Docker

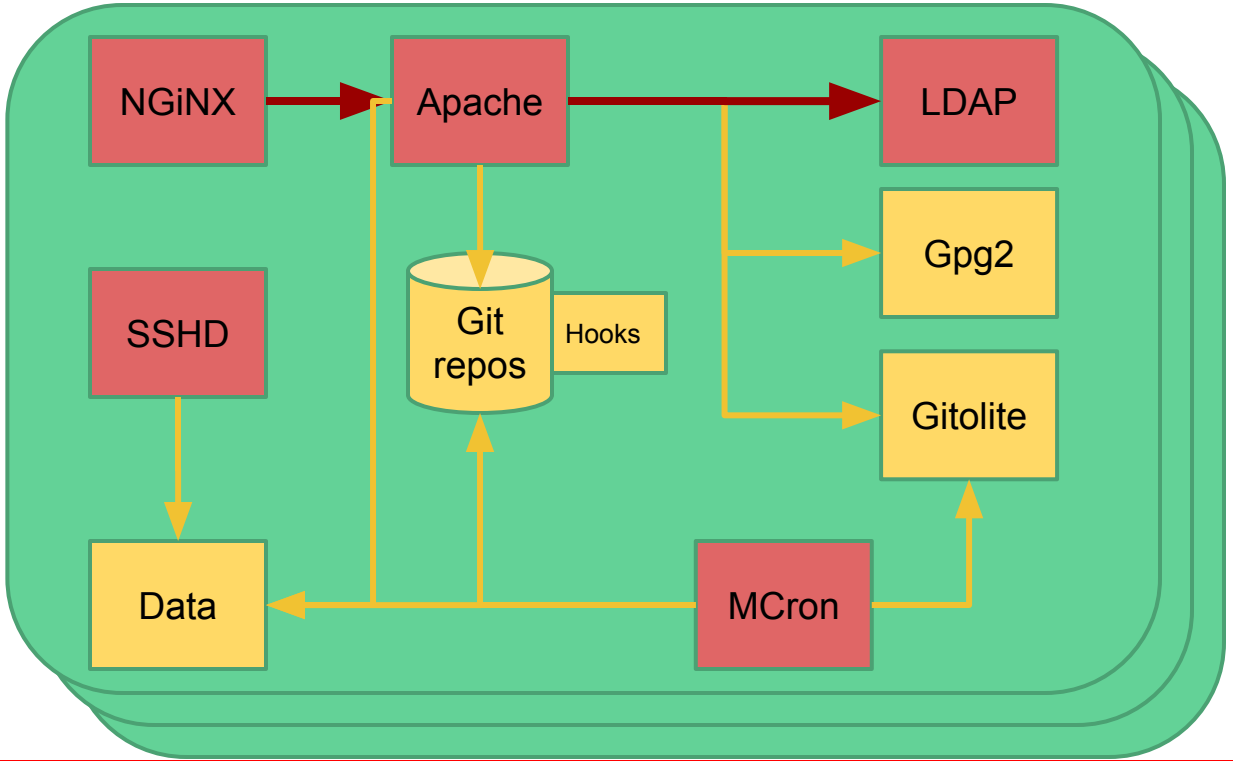
Architecture Rework Case Study

Project

From:

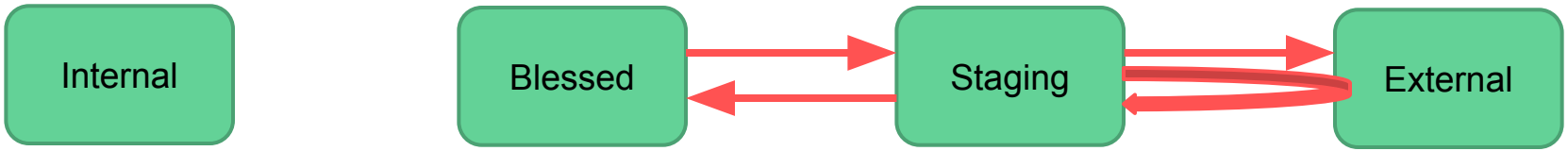
Project

To:


NGiNX
Apache
LDAP
Gpg2
SSHD
Git repos
Hooks
Gitolite
Data
MCron

What are the issues?

Example: Replicated Git repos hosting servers



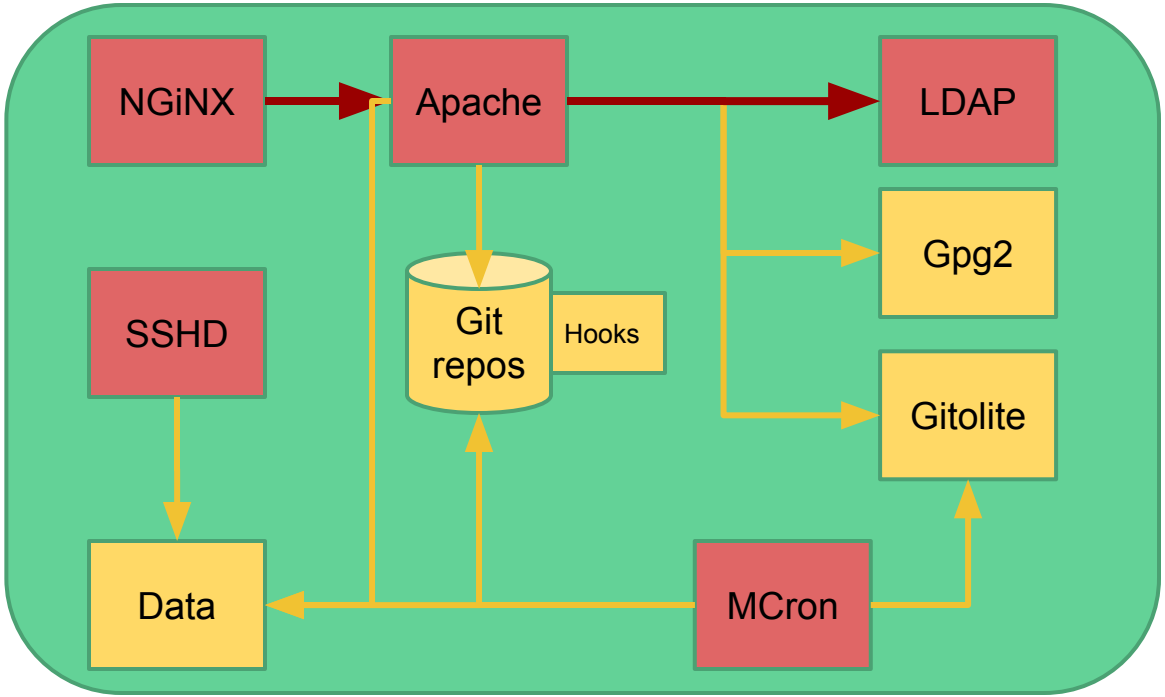
- Isolation (server)
- Configuration
- Reproducibility

What are the issues?

Example: Monolithic service => Isolation (processes) issue

Blessed / Staging / External / Internal

=



What is Docker

Lightweight virtualization

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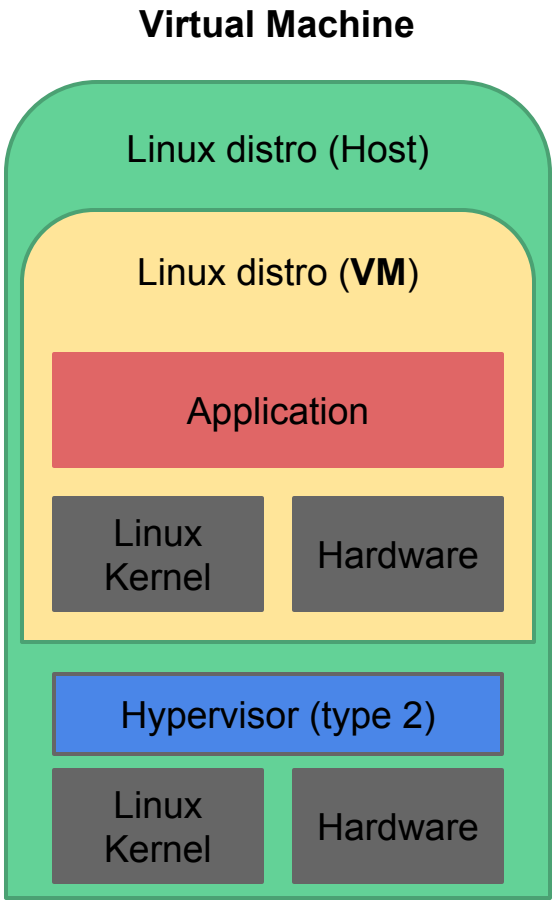
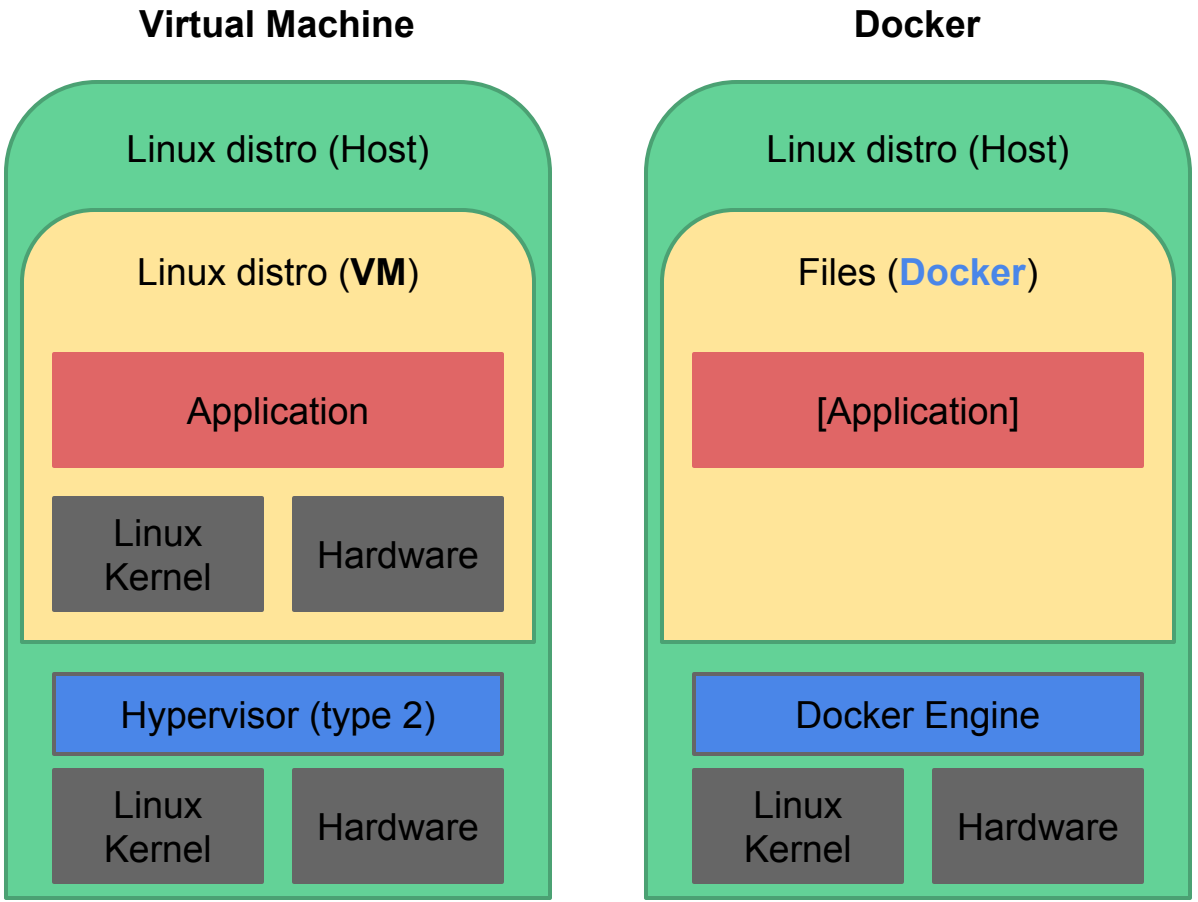
Lightweight virtualization



What is Docker

Lightweight virtualization



What is Docker?

Containers

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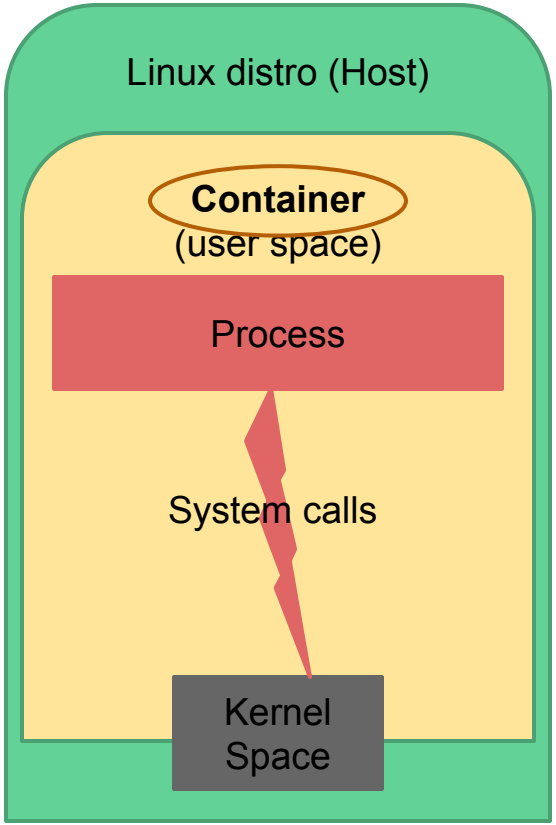
Containers



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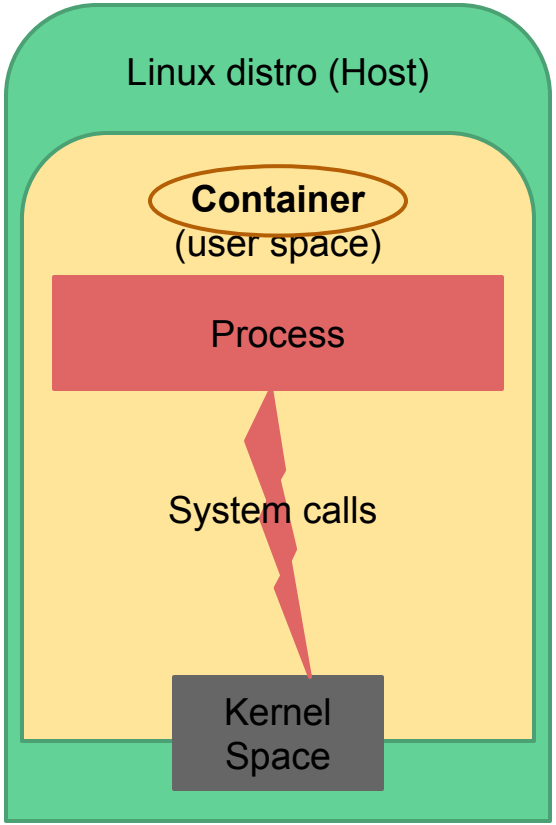
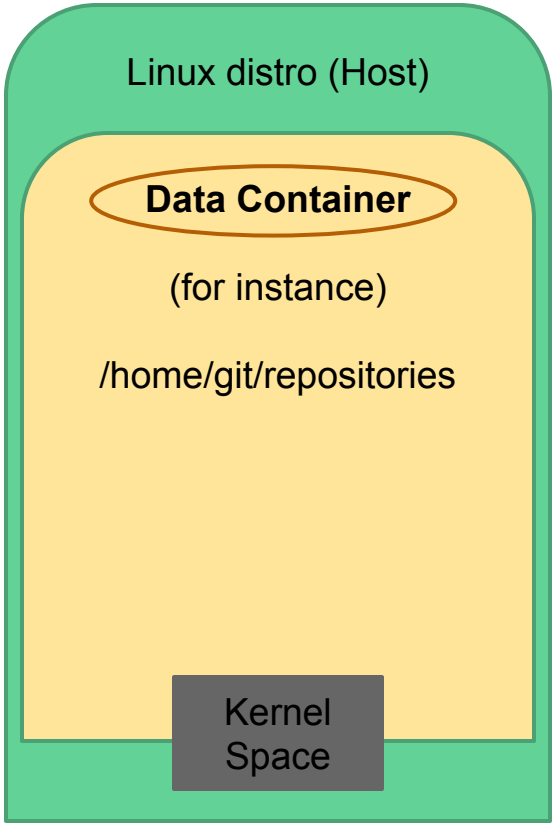
Containers



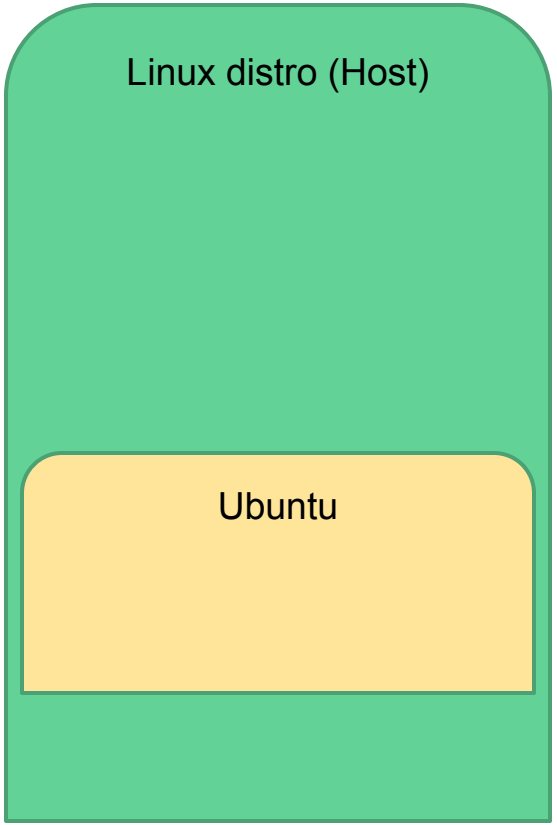


What is Docker?

Images: docker build

Dockerfile:

FROM ubuntu



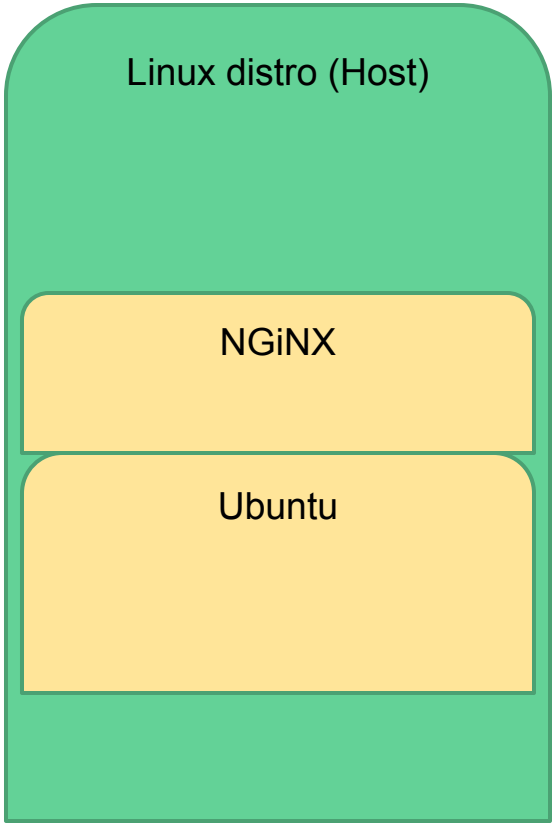
What is Docker?

Images: docker build

Dockerfile:

```
FROM ubuntu

RUN \
  add-apt-repository -y ppa:nginx/stable && \
  apt-get update && \
  apt-get install -y nginx
```



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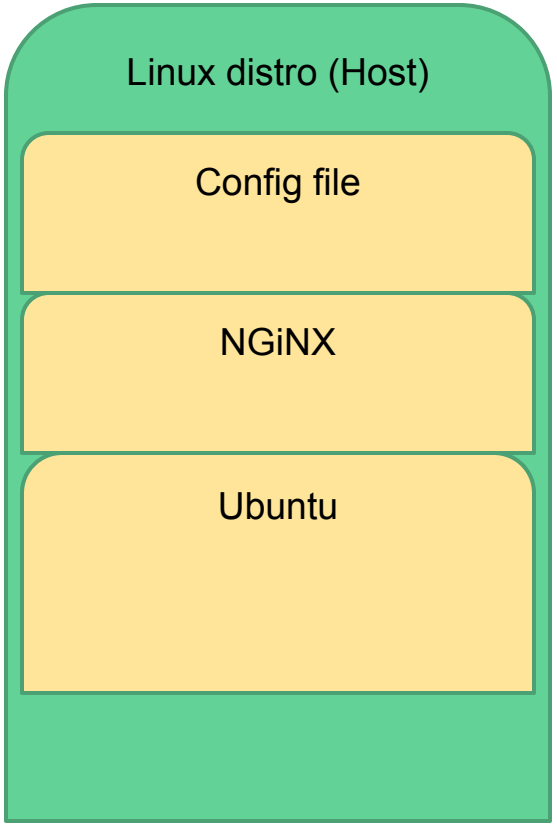
Images: docker build

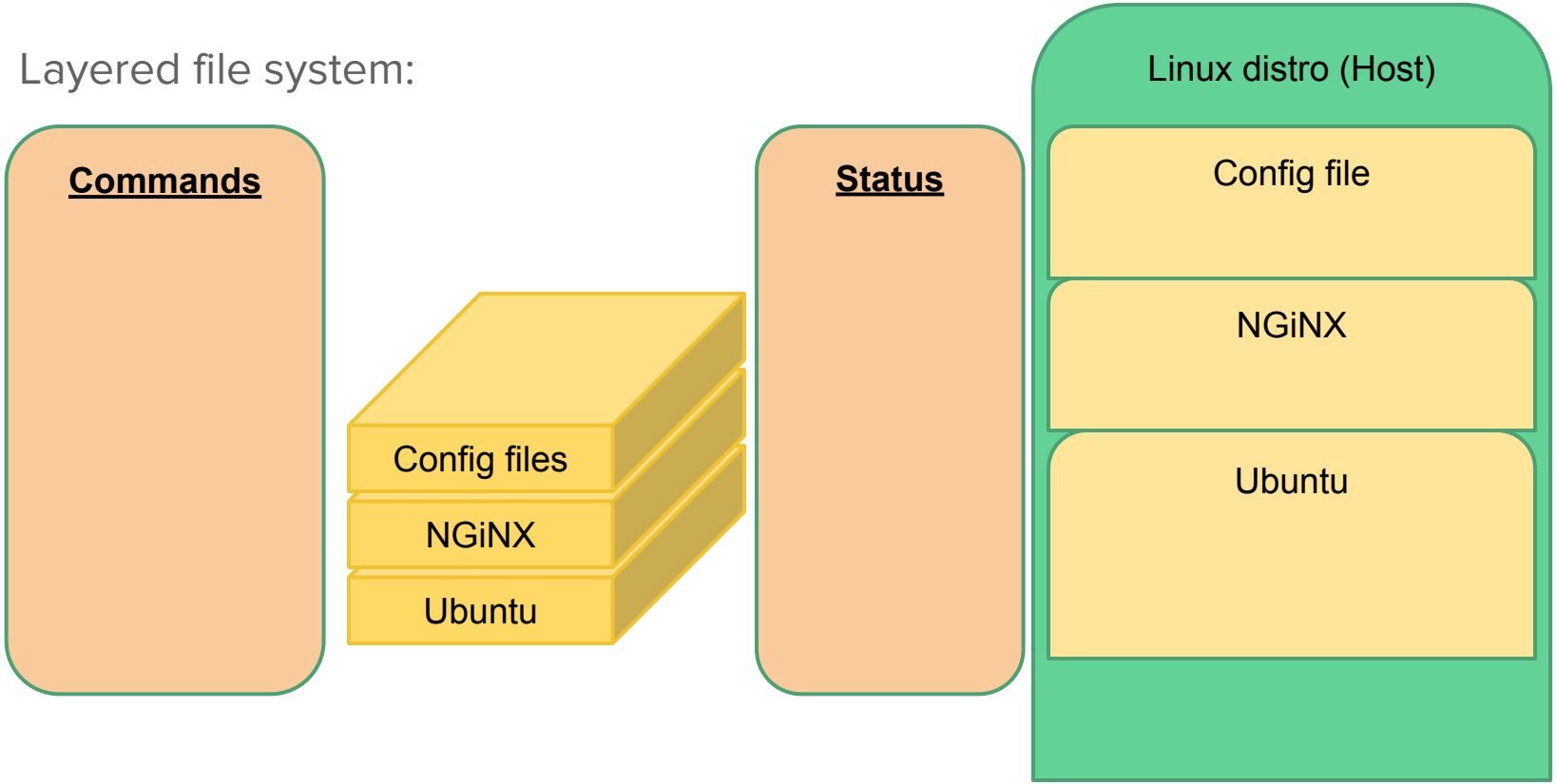
Dockerfile:

```
FROM ubuntu

RUN \
  add-apt-repository -y ppa:nginx/stable && \
  apt-get update && \
  apt-get install -y nginx

COPY env.conf /home/git/
RUN ln -fs /home/git/nginx/cnf /etc/nginx/nginx.conf

EXPOSE 80
EXPOSE 443

ENTRYPOINT ["/bin/sh", "-c"]
CMD ["nginx"]
```



What is Docker?

Layered file system:



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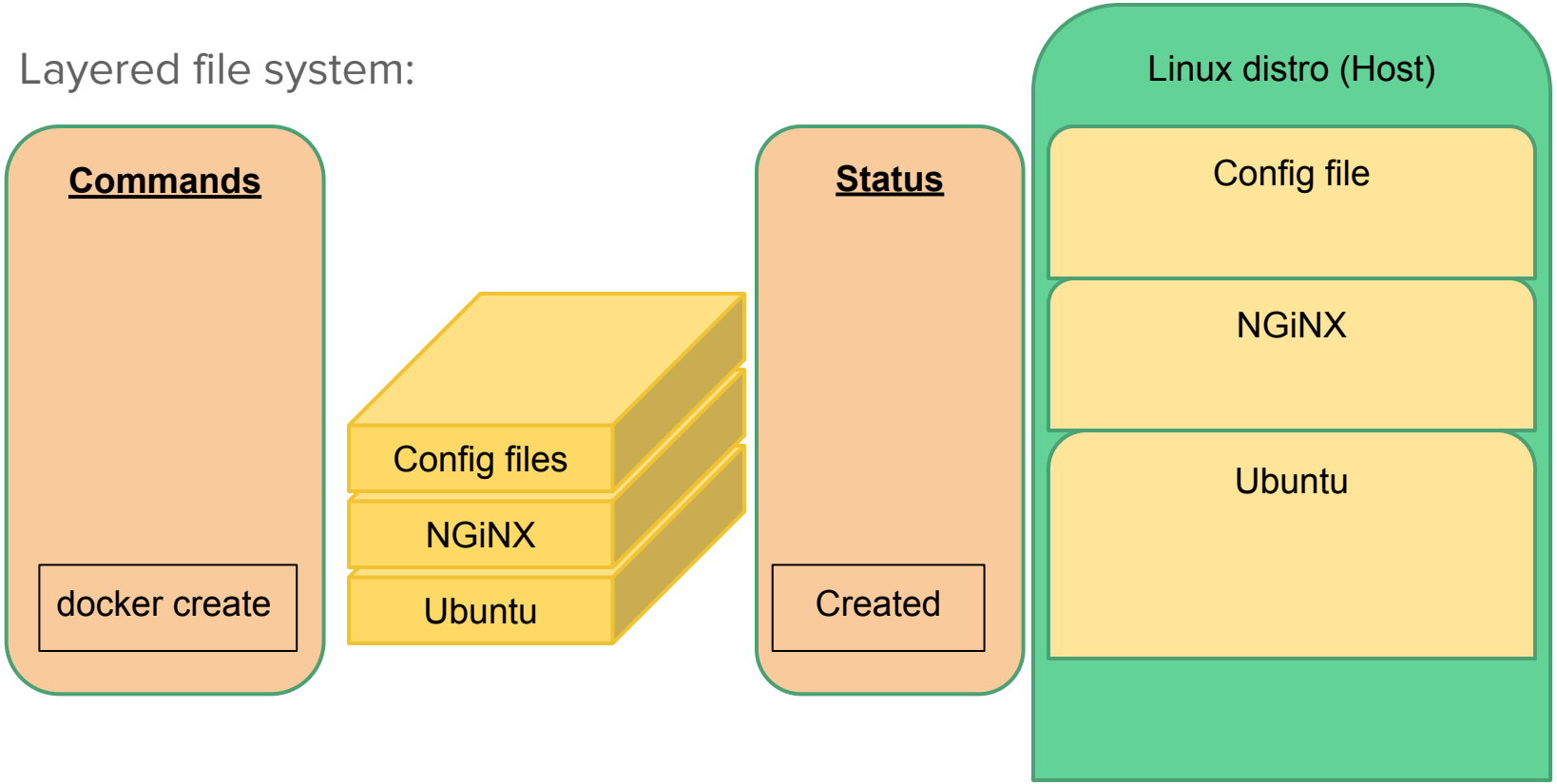

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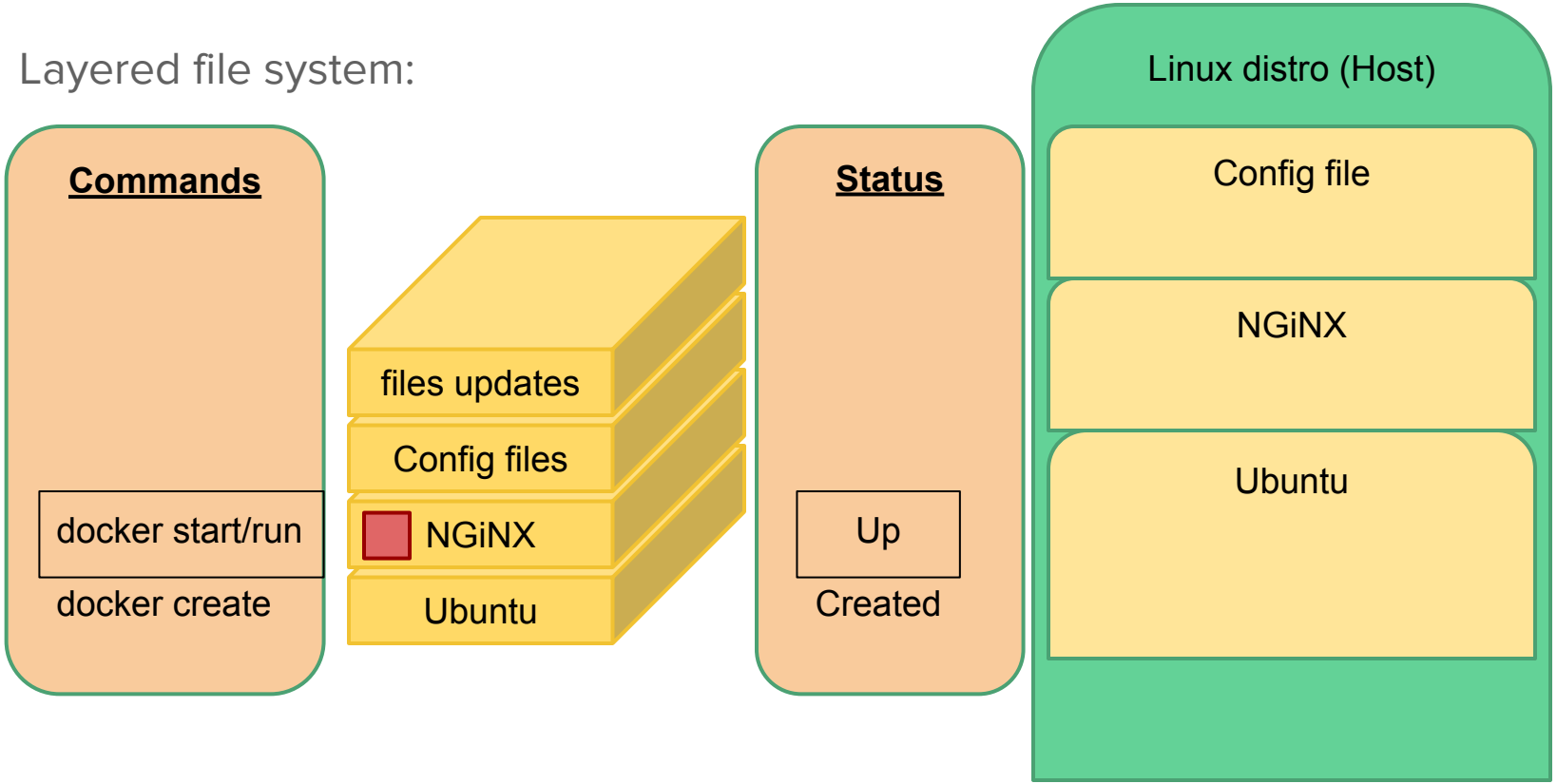

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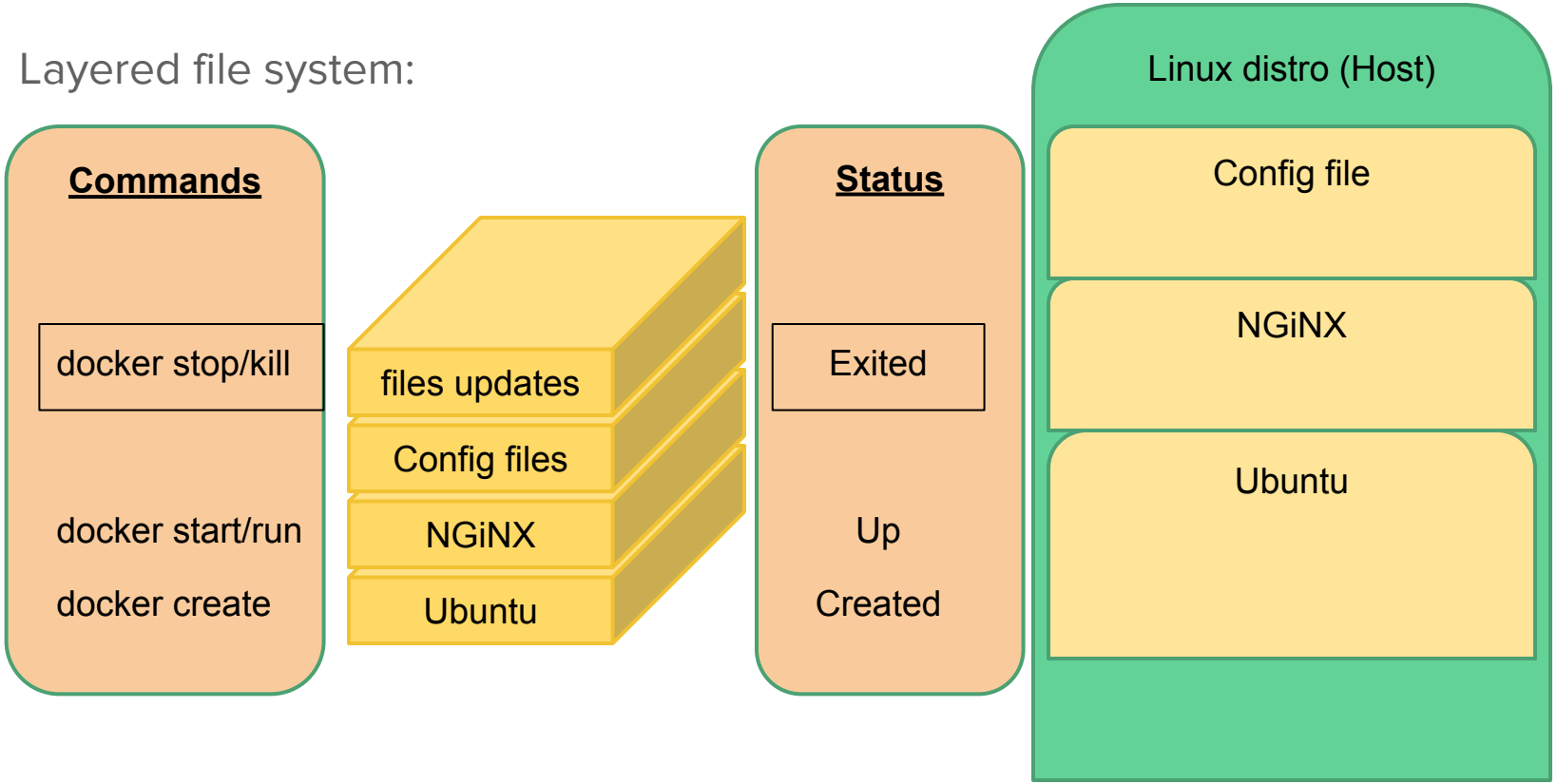

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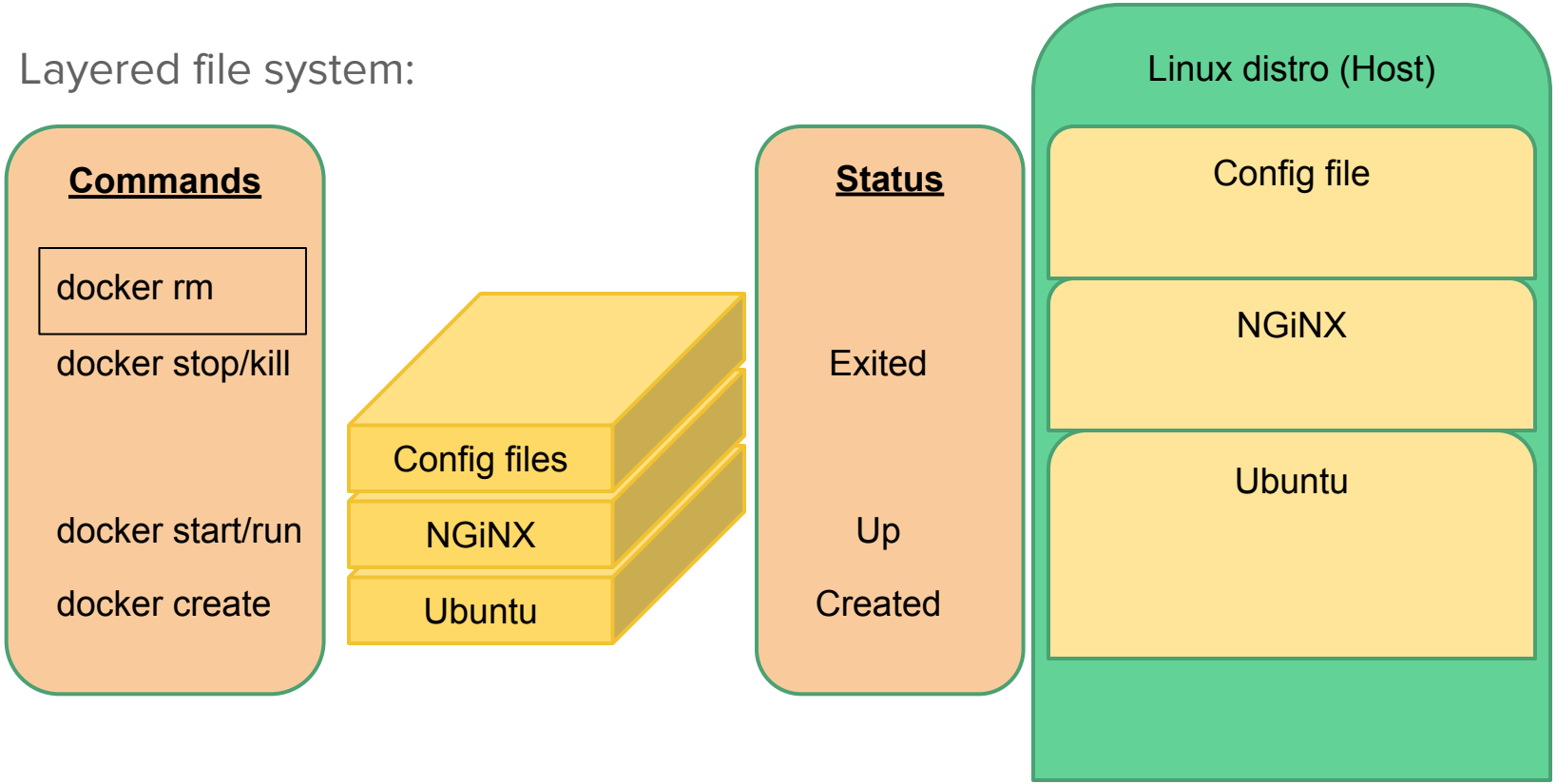
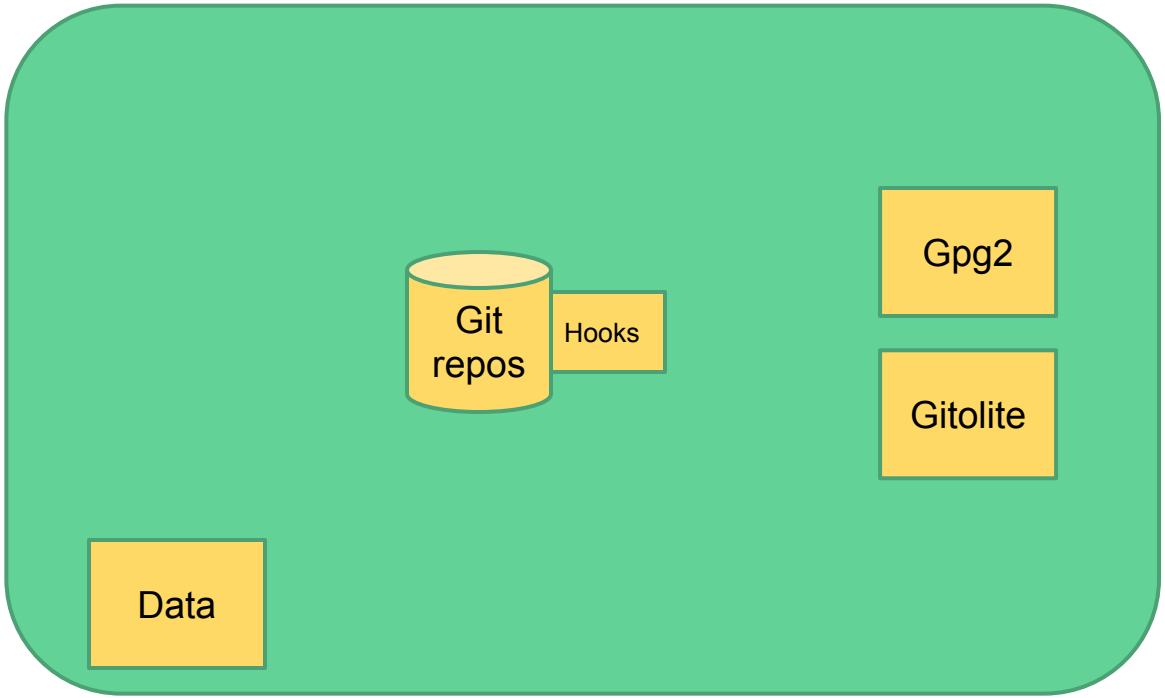


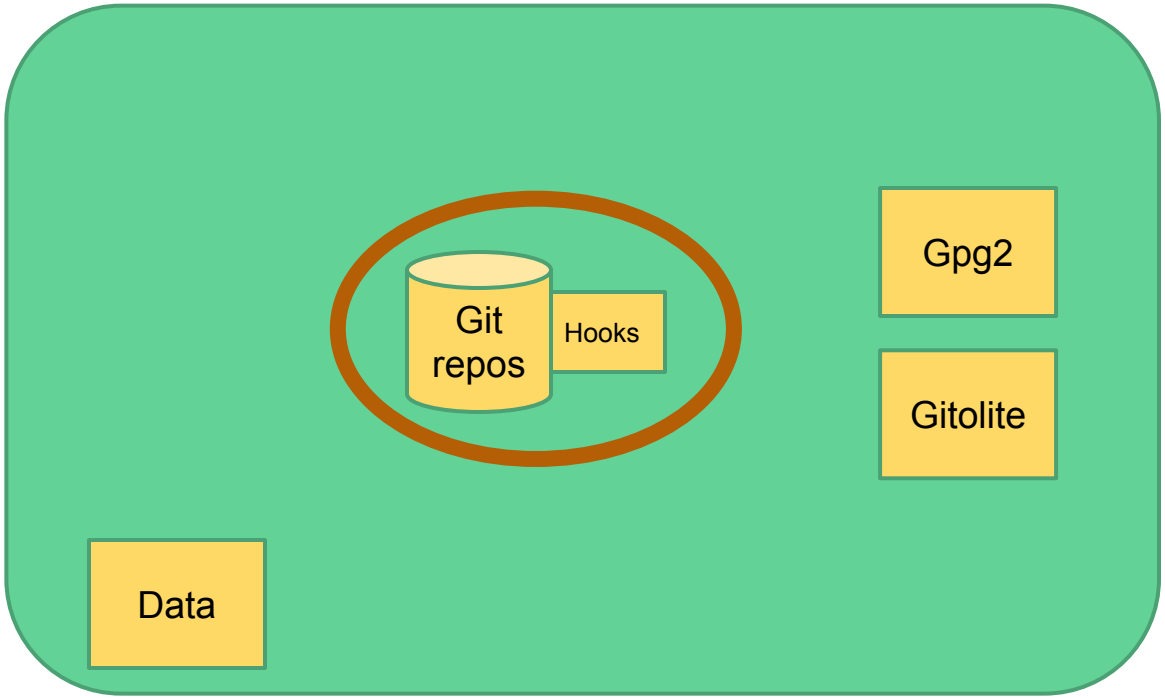
Docker rework

Data Container first



Docker rework

Data Container first

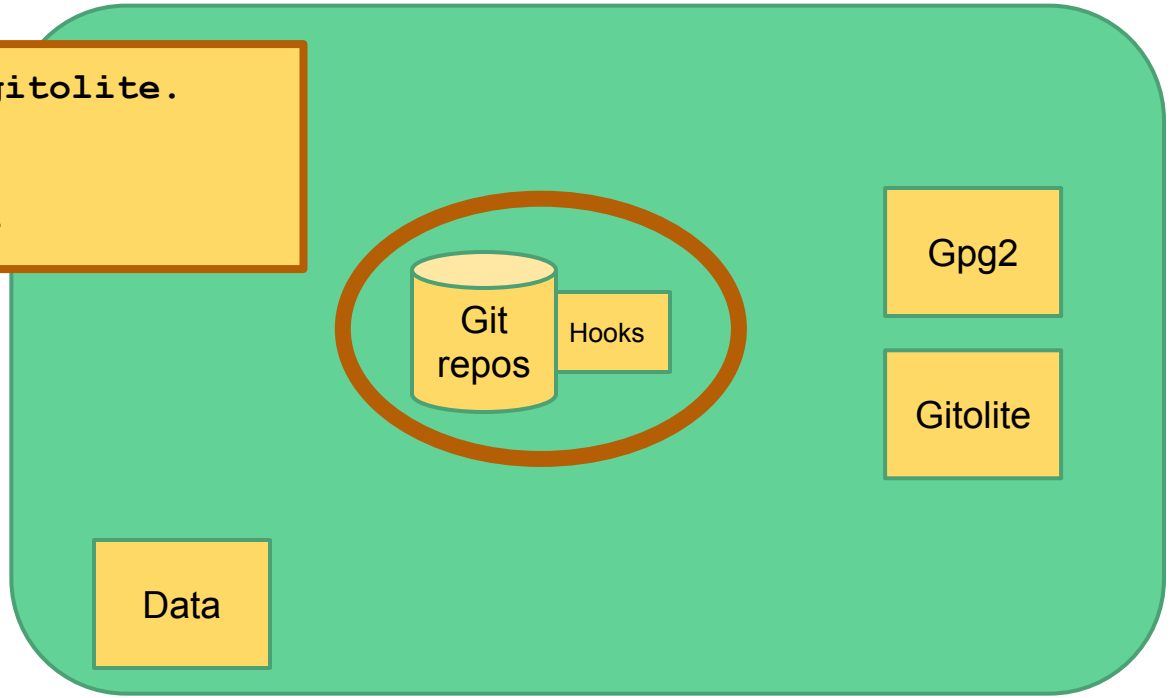


Docker rework

Data Container first

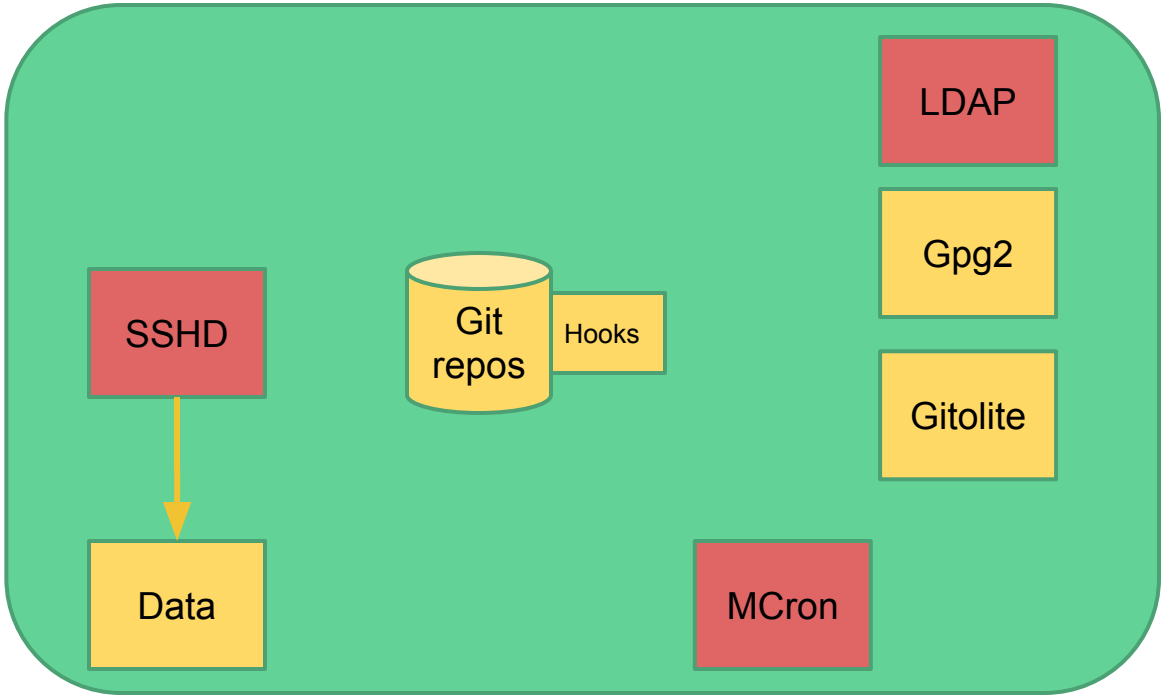
```
docker create --name=gitolite.
repos.blessed.cont

/home/git/repositories
```



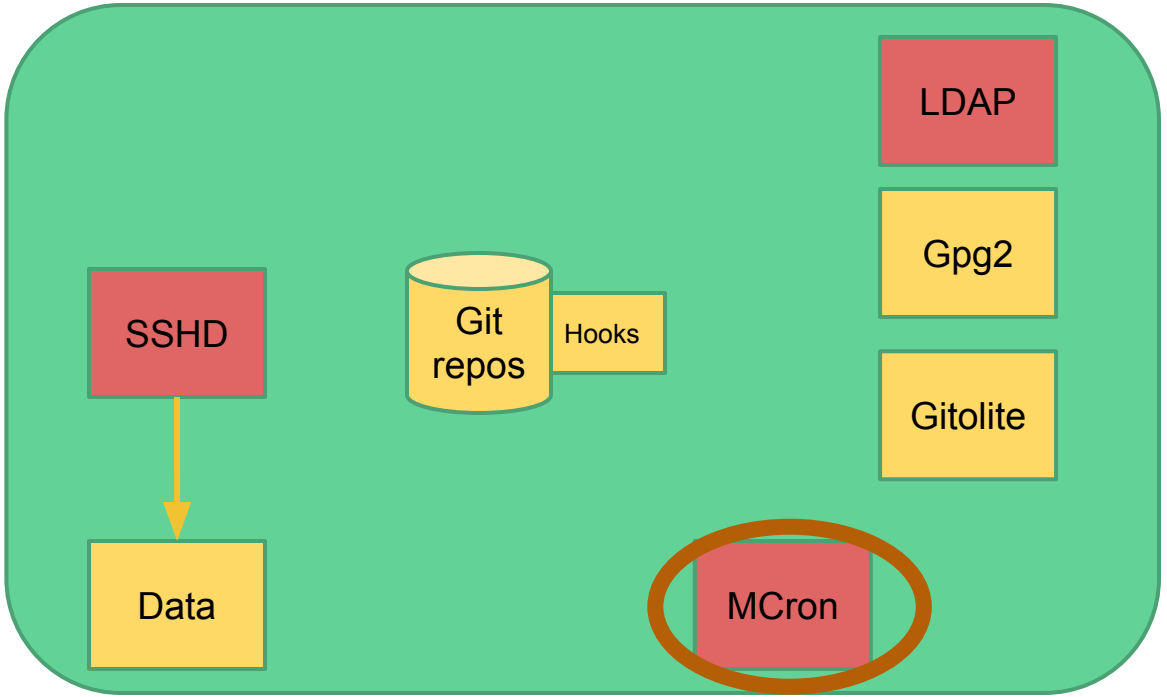
Docker rework

Leaf containers second



Docker rework

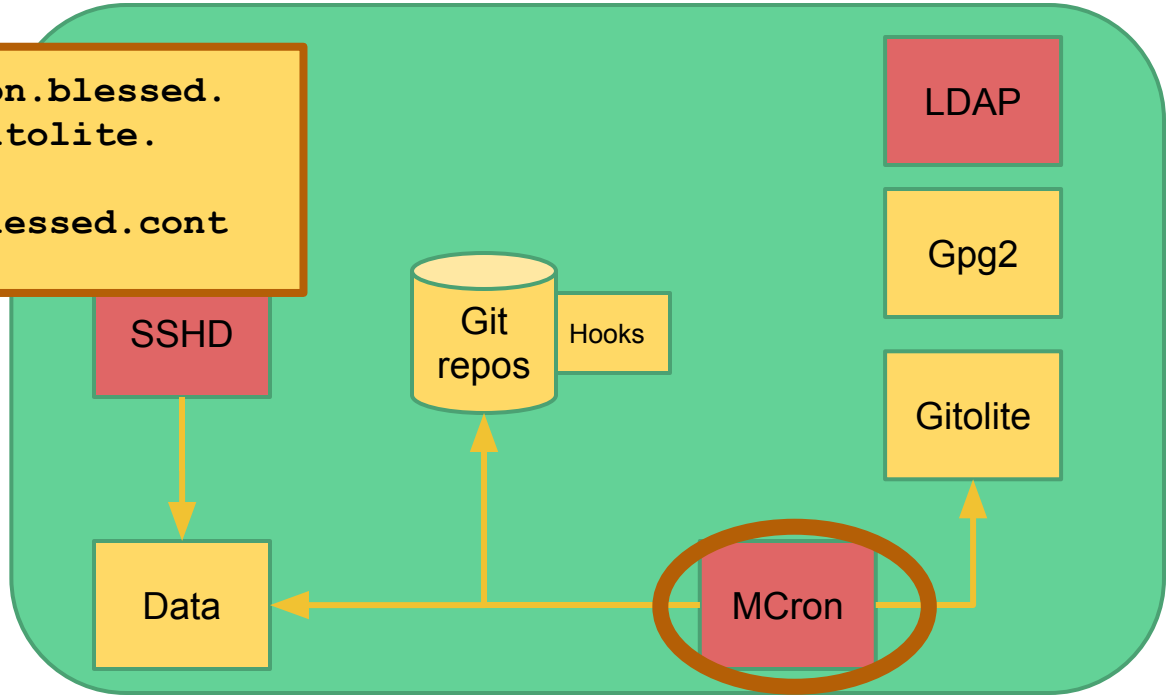
Leaf containers second



Docker rework

Leaf containers second

```
docker run --name=mcron.blessed.
cont --volumes-from gitolite.
blessed.cont
--volumes-from data.blessed.cont
```

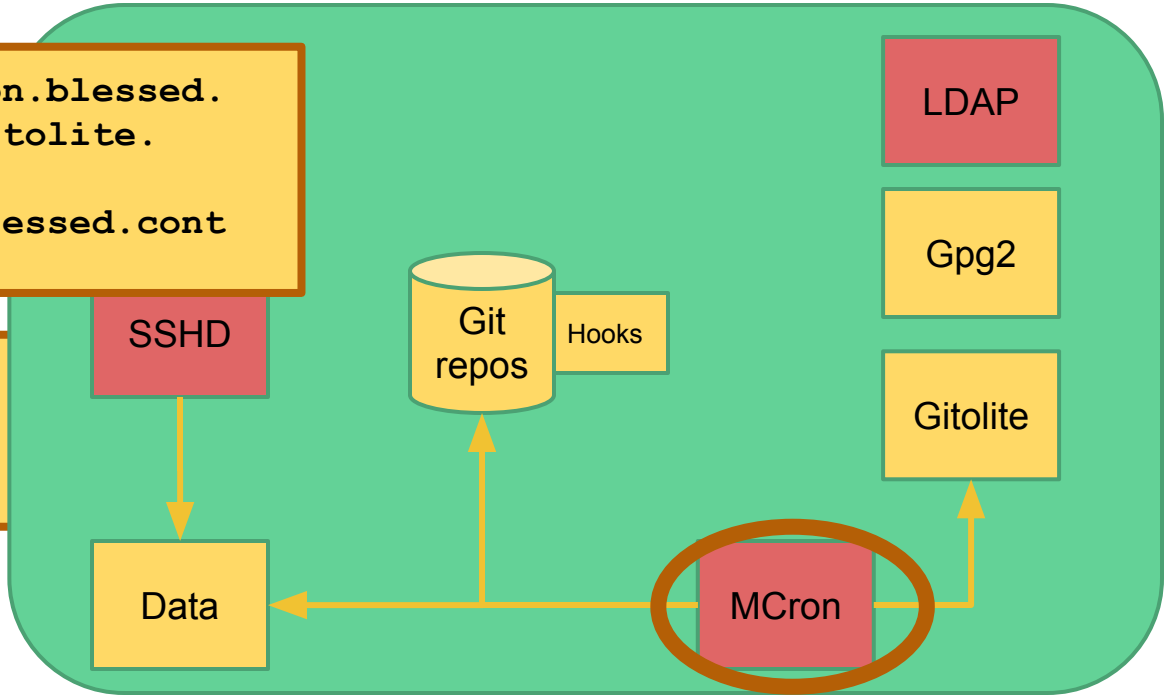


Docker rework

Leaf containers second

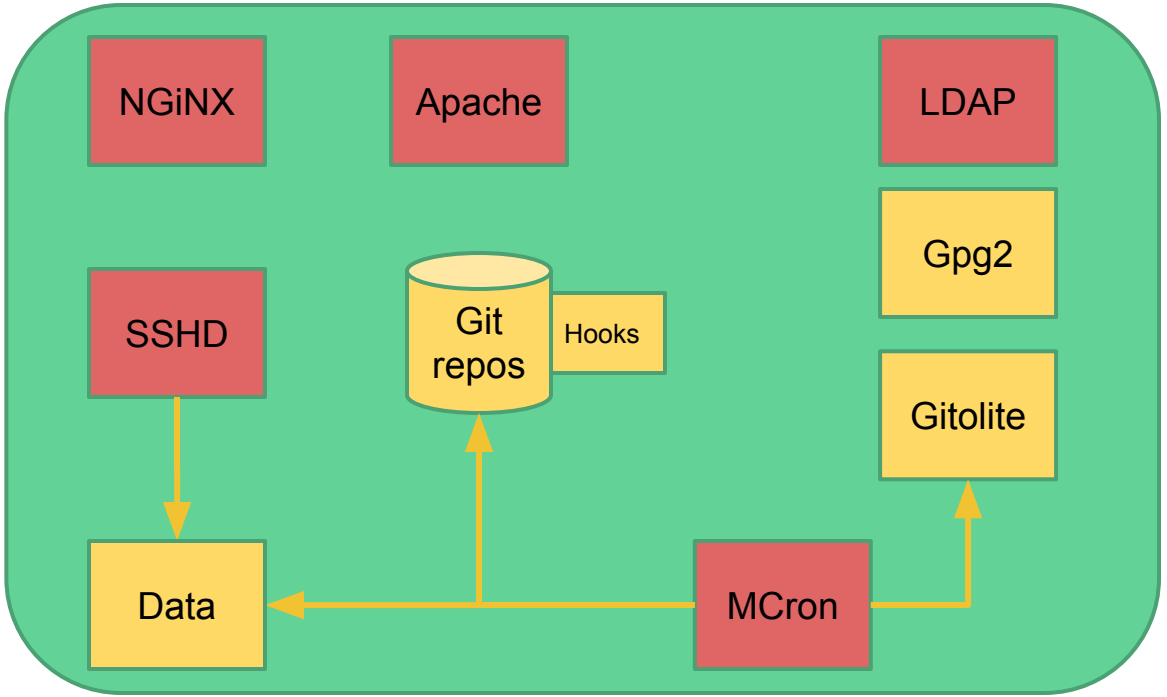
```
docker run --name=mcron.blessed.
cont --volumes-from gitolite.
blessed.cont
--volumes-from data.blessed.cont
```

```
/home/git/repositories
/home/git/gitolite
/home/git/data
```



Docker rework

Linked containers last



Docker rework

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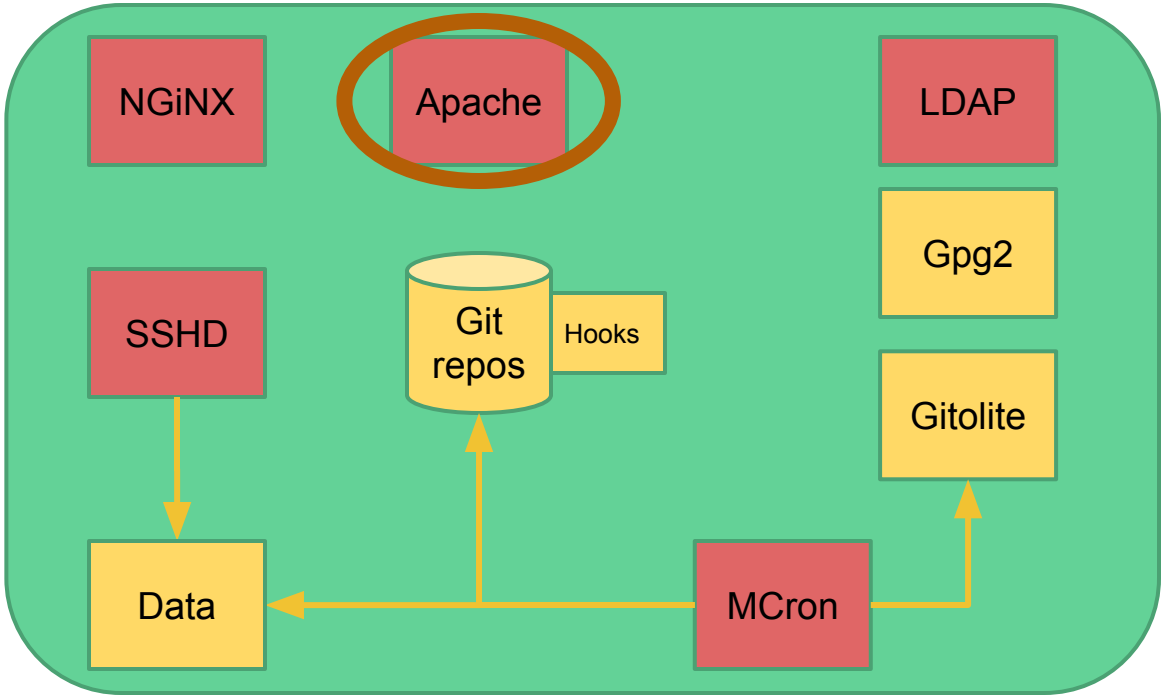
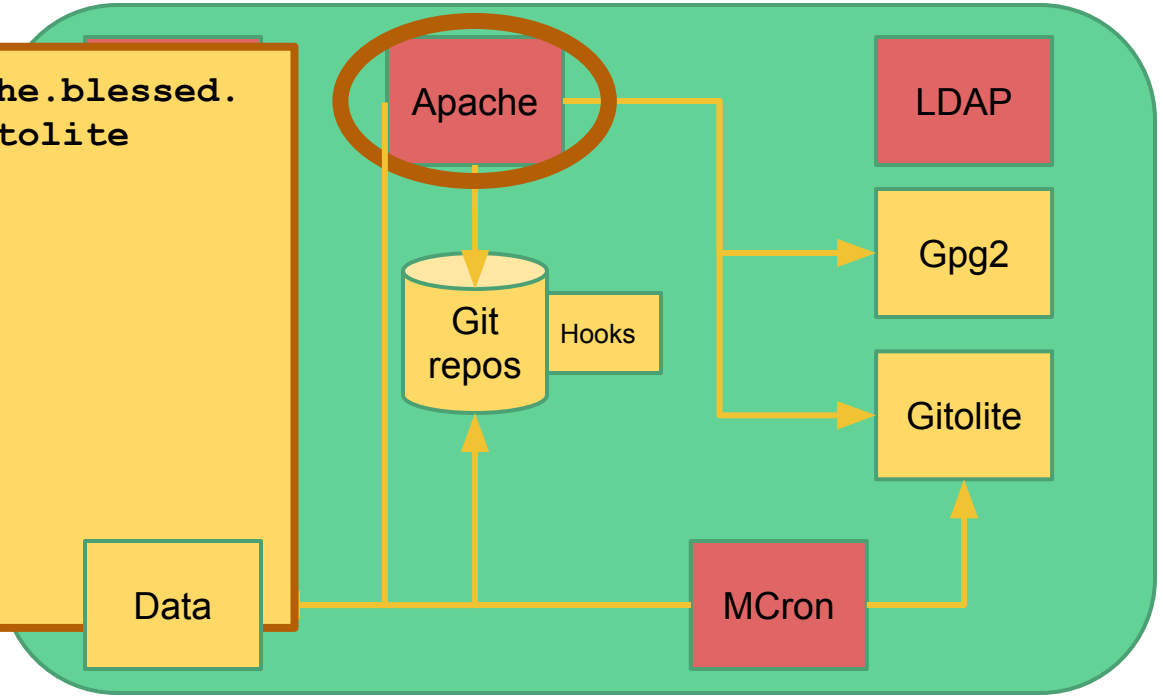


Docker rework

Linked containers last

```
docker run --name=apache.blessed.
cont --volumes-from gitolite
--volumes-from repos
--volumes-from gpg2
--volumes-from data
```

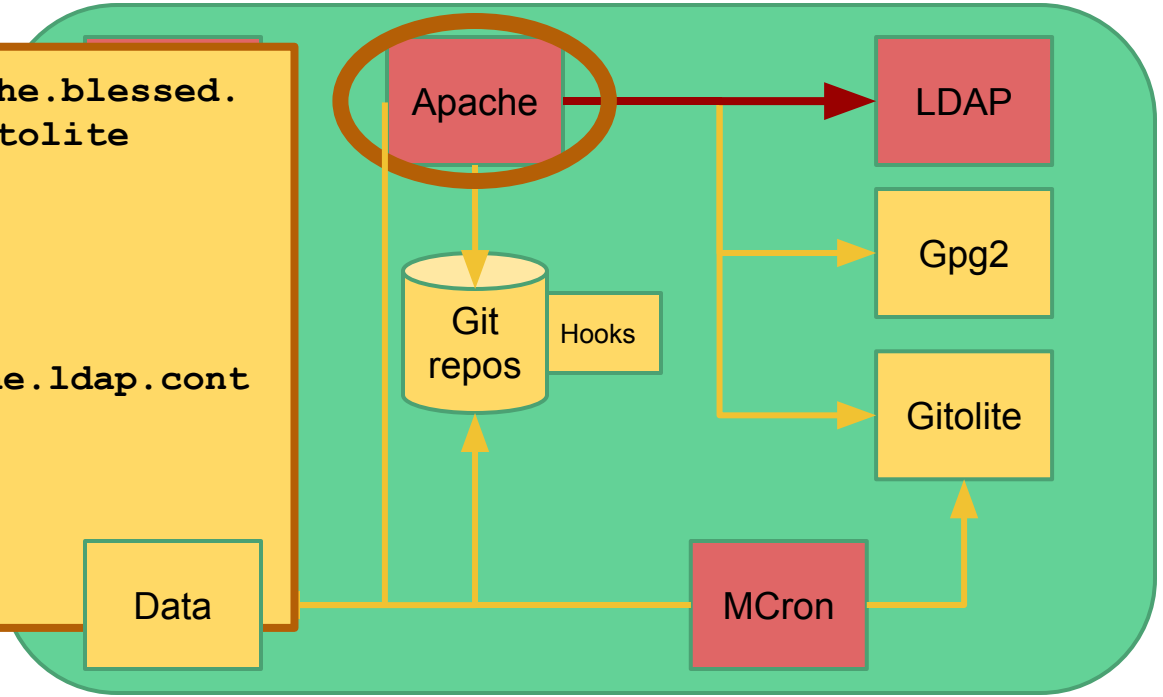


Docker rework

Linked containers last

```
docker run --name=apache.blessed.
cont --volumes-from gitolite
--volumes-from repos
--volumes-from gpg2
--volumes-from data

--link ldap.cont:apache.ldap.cont
```

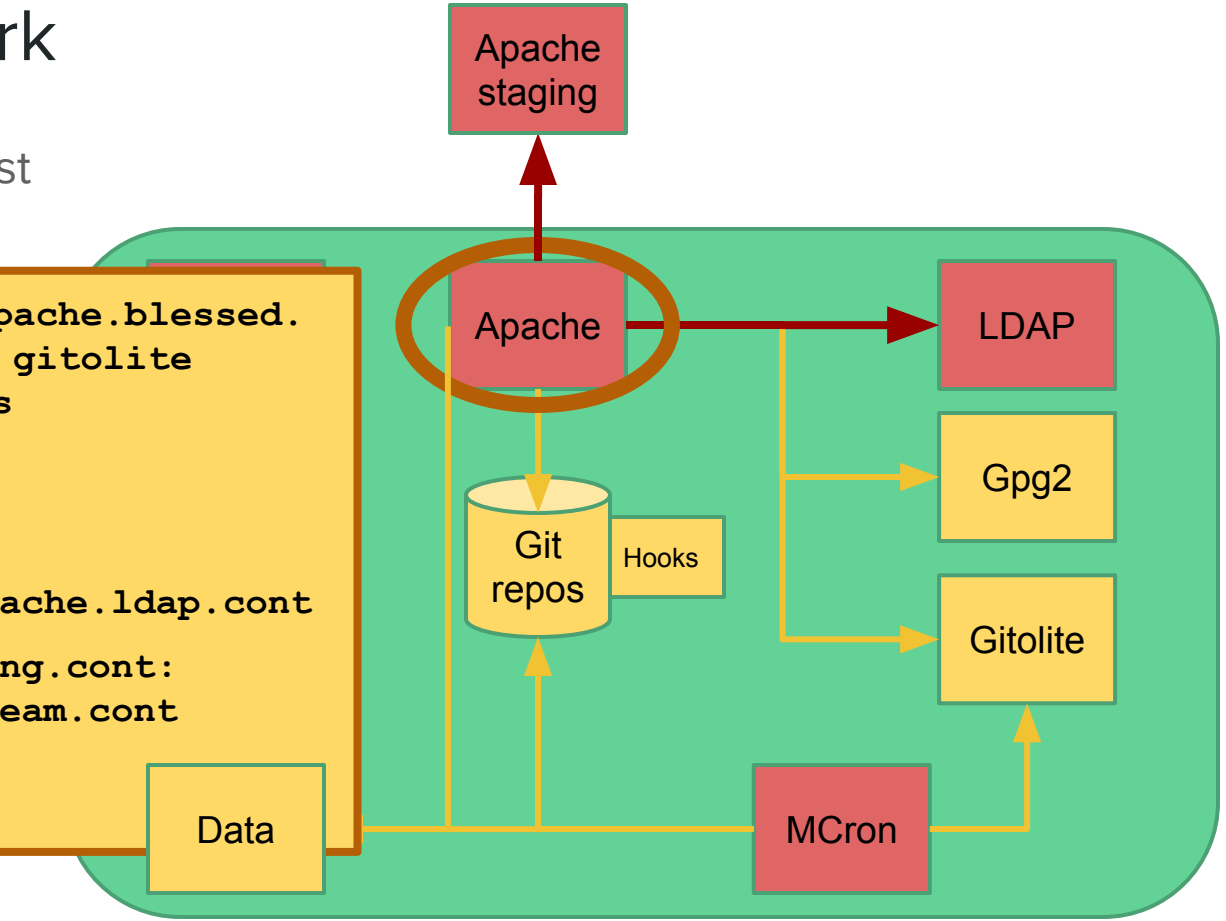


Docker rework

Linked containers last

```
docker run --name=apache.blessed.
cont --volumes-from gitolite
--volumes-from repos
--volumes-from gpg2
--volumes-from data

--link ldap.cont:apache.ldap.cont
--link apache.staging.cont:
       apache.upstream.cont
```

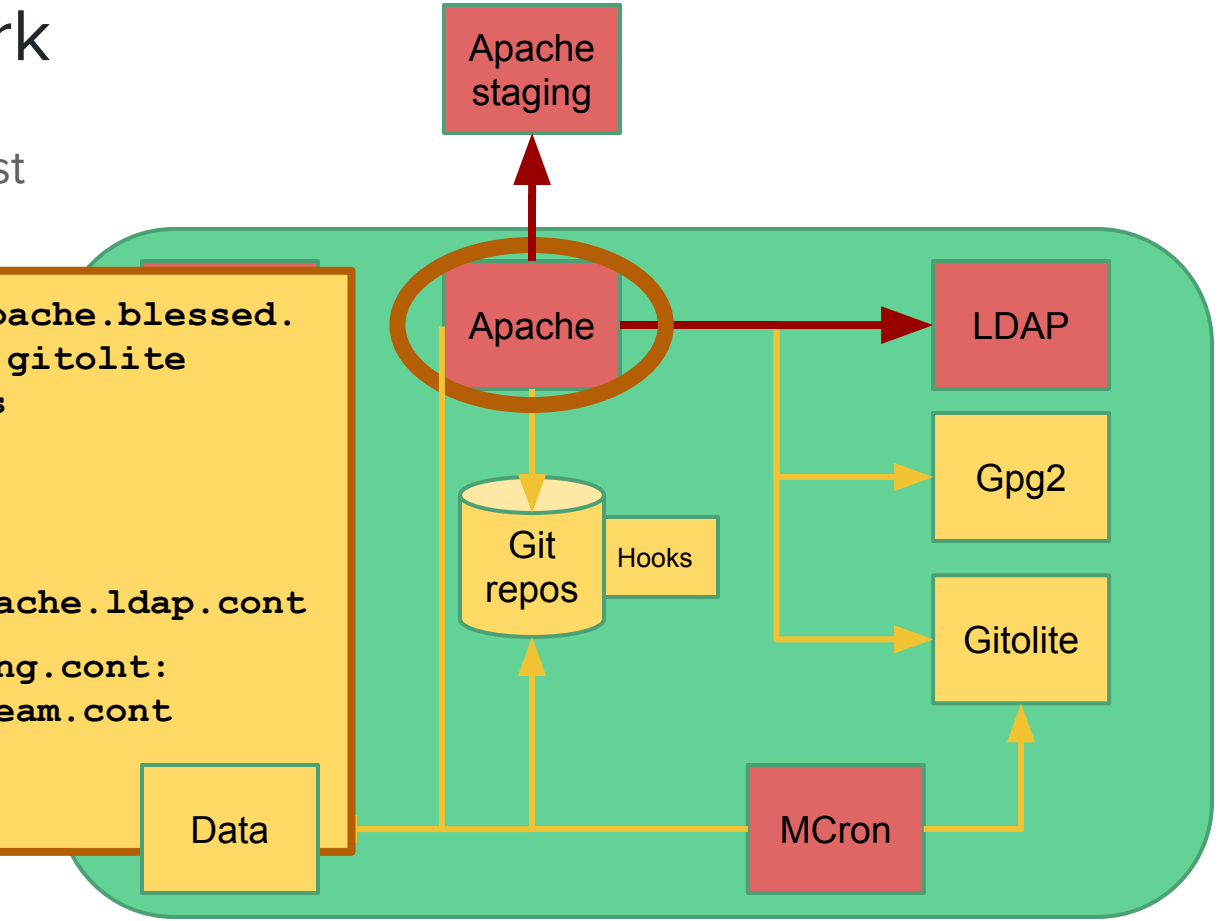


Docker rework

Linked containers last

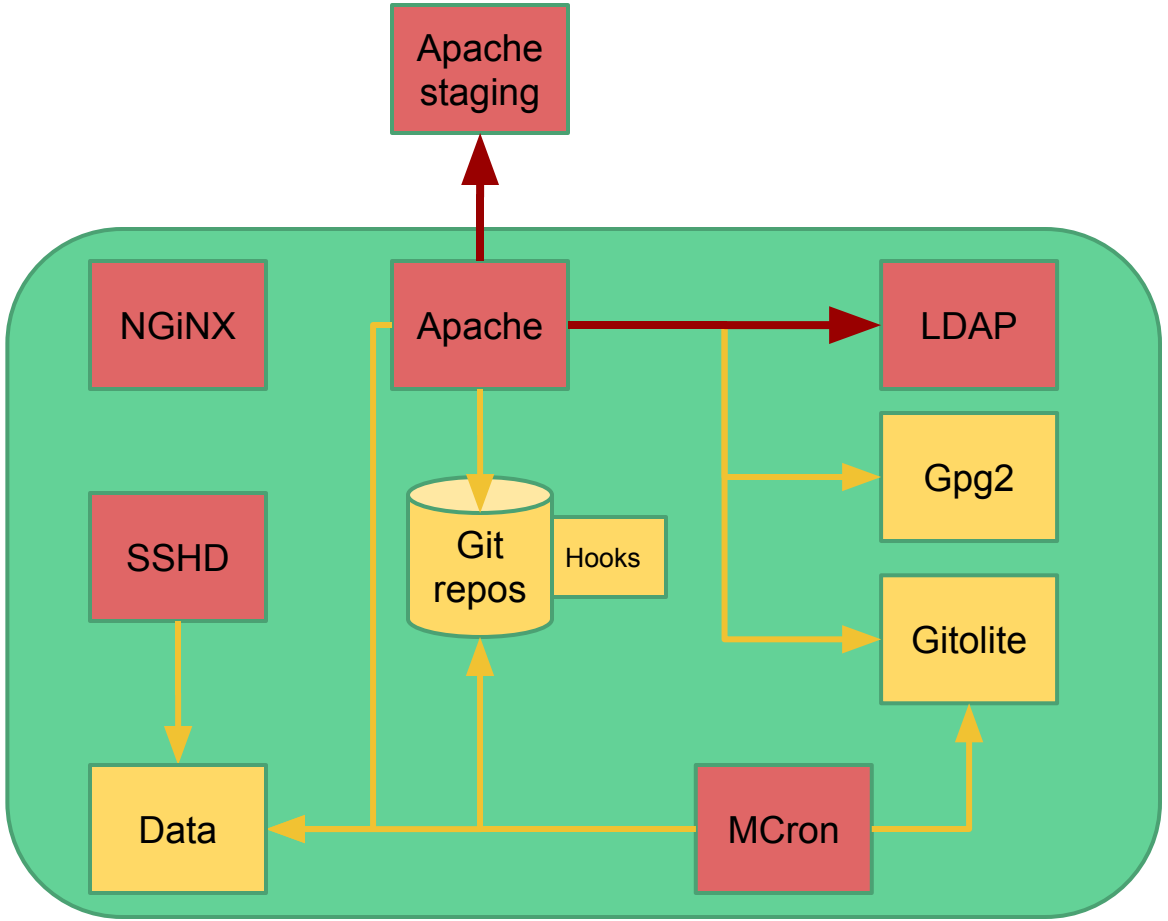
```
docker run --name=apache.blessed.
cont --volumes-from gitolite
--volumes-from repos
--volumes-from gpg2
--volumes-from data

--link ldap.cont:apache.ldap.cont
--link apache.staging.cont:
       apache.upstream.cont
-p 6043:8543
-p 6053:8553
```



Docker rework

Linked containers last



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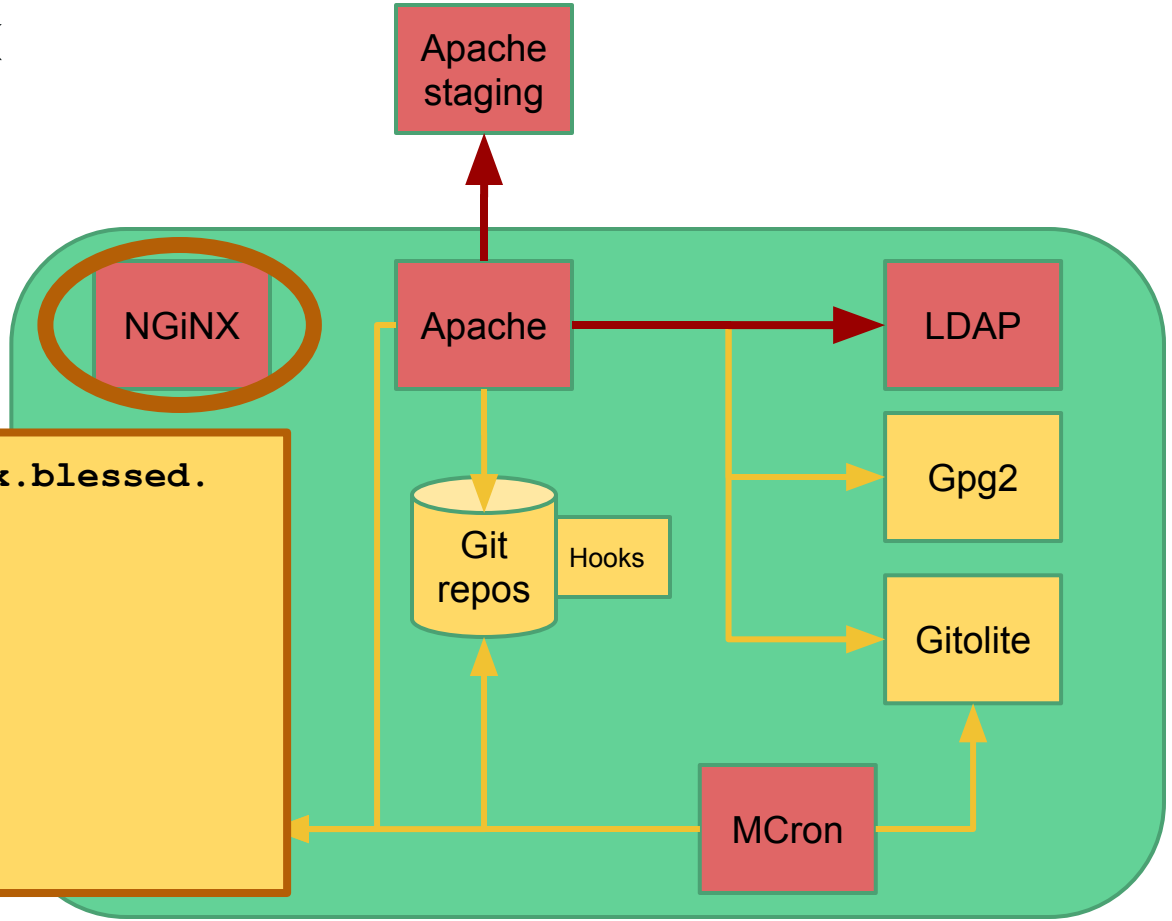
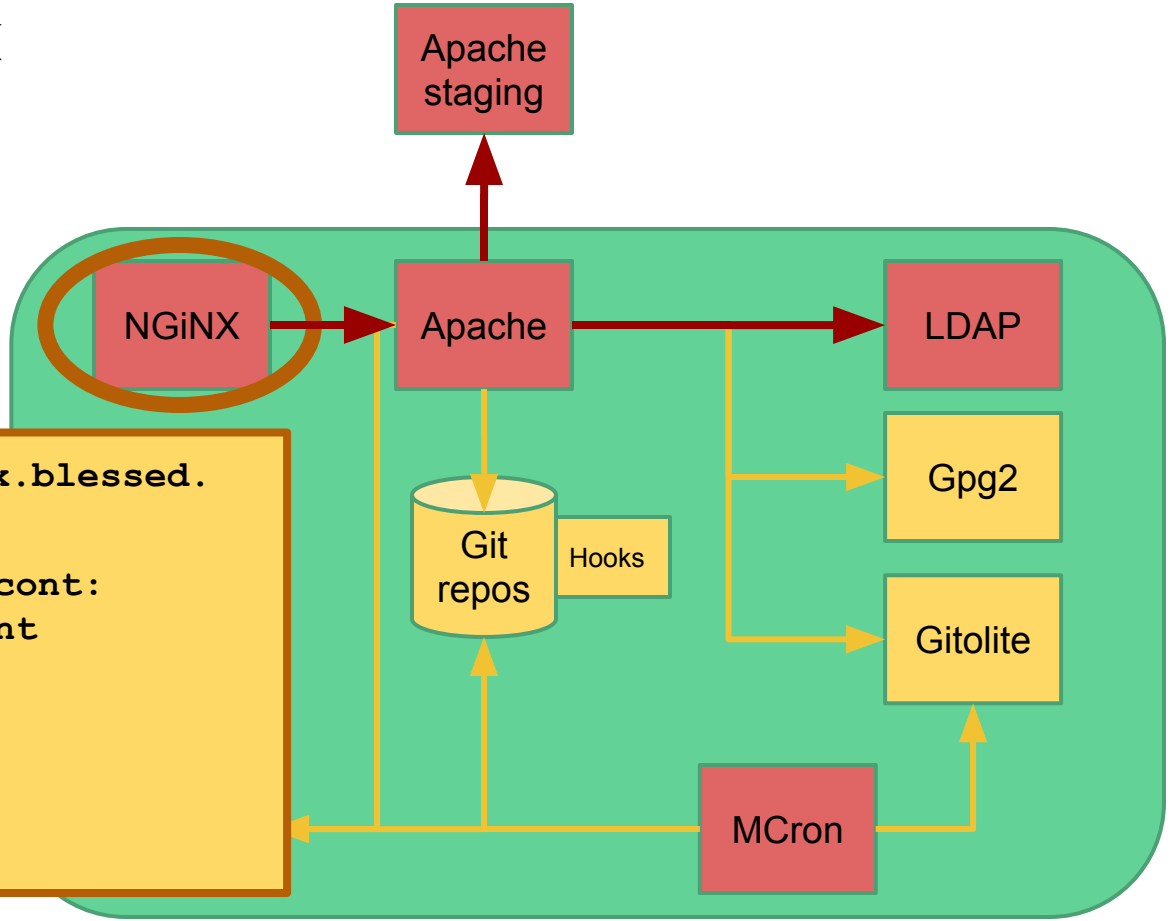



```
docker run --name=nginx.blessed.
cont
```

Docker rework

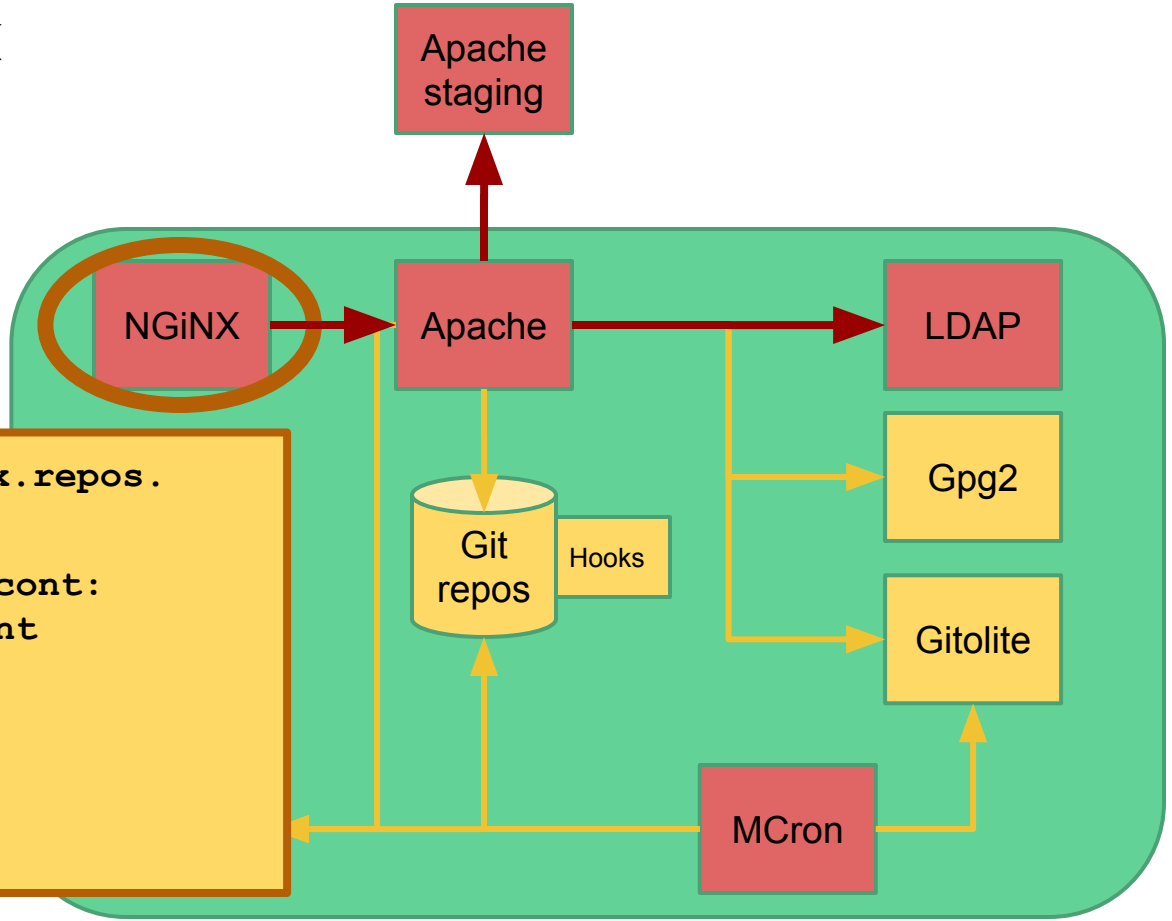
Linked containers last




```
docker run --name=nginx.blessed.
cont
--link apache.blessed.cont:
       nginx.apache.cont
```

Docker rework

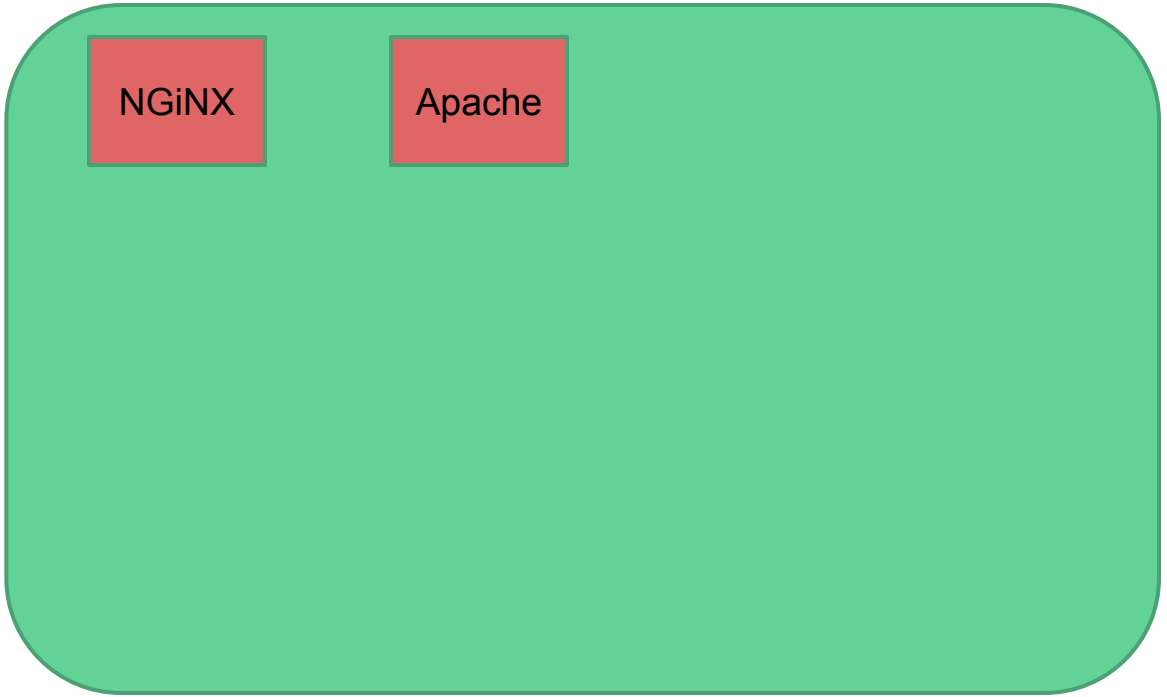
Linked containers last




```
docker run --name=nginx.repos.
blessed.cont
--link apache.blessed.cont:
       nginx.apache.cont
-p 6080:80
-p 6443:443
```

Docker Advantages

Configuration



Docker Advantages

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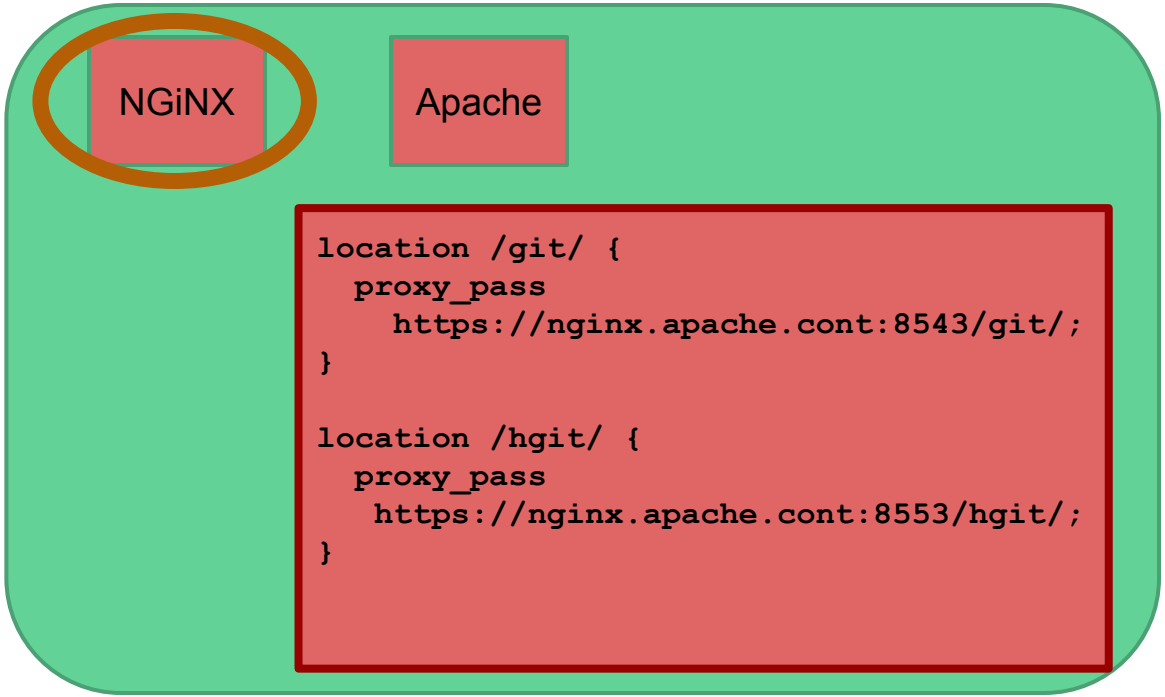
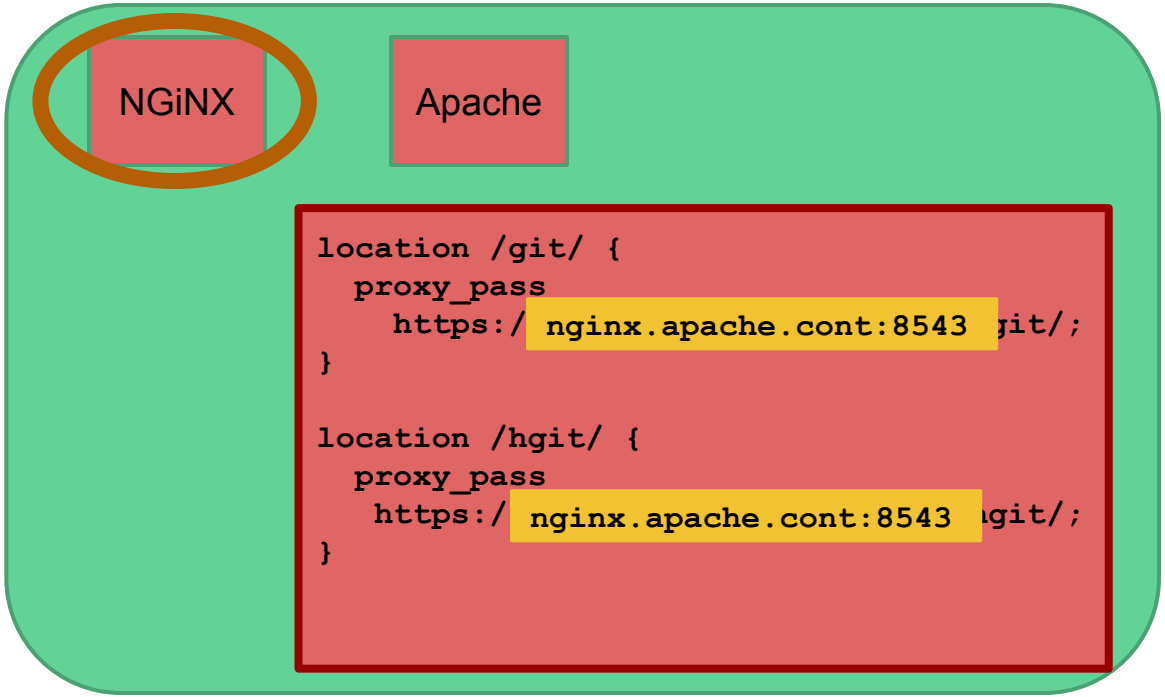


Docker Advantages

Configuration



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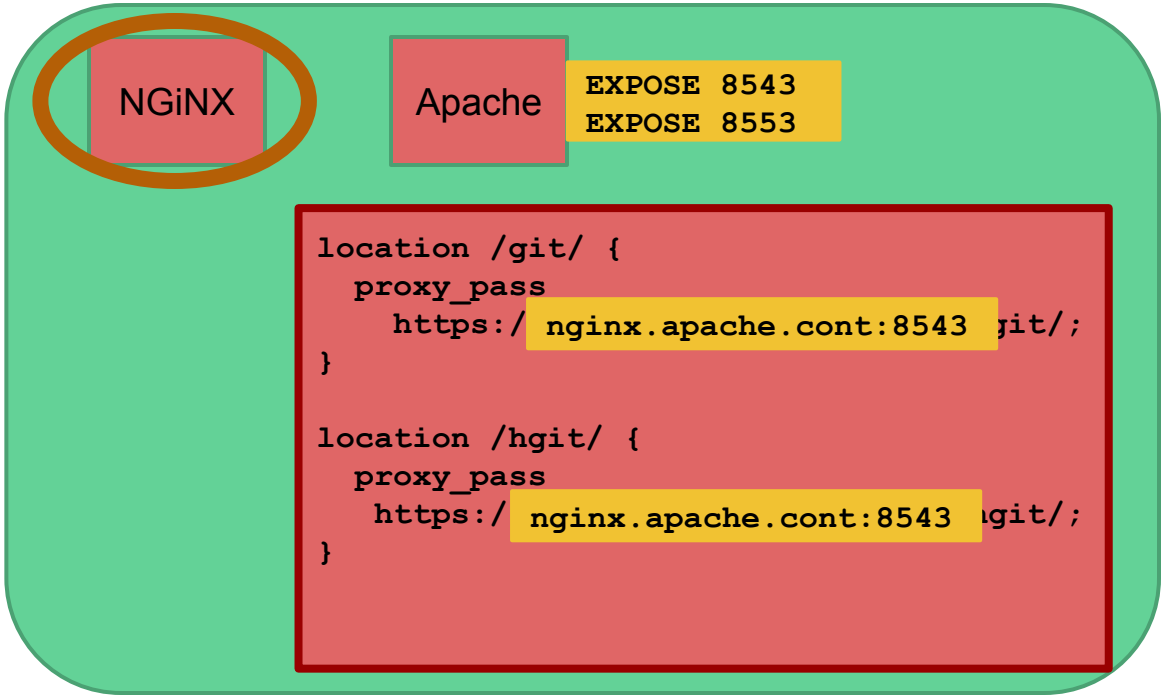

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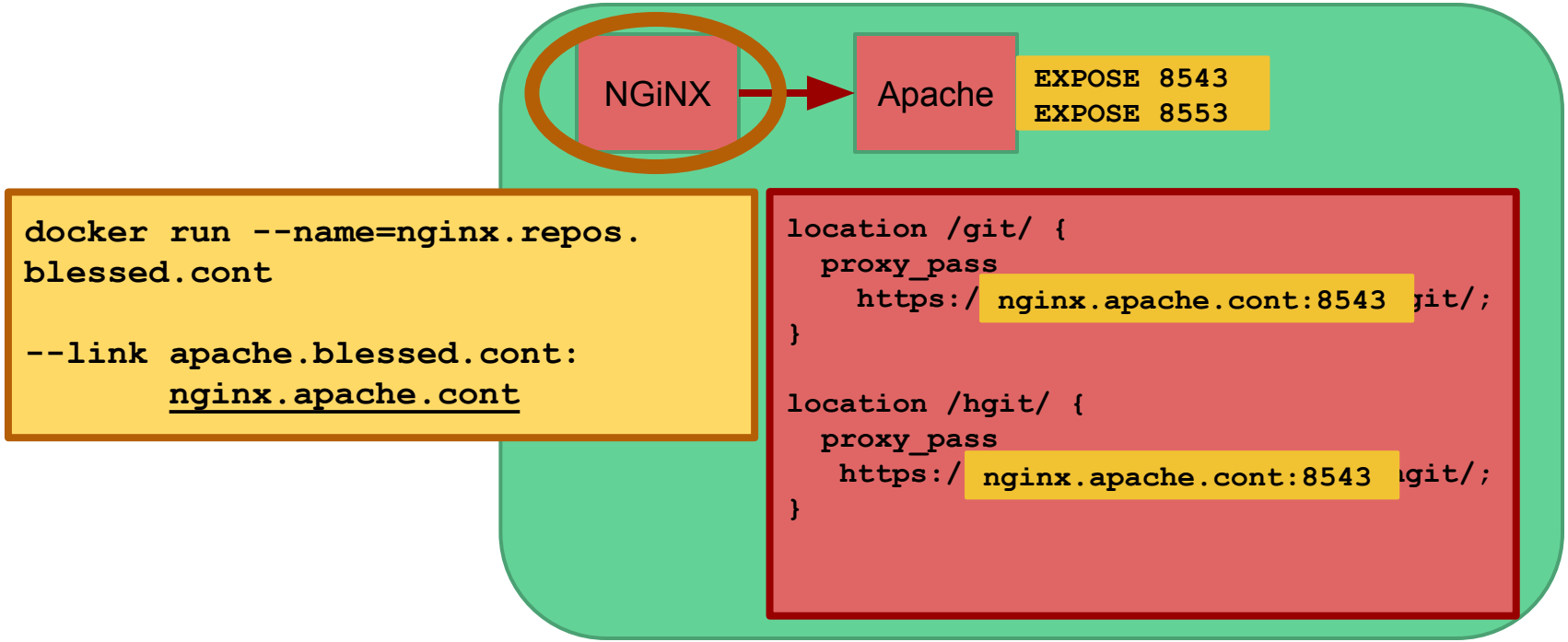
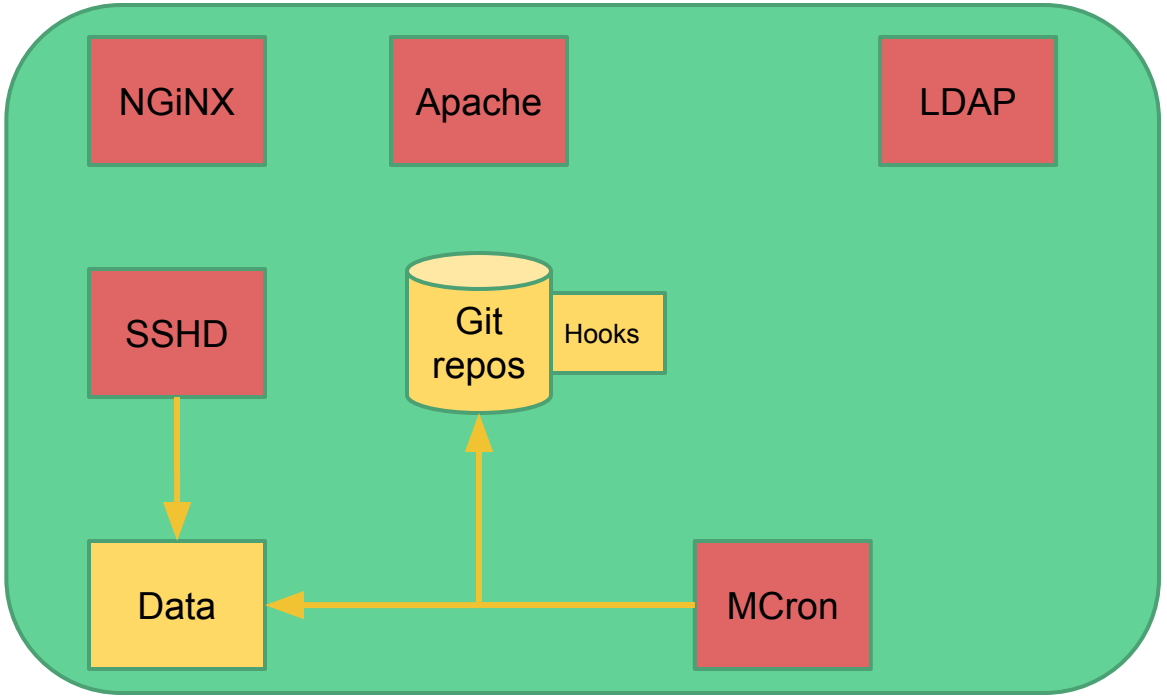
Configuration



Docker Advantages

Isolation (services)



Docker Advantages

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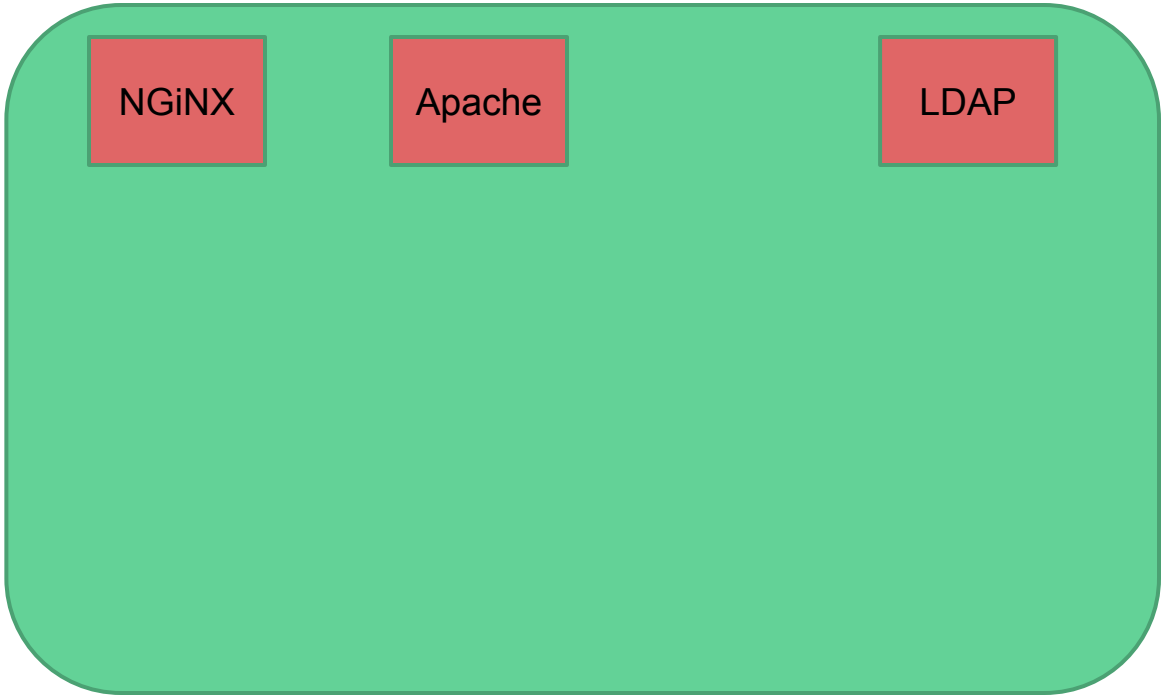

Docker Advantages

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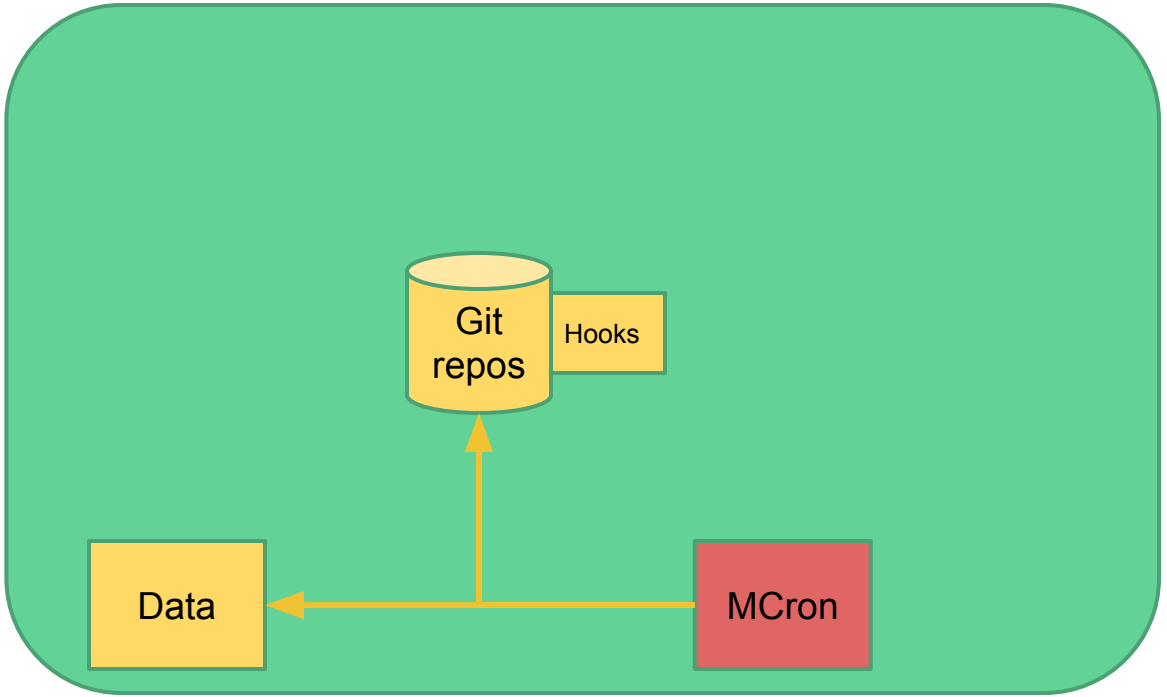

Docker Advantages

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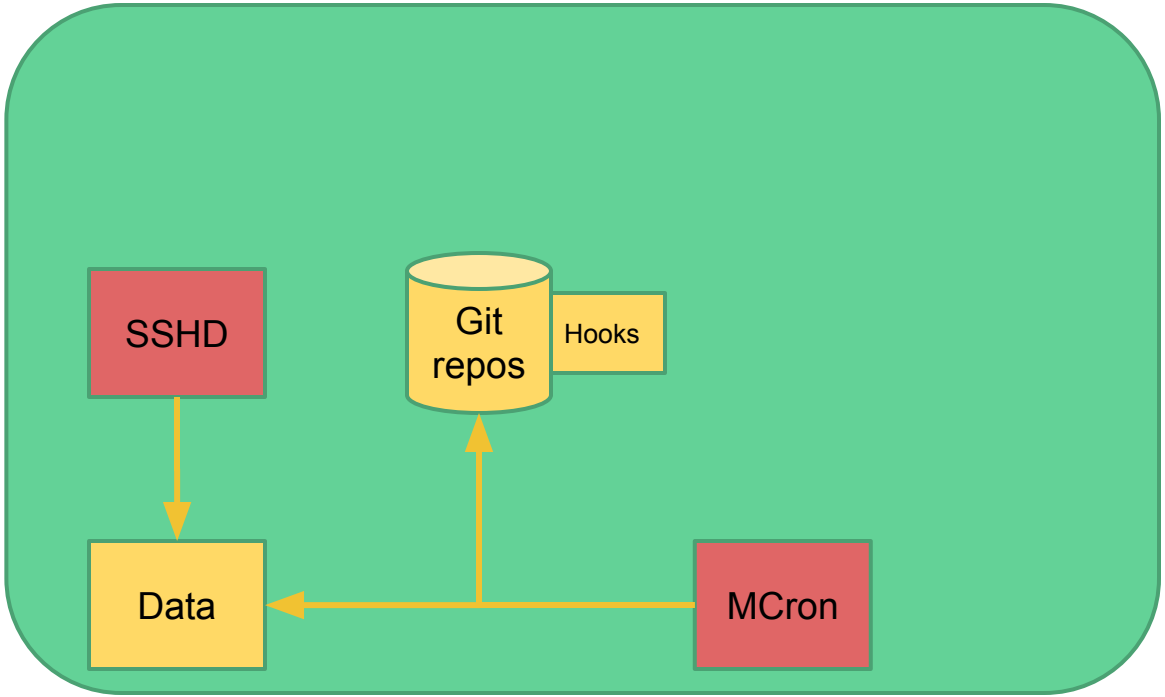

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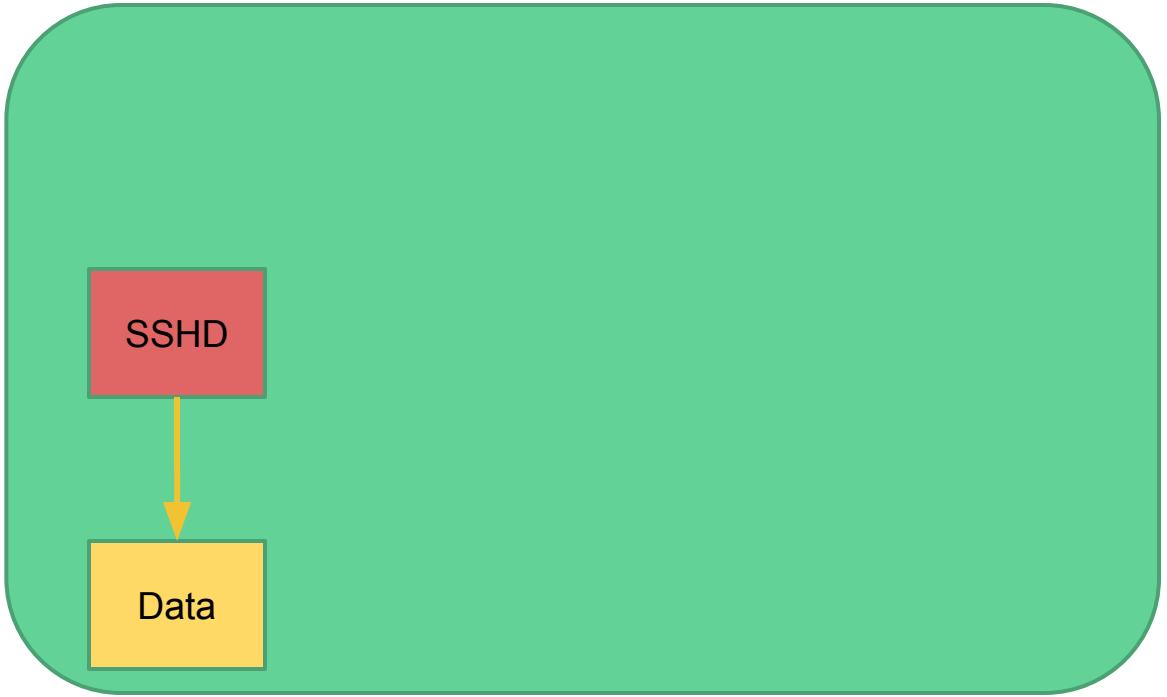
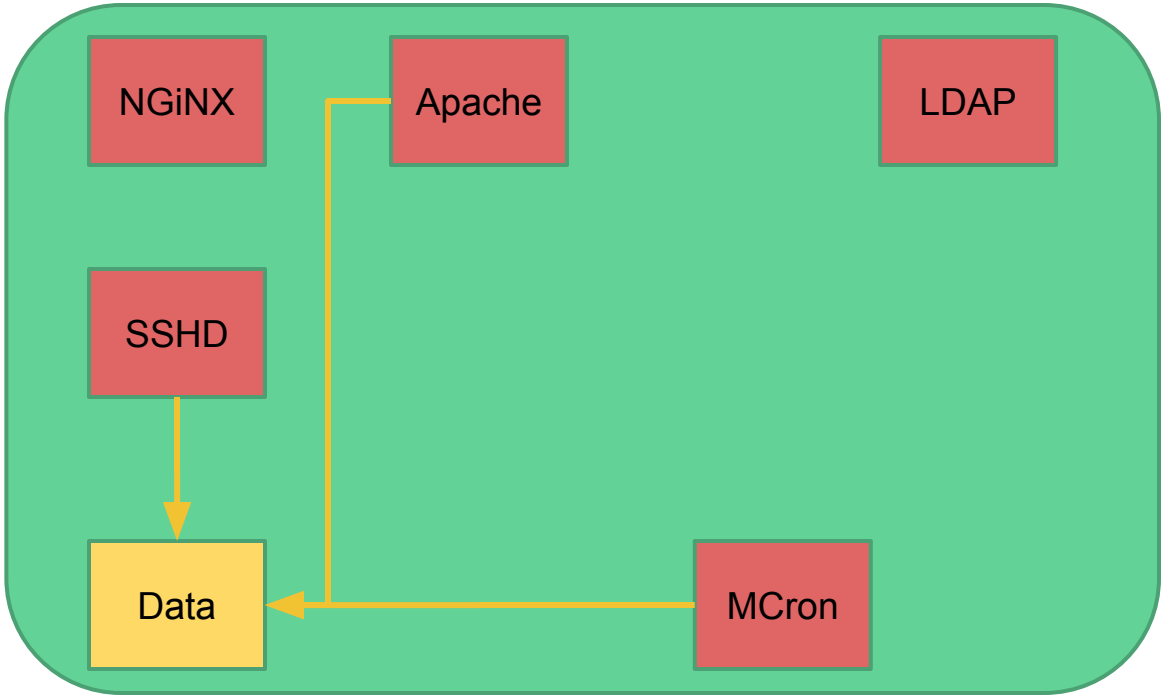


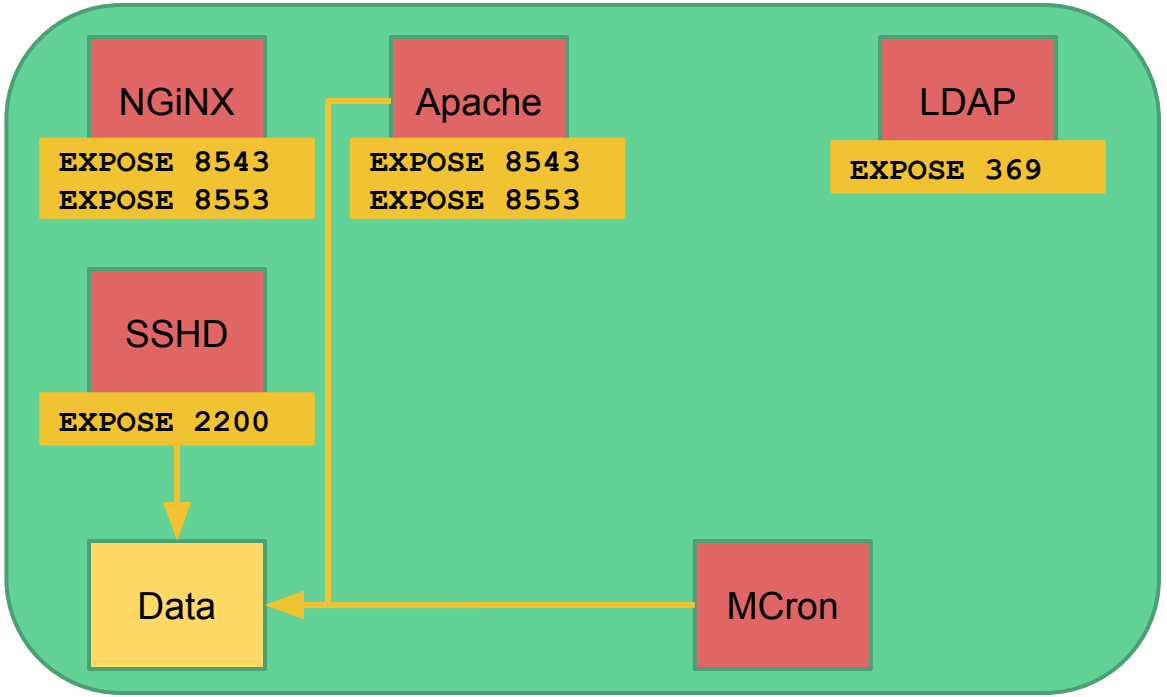
Docker Advantages

Isolation (ports/names)



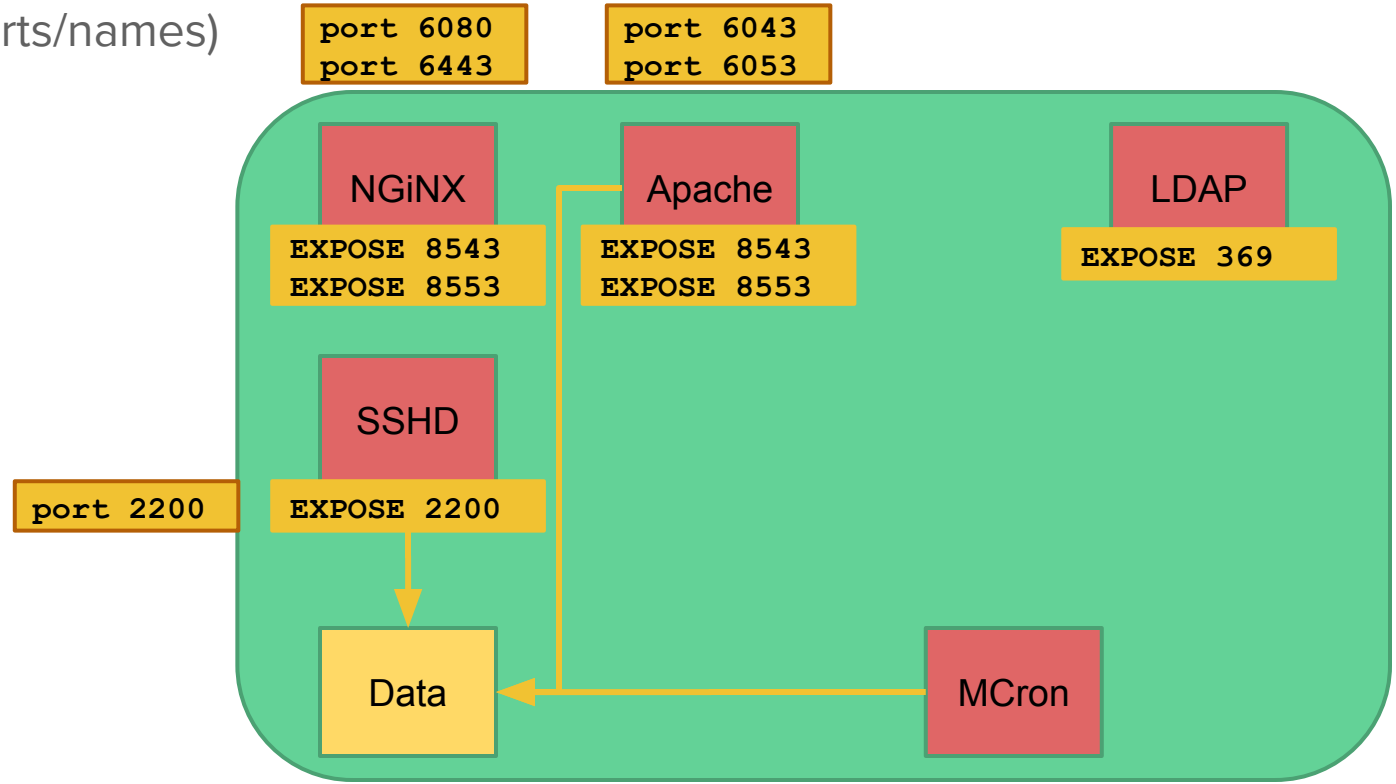
Docker Advantages

Isolation (ports/names)



Docker Advantages

Isolation (ports/names)



End result

From:

To:

- 21 containers, in 3 sets, one for each environment.
- service vs. data
- Extensible without downtime.