

# 102.4 Use debian package management

Curs 2021 - 2022

ASIX M01-ISO LPI 102-Linux\_installation\_and\_package\_management

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## Paquets amb dpkg i apt

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### Descripció

#### Conceptes clau:

- ☐ Paquets deb
- ☐ Paquets amb dpkg i apt
- ☐ Repositoris
- ☐ Paquets binaris i sources

#### Ordres a treballar:

- ☐ dpkg
- ☐ apt-get update
- ☐ apt-get install
- ☐ apt-get remove
- ☐ apt-get purge

- ❑ apt-get --only-upgrade
- ❑ apt-cache search
- ❑ apt-cache depends
- ❑ apt-cache show
- ❑ /etc/apt/sources.list
- ❑ apt-get upgrade
- ❑ apt-get clean

## Gestió de paquets amb dpkg i apt-get

### apt-get update i sources-list

- apt-get update carregar a memòria la llista actualitzada de paquets dels repositoris configurats.
- /etc/apt/sources.list fitxer de configuració dels repositoris

Package name:

```
package-name_version-release_architecture.deb
```

```
# apt-get update
```

```
# cat /etc/apt/sources.list
# deb cdrom:[Debian GNU/Linux 10.6.0 _Buster_ - Official amd64 DVD Binary-1
20200926-10:17]/ buster contrib main

#deb cdrom:[Debian GNU/Linux 10.6.0 _Buster_ - Official amd64 DVD Binary-1
20200926-10:17]/ buster contrib main

deb http://deb.debian.org/debian/ buster main
deb-src http://deb.debian.org/debian/ buster main

deb http://security.debian.org/debian-security buster/updates main contrib
deb-src http://security.debian.org/debian-security buster/updates main contrib

# buster-updates, previously known as 'volatile'
deb http://deb.debian.org/debian/ buster-updates main contrib
deb-src http://deb.debian.org/debian/ buster-updates main contrib
```

- Inside the /etc/apt/sources.list.d directory you can add files with additional repositories to be used by APT, without the need to modify the main /etc/apt/sources.list file. These are simple text files, with the same syntax described above and the .list file extension.

```
# ls -l /etc/apt/sources.list.d/
total 4
-rw-r--r-- 1 root root 131 oct 17 20:58 docker.list
```

The syntax is archive type, URL, distribution and one or more components, where:

[Archive type](#)

A repository may contain packages with ready-to-run software (binary packages, type deb) or with the source code to this software (source packages, type deb-src). The example above provides binary packages.

#### URL

The URL for the repository.

#### Distribution

The name (or codename) for the distribution for which packages are provided. One repository may host packages for multiple distributions. In the example above, disco is the codename for Ubuntu 19.04 Disco Dingo.

#### Components

Each component represents a set of packages. These components may be different on different Linux distributions. For example, on Debian and derivatives, they are:

##### main

consists of packages compliant with the Debian Free Software Guidelines (DFSG), which do not rely on software outside this area to operate. Packages included here are considered to be part of the Debian distribution.

##### contrib

contains DFSG-compliant packages, but which depend on other packages that are not in main.

##### non-free

contains packages that are not compliant with the DFSG.

##### security

contains security updates.

##### backports

contains more recent versions of packages that are in main. The development cycle of the stable versions of Debian is quite long (around two years), and this ensures that users can get the most up-to-date packages without having to modify the main core repository.

## dpkg

#### Accions:

- -i --install. Instal·la el paquet indicat.
- -r --remove. Elimina el paquet però no la seva configuració
- -P --purge. Elimina definitivament tot el contingut del paquet
- -L Llista el contingut del paquet.
  
- -l -l string --list. Llista els paquets instal·lats, tots o els del file-glob
- -s --status. Mostra informació general descriptiva del paquet.
- -l filelocal.deb Mostra informació d'un paquet (fitxer .deb local).
- -S pattern|file --search. Donat un fitxer o patró indica a quin paquet pertany (instal·lat).

```
# dpkg -i <nompaquet>
# dpkg --install <nompaquet>

# dpkg -r <nompaquet>
# dpkg --remove <nompaquet>

# dpkg -P <nompaquet>
# dpkg --purge <nompaquet>
```

```
# dpkg -l
Deseado=desconocido (U) /Instalar/eliminaR/Purgar/retener (H)
|Estado=No/Inst/ficheros-Conf/desempaUetado/medio-conf/medio-inst (H) /espera-disparo (W) /pendienTe-disparo
|/ Err?=(ninguno)/requiere-Reinst (Estado,Err: mayúsc.=malo)
|/ Nombre Versión Arquitectura Descripción
+++-----
```

Nombre	Versión	Arquitectura	Descripción
ii accountsservice	0.6.45-2	amd64	query and manipulate user account
information			
ii acl	2.2.53-4	amd64	access control list - utilities
ii adduser	3.118	all	add and remove users and groups
ii adwaita-icon-theme	3.30.1-1	all	default icon theme of GNOME
ii aisleriot	1:3.22.7-2	amd64	GNOME solitaire card game collection
ii alsa-utils	1.1.8-2	amd64	Utilities for configuring and using
ALSA			
ii anacron	2.3-28	amd64	cron-like program that doesn't go by
time			
ii apache2-bin	2.4.38-3+deb10u4	amd64	Apache HTTP Server (modules and other
binary files)			
ii apg	2.2.3.dfsg.1-5	amd64	Automated Password Generator -
Standalone version			
ii apparmor	2.13.2-10	amd64	user-space parser utility for AppArmor
ii appstream	0.12.5-1	amd64	Software component metadata management
ii apt	1.8.2.1	amd64	commandline package manager
ii apt-config-icons	0.12.5-1	all	APT configuration snippet to enable
icon downloads			
ii apt-listchanges	3.19	all	package change history notification
tool			
ii apt-utils	1.8.2.1	amd64	package management related utility
programs			

- The first letter reflects the desired status of the package, which can be i for installed, u for unknown, r for remove or h for hold.
- The second letter represents the actual status of the package, where i means installed, and n means not installed.
- The most common two-letter codes are **ii** for fully installed and **un** for not installed.

```
# dpkg -l apt*
Deseado=desconocido (U) /Instalar/eliminaR/Purgar/retener (H)
|Estado=No/Inst/ficheros-Conf/desempaUetado/medio-conf/medio-inst (H) /espera-disparo (W) /pendienTe-dispar
|/ Err?=(ninguno)/requiere-Reinst (Estado,Err: mayúsc.=malo)
|/ Nombre Versión Arquitectura Descripción
+++-----
```

Nombre	Versión	Arquitectura	Descripción
ii apt	1.8.2.1	amd64	commandline package manager
ii apt-config-icons	0.12.5-1	all	APT configuration snippet to enable icon downloads
un apt-config-icons-hidpi	<ninguna>	<ninguna>	(no hay ninguna descripción disponible)
un apt-doc	<ninguna>	<ninguna>	(no hay ninguna descripción disponible)
ii apt-listchanges	3.19	all	package change history notification tool
un apt-show-versions	<ninguna>	<ninguna>	(no hay ninguna descripción disponible)
un apt-transport-https	<ninguna>	<ninguna>	(no hay ninguna descripción disponible)
ii apt-utils	1.8.2.1	amd64	package management related utility programs
un aptitude	<ninguna>	<ninguna>	(no hay ninguna descripción disponible)

```
# dpkg -s tree
Package: tree
Status: install ok installed
Priority: optional
Section: utils
Installed-Size: 114
Maintainer: Florian Ernst <florian@debian.org>
Architecture: amd64
Version: 1.8.0-1
Depends: libc6 (>= 2.4)
Description: displays an indented directory tree, in color
Tree is a recursive directory listing command that produces a depth indented
listing of files, which is colorized ala dircolors if the LS_COLORS environment
variable is set and output is to tty.
Homepage: http://mama.indstate.edu/users/ice/tree/
```

```
# dpkg -L tree
/.
/usr
/usr/bin
/usr/bin/tree
/usr/share
/usr/share/doc
/usr/share/doc/tree
/usr/share/doc/tree/README.gz
/usr/share/doc/tree/TODOL
/usr/share/doc/tree/changelog.Debian.gz
/usr/share/doc/tree/changelog.gz
/usr/share/doc/tree/copyright
/usr/share/man
/usr/share/man/man1
/usr/share/man/man1/tree.1.gz
```

```
# dpkg -S /bin/date
coreutils: /bin/date

# dpkg -S passwd
grub-common: /usr/bin/grub-mkpasswd-pbkdf2
base-passwd: /usr/share/man/ru/man8/update-passwd.8.gz
grub-common: /usr/share/man/man1/grub-mkpasswd-pbkdf2.1.gz
samba-libs:amd64: /usr/lib/x86_64-linux-gnu/samba/libsmbpasswdparser.so.0
passwd: /usr/share/man/tr/man5/passwd.5.gz
augeas-lenses: /usr/share/augeas/lenses/dist/masterpasswd.aug
passwd: /usr/share/man/zh_TW/man8/chpasswd.8.gz
exim4-config: /usr/share/man/man5/exim4_passwd.5.gz
passwd: /usr/share/man/cs/man1/gpasswd.1.gz
...
```

- Tornar a executar la part de configuració d'un paquet ja instal·lat.

```
# dpkg-reconfigure <nompaquet>
[reconfigura de nou el paquet, ja instal·lat però torna a executar-ne el procés de
configuració]

# dpkg-reconfigure tzdata
Current default time zone: 'Europe/Madrid'
Local time is now:      Mon Oct 18 17:21:50 CEST 2021.
Universal Time is now:  Mon Oct 18 15:21:50 UTC 2021.
```

## apt-cache

- use `apt-cache search` followed by a search pattern. The output will be a list of every package that contains the pattern, either in its package name, description or files provided.

```
# apt-cache search xinetd
update-inetd - Actualizador del archivo de configuración de inetd
globus-gfork-progs - Grid Community Toolkit - GFork Programs
puppet-module-puppetlabs-tftpd - Puppet module for managing tftpd-hpa
puppet-module-puppetlabs-xinetd - Puppet module for xinetd
resource-agents - Cluster Resource Agents
rlinetd - gruesomely over-featured inetd replacement
rush - restricted user shell
xinetd - replacement for inetd with many enhancements
yasat - simple stupid audit tool
```

```
# apt-cache depends tree
```

```
tree
```

```
Depende: libc6
```

```
# apt-cache depends nmap
```

```
nmap
```

```
Depende: nmap-common
```

```
Depende: libc6
```

```
Depende: libgcc1
```

```
Depende: liblinear3
```

```
Depende: liblua5.3-0
```

```
Depende: libpcap0.8
```

```
Depende: libpcr3
```

```
Depende: libssh2-1
```

```
Depende: libssl1.1
```

```
Depende: libstdc++6
```

```
Depende: zlib1g
```

```
Sugiere: ncat
```

```
Sugiere: ndiff
```

```
Sugiere: zenmap
```

```
# apt-cache show xinetd
```

```
Package: xinetd
```

```
Version: 1:2.3.15.3-1
```

```
Installed-Size: 319
```

```
Maintainer: Salvo 'LtWorf' Tomaselli <tiposchi@tiscali.it>
```

```
Architecture: amd64
```

```
Provides: inet-superserver
```

```
Depends: libc6 (>= 2.14), libselinux1 (>= 1.32), libwrap0 (>= 7.6-4~), netbase, lsb-base (>= 3.0-6)
```

```
Recommends: rsyslog | system-log-daemon, logrotate, update-inetd
```

```
Conflicts: inet-superserver
```

```
Description-en: replacement for inetd with many enhancements
```

```
  xinetd has access control mechanisms, extensive logging capabilities,  
  the ability to make services available based on time, and can place  
  limits on the number of servers that can be started, among other things.
```

```
.
```

```
  It has the ability to redirect TCP streams to a remote host and port.  
  This is useful for those of that use IP masquerading, or NAT, and want  
  to be able to reach your internal hosts.
```

```
.
```

```
  It also has the ability to bind specific services to specific interfaces.  
  This is useful when you want to make services available for your internal  
  network, but not the rest of the world. Or to have a different service  
  running on the same port, but different interfaces.
```

```
Description-md5: dc305c474ff901c52b71c07c0ec109d0
```

```
Homepage: https://github.com/openSUSE/xinetd
```

```
Tag: interface::daemon, network::server, network::service, role::program
```

```
Section: net
```

```
Priority: optional
```

```
Filename: pool/main/x/xinetd/xinetd_2.3.15.3-1_amd64.deb
```

```
Size: 133360
```

```
MD5sum: db5d1f6228ccc91f0addb4e51d31edc8
```

```
SHA256: 48382ccf1ce880fed5742b324396f0c9218afad3511ca714053ecdb31c446f5c
```

## apt-get

```
# apt-get install nmap
```

```
Leyendo lista de paquetes... Hecho
```

```
Creando árbol de dependencias
```

```
Leyendo la información de estado... Hecho
```

```
nmap ya está en su versión más reciente (7.70+dfsg1-6+deb10u2).
```

```
0 actualizados, 0 nuevos se instalarán, 0 para eliminar y 206 no actualizados.
```

```
# apt-get install xinetd
```

```
Leyendo lista de paquetes... Hecho
```

```
Creando árbol de dependencias
```

```
Leyendo la información de estado... Hecho
```

```
Se instalarán los siguientes paquetes NUEVOS:
```

```
  xinetd
```

```
0 actualizados, 1 nuevos se instalarán, 0 para eliminar y 206 no actualizados.
```

```
Se necesita descargar 133 kB de archivos.
```

```
Se utilizarán 327 kB de espacio de disco adicional después de esta operación.
```

```
Des:1 http://deb.debian.org/debian buster/main amd64 xinetd amd64 1:2.3.15.3-1 [133 kB]
```

```
Descargados 133 kB en 0s (7.285 kB/s)
```

```
Seleccionando el paquete xinetd previamente no seleccionado.
(Leyendo la base de datos ... 147568 ficheros o directorios instalados actualmente.)
Preparando para desempaquetar .../xinetd_1%3a2.3.15.3-1_amd64.deb ...
Desempaquetando xinetd (1:2.3.15.3-1) ...
Configurando xinetd (1:2.3.15.3-1) ...
Procesando disparadores para man-db (2.8.5-2) ...
Procesando disparadores para systemd (241-7~deb10u4) ...
```

```
# apt-get remove xinetd
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
Los siguientes paquetes se ELIMINARÁN:
  xinetd
0 actualizados, 0 nuevos se instalarán, 1 para eliminar y 206 no actualizados.
Se liberarán 327 kB después de esta operación.
¿Desea continuar? [S/n] s
(Leyendo la base de datos ... 147605 ficheros o directorios instalados actualmente.)
Desinstalando xinetd (1:2.3.15.3-1) ...
Procesando disparadores para man-db (2.8.5-2) ...
```

```
# apt-get purge xinetd
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
Los siguientes paquetes se ELIMINARÁN:
  xinetd*
0 actualizados, 0 nuevos se instalarán, 1 para eliminar y 206 no actualizados.
Se utilizarán 0 B de espacio de disco adicional después de esta operación.
¿Desea continuar? [S/n] s
(Leyendo la base de datos ... 147583 ficheros o directorios instalados actualmente.)
Purgando ficheros de configuración de xinetd (1:2.3.15.3-1) ...
Procesando disparadores para systemd (241-7~deb10u4) ...
```

```
# apt-get --only-upgrade install xinetd
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
Omitiendo xinetd, no está instalado y solo se están solicitando actualizaciones.
0 actualizados, 0 nuevos se instalarán, 0 para eliminar y 206 no actualizados.

# apt-get --only-upgrade install nmap
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
nmap ya está en su versión más reciente (7.70+dfsg1-6+deb10u2).
0 actualizados, 0 nuevos se instalarán, 0 para eliminar y 206 no actualizados.
```

## Upgrade all the system

```
# apt-get update
# apt-get upgrade
```

## Verificar el checksum

- tenim localment el fitxer origen i el fitxer amb el checksum.

```
# md5sum -c file.md5
# sha256sum -c anyfile.sha256
```

<https://cloud.debian.org/images/cloud/buster/latest/SHA512SUMS>

```
b049f0d78defcaf1d5fe2c1c25791744e0d063a417b66547d29397ca71bd1f3d1c7878cd76fa81bbc71a35f4
5a12636381867b0015ca695762092980bffb2c5e  debian-10-nocloud-amd64.qcow2
```

## Cache: /var/cache/apt/archives

```
# ls -l /var/cache/apt/archives/ | head
total 498848
-rw-r--r-- 1 root root 1307844 sep 30 16:25 apache2-bin_2.4.38-3+deb10u6_amd64.deb
-rw-r--r-- 1 root root 1418424 abr 19 22:42 apt_1.8.2.3_amd64.deb
-rw-r--r-- 1 root root 149384 abr 19 22:27 apt-transport-https_1.8.2.3_all.deb
-rw-r--r-- 1 root root 421144 abr 19 22:42 apt-utils_1.8.2.3_amd64.deb
-rw-r--r-- 1 root root 225740 jul 31 01:15 aspell_0.60.7~20110707-6+deb10u1_amd64.deb
-rw-r--r-- 1 root root 41404 mar 2 2019 attr_1%3a2.4.48-4_amd64.deb
-rw-r--r-- 1 root root 441696 ene 24 2019 augeas-lenses_1.11.0-3_all.deb
-rw-r--r-- 1 root root 93008 feb 14 2021 avahi-daemon_0.7-4+deb10u1_amd64.deb
-rw-r--r-- 1 root root 69920 oct 3 16:40 base-files_10.3+deb10u11_amd64.deb

# ls -l /var/cache/apt/archives/ | wc -l
370

# apt-get clean

# ls -l /var/cache/apt/archives/ | wc -l
3
```

## Repositories contrib i nonfree

- Afegir al final dels repositoris (no cal en els deb-src) les paraules contrib i non-free.
- Són repositoris amb software que no és free.

/etc/apt/sources.list

```
deb http://ftp.calui.cat/debian/ bullseye main contrib non-free
...

deb http://security.debian.org/debian-security bullseye-security main contrib non-free
...
deb http://ftp.calui.cat/debian/ bullseye-updates main contrib non-free
...
```

```
# apt-update
bash: apt-update: orden no encontrada
# apt-get update
Obj:1 http://deb.debian.org/debian buster InRelease
Obj:2 http://deb.debian.org/debian buster-updates InRelease
Obj:3 http://security.debian.org/debian-security buster/updates InRelease
Des:4 http://deb.debian.org/debian buster/non-free amd64 Packages [87,7 kB]
Des:5 http://deb.debian.org/debian buster/non-free Translation-en [88,8 kB]
Des:6 http://deb.debian.org/debian buster/non-free amd64 DEP-11 Metadata [9.096 B]
Des:7 http://deb.debian.org/debian buster/non-free DEP-11 48x48 Icons [3.491 B]
Des:8 http://deb.debian.org/debian buster/non-free DEP-11 64x64 Icons [38,3 kB]
Des:9 http://security.debian.org/debian-security buster/updates/non-free amd64 Packages
[556 B]
Des:10 http://security.debian.org/debian-security buster/updates/non-free Translation-en
[344 B]
```



```
Descargados 228 kB en 1s (412 kB/s)
Leyendo lista de paquetes... Hecho
```

## Pràctica instal·lar Docker per Debian

<https://docs.docker.com/engine/install/debian/>

```
# sudo apt-get update

# sudo apt-get install apt-transport-https ca-certificates curl gnupg lsb-release

# curl -fsSL https://download.docker.com/linux/debian/gpg | sudo gpg --dearmor -o
/usr/share/keyrings/docker-archive-keyring.gpg

# echo \
"deb [arch=$(dpkg --print-architecture)
signed-by=/usr/share/keyrings/docker-archive-keyring.gpg]
https://download.docker.com/linux/debian \
$(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list >
/dev/null

# apt-get update

# apt-get install docker-ce docker-ce-cli containerd.io

# docker run hello-world
```

```
# ls /etc/apt/sources.list.d/
docker.list

# cat /etc/apt/sources.list.d/docker.list
deb [arch=amd64 signed-by=/usr/share/keyrings/docker-archive-keyring.gpg]
https://download.docker.com/linux/debian buster stable
```

```
# docker run --rm -h myfedora -it fedora:32 /bin/bash

# docker run --rm -h myubuntu -it ubuntu /bin/bash

# docker run --rm -h mydeb -it debian /bin/bash
```

## Exercicis d'exemple

1. Which command actualizes the apt cache information?
2. Install the geany and pwgen packages
3. List all installed packages.
4. Show the geany package information.
5. Show the contents of the pwgen package.
6. Which package contains the /usr/bin/passwd file?
7. reconfigure the package tzdata.

8. Search for packages with the name ldap-utils.
9. Show information about the ldap-utils package.
10. Show the dependencies of the ldap-utils package.
11. Show the file containing the repository configurations.
12. Purge the package geany.
13. Local download the geany package and install it.
14. Install the repositories contrib and non-free.
15. Install docker for Debian.
16. Realitza els exercicis indicats a:  
[https://learning.lpi.org/en/learning-materials/101-500/102/102.4/102.4\\_01/](https://learning.lpi.org/en/learning-materials/101-500/102/102.4/102.4_01/)
17. Realitza els exercicis del Question-Topics 102.4.