

apt vs. apt-get

The **apt** command-line utility is a successor to the well known **apt-get**, offering simpler installation and maintenance for the DEB packages used with Debian, Ubuntu, Knoppix, and many other Linux distros. BY FERDINAND THOMMES

The Debian package management infrastructure is a simple yet powerful system that has been a distinguishing feature of Debian since the project's early years. At the core of the Debian package management is **dpkg** [1], a low-level tool used for installing and removing Debian **.deb** packages. The bigger and more comprehensive Advanced Package Tool (APT) [2] is a higher-level tool that includes **dpkg** on the back end. APT performs most of the other functions associated with a package management system, including integrating external repositories.

The APT package system supports a number of front-end applications, both command-line and GUI-based, that act as a user-friendly interface for managing Debian packages. In the past, most users who wanted to work at the command line depended on the classic **apt-get** tool as an interface to the Debian package system. Through the years, **apt-get** and a constellation of other supporting utilities, such as **apt-cache**, have provided

nearly effortless package management for Debian users, as well as users of Debian-based distros like Ubuntu and Knoppix, who take the time to master the commands.

However, some users were not happy about the complex, and often confusing, system of **apt-get** commands and options. Since the release of Debian 8 "Jessie" and Ubuntu 16.04 "Xenial Xerus," all users of Debian-based systems can enjoy a new command-line interface to the APT system: **apt**. The **apt** utility consolidates features that were once spread among **apt-get**, **apt-cache**, and other commands, and it simplifies many of the command options for an easier and friendlier user experience.

The **apt** utility has been used in the Debian "Unstable" edition since 2014, and it became official with Debian 8. Because **apt-get** still works in recent releases of Debian and other Debian-based distros, many users have not taken the time to learn about **apt**. This article introduces the **apt**

Table 1: Differences

Function	apt-get	apt
Install package	<code>apt-get install <package></code>	<code>apt install <package></code>
Remove package	<code>apt-get remove <package></code>	<code>apt remove <package></code>
Remove package including configuration	<code>apt-get purge <package></code>	<code>apt purge <package></code>
Update sources	<code>apt-get update</code>	<code>apt update</code>
Update packages (without removing or reinstalling)	<code>apt-get upgrade</code>	<code>apt upgrade¹</code>
Update packages (with removing and reinstalling)	<code>apt-get dist-upgrade</code>	<code>apt full-upgrade</code>
Remove unnecessary dependencies	<code>apt-get autoremove</code>	<code>apt autoremove</code>
Search package	<code>apt-get search <package></code>	<code>apt search <package></code>
Display package information	<code>apt-cache show <package></code>	<code>apt show <package></code>
Display active package sources in detail	<code>apt-cache policy</code>	<code>apt policy</code>
Display available and installed package versions	<code>apt-cache policy <package></code>	<code>apt policy <package></code>
New Commands		
Edit packages sources	—	<code>apt edit-sources</code>
List packages by criteria	<code>dpkg --get-selections > list.txt</code>	<code>apt list</code>
Set/change package status	<code>echo <package> hold dpkg --set-selections</code>	<code>apt-mark <package></code>

¹ Corresponds to `apt-get upgrade --install new-pkgs`

package management tool and explores some of the differences between apt and apt-get.

Note: The apt tool discussed in this article is not the same as the apt Python wrapper created by Linux Mint developers a few years ago.

apt vs apt-get

apt does not guarantee downwards-compatibility with apt-get, but many (though not all) command options are interchangeable. For a full comparison, type `apt --help` and `apt-get --help` and compare the results.

Table 1 shows some of the important commands side by side. As you can see, many commands are the same if you just exchange `apt-get` for `apt`. One exception is the `apt upgrade` command. The old command: `apt-get upgrade` installed the latest versions of all packages currently installed on the system from the repository, but it didn't remove existing packages or retroactively add dependencies. The new `apt upgrade` installs new packages when they are added as

```
root@dd-ubu1704d-x64-vm: /home/dd#
root@dd-ubu1704d-x64-vm:/home/dd# apt-get update
Hit:1 http://security.ubuntu.com/ubuntu zesty-security InRelease
Hit:2 http://us.archive.ubuntu.com/ubuntu zesty InRelease
Hit:3 http://us.archive.ubuntu.com/ubuntu zesty-updates InRelease
Hit:4 http://us.archive.ubuntu.com/ubuntu zesty-backports InRelease
Reading package lists... Done
root@dd-ubu1704d-x64-vm:/home/dd#
```

Figure 1: Use `apt-get update` to update the lists using the packages provided by the repository, but do not expect to see any additional information.

```
root@dd-ubu1704d-x64-vm: /home/dd#
root@dd-ubu1704d-x64-vm:/home/dd# apt-get update
Hit:1 http://security.ubuntu.com/ubuntu zesty-security InRelease
Hit:2 http://us.archive.ubuntu.com/ubuntu zesty InRelease
Hit:3 http://us.archive.ubuntu.com/ubuntu zesty-updates InRelease
Hit:4 http://us.archive.ubuntu.com/ubuntu zesty-backports InRelease
Reading package lists... Done
root@dd-ubu1704d-x64-vm:/home/dd#
```

Figure 2: The `apt update` command not only updates the package lists, but also shows you if and how many new versions of the packages exist in the repository.

```
root@dd-ubu1704d-x64-vm: /home/dd#
root@dd-ubu1704d-x64-vm:/home/dd#
root@dd-ubu1704d-x64-vm:/home/dd# apt list --upgradable
Listing... Done
/zesty-updates,zesty-updates 2.20.4-0ubuntu4.9 all [upgradable from: 2.20.4-0ubuntu4]
/zesty-updates,zesty-updates 2.20.4-0ubuntu4.9 all [upgradable from: 2.20.4-0ubuntu4]
/zesty-updates 1.4.6-17.04.1 amd64 [upgradable from: 1.4]
/zesty-updates 1:9.10.3.dfsg.P4-10.1ubuntu5.3 amd64 [upgradable from: 1:9.10.3.dfsg.P4-10.1ubuntu4]
/zesty-updates,zesty-security 5.43-0ubuntu1.1 amd64 [upgradable from: 5.43-0ubuntu1]
/zesty-updates,zesty-security 5.43-0ubuntu1.1 amd64 [upgradable from: 5.43-0ubuntu1]
/zesty-updates,zesty-updates,zesty-security,zesty-security 20170717-17.04.1 all [upgradable from: 20161130]
/zesty-updates 2.9.2-3ubuntu1 amd64 [upgradable from: 2.9.2-3]
/zesty-updates,zesty-security 7.52.1-4ubuntu1.4 amd64 [upgradable from: 7.52.1-4ubuntu1]
/zesty-updates,zesty-updates 0.33ubuntu0.3 all [upgradable from: 0.33]
/zesty-updates 1:9.10.3.dfsg.P4-10.1ubuntu5.3 amd64 [upgradable from: 1:9.10.3.dfsg.P4-10.1ubuntu4]
/zesty-updates,zesty-security 3.24.0-0ubuntu1.3 amd64 [upgradable from: 3.24.0-0ubuntu1]
/zesty-updates,zesty-updates,zesty-security,zesty-security 3.24.0-0ubuntu1.3 all [upgradable from: 3.24.0-0ubuntu1]
/zesty-updates,zesty-security 1:5.29-3ubuntu0.1 amd64 [upgradable from: 1:5.29-3]
/zesty-updates,zesty-security 57.0.1+build2-0ubuntu0.17.04.1 amd64 [upgradable from: 52.0.1+build2-0ubuntu1]
/zesty-updates 0.8.1-3ubuntu0.1 amd64 [upgradable from: 0.8.1-3]
/zesty-updates,zesty-security 7.12.50.20170314-0ubuntu1.1 amd64 [upgradable from: 7.12.50.20170314-0ubuntu1]
/zesty-updates,zesty-security 7.12.50.20170314-0ubuntu1.1 amd64 [upgradable from: 7.12.50.20170314-0ubuntu1]
/zesty-updates,zesty-security 9.19-dfsg+1-0ubuntu7.6 amd64 [upgradable from: 9.19-dfsg+1-0ubuntu7.1]
/zesty-updates,zesty-security 9.19-dfsg+1-0ubuntu7.6 amd64 [upgradable from: 9.19-dfsg+1-0ubuntu7.1]
/zesty-updates,zesty-security 2.36.5-3ubuntu0.2 amd64 [upgradable from: 2.36.5-3]
/zesty-updates,zesty-security 2.18.3-0ubuntu0.17.04.1 amd64 [upgradable from: 2.16.1-1]
/zesty-updates,zesty-security 2.56.0-2ubuntu0.1 amd64 [upgradable from: 2.56.0-2]
/zesty-updates,zesty-security 2.18.3-0ubuntu0.17.04.1 amd64 [upgradable from: 2.16.1-1]
/zesty-updates 3.24.2-0ubuntu0.1 amd64 [upgradable from: 3.24.0-0ubuntu1]
/zesty-updates,zesty-updates 3.24.2-0ubuntu0.1 all [upgradable from: 3.24.0-0ubuntu1]
/zesty-updates,zesty-updates 3.24.2-0ubuntu0.1 all [upgradable from: 3.24.0-0ubuntu2]
/zesty-updates 3.22.7-0ubuntu3.17.04.7 amd64 [upgradable from: 3.22.7-0ubuntu3]
/zesty-updates,zesty-updates 3.22.7-0ubuntu3.17.04.7 all [upgradable from: 3.22.7-0ubuntu3]
/zesty-updates 3.22.7-0ubuntu3.17.04.7 amd64 [upgradable from: 3.22.7-0ubuntu3]
/zesty-updates 2.02-beta3-4ubuntu2.2 amd64 [upgradable from: 2.02-beta3-4ubuntu2]
/zesty-updates 2.02-beta3-4ubuntu2.2 amd64 [upgradable from: 2.02-beta3-4ubuntu2]
/zesty-updates 2.02-beta3-4ubuntu2.2 amd64 [upgradable from: 2.02-beta3-4ubuntu2]
/zesty-updates,zesty-security 8:6.9.7.4+dfsg-3ubuntu1.2 amd64 [upgradable from: 8:6.9.7.4+dfsg-
```

Figure 3: Use `apt list --upgradable` to provide some color for a better overview of the packages for which the repository provides a more recent version.

```

root@dd-ubu1704d-x64-vm: /home/dd
Preparing to unpack .../apt-1.4.6-17.04.1_amd64.deb ...
Unpacking apt (1.4.6-17.04.1) over (1.4) ...
Setting up apt (1.4.6-17.04.1) ...
Created symlink /etc/systemd/system/timers.target.wants/apt-daily-upgrade.timer
→ /lib/systemd/system/apt-daily-upgrade.timer.
(Reading database ... 168839 files and directories currently installed.)
Preparing to unpack .../apt-utils-1.4.6-17.04.1_amd64.deb ...
Unpacking apt-utils (1.4.6-17.04.1) over (1.4) ...
Preparing to unpack .../xserver-common-2%3a1.19.3-1ubuntu1.3_all.deb ...
Unpacking xserver-common (2:1.19.3-1ubuntu1.3) over (2:1.19.3-1ubuntu1) ...
Preparing to unpack .../libsystemd0-232-21ubuntu7.1_amd64.deb ...
Unpacking libsystemd0:amd64 (232-21ubuntu7.1) over (232-21ubuntu2) ...
Setting up libsystemd0:amd64 (232-21ubuntu7.1) ...
(Reading database ... 168839 files and directories currently installed.)
Preparing to unpack .../0-xserver-xorg-core-2%3a1.19.3-1ubuntu1.3_amd64.deb ...
Unpacking xserver-xorg-core (2:1.19.3-1ubuntu1.3) over (2:1.19.3-1ubuntu1) ...
Preparing to unpack .../1-libnss-resolve-232-21ubuntu7.1_amd64.deb ...
Unpacking libnss-resolve:amd64 (232-21ubuntu7.1) over (232-21ubuntu2) ...
Preparing to unpack .../2-libpam-systemd-232-21ubuntu7.1_amd64.deb ...
Unpacking libpam-systemd:amd64 (232-21ubuntu7.1) over (232-21ubuntu2) ...
Preparing to unpack .../3-systemd-232-21ubuntu7.1_amd64.deb ...
Unpacking systemd (232-21ubuntu7.1) over (232-21ubuntu2) ...
#####

```

Figure 4: `apt full-upgrade` uses a new element in the form of a progress bar to inform users about the upgrade's progress.

dependencies of packages to be updated, although it still doesn't remove previously installed packages.

The new command structure offers subtle improvements that save time and extra steps. For instance, `apt-get` lets you move a package to `/var/cache/apt/archives/` and then install the package using `apt-get install package_name`, and the software automatically manages the dependencies. `apt` eliminates the need to push things around; all you need is `apt install package_name`, specifying the full path if necessary.

Design Error Corrected

`apt` fixes some errors of the original `apt-get` implementation. For example, in addition to `apt-get` for editing Debian packages, the legacy system used the `apt-cache` command for outputting information about the packages. The new `apt` command thoroughly cleans up, combining functions from both old commands and structuring them in a better way. `apt` provides features of the most commonly used `apt-get` and `apt-cache` commands, adding useful information that once required additional options.

For example, `apt-get update` only reports execution at the end (Figure 1), but `apt update` shows

the number of updatable packages and offers an option to display a structured list of possible updates (Figure 2). This list even provides a better overview, adding color to the otherwise drab display (Figure 3).

The actual package update command has been given a new visual element: Both `apt upgrade` and `apt full-upgrade` or `apt dist-upgrade` now show a progress bar that informs users of the update progress (Figure 4).

The update bar also appears when removing packages with `apt remove` or `apt purge`. `apt remove` removes the package itself, and `apt purge` removes the entire associated configuration – if it is located outside the home directory: `apt` never tampers with configurations in the user directory.

Two New Commands

The `apt show` command sorts the output alphabetically and suppresses some less important information that you might see with `apt-cache show`. The `dist-upgrade` parameter is assigned the more significant name of `full-upgrade`, although the two commands behave in the same way.

The `apt list` and `apt edit-sources` commands are new: `apt list` in connection with the `--installed` or `--upgradeable` options outputs lists of the installed or upgradeable packages; `apt edit-sources <List>` opens `/etc/etc/apt/sources.list.d/` with the specified list in the editor for editing (Figure 5).

Conclusions

It was high time to detox and dust off Debian's command-line package management tool. The new `apt` utility has been available since 2014, but habits change slowly, and `apt` has still not completely replaced `apt-get` in the real world. The differences between `apt-get` and `apt` still cause confusion in Internet forums, especially on Ubuntu and Linux Mint. Switching to `apt` is definitely worthwhile: The new command is faster, more logically structured, and easier to use. ■■■

Info

- [1] `dpkg`: https://en.wikipedia.org/wiki/Debian_Package_Manager
- [2] `APT`: https://en.wikipedia.org/wiki/Advanced_Packaging_Tool

```

GNU nano 2.8.7                               Datel: /etc/apt/s
# debian loadbalancer
deb http://ftp.debian.org/debian/ unstable main contrib non-free
# deb-src http://httpredir.debian.org/debian/ unstable main contrib non-free
# deb http://ftp.debian-ports.org/debian unstable main
deb http://incoming.debian.org/debian-builddd builddd-unstable main contrib non-free
deb http://ftp.debian.org/debian/ testing main contrib non-free
# deb http://ftp.debian.org/debian/ experimental main contrib non-free

```

Figure 5: The `apt` tool opens the specified file for manual changes in the standard editor with the command `apt edit-sources debian.list`.