CC Mini project: Inter-container Communication in Docker.

Title: Implement Inter-container Communication in Docker.

Introduction : A lot of environment have instances where container are use to provide a single service such as Database as a Mongo container or web server setup in some other container or proxy server in some container and the key here is how one container talk to another container or one container make a request to another container.

Docker: Docker is a tool designed to make it easier to create, deploy, and run applications by using containers. Containers allow a developer to package up an application with all of the parts it needs, such as libraries and other dependencies, and ship it all out as one package. By doing so, thanks to the container, the developer can rest assured that the application will run on any other Linux machine regardless of any customized settings that machine might have that could differ from the machine used for writing and testing the code.

In a way, Docker is a bit like a virtual machine. But unlike a virtual machine, rather than creating a whole virtual operating system, Docker allows applications to use the same Linux kernel as the system that they're running on and only requires applications be shipped with things not already running on the host computer. This gives a significant performance boost and reduces the size of the application.

Implementation Details:

Docker containers are self-contained, isolated environments. However, they are often only useful if they can talk to each other. Here we have created two Ubuntu container and in one container we have install and setup the Nginx web server and in another container we have install Nodejs web server. Nginx web server is configured on port 80 and we have written a simple java script code to configure the Nodejs web server on port 3000.

Steps:

1. **Setup Two Docker Containers on Host**

   Run this command twice to download the public Ubuntu image and stand up two instances of that image in the background.

   Docker run -it –d ubuntu

2. **Verify image is downloaded**

   Docker images

3. **Verify container are up and running**

   Docker ps –a

4. **Setup NGINX in one of the containers**

   Docker exec –it container_id bash

5. Update the Package Manager

Before downloading any new software from the package manager we want to update the package manager to ensure everything is up to date.

apt-get update

6. Install NGINX

Install NGINX web server software. This will allow us to stand up a demo website on port 80.

apt-get install nginx

7. Stand Up nginx web server

Service nginx reload

Service nginx restart

8. Install Curl

So that we can verify our web server is up and running we need a utility to request the origin content on port 80 (localhost: 80). So we need to download the CURL utility.

apt-get install curl

9. Verify the web server is running

This should return the "Welcome to NGINX" html page.

Curl localhost

10. Log into the other Container

Docker exec –it container_id bash

11. Update the Package Manager

Before downloading any new software from the package manager we want to update the package manager to ensure everything is up to date.

apt-get update

12. Install Node

Apt-get install nodejs

Apt-get install npm

13. Switch the Node Alias

Sudo update-alternative –install /usr/bin/node node /usr/bin/nodejs

14. Verify Node is installed

node –v

15. Express

npm install express –save

16. Install Curl

apt-get install curl

17. Install VIM text editor

apt-get install vim

18. Create Node.js web server on port 3000

vim app.js

19. Copy the code below as app.js

```
var express = require('express');
var app = express();

app.get('/', function(req,res){
  res.send('Hello World');
});

app.listen(3000, function() {
  console.log ('Example app listening on port 3000!');
});
```

20. Save and Exit file

:x+ enter

21. Install Forever for Node.js

Npm install forever –g

22. Stand Up Node server as Daemon

Forever start app.js

23. Verify the Node server is working

Curl localhost: 3000

24. Log out of Container

exit + enter

25. Get IP Address of Container

Docker inspect container_id

26. Verify Node.js Container Service from Host

Curl ip_address:3000

27. Verify NGINX Container Service from Host

Curl ip_address:80

28. Communication Between Docker Containers

Log onto Node.js container

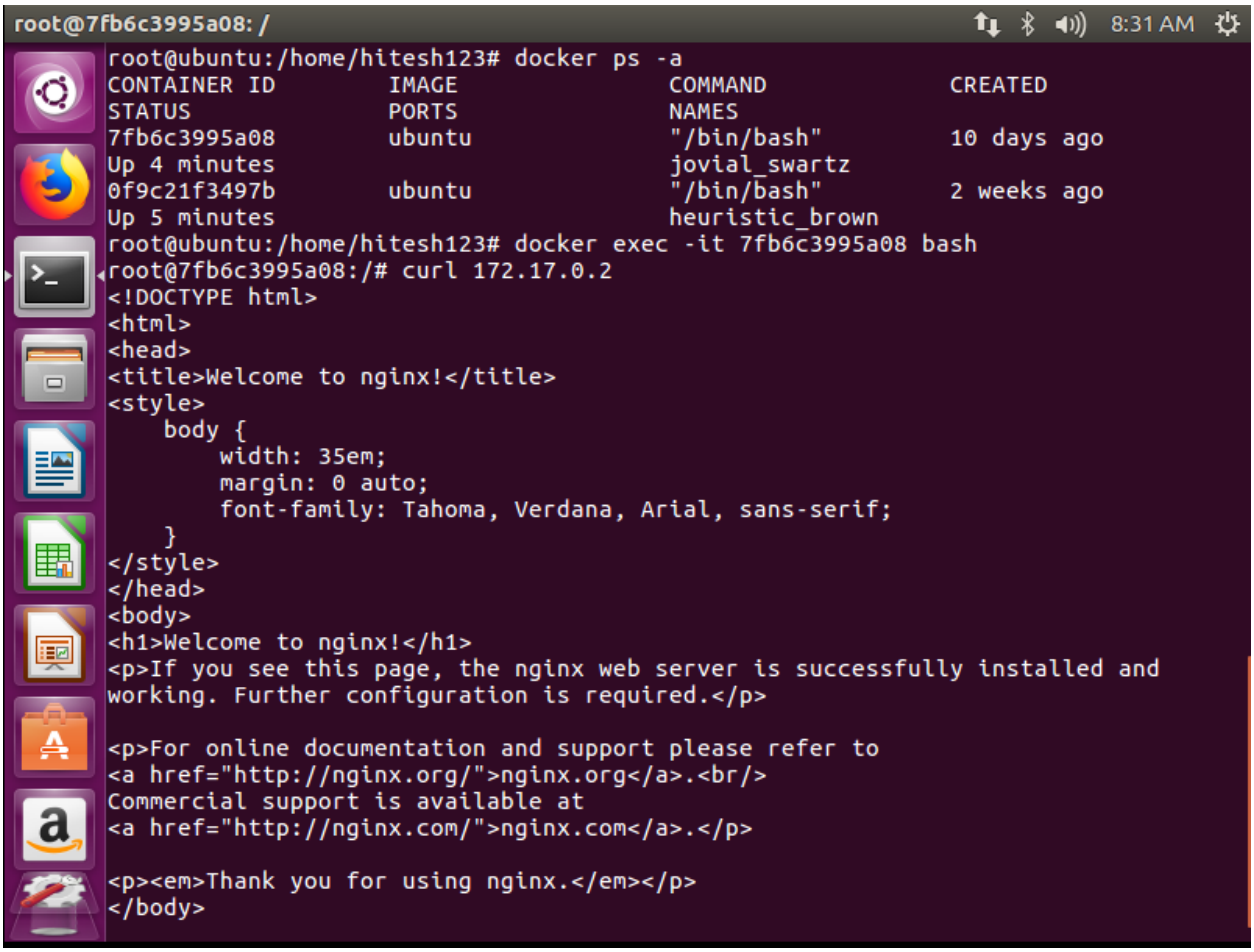
Docker exec –it container_id bash

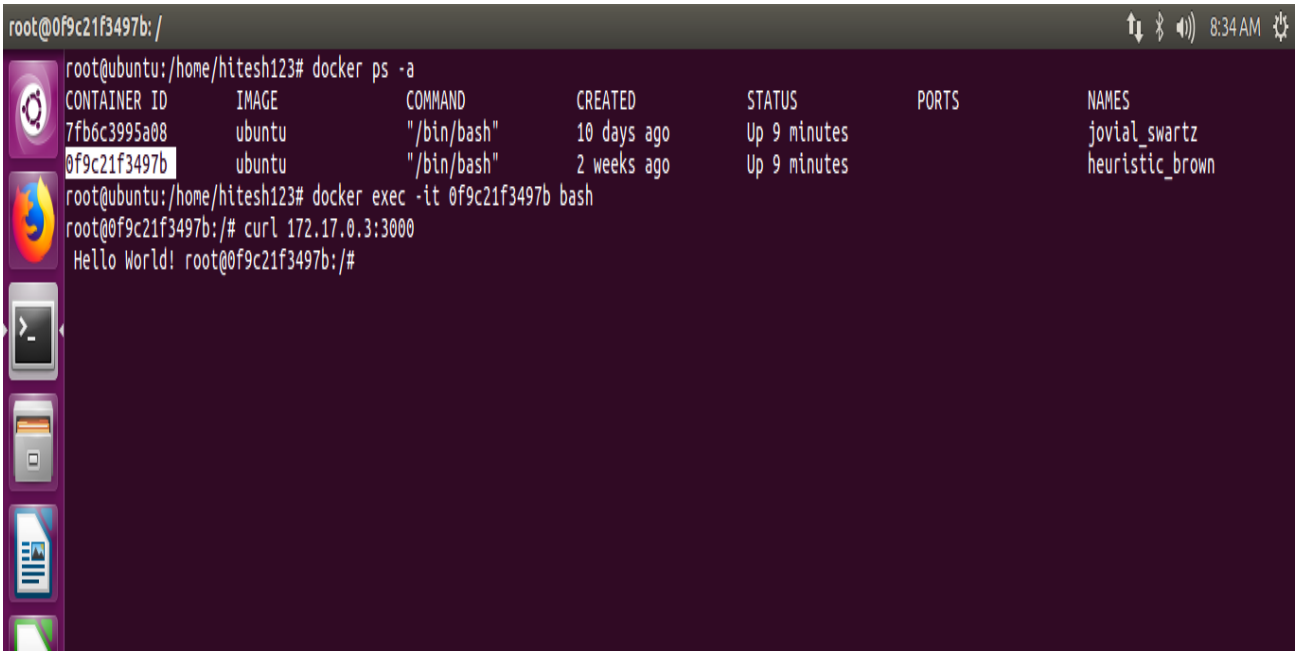
Curl NGINX web server

This should return the “Welcome to NGINX” html page.

Curl nginx_docker_ip_address

Output Screens:





Conclusion: Thus, we have studied Docker and its containers and implement communication between Docker containers.