1.106.2
Change runlevels and
shutdown or reboot
system
Weight 3

Geoff Robertson

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Linux Professional Institute Certification — 102

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Description of Objective
1.106.2 Change runlevels and shutdown or reboot system

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Candidates should be able to manage the runlevel of the system. This objective includes changing to single user mode, shutdown or rebooting the system. Candidates should be able to alert users before switching runlevel, and properly terminate processes. This objective also includes setting the default runlevel.

Key files, terms, and utilities include:

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```
/etc/inittab
shutdown
init
```

Change runlevels and shutdown or reboot system
Objective

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Candidates should be able to manage the runlevel of the system. This objective includes changing to single user mode, shutdown or rebooting the system. Candidates should be able to alert users before switching runlevel, and properly terminate processes. This objective also includes setting the default runlevel.

Boot the system
Key files, terms, and utilities

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```
/etc/inittab
shutdown
init
```

/sbin/init

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"init" is the process started by the kernel after booting. It is up to init to start the rest of the system. The usual "SysV init" does this according to /etc/inittab.

The kernel also treats process ID 1 (init) specially:

- ▶ PID 1 is skipped by various "kill all" operations, etc
- ▶ "orphaned" child processes are adopted by PID 1

Telling `init` what to do

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By sending signals directly (as root) or by running various
commands, which relay to `init`:

   telinit Tell `init` to reload inittab, re-exec itself or switch
          runlevels

   shutdown Initiate a shutdown by doing some book-keeping
           and then signalling `init`

halt, reboot, poweroff Tools used to initiate or finalise special
                       kinds of shutdown

   runlevel Find out current or previous runlevel

Runlevels

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The Linux Standards Base (http://refspecs.
freestandards.org/LSB_3.0.0/LSB-Core-generic/
LSB-Core-generic/runlevels.html) defines the
following standard runlevels that all distributions should follow
to be compliant:

   0   halt
   1   single user mode
   2   multiuser with no network services exported
   3   normal/full multiuser
   4   reserved for local use, default is normal/full multiuser
   5   multiuser with a display manager or equivalent
   6   reboot

Passed through via kernel command line, telinit or default
in /etc/inittab.

/etc/inittab

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id : *runlevels* : *action* : *process*

```
# /etc/inittab: init(8) configuration.

id:5:initdefault:

# System initialization.
si::sysinit:/etc/rc.d/rc.sysinit

# /etc/init.d executes the S and K scripts
# scripts when change runlevel.
l0:0:wait:/etc/rc.d/rc 0
l1:1:wait:/etc/rc.d/rc 1
l2:2:wait:/etc/rc.d/rc 2
l3:3:wait:/etc/rc.d/rc 3
l4:4:wait:/etc/rc.d/rc 4
l5:5:wait:/etc/rc.d/rc 5
l6:6:wait:/etc/rc.d/rc 6
```

/etc/init.d/rc runs all the "K" scripts in /etc/rc*N*.d/,
followed by the "S" scripts.

/etc/inittab

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```
# Trap CTRL-ALT-DELETE
ca::ctrlaltdel:/sbin/shutdown -t3 -r now

# When our UPS tells us power has
# failed, assume we have a few minutes
# of power left.  Schedule a shutdown
# for 2 minutes from now.
# This does, of course, assume you have
# powerd installed and your
# UPS connected and working correctly.

pf::powerfail:/sbin/shutdown -f -h +2 "Power Failure; System Shutting Down"

# If power was restored before the shutdown kicked in, cancel it.
pr:12345:powerokwait:/sbin/shutdown -c "Power Restored; Shutdown Cancelled"
```

/etc/inittab

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```
# Run gettys in standard runlevels
#co:2345:respawn:/sbin/agetty ttyS0 38400 vt100
1:2345:respawn:/sbin/mingetty tty1
2:2345:respawn:/sbin/mingetty tty2
3:2345:respawn:/sbin/mingetty tty3
4:2345:respawn:/sbin/mingetty tty4
5:2345:respawn:/sbin/mingetty tty5
6:2345:respawn:/sbin/mingetty tty6

# Run xdm in runlevel 5
x:5:once:/etc/X11/prefdm -nodaemon

#co:2345:respawn:/sbin/agetty ttyS0 38400 vt100
S1:2345:respawn:/sbin/mgetty ttyS1
```

/etc/inittab

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```
# Example how to put a getty on a serial line (for a terminal)
#
#T0:23:respawn:/sbin/getty -L ttyS0 9600 vt100
#T1:23:respawn:/sbin/getty -L ttyS1 9600 vt100

# Example how to put a getty on a modem line.
#
#T3:23:respawn:/sbin/mgetty -x0 -s 57600 ttyS3
```

Initiating a shutdown

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```
shutdown [options] time [message]
```
Popular options:

      -r Reboot

      -h Halt

      -c Cancel a running shutdown

"time" can be *HH:MM* (eg 17:30) or +*minutes* (eg +5) or "now"
Examples:

```
shutdown -r now
shutdown -h 17:30 Scheduled hardware maintenance
```

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