

109-2 Web Programming

Deployment Tutorial

Presenter 陳柏志

2021/6/28

Table of Contents

- Deploy on **Personal PC / Work Station**
- Deploy on **GCP**
- Frontend , Backend & Database
- Build React App and **Express** Server
- Deploy on **Heroku**
- Some other COOL stuff

- Appendix - Deploy on **Github Pages**

Deploy on Personal PC / Work Station

109-2 Web Programming

- Execute your code directly on your **computer**
- Need fixed IP you may need to set up for this, e.g. **port forwarding**
140.112.218.2
- The computer must be always on
- Your Deployed service 網址 `http://140.112.218.2:3000`
- Cool Dev boards that can be used as servers:



Raspberry pi



ESP32

Deploy on GCP

- Professional
- \$300 USD creditable amount
- GPU available
- Servers in Taiwan
- Google APIs

Deploy on GCP

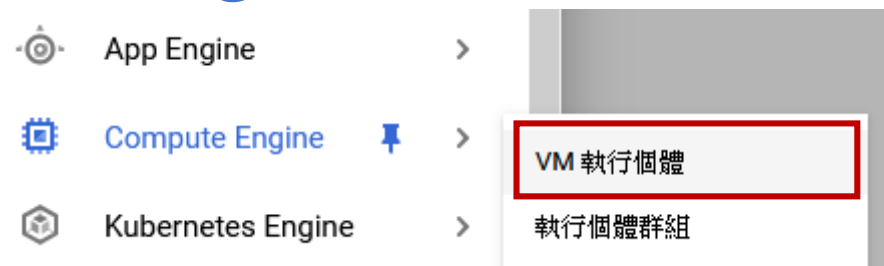
- Go to <https://cloud.google.com/>



- Add credit card information
- 新增專案



- Go to **Compute Engine** → **VM 執行個體**



Deploy on GCP

• Setup VM

名稱 ?

名稱經設定後即無法變更

instance-1

標籤 ? (選填)

+ 新增標籤

區域 ?

地區經設定後即無法變更

us-central1 (愛荷華州)

區域 ?

區域經設定後即無法變更

us-central1-a

機器設定

機器系列

一般用途

運算最佳化

記憶體最佳化

GPU

適用於一般工作負載的機器類型，已針對費用和彈性進行最佳化

系列

E2

根據可用性選擇 CPU 平台

機器類型

e2-medium (2 個 vCPU，4 GB 記憶體)



vCPU

1 個共用核心

記憶體

4 GB

GPU

-

每月 \$24.86 (預估值)

每小時約為 \$0.034

用多少付多少：無須預繳費用，而且是以秒計費

詳細資料

開機磁碟 ?



新的 10 GB 標準永久磁碟

映像檔

Debian GNU/Linux 10 (buster)

變更

防火牆 ?

您可以新增標記和防火牆規則，允許接受來自網際網路的特定流量

☒ 允許 HTTP 流量

☒ 允許 HTTPS 流量

Deploy on GCP

- Install npm, git and tmux

```
sudo apt-get install npm
```

```
sudo apt-get install git
```

```
sudo apt-get install tmux
```

```
git clone ...
```

Deploy on GCP

- Use tmux to run code

```
tmux new -s "webserver" // create a named tmux session
```

```
sudo npm start
```

```
Ctrl + b // hot ket → d // leave the tmux session
```

```
tmux ls // list tmux sessions
```

```
tmux a -t "webserver" // enter "webserver" session
```

```
tmux kill-session -t "webserver" // kill the "webserver" session
```

```
Ctrl + b // hot ket → % // split window
```


Deploy on GCP

- Check your IP

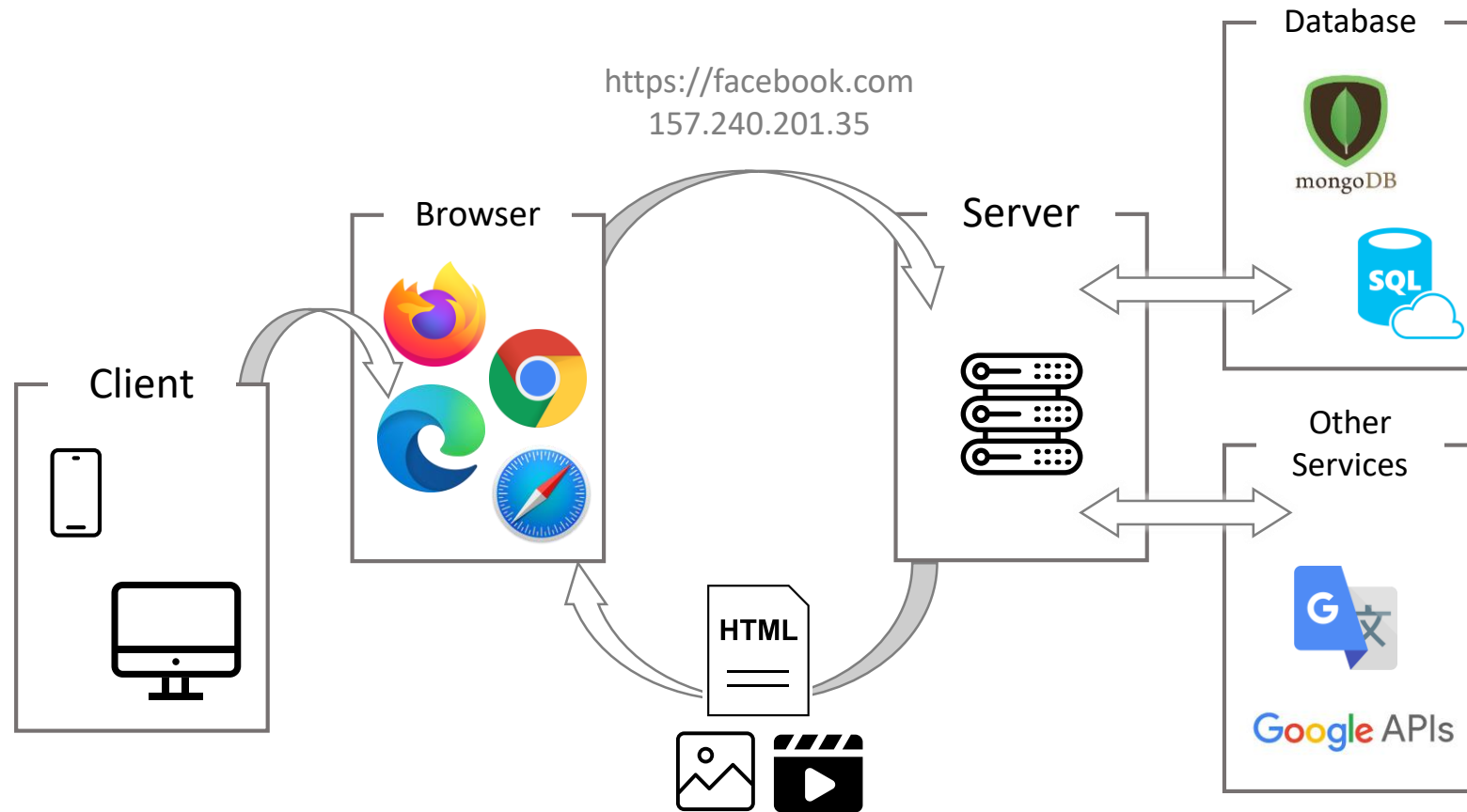
內部 IP	外部 IP	複製到剪	連接
10.140.0.15 (nic0)	35.229.173.87 ↗	複製到剪	SSH ▾ ⋮

- Your Deployed service 網址

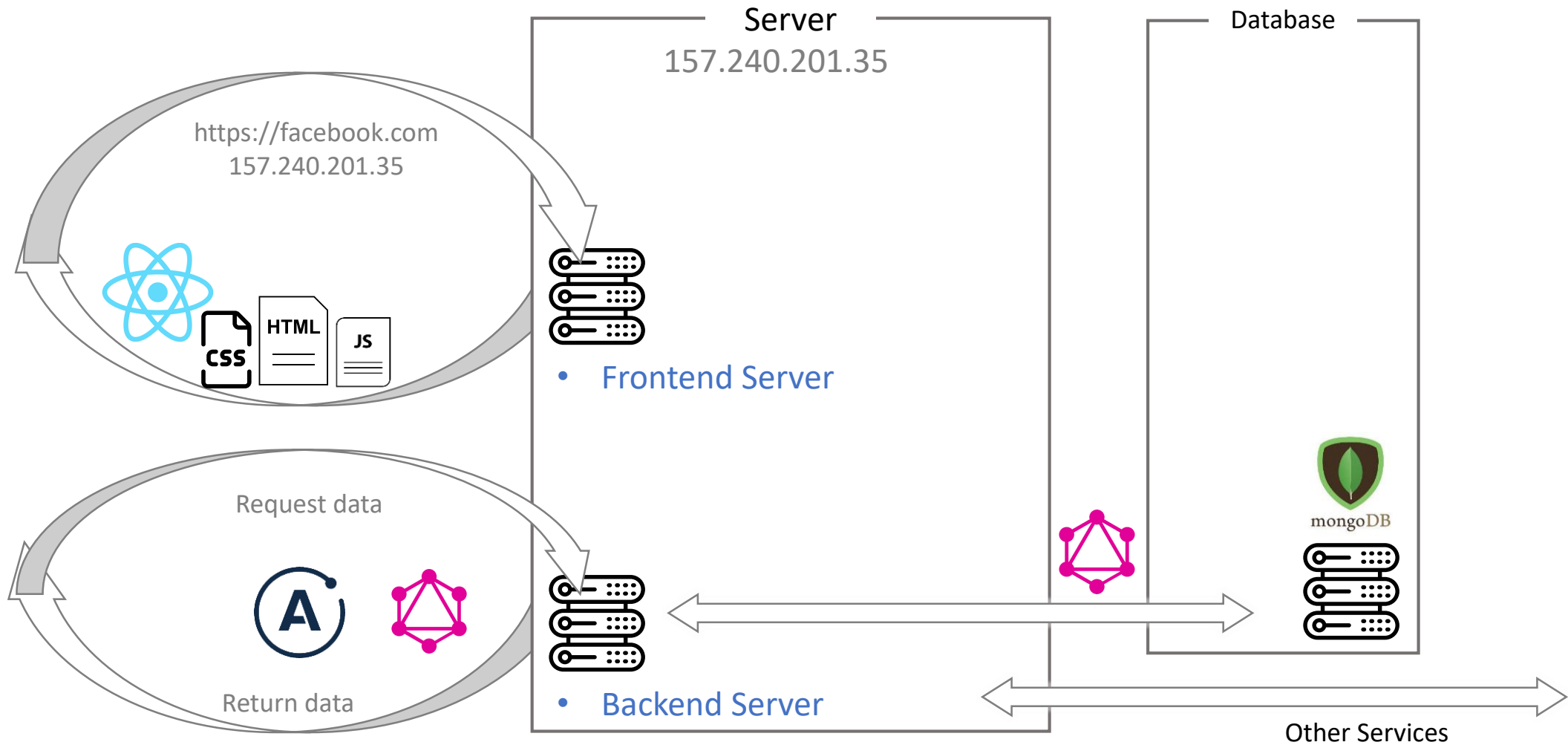
<http://35.229.173.87:3000>

Frontend , Backend & Database

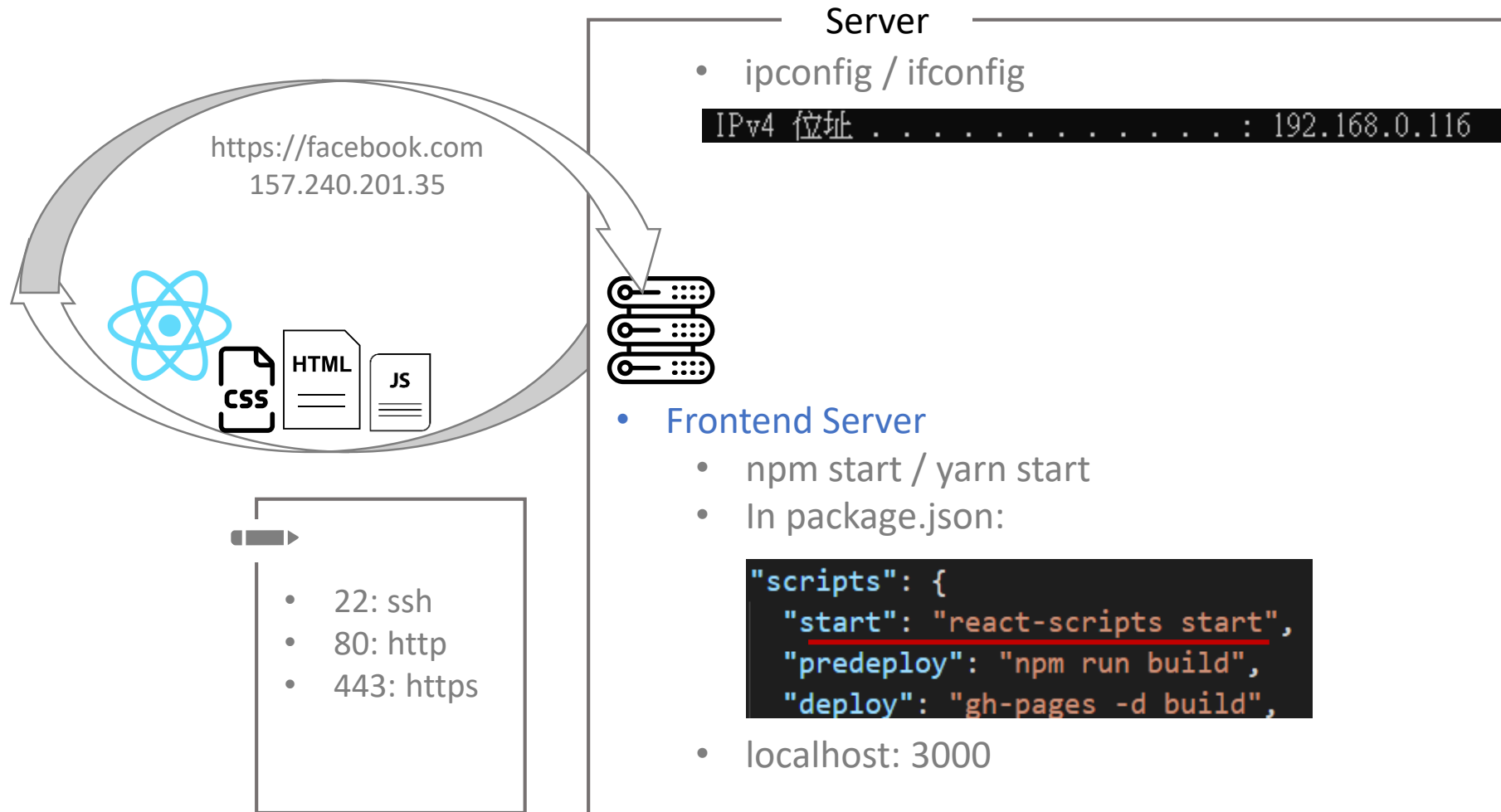
109-2 Web Programming



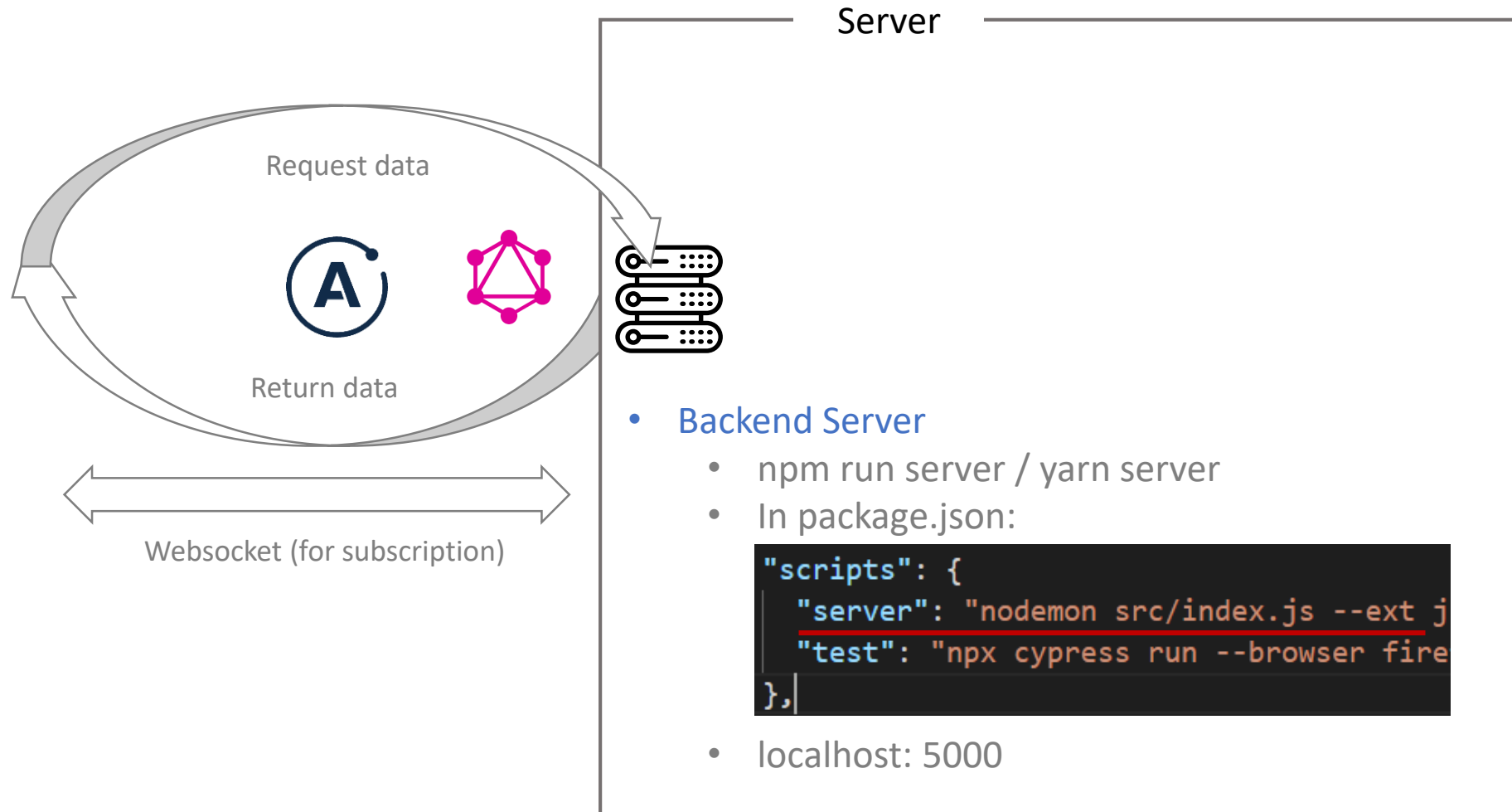
Frontend , Backend & Database



Frontend , Backend & Database



Frontend , Backend & Database



Build React App and Express Server

- Fork or clone the example code here: <http://toby.best/deploy-tutorial>

TobyChen0106 / 109-2-web-deploy-tutorial

Unwatch 1 Star 0 Fork 0

Code Issues Pull requests Actions Projects Wiki Security Insights

main Go to file Add file Code About

Toby Chen update apollo server express ... 9 minutes ago 3

backend	update apollo server express	9 minutes ago
public	update apollo server express	9 minutes ago
src	update apollo server express	9 minutes ago
.env.defaults	update apollo server express	9 minutes ago
.gitignore	update apollo server express	9 minutes ago

About
No description, website, or topics provided.

Readme

Releases
No releases published
[Create a new release](#)

Build React App and Express Server

- Clone the code from your repository

```
git clone https://github.com/...
```

The screenshot shows a GitHub repository page for 'ntuee-webprogramming / 109-1-web-deploy-tutorial'. The repository is forked from 'TobyChen0106/109-1-web-deploy-tutorial'. The 'Code' dropdown menu is open, showing options to clone the repository using HTTPS, SSH, or GitHub CLI. The HTTPS URL 'https://github.com/ntuee-webprogramm' is highlighted with a red box. Below the clone options, there is a section for 'About' with a description, a 'Readme' link, and sections for 'Releases' and 'Packages'. The repository also has a file list on the left side.

ntuee-webprogramming / 109-1-web-deploy-tutorial
forked from TobyChen0106/109-1-web-deploy-tutorial

Code Pull requests Actions Projects Wiki Security Insights

main

This branch is even with TobyChen0106:main.

Clone
HTTPS SSH GitHub CLI
https://github.com/ntuee-webprogramm
Use Git or checkout with SVN using the web URL.

Open with GitHub Desktop
Download ZIP

Toby Chen tutorial setup

File	Size	Modified
public	tutorial setup	
src	tutorial setup	
.gitignore	tutorial setup	
README.md	tutorial setup	8 minutes ago
package.json	tutorial setup	8 minutes ago
server.js	tutorial setup	8 minutes ago
server.py	tutorial setup	8 minutes ago

About
No description, website, or topics provided.

Readme

Releases
No releases published
[Create a new release](#)

Packages
No packages published
[Publish your first package](#)

Languages

Build React App and Express Server

- In `package.json`

```
"scripts": {  
  "start": "node server.js",  
  "build": "react-scripts build",  
  "start_react": "react-scripts start"  
},
```

- Fill `.env` file

```
2 MONGO_URL=  
3 PORT=
```

- Run `npm install` / `yarn install`
- Run `npm run build` / `yarn build`
- Run `npm start` / `yarn start`

Build React App and Express Server

109-2 Web Programming

```
19 const __dirname = dirname(fileURLToPath(import.meta.url));
20 const port = process.env.PORT || 80;
21
22 const typeDefs = importSchema("../backend/schema.graphql");
23 const pubsub = new PubSub();
24 const app = express();
25
26 app.use(cors());
27 app.use("/api", apiRoute);
28 app.use(bodyParser.json());
29 app.use(express.static(path.join(__dirname, "build")));
30 app.get("/*", function (req, res) {
31   res.sendFile(path.join(__dirname, "build", "index.html"));
32 });
33
34 > const server = new ApolloServer({ ...
45   });
46
47 server.applyMiddleware({ app });
48 const httpServer = http.createServer(app);
49 server.installSubscriptionHandlers(httpServer);
50
51 mongo.connect();
52
53 httpServer.listen(port, () => {
54   console.log(
55     `🚀 Server Ready at ${port}! 🚀`
56   );
57   console.log(
58     `GraphQL Port at ${port}${server.subscriptionsPath}`
59   );
60 });
```

- In `server.js`
- Use express to serve:
 - `build/index.html`
 - RESTful APIs
 - Apollo server
- Connect to MongoDB
- Serve at given port

***Using node v14.15.4**

Deploy on Heroku

- Includes **backend** server
- **Database** api
- **5** free apps
- **500** free dyno hours per month
- Your app falls **asleep** in **30 minutes** if no one ping it
- **Awaking** the app takes a while (~30s)

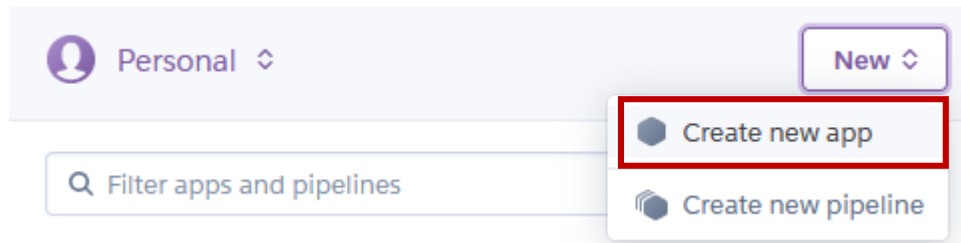


HEROKU

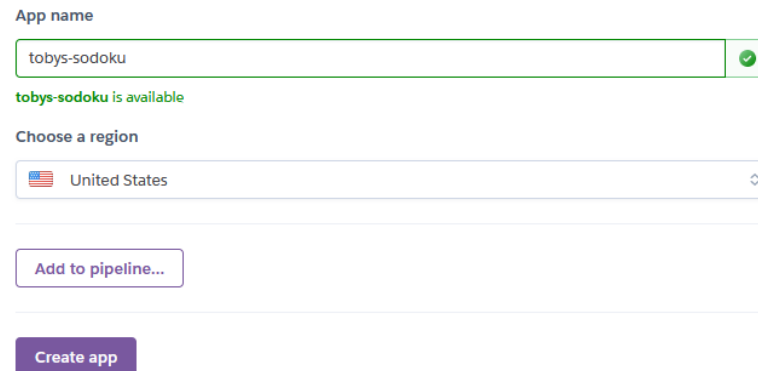
<https://www.heroku.com/>

Deploy on Heroku

- Register and login
- Click “New” → “Create new app”



- Create App

A screenshot of the 'Create App' form in Heroku. The form has two main sections. The first section is 'App name', which contains a text input field with 'tobys-sudoku' and a green checkmark icon to its right. Below the input field, a green message says 'tobys-sudoku is available'. The second section is 'Choose a region', which contains a dropdown menu with 'United States' selected. Below the dropdown menu is a button labeled 'Add to pipeline...'. At the bottom of the form is a purple button labeled 'Create app'.

Deploy on Heroku

- Go to Settings section

Overview Resources Deploy Metrics Activity Access **Settings**

- Select “Add buildpack”

Buildpacks

Buildpacks are scripts that are run when your app is deployed. They are used to install dependencies for your app and configure your environment. [Find new buildpacks on Heroku Elements](#)

Add buildpack

Buildpacks will appear here

Buildpacks are used to install dependencies for your app and configure your environment.

- Choose “node.js”

Add Buildpack ×

Enter Buildpack URL

Or select from our officially supported buildpacks

nodejs	python	php	ruby	java
go	gradle	scala	clojure	

Save changes

Deploy on Heroku






- Setup Variable

Config Vars

Config vars change the way your app behaves. In addition to creating your own, some add-ons come with their own.

Config Vars

Hide Config Vars

MONGO_URL	your mongo connect url	 
PORT	80	 
KEY	VALUE	

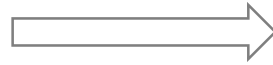
Deploy on Heroku

- Create a new branch for Heroku deploy (optional)

```
git checkout -b heroku
```

- Check current branch

```
git branch
```



```
* heroku  
main
```

- Add and commit your code

```
git add .
```

```
git commit -m "deploy on heroku"
```

- Push your code

```
git push origin heroku
```


Deploy on Heroku


- Go to Deploy section


Overview Resources **Deploy** Metrics Activity Access Settings

- Select Github, connect to Github and connect to your repo

Deployment method

 Heroku Git
Use Heroku CLI


 **GitHub**
Connect to GitHub

 Container Registry
Use Heroku CLI




Connect to GitHub

Connect this app to GitHub to enable code diffs and deploys.

Search for a repository to connect to

 TobyChen0106

Missing a GitHub organization? [Ensure Heroku Dashboard has team access.](#)

 TobyChen0106/109-1-Web-Hackathon02	<input type="button" value="Connect"/>
 TobyChen0106/109-1-Web-Hackathon03	<input type="button" value="Connect"/>
 TobyChen0106/109-1-Web-Hackathon02-Example	<input type="button" value="Connect"/>

Deploy on Heroku

- Select branch

Automatic deploys

Enables a chosen branch to be automatically deployed to this app.

You can now change your main deploy branch from "master" to "main" for both manual and automatic deploys, please follow the instructions [here](#).

Enable automatic deploys from GitHub

Every push to the branch you specify here will deploy a new version of this app. **Deploys happen automatically**; be sure that this branch is always in a deployable state and any tests have passed before you push. [Learn more](#).

Choose a branch to deploy

main

heroku

main

Enable Automatic Deploys

- Deploy

Manual deploy

Deploy the current state of a branch to this app.

Deploy a GitHub branch

This will deploy the current state of the branch you specify below. [Learn more](#).

Choose a branch to deploy

main

main

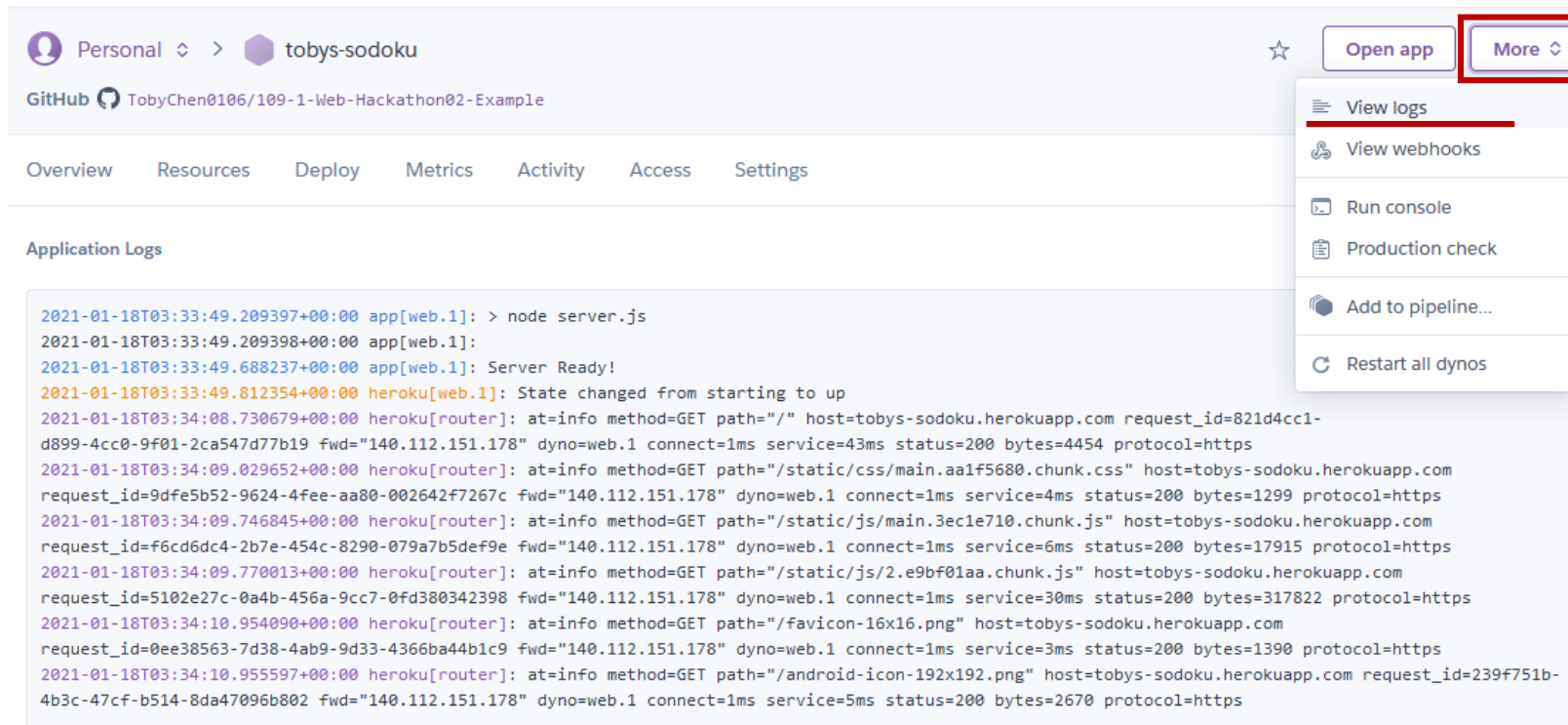
Deploy Branch

- What the Heroku node.js buildpack does:

```
git clone → npm install → npm run build → npm start
```


Deploy on Heroku

- Check logs



Personal > tobys-sudoku

GitHub TobyChen0106/109-1-Web-Hackathon02-Example

Overview Resources Deploy Metrics Activity Access Settings

Application Logs

```
2021-01-18T03:33:49.209397+00:00 app[web.1]: > node server.js
2021-01-18T03:33:49.209398+00:00 app[web.1]:
2021-01-18T03:33:49.688237+00:00 app[web.1]: Server Ready!
2021-01-18T03:33:49.812354+00:00 heroku[web.1]: State changed from starting to up
2021-01-18T03:34:08.730679+00:00 heroku[router]: at=info method=GET path="/" host=tobys-sudoku.herokuapp.com request_id=821d4cc1-d899-4cc0-9f01-2ca547d77b19 fwd="140.112.151.178" dyno=web.1 connect=1ms service=43ms status=200 bytes=4454 protocol=https
2021-01-18T03:34:09.029652+00:00 heroku[router]: at=info method=GET path="/static/css/main.aaf5680.chunk.css" host=tobys-sudoku.herokuapp.com request_id=9dfe5b52-9624-4fee-aa80-002642f7267c fwd="140.112.151.178" dyno=web.1 connect=1ms service=4ms status=200 bytes=1299 protocol=https
2021-01-18T03:34:09.746845+00:00 heroku[router]: at=info method=GET path="/static/js/main.3ec1e710.chunk.js" host=tobys-sudoku.herokuapp.com request_id=f6cd6dc4-2b7e-454c-8290-079a7b5def9e fwd="140.112.151.178" dyno=web.1 connect=1ms service=6ms status=200 bytes=17915 protocol=https
2021-01-18T03:34:09.770013+00:00 heroku[router]: at=info method=GET path="/static/js/2.e9bf01aa.chunk.js" host=tobys-sudoku.herokuapp.com request_id=5102e27c-0a4b-456a-9cc7-0fd380342398 fwd="140.112.151.178" dyno=web.1 connect=1ms service=30ms status=200 bytes=317822 protocol=https
2021-01-18T03:34:10.954090+00:00 heroku[router]: at=info method=GET path="/favicon-16x16.png" host=tobys-sudoku.herokuapp.com request_id=0ee38563-7d38-4ab9-9d33-4366ba44b1c9 fwd="140.112.151.178" dyno=web.1 connect=1ms service=3ms status=200 bytes=1390 protocol=https
2021-01-18T03:34:10.955597+00:00 heroku[router]: at=info method=GET path="/android-icon-192x192.png" host=tobys-sudoku.herokuapp.com request_id=239f751b-4b3c-47cf-b514-8da47096b802 fwd="140.112.151.178" dyno=web.1 connect=1ms service=5ms status=200 bytes=2670 protocol=https
```

Deploy on Heroku

- Keep your app awake
 - Import the code:

```
import wakeUpDyno from "../backend/route/wakeUpDyno.js";
```

- Call it in `server.js`

```
httpServer.listen(port, () => {  
  const DYN0_URL = "https://my_app_A.herokuapp.com/";  
  wakeUpDyno(DYN0_URL);  
  console.log(`🚀 Server Ready at ${port}! 🚀`);  
  console.log(`GraphQL Port at ${port}${server.subscriptionsPath}`);  
});
```

Other COOL Platforms

- GitHub Pages
 - Frontend only
- AWS
- Azure
- Firebase

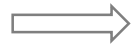


Some other COOL stuff

- Buy your own **domain**:

- COOL

140.112.218.2



haha.toby.best

- Create your own mail server

hi@toby.best

- Do something COOL



namecheap

<https://ap.www.namecheap.com/>










TLD LIST

Compare Prices of All Top-Level Domains


<https://tld-list.com/>

Some other COOL stuff

- Buy your own domain:

ric.us	PREMIUM ⓘ	\$3,835.00 Renews at \$8.48/yr	 Add to cart
ric.vip	REGISTERED IN 2017		 Make offer
ric.design	REGISTERED IN 2016		 Make offer
ric.ink	REGISTERED IN 2020		 Make offer
ric.studio	PREMIUM	\$78.00	 Add to cart
ric.wiki	72% OFF	\$6.98/yr Retail \$24.88/yr	 Add to cart
ric.digital	PREMIUM	\$42.90	 Add to cart
ric.news	REGISTERED IN 2018		 Make offer
ric.group	PREMIUM	\$42.90	 Add to cart

- Setup A Record

<input type="checkbox"/>	A Record	myapp	35.229.173.87	Automatic	
--------------------------	----------	-------	---------------	-----------	---

Some other COOL stuff

- Using **https**



- Require an SSL certificate and it is signed by a CA
- Certbot: <https://certbot.eff.org/>
- Use Cloudflare: <https://www.cloudflare.com>
 - Simple access to https
 - Firewall
 - Speedup your website

Type	Name	IPv4 address	TTL	Proxy status
A	www888	35.229.173.87	Auto	Proxied

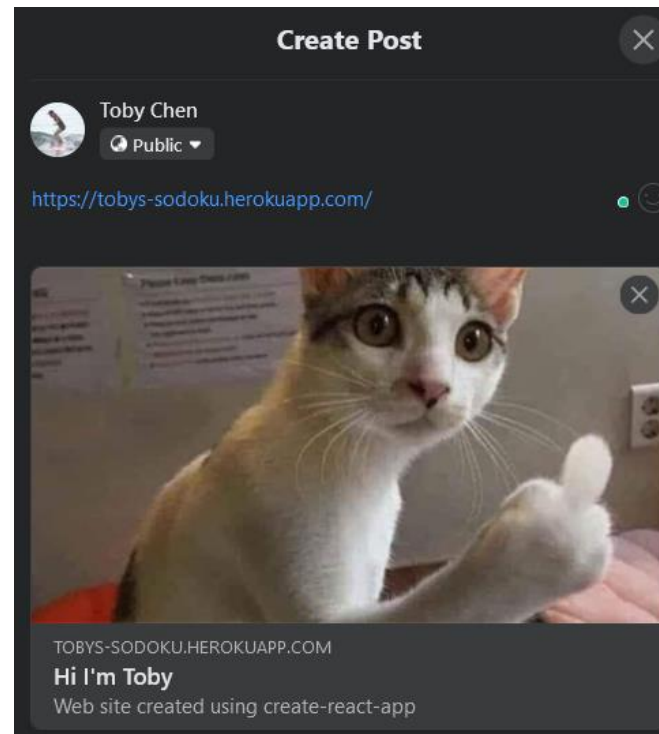
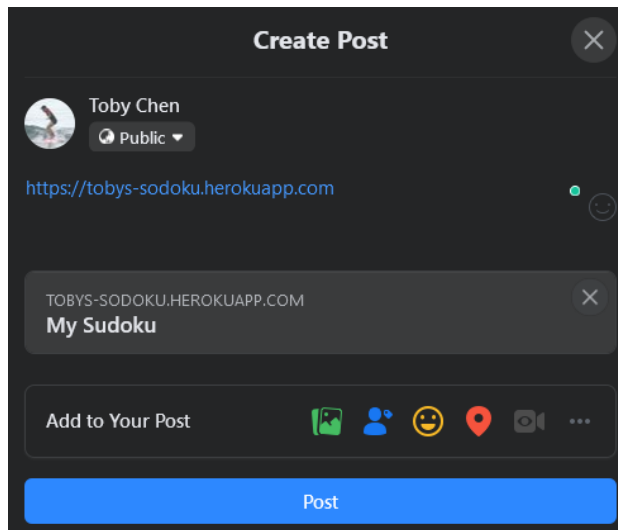
Cancel Save

✓ Visitors to your website see content in 2.1 seconds on Cloudflare.
That's 27% faster!



Some other COOL stuff

- Favicon <https://www.favicon-generator.org/>
 - Update favicon files and `manifest.json`
- OG property <https://ogp.me/>



Some other COOL stuff

- OG property <https://ogp.me/>

```
63 lines (55 sloc) | 2.99 KB
Raw Blame
1 <!DOCTYPE html>
2 <html lang="en">
3
4 <head>
5   <meta charset="utf-8" />
6   <link rel="icon" href="%PUBLIC_URL%/favicon.ico" />
7   <meta name="viewport" content="width=device-width, initial-scale=1" />
8   <meta name="theme-color" content="#000000" />
9   <meta name="description" content="Web site created using create-react-app" />
10
11   <meta property="og:title" content="Hi I'm Toby" />
12   <meta property="og:image" content="https://s.keepmeme.com/files/en_posts/20200825/389052dac5820aeb2660ed9fb1bc1c22cat-showing-middle-finger-meme.jpg" />
13
14   <link rel="apple-touch-icon" href="%PUBLIC_URL%/logo192.png" />
15 <!--
16   manifest.json provides metadata used when your web app is installed on a
```

- OG image design principle:

<https://www.kapwing.com/resources/what-is-an-og-image-make-and-format-og-images-for-your-blog-or-webpage/>

Friendly Reminders

- Deadline at 9pm, Thursday, 07/01
- Try to Deploy **ASAP**
- Write your README properly

Dear all:

如先前公告之期末專題說明 (<https://bit.ly/3xJuP0e>), 請大家注意底下事項:

1. Deadline 為 9pm, Thursday, 07/01.

在那之前, 需要繳交多項資料, 列舉如下:

2. 將 code push 到 Ceiba, 並按照上項規定將報告寫在 README.md

3. 完成服務部署 (deployment)

4. 拍攝 6 mins 之 demo/說明影片, 上傳至雲端服務/空間

5. 至 FB 社團發表專題介紹

6. 至 <https://bit.ly/3fyvADe> Google Form, 填寫上述 2-5 項之連結, 以利助教收集大家的期末專題資訊。

7. 此外, 請記得以組為單位, 將組員互評填寫在 "wp1092/final/eval.txt" 這個檔案

以上, 請參考專題說明 (<https://bit.ly/3xJuP0e>)之說明, 如有問題, 請來信: eewebprogramming@googlegroups.com

祝大家期末專題順利!

- Ric

Dear all:

有鑒於上學期有不少同學的「安裝」與「測試」說明沒有寫清楚, 導致被助教判定為 compile error 或是有些功能沒有被看到, 進而造成分數的損失, 在此特別提醒大家, 務必在 README.md 寫清楚:

1. 如何在 localhost 安裝之詳細步驟

我們會按照你提供的步驟在我們的 local machine 進行安裝。

如果因為說明不全而導致我們安裝或是執行失敗, 我們不會主動腦補去看你們的 code 來搞清楚怎麼安裝/執行, in such case, 你很可能會被判定為「無法 compile/執行」, 而遭受底下其中之一的 penalty:

* 缺如 .env 等設定檔案 (2% ~ 5%)

* 無法 compile, 但後來有改好 (2% ~ 30%)

* 無法 compile, 但還是改不好 (個案處理)

* 可以 compile 但不能在 local repo work, 只能從 deployed 版本評分 (10% up)

* Readme 沒照規定寫安裝方式/服務內容/心得/deploy連結/demo連結 (2% ~ 10%)

2. 如何在 localhost 執行與建議之測試方式

我們會按照你提供的功能說明進行測試。

所以如果你的功能說明不全、或是有些功能未完成但卻沒有指出來、或者是有些需要特別指引才能執行的功能, 請務必說明清楚, 或者是提供對應的測資。

如果因為說明不完整而導致我們沒有測到, 影響到分數, 請自行負責。

大家加油!

- Ric

Thanks for Your Attention

Deployment Tutorial

Presenter 陳柏志

2021/6/28

Appendix - Deploy on GitHub Pages

- Run `npm install gh-pages --save-dev` / `yarn add gh-pages --save-dev`
- Go to your **GitHub Repo**
 - settings → options → **GitHub Pages**

GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository. [Learn more.](#)

Source

GitHub Pages is currently disabled. Select a source below to enable GitHub Pages for this repository. [Learn more.](#)

None ▾ Save

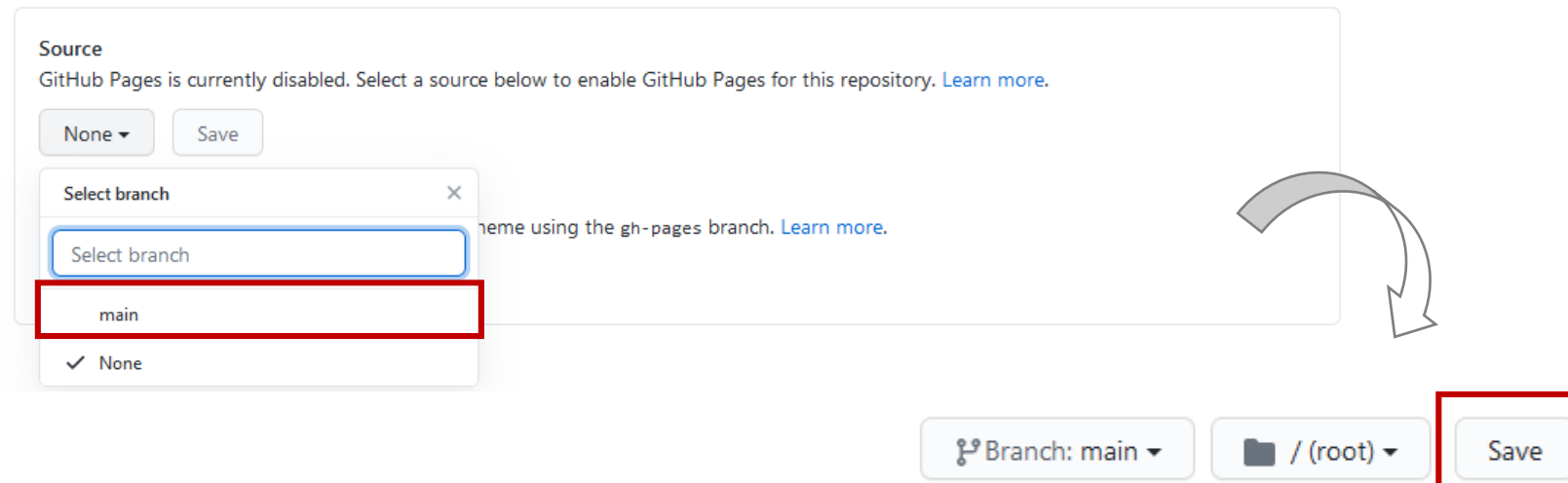
Select branch

Select branch

main

✓ None

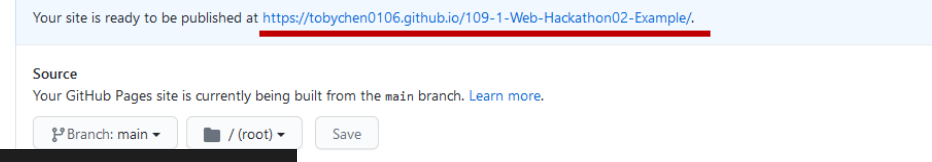
Branch: main ▾ / (root) ▾ Save



Appendix - Deploy on GitHub Pages

- Add homepage attribute in package.json

```
{  
  "name": "my-sudoku",  
  "version": "0.1.0",  
  "private": true,  
  "homepage": "https://tobychen0106.github.io/109-1-Web-Hackathon02-Example/",  
}
```



- Add attributes in scripts in package.json

```
"scripts": {  
  "start": "react-scripts start",  
  "predeploy": "npm run build",  
  "deploy": "gh-pages -d build",  
  "start_server": "node server.js",  
  "build": "react-scripts build"  
},
```

"predeploy" : "npm run build"
"deploy" : "gh-pages -d build"

```
"scripts": {  
  "start": "react-scripts start",  
  "predeploy": "yarn build",  
  "deploy": "gh-pages -d build",  
  "start_server": "node server.js",  
  "build": "react-scripts build"  
},
```

"predeploy" : "yarn build"
"deploy" : "gh-pages -d build"

Appendix - Deploy on GitHub Pages

- Run `git add .`
- Run `git commit -m "for github-pages deployment"`
- Run `npm run deploy` / `yarn run deploy`

Appendix - Deploy on GitHub Pages

- Go to the Github Pages options:

✓ Your site is published at <https://tobychen0106.github.io/109-1-Web-Hackathon02-Example/>

Source
Your GitHub Pages site is currently being built from the `main` branch. [Learn more.](#)

Branch: `gh-pages` / (root) **Save**

Select branch

Select branch

main

✓ `gh-pages`

None

Save