Chapter 1: Getting Started with Docker

![Diagram of Hypervisor Types]

- **Type 1**: Hypervisor directly manages the Guest OS and applications.
- **Type 2**: Hypervisor manages the Guest OS and applications, which are then managed by a container manager that interacts with the Host OS.
Docker is now up and running!

Open your favorite terminal and start typing Docker commands!

$ docker info

Click on the whale in your menu bar to access settings, feedback & documentation.

Send diagnostics & usage data
Privacy settings

Got it!
Completed the Docker Setup Wizard

Click the Finish button to exit the Setup Wizard.

Make sure “Launch Docker” is selected (it should be by default).
Docker is now up and running!

Open your favorite terminal and start typing Docker commands!

> docker run hello-world

Click on the whale in your notification area for settings, feedback and documentation.

We send usage statistics, check your privacy settings.

Got it!
$ sudo docker info
Containers: 0
  Running: 0
  Paused: 0
  Stopped: 0
Images: 0
Server Version: 17.03.0-ce
Storage Driver: aufs
  Root Dir: /var/lib/docker/aufs
  Backing Filesystem: extfs
  Dirs: 0
  Dirperm1 Supported: true
Logging Driver: json-file
Cgroup Driver: cgroupfs
Plugins:
  Volume: local
  Network: bridge host macvlan null overlay
Swarm: inactive
Runtimes: runc
  Default Runtime: runc
  Init Binary: docker-init
  containerd version: 977c511eda0925a723debdc94d09459af49d082a
  runc version: a01dafd48bc1c7cc12b2b01206f9fead7dd6feb70
  init version: 949e6fa
Security Options:
  apparmor
  seccomp
Profile: default
Kernel Version: 4.4.0-66-generic
Operating System: Ubuntu 16.04.2 LTS
OSType: linux
Architecture: x86_64
CPUs: 2
Total Memory: 992.2 MiB
Name: ubuntu-xenial
ID: GMHP5H3Z;CL5D;ZJMY;3KTP;627Q;BNFN;GSCX;QW0J;CNGE;GIH3;SP10
Docker Root Dir: /var/lib/docker
Debug Mode (client): false
Debug Mode (server): false
Registry: https://index.docker.io/v1/
WARNING: No swap limit support
Experimental: false
Insecure Registries:
  127.0.0.0/8
Live Restore Enabled: false
$
$ docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
3. The Docker daemon created a new container from that image which runs the executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://cloud.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/engine/userguide/

- docker.service - Docker Application Container Engine
  Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor preset: enabled)
  Active: active (running) since Thu 2017-02-23 10:52:39 UTC; 2 days ago
    Docs: https://docs.docker.com
  Main PID: 29327 (dockerd)
    Tasks: 22
    Memory: 31.6M
      CPU: 1min 18.943s
  CGroup: /system.slice/docker.service
    ₜ-29327 /usr/bin/dockerd -H fd://
    ₜ-29336 docker-containerd -l unix:///var/run/docker/libcontainerd/docker-containerd
Chapter 2: Handling Docker Containers

Diagram:
- `ubuntu (Base Image)`
- Kernel
- `add Tomcat (Image)`
- `add wget (Image)`
- `ubuntu (Base Image)`
- Kernel

Reference:
- `image wget`
- `image ubuntu`
$ sudo docker pull busybox
Using default tag: latest
latest: Pulling from library/busybox
8ddc19f16526: Pull complete
Digest: sha256:a59906e33509d14c036c8678d867bd4ec81ed7c4b8ce907b888c607f6a1e0e6
Status: Downloaded newer image for busybox:latest

$ sudo docker pull busybox:1.24
1.24: Pulling from library/busybox
385e281300cc: Pull complete
a3ed95caeb02: Pull complete
Digest: sha256:8ea3273d79b47a8b6d018be398c17590a4b5ec604515f416c5b797db9dde3ad8
Status: Downloaded newer image for busybox:1.24
$ sudo docker images
REPOSITORY        TAG           IMAGE ID       CREATED
hello-world      latest        c54a2cc56cbb  3 weeks ago
busybox           latest        2b8fd9751c4c  4 weeks ago
busybox           1.24          47bcc53f74dc  4 months ago

$ sudo docker search mysql | head -10
NAME                           DESCRIPTION                                               STARS  OFFICIAL  AUTOMATED
mysql                          MySQL is a widely used, open-source relati... 2759     [OK]        [OK]
mysql/mysql-server             Optimized MySQL Server Docker images. Crea... 178      [OK]        [OK]
centurylink/mysql              Image containing mysql. Optimized to be li... 46       [OK]        [OK]
samwersbmn/mysql               CentOS/Debian Based Customizable MySQL Con... 36       [OK]        [OK]
appcontainers/mysql            CentOS/Debian Based Customizable MySQL Con... 8        [OK]        [OK]
marvambass/mysql               CentOS/Debian Based Customizable MySQL Con... 6        [OK]        [OK]
alterway/mysql                 Docker Mysql                                   2        [OK]        [OK]
drupal/docker/mysql            MySQL For Drupal                                  2        [OK]        [OK]
azuki/app/mysql                Docker Image to run MySQL by Azuki - http:... 2        [OK]        [OK]

$ sudo docker container prune
WARNING! This will remove all stopped containers.
Are you sure you want to continue? [y/N] y
Deleted Containers:
9b1aaaf108d3922da503fe01e9024302f0434a3b387c450d3b302020966a13e
d43c75065c6147501a7bc62f418fe501eeabadd8617d77a4b28b5807df6aa89
1614c44092f1c358cbb248a49430e70b674b52b32b8a193da8bba9b7136d1640

Total reclaimed space: 0 B
Chapter 4: Publishing Images
<table>
<thead>
<tr>
<th>Repository</th>
<th>Stars</th>
<th>Pulls</th>
</tr>
</thead>
<tbody>
<tr>
<td>NGINX</td>
<td>3.8K</td>
<td>10M+</td>
</tr>
<tr>
<td>busybox</td>
<td>769</td>
<td>10M+</td>
</tr>
<tr>
<td>ubuntu</td>
<td>4.5K</td>
<td>10M+</td>
</tr>
<tr>
<td>redis</td>
<td>2.6K</td>
<td>10M+</td>
</tr>
<tr>
<td>registry</td>
<td>1.0K</td>
<td>10M+</td>
</tr>
</tbody>
</table>
PUBLIC REPOSITORY

vinoddandy/imageforhub2  ⭐

Last pushed: 2 minutes ago

Visibility Settings

Make this Repository Private

Private repositories are only available to you or members of your organization.
You are using 0 of 1 private repositories.

Delete Repository

Please type the name of your repository to confirm deletion: imageforhub2

imageforhub2

Delete
Linked Accounts & Services

Linked Accounts
These account links are currently used for Automated Builds, so that we can access your project lists and help you configure your Automated Builds. Please note: A github/bitbucket account can be connected to only one docker hub account at a time.

Connect to GitHub
We let you choose how much access we have to your GitHub account.

Public and Private (Recommended)
- Read and Write access to public and private repositories. (We only use write access to add service hooks and add deploy keys)
- Required if you want to setup an Automated Build from a private GitHub repository.
- Required if you want to use a private GitHub organization.
- We will automatically configure the service hooks and deploy keys for you.

Select
Sign into GitHub
to continue to Docker Hub Registry

Username or email address
vinodsingh

Password

Sign in

New to GitHub? Create an account.
Linked Accounts & Services

Linked Accounts
These account links are currently used for Automated Builds, so that we can access your project lists and help you configure your Automated Builds. Please note: A github/bitbucket account can be connected to only one docker hub account at a time.

Unlink Github

Link Bitbucket

PUBLIC | AUTOMATED BUILD

vinoddandy/dockerautomatedbuild ✯
Last pushed: 20 minutes ago

<table>
<thead>
<tr>
<th>Status</th>
<th>Tag</th>
<th>Created</th>
<th>Last Updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>GithubImage</td>
<td>a few seconds ago</td>
<td>a few seconds ago</td>
</tr>
<tr>
<td>Success</td>
<td>GithubImage</td>
<td>21 minutes ago</td>
<td>20 minutes ago</td>
</tr>
<tr>
<td>Success</td>
<td></td>
<td>2 years ago</td>
<td>2 years ago</td>
</tr>
<tr>
<td>Success</td>
<td></td>
<td>2 years ago</td>
<td>2 years ago</td>
</tr>
</tbody>
</table>

Source Repository

vinodosingh/dockerautomatedbuild
Organizations & Teams

Create Organization
Organizations can have multiple Teams. Teams can have differing permissions. Namespace is unique and this is where repositories for this organization will be created.

neworg1's teams

Choose Team
owners

Create Team
Team Name
Description
Add
Cancel
Chapter 5: Running Your Private Docker Infrastructure
Chapter 6: Running Services in a Container

```
$ docker network ls
NETWORK ID   NAME       DRIVER    SCOPE
daa55dd5830a bridge   bridge    local
3e99b1085979 host      host      local
9b06957b4a00 none      null      local
```

```
$ docker run --rm --net=none busybox ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue
   link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
   inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
   inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
```

$
$ docker network inspect bridge
{
  "Name": "bridge",
  "Id": "daa5dd5339aa4d5ad2cfa68885644baea2651a1a6ed8664ed8ef0a74b18f6bc5",
  "Scope": "local",
  "Driver": "bridge",
  "EnableIPv6": false,
  "IPAM": {
    "Driver": "default",
    "Options": null,
    "Config": {
      "Subnet": "172.17.0.0/16",
      "Gateway": "172.17.0.1"
    }
  },
  "Internal": false,
  "Containers": {},
  "Options": {
    "com.docker.network.bridge.default_bridge": "true",
    "com.docker.network.bridge.enable_icc": "true",
    "com.docker.network.bridge.enable_ip_masquerade": "true",
    "com.docker.network.bridge.host_binding_ip": "0.0.0.0",
    "com.docker.network.bridge.name": "docker0",
    "com.docker.network.driver.mtu": "1500"
  }
},
"Labels": {}
Apache2 Ubuntu Default Page

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after
Chapter 8: Orchestrating Containers
Chapter 9: Testing with Docker

Getting Started

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it?) and this file on the server:

/var/lib/jenkins/secrets/initialAdminPassword

Please copy the password from either location and paste it below.

Administrator password
Customize Jenkins
Plugins extend Jenkins with additional features to support many different needs

Install suggested plugins
Install plugins the Jenkins community finds most useful.

Select plugins to install
Select and install plugins most suitable for your needs.

Create First Admin User
Username: 
Password: 
Confirm password: 
Full name: 
E-mail address: 

Continue as admin
Jenkins is ready!

You've skipped creating an admin user. To log in, use the username: 'admin' and the administrator password you used to access the setup wizard.

Your Jenkins setup is complete.

Start using Jenkins

Welcome to Jenkins!

Please create new jobs to get started.
Enter an item name
Docker-Testing

Freestyle project
This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

Pipeline
Orchestrates long-running activities that can span multiple build slaves. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-standing job type.

External Job
This type of job allows you to record the execution of a process run outside Jenkins, even on a remote machine. This is designed so that you can use Jenkins as a dashboard for your existing automation system.

Multi-configuration project
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

Folder
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things at the same name as long as they are in different folders.

GitHub Organization
Scans a GitHub organization (or user account) for all repositories matching some-defined markers.

Multibranch Pipeline
Creates a set of Pipeline projects according to detected branches in one SCM repository.

Source Code Management
- None
- CVS
- CVS Projectset
- Git

Repositories

Repository URL
https://github.com/thedocker/testing/

Credentials
- none -  Add

Advanced...
<table>
<thead>
<tr>
<th>S</th>
<th>W</th>
<th>Name</th>
<th>Last Success</th>
<th>Last Failure</th>
<th>Last Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Docker-testing</td>
<td>19 min · #1</td>
<td>N/A</td>
<td>43 sec</td>
</tr>
</tbody>
</table>

Legend: RSS for all RSS for failures RSS for just latest builds

<table>
<thead>
<tr>
<th>S</th>
<th>W</th>
<th>Name</th>
<th>Last Success</th>
<th>Last Failure</th>
<th>Last Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Docker-Testing</td>
<td>8 min 15 sec · #1</td>
<td>N/A</td>
<td>25 sec</td>
</tr>
</tbody>
</table>

Legend: RSS for all RSS for failures RSS for just latest builds

Icon: S M L
<table>
<thead>
<tr>
<th>Name</th>
<th>Last Success</th>
<th>Last Failure</th>
<th>Last Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Docker-Testing</td>
<td>8 min 15 sec - #1</td>
<td>N/A</td>
<td>25 sec</td>
</tr>
</tbody>
</table>

**Legend:**
- S: Success
- W: Warning
- M: Modified
- L: Lost

**RSS Feeds:**
- RSS for all
- RSS for failures
- RSS for just latest builds

**Actions:**
- Changes
- Console Output
- Edit Build Information
- Delete Build
- Git Build Data
- No Tags
Chapter 11: Securing Docker Containers

Hypervisor based Virtualization
Operating System/Container Virtualization
Chapter 12: The Docker Platform – Distinct Capabilities and Use Cases