



Run Java applications with Docker on the Raspberry Pi and other platforms

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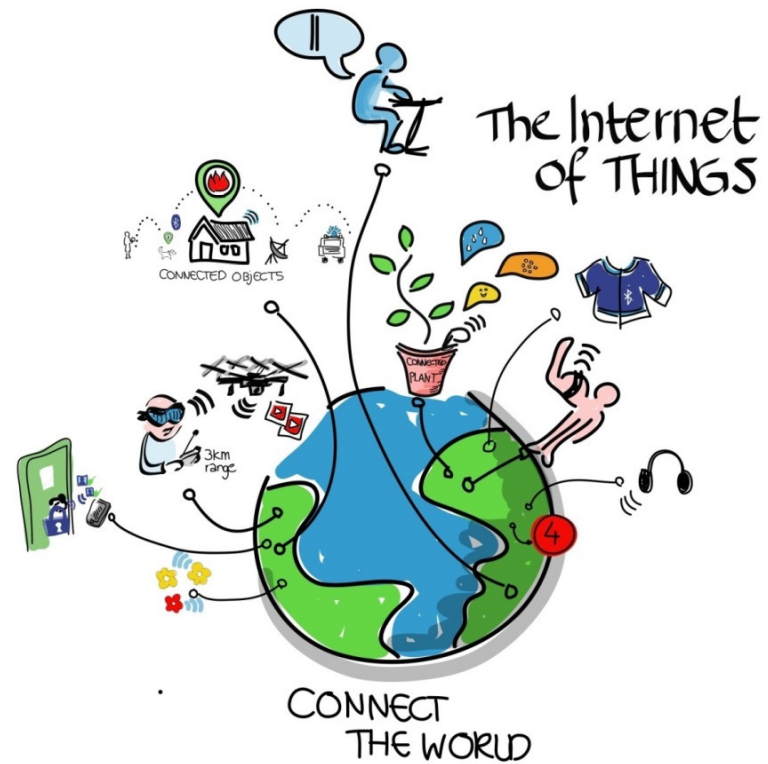
Content

 Internet of Things






 Docker and Java on a Raspberry Pi


 Questions

Internet of Things



Developments outside the IoT

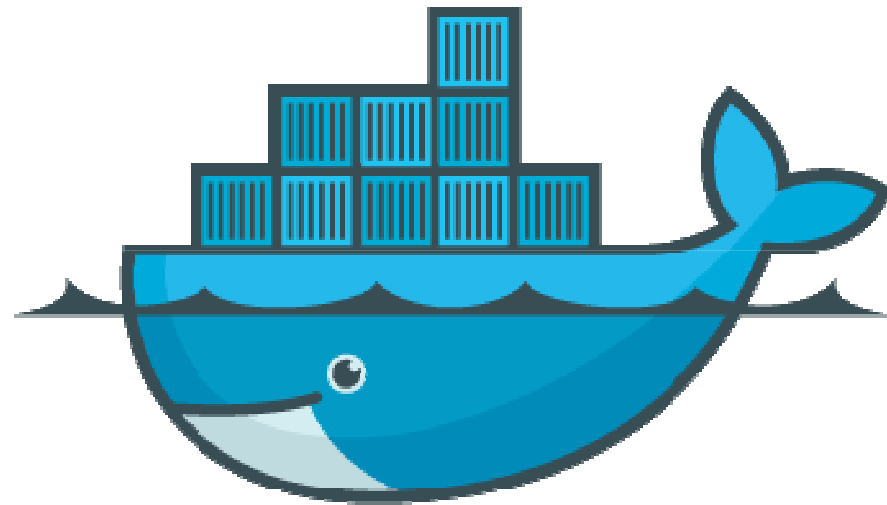
-  Continuous Delivery
-  Virtual machines
-  Provisioning (Chef, Puppet, Vagrant ...)
-  Version control / infrastructure as code
-  Isolation

-  Updating and synchronizing environments

What to deliver?

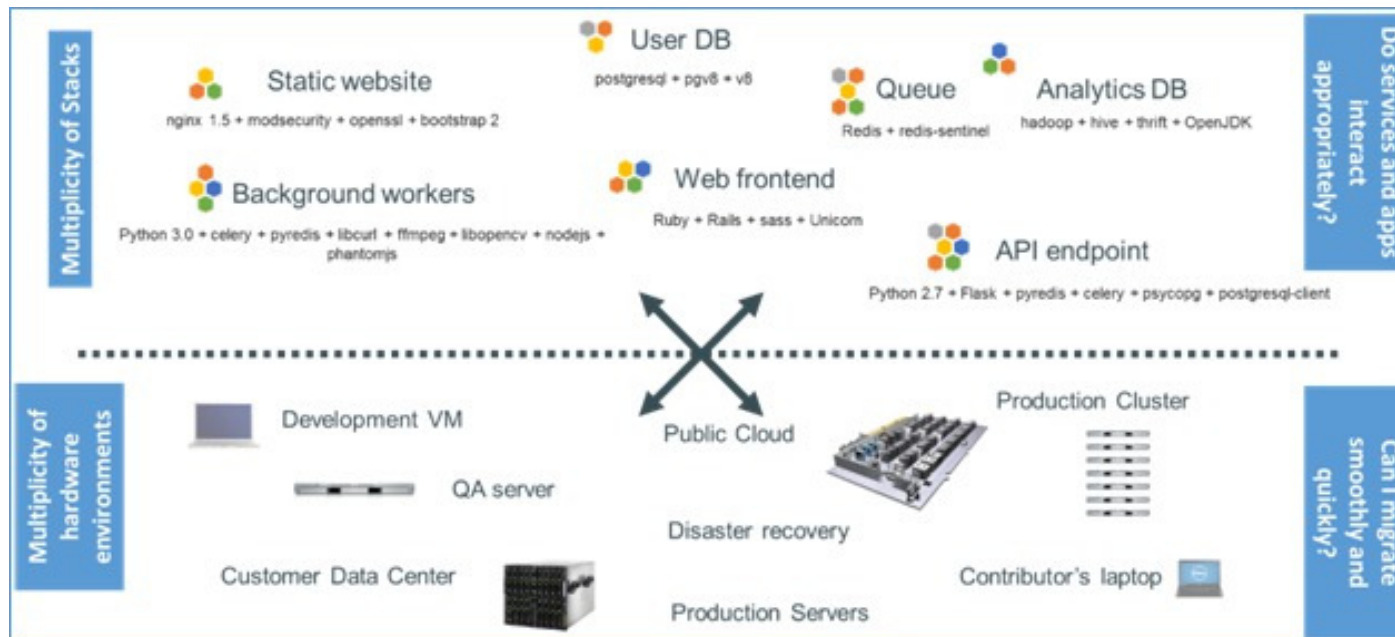


Docker

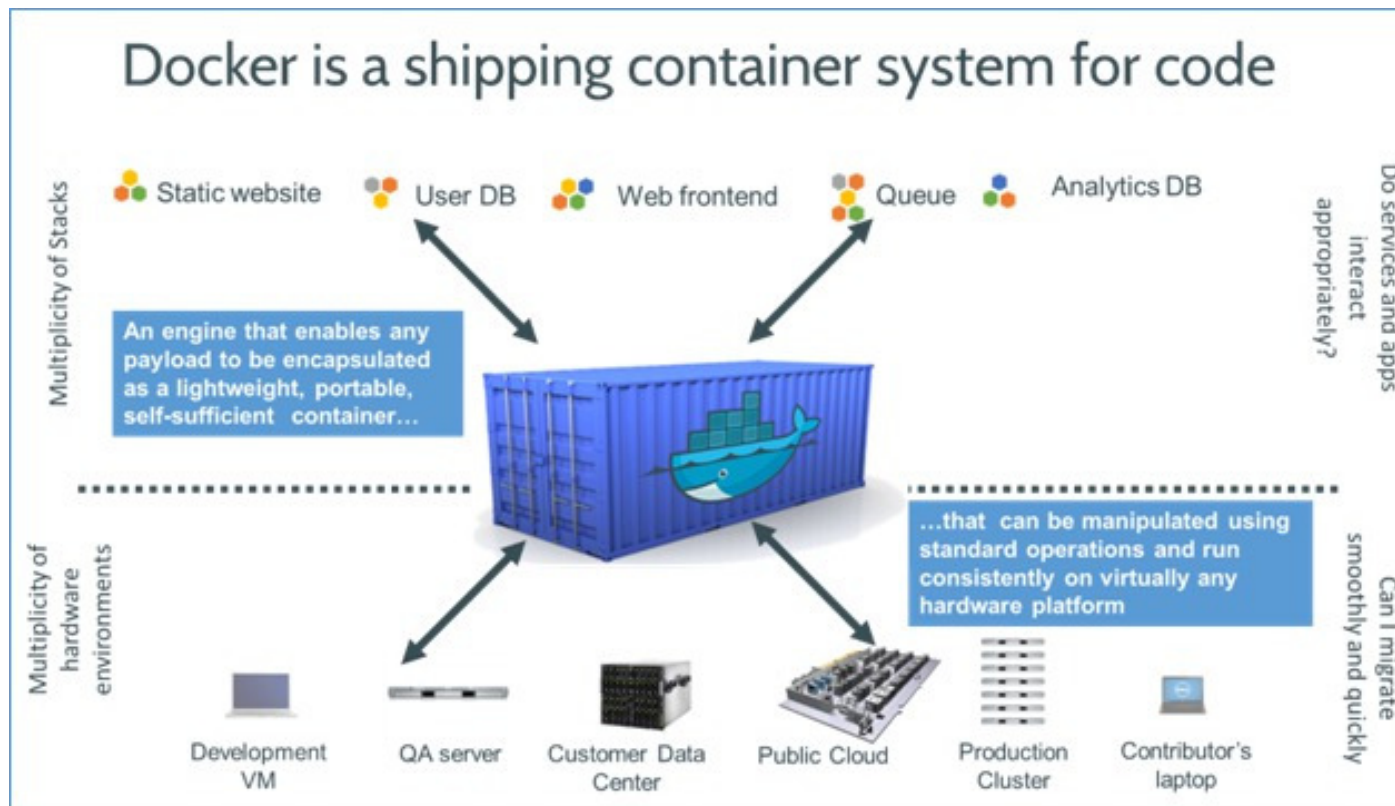


docker








Software issue



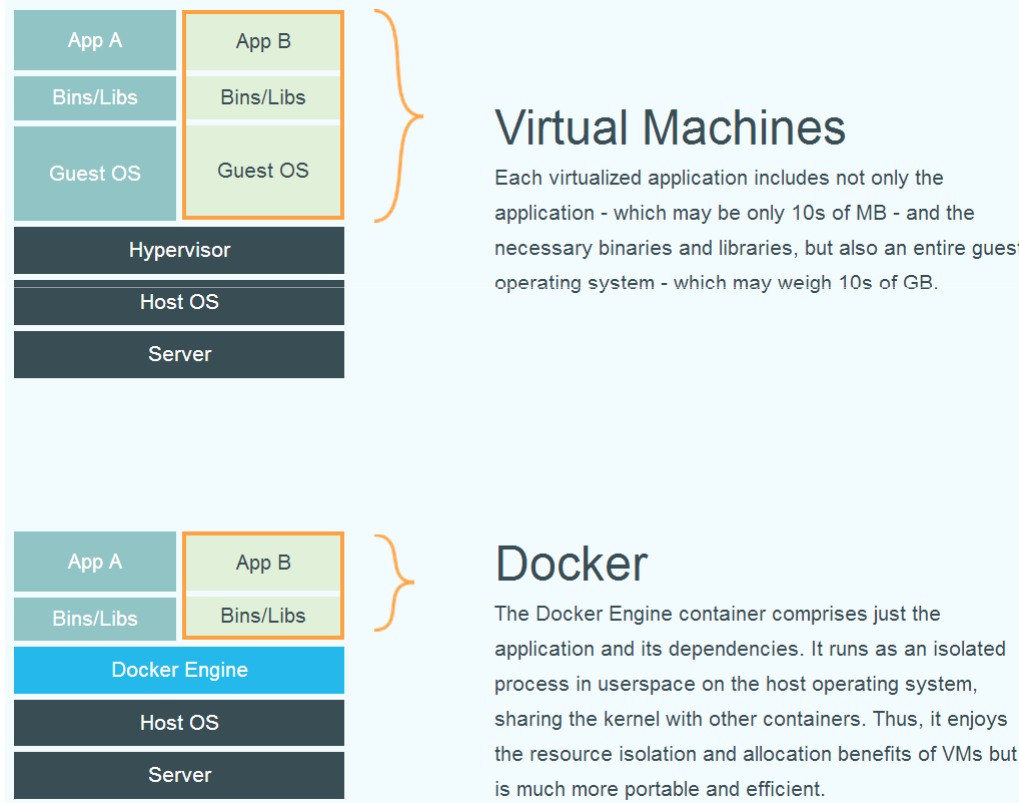
Software solution










Why Docker

-  To enable continuous delivery
-  Quickly provision environments
-  Easy to roll forward
-  Security
 -  For instance to run 'untrusted' applications like a Dropbox client
-  Alternative for virtual machines
-  On top of virtual machines

Docker vs Virtual Machines



Docker vs Virtual Machines




-  Disk space efficiency
-  Memory efficiency
-  Speed
-  Compatibility (run anywhere)
-  Isolation
-  Versioning
-  Internet of Things (Raspberry Pi etc.)

My first Pi Docker container

 Docker on the Raspberry Pi

```
docker run -i -t  
    resin/rpi-raspbian /bin/bash
```


Raspberry installation

-  Update repositories
`pacman -Syy`
-  Optional update al packages:
`pacman -Syu`
-  Install Docker
`pacman -S docker`

Tomcat Dockerfile

```
FROM resin/rpi-raspbian
```

```
RUN apt-get update
```

```
RUN apt-get install -y openjdk-7-jre-headless wget
```

```
RUN wget -O /tmp/tomcat8.tar.gz
```

```
http://archive.apache.org/dist/tomcat/tomcat-8/v8.0.9/bin/apache-tomcat-8.0.9.tar.gz
```

```
RUN (cd /opt && tar xzf /tmp/tomcat8.tar.gz)
```

```
RUN (mv /opt/apache-tomcat* /opt/tomcat)
```

```
ENV JAVA_HOME /usr/lib/jvm/java-1.7.0-openjdk-armhf
```

```
RUN rm -rf /opt/tomcat/webapps/docs
```

```
/opt/tomcat/webapps/examples /opt/tomcat/webapps/host-manager
```

```
/opt/tomcat/webapps/manager
```

```
EXPOSE 8080
```

```
CMD ["/opt/tomcat/bin/catalina.sh", "run"]
```

Tomcat Dockerfile explained

```
FROM resin/rpi-raspbian
```

```
RUN apt-get install -y openjdk-7-jre-headless wget
```

```
ENV JAVA_HOME /usr/lib/jvm/java-1.7.0-openjdk-armhf
```

```
EXPOSE 8080
```

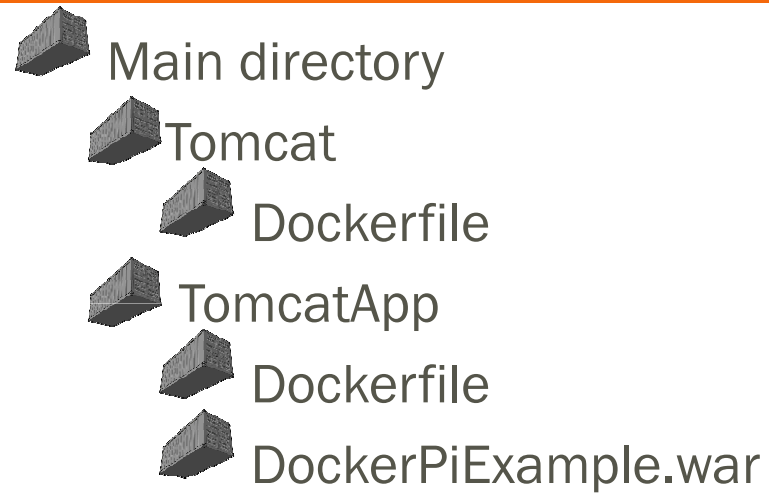
```
CMD ["/opt/tomcat/bin/catalina.sh", "run"]
```

TomcatApp Dockerfile

```
FROM tomcat
```

```
ADD DockerPiExample.war  
    /opt/tomcat/webapps/
```

Directory structure



Build



Create the Dockerfiles



Build the containers

```
cd Tomcat (optional)
```

```
docker build -t tomcat . (optional)
```

```
cd .. (optional)
```

```
cd TomcatApp
```

```
docker build -t tomcatapp .
```

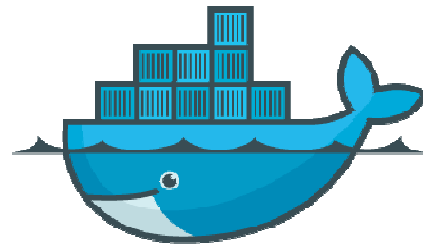
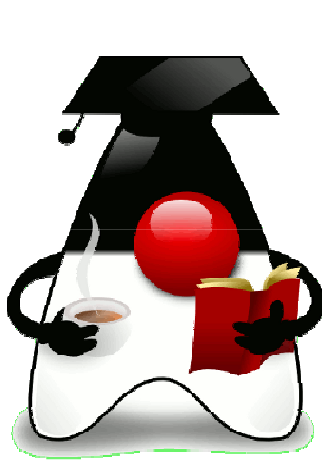
Run



Start the container

```
docker run -p 8080:8080 -d tomcatapp
```

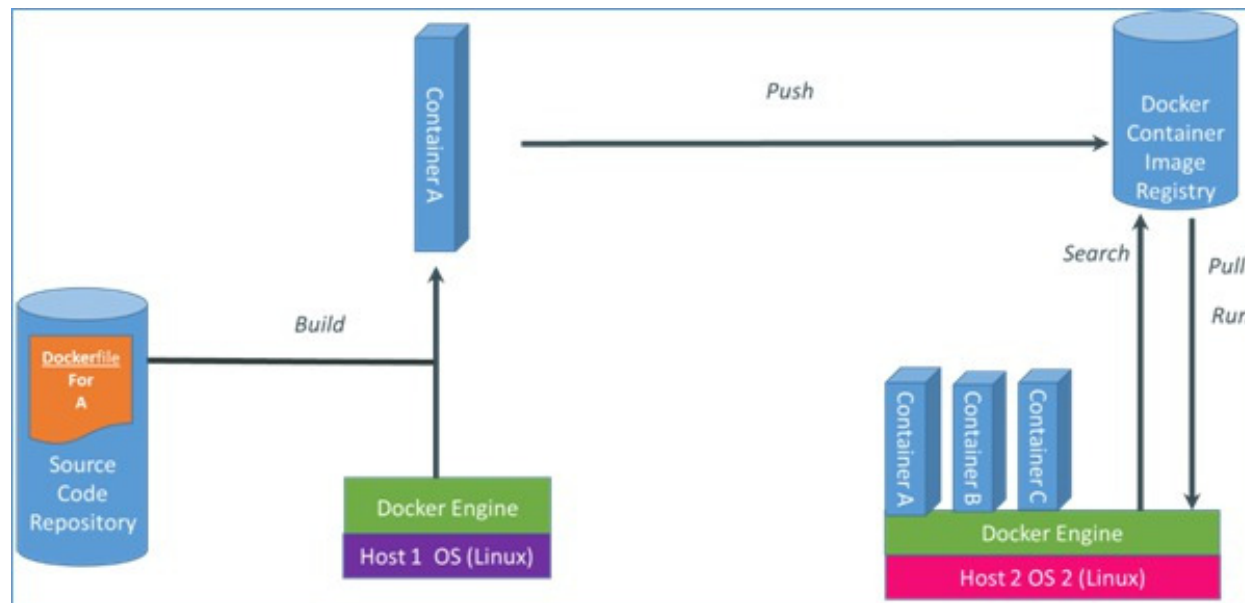
Demo



docker



Docker overview



One ring to rule them all



Docker registry



Creating the Docker registry

```
docker run -p 5000:5000 registry
```

Docker client 1 (push)

 Change container (using touch for instance)

 Commit

```
docker.io commit 064f
```

```
192.168.56.31:5000/test-version-0.2
```

 New containerid -> [ff7e](#)

 Push

```
docker.io push
```

```
192.168.56.31:5000/test-version-0.2
```

Docker client 2 (pull)



Pull

```
docker.io pull
```

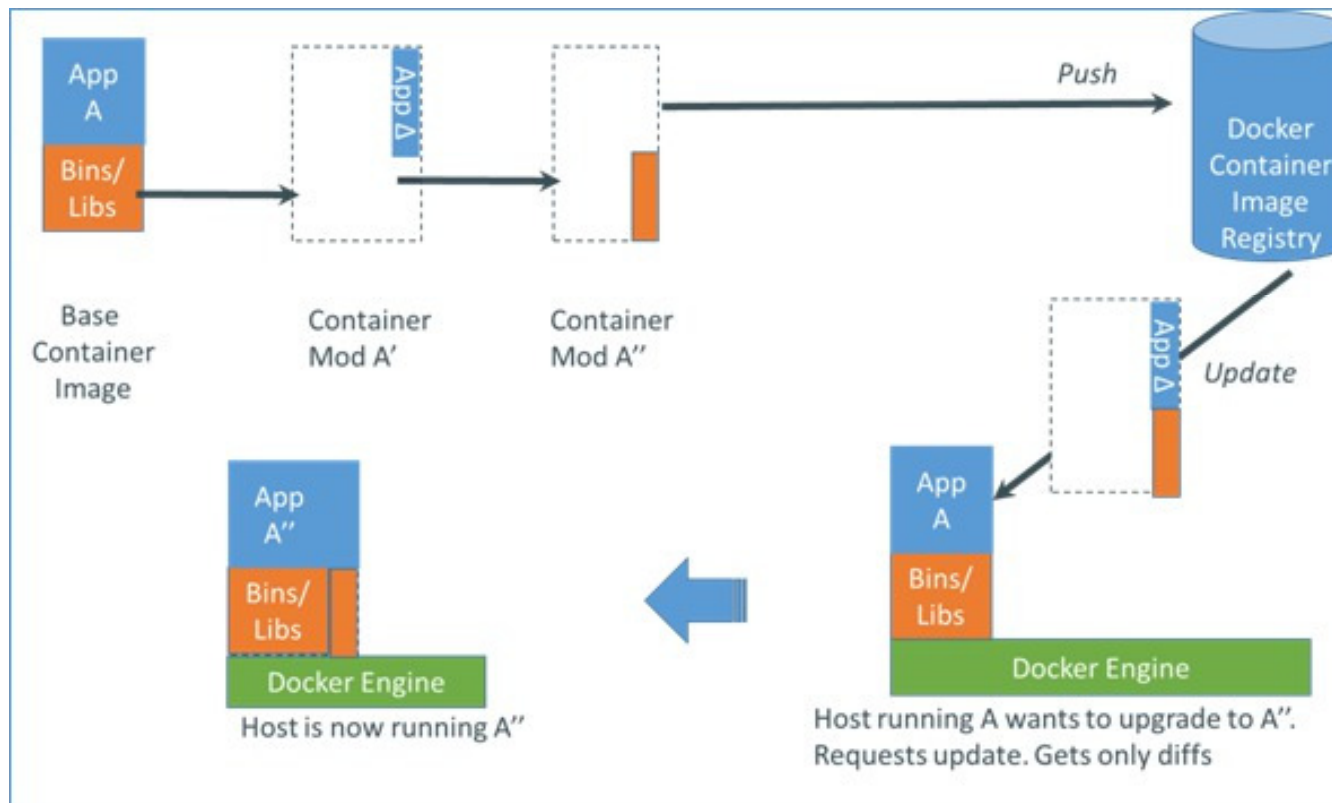
```
192.168.56.31:5000/test-version-0.2
```



Run

```
docker.io run -i -t ff7e /bin/bash
```

Updating containers



Pull update only on Docker client 2

```
docker images -tree
```

```
└─153bf43b408a 194.2 MB test-version-0.1:latest
```

```
docker pull 192.168.56.31:5000/test-version-0.2
```

```
ff7e110ebadd: Download complete
```

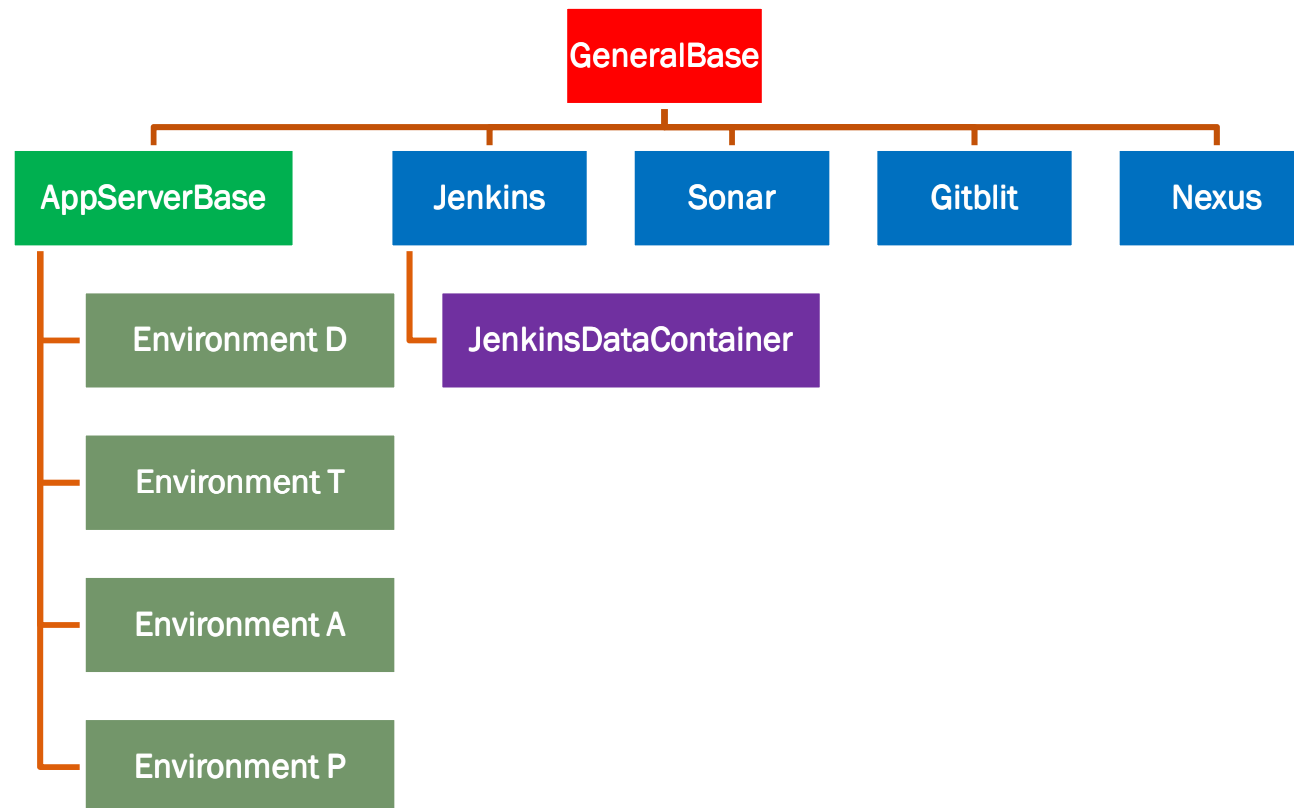
```
153bf43b408a: Download complete
```

```
docker images -tree
```

```
└─153bf43b408a 194.2 MB test-version-0.1:latest
```

```
└─ff7e110ebadd 194.2 MB test-version-0.2:latest
```

We need lots of Docker containers



Diskspace

```
# docker.io images --tree
```

```
└─ 179.9 MB Tags: ubuntu:saucy
```

```
└─ 253.6 MB
```

```
└─ 741.8 MB Tags: GeneralBase:latest
```

```
└─ 763.6 MB Tags: AppServerBase:latest
```

```
└─ 763.6 MB Tags: EnvironmentP:latest
```

```
└─ 865.6 MB Tags: Nexus:latest
```

```
└─ 808.3 MB Tags: Gitblit:latest
```

```
└─ 901.5 MB Tags: Sonar:latest
```

```
└─ 805.4 MB Tags: Jenkins:latest
```




Execution time on laptop

real 4m11.729s

user 0m3.329s

sys 0m10.054s

Summary

-  Big potential market for Docker and Java
-  Easy to use
-  Highly flexible and customizable

Isolation



Isolation





Isolation



Isolation



Questions

 <http://blogs.infosupport.com>
 Ask us!



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