

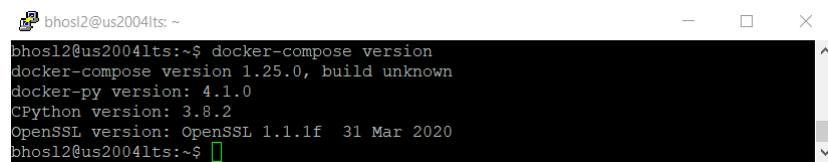
Containerization and Big Data: Exercise 3-1

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3 Multi-Container Apps with Docker Compose

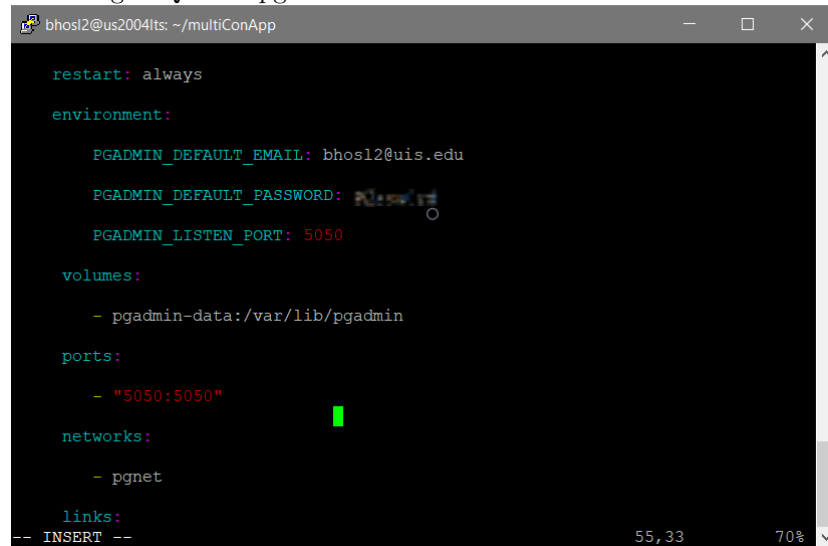
3.1 Install Docker Compose

A terminal window with a black background and white text. The prompt is 'bhosi2@us2004lts: ~'. The command 'docker-compose version' has been executed, resulting in the following output: 'docker-compose version 1.25.0, build unknown', 'docker-py version: 4.1.0', 'CPython version: 3.8.2', and 'OpenSSL version: OpenSSL 1.1.1f 31 Mar 2020'. The prompt is now 'bhosi2@us2004lts:~\$' with a green cursor.

```
bhosi2@us2004lts: ~  
bhosi2@us2004lts:~$ docker-compose version  
docker-compose version 1.25.0, build unknown  
docker-py version: 4.1.0  
CPython version: 3.8.2  
OpenSSL version: OpenSSL 1.1.1f 31 Mar 2020  
bhosi2@us2004lts:~$
```

3.2 Docker Compose File

For PostgreSQL and pgAdmin

A terminal window with a black background and white text. The title bar shows 'bhosi2@us2004lts: ~/multiConApp'. The content is a Docker Compose file for pgAdmin. The file includes settings for restart policy, environment variables (PGADMIN_DEFAULT_EMAIL, PGADMIN_DEFAULT_PASSWORD, PGADMIN_LISTEN_PORT), volumes (pgadmin-data), ports (5050:5050), networks (pgnet), and links. The prompt is '-- INSERT --' with a green cursor.

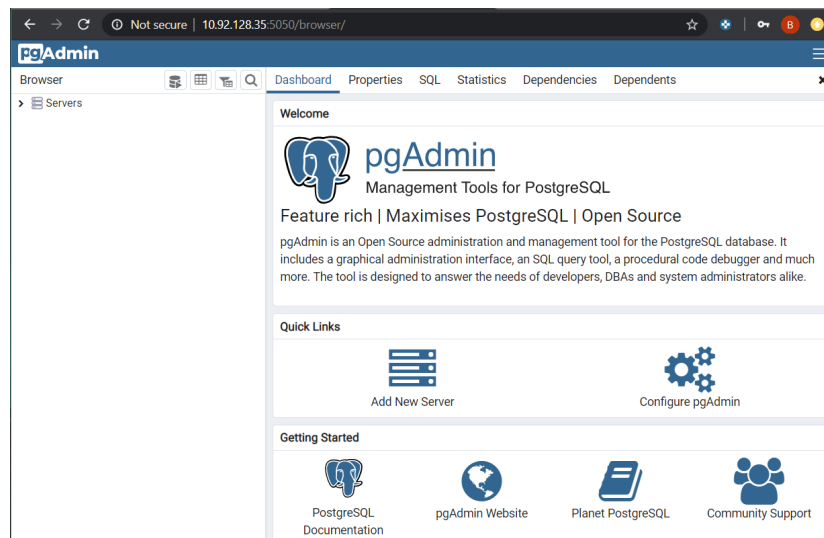
```
bhosi2@us2004lts: ~/multiConApp  
restart: always  
  
environment:  
    PGADMIN_DEFAULT_EMAIL: bhosi2@uis.edu  
    PGADMIN_DEFAULT_PASSWORD: NewAdmin  
    PGADMIN_LISTEN_PORT: 5050  
  
volumes:  
    - pgadmin-data:/var/lib/pgadmin  
  
ports:  
    - "5050:5050"  
  
networks:  
    - pgnet  
  
links:  
-- INSERT --
```

3.3 Running PostgreSQL and pgAdmin

```
bhos12@us2004lts: ~/multiConApp
bhos12@us2004lts:~/multiConApp$ docker-compose up -d
Creating network "multiconapp_pgnet" with driver "bridge"
Creating volume "multiconapp_postgres-data" with default driver
Creating volume "multiconapp_pgadmin-data" with default driver
Pulling postgres (postgres:12.1)...
12.1: Pulling from library/postgres
bc51dd8edc1b: Pull complete

bhos12@us2004lts: ~/multiConApp
651e60d03bc3: Pull complete
f718fdf08d6e: Pull complete
Digest: sha256:blf00b8163cf5689e720099daa0cc8ee61777a71b8ee6088d28e0a2bb1984dea
Status: Downloaded newer image for dpape/pgadmin4:latest
Creating myPostgresCon ... done
Creating multiconapp_pgadmin_1 ... done
bhos12@us2004lts:~/multiConApp$
```

3.4 Accessing PostgreSQL DB from pgAdmin



3.5 Add Portainer to the App

3.5.1 New compose file

```
version: "3.7"
services:
  postgres:
    container_name: postgres_bhosl2
    image: postgres:12.1
    restart: always
    environment:
      POSTGRES_DB: myDB
      POSTGRES_USER: admin
      POSTGRES_PASSWORD: #####
      PGDATA: /var/lib/postgresql/data
    volumes:
      - postgres-data:/var/lib/postgresql/data
    ports:
      - "5432:5432"
    networks:
      - pgnet

  pgadmin:
    container_name: pgAdmin_bhosl2
    image: dpage/pgadmin4
    restart: always
    environment:
      PGADMIN_DEFAULT_EMAIL: bhosl2@uis.edu
      PGADMIN_DEFAULT_PASSWORD: #####
      PGADMIN_LISTEN_ADDRESS: 0.0.0.0
      PGADMIN_LISTEN_PORT: 5050
    volumes:
      - pgadmin-data:/var/lib/pgadmin
    ports:
      - "5050:5050"
    networks:
      - pgnet
    links:
      - "postgres:pgsql-server"

  portainer:
    container_name: portainer_bhosl2
    image: portainer/portainer
    command: -H unix:///var/run/docker.sock
    restart: always
    volumes:
      - /var/run/docker.sock:/var/run/docker.sock
      - ./portainer-data:/var/lib/data
```

```

ports:
  - "9000:9000"
  - "8000:8000"

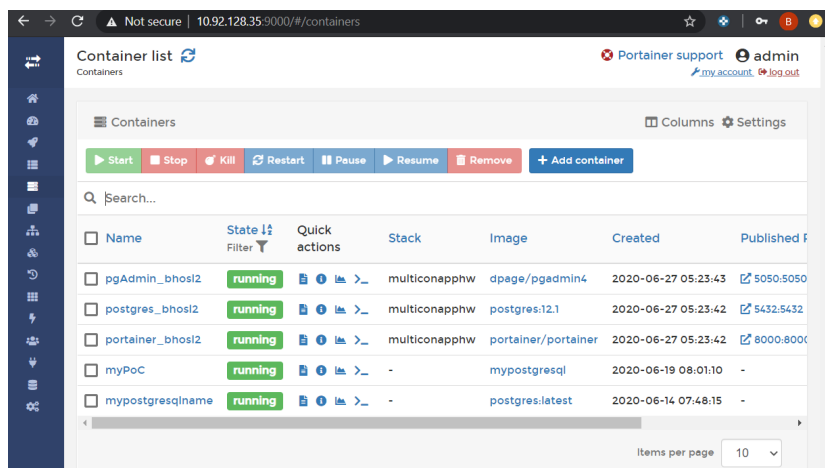
networks:
  - pgnet

networks:
  pgnet:
    driver: bridge

volumes:
  postgres-data:
  pgadmin-data:

```

3.5.2 List of containers in Portainer



The screenshot shows the Portainer web interface in a browser. The address bar indicates the URL is 10.92.128.35:9000/#/containers. The page title is "Container list". At the top right, there are links for "Portainer support", "admin", "my account", and "log out". Below the title, there is a "Containers" section with a search bar and a table of containers. The table has columns for Name, State, Quick actions, Stack, Image, Created, and Published. The containers listed are pgAdmin_bhosl2, postgres_bhosl2, portainer_bhosl2, myPoC, and mypostgresqlname, all in a "running" state. At the bottom right, there is a "Items per page" dropdown set to 10.

Name	State	Quick actions	Stack	Image	Created	Published
pgAdmin_bhosl2	running	[Icons]	multiconapphw	dpage/pgadmin4	2020-06-27 05:23:43	5050:5050
postgres_bhosl2	running	[Icons]	multiconapphw	postgres:12.1	2020-06-27 05:23:42	5432:5432
portainer_bhosl2	running	[Icons]	multiconapphw	portainer/portainer	2020-06-27 05:23:42	8000:8000
myPoC	running	[Icons]	-	mypostgresql	2020-06-19 08:01:10	-
mypostgresqlname	running	[Icons]	-	postgres:latest	2020-06-14 07:48:15	-