

## **Annex: Med&BS RDBFIS Application Server Installation Guide**

### **1. Installation of Docker in AWS EC2 running Amazon Linux 2**

#### **i. Install Docker CE**

```
sudo amazon-linux-extras install docker
```

#### **ii. Start Docker service**

```
sudo service docker start
```

#### **iii. Run Docker without Root**

```
sudo usermod -a -G docker ec2-user
```

#### **iv. Run Docker without Root**

```
sudo usermod -a -G docker ec2-user
```

#### **v. Enable Docker auto start**

```
sudo chkconfig docker on
```

#### **vi. Reboot**

```
sudo reboot
```

### **2. Installation of Docker Compose in Amazon Linux 2**

#### **i. Download the current stable release of Docker Compose**

```
sudo curl -L "https://github.com/docker/compose/releases/download/1.29.2/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose
```

#### **ii. Apply executable permissions to the binary**

```
sudo chmod +x /usr/local/bin/docker-compose
```

#### **iii. Verify installation**

```
docker-compose version
```

### **3. Installation of OpenJDK-11 in Amazon Linux 2**

OpenJDK is installed with the command:

```
sudo amazon-linux-extras install java-openjdk11
```

#### 4. Installation of Git in Amazon Linux 2

The following commands are executed:

```
sudo yum update -y  
sudo yum install git -y
```

#### 5. Plumber Installation

In order to download necessary files for the R Docker images the following command is executed (on the same line)

```
git clone https://<secret>@github.com/medbsrdb/rplumberapi
```

Then the user changes directory to rplumber api and pulls the rstudio/plumber docker image:

```
docker pull rstudio/plumber
```

Then, the customized plumber docker image must be created through the following command:

```
./recreate_plumberdocker.sh
```

#### 6. Installation of the Tomcat / Springboot Application Server

Before proceeding with the deployment of the nginx web server / the load balancer and the instances of plumber serving requests to R it is necessary to deploy the Application Server Docker Image in order to create the internal network.

- a. A file named `hubpwd.txt` must be created at the home directory (`/home/ec2-user`) containing the password to download the latest version of the Application Server Docker Image from Docker Hub.
- b. Then the bash script `./pull_and_run_web_app.sh` is executed within the `rplumberapi` directory
- c. We can see with the command `$ docker ps` that the Application Server is up and running (not yet accessible because of necessary network configuration)

#### 7. Deployment of Plumber API with Nginx, a Load Balancer and 3 instances

The R services are deployed with the command:

```
docker-compose up --scale app=5 -d
```

The command `docker ps` shows now the running services in Amazon Linux 2

## 8. Docker network configuration

The docker images for the load balance and for nginx are connected to the network of the Application Server with the following commands (**with the specific order**):

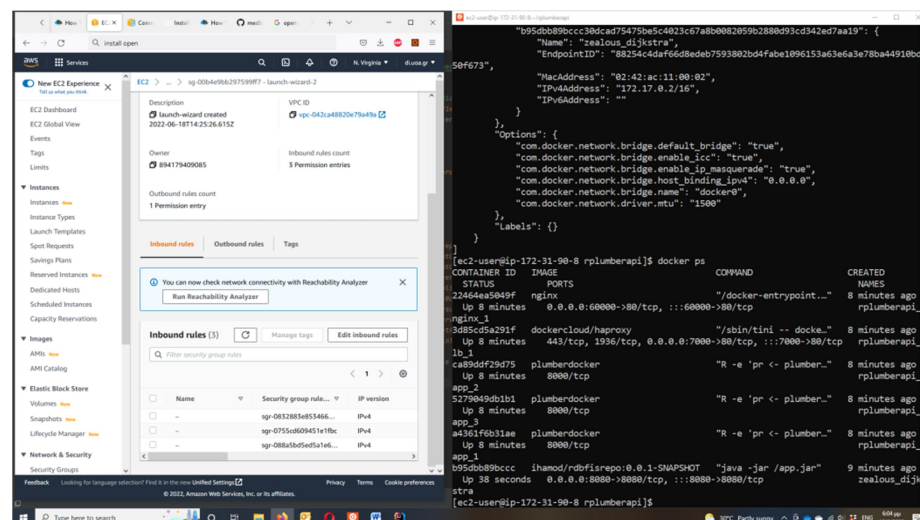
```
docker network connect bridge rplumberapi_lb_1
```

```
docker network connect bridge rplumberapi_nginx_1
```

The command `docker network inspect bridge` shows the configuration of the network. It must be assured that the `rplumberapi_nginx_1` image has been assigned the following IP: 172.10.0.4

## 9. Amazon Firewall configuration

The user must navigate to the Amazon EC2 dashboard, navigate to the instance and select the **Security** tab. The security group link must be selected and then the button **Edit inbound rules** must be pressed.



The button **Add rule** must be pressed and the rule must be filled according to what is shown below:

**Inbound rules** [Info](#)

**Inbound rule ↑** [Delete](#)

Security group rule ID  
sgr-011568bf464f202a4

Type [Info](#)  
Custom TCP

Protocol [Info](#)  
TCP

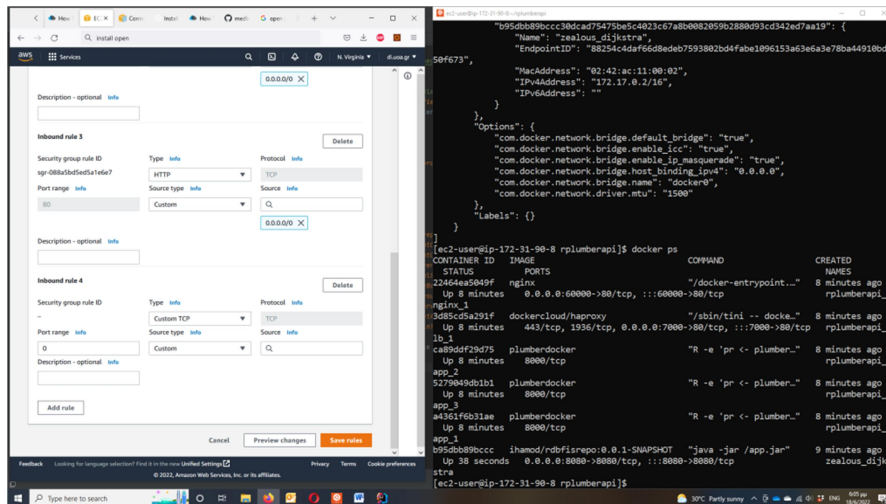
Port range [Info](#)  
8080

Source type [Info](#)  
Custom

Source [Info](#)  
0.0.0.0/0

Description - optional [Info](#)  
Tomcat

Then the button **Save rules** must be pressed



## 10. OpenVPN configuration

In order for the Application Server to work the Amazon Linux VM must connect to the VPN of the current location of the Postgres Database:

### i. Update the Amazon Linux 2 packages

```
sudo yum update
```

### ii. Install the epel repo

```
sudo amazon-linux-extras install epel
```

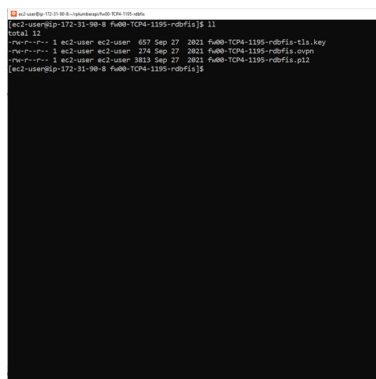
### iii. Install OpenVPN

```
sudo yum install openvpn
```

### iv. Verify the installation

```
openvpn --version
```

Then, in order to connect with the VPN the user must utilize the key, certificate and configuration files provided by HCMR:



The user is connected to the VPN with the command:

```
$ sudo openvpn --config fw00-TCP4-1195-rdbfis.ovpn --daemon
```

## 11. Connection with Med&BS RDBFIS

Then the user may use the public IP of the Amazon Linux 2 VM (which must be open for HTTP and HTTPs connections when created) to connect to the Application Server at the port 8080.

The screenshot displays a web browser window with the Med&BS RDBFIS dashboard. The dashboard has a blue header with the logo and a 'User Settings' dropdown. Below the header, there are two tabs: 'Tabular Visualization' and 'Import CSV data'. The 'Tabular Visualization' tab is active, showing a 'Select a table' section with a dropdown menu set to 'Catch' and a button 'Open Advanced Query Form'. Below this is a 'Data Table' with a table of data. The table has columns for Country, Year, Quarter, Vessel Length, and Fishing Tech. The data is filtered by Country: BGR, Year: 2019, Quarter: 4, Vessel Length: VL0006, and Fishing Tech: DFN. The table contains 10 rows of data.

Country	Year	Quarter	Vessel Length	Fishing Tech
BGR	2019	4	VL0006	DFN
BGR	2019	3	VL0006	DFN
BGR	2019	1	VL0006	DFN
BGR	2019	2	VL0006	DFN
BGR	2019	4	VL0006	DFN
BGR	2019	4	VL0006	DFN
BGR	2019	2	VL0006	DFN
BGR	2019	1	VL0006	DFN
BGR	2019	3	VL0006	DFN
BGR	2019	4	VL0006	DFN

To the right of the browser window is a terminal window showing a shell prompt and several commands. The commands are:

```
2-31-90-8 fw00-TCP4-1195-rdbfis]$ ll
2-user ec2-user 657 Sep 27 2021 fw00-TCP4-1195-rdbfis-tls.key
2-user ec2-user 274 Sep 27 2021 fw00-TCP4-1195-rdbfis.ovpn
2-user ec2-user 3813 Sep 27 2021 fw00-TCP4-1195-rdbfis.pl2
2-31-90-8 fw00-TCP4-1195-rdbfis]$ sudo openvpn --config fw00-TCP4-1195-rdbfis.ovpn --daemon
2-31-90-8 fw00-TCP4-1195-rdbfis]$
```