

An Introduction to Docker and Project Atomic

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- What is Docker?
- Why not LXC or VM?
- Project Atomic is here!
- .. Along with rpm-ostree ..
- .. and Systemd
- Starting our Atomic Host
- Docker Commands
- Docker Repository

What is the problem?



- My production needs to be homogeneous
- I need to ship entire environment to my colleague
- My hypervisor ate all the CPU (or RAM)
- Classic problem " .. but it works on my machine .. "

What is Docker?



- LXC turbo charged
- Kernel Cgroups and Namespace implementation
- Using Device Mapper Thin Provisionsing
- Portable. Registries are awesome!

Why Docker?



- Lightweight linux container
- Boots up in seconds
- Incrementally build, revert and reuse your container
- API to manage things remotely

Why not LXC containers or VM?



- Less resource consuming than virtual machines
- Faster than VM with reasonable amount of isolation.
According to a benchmark by Boden Russell, IBM (approx figures):
 - CPU usage 20 % vs 70 %
 - Memory usage 50 MB vs 300 MB
- Better tools ecosystem around docker than LXC
- Case study of Spotify

Project Atomic is here!



- Minimal operating system
- Benefits of our favorite Enterprise Linux
- Robust atomic upgrades and systemd
- Ready to take on cloud, virtualized or bare metal

.. including rpm-ostree ..



- Bootable, immutable, versioned filesystem trees
- Composed from standard rpms
- Atomic upgrade and rollbacks
- Only /etc and /var are writable



- System and service manager for Linux
- Replacing the init in Centos 7
- Highly modular and much more powerful than sysV
- Check out <http://0pointer.de/blog/projects/why.html>

Starting Atomic Host



- Atomic host needs cloud-init data
- Info about the host, i.e. meta-data
- Info about the user, i.e. user-data

cloud-init data

```
$ cat meta-data
instance-id: iid-local01;
local-hostname: myhost;
```

```
$ cat user-data
#cloud-config
password: mypassword
ssh_pwauth: True
chpasswd: { expire: False }
```

```
ssh_authorized_keys:
  - ssh-rsa ... foo@foo.com
```

```
$ genisoimage -output init.iso -volid cidata -joliet \
-rock user-data meta-data
```

Let's try this out!



- `yum install docker-io`
- `systemctl start docker`
- `docker pull adimania/fedora-busybox`
- `docker run -i -t adimania/fedora-busybox /sbin/sh`
- `docker ps`
- `docker images`
- `docker commit <container> <tag>`
- `docker stop`

```
FROM centos
MAINTAINER Aditya Patawari <adimania@fedoraproject.org>

RUN yum -y update
RUN yum -y install httpd

EXPOSE 80

CMD [ "httpd" ]
```

Docker build

```
$ docker build .  
.  
.  
.  
---> a8d3d615599a  
Removing intermediate container cc142bec3471  
Step 4 : EXPOSE 6379  
---> Running in 3aaa20ddda02  
---> 3bef54fa4135  
Removing intermediate container 3aaa20ddda02  
Step 5 : CMD [ "redis-server" ]  
---> Running in eef0cb48742a  
---> 4f09b11a3dd2  
Removing intermediate container eef0cb48742a  
Successfully built 4f09b11a3dd2
```



- Download only official or trusted images
- You're still on your own on security updates
- An attack on non-namespaced subsystem or device is a potential risk

Questions?

Now is your chance :)