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PACKAGE INSTALLATION

Packet Installation

Linux is constantly in development. What applies to the kernel, is also true of the countless number of additonal packages. Every day various programs are updated and require updates. It's easy with the right package management tools for RPM and Debian packages.



Debian

Using *dselect* it is possible to select, install, configure and cleanly delete **Debian packages**. So much for the short version, but what really goes on, in and behind this program? First of all, it's important that a specific sequence of work steps is proposed. If you want to cleanly install or delete individual packages, you should not omit any of these steps:

- Updating available packages
- Selection of packages to be installed or deleted
- Installation and updating
- Configuration (where necessary)
- Uninstalling the packages to be deleted As soon as one of these work steps has been successfully completed, *dselect* jumps automatically to the next point. Before you start the

program for the first time (which by the way goes in an *xterm* exactly as on the console) ensure that you are *root*. If you forget, the program will remind you – *Read-only access: only preview of selections is available!*

First retrieval – step by step through the menu

If you start the program as *root*, you will see a listing of the possible actions. The seven items are quickly explained: *[A]ccess* tells the program where to look for the Debian packages. The default is *apt*, but *ftp*, *nfs* or *floppy* are also possible. Using *[U]pdate* the package directories are read from the previously-specified source, with *[S]elect* you choose from the selection. In the penultimate step, *[I]nstall*, the program is used which was previously specified

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under [A]ccess. To resolve the problem of dependencies of Debian packages, [I]nstall and [C]onfig work hand in hand. Packages that could not be correctly configured during installation, are here "processed" once again. [R]emove tkes out any packages no longer needed, [Q]uit ends the program.

The key to the door...

For the third step (the selection of packages) you should remember a few important keyboard commands with which you can navigate rapidly and surely through the program. If you confirm the item *[S]elect* with the return key, it can take a moment before the next page is displayed – have a bit of patience, especially with slower computers. The first help page appears. In the bottom line you can see how it continues. With ? you can get help at any time. With the space bar you leave it again. The full stop is used for paging. Now activate the space bar to get to the *main package listing* (see Figure 1).

You can confirm the selection at any time and return to the main menu by pressing the return key. Before you get cracking, take a closer look at the window. In the top lines, the most important keyboard commands are listed for use (see Table 1):In the second ine, next to the letters *EIOM* ("Error", "Installed", "Old" – old marking, "Marked" – present marking) you will also see details on the priority (e.g. "Required" or "Optional"), the installed version, whether a more recent one is available and a longer description of the package. Too many symbols? This can all be easily explained using an example:

EIOM Pri Sectio	n Package	Inst.ver	Avai 7
l.ver Descrip	tion		
*** Opt admin	sudo	1.6.2p2-1	1.6.7
2p2-1 Provide	s limited		

The solution to the puzzle: There is no error in the package "sudo", it is installed and still selected. If you would like to uninstall it, type in, as shown above, - or _ (see Table 1). Now the marking has been removed:

EIOM pri Section Package Inst.ver Avai 1.ver Description ... **- Opt admin sudo 1.6.2p2-1 1.6.2 2p2-1 Provides limited ...

It can sometimes happen that a package needs another one. In that case, after selection the screen content changes with +. In the top line of the help menu it should say *Help: Introduction to conflict/dependency resolution sub-list*. Press the space bar, and you will see which conflicts with other packages arise or which should be additionally installed. At this point, packages which you do not wish to install can be proposed ("suggests"). Using the command Q you can force *dselect* to suppress such messages. Always bear in mind that Linux systems do exactly what the Debian package: This generic term combines all necessarv information on installation. uninstallation and execution of programs. The file names are composed as follows: packagename (e.g. xskat), version number and file ending .deb. So the file is called: xskat_3.2-1.deb. **Apt:** Stands for **A**dvanced Package Tool. This is in fact a whole system of tools for retrieving, installing and deleting packages. Using the Apt functions, complete system updates can be performed. Buffer memories can be installed and managed for packages.

Fig. 1: Package selection by *dselect*



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Fig. 2: *kpackage* can be used on either RPM or Debianbased systems administrator tells them. If you want to play safe, it's best to accept the system defaults. If you have finished selecting all packets, press Return to go back to the main menu.

If you now go to the item [I]nstall and confirm with Return, you will see that something is happening on the command line:

asteroid:># dselect
Reading Package Lists... Done
Building Dependency Tree... Done
The following NEW packages will be installed:
 libgdlg libwxxtl linuxconf linuxconf-i18n 1
 inuxconf-x
0 packages upgraded, 5 newly installed,0 to 7
remove and 0 not upgraded.
Need to get 0B/3744kB of archives. After unpa7
cking 13.5MB will be used.
Do you want to continue? [Y/N]

Here you can thus check again whether you have correctly selected everything. If so, type *y* and you will be asked about the installation medium, (CD-ROM for example). During the installation status messages will be output on the console:

23% [Working]
(Reading database ...
Unpacking libgdlg (from .../libs/libgdlg_1.77
.3-0.1.deb) ...
Setting up libgdlg (1.7.30.1) ...

Table 1: Keyboard commands in main selection				
Key	definition			
+	selects the package			
=	replaces the package			
-	deletes the package			
_	deletes the package with its configuration files			
v	switches between more detailed and briefer display			
d	pages down the long description of the package			
u	pages up the long description of the package			
L	changes the distribution of the screen			

Now *dselect* jumps to the *[C]onfig* item. Here again you should press Return, and on it goes. Again a message appears on the command line:

running dpkg --pending --configure ...

A similar message appears at the menu item *[R]emove*:

running dpkg --pending --remove ...

These messages will be explained in the next section.

Glimpse behind the scenes

If you take a look at the man page of *dpkg*, it says: *dpkg* – *a medium-level package manager for Debian GNU/Linux*. This program is the actual package tool of Debian, *dselect* is a frontend to it. Unlike *dselect* it works completely on the command line. It also offers more powerful options. If you have downloaded the file *xskat_3.2-1.deb* from the Internet, you can investigate this in detail before you begin with the installation. For example try out *dpkg -c xskat_3.2-1.deb*. The parameter *-c* (short for *--contents*) shows you exactly which components would be filed:

lrwxr-xr-x root/root	0 1999-10-10 17:4
):54 usr/	
lrwxr-xr-x root/root	0 1999-10-10 17:4
):55 usr/games/	
-rwxr-xr-x root/root	341872 1999-10-10 17:7
10:55 usr/games/xskat	
lrwxr-xr-x root/root	0 1999-10-10 17:4 2
):54 usr/share/	

'Not sure whether you have already installed the package? The call *dpkg -s xskat* gives information on the package name, status (either cleanly deleted or never installed), priority (necessary or optional) an associated domain (e.g. *games*). If you would now like to install the game XSkat, you can check whether everything will run smoothly first. Try *dpkg --no-act -i xskat_3.2-1.deb* and the system will tell you about potential dependency problems. Everything has gone smoothly? Leave out the option *--no-act* in the next call, and you will get the same messages on the command line as with *dselect*.

And for uninstalling, you can use *dpkg*. Here again you need to decide if you want to completely delete the configuration files. If so, use the call *dpkg -P* packagename (short for *--purge*). If the settings under */etc* remain, select *dpkg -r* (for *--remove*).

RPM

Just as Debian's package tools all implement the command line program *dpkg*, in **RPM**-based distributions, too, there is a basic management tool for the console, which significantly enough is

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known as *rpm*. It offers options with similar performance to *dpkg*, with which you can install, delete or update packages. The most important ones of these are:

rpm -i package-1.23-1.i386.rpm rpm -U package-1.23-1.i386.rpm rpm -e package

With the first option "-i" (short for "--install") of rpm a package is newly installed, which is not yet on the computer. Here the full file name of the RPM package must be specified. Correspondingly rpm when using the option "-U" executes a package update. An installed package is thus replaced with more recent version. rpm ensures at this point that the old version has first been completely deleted. This update option, by the way, functions even when no older version exists. You can generally use "-U" instead of "-i". In the third command call, a package is to be removed ("-e" for "--erase"). Only the basic name of the package without version numbers needs to be specified. RPM packages always have names of the form packet-1.23-1.i386.rpm. "1.23" in this case is the version number of the program, the "-1" specifies how many times an RPM package has been built from the sources, and "i386" designates the processor architecture, for which the packet was compiled. Useful additional options for installation with *rpm* are "--nodeps" and "--force": the first forces *rpm* to ignore package dependencies (e.g. required libraries) and to install a package even when a requisite additional package is not available. With the second you can instruct rpm to ignore package conflicts and install the package even if this would mean overwriting files of the same name from another package. A command in the form,

rpm -U --nodeps --force package-1.23-1.rpm

should thus always lead to installation. You should weigh up the consequences first, if a simple "rpm -U package..." brought an error message.

rpm also gives an overview of installed packages without any great fuss. With *rpm* -qa you get a list of all packages on the system, *rpm* -q *packagename* displays whether a specific package exists. If so, with *rpm* -qi package you get more information on the package, and *rpm* -qil package additionally issues a list of all files forming part of the package.

Graphical RPM tools

For the two popular desktop systems KDE and GNOME, there environments are easy to use RPM package tool. These are called *kpackage* (KDE) and *gnorpm* (GNOME). With these package tools you have access to frontends which display an overview listing installed packages and (like *rpm* itself) allow installation, updating, and deletion of packages. Both tools also offer the option of ignoring dependencies or package conflicts, but doesn't



have the entire functional range of the powerful *rpm* program.

For RPM professionals: rpmlevel

Anyone familiar with he command line tool *rpm* should also take a look at *rpmlevel* (Homepage: *http://www.coralys.com/products/rpmlevel.shtml*, Download: ftp://coralys.com/pub/free/rpmlevel-1.2-1.noarch.rpm – it offers an expansion of the range of functions of *rpm* and at the same time takes into account all changes with respect to the first installation of the distribution. This means that you can always get an overview on how far your current system differs from the original system with *rpmlevel*. It's also easy to update all installed packages.

rpmlevel --sync redhat61

performs all necessary updates on a Red Hat 6.1 system; with

rpmlevel --report u redhat61

you get a list of all packages which have been updated since first installation.

So much more...

In this article we have only been able to take a brief look at the multiplicity of functions of package management tools. In a quiet moment, have a look at all the options of this program (in the case of *rpm, dselect* and *dpkg* in the respective man pages, or else in the online help). Experiment with them a bit. It's good to know that under Linux you can retain control over all installed software, and it makes no difference whether your distribution is Debian or RPMbased. Fig. 3: The name is program: *gnorpm* works only with RPM packages

RPM: The Red Hat Package Manager is the package management tool created by the distributor Red Hat. It is used by almost all the "big" distributions (apart from Debian and the classic Slackware). RPM does however also stand for the packageformat itself; so RPM packages always end in .rpm.