

LAB3

Step 1

เปลี่ยนชื่อ Server

backend1-66543210009

1. sudo nano /etc/hostname

backend1-66543210009

2. sudo nano /etc/hosts

- เปลี่ยนชื่อต่อ 127.0.1.1 เป็นชื่อใหม่

127.0.1.1 backend1-66543210009

3. sudo reboot

devuser@webserver097:~\$ sudo reboot

4. เช็คชื่อ server

- hostnamectl

```
devuser@backend1-66543210009:~$ hostnamectl
Static hostname: backend1-66543210009
          Icon name: computer-vm
            Chassis: vm
      Machine ID: b3b3ecf24d694aafb26c9c283b492b4f
          Boot ID: 139921e8f80a4077a3325926018de909
  Virtualization: parallels
Operating System: Ubuntu 22.04.3 LTS
          Kernel: Linux 5.15.0-91-generic
        Architecture: arm64
  Hardware Vendor: Parallels International GmbH.
  Hardware Model: Parallels ARM Virtual Machine
```

backend2-66543210009 ทำเหมือน backend1-66543210009

```
devuser@backend2-66543210009:~$ hostnamectl
Static hostname: backend2-66543210009
          Icon name: computer-vm
            Chassis: vm
      Machine ID: 1a6936cd4e8042199c21e487a525c37e
          Boot ID: 51e9e862a9424537919aa8519b60da65
  Virtualization: parallels
Operating System: Ubuntu 22.04.3 LTS
          Kernel: Linux 5.15.0-91-generic
        Architecture: arm64
  Hardware Vendor: Parallels International GmbH.
  Hardware Model: Parallels ARM Virtual Machine
```

เพิ่ม User

เปลี่ยนชื่อคนทั้ง backend1 และ backend2

1. sudo -i

- adduser chawanrak
- usermod -aG sudo chawanrak
- ufw allow OpenSSH
- ufw enable
- ufw status

```
devuser@backend1-66543210009:~$ sudo -i
[sudo] password for devuser:
root@backend1-66543210009:~# adduser chawanrak
Adding user `chawanrak' ...
Adding new group `chawanrak' (1001) ...
Adding new user `chawanrak' (1001) with group `chawanrak' ...
Creating home directory `/home/chawanrak' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for chawanrak
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] y
root@backend1-66543210009:~# usermod -aG sudo chawanrak
root@backend1-66543210009:~# ufw allow OpenSSH
Skipping adding existing rule
Skipping adding existing rule (v6)
root@backend1-66543210009:~# ufw enable
Command may disrupt existing ssh connections. Proceed with operation (y|n)? y
Firewall is active and enabled on system startup
```

```
root@backend1-66543210009:~# ufw status
Status: active

To                         Action      From
--                         --          --
OpenSSH                      ALLOW      Anywhere
Apache                       ALLOW      Anywhere
Nginx Full                   ALLOW      Anywhere
3333                         ALLOW      Anywhere
3000                         ALLOW      Anywhere
3001                         ALLOW      Anywhere
3002                         ALLOW      Anywhere
3003                         ALLOW      Anywhere
3004                         ALLOW      Anywhere
4000                         ALLOW      Anywhere
OpenSSH (v6)                  ALLOW      Anywhere (v6)
Apache (v6)                   ALLOW      Anywhere (v6)
Nginx Full (v6)              ALLOW      Anywhere (v6)
3333 (v6)                     ALLOW      Anywhere (v6)
3000 (v6)                     ALLOW      Anywhere (v6)
3001 (v6)                     ALLOW      Anywhere (v6)
3002 (v6)                     ALLOW      Anywhere (v6)
3003 (v6)                     ALLOW      Anywhere (v6)
3004 (v6)                     ALLOW      Anywhere (v6)
4000 (v6)                     ALLOW      Anywhere (v6)
```

2. ssh chawanrak@10.211.55.5 (**backend1**)

```
root@backend1-66543210009:~# ssh chawanrak@10.211.55.5
The authenticity of host '10.211.55.5 (10.211.55.5)' can't be established.
ED25519 key fingerprint is SHA256:JMKCWlJJ0NPSS0gH7Bhn3/S4PrfxU8dHUqNYQg0sOY.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added '10.211.55.5' (ED25519) to the list of known hosts.
chawanrak@10.211.55.5's password:
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 5.15.0-91-generic aarch64)
```

3. ssh chawanrak@10.211.55.6 (**backend2**)

```
root@backend2-66543210009:~# ssh chawanrak@10.211.55.6
The authenticity of host '10.211.55.6 (10.211.55.6)' can't be established.
ED25519 key fingerprint is SHA256:7VwpqDnguqng6P5TEHyT+xwdYfNXeIWrE9/NbgLVRJI.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added '10.211.55.6' (ED25519) to the list of known hosts.
chawanrak@10.211.55.6's password:
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 5.15.0-91-generic aarch64)
```

Step 4

Connect VS Code ทาง SSH มาที่ Server ทั้ง 2 ตัว (**backend1** และ **backend2**)



Step 6 (backend1)

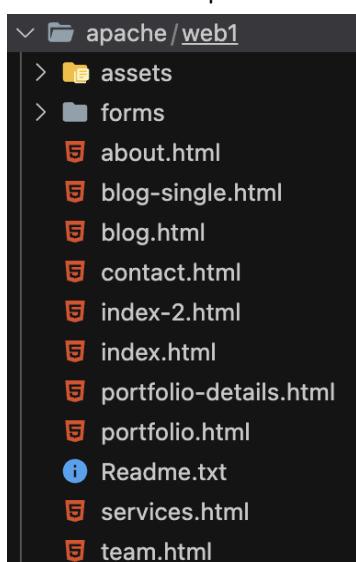
Apache

1. sudo mkdir -p /var/www/apache/web1

- cd /var/www/apache/web1
- sudo chown -R \$USER:\$USER /var/www/apache/web1
- sudo chown -R \$USER:\$USER /var/www

```
chawanrak@backend1-66543210009:~$ sudo mkdir -p /var/www/apache/web1
[sudo] password for chawanrak:
chawanrak@backend1-66543210009:~$ cd /var/www/apache/web1
chawanrak@backend1-66543210009:/var/www/apache/web1$ sudo chown -R $USER:$USER /var/www/apache/web1
chawanrak@backend1-66543210009:/var/www/apache/web1$ sudo chown -R $USER:$USER /var/www
```

2. นำ web template เข้าไปใส่ VScode



3. sudo cp /etc/apache2/sites-available/000-default.conf
/etc/apache2/sites-available/web1.conf

```
chawanrak@backend1-66543210009:/var/www/apache/web1$ sudo cp /etc/apache2/sites-available/000-default.conf /etc/apache2/sites-available/web1.conf
chawanrak@backend1-66543210009:/var/www/apache/web1$ sudo nano /etc/apache2/sites-available/web1.conf
```

- sudo nano /etc/apache2/sites-available/web1.conf
 - ServerAdmin webmaster@localhost
 - ServerName web1
 - ServerAlias web1.backend1.com
 - DocumentRoot /var/www/apache/web1

```
<VirtualHost *:80>
    ServerAdmin admin@web1.backend1
    ServerName web1.backend1
    ServerAlias www.web1.backend1.com
    DocumentRoot /var/www/apache/web1

    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined

</VirtualHost>
```

4. sudo a2ensite web1.conf

- sudo a2ensite web1.conf
- systemctl reload apache2

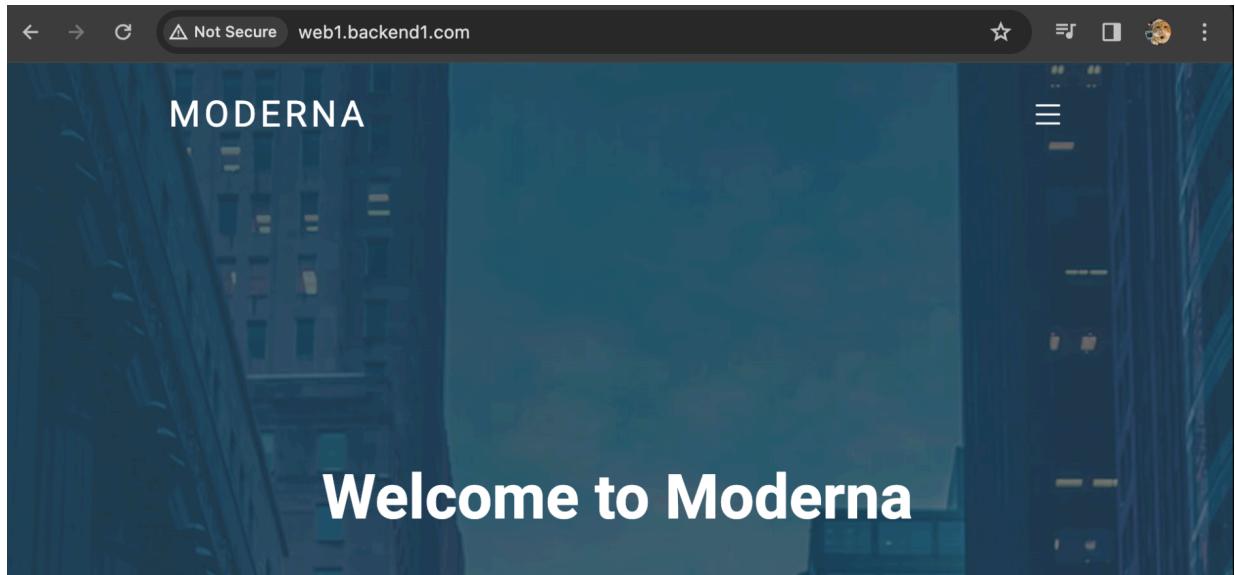
```
chawanrak@backend1-66543210009:/var/www/apache/web1$ sudo a2ensite web1.conf
Enabling site web1.
To activate the new configuration, you need to run:
    systemctl reload apache2
```

```
chawanrak@backend1-66543210009:/var/www/apache/web1$ sudo a2dissite 000-default.conf
Site 000-default already disabled
chawanrak@backend1-66543210009:/var/www/apache/web1$ sudo apache2ctl configtest
AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' directive globally to suppress this message
Syntax OK
```

```
chawanrak@backend1-66543210009:/var/www/apache/web1$ systemctl reload apache2
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ===
Authentication is required to reload 'apache2.service'.
Multiple identities can be used for authentication:
 1. Devuser (devuser)
 2. ,,, (chawanrak)
Choose identity to authenticate as (1-2): 1
Password:
==== AUTHENTICATION COMPLETE ===
```

5. sudo nano /etc/hosts

```
10.211.55.5      web1.backend1.com
```



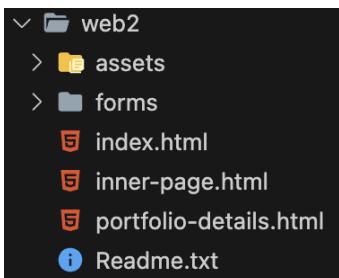
Nginx

1. sudo mkdir -p /var/www/nginx/web2

- cd /var/www/nginx/web2
- sudo chown -R \$USER:\$USER /var/www/nginx/web2/

```
chawanrak@backend1-66543210009:/var/www$ sudo mkdir -p /var/www/nginx/web2
[sudo] password for chawanrak:
chawanrak@backend1-66543210009:/var/www$ cd /var/www/nginx/web2
chawanrak@backend1-66543210009:/var/www/nginx/web2$ sudo chown -R $USER:$USER /var/www/nginx/web2/
```

2. นำ web template เข้าไปใน VScode



3. cd /etc/nginx/sites-available/

- sudo cp default web2
- sudo systemctl restart nginx

```
chawanrak@backend1-66543210009:/var/www/nginx/web2$ cd /etc/nginx/sites-available/
```

```
server {
    listen 81 default_server;
    listen [::]:81 default_server;

    root /var/www/nginx/web2;

    index index.html index.htm index.nginx-debian.html;

    server_name web2.backend1.com;
    location / {
        try_files $uri $uri/ =404;
    }
}

server {
    listen 81 default_server;
    listen [::]:81 default_server;

    root /var/www/nginx/web2;

    index index.html index.htm index.nginx-debian.html;

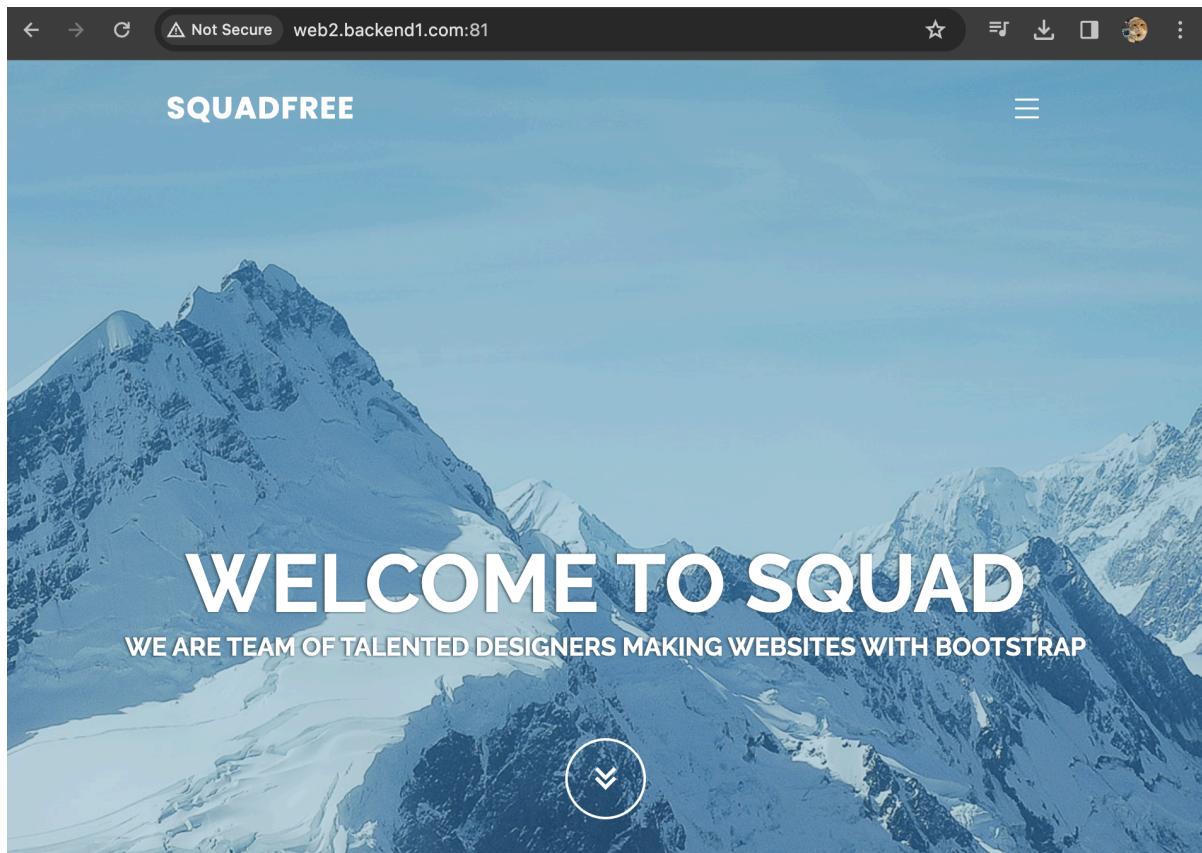
    server_name web2.backend1.com;
    location / {
        try_files $uri $uri/ =404;
    }
}
```

```
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo cp default web2
```

```
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo systemctl restart nginx
```

```
4 . sudo nano /etc/hosts
```

```
10.211.55.5      web2.backend1.com
```



Step 8 (backend1)

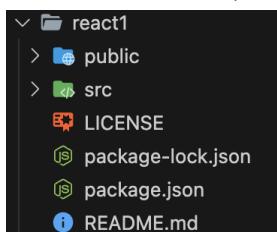
React1

1. sudo mkdir -p /var/www/nginx/react1

- cd /var/www/nginx/react1/
- sudo chown -R \$USER:\$USER /var/www/nginx/react1/

```
chawanrak@backend1-66543210009:~$ sudo mkdir -p /var/www/nginx/react1
chawanrak@backend1-66543210009:~$ cd /var/www/nginx/react1/
chawanrak@backend1-66543210009:/var/www/nginx/react1$ sudo chown -R $USER:$USER /var/www/nginx/react1/
```

2. นำ React template เข้าไปใส่ VScode



เปลี่ยน PORT เป็น 3010 ใน package.json

```
"scripts": {
  "start": "PORT=3010
```

- npm install
- npm i
- sudo ufw allow 3010

```
chawanrak@backend1-66543210009:/var/www/nginx/react1$ npm install
```

```
chawanrak@backend1-66543210009:/var/www/nginx/react1$ npm i
```

```
chawanrak@backend1-66543210009:/var/www/nginx/react1$ sudo ufw allow 3010
```

3. cd /etc/nginx/sites-available

- sudo cp default react1
- sudo nano react1
- sudo systemctl restart nginx

```
chawanrak@backend1-66543210009:/var/www/nginx/react1$ cd /etc/nginx/sites-available
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo cp myapp react1
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo nano react1
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo systemctl restart nginx
```

```
server {
    listen 81;
    listen [::]:81;
    server_name react1.backend1.com;

    location / {
        proxy_pass http://127.0.0.1:3010; # !!! - change to your app port
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection 'upgrade';
        proxy_set_header Host $host;
        proxy_cache_bypass $http_upgrade;
    }
}
```

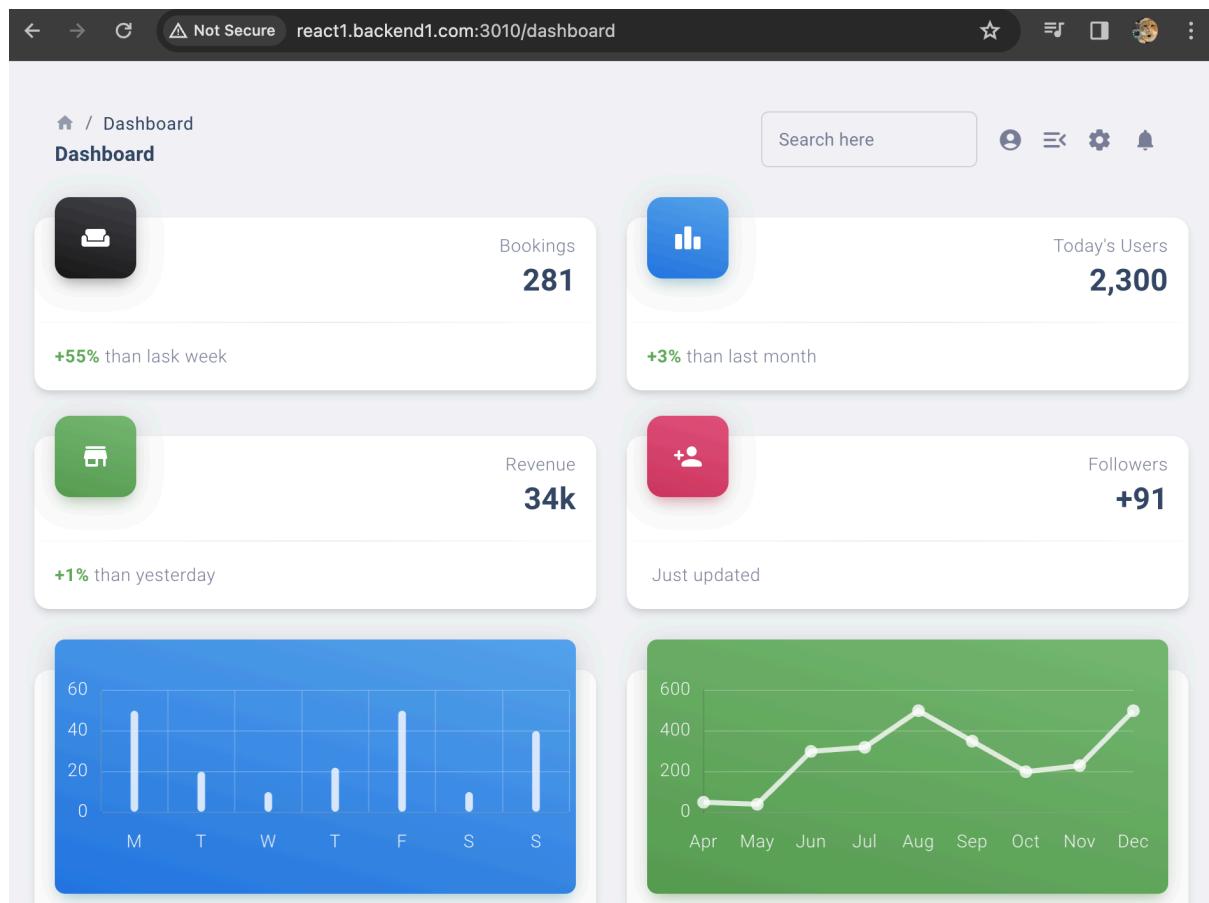
4. sudo nano /etc/hosts

10.211.55.5 react1.backend1.com

5. cd /var/www/nginx/react1/

- npm start

```
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ cd /var/www/nginx/react1/
chawanrak@backend1-66543210009:/var/www/nginx/react1$ npm start
```



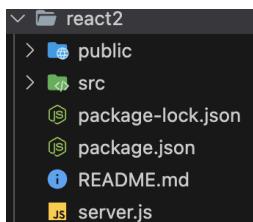
React2

1. sudo mkdir -p /var/www/nginx/react2

- cd /var/www/nginx/react2/
- sudo chown -R \$USER:\$USER /var/www/nginx/react2/

```
chawanrak@backend1-66543210009:/var/www/nginx$ sudo mkdir -p /var/www/nginx/react2
chawanrak@backend1-66543210009:/var/www/nginx$ cd /var/www/nginx/react2/
chawanrak@backend1-66543210009:/var/www/nginx/react2$ sudo chown -R $USER:$USER /var/www/nginx/react2/
```

2. นำ React template เข้าไปใน VScode



เปลี่ยน PORT เป็น 3011 ใน package.json

```
"scripts": {
  "start": "PORT=3011
```

- npm install
- npm i
- sudo ufw allow 3011

```
chawanrak@backend1-66543210009:/var/www/nginx/react2$ npm install
```

```
chawanrak@backend1-66543210009:/var/www/nginx/react2$ npm i
```

```
chawanrak@backend1-66543210009:/var/www/nginx/react2$ sudo ufw allow 3011
Rule added
Rule added (v6)
```

3. cd /etc/nginx/sites-available

- sudo cp react1 react2
- sudo nano react2
- sudo systemctl restart nginx

```
chawanrak@backend1-66543210009:/var/www/nginx/react2$ cd /etc/nginx/sites-available
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo cp react1 react2
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo nano react2
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo systemctl restart nginx
```

```
server {
    listen 81;
    listen [::]:81;
    server_name react2.backend1.com;

    location / {
        proxy_pass http://127.0.0.1:3011; # !!! - change to your app port
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection 'upgrade';
        proxy_set_header Host $host;
        proxy_cache_bypass $http_upgrade;
    }
}
```

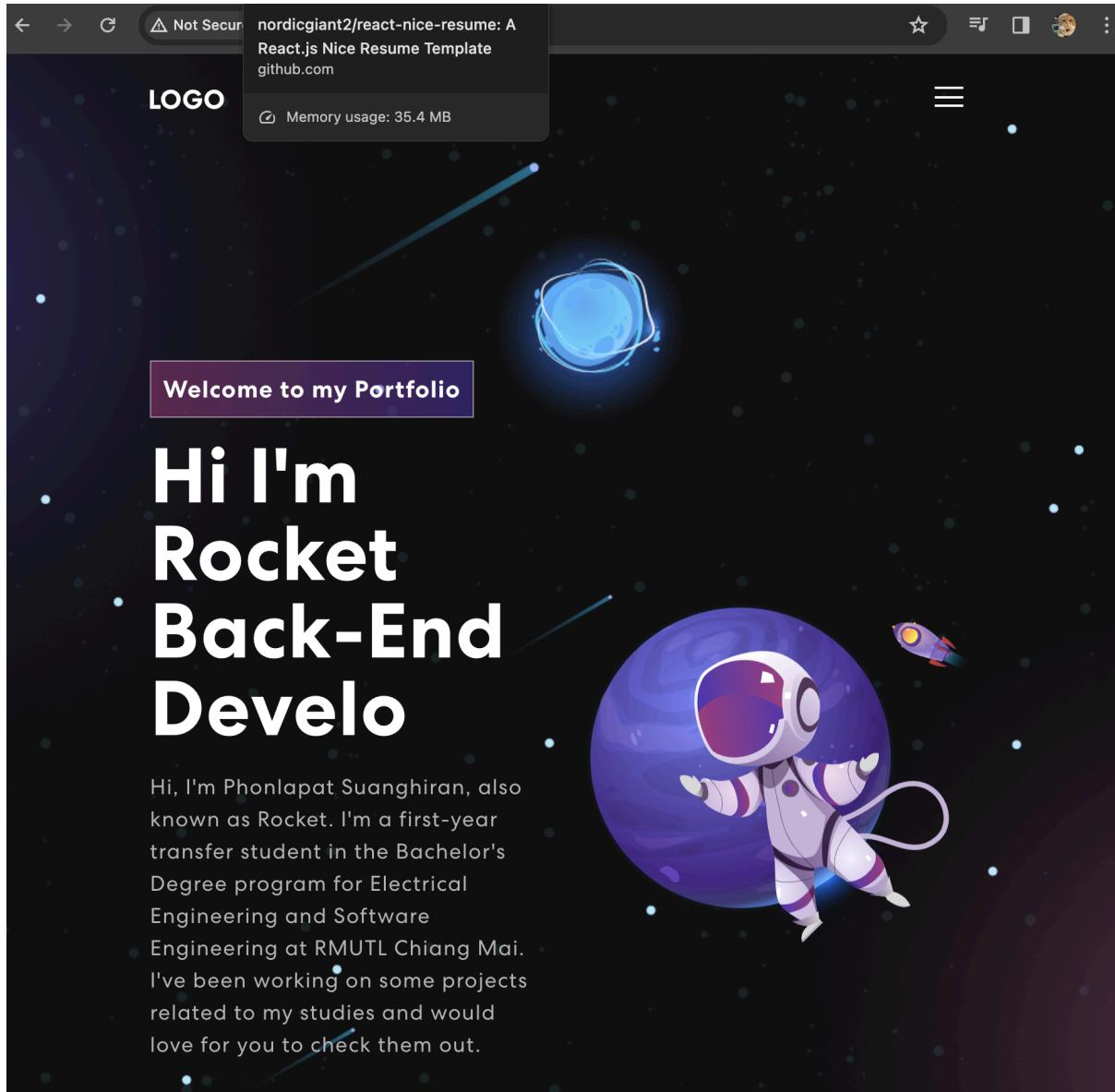
4. sudo nano /etc/hosts

10.211.55.5 react2.backend1.com

```
5. cd /var/www/nginx/react2/
```

- npm start

```
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ cd /var/www/nginx/react2/
chawanrak@backend1-66543210009:/var/www/nginx/react2$ npm start
```



Step 9 (backend2)

1. แก้พอร์ต server ให้เป็น 4040 ใน index.js

```
chawanrak@backend2-66543210009:/etc/nginx/sites-available$ sudo ufw allow 4040
```

2. sudo ufw allow 4040

```
app.listen(4040, () => {
  console.log("running server");
});
```

3. cd /etc/nginx/sites-available/

- sudo nano server

```
chawanrak@backend2-66543210009:~$ cd /etc/nginx/sites-available/
chawanrak@backend2-66543210009:/etc/nginx/sites-available$ sudo nano server
```

```
server {
  listen 81;
  listen [::]:81;
  server_name api.backend2.com;

  location / {
    proxy_pass http://127.0.0.1:4040; # !!! - change to your app port
    proxy_http_version 1.1;
    proxy_set_header Upgrade $http_upgrade;
    proxy_set_header Connection 'upgrade';
    proxy_set_header Host $host;
    proxy_cache_bypass $http_upgrade;
  }
}
```

4. systemctl restart nginx.service

```
chawanrak@backend2-66543210009:/etc/nginx/sites-available$ systemctl restart nginx.service
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ===
Authentication is required to restart 'nginx.service'.
Multiple identities can be used for authentication:
 1. chawanrak (devuser)
 2. ,,, (fang)
 3. ,,, (chawanrak)
Choose identity to authenticate as (1-3): 1
Password:
==== AUTHENTICATION COMPLETE ===
```

5. sudo nano /etc/host

10.211.55.6 api.backend2.com

6. ให้รับแบบโดยเข้าไปแก้พอร์ตใน server/index.js

["http://api.midterm-engse202-009.com"] => ["http://api.backend2.com"]

```
cors({
  origin: ["http://api.backend2.com"],
  methods: ["GET", "POST"],
  credentials: true,
```

Step 10 (backend2)

node index.js

```
chawanrak@backend2-66543210009:/var/www/lab4/server$ node index.js
running server
Hello from API
```

POSTMAN : http://api.backend2.com:4040

GTE

The screenshot shows the Postman interface with a GET request to `http://api.backend2.com:4040`. The 'Headers' tab shows `(6)`. The 'Query Params' table is empty. The 'Response' section displays a loading message: `Sending request...` with a small character icon.

POST

The screenshot shows the Postman interface with a POST request to `http://api.backend2.com:4040`. The 'Headers' tab shows `(7)`. The 'Query Params' table is empty. The 'Body' tab is selected, showing the response body:

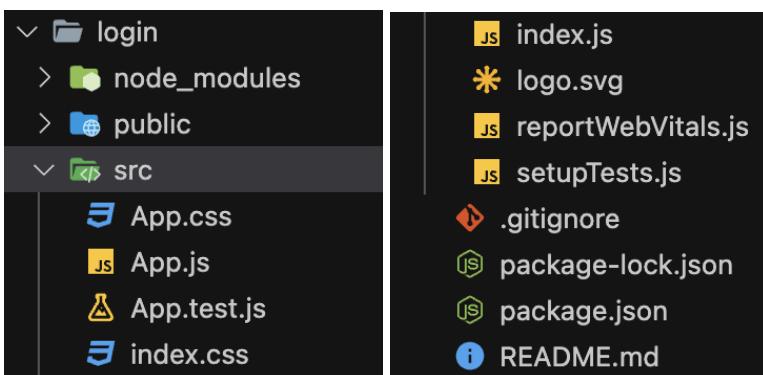
```
1 <!DOCTYPE html>
2 <html lang="en">
3
4 <head>
5   <meta charset="utf-8">
6   <title>Error</title>
7 </head>
8
9 <body>
10  |  <p>Cannot POST /</p>
```

Step 11 (backend1)

1. sudo mkdir -p /var/www/nginx/login
 - cd /var/www/nginx/login/
 - sudo chown -R \$USER:\$USER /var/www/nginx/login/
 - npx create-react-app .
 - npm i --save axios
 - npm install express --save
 - npm install --save mysql2
 - npm i --save cors

```
chawanrak@backend1-66543210009:~$ sudo mkdir -p /var/www/nginx/login
chawanrak@backend1-66543210009:~$ cd /var/www/nginx/login/
chawanrak@backend1-66543210009:/var/www/nginx/login$ sudo chown -R $USER:$USER /var/www/nginx/login/
chawanrak@backend1-66543210009:/var/www/nginx/login$ npx create-react-app .
```

2. Connect VS Code



3. นำโค้ดเข้าไปใน VSCode

- App.css

```
login > src > App.css > .App
1   .App {
2     text-align: center;
3   }
4
5   .registration {
6     display: flex;
7     flex-direction: column;
8     justify-content: center;
9     align-items: center;
10  }
11
12  .login {
13    display: flex;
14    flex-direction: column;
15    justify-content: center;
16    align-items: center;
17  }
18  input {
19    width: 250px;
20    height: 40px;
21  }
```

- App.js

```
login > src > App.js > App > register > then() callback
1 import React, { useEffect, useState } from "react";
2 import Axios from 'axios';
3 import './App.css';
4 function App() {
5   const [usernameReg, setUsernameReg] = useState("");
6   const [passwordReg, setPasswordReg] = useState ("");
7   const [username, setUsername] = useState("");
8   const [password, setPassword] = useState ("");
9   const [loginStatus, setLoginStatus] = useState("");
10  const register = () => {
11    Axios.post("http://10.211.55.6:4040/register", {
12      username: usernameReg,
13      password: passwordReg,
14    }).then((response) => {
15      console.log(response);
16
17      if (!response.data.err) {
18        setLoginStatus(`"${usernameReg}" was inserted.`);
19      } else {
20        setLoginStatus(response.data.err.sqlMessage);
21      }
22    });
23  };
24
25  );
26  );
27  const login = () => {
28    Axios.post("http://10.211.55.6:4040/login", {
29      username: username,
30      password: password,
31    }).then((response) => {
```

- index.js

```
login > src > index.js
1 import React from 'react';
2 import ReactDOM from 'react-dom';
3 import './App.css';
4 import App from './App';
5
6 ReactDOM.render(
7   <React.StrictMode>
8     <App />
9   </React.StrictMode>,
10  document.getElementById('root')
```

- เปิดยูนิ PORT = 3012

```
"scripts": {
  "start": "PORT=3012
```

4. sudo ufw allow 3012

```
chawanrak@backend1-66543210009:/var/www/nginx/login$ sudo ufw allow 3012
[sudo] password for chawanrak:
Rule added
Rule added (v6)
```

5. cd /etc/nginx/sites-available

- sudo cp default login
- sudo nano login
- sudo systemctl restart nginx

```
chawanrak@backend1-66543210009:/var/www/nginx/login$ cd /etc/nginx/sites-available
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo cp default login
chawanrak@backend1-66543210009:/etc/nginx/sites-available$ sudo nano login
```

```
server {
  listen 81;
  listen [::]:81;
  server_name login.backend1.com;

  location / {
    proxy_pass http://127.0.0.1:3012; # !!! - change to your app port
    proxy_http_version 1.1;
    proxy_set_header Upgrade $http_upgrade;
    proxy_set_header Connection 'upgrade';
    proxy_set_header Host $host;
    proxy_cache_bypass $http_upgrade;
  }
}
```

6. sudo nano /etc/hosts

10.211.55.5 login.backend1.com

7. cd /var/www/nginx/login/

- npm start



Registration

Username

password

Register

Login

Fang

....

Login

'Fang' was logged in.

```
chawanrak@backend2-66543210009:/var/www/lab4/server$ node index.js
running server
body: {"username":"test","password":"test"}
username: test
password: test
body: {"username":"test2","password":"test2"}
username: test2
password: test2
body: {"username":"test","password":"test"}
username: test
password: test
body: {"username":"Fang","password":"Fang"}
username: Fang
password: Fang
body: {"username":"Fang","password":"Fang"}
username: Fang
password: Fang
[]
```



Registration

Username

password

Login

'test' was logged in.



Registration

Username

password

Login

'Fang' was logged in.