– General Linux 2 –

Change runlevels and shutdown or reboot system

(Linux Professional Institute Certification)

Change runlevels and shutdown or reboot system

Objective

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

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

`/sbin/init`

"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

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

0	Halt
1 or S	"Single user mode"
2–5	Normal multi-user runlevels
6	Reboot

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

/etc/inittab

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

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

# The default runlevel.
id:2:initdefault:

# Boot-time system configuration/initialisation script.
# This is run first except when booting in emergency (-b) mode.
si::sysinit:/etc/init.d/rcS

# What to do in single-user mode.
~~:S:wait:/sbin/sulogin
```

/etc/inittab

```
# /etc/init.d executes the S and K scripts upon change
# of runlevel.

l0:0:wait:/etc/init.d/rc 0
l1:1:wait:/etc/init.d/rc 1
  .
  .
  .
l6:6:wait:/etc/init.d/rc 6
# Normally not reached, but fallthrough in case of emergency.
z6:6:respawn:/sbin/sulogin
```

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

/etc/inittab

```
# What to do when CTRL-ALT-DEL is pressed.
ca:12345:ctrlaltdel:/sbin/shutdown -t1 -a -r now

# Action on special keypress (ALT-UpArrow).
#kb::kbrequest:/bin/echo "Keyboard Request."

# What to do when the power fails/returns.
pf::powerwait:/etc/init.d/powerfail start
pn::powerfailnow:/etc/init.d/powerfail now
po::powerokwait:/etc/init.d/powerfail stop
```

`/etc/inittab`

```
# /sbin/getty invocations for the runlevels.
#
# The "id" field MUST be the same as the last
# characters of the device (after "tty").
#
# Note that on most Debian systems tty7 is used by the X Window Sy
# so if you want to add more getty's go ahead but skip tty7 if you
#
1:2345:respawn:/sbin/getty 38400 tty1
2:23:respawn:/sbin/getty 38400 tty2
  :
  :
6:23:respawn:/sbin/getty 38400 tty6
```

/etc/inittab

```
# 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

```
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
```