

Running systemd integration tests with mkosi

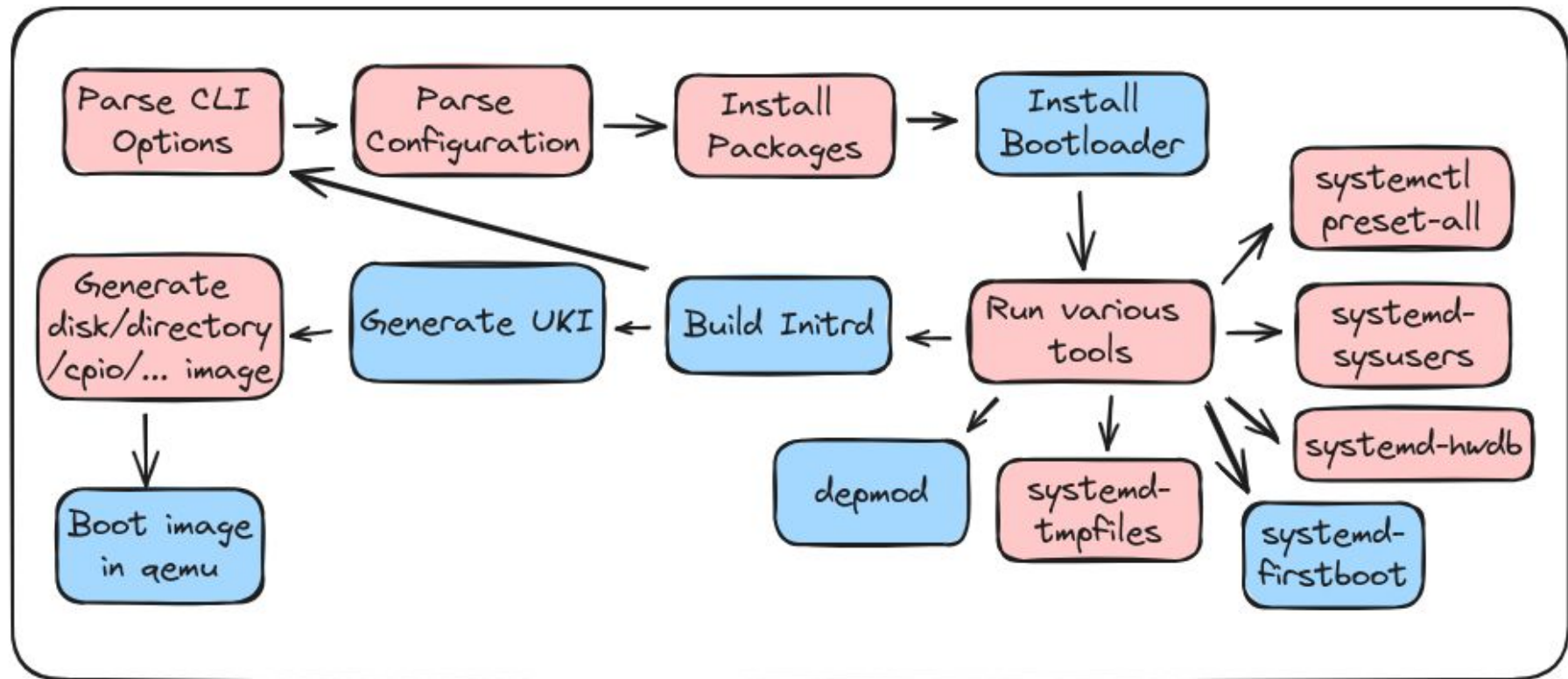
About Me

- Daan De Meyer
- systemd/mkosi maintainer
- Linux Userspace Team @ Meta

Motivation

- How do we run systemd's integration tests without bricking the host machine?
- How do we minimize the requirements to run systemd's integration tests?
- How do we avoid host system details leaking into test execution?
- How do we safely parallelize integration test execution?
- How do we make it easy to run systemd's integration tests?
- How do we make it easy to write new integration tests?

What is mkosi?



Quick Start

```
mkosi -d arch -p systemd -p linux --autologin -f qemu
```

```
CentOS Stream 9
Kernel 5.14.0-350.el9.x86_64 on an x86_64

localhost login: root (automatic login)

Last login: Wed Aug 9 12:44:36 on tty1
[root@localhost ~]#
```

```
localhost login: root (automatic login)

Have a lot of fun...
localhost:~ #
```

```
Arch Linux 6.4.8-arch1-1 (ttyS0)

archlinux login: root (automatic login)

[root@archlinux ~]#
```

```
Fedora Linux 39 (Rawhide Prerelease)
Kernel 6.5.0-0.rc5.36.fc39.x86_64 on an x86_64 (ttyS0)

fedora login: root (automatic login)

[root@fedora ~]#
```

```
Debian GNU/Linux trixie/sid localhost ttyS0
```

```
localhost login: root (automatic login)
```

```
Linux localhost 6.4.0-1-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.4.4-2 (2023-07-30) x86_64
```

```
The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
```

```
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
```

```
Last login: Wed Aug 9 10:30:29 UTC 2023 on tty1
root@localhost:~#
```

```
Ubuntu 23.04 localhost ttyS0
```

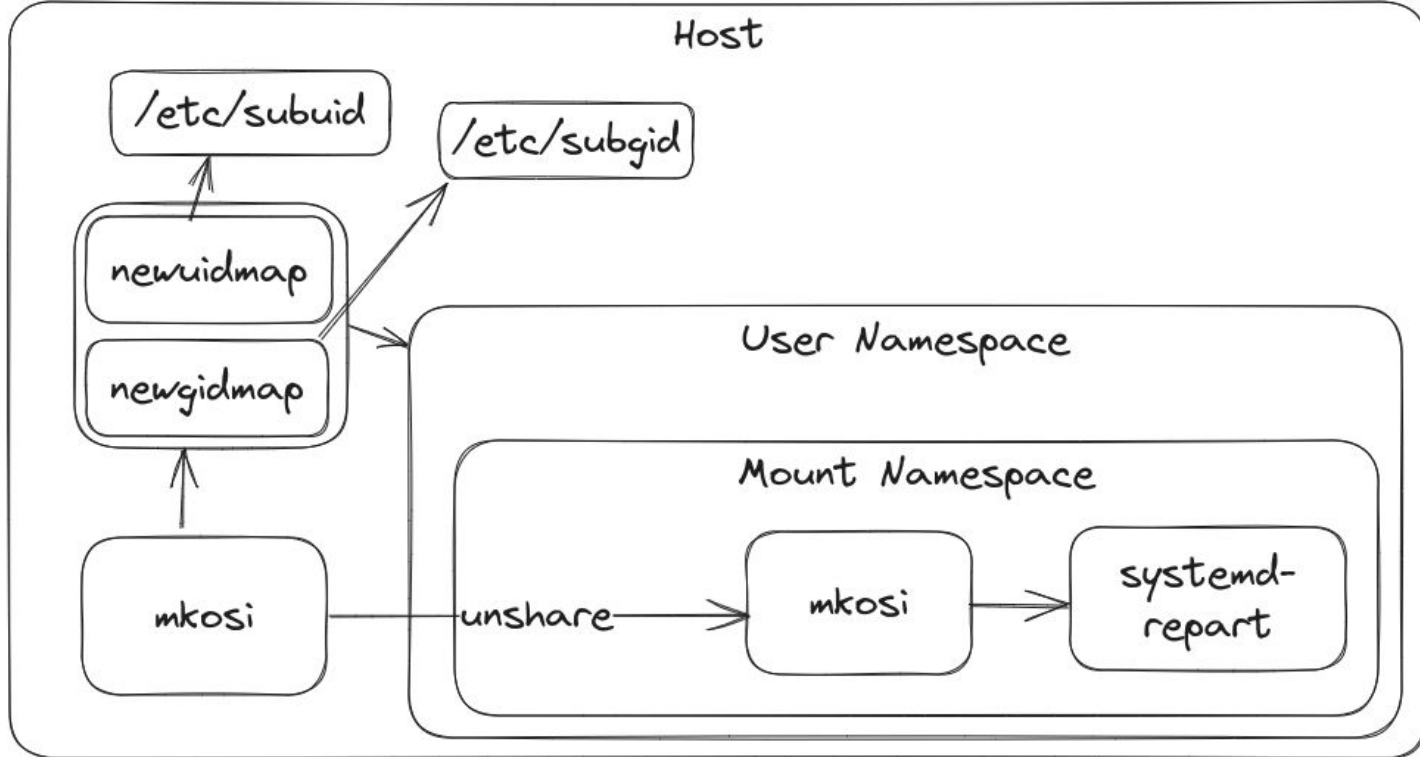
```
localhost login: root (automatic login)
```

```
Welcome to Ubuntu 23.04 (GNU/Linux 6.2.0-1009-kvm x86_64)
```

- * Documentation: <https://help.ubuntu.com>
- * Management: <https://landscape.canonical.com>
- * Support: <https://ubuntu.com/advantage>

```
Last login: Wed Aug 9 10:25:24 UTC 2023 on ttyS0
root@localhost:~#
```

No root privileges required!



Configuration

```
[Match]
Distribution=fedora

[Distribution]
Release=rawhide

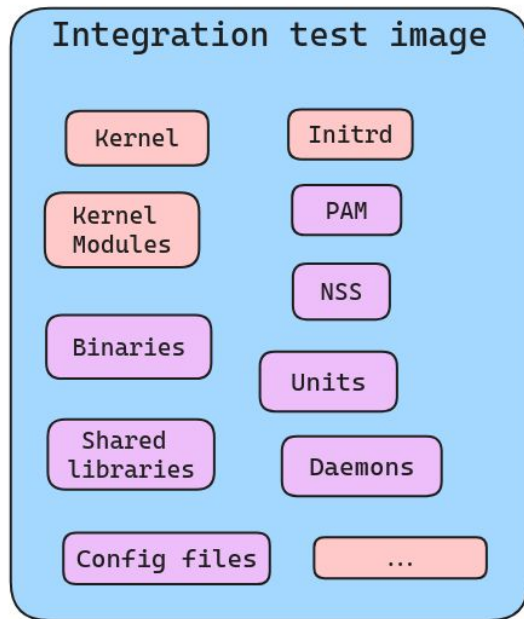
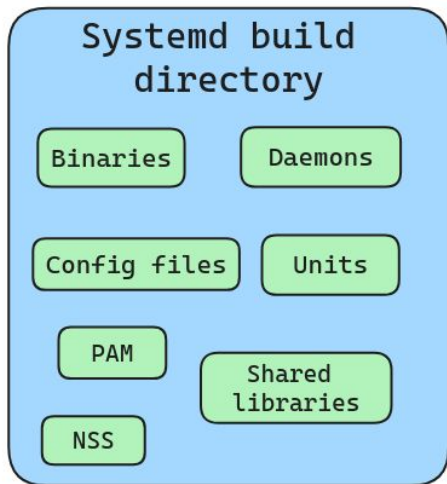
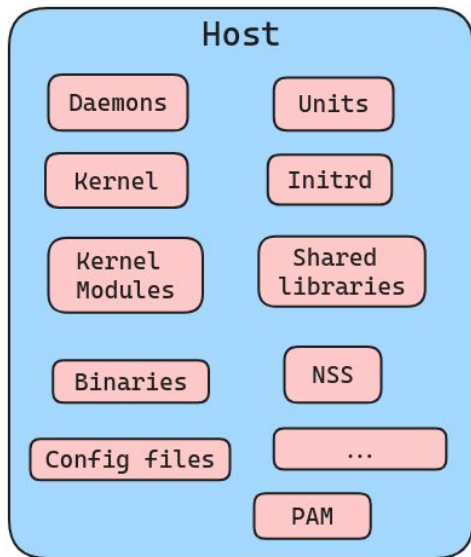
[Content]
Packages=kernel-core
         systemd
         systemd-boot
         udev
         util-linux
         grub2-pc
```


Current Situation

- Tests exist outside systemd's meson build system
- Test are independent from development environment (mkosi)
- Custom test runner using make
- Test are implemented as systemd units that execute a test script
- Test specific dependencies have to be explicitly added to the image
- Any customization requires modifying bash scripts
- Running a test:

```
sudo make -C test/TEST-50-DISSECT BUILD_DIR=$PWD/build/ clean setup run
```

Current Situation

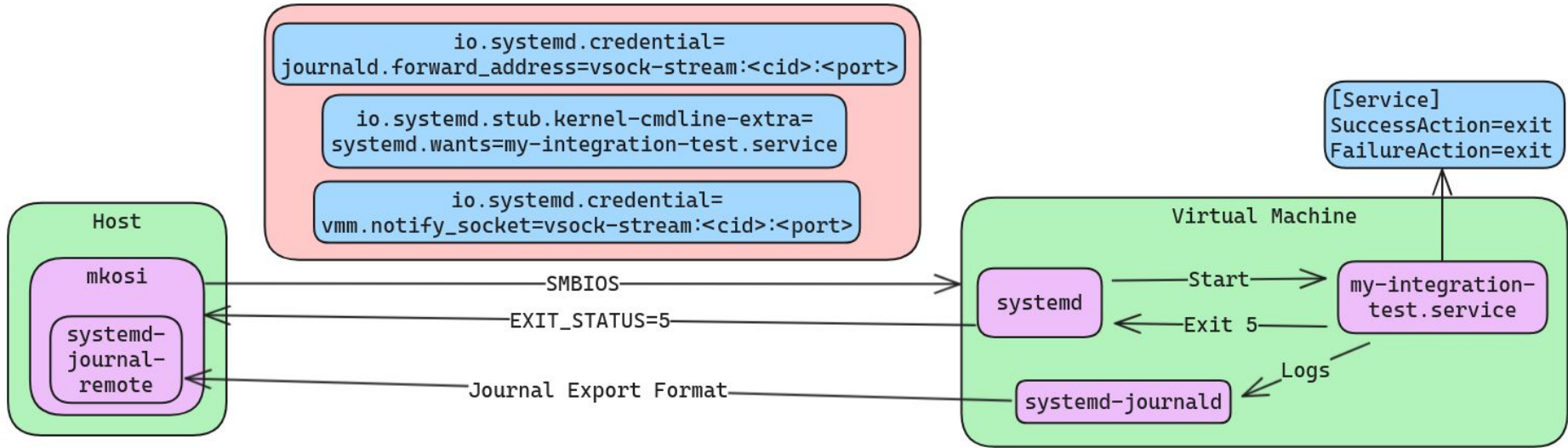


Goal

- Tests are part of systemd's meson build system
- Tests reuse development environment (mkosi)
- Tests are executed using meson's test runner
- Tests mostly reuse the same image
- Customization can be done by writing mkosi config dropin files
- Running a test:

```
meson test -C build -v TEST-50-TMPFILES
```

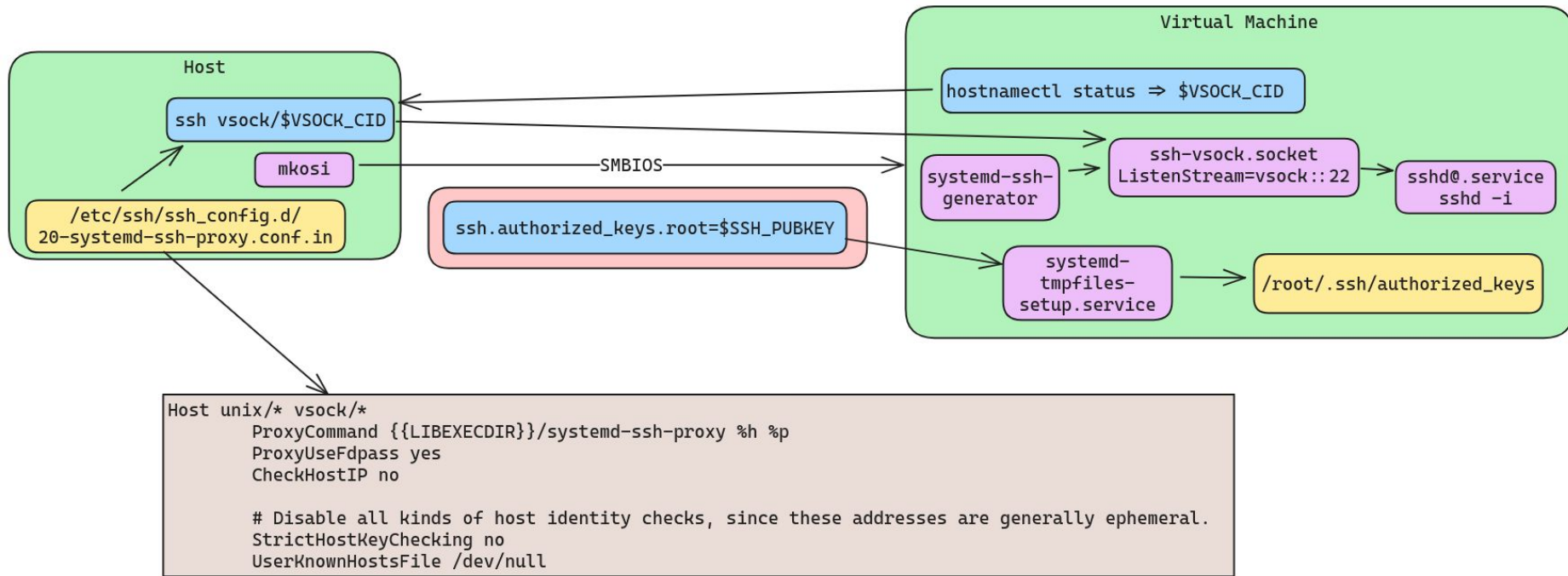
Running integration tests in VMs with systemd



SSH over VSOCK

Ssh=yes

mkosi ssh



<https://github.com/systemd/mkosi>