

Runit

1. Introduction

runit is a UNIX init scheme with service supervision. It is a cross-platform Unix init scheme with service supervision, a replacement for sysvinit, and other init schemes and supervision that are used with the traditional init. runit is compatible with djb's daemontools.

In Unix-based computer operating systems, init (short for initialization) is the first process started during booting of the computer system. Init is a daemon process that continues running until the system is shut down. Slackware comes with its own legacy init (/sbin/init) from the sysvinit package, that used to be included in almost all other major Linux distributions.

The init daemon (or its replacement) is characterised by Process ID 1 (PID 1).

To read on the benefits of runit, see here: <http://smarden.org/runit/benefits.html>

2. Use runit with traditional init

runit is not provided by Slackware, but a SlackBuild is maintained on <https://slackbuilds.org/>. It does not have any dependencies.

As we do not want yet to replace init with runit, run the slackbuild with CONFIG=no:

```
CONFIG=no ./runit.SlackBuild
```

Then install the resulting package and proceed as follows:

```
mkdir /etc/runit/ /service/  
cp -a /usr/doc/runit-*/etc/2 /etc/runit/  
/sbin/runsvdir-start &
```

For a typical Slackware-style service, you can also edit /etc/rc.d/rc.local file

```
if [ -x /sbin/runsvdir-start ]; then  
    /sbin/runsvdir-start &  
fi
```

if you require it.

and then edit write /etc/rc.d/rc.local_shutdown

```
#!/bin/sh  
RUNIT=x$( /sbin/pidof runsvdir )  
if [ "$RUNIT" != x ]; then  
    kill $RUNIT
```

```
fi
```

Then give `rc.local_shutdown` executive permission:

```
chmod +x /etc/rc.d/rc.local_shutdown
```

and reboot

3. Using runit with sysvinit and inittab

Remove the entries in `/etc/rc.d/rc.local` and `/etc/rc.d/rc.local_shutdown` described above.

Edit `/etc/inittab`

```
cat >>/etc/inittab <<EOT
SV:123456:respawn:/sbin/runsvdir-start
EOT
```

and tell `init` to re-read its configuration, e.g.:

```
init q
```

or reboot

4. How to replace `init` with `runit`

If you followed the previous chapter, then stop `runsvdir` and reverse all the changes that you made on your system.

Remove the last line from `/etc/inittab`

```
rm -rf /etc/runit /service
```

Reboot:

```
shutdown -r now
```

Also, it is best to re-build and re-install `runit`

This time, when running `slackbuild`, do pass not any value for `CONFIG`, or set it to `yes`:

```
unset CONFIG
sh runit.SlackBuild
```

and upgrade with the resulting `runit` package.

Disable services that are already provided by the traditional init:

```
cd /service/  
rm *
```

Create a new TTY service for runit:

```
cd /etc/sv/  
cp -ar agetty-tty1/ agetty-tty8/  
sed -i 's/tty1/tty8/g' agetty-tty8/*  
ln -s /etc/sv/agetty-tty8 /service
```

Start runit's stage 2 for testing:

```
/etc/runit/2 &
```

And check that the agetty is running, by logging in as an unprivileged user (not as root!)

```
CTRL+ALT+F8
```

If this has been successful, then reverse the last intervention:

```
kill $( pidof runsvdir )  
  
rm /service/agetty-tty8  
rm -rf /etc/sv/agetty-tty8  
for N in {1..6}; do  
  ln -s /etc/sv/agetty-tty${N} /service  
done
```

Then, to boot in runit, reboot and enter `init=/sbin/runit-init` in the Lilo prompt. To do this, hit the tab key when you are presented with the Lilo menu as shown in Images 1 and 2 below.



Image 1.: Hit the Tab key on the Lilo Menu before the counter times out.

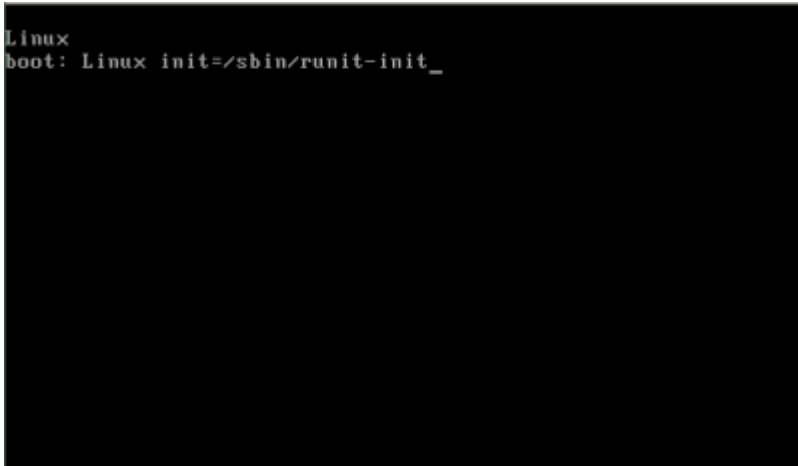


Image 2: Add `init=/sbin/runit-init` in the OS Selection Prompt

Confirm that runit has taken PID 1:

```
ps -o comm= -p 1
runit
```

If you do not have a multi boot system, you may append the init selection in `/etc/lilo.conf`

For example:

```
append="vt.default_utf8=0 init=/sbin/runit-init"
```

Then run lilo:

```
lilo -v
```

Or just replace `/sbin/init` with `/sbin/runit-init` like this:

```
cp /sbin/init /sbin/init.sysv
cp /sbin/runit-init /sbin/init
```

However, with the last alternative, be warned that if you had booted with the original init, the system may refuse to reboot, therefore boot from runit-init first.

5. Startup and Shutdown

The traditional init reads `/etc/inittab` file to see how to run the system. It runs the `/etc/rc.d/rc.S` script and runs it. If set in the default runlevel 3, it follows it with `/etc/rc.d/rc.M`. In runit the initialisation script is located in `/etc/runit/1` for all runlevels. By default `/etc/runit/2` is restricted to the TTY services.

The script `/etc/rc.d/rc.6` is the rebooting script for the traditional init, while `/etc/rc.d/rc.0` (symlinked to former) is the halting script. In runit, these scripts are called by `/etc/runit/3`

Note that the shutdown command provided by `sysvinit` package will not work in runit. To reboot you

enter

```
/sbin/runit-init 6
```

and to halt enter

```
/sbin/runit-init 0
```

A convenient script is provided with the configuration files which is placed in `/usr/sbin/shutdown` that determines whether the system has booted with the traditional `init` or `runit` and then calls the relevant command accordingly.

The `halt`, `reboot` and `poweroff` commands provided by the `sysvinit` package would still work with `runit`.

6. runsv

Although `runit` may replace `init` as the PID 1 daemon, there is not much benefit unless other services are migrated from Slackware's BSD style to `runsv(8)`. While this is not a complicated task, some familiarisation with `runit`'s characteristics is recommended and makes the task easier. This short example should help illustrate `runsv` to new users.

Make an arbitrary directory under `/etc/sv/`

```
mkdir /etc/sv/example/
```

In order to let the non-privileged user (say user `chris`) run it, change the ownership of the service directory

```
chmod -R chris.users /etc/sv/example
```

As a non-privileged user, create some directories

```
mkdir -p /home/chris/runit/logs
```

Then edit a script that simulates a (finicky) service in a convenient directory; say

```
#!/bin/bash
echo "Started service..."
for i in {1..10}
do
    echo "Doing stuff..."
    sleep 1
done
echo "Oh no I crashed..." >&2
exit 1
```

Give it executable permission:

```
chmod +x /home/chris/runit/service.sh
```

Run it to check and appreciate its execution:

```
/home/chris/runit/service.sh
```

Edit a file called `/etc/sv/example/run` and give it executable permissions

```
#!/bin/sh -e
exec 2>&1
exec chpst -u chris /home/chris/runit/service.sh
```

```
chmod +x /etc/sv/example/run
```

Note the `exec` in the last line, it tells the shell that interprets the script to replace itself with the service daemon

Naturally edit as necessary.

Create another directory:

```
mkdir /etc/sv/example/log/
```

and edit another file under it also called `/etc/sv/example/log/run`

```
#!/bin/sh
exec chpst -u chris svlogd -tt /home/chris/runit/logs
```

Give it executable permission:

```
chmod +x /etc/sv/example/log/run
```

Run the `sv` service to ensure that it works:

```
/etc/sv/example/run
```

Finally, we are ready to deploy the service. Create a symbolic link in `/service` to our staging location.

```
ln -s /etc/sv/example /service
```

Watch how your “service” works, crashes, but it is recovered by `runit`:

```
tail -f /home/chris/logs/current
```

7. Managing Services with `sv`

To see the status of a supervised service use `sv s <service_name>`, for example,

```
sv s example
```

returns

```
run: example: (pid 42) 1587s
```

To see the status of all services, use

```
sv s /service/*
```

7.1. Stop/Start/Restart

Start a service

```
sv u example
```

Stop a service

```
sv d example
```

Restart a service

```
sv t example
```

Each of these is a shortcut, for 'up', 'down', and 'terminate', respectively. Only the first letter of each word is recognised. More verbose forms of the above

```
sv start sshd
```

```
sv stop sshd
```

```
sv restart sshd
```

Each of these will also return the status of the service upon exit.

7.2. Enabling a service

Service directories are placed under `/etc/sv/`. To enable a service in the current runlevel, create a symlink from it to `/service`.

```
ln -s /etc/sv/example /service/
```

Once a service is linked it will always start on boot and restart if it stops (unless this is disabled).

7.3. Disabling a service

To disable a service in the current runlevel remove the symlink to its service directory from `/service`.

```
rm /service/example
```

Removing the symlink will also stop the service.

Check out the `sv` man page to see additional options.

```
man sv
```

If you do not want a service to start upon bootup, or when enabled, just touch an empty file called `down` in the appropriate service directory.

```
touch /etc/sv/service/down
```

7.4. Dependencies

Dependencies of service are supported by starting the dependent run script as follows:

```
#!/bin/sh
sv start dependent-service || exit 1
.
.
exec ...
```

8. Runlevels

If you installed the slackbuild configuration files, you have two runlevels: `default` and `single`. The current runlevel is `default`. You can verify by looking under `/etc/runit/runsvdir/`, you will see that `/etc/runit/current` is a symbolic link `/etc/runit/default`.

Change runlevel to another runlevel; `single`:

```
runsvchdir single
```

You will see that `/etc/runit/runsvdir/current` is now symlinked to `/etc/runit/runsvdir/single` and `/etc/runit/runsvdir/previous` is symlinked to `/etc/runit/runsvdir/default`. If you reboot, you will boot again `default` runlevel as you have this entry in `/etc/runit/2`

```
runsvchdir default >/dev/null
```

You can create any other runlevel and name them as you like. To start you can copy an existing runlevel directory and modify as you wish.


```
cp -ar /etc/runit/runsvdir/default /etc/runit/runsvdir/custom/
```

You can edit the runsvdir line of `/etc/runit/2` to your requirements.

9. run scripts

Only one executable can be called for a service and the last line must be called by the `exec` command. There are some generic runit run scripts on the Internet, in other Linux distributions. Also, other Slackers may post them on publicly available repositories. The author of this article has placed his here: https://gitlab.com/chrisabela/runit_scripts_for_slackware

In direct contrast to Slackware's BSD style service scripts, runit run scripts must not run in the foreground, otherwise runit would think that they have crashed and restart them.

For some services, this may not be possible, but there are workarounds. You can forcefully terminate them by ending the run script like this:

```
sv d service_name
```

Or you can use the `pause` command to keep the service alive. `pause` is a trivial command that will simply not exit, until it is killed (akin to `tail -f /dev/null`). A SlackBuild for `pause` is available at <https://slackbuilds.org> Then end the run script with:

```
exec chpst -b service_name pause
```

10. Migrating Services

It is suggested that services are migrated from stage 2 (which are still under the Slackware's BSD init scheme) to stage 3 carefully. Start from the bottom of `/etc/rc.d/rc.M` and work up. This means that you should start with any entries under `/etc/rc.d/rc.local`

Then continue for `/etc/rc.d/rc.S`

Proceed with other services to benefit's from runit features. Note that for some services, such as `atd` and `crond`, you would need to edit `/etc/rc.d/rc.M` as they are hard-coded.

Let's take the popular `NetworkManager` service as an example. According to the permission of `/etc/rc.d/rc.networkmanager` this script is called by `/etc/rc.d/rc.M` The latter is called by `/etc/runit/2` (stage 2).

Stop the service:

```
/etc/rc.d/rc.networkmanager stop
```

Disable it:

```
chmod -x /etc/rc.d/rc.networkmanager
```

Create a suitable directory for runit

```
mkdir /etc/sv/networkmanager/
```

Write a runit run script: /etc/sv/networkmanager/run

```
#!/bin/sh
prefix=/usr
exec_prefix=/usr
sbindir=${exec_prefix}/sbin
NETWORKMANAGER_BIN=${sbindir}/NetworkManager

export XDG_CACHE_HOME=/root/.cache
exec $NETWORKMANAGER_BIN -n > /dev/null 2>&1
```

Symlink the /etc/sv/networkmanager directory to /service to enable under current runlevel and it will start in a few seconds:

```
ln -s /etc/sv/networkmanager /service
```

For udev, it is suggested to let it under runit's stage 2, but you can setup its monitoring for stage 3.

11. Sources

- (1) <http://smarden.org/runit/>
- (2) <https://slackbuilds.org>
- (3) <https://en.wikipedia.org/wiki/Inix>
- (4) <https://voidlinux.org/usage/runit/>
- (5) <https://www.youtube.com/watch?v=jiBlhFxNJo>
- (6) <http://kchard.github.io/runit-quickstart/>
- (7) <https://www.slackbook.org/beta/>
- (8) https://gitlab.com/chrisabela/runit_scripts_for_slackware
 - Written for Slackware 14.2 in December 2018
 - Originally written by [Chris Abela](#)

[init](#), [runit](#)

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