"/>
    </tInstance>
  </tAppl>
  <!-- Validated against /opt/ds4s/osdep/lcldb/dtd/ds4sapplications.dtd -->
</ds4sapplications>
```



DCS3 - ds4s-service

SERVICE SCRIPT

INVOCATION AS „<SID>ADM“

```
dcplnx19788573:~ # su - lcoadm
dcplnx19788573:lcoadm 51> ds4s-service
Main usage:
ds4s-service start          --id XXX_00_XX [--bind|--mount|--app]
ds4s-service stop          --id XXX_00_XX [--bind|--mount|--app]
ds4s-service status        --id XXX_00_XX
ds4s-service snapxconfig --id XXX_00_XX
ds4s-service cron          --id XXX_00_XX
ds4s-service types
ds4s-service --version|--usage|--man

dcplnx19788573:lcoadm 51>
```

- manpage:



service-script-manpage.txt

- output of a complete system restart:



lco-restart.txt



DCS3 - ds4s-service

```
dcplnx21530134:~ # su - qpiadm
dcplnx21530134 appusers/qpiadm% ds4s-service start --id QPI_25_DB --bind --mount
I:Bound takdbqpi2500a6 ip 2a00:da9:3:2161:111:0:125:47/64 on interface admin@dcplnx21530134
I:Bound takdbqpi2500s6 ip 2a00:da9:3:1160:111:0:125:47/64 on interface storage@dcplnx21530134
I:Bound takdbqpi2500s4 ip 164.22.0.89/20 on interface storage@dcplnx21530134
I:Bound takdbqpi2500c6 ip 2a00:da9:3:3162:111:0:125:47/64 on interface customer@dcplnx21530134
I:Bound takdbqpi2500c4 ip 10.200.3.225/22 on interface customer@dcplnx21530134

I:Sent feedback to eCMDB
I:Crontab scheduled
I:Mounted /oracle/QPI @dcplnx21530134
I:Mounted /oracle/QPI/archivepool @dcplnx21530134
I:Mounted /oracle/QPI/mirrlogA @dcplnx21530134
I:Mounted /oracle/QPI/mirrlogB @dcplnx21530134
I:Mounted /oracle/QPI/oraarch @dcplnx21530134
I:Mounted /oracle/QPI/origlogA @dcplnx21530134
I:Mounted /oracle/QPI/origlogB @dcplnx21530134
I:Mounted /oracle/QPI/saparch @dcplnx21530134
I:Mounted /oracle/QPI/sapbackup @dcplnx21530134
I:Mounted /oracle/QPI/sapdata1 @dcplnx21530134
I:Mounted /oracle/QPI/sapreorg @dcplnx21530134
I:Mounted /oracle/QPI/saptrace @dcplnx21530134
I:Mounted /sapmnt/QPI @dcplnx21530134
I:Mounted /usr/sap/QPI @dcplnx21530134
I:Updated /usr/sap/toolbox/snapx/configs/QPI.conf
dcplnx21530134 appusers/qpiadm% ds4s-service start --id QPI_25_CI --bind --mount
I:Bound takciqpi2500a6 ip 2a00:da9:3:2161:111:0:225:47/64 on interface admin@dcplnx21530134
I:Bound takciqpi2500s6 ip 2a00:da9:3:1160:111:0:225:47/64 on interface storage@dcplnx21530134
I:Bound takciqpi2500s4 ip 164.22.0.88/20 on interface storage@dcplnx21530134
I:Bound takciqpi2500c6 ip 2a00:da9:3:3162:111:0:225:47/64 on interface customer@dcplnx21530134
I:Bound takciqpi2500c4 ip 10.200.3.25/22 on interface customer@dcplnx21530134

I:Sent feedback to eCMDB
I:Crontab scheduled
I:Mounted /sapmnt/QPI @dcplnx21530134
I:Mounted /sapmnt/QPI/oraclient @dcplnx21530134
I:Mounted /usr/sap/QPI @dcplnx21530134
I:Mounted /usr/sap/interfaces @dcplnx21530134
I:Mounted /usr/sap/put @dcplnx21530134
I:Mounted /usr/sap/trans @dcplnx21530134
dcplnx21530134 appusers/qpiadm% Connection to frankfurt closed.
```



[illegible]