

Tutorial: Docker installation

1. Overview

Welcome to the Docker installation tutorial. Before starting MP2, we need to set up the environment for this programming assignment. Our autograders run on docker containers and will have **Apache Hadoop 2.9.0**, **Apache Spark 2.2.1** (for Apache Hadoop 2.7 and later), and **Apache Storm 1.0.5** installed. This tutorial provides instructions to install Docker on your computer, create a docker machine, build a Docker image from our Dockerfile, and run the Docker image in a new container.

Objectives

Upon completing this tutorial, students will be able to:

- Set up the Docker installation
- Create new Docker machines
- Build Docker image from Dockerfile
- Run the Docker image in a new container
- Delete a Docker image

2. Requirements

Install **Community Edition (CE) of Docker** on your computer through **Stable** channel

- for Mac:

1. go to <https://docs.docker.com/docker-for-mac/install/>
2. click "Get Docker for Mac"
3. follow the "Docker for Mac Installer" instructions

- for 64-bit Windows 10 Pro with Hyper-V available:

1. go to <https://docs.docker.com/docker-for-windows/install/>
2. click "Get Docker for Windows"
3. follow the "Docker for Windows Installer" instructions

- for 64-bit Windows 7 or higher:

1. go to https://docs.docker.com/toolbox/toolbox_install_windows/
2. click "Get Docker Toolbox for Windows" (we recommend full installation; please install "VirtualBox with NDIS5 driver" if you have not downloaded VirtualBox yet)

3. **before start the Docker quickstart terminal**, you need to enter the BIOS setup utility and enable VT-x/AMD-v on your computer
 4. start the Docker quickstart terminal
- for other operating systems, please go to <https://docs.docker.com/install/> for more details

3. Create new Docker machines

For Mac and Windows 7 or higher (not Windows 10 Pro), in your terminal:

```
$ docker-machine create -d virtualbox --virtualbox-memory 4096 default
```

For Windows 10 Pro with Hyper-V users

```
$ docker-machine create -d hyperv --hyperv-memory 4096 default
```

If the Docker machine "default" already exists, do this first:

```
$ docker-machine rm default
```

If the Docker machine "default" is stopped, run:

```
$ docker-machine start default
```

Note: After you create the "default" machine once, you may not need to create it again. Please verify that the "default" machine is the one that you create with "**\$docker-machine inspect default**" and confirm that "Memory" is 4096. On the other side, you will need to run "**\$docker-machine env**" and follow its instruction everytime you open the terminal.

Then, connect your Docker Client to the Docker Engine running on this virtual machine, and configure your shell following the instructions.

4. Build Docker image from Dockerfile

step1: download our sample Dockerfile and related files, run:

```
1 $ git clone https://github.com/UIUC-public/Docker_MP2.git
```

step2: change the current folder to:

```
1 $ cd Docker_MP2
```

step3: build the Docker image, run:

```
$ docker build -t sample_image.v1 .
```

Please remember the '.' at the end of the command line.

5. Run the Docker image in a new container

```
$ docker run -it sample_image.v1 bin/bash
```

To exit the virtual machine, use **Ctrl+D**; Please note that once you exit the virtual machine, the changes that you made inside the virtual machine wil NOT remain when you run that Docker image the next time. Please make sure that you save your code on your local computer.

6. Delete a Docker image

If your Docker machine has too many Docker images, you may want to delete unused images.

To list the Docker images and their 'IMAGE ID', run:

```
$ docker images
```

To delete a docker image with "IMAGE ID": a0b1bc472d85, run:

```
$ docker rmi a0b1bc472d85
```

For more information about Docker, please visit:

<https://docs.docker.com/engine/reference/commandline/docker/>