**Docker Compose Example**

This is the step by step tutorial to understand uses of Docker compose. In this tutorial, I will create two Docker containers using Docker compose. One docker container will have MySQL database instance and another Docker container have Apache web server with our dummy application file.

Let’s follow step by step tutorial and watch the things happening there.

**Step 1 – Create Directory Structure**

First of all, create a directory structure. Here webapp is our web application directory. Also, create a index.html in webapp directory for testing.



|  |  |
| --- | --- |
| 1  2  3 | $ mkdir dockercompose && cd dockercompose  $ mkdir webapp  $ echo "<h2>It Works</h2>" > webapp/index.html |

**Step 2 – Create Dockerfile for Webapp**

Now create a Dockerfile in webapp directory to create a customized image for your application including Apache web server.

$ vim webapp/Dockerfile

add following content

FROM tecadmin/ubuntu-ssh:16.04

RUN apt-get update \

&& apt-get install -y apache2

COPY index.html /var/www/html/

WORKDIR /var/www/html

CMD ["apachectl", "-D", "FOREGROUND"]

EXPOSE 80

**Step 3 – Create Docker Compose File**

Finally create a docker compose configuration file (docker-compose.yml) file in current directory. This will define all the containers will be used in your current setup.

$ vim docker-compose.yml

add following content.

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17 | version: '3'  services:    db:       image: mysql       container\_name: mysql\_db       restart: always       environment:          - MYSQL\_ROOT\_PASSWORD="secret"    web:      image: apache      build: ./webapp      depends\_on:         - db      container\_name: apache\_web      restart: always      ports:        - "8080:80" |

Above docker compose file has settings for two containers. The first container is for mysql database server and the second is for web server. The web container will run our application on Apache server. As this is customized we have defined build directory to webapp.

**Step 4 – Build Webapp Image**

Now, build an image using the following command. This will create an image named apache using Dockerfile and contents from webapp directory.

$ docker-compose build

read the below output of above command. I have skipped some part of output which is not required. The first line of below output shows that it skipped building for db container due to no build defined. For web container it uses **webapp/Dockerfile** to build an image.

db uses an image, skipping

Building web

Step 1/6 : FROM tecadmin/ubuntu-ssh:16.04

16.04: Pulling from tecadmin/ubuntu-ssh

b3e1c725a85f: Pull complete

4daad8bdde31: Pull complete

63fe8c0068a8: Pull complete

4a70713c436f: Pull complete

bd842a2105a8: Pull complete

c41407f48fa7: Pull complete

1fcfeb9b5ef4: Pull complete

13195a7d2240: Pull complete

b86be64bbda8: Pull complete

8c951fe917dc: Pull complete

f74bc80103b6: Pull complete

Digest: sha256:523d6fbc97954e9f77231bf54bfcfbbdd4805349887477fbac4a63dc735d777d

Status: Downloaded newer image for tecadmin/ubuntu-ssh:16.04

---> bb63b492da01

Step 2/6 : RUN apt-get update && apt-get install -y apache2

---> Running in 00be0dd717ce

[[[Removed long output from here]]]

---> 41c731590234

Removing intermediate container 00be0dd717ce

Step 3/6 : COPY index.html /var/www/html/

---> 42f84d4c2243

Removing intermediate container 945aaee6cbde

Step 4/6 : WORKDIR /var/www/html

---> 40bebd21e352

Removing intermediate container e13f5f412906

Step 5/6 : CMD apachectl -D FOREGROUND

---> Running in ab0db1ef1c6e

---> 587bf2323289

Removing intermediate container ab0db1ef1c6e

Step 6/6 : EXPOSE 80

---> Running in 7bcbef52d585

---> 8f03d4135394

Removing intermediate container 7bcbef52d585

Successfully built 8f03d4135394

Successfully tagged apache:latest

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

[root@docker webapp]# echo "<h2>It Works</h2>" > webapp/index.html

-bash: webapp/index.html: No such file or directory

[root@docker webapp]# echo "<h2>It Works</h2>" > /root/mysqlwebapp/inde x.html

-bash: /root/mysqlwebapp/index.html: No such file or directory

[root@docker webapp]#

[root@docker webapp]#

[root@docker webapp]# ll

total 0

[root@docker webapp]# cd ..

[root@docker mysql]#

[root@docker mysql]# echo "<h2>It Works</h2>" > webapp/index.html

[root@docker mysql]# vim webapp/Dockerfile

[root@docker mysql]# vim webapp/Dockerfile

[root@docker mysql]#

[root@docker mysql]#

[root@docker mysql]# docker-compose build

db uses an image, skipping

Building web

Step 1/6 : FROM tecadmin/ubuntu-ssh:16.04

16.04: Pulling from tecadmin/ubuntu-ssh

b3e1c725a85f: Pull complete

4daad8bdde31: Pull complete

63fe8c0068a8: Pull complete

4a70713c436f: Pull complete

bd842a2105a8: Pull complete

c41407f48fa7: Pull complete

1fcfeb9b5ef4: Pull complete

13195a7d2240: Pull complete

b86be64bbda8: Pull complete

8c951fe917dc: Pull complete

f74bc80103b6: Pull complete

Digest: sha256:523d6fbc97954e9f77231bf54bfcfbbdd4805349887477fbac4a63dc735d777d

Status: Downloaded newer image for tecadmin/ubuntu-ssh:16.04

---> bb63b492da01

Step 2/6 : RUN apt-get update && apt-get install -y apache2

---> Running in 5bab1e33f5a6

Hit:1 http://archive.ubuntu.com/ubuntu xenial InRelease

Get:2 http://archive.ubuntu.com/ubuntu xenial-updates InRelease [109 kB]

Get:3 http://archive.ubuntu.com/ubuntu xenial-security InRelease [109 kB]

Get:4 http://archive.ubuntu.com/ubuntu xenial-updates/main Sources [427 kB]

Get:5 http://archive.ubuntu.com/ubuntu xenial-updates/restricted Sources [2696 B]

Get:6 http://archive.ubuntu.com/ubuntu xenial-updates/universe Sources [324 kB]

Get:7 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 Packages [1265 kB]

Get:8 http://archive.ubuntu.com/ubuntu xenial-updates/restricted amd64 Packages [13.1 kB]

Get:9 http://archive.ubuntu.com/ubuntu xenial-updates/universe amd64 Packages [972 kB]

Get:10 http://archive.ubuntu.com/ubuntu xenial-security/main Sources [189 kB]

Get:11 http://archive.ubuntu.com/ubuntu xenial-security/restricted Sources [2243 B]

Get:12 http://archive.ubuntu.com/ubuntu xenial-security/universe Sources [131 kB]

Get:13 http://archive.ubuntu.com/ubuntu xenial-security/main amd64 Packages [882 kB]

Get:14 http://archive.ubuntu.com/ubuntu xenial-security/restricted amd64 Packages [12.7 kB]

Get:15 http://archive.ubuntu.com/ubuntu xenial-security/universe amd64 Packages [566 kB]

Fetched 5005 kB in 12s (388 kB/s)

Reading package lists...

Reading package lists...

Building dependency tree...

Reading state information...

The following additional packages will be installed:

apache2-bin apache2-data apache2-utils ifupdown iproute2 isc-dhcp-client

isc-dhcp-common libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap

libasn1-8-heimdal libatm1 libdns-export162 libffi6 libgdbm3 libgmp10

libgnutls30 libgssapi3-heimdal libhcrypto4-heimdal libheimbase1-heimdal

libheimntlm0-heimdal libhogweed4 libhx509-5-heimdal libicu55

libisc-export160 libkrb5-26-heimdal libldap-2.4-2 liblua5.1-0 libmnl0

libnettle6 libp11-kit0 libperl5.22 libroken18-heimdal libsasl2-2

libsasl2-modules libsasl2-modules-db libtasn1-6 libwind0-heimdal libxml2

libxtables11 netbase perl perl-base perl-modules-5.22 rename sgml-base

ssl-cert xml-core

Suggested packages:

www-browser apache2-doc apache2-suexec-pristine | apache2-suexec-custom ufw

ppp rdnssd iproute2-doc resolvconf avahi-autoipd isc-dhcp-client-ddns

apparmor gnutls-bin libsasl2-modules-otp libsasl2-modules-ldap

libsasl2-modules-sql libsasl2-modules-gssapi-mit

| libsasl2-modules-gssapi-heimdal perl-doc libterm-readline-gnu-perl

| libterm-readline-perl-perl make sgml-base-doc openssl-blacklist debhelper

The following NEW packages will be installed:

apache2 apache2-bin apache2-data apache2-utils ifupdown iproute2

isc-dhcp-client isc-dhcp-common libapr1 libaprutil1 libaprutil1-dbd-sqlite3

libaprutil1-ldap libasn1-8-heimdal libatm1 libdns-export162 libffi6 libgdbm3

libgmp10 libgnutls30 libgssapi3-heimdal libhcrypto4-heimdal

libheimbase1-heimdal libheimntlm0-heimdal libhogweed4 libhx509-5-heimdal

libicu55 libisc-export160 libkrb5-26-heimdal libldap-2.4-2 liblua5.1-0

libmnl0 libnettle6 libp11-kit0 libperl5.22 libroken18-heimdal libsasl2-2

libsasl2-modules libsasl2-modules-db libtasn1-6 libwind0-heimdal libxml2

libxtables11 netbase perl perl-modules-5.22 rename sgml-base ssl-cert

xml-core

The following packages will be upgraded:

perl-base

1 upgraded, 49 newly installed, 0 to remove and 75 not upgraded.

Need to get 21.6 MB of archives.

After this operation, 91.5 MB of additional disk space will be used.

Get:1 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 perl-base amd64 5.22.1-9ubuntu0.6 [1283 kB]

Get:2 http://archive.ubuntu.com/ubuntu xenial/main amd64 libatm1 amd64 1:2.5.1-1.5 [24.2 kB]

Get:3 http://archive.ubuntu.com/ubuntu xenial/main amd64 libmnl0 amd64 1.0.3-5 [12.0 kB]

Get:4 http://archive.ubuntu.com/ubuntu xenial/main amd64 libgdbm3 amd64 1.8.3-13.1 [16.9 kB]

Get:5 http://archive.ubuntu.com/ubuntu xenial/main amd64 sgml-base all 1.26+nmu4ubuntu1 [12.5 kB]

Get:6 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 perl-modules-5.22 all 5.22.1-9ubuntu0.6 [2629 kB]

Get:7 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libperl5.22 amd64 5.22.1-9ubuntu0.6 [3405 kB]

Get:8 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 perl amd64 5.22.1-9ubuntu0.6 [237 kB]

Get:9 http://archive.ubuntu.com/ubuntu xenial/main amd64 libapr1 amd64 1.5.2-3 [86.0 kB]

Get:10 http://archive.ubuntu.com/ubuntu xenial/main amd64 libaprutil1 amd64 1.5.4-1build1 [77.1 kB]

Get:11 http://archive.ubuntu.com/ubuntu xenial/main amd64 libaprutil1-dbd-sqlite3 amd64 1.5.4-1build1 [10.6 kB]

Get:12 http://archive.ubuntu.com/ubuntu xenial/main amd64 libgmp10 amd64 2:6.1.0+dfsg-2 [240 kB]

Get:13 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libnettle6 amd64 3.2-1ubuntu0.16.04.1 [93.5 kB]

Get:14 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libhogweed4 amd64 3.2-1ubuntu0.16.04.1 [136 kB]

Get:15 http://archive.ubuntu.com/ubuntu xenial/main amd64 libffi6 amd64 3.2.1-4 [17.8 kB]

Get:16 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libp11-kit0 amd64 0.23.2-5~ubuntu16.04.1 [105 kB]

Get:17 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libtasn1-6 amd64 4.7-3ubuntu0.16.04.3 [43.5 kB]

Get:18 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libgnutls30 amd64 3.4.10-4ubuntu1.5 [548 kB]

Get:19 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libroken18-heimdal amd64 1.7~git20150920+dfsg-4ubuntu1.16.04.1 [41.4 kB]

Get:20 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libasn1-8-heimdal amd64 1.7~git20150920+dfsg-4ubuntu1.16.04.1 [174 kB]

Get:21 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libhcrypto4-heimdal amd64 1.7~git20150920+dfsg-4ubuntu1.16.04.1 [85.0 kB]

Get:22 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libheimbase1-heimdal amd64 1.7~git20150920+dfsg-4ubuntu1.16.04.1 [29.3 kB]

Get:23 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libwind0-heimdal amd64 1.7~git20150920+dfsg-4ubuntu1.16.04.1 [47.8 kB]

Get:24 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libhx509-5-heimdal amd64 1.7~git20150920+dfsg-4ubuntu1.16.04.1 [107 kB]

Get:25 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libkrb5-26-heimdal amd64 1.7~git20150920+dfsg-4ubuntu1.16.04.1 [202 kB]

Get:26 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libheimntlm0-heimdal amd64 1.7~git20150920+dfsg-4ubuntu1.16.04.1 [15.1 kB]

Get:27 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libgssapi3-heimdal amd64 1.7~git20150920+dfsg-4ubuntu1.16.04.1 [96.1 kB]

Get:28 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libsasl2-modules-db amd64 2.1.26.dfsg1-14ubuntu0.1 [14.5 kB]

Get:29 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libsasl2-2 amd64 2.1.26.dfsg1-14ubuntu0.1 [48.6 kB]

Get:30 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libldap-2.4-2 amd64 2.4.42+dfsg-2ubuntu3.5 [161 kB]

Get:31 http://archive.ubuntu.com/ubuntu xenial/main amd64 libaprutil1-ldap amd64 1.5.4-1build1 [8720 B]

Get:32 http://archive.ubuntu.com/ubuntu xenial/main amd64 liblua5.1-0 amd64 5.1.5-8ubuntu1 [102 kB]

Get:33 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libicu55 amd64 55.1-7ubuntu0.4 [7646 kB]

Get:34 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libxml2 amd64 2.9.3+dfsg1-1ubuntu0.6 [697 kB]

Get:35 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 apache2-bin amd64 2.4.18-2ubuntu3.10 [926 kB]

Get:36 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 apache2-utils amd64 2.4.18-2ubuntu3.10 [81.7 kB]

Get:37 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 apache2-data all 2.4.18-2ubuntu3.10 [162 kB]

Get:38 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 apache2 amd64 2.4.18-2ubuntu3.10 [86.6 kB]

Get:39 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 iproute2 amd64 4.3.0-1ubuntu3.16.04.5 [523 kB]

Get:40 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 ifupdown amd64 0.8.10ubuntu1.4 [54.9 kB]

Get:41 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libisc-export160 amd64 1:9.10.3.dfsg.P4-8ubuntu1.14 [153 kB]

Get:42 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libdns-export162 amd64 1:9.10.3.dfsg.P4-8ubuntu1.14 [667 kB]

Get:43 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 isc-dhcp-client amd64 4.3.3-5ubuntu12.10 [224 kB]

Get:44 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 isc-dhcp-common amd64 4.3.3-5ubuntu12.10 [105 kB]

Get:45 http://archive.ubuntu.com/ubuntu xenial/main amd64 libxtables11 amd64 1.6.0-2ubuntu3 [27.2 kB]

Get:46 http://archive.ubuntu.com/ubuntu xenial/main amd64 netbase all 5.3 [12.9 kB]

Get:47 http://archive.ubuntu.com/ubuntu xenial-updates/main amd64 libsasl2-modules amd64 2.1.26.dfsg1-14ubuntu0.1 [47.5 kB]

Get:48 http://archive.ubuntu.com/ubuntu xenial/main amd64 xml-core all 0.13+nmu2 [23.3 kB]

Get:49 http://archive.ubuntu.com/ubuntu xenial/main amd64 rename all 0.20-4 [12.0 kB]

Get:50 http://archive.ubuntu.com/ubuntu xenial/main amd64 ssl-cert all 1.0.37 [16.9 kB]

debconf: delaying package configuration, since apt-utils is not installed

Fetched 21.6 MB in 1min 23s (258 kB/s)

(Reading database ... 11927 files and directories currently installed.)

Preparing to unpack .../perl-base\_5.22.1-9ubuntu0.6\_amd64.deb ...

Unpacking perl-base (5.22.1-9ubuntu0.6) over (5.22.1-9) ...

Setting up perl-base (5.22.1-9ubuntu0.6) ...

Selecting previously unselected package libatm1:amd64.

(Reading database ... 11927 files and directories currently installed.)

Preparing to unpack .../libatm1\_1%3a2.5.1-1.5\_amd64.deb ...

Unpacking libatm1:amd64 (1:2.5.1-1.5) ...

Selecting previously unselected package libmnl0:amd64.

Preparing to unpack .../libmnl0\_1.0.3-5\_amd64.deb ...

Unpacking libmnl0:amd64 (1.0.3-5) ...

Selecting previously unselected package libgdbm3:amd64.

Preparing to unpack .../libgdbm3\_1.8.3-13.1\_amd64.deb ...

Unpacking libgdbm3:amd64 (1.8.3-13.1) ...

Selecting previously unselected package sgml-base.

Preparing to unpack .../sgml-base\_1.26+nmu4ubuntu1\_all.deb ...

Unpacking sgml-base (1.26+nmu4ubuntu1) ...

Selecting previously unselected package perl-modules-5.22.

Preparing to unpack .../perl-modules-5.22\_5.22.1-9ubuntu0.6\_all.deb ...

Unpacking perl-modules-5.22 (5.22.1-9ubuntu0.6) ...

Selecting previously unselected package libperl5.22:amd64.

Preparing to unpack .../libperl5.22\_5.22.1-9ubuntu0.6\_amd64.deb ...

Unpacking libperl5.22:amd64 (5.22.1-9ubuntu0.6) ...

Selecting previously unselected package perl.

Preparing to unpack .../perl\_5.22.1-9ubuntu0.6\_amd64.deb ...

Unpacking perl (5.22.1-9ubuntu0.6) ...

Selecting previously unselected package libapr1:amd64.

Preparing to unpack .../libapr1\_1.5.2-3\_amd64.deb ...

Unpacking libapr1:amd64 (1.5.2-3) ...

Selecting previously unselected package libaprutil1:amd64.

Preparing to unpack .../libaprutil1\_1.5.4-1build1\_amd64.deb ...

Unpacking libaprutil1:amd64 (1.5.4-1build1) ...

Selecting previously unselected package libaprutil1-dbd-sqlite3:amd64.

Preparing to unpack .../libaprutil1-dbd-sqlite3\_1.5.4-1build1\_amd64.deb ...

Unpacking libaprutil1-dbd-sqlite3:amd64 (1.5.4-1build1) ...

Selecting previously unselected package libgmp10:amd64.

Preparing to unpack .../libgmp10\_2%3a6.1.0+dfsg-2\_amd64.deb ...

Unpacking libgmp10:amd64 (2:6.1.0+dfsg-2) ...

Selecting previously unselected package libnettle6:amd64.

Preparing to unpack .../libnettle6\_3.2-1ubuntu0.16.04.1\_amd64.deb ...

Unpacking libnettle6:amd64 (3.2-1ubuntu0.16.04.1) ...

Selecting previously unselected package libhogweed4:amd64.

Preparing to unpack .../libhogweed4\_3.2-1ubuntu0.16.04.1\_amd64.deb ...

Unpacking libhogweed4:amd64 (3.2-1ubuntu0.16.04.1) ...

Selecting previously unselected package libffi6:amd64.

Preparing to unpack .../libffi6\_3.2.1-4\_amd64.deb ...

Unpacking libffi6:amd64 (3.2.1-4) ...

Selecting previously unselected package libp11-kit0:amd64.

Preparing to unpack .../libp11-kit0\_0.23.2-5~ubuntu16.04.1\_amd64.deb ...

Unpacking libp11-kit0:amd64 (0.23.2-5~ubuntu16.04.1) ...

Selecting previously unselected package libtasn1-6:amd64.

Preparing to unpack .../libtasn1-6\_4.7-3ubuntu0.16.04.3\_amd64.deb ...

Unpacking libtasn1-6:amd64 (4.7-3ubuntu0.16.04.3) ...

Selecting previously unselected package libgnutls30:amd64.

Preparing to unpack .../libgnutls30\_3.4.10-4ubuntu1.5\_amd64.deb ...

Unpacking libgnutls30:amd64 (3.4.10-4ubuntu1.5) ...

Selecting previously unselected package libroken18-heimdal:amd64.

Preparing to unpack .../libroken18-heimdal\_1.7~git20150920+dfsg-4ubuntu1.16.04.1\_amd64.deb ...

Unpacking libroken18-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Selecting previously unselected package libasn1-8-heimdal:amd64.

Preparing to unpack .../libasn1-8-heimdal\_1.7~git20150920+dfsg-4ubuntu1.16.04.1\_amd64.deb ...

Unpacking libasn1-8-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Selecting previously unselected package libhcrypto4-heimdal:amd64.

Preparing to unpack .../libhcrypto4-heimdal\_1.7~git20150920+dfsg-4ubuntu1.16.04.1\_amd64.deb ...

Unpacking libhcrypto4-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Selecting previously unselected package libheimbase1-heimdal:amd64.

Preparing to unpack .../libheimbase1-heimdal\_1.7~git20150920+dfsg-4ubuntu1.16.04.1\_amd64.deb ...

Unpacking libheimbase1-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Selecting previously unselected package libwind0-heimdal:amd64.

Preparing to unpack .../libwind0-heimdal\_1.7~git20150920+dfsg-4ubuntu1.16.04.1\_amd64.deb ...

Unpacking libwind0-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Selecting previously unselected package libhx509-5-heimdal:amd64.

Preparing to unpack .../libhx509-5-heimdal\_1.7~git20150920+dfsg-4ubuntu1.16.04.1\_amd64.deb ...

Unpacking libhx509-5-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Selecting previously unselected package libkrb5-26-heimdal:amd64.

Preparing to unpack .../libkrb5-26-heimdal\_1.7~git20150920+dfsg-4ubuntu1.16.04.1\_amd64.deb ...

Unpacking libkrb5-26-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Selecting previously unselected package libheimntlm0-heimdal:amd64.

Preparing to unpack .../libheimntlm0-heimdal\_1.7~git20150920+dfsg-4ubuntu1.16.04.1\_amd64.deb ...

Unpacking libheimntlm0-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Selecting previously unselected package libgssapi3-heimdal:amd64.

Preparing to unpack .../libgssapi3-heimdal\_1.7~git20150920+dfsg-4ubuntu1.16.04.1\_amd64.deb ...

Unpacking libgssapi3-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Selecting previously unselected package libsasl2-modules-db:amd64.

Preparing to unpack .../libsasl2-modules-db\_2.1.26.dfsg1-14ubuntu0.1\_amd64.deb ...

Unpacking libsasl2-modules-db:amd64 (2.1.26.dfsg1-14ubuntu0.1) ...

Selecting previously unselected package libsasl2-2:amd64.

Preparing to unpack .../libsasl2-2\_2.1.26.dfsg1-14ubuntu0.1\_amd64.deb ...

Unpacking libsasl2-2:amd64 (2.1.26.dfsg1-14ubuntu0.1) ...

Selecting previously unselected package libldap-2.4-2:amd64.

Preparing to unpack .../libldap-2.4-2\_2.4.42+dfsg-2ubuntu3.5\_amd64.deb ...

Unpacking libldap-2.4-2:amd64 (2.4.42+dfsg-2ubuntu3.5) ...

Selecting previously unselected package libaprutil1-ldap:amd64.

Preparing to unpack .../libaprutil1-ldap\_1.5.4-1build1\_amd64.deb ...

Unpacking libaprutil1-ldap:amd64 (1.5.4-1build1) ...

Selecting previously unselected package liblua5.1-0:amd64.

Preparing to unpack .../liblua5.1-0\_5.1.5-8ubuntu1\_amd64.deb ...

Unpacking liblua5.1-0:amd64 (5.1.5-8ubuntu1) ...

Selecting previously unselected package libicu55:amd64.

Preparing to unpack .../libicu55\_55.1-7ubuntu0.4\_amd64.deb ...

Unpacking libicu55:amd64 (55.1-7ubuntu0.4) ...

Selecting previously unselected package libxml2:amd64.

Preparing to unpack .../libxml2\_2.9.3+dfsg1-1ubuntu0.6\_amd64.deb ...

Unpacking libxml2:amd64 (2.9.3+dfsg1-1ubuntu0.6) ...

Selecting previously unselected package apache2-bin.

Preparing to unpack .../apache2-bin\_2.4.18-2ubuntu3.10\_amd64.deb ...

Unpacking apache2-bin (2.4.18-2ubuntu3.10) ...

Selecting previously unselected package apache2-utils.

Preparing to unpack .../apache2-utils\_2.4.18-2ubuntu3.10\_amd64.deb ...

Unpacking apache2-utils (2.4.18-2ubuntu3.10) ...

Selecting previously unselected package apache2-data.

Preparing to unpack .../apache2-data\_2.4.18-2ubuntu3.10\_all.deb ...

Unpacking apache2-data (2.4.18-2ubuntu3.10) ...

Selecting previously unselected package apache2.

Preparing to unpack .../apache2\_2.4.18-2ubuntu3.10\_amd64.deb ...

Unpacking apache2 (2.4.18-2ubuntu3.10) ...

Selecting previously unselected package iproute2.

Preparing to unpack .../iproute2\_4.3.0-1ubuntu3.16.04.5\_amd64.deb ...

Unpacking iproute2 (4.3.0-1ubuntu3.16.04.5) ...

Selecting previously unselected package ifupdown.

Preparing to unpack .../ifupdown\_0.8.10ubuntu1.4\_amd64.deb ...

Unpacking ifupdown (0.8.10ubuntu1.4) ...

Selecting previously unselected package libisc-export160.

Preparing to unpack .../libisc-export160\_1%3a9.10.3.dfsg.P4-8ubuntu1.14\_amd64.deb ...

Unpacking libisc-export160 (1:9.10.3.dfsg.P4-8ubuntu1.14) ...

Selecting previously unselected package libdns-export162.

Preparing to unpack .../libdns-export162\_1%3a9.10.3.dfsg.P4-8ubuntu1.14\_amd64.deb ...

Unpacking libdns-export162 (1:9.10.3.dfsg.P4-8ubuntu1.14) ...

Selecting previously unselected package isc-dhcp-client.

Preparing to unpack .../isc-dhcp-client\_4.3.3-5ubuntu12.10\_amd64.deb ...

Unpacking isc-dhcp-client (4.3.3-5ubuntu12.10) ...

Selecting previously unselected package isc-dhcp-common.

Preparing to unpack .../isc-dhcp-common\_4.3.3-5ubuntu12.10\_amd64.deb ...

Unpacking isc-dhcp-common (4.3.3-5ubuntu12.10) ...

Selecting previously unselected package libxtables11:amd64.

Preparing to unpack .../libxtables11\_1.6.0-2ubuntu3\_amd64.deb ...

Unpacking libxtables11:amd64 (1.6.0-2ubuntu3) ...

Selecting previously unselected package netbase.

Preparing to unpack .../archives/netbase\_5.3\_all.deb ...

Unpacking netbase (5.3) ...

Selecting previously unselected package libsasl2-modules:amd64.

Preparing to unpack .../libsasl2-modules\_2.1.26.dfsg1-14ubuntu0.1\_amd64.deb ...

Unpacking libsasl2-modules:amd64 (2.1.26.dfsg1-14ubuntu0.1) ...

Selecting previously unselected package xml-core.

Preparing to unpack .../xml-core\_0.13+nmu2\_all.deb ...

Unpacking xml-core (0.13+nmu2) ...

Selecting previously unselected package rename.

Preparing to unpack .../archives/rename\_0.20-4\_all.deb ...

Unpacking rename (0.20-4) ...

Selecting previously unselected package ssl-cert.

Preparing to unpack .../ssl-cert\_1.0.37\_all.deb ...

Unpacking ssl-cert (1.0.37) ...

Processing triggers for libc-bin (2.23-0ubuntu5) ...

Processing triggers for systemd (229-4ubuntu12) ...

Setting up libatm1:amd64 (1:2.5.1-1.5) ...

Setting up libmnl0:amd64 (1.0.3-5) ...

Setting up libgdbm3:amd64 (1.8.3-13.1) ...

Setting up sgml-base (1.26+nmu4ubuntu1) ...

Setting up perl-modules-5.22 (5.22.1-9ubuntu0.6) ...

Setting up libperl5.22:amd64 (5.22.1-9ubuntu0.6) ...

Setting up perl (5.22.1-9ubuntu0.6) ...

update-alternatives: using /usr/bin/prename to provide /usr/bin/rename (rename) in auto mode

Setting up libapr1:amd64 (1.5.2-3) ...

Setting up libaprutil1:amd64 (1.5.4-1build1) ...

Setting up libaprutil1-dbd-sqlite3:amd64 (1.5.4-1build1) ...

Setting up libgmp10:amd64 (2:6.1.0+dfsg-2) ...

Setting up libnettle6:amd64 (3.2-1ubuntu0.16.04.1) ...

Setting up libhogweed4:amd64 (3.2-1ubuntu0.16.04.1) ...

Setting up libffi6:amd64 (3.2.1-4) ...

Setting up libp11-kit0:amd64 (0.23.2-5~ubuntu16.04.1) ...

Setting up libtasn1-6:amd64 (4.7-3ubuntu0.16.04.3) ...

Setting up libgnutls30:amd64 (3.4.10-4ubuntu1.5) ...

Setting up libroken18-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Setting up libasn1-8-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Setting up libhcrypto4-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Setting up libheimbase1-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Setting up libwind0-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Setting up libhx509-5-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Setting up libkrb5-26-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Setting up libheimntlm0-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Setting up libgssapi3-heimdal:amd64 (1.7~git20150920+dfsg-4ubuntu1.16.04.1) ...

Setting up libsasl2-modules-db:amd64 (2.1.26.dfsg1-14ubuntu0.1) ...

Setting up libsasl2-2:amd64 (2.1.26.dfsg1-14ubuntu0.1) ...

Setting up libldap-2.4-2:amd64 (2.4.42+dfsg-2ubuntu3.5) ...

Setting up libaprutil1-ldap:amd64 (1.5.4-1build1) ...

Setting up liblua5.1-0:amd64 (5.1.5-8ubuntu1) ...

Setting up libicu55:amd64 (55.1-7ubuntu0.4) ...

Setting up libxml2:amd64 (2.9.3+dfsg1-1ubuntu0.6) ...

Setting up apache2-bin (2.4.18-2ubuntu3.10) ...

Setting up apache2-utils (2.4.18-2ubuntu3.10) ...

Setting up apache2-data (2.4.18-2ubuntu3.10) ...

Setting up apache2 (2.4.18-2ubuntu3.10) ...

Enabling module mpm\_event.

Enabling module authz\_core.

Enabling module authz\_host.

Enabling module authn\_core.

Enabling module auth\_basic.

Enabling module access\_compat.

Enabling module authn\_file.

Enabling module authz\_user.

Enabling module alias.

Enabling module dir.

Enabling module autoindex.

Enabling module env.

Enabling module mime.

Enabling module negotiation.

Enabling module setenvif.

Enabling module filter.

Enabling module deflate.

Enabling module status.

Enabling conf charset.

Enabling conf localized-error-pages.

Enabling conf other-vhosts-access-log.

Enabling conf security.

Enabling conf serve-cgi-bin.

Enabling site 000-default.

invoke-rc.d: could not determine current runlevel

invoke-rc.d: policy-rc.d denied execution of start.

Setting up iproute2 (4.3.0-1ubuntu3.16.04.5) ...

Setting up ifupdown (0.8.10ubuntu1.4) ...

Creating /etc/network/interfaces.

Setting up libisc-export160 (1:9.10.3.dfsg.P4-8ubuntu1.14) ...

Setting up libdns-export162 (1:9.10.3.dfsg.P4-8ubuntu1.14) ...

Setting up isc-dhcp-client (4.3.3-5ubuntu12.10) ...

Setting up isc-dhcp-common (4.3.3-5ubuntu12.10) ...

Setting up libxtables11:amd64 (1.6.0-2ubuntu3) ...

Setting up netbase (5.3) ...

Setting up libsasl2-modules:amd64 (2.1.26.dfsg1-14ubuntu0.1) ...

Setting up xml-core (0.13+nmu2) ...

Setting up rename (0.20-4) ...

update-alternatives: using /usr/bin/file-rename to provide /usr/bin/rename (rename) in auto mode

Setting up ssl-cert (1.0.37) ...

debconf: unable to initialize frontend: Dialog

debconf: (TERM is not set, so the dialog frontend is not usable.)

debconf: falling back to frontend: Readline

Processing triggers for libc-bin (2.23-0ubuntu5) ...

Processing triggers for systemd (229-4ubuntu12) ...

Processing triggers for sgml-base (1.26+nmu4ubuntu1) ...

Removing intermediate container 5bab1e33f5a6

---> 168c754f6c9d

Step 3/6 : COPY index.html /var/www/html/

---> 273f62895749

Step 4/6 : WORKDIR /var/www/html

---> Running in 346db5678826

Removing intermediate container 346db5678826

---> 5ac163e164aa

Step 5/6 : CMD ["apachectl", "-D", "FOREGROUND"]

---> Running in ba6421105a12

Removing intermediate container ba6421105a12

---> 6235f05db7dd

Step 6/6 : EXPOSE 80

---> Running in a10bed61a593

Removing intermediate container a10bed61a593

---> 54d40c83c71c

Successfully built 54d40c83c71c

Successfully tagged apache:latest

## Step 5 – Launch Docker Containers

Finally launch your containers using docker-compose up command. Use **-d** switch to run them in daemon mode.

$ docker-compose up -d

You can access your web application running on the apache\_web container by accessing your docker host on port 8080. For example, http://dockerhost:8080/ where dockerhost is IP or hostname of your Docker host machine.

## Step 6 – Update Content in Web Application

Let’s make a change in your web application. I have added some more content to webapp/index.html file as following.

$ echo "Welcome to Docker Compose Tutorial" >> webapp/index.html

Now use the following commands to rebuild webapp container and relaunch using docker-compose.

$ docker-compose build

$ docker-compose up -d

Check the output of the command.

You can see that mysql\_db container is showing unchanged as nothing changed there. The only apache\_web container has been recreated due to new build found for the image used for that.

Again access your web application on port 8080 of docker host machine. You will see the updated content here.

http://dockerhost:8080/

[root@docker mysql]# docker-compose up

Creating network "mysql\_default" with the default driver

Pulling db (mysql:)...

latest: Pulling from library/mysql

fc7181108d40: Pull complete

787a24c80112: Pull complete

a08cb039d3cd: Pull complete

4f7d35eb5394: Pull complete

5aa21f895d95: Pull complete

a742e211b7a2: Pull complete

0163805ad937: Pull complete

87f18876c3ff: Pull complete

78082f25f167: Pull complete

0a510f055c17: Pull complete

312b0999e433: Pull complete

f864cfdc0264: Pull complete

Creating mysql\_db ... done

Creating apache\_web ... done

Attaching to mysql\_db, apache\_web

db\_1 | Initializing database

apache\_web | AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 172.19.0.3. Set the 'ServerName' directive globally to suppress this message

db\_1 | 2019-06-27T04:34:14.124852Z 0 [Warning] [MY-011070] [Server] 'Disabling symbolic links using --skip-symbolic-links (or equivalent) is the default. Consider not using this option as it' is deprecated and will be removed in a future release.

db\_1 | 2019-06-27T04:34:14.124996Z 0 [System] [MY-013169] [Server] /usr/sbin/mysqld (mysqld 8.0.16) initializing of server in progress as process 27

db\_1 | 2019-06-27T04:34:19.341292Z 5 [Warning] [MY-010453] [Server] root@localhost is created with an empty password ! Please consider switching off the --initialize-insecure option.

db\_1 | 2019-06-27T04:34:21.237360Z 0 [System] [MY-013170] [Server] /usr/sbin/mysqld (mysqld 8.0.16) initializing of server has completed

db\_1 | Database initialized

db\_1 | MySQL init process in progress...

db\_1 | MySQL init process in progress...

db\_1 | 2019-06-27T04:34:23.554454Z 0 [Warning] [MY-011070] [Server] 'Disabling symbolic links using --skip-symbolic-links (or equivalent) is the default. Consider not using this option as it' is deprecated and will be removed in a future release.

db\_1 | 2019-06-27T04:34:23.555892Z 0 [System] [MY-010116] [Server] /usr/sbin/mysqld (mysqld 8.0.16) starting as process 78

db\_1 | 2019-06-27T04:34:24.452386Z 0 [Warning] [MY-010068] [Server] CA certificate ca.pem is self signed.

db\_1 | 2019-06-27T04:34:24.469663Z 0 [Warning] [MY-011810] [Server] Insecure configuration for --pid-file: Location '/var/run/mysqld' in the path is accessible to all OS users. Consider choosing a different directory.

db\_1 | 2019-06-27T04:34:24.497318Z 0 [System] [MY-010931] [Server] /usr/sbin/mysqld: ready for connections. Version: '8.0.16' socket: '/var/run/mysqld/mysqld.sock' port: 0 MySQL Community Server - GPL.

db\_1 | 2019-06-27T04:34:24.687211Z 0 [System] [MY-011323] [Server] X Plugin ready for connections. Socket: '/var/run/mysqld/mysqlx.sock'

db\_1 | Warning: Unable to load '/usr/share/zoneinfo/iso3166.tab' as time zone. Skipping it.

db\_1 | Warning: Unable to load '/usr/share/zoneinfo/leap-seconds.list' as time zone. Skipping it.

db\_1 | Warning: Unable to load '/usr/share/zoneinfo/zone.tab' as time zone. Skipping it.

db\_1 | Warning: Unable to load '/usr/share/zoneinfo/zone1970.tab' as time zone. Skipping it.

db\_1 |

db\_1 | 2019-06-27T04:34:31.055380Z 0 [System] [MY-010910] [Server] /usr/sbin/mysqld: Shutdown complete (mysqld 8.0.16) MySQL Community Server - GPL.

db\_1 |

db\_1 | MySQL init process done. Ready for start up.

db\_1 |

db\_1 | 2019-06-27T04:34:31.427013Z 0 [Warning] [MY-011070] [Server] 'Disabling symbolic links using --skip-symbolic-links (or equivalent) is the default. Consider not using this option as it' is deprecated and will be removed in a future release.

db\_1 | 2019-06-27T04:34:31.427108Z 0 [System] [MY-010116] [Server] /usr/sbin/mysqld (mysqld 8.0.16) starting as process 1

db\_1 | 2019-06-27T04:34:32.112123Z 0 [Warning] [MY-010068] [Server] CA certificate ca.pem is self signed.

db\_1 | 2019-06-27T04:34:32.152785Z 0 [Warning] [MY-011810] [Server] Insecure configuration for --pid-file: Location '/var/run/mysqld' in the path is accessible to all OS users. Consider choosing a different directory.

db\_1 | 2019-06-27T04:34:32.178846Z 0 [System] [MY-010931] [Server] /usr/sbin/mysqld: ready for connections. Version: '8.0.16' socket: '/var/run/mysqld/mysqld.sock' port: 3306 MySQL Community Server - GPL.

db\_1 | 2019-06-27T04:34:32.226485Z 0 [System] [MY-011323] [Server] X Plugin ready for connections. Socket: '/var/run/mysqld/mysqlx.sock' bind-address: '::' port: 33060

^CGracefully stopping... (press Ctrl+C again to force)

Stopping apache\_web ... done

Stopping mysql\_db ... done

[root@docker mysql]# docker-compose up -d

Starting mysql\_db ... done

Starting apache\_web ... done

[root@docker mysql]# echo "Welcome to Docker Compose Tutorial" >> webapp/index.html

[root@docker mysql]# docker-compose build

db uses an image, skipping

Building web

Step 1/6 : FROM tecadmin/ubuntu-ssh:16.04

---> bb63b492da01

Step 2/6 : RUN apt-get update && apt-get install -y apache2

---> Using cache

---> 168c754f6c9d

Step 3/6 : COPY index.html /var/www/html/

---> 64db42d3e0cd

Step 4/6 : WORKDIR /var/www/html

---> Running in 41323d02b83f

Removing intermediate container 41323d02b83f

---> c8928f0028ec

Step 5/6 : CMD ["apachectl", "-D", "FOREGROUND"]

---> Running in a01529a719b4

Removing intermediate container a01529a719b4

---> 63ee32d3a6f7

Step 6/6 : EXPOSE 80

---> Running in 9d54412f490d

Removing intermediate container 9d54412f490d

---> eb75873b515c

Successfully built eb75873b515c

Successfully tagged apache:latest

[root@docker mysql]# docker-compose up -d

mysql\_db is up-to-date

Recreating apache\_web ... done

[root@docker mysql]#

[root@docker mysql]#

[root@docker mysql]#

[root@docker mysql]# curl localhost:8080

<h2>It Works</h2>

Welcome to Docker Compose Tutorial

[root@docker mysql]#

[root@docker mysql]#

[root@docker mysql]#

[root@docker mysql]# ll

total 4

-rw-r--r--. 1 root root 308 Jun 27 09:39 docker-compose.yml

drwxr-xr-x. 2 root root 40 Jun 27 09:44 webapp

[root@docker mysql]#

[root@docker mysql]#

[root@docker mysql]#

[root@docker mysql]# histYou can see that mysql\_db container is showing unchanged as nothing changed there. The only apache\_web container has been recreated due to new build found for the image used for that.

-bash: histYou: command not found

[root@docker mysql]#

[root@docker mysql]# Again access your web application on port 8080 of docker host machine. You will see the updated content here.

-bash: Again: command not found

[root@docker mysql]#

[root@docker mysql]# http://dockerhost:8080/

-bash: http://dockerhost:8080/: No such file or directory

[root@docker mysql]#