Angular Webapp

A Single Page Application (SPA) for tracking vehicle

Outline

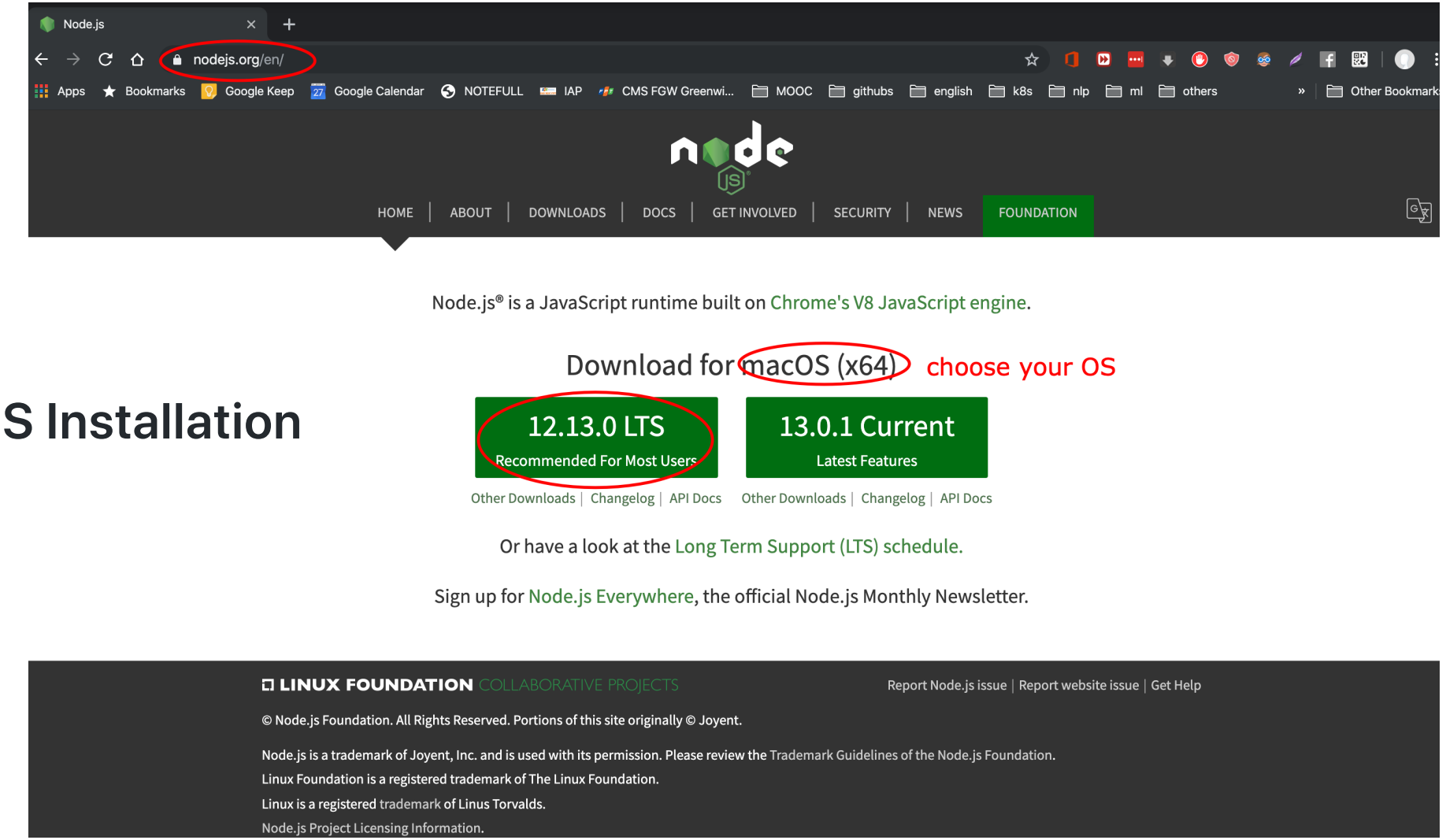
- Requirements
- Installation: NodeJS, Angular CLI
- Create an Angular project
- Containerization the project

Requirements

- Installed Softwares :
  - Docker (already installed)
  - Docker Compose (already installed)
  - NodeJS
  - Angular CLI
  - Visual Studio Code (already installed)
- Basic Knowledge:
  - Docker
  - Javascrip, CSS, HTML
  - Typescript

Installation: NodeJS, Angular CLI

NodeJS Installation



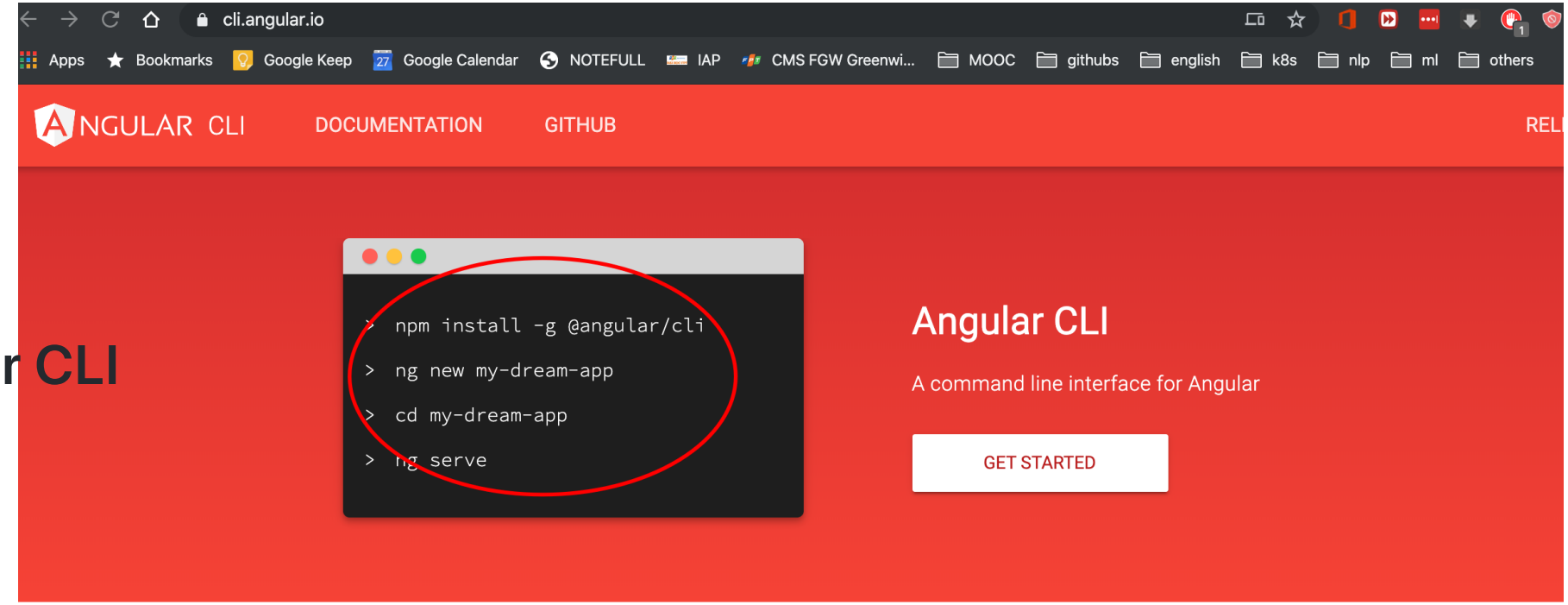
NodeJS Version Checking

Checking `node`'s version and `npm`'s version

```
$ node -v
v12.13.0

$ npm -v
6.12.0
```

Angular CLI



ng new

Create a new Angular project

```
$ ng new angular-webapp
```

Use Visual Studio Code to open folder `angular-webapp`

- Type `y` (yes) or `Enter` to any question showing up.

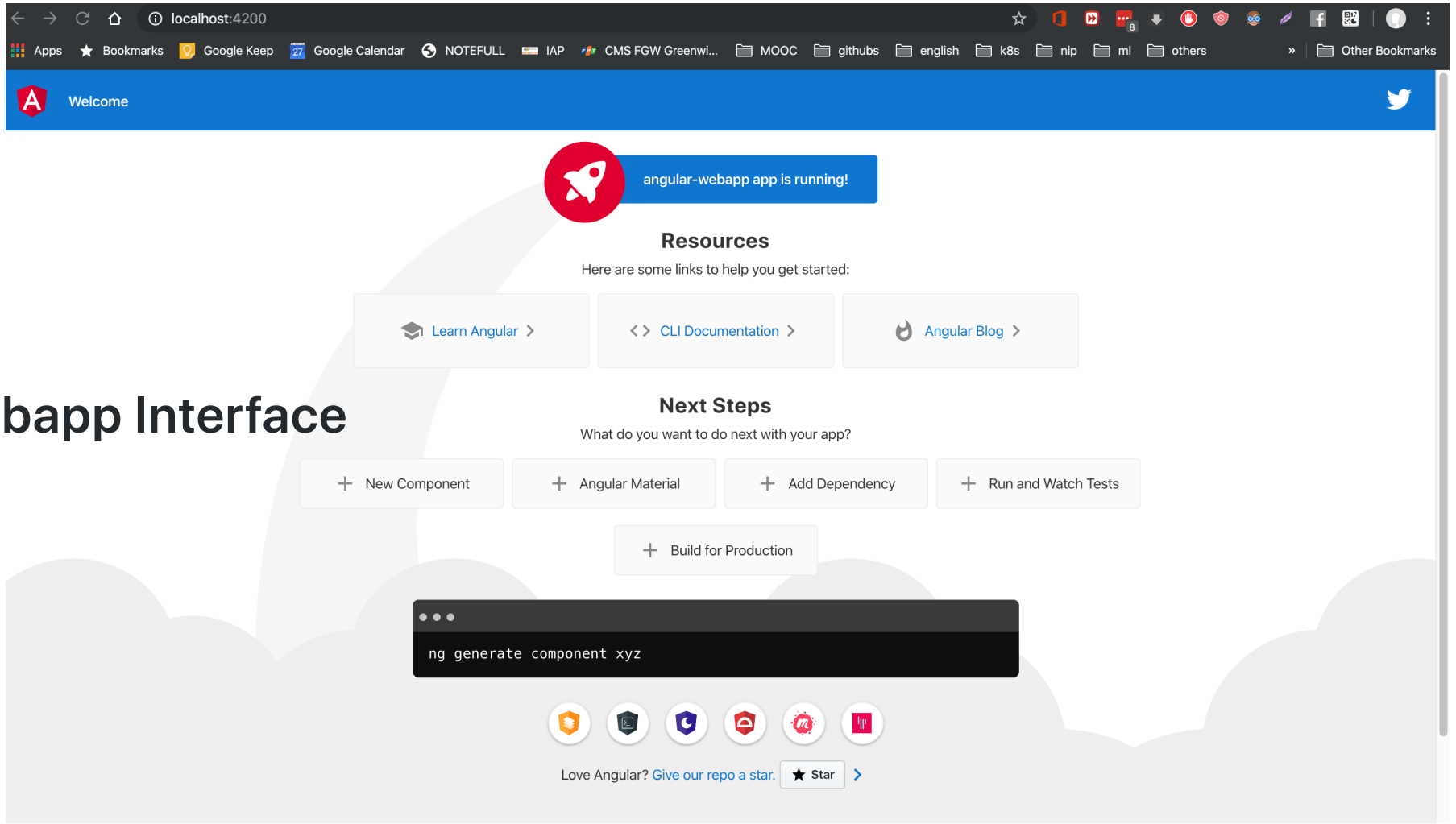
When the creation process is done, start the webapp with the following command

```
$ ng serve
```

Open your browser with `http://localhost:4200`

Terminate the website by typing `Ctrl + C`

The Webapp Interface



Build the Webapp for Production

```
ng build --prod
```

This process compiles an Angular project's source to a bundble which includes `.html`, `.css`, `.cs` files for production.

When it is done, the production files are generated in folder `dist`

Containerization the project

Create Docker Image of the Webapp

We create an image of the webapp by composing `Dockerfile`.

Create an `Dockerfile` by the command

```
$ touch Dockerfile
```

What systems will run on the container?

The Webapp

Nginx

- Webserver
- Reverse Proxy
- Load Balancer

Add code to Dockerfile

```
# base image
FROM nginx:1.14.0-alpine

MAINTAINER Ho Tuan Dung "htdung820@gmail.com"

## installing some required Python packages
RUN apk --no-cache add \
      python2 \
      py2-pip && \
    pip2 install j2cli[yaml]
RUN apk add --update bash && rm -rf /var/cache/apk/*

# Deploy the production files of the webapp
RUN rm -rf /usr/share/nginx/html/*
COPY /dist/angular-webapp /usr/share/nginx/html

# Deploy configuration files of Nginx
COPY nginx.conf.j2 /templates/
COPY docker-entrypoint.sh /

ENTRYPOINT ["/docker-entrypoint.sh"]
CMD ["nginx", "-g", "daemon off;"]
```

Another required files: `nginx.conf.j2`

```
$ touch nginx.conf.j2
```

Add the following content

```
events {
  worker_connections  4096;  ## Default: 1024
}

http {
   map $http_upgrade $connection_upgrade {
       default upgrade;
      '' close;
   }

   include /etc/nginx/mime.types;

   server {
      listen 80;

      location /api {
        proxy_set_header        Host $host;
        proxy_set_header        X-Real-IP $remote_addr;
        proxy_set_header        X-Forwarded-For $proxy_add_x_forwarded_for;
        proxy_set_header        X-Forwarded-Proto $scheme;

        proxy_read_timeout  90;

        proxy_http_version 1.1;  # recommended with keepalive connections - http://nginx.org/en/docs/http/ngx_http_proxy_module.html#proxy_http_version

        # WebSocket proxying - from http://nginx.org/en/docs/http/websocket.html
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection $connection_upgrade;
      }

      location / {
         root /usr/share/nginx/html;
      }
    }
}
```

Another required files: `docker-entrypoint.sh`

Add `docker-entrypoint.sh` with the following content

```
#!/bin/bash -e
j2 /templates/nginx.conf.j2 > /etc/nginx/nginx.conf
exec "$@"
```

Build the image

```
$ docker build -t angular-webapp:1.0 .
```

Start the container

```
$ docker container run --rm --name angular-webapp -d -p 8080:80 angular-webapp:1.0
```

Open your browser with `http://localhost:8080`

Stop and Remove the container

```
$ docker container rm -f angular-webapp
```