



DOCKER WORKSHOP!

MATT MCQUIN

GENERAL DYNAMICS MISSION SYSTEMS

GDMS – WHO WE ARE

LAND

ONE STEP AHEAD



SEA



AIR



SPACE



CYBER



CONTAINERIZATION!



- Allows us to package code into a runnable image
- Portable over various OS – Linux/Mac/Windows
- Easily start/stop parts of our application
- Reuse functionality by reusing images

CONTAINERS VS. VIRTUAL MACHINES

VMs	Containers
Heavyweight	Lightweight
Limited performance	Native performance
Each VM runs in its own OS	All containers share the host OS
Hardware-level virtualization	OS virtualization
Startup time in minutes	Startup time in milliseconds
Allocates required memory	Requires less memory space
Fully isolated and hence more secure	Process-level isolation, possibly less secure

DOCKER HUB

hub.docker.com/search?q=&type=image

Introducing Docker Hub's improved tag user experience. [Learn more >](#)



Search for great content (e.g., mysql)

[Explore](#)

[Sign In](#)

[Pricing](#)

[Get Started](#)

DOCKER EE

DOCKER CE

CONTAINERS

PLUGINS

Filters

Docker Certified

☐ Docker Certified

Images

☐ Verified Publisher
Docker Certified And Verified Publisher Content

☐ Official Images
Official Images Published By Docker

Categories

- ☐ Analytics
- ☐ Application Frameworks
- ☐ Application Infrastructure
- ☐ Application Services
- ☐ Base Images
- ☐ Databases
- ☐ DevOps Tools
- ☐ Featured Images
- ☐ Messaging Services
- ☐ Monitoring
- ☐ Operating Systems
- ☐ Programming Languages
- ☐ Security
- ☐ Storage

Operating Systems

- ☐ Linux
- ☐ Windows

Architectures

- ☐ ARM
- ☐ ARM 64
- ☐ IBM POWER
- ☐ IBM Z

1 - 25 of 2,626,247 available images.

Most Popular



Oracle Database Enterprise Edition

By Oracle • Updated 2 years ago

Oracle Database 12c Enterprise Edition

[Container](#) [Docker Certified](#) [Linux](#) [x86-64](#) [Databases](#)

VERIFIED PUBLISHER



Oracle Java 8 SE (Server JRE)

By Oracle • Updated 4 months ago

Oracle Java 8 SE (Server JRE)

[Container](#) [Docker Certified](#) [Linux](#) [x86-64](#) [Programming Languages](#)

VERIFIED PUBLISHER



Oracle WebLogic Server

By Oracle • Updated 4 months ago

Oracle WebLogic Server

[Container](#) [Docker Certified](#) [Linux](#) [x86-64](#) [Application Frameworks](#) [Application Infrastructure](#)

VERIFIED PUBLISHER



MySQL Server Enterprise Edition

By Oracle • Updated 10 months ago

The world's most popular open source database system

[Container](#) [Docker Certified](#) [Linux](#) [x86-64](#) [Databases](#)

VERIFIED PUBLISHER



couchbase

Updated an hour ago

Couchbase Server is a NoSQL document database with a distributed architecture.

[Container](#) [Linux](#) [x86-64](#) [Storage](#) [Application Frameworks](#)

OFFICIAL IMAGE

10M+ 480
Downloads Stars

VERIFIED PUBLISHER

CREATING OUR OWN IMAGES

1. Pick an appropriate base image (e.g. OpenJDK/Python/etc.)
2. Create a Dockerfile for our application
3. Build the Docker image and tag with a name

EXAMPLE DOCKERFILE

```
FROM openjdk:11
```

Sets base image

```
EXPOSE 80
```

Documents ports to expose

```
WORKDIR /opt
```

Sets working directory

```
RUN mkdir /opt/persistent-data
```

Runs commands

```
VOLUME /opt/persistent-data
```

Mounts directory inside container to a directory on host

```
COPY my-application-executable.jar /opt/app.jar
```

Copies resources into container

```
CMD ["java", "-jar", "app.jar"]
```

Kicks off container executable(s)

Note: Best practice is to name this file "Dockerfile" (no extension)

BUILDING DOCKER IMAGE

- To build, navigate to directory with Dockerfile and run:

```
$ docker build -t my-application-name:1.0.0 .
```

- This creates an image named “my-application-name” version 1.0.0
- You can see all docker images by running “docker images”:

```
$ docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
openjdk	8	e8d00769c8a8	4 days ago	488MB
my-application-name	1.0.0	e8d00769c8a8	4 days ago	488MB

RUNNING DOCKER IMAGE

- To run basic image, you can use:

```
$ docker run -it my-application-name:1.0.0
```

- Some basic flags for run command:

- p 80:8080 Publish host port to container port (respectively)
- d Runs the container detached (in background)
- it Start in interactive mode with TTY
- e VAR=foo Declares an environment variable inside the container

GENERAL DYNAMICS

Mission Systems

Questions after the workshop?

Matt McQuin

Matthew.mcquin@gd-ms.com

Matt.mcquin@gmail.com