



Home
General
Commands
Backup
Package
Admin
Network
Webserver
Security
Free Tools
Favourite
Links
Site Map
Contact Me

Debian Run Levels

Linux run levels are numbered 0 through 6. Run levels stop at six for practical and historical reasons, but it is entirely possible to have more if desired.

The following table summarizes the User Linux run levels:

* 0	System Halt
* 1	Single user
* 2	Full multi-user mode (Default)
* 3-5	Same as 2
* 6	System Reboot

Special Run Levels

Run level 0 is the system halt condition. Nearly all modern X86 computers will power off automatically when run level 0 is reached. Older X86 computers, and various different architectures will remain powered on and display a message referring to the halt condition.

Run Level 1 is known as 'single user' mode. A more apt description would be 'rescue', or 'trouble-shooting' mode. In run level 1, no daemons (services) are started. Hopefully single user mode will allow you to fix whatever made the transition to rescue mode necessary. (You can boot into single user mode typically by using your boot loader, lilo or grub, to add the word 'single' to the end of the kernel command line).

Run levels 2 through 5 are full multi-user mode and are the same in a default User Linux (Debian) system. It is a common practice in other Linux distributions to use run level 3 for a text console login and run level 5 for a graphical login.

Run level 6 is used to signal system reboot. This is just like run level 0 except a reboot is issued at the end of the sequence instead of a power off. In the interests of completeness, there is also a runlevel 'S' that the system uses on it's way to another runlevel. Read the man page for the init command ("For manpage click here") for more information, but you can safely skip this for all practical purposes.

Where Does a Run Level Live?

Like everything else in a Linux system, run levels are defined by files in the file system. All the run level files are found in the `/etc` directory according to the following table:

<code>/etc/rc0.d</code>	Run level 0
<code>/etc/rc1.d</code>	Run level 1
<code>/etc/rc2.d</code>	Run level 2
<code>/etc/rc3.d</code>	Run level 3
<code>/etc/rc4.d</code>	Run level 4
<code>/etc/rc5.d</code>	Run level 5
<code>/etc/rc6.d</code>	Run level 6

Each defined run level should have an `rcX.d` directory where X is the run level number. The contents of the `rcX.d` directory determines what happens at that run level.

how do I change run levels?

Before we change run levels it might help to find out which run level is current. Use the 'runlevel' command to tell you two things: The last run level, and the current run level. Here is the command and the output shown together due to the sparsity of the output:

```
#:/home/www# runlevel N 2
```

The 'N' stands for none, meaning there has been no run level change since powering up. The init system controls run levels, but then again, the init system pretty much controls everything. The init system will be looked at in detail in a future article.

The primary command used to change run levels is 'telinit'. Get it? "Tell Init" to do something; like this:
telinit 3

telinit takes one argument on the command line. As always, see the man page for full details. Normally the argument will be one of: 0,1,2,3,4,5,6, or the letter 'S'. As you may have guessed, the numbers correspond to the run level you wish to move to. Using the 'S', for single-user, is the same as the number 1, but don't do it; the 'S' runlevel is intended for use by the UserLinux (Debian)system.

A note of caution is warranted here. You can easily use the `telinit` command to reboot (run level 6), or shutdown (run level 0) the system, but **it is not recommended**. Certain programs need special processing

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for an orderly shutdown. Bypassing the expected shutdown sequence can have dire effects on your data. Older `_Unix_` systems are especially sensitive to shutdown/bootup operations.

The preferred method for a serious runlevel change is 'shutdown'. There are easier mnemonics, but in a running system they all point to the 'shutdown' command. You can use the 'halt', or 'poweroff' command to stop a system and the 'reboot' command to restart your system. In each case they call the 'shutdown' command with different parameters.

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