Docker learnings

Learnings from using Docker after 3 years

Jan Baer

28. April 2019

This talk is not about Kubernetes or Docker Swarm

Security

- You shouldn't run your container as root
    - Create user in Dockerfile
    - Take care about **uid**, map to an existing uid on the host if needed
- Give only the privileges you really need
    - Docker documentation

  ```
  docker run -d --cap-drop CHOWN alpine
  ```
- Using **tmpfs** for sensitive data which shouldn't be saved outside of the container

```
--tmpfs /tmp/${CONTAINER_NAME}:uid=1000,gid=1000
```

Docker build - How to build smaller images

- Use multistage builds
- Use build cache (copy package.json and yarn.lock in an extra step before yarn install)
- Remove dev node_modules before copy

Maintaining - Cleanup up your Docker with prune

Cleanup

- Remove dangling images with **docker image prune**
- Remove stopped containers with **docker container prune**
- Same for network and volume or all in once with **docker system prune**
- Autoremove a container after it's stopped with **docker –rm...**

More tips - Using a UI in the browser or terminal

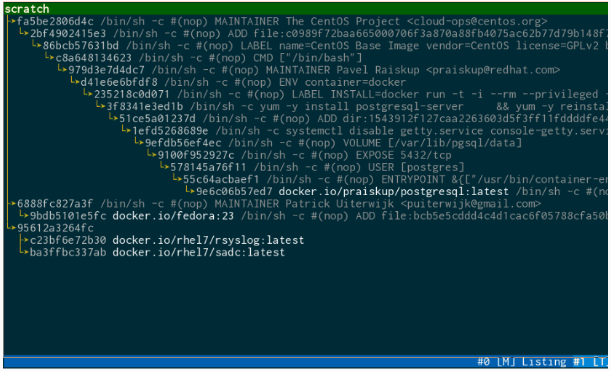
Use portainer locally without a password

```
alias portainer="docker run --rm -d
  -p 9000:9000
  --name=portainer
  -v /var/run/docker.sock:/var/run/docker.sock
  portainer/portainer --no-auth"
```

Hint: call it in an anonymus browser session

Use sen as terminal ui to inspect the layers of your images

```
alias sen="docker run --rm --name=sen
  -v /var/run/docker.sock:/run/docker.sock
  -ti -e TERM tomastomecek/sen"
```

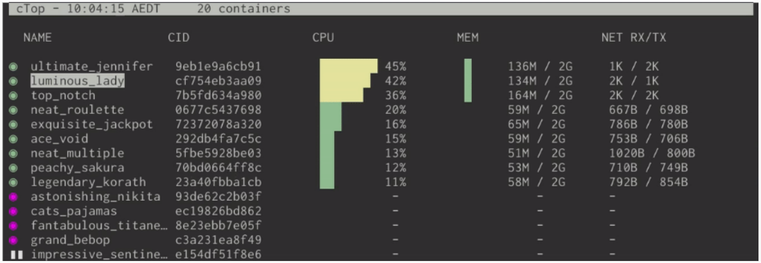


```
scratch
├→fa5be2806d4c /bin/sh -c #(nop) MAINTAINER The CentOS Project <cloud-ops@centos.org>
│ └→2bf4902415e3 /bin/sh -c #(nop) ADD file:c0989f72baa665000706f3a870a88fb4075ac62b77d79b148f
│   └→86bcb57631bd /bin/sh -c #(nop) LABEL name=CentOS Base Image vendor=CentOS license=GPLv2 
│     └→c8a648134623 /bin/sh -c #(nop) CMD ["/bin/bash"]
│       └→979d3e7d4dc7 /bin/sh -c #(nop) MAINTAINER Pavel Raiskup <praiskup@redhat.com>
│         └→d41e6e6bfdf8 /bin/sh -c #(nop) ENV container=docker
│           └→235218c0d071 /bin/sh -c #(nop) LABEL INSTALL=docker run -t -i --rm --privileged 
│             └→3f8341e3ed1b /bin/sh -c yum -y install postgresql-server     && yum -y reinsta
│               └→51ce5a01237d /bin/sh -c #(nop) ADD dir:1543912f127caa2263603d5f3ff11fddddfe4
│                 └→1efd5268689e /bin/sh -c systemctl disable getty.service console-getty.serv
│                   └→9efdb56ef4ec /bin/sh -c #(nop) VOLUME [/var/lib/pgsql/data]
│                     └→9100f952927c /bin/sh -c #(nop) EXPOSE 5432/tcp
│                       └→578145a76f11 /bin/sh -c #(nop) USER [postgres]
│                         └→55c64acbaef1 /bin/sh -c #(nop) ENTRYPOINT &{["/usr/bin/container-e
│                           └→9e6c06b57ed7 docker.io/praiskup/postgresql:latest /bin/sh -c #(n
├→6888fc827a3f /bin/sh -c #(nop) MAINTAINER Patrick Uiterwijk <puiterwijk@gmail.com>
│ └→9bdb5101e5fc docker.io/fedora:23 /bin/sh -c #(nop) ADD file:bcb5e5cddd4c4d1cac6f05788cfa50
└→95612a3264fc
  ├→c23bf6e72b30 docker.io/rhel7/rsyslog:latest
  └→ba3ffbc337ab docker.io/rhel7/sadc:latest

                                                                 #0 [M] Listing #1 [T]
```

Use ctop for monitoring your local containers

- github ctop



```
cTop - 10:04:15 AEDT      20 containers

 NAME                CID                 CPU                 MEM                 NET RX/TX

● ultimate_jennifer   9eb1e9a6cb91            45%                 136M / 2G     1K / 2K
● luminous_lady       cf754eb3aa09            42%                 134M / 2G     2K / 1K
● top_notch           7b5fd634a980            36%                 164M / 2G     2K / 2K
● neat_roulette       0677c5437698            20%                 59M / 2G      667B / 698B
● exquisite_jackpot   72372078a320            16%                 65M / 2G      786B / 780B
● ace_void            292db4fa7c5c            15%                 59M / 2G      753B / 706B
● neat_multiple       5fbe5928be03            13%                 51M / 2G      1020B / 800B
● peachy_sakura       70bd0664ff8c            12%                 53M / 2G      710B / 749B
● legendary_korath    23a40fbba1cb            11%                 58M / 2G      792B / 854B
● astonishing_nikita  93de62c2b03f            -                   -             -
● cats_pajamas        ec19826bd862            -                   -             -
● fantabulous_titane… 8e23ebb7e05f            -                   -             -
● grand_bebop         c3a231ea8f49            -                   -             -
▮▮ impressive_sentine… e154df51f8e6           -                   -             -
```

Keep an eye on your logfiles

How to grep the logs

```
docker logs {container} | grep {term}
```

This will not work as expected

How to grep the logs

```
docker logs {container} | grep {term}
```

This will not work as expected

```
docker logs {container} 2>&1 | grep {term}
```

The reason why it’s not working in the way you would expect is, that docker is not logging to stdout. Instead it’s logging the stderror. So you have to redirect stderror to stdout before your can pipe it to grep.

Cleanup the Docker logs

To delete all log files, you can use the following command

```
find /var/lib/docker/containers/
    -type f -name "*.log" -delete
```

Take care about the size of your Docker log files

- When using JSON File logging driver (which is the default)
    - Using **/etc/docker/daemon.json**

```
{
"log-driver": "json-file",
"log-opts": {
  "max-size": "10m",
  "max-file": "3"
}
}
```

- Or using commandline option

```
docker run --rm -it --log-opt max-size=10m alpine
```

- See also

Thank you!