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About me

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Improving container security

Running your containers rootless with podman

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Why do we like running containers with docker?

It's easy!

- Deployment
- Network
- Volumes
- Server-client architecture with Remote management API

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Why Docker just works

- Client <=> Server/service architecture
- The service is running as root
- To start a docker container, users either have to use sudo or they need to be added to the `docker` group.

```
olle@olle-ThinkPad-L480:~$ ps aux | grep dockerd
root      625302  0.0  0.1 1752820 46812 ?       Ssl  mai09   1:28 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock
olle      972300  0.0  0.0  20740  2708 pts/2    S+   10:36   0:00 grep --color=auto dockerd
olle@olle-ThinkPad-L480:~$
```

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Whats the problem with rootfull containers?

As a regular user I can gain access to protected files.

```
docker run -it --rm \
    -v /etc/passwd:/files_to_edit/passwd \
    -v /etc/shadow:/files_to_edit/shadow \
    -v /etc/group:/files_to_edit/group \
    alpine /bin/ash
```

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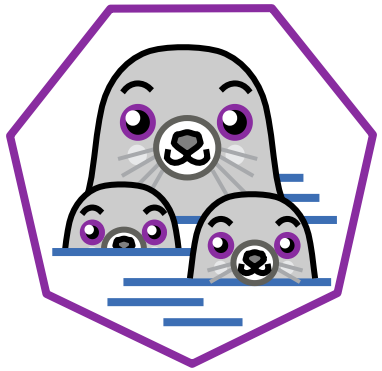
Podman to the rescue



podman

https://podman.io

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alias docker=podman

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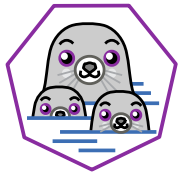
All good things come in threes



podman

buildah

skopeo

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What's the catch with rootless containers?

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Network limitations

Can only publish ports above 1024 (unprivileged ports)

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File access

The container does not have access to "all" files (because your are not running it as root)

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Limitation workarounds

Challenge accepted!

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Networking

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Iptables portforwarding

- "Forward port 80 to localhost:8080"

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Run the one container that need access as root

- "its ok to run a container as root, if there is no other alternative."

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Reverse proxy/load balancer service

- Install a loadbalancer (haproxy) on server and route traffic to "correct" port.

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File/storage/dev access

Make shure the user has access to the file/folder

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But what about docker-compose?

`podman-compose` to the rescue!

- "An implementation of Compose Spec with Podman backend."
- Focus on running podman rootless and with no running deamon

```
$ pip3 install podman-compose
$ podman-compose up -d
```

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Podman has pods not just containers

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Podman kan generate YAML

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Alternative ways to start up containers?

What about systemd?

```
$ loginctl enable-linger olle
$ podman run -d --volume /home/olle/nginx/www:/usr/share/nginx/html:ro --name nginx -p 8080:80 nginx:latest
$ podman generate systemd --new --files --name nginx
$ mkdir -p $HOME/.config/systemd/user
$ cp container-nginx.service $HOME/.config/systemd/user/.
$ systemctl --user enable container-nginx.service
$ systemctl --user start container-nginx.service
```

Thank you!

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References

- https://podman.io
- https://github.com/containers/podman-compose
- https://developers.redhat.com/blog/2020/09/25/rootless-containers-with-podman-the-basics
- https://docs.docker.com/engine/security/rootless/
- https://github.com/rootless-containers/rootlesskit
- https://www.redhat.com/sysadmin/podman-run-pods-systemd-services
- `man podman-generate-systemd`