



Getting Hands On with Progressive Web Applications

Hands-On Workshop | Digital Summit '18

Miracle Innovation Labs

Miracle Software Systems, Inc.

Getting Hands On with Progressive Web Applications

Goal

This document contains a step-by-step process for pushing an Angular application to Firebase and how to convert an Angular application to PWA.

This guide was prepared by [Miracle's Innovation Labs](#).

Pre-Requisites

All attendees must have their workstation (with Internet) to participate in the lab (Both PC and MAC are compatible). The following pre-requisites will help you to make the Hands-on Lab experience easier.

- Google Account
- Node JS and npm installed
- Text editor (Visual Studio Code is preferred)

Technology Involved

- Angular 6 Framework
- HTML, CSS, Javascript
- Typescript

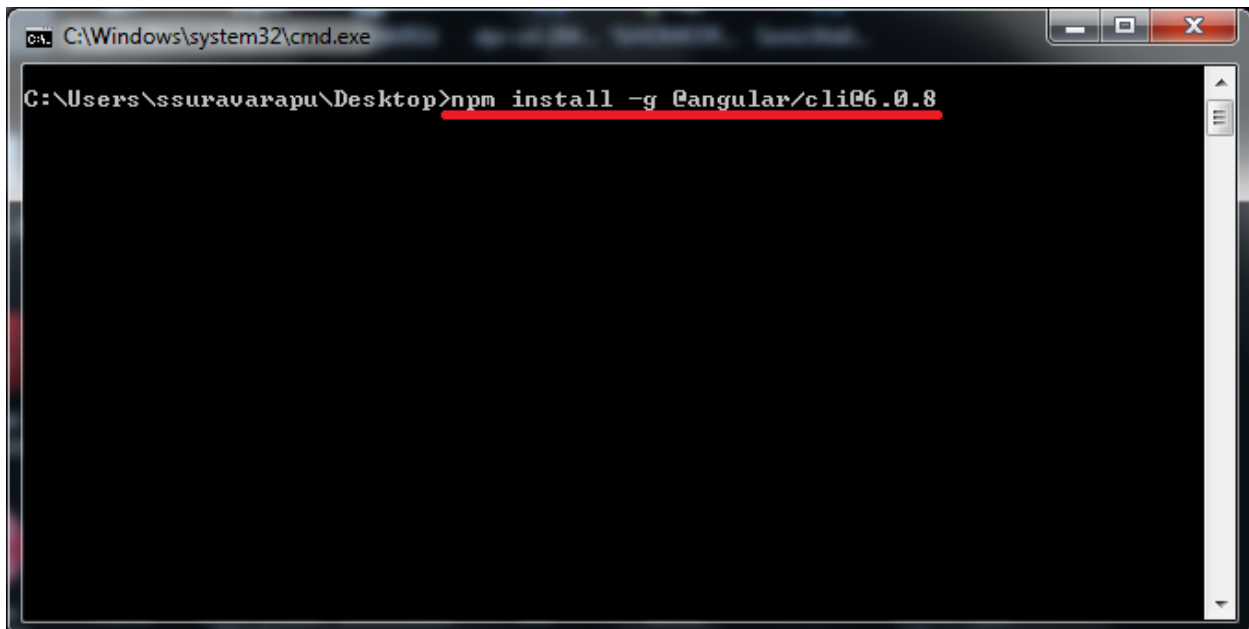
Lab Steps

So, let us get started with the application!

Step #1 | Angular 6 Installation

Open the folder which is downloaded from Github account and open command prompt. To install Angular 6, give the following command, (Ignore if already installed)

npm install -g @angular/cli@6.0.8

A screenshot of a Windows Command Prompt window. The title bar at the top reads "C:\Windows\system32\cmd.exe". The command prompt shows the current directory as "C:\Users\ssuravarapu\Desktop" and the command "npm install -g @angular/cli@6.0.8" has been entered. The command text is underlined in red. The window has standard Windows window controls (minimize, maximize, close) in the top right corner.

```
C:\Windows\system32\cmd.exe

C:\Users\ssuravarapu\Desktop>npm install -g @angular/cli@6.0.8
C:\Users\ssuravarapu\AppData\Roaming\npm\ng -> C:\Users\ssuravarapu\AppData\Roaming\npm\node_modules\@angular\cli\bin\ng

> @angular/cli@6.0.8 postinstall C:\Users\ssuravarapu\AppData\Roaming\npm\node_modules\@angular\cli
> node ./bin/ng-update-message.js

npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@1.2.4 (node_modules\@angular\cli\node_modules\fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.4: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"})

+ @angular/cli@6.0.8
added 21 packages, removed 701 packages, updated 72 packages and moved 10 packages in 161.537s

C:\Users\ssuravarapu\Desktop>
```

To check whether Angular is installed or not, provide the below command,
ng -v

```
C:\Windows\system32\cmd.exe

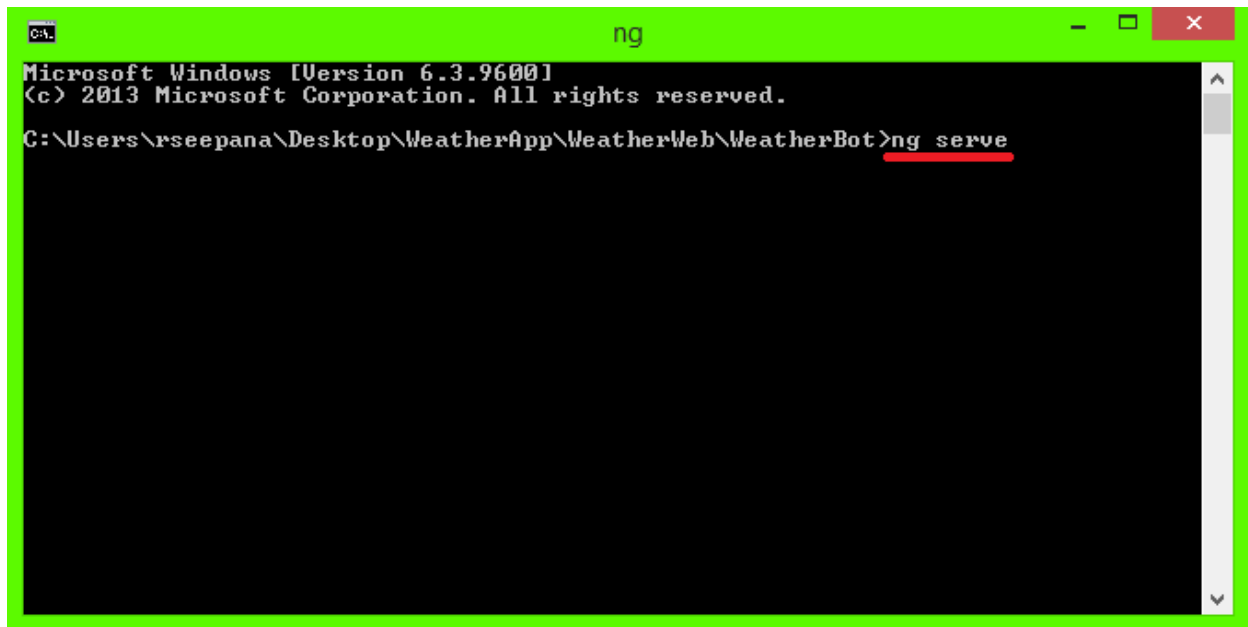
C:\Users\ssuravarapu\Desktop>ng -v

Angular CLI
Angular CLI: 6.0.8
Node: 8.11.1
OS: win32 x64
Angular:
...

Package      Version
-----
@angular-devkit/architect  0.6.8
@angular-devkit/core       0.6.8
@angular-devkit/schematics 0.6.8
@schematics/angular        0.6.8
@schematics/update         0.6.8
rxjs                6.3.3
```

Step #2 | Run the Web App Locally

To run the downloaded application locally give the below command,
ng serve



```
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\rseepana\Desktop\WeatherApp\WeatherWeb\WeatherBot>ng serve
```

You will be displayed as below if your app is running successfully



```
49% building modules 326/327 modules 1 active .les\@angular\compiler\fesm5\comp
49% building modules 326/328 modules 2 active .s\core-js\modules\_to-absolute-i
49% building modules 327/328 modules 1 active .les\@angular\compiler\fesm5\comp
92% after chunk asset optimization SourceMapDevToolPlugin main.js generate Sour
92% after chunk asset optimization SourceMapDevToolPlugin polyfills.js generate
92% after chunk asset optimization SourceMapDevToolPlugin runtime.js generate S
92% after chunk asset optimization SourceMapDevToolPlugin styles.js generate So
92% after chunk asset optimization SourceMapDevToolPlugin vendor.js generate So
92% after chunk asset optimization SourceMapDevToolPlugin main.js attach Sourc
92% after chunk asset optimization SourceMapDevToolPlugin polyfills.js attach S
92% after chunk asset optimization SourceMapDevToolPlugin runtime.js attach Sou
92% after chunk asset optimization SourceMapDevToolPlugin styles.js attach Sour
92% after chunk asset optimization SourceMapDevToolPlugin vendor.js attach Sour

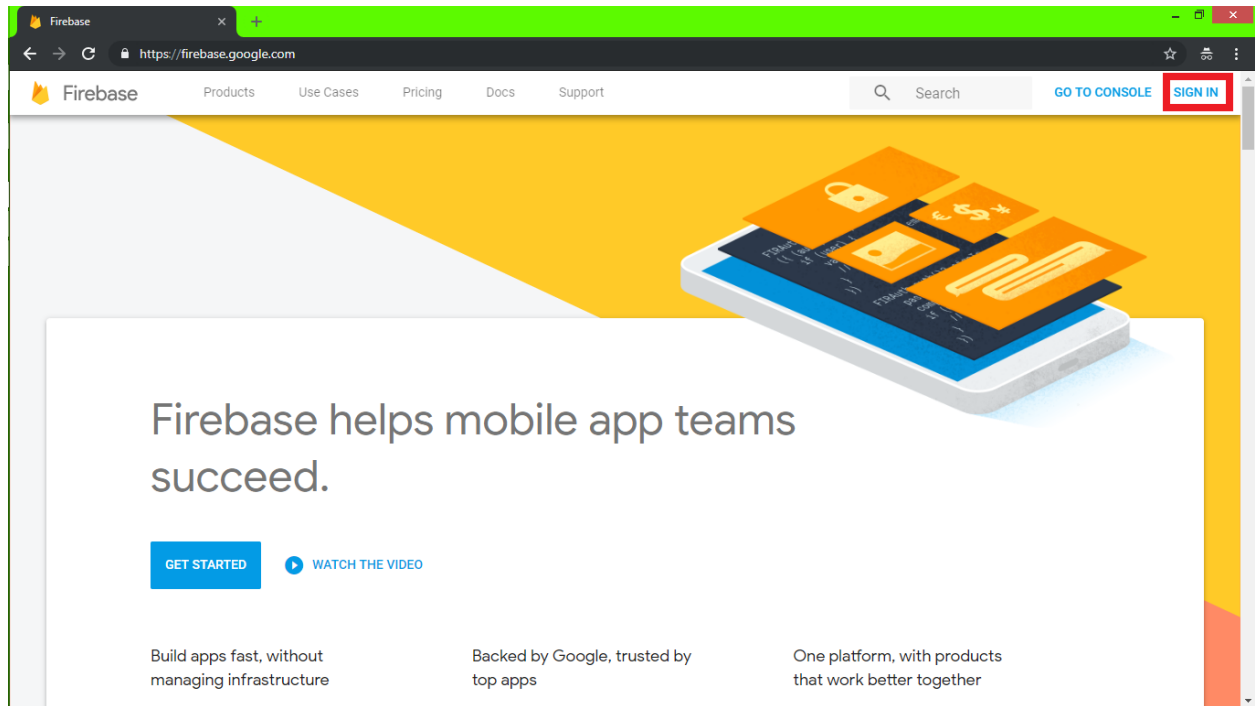
Date: 2018-12-12T18:05:04.327Z
Hash: 2518602605588c82474a
Time: 22374ms
chunk <main> main.js, main.js.map <main> 17.2 kB [initial] [rendered]
chunk <polyfills> polyfills.js, polyfills.js.map <polyfills> 227 kB [initial] [r
rendered]
chunk <runtime> runtime.js, runtime.js.map <runtime> 5.22 kB [entry] [rendered]
chunk <styles> styles.js, styles.js.map <styles> 15.6 kB [initial] [rendered]
chunk <vendor> vendor.js, vendor.js.map <vendor> 3.63 MB [initial] [rendered]
i ?wdm?: Compiled successfully.
```

Open the browser and type **localhost:4200**. Now the weather application will be opened.

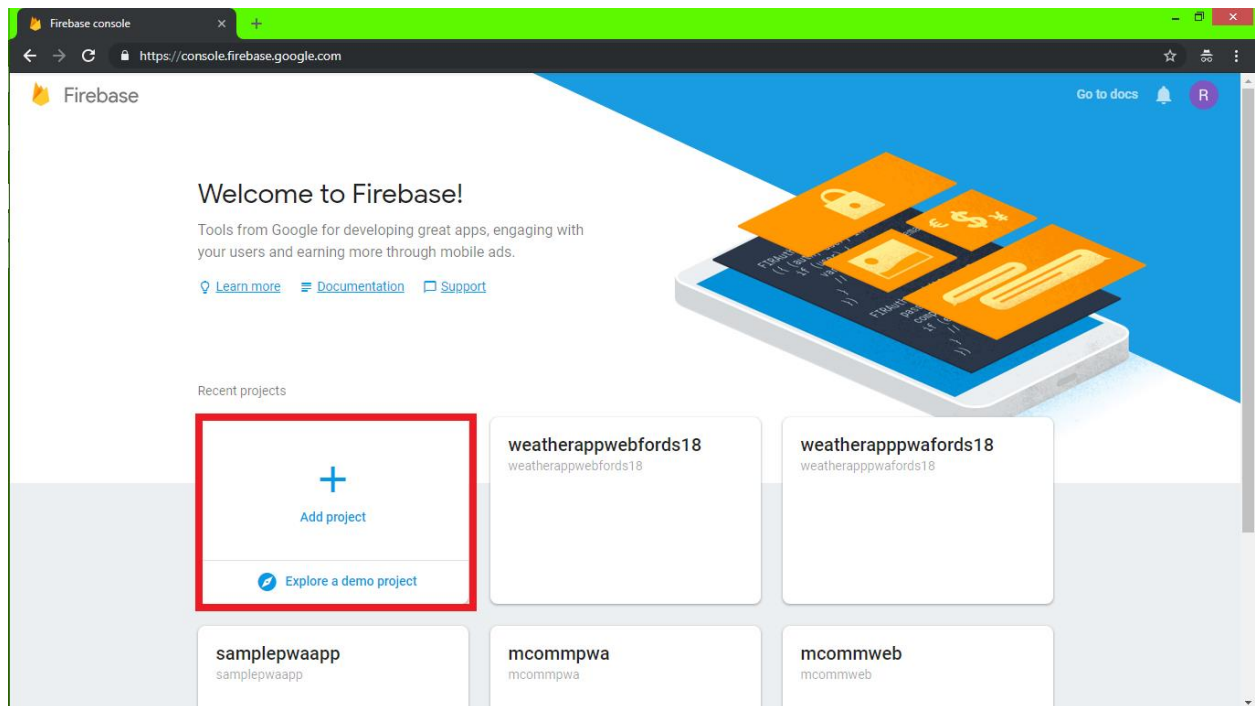
Step #3 | Create Firebase Account and Create a Project

To push the application into Firebase, we need to create a Firebase account. For

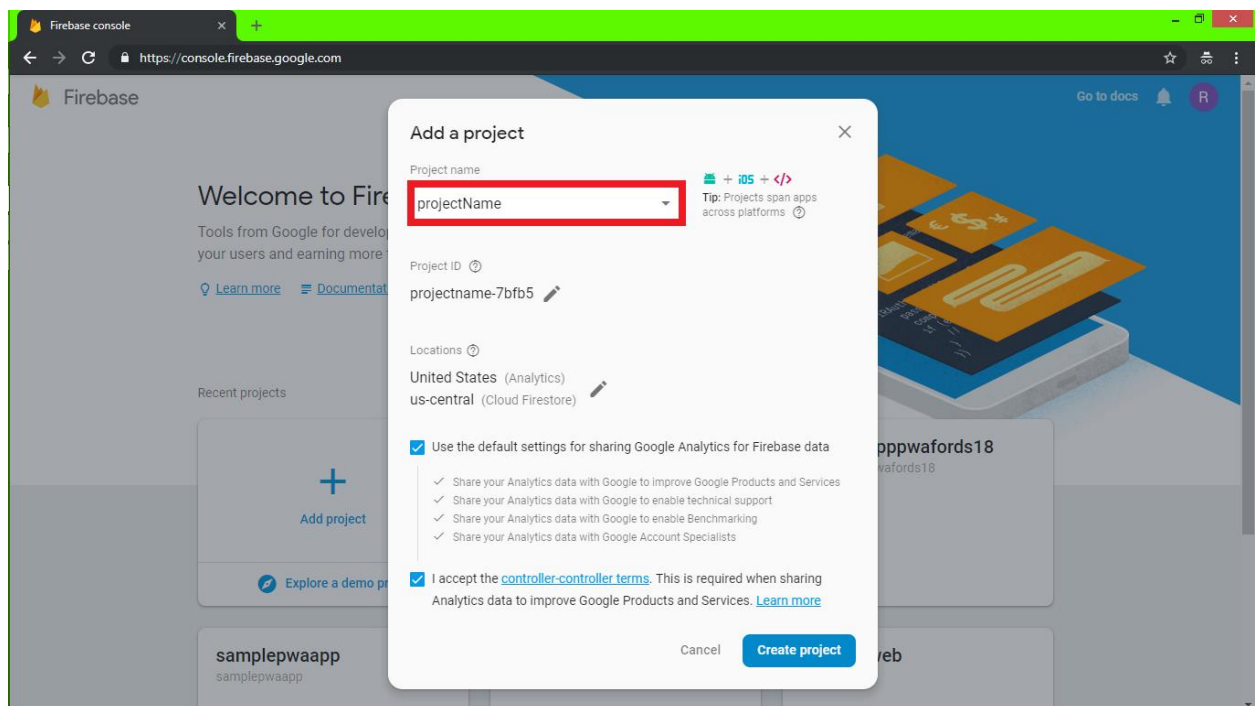
that open the browser, and type **https://firebase.google.com/** and click on **SIGN IN**



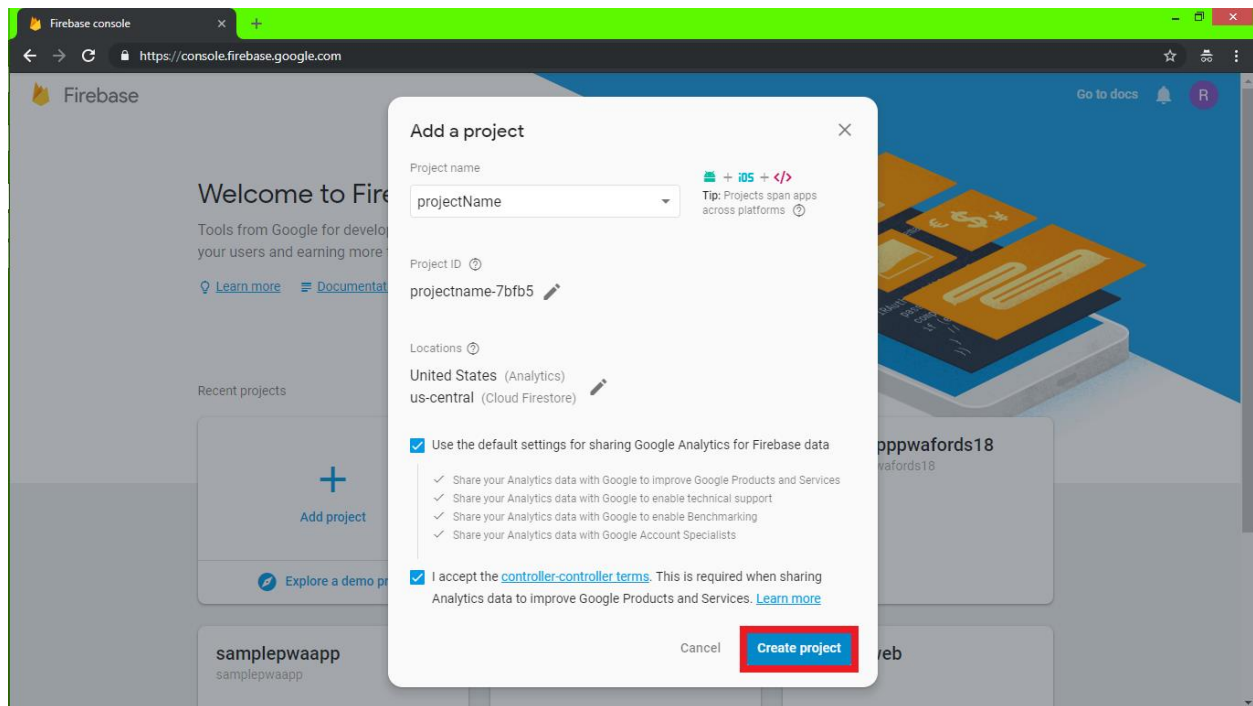
Provide your Gmail credentials to login. After successful login, you will be seeing the home page. Click on **Add project**



Now, enter your project name in the given field.



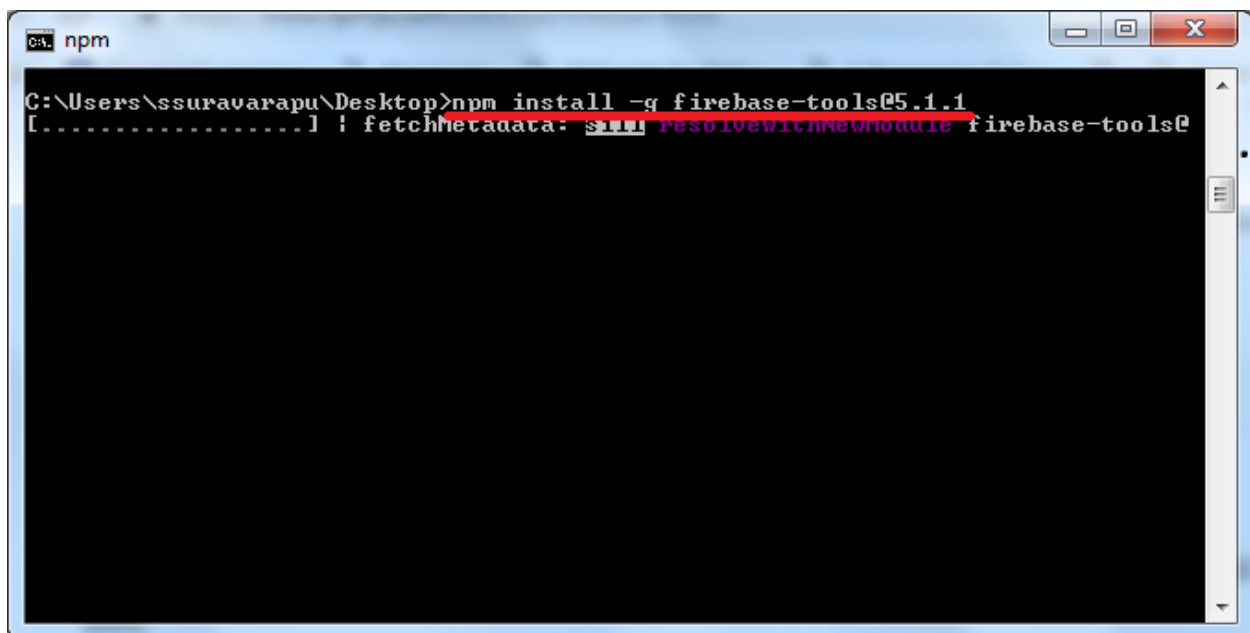
Click on **Create project**.

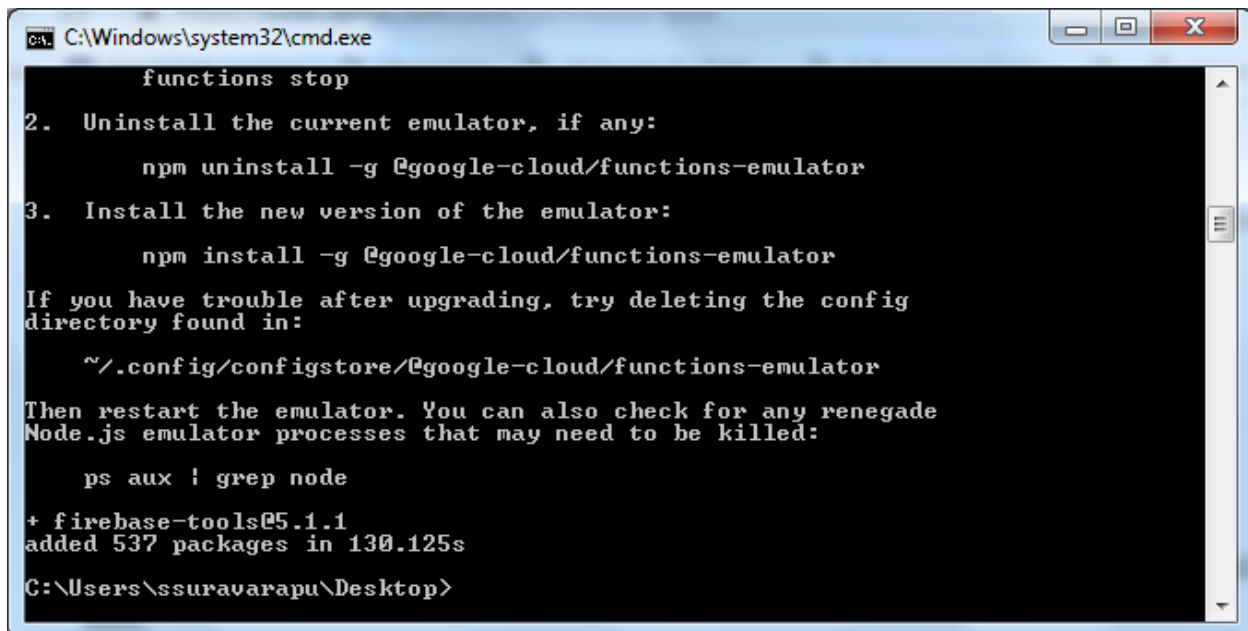


Step #4 | Install Firebase and Authentication in CLI

Open the command prompt and type

npm install -g [firebase-tools@5.1.1](#)





```
C:\Windows\system32\cmd.exe

functions stop

2. Uninstall the current emulator, if any:

    npm uninstall -g @google-cloud/functions-emulator

3. Install the new version of the emulator:

    npm install -g @google-cloud/functions-emulator

If you have trouble after upgrading, try deleting the config
directory found in:

    ~/.config/configstore/@google-cloud/functions-emulator

Then restart the emulator. You can also check for any renegade
Node.js emulator processes that may need to be killed:

    ps aux | grep node

+ firebase-tools@5.1.1
added 537 packages in 130.125s
C:\Users\ssuravarapu\Desktop>
```

After successful firebase tools installation, we need to login with firebase credentials in command prompt. For that provide the following command

firebase login



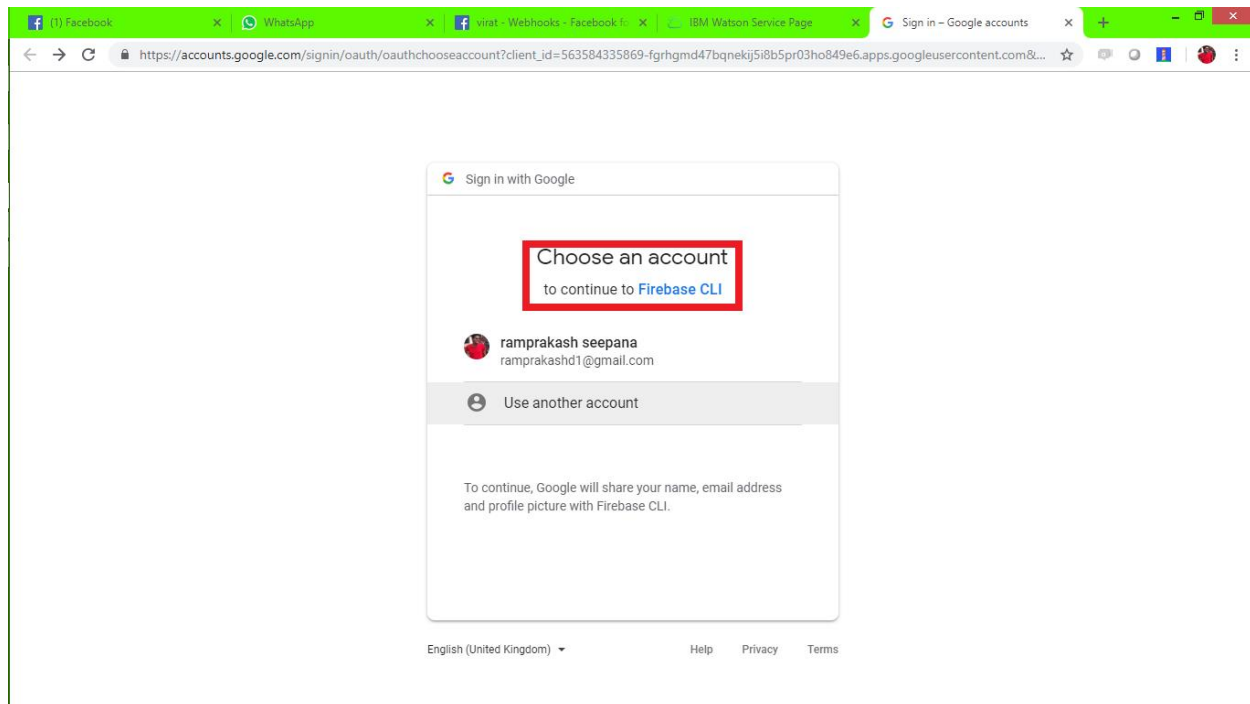
```
C:\Windows\system32\cmd.exe - firebase login

C:\Users\rseepana\Desktop>firebase login
? Allow Firebase to collect anonymous CLI usage and error reporting information
? <Y/n>
```

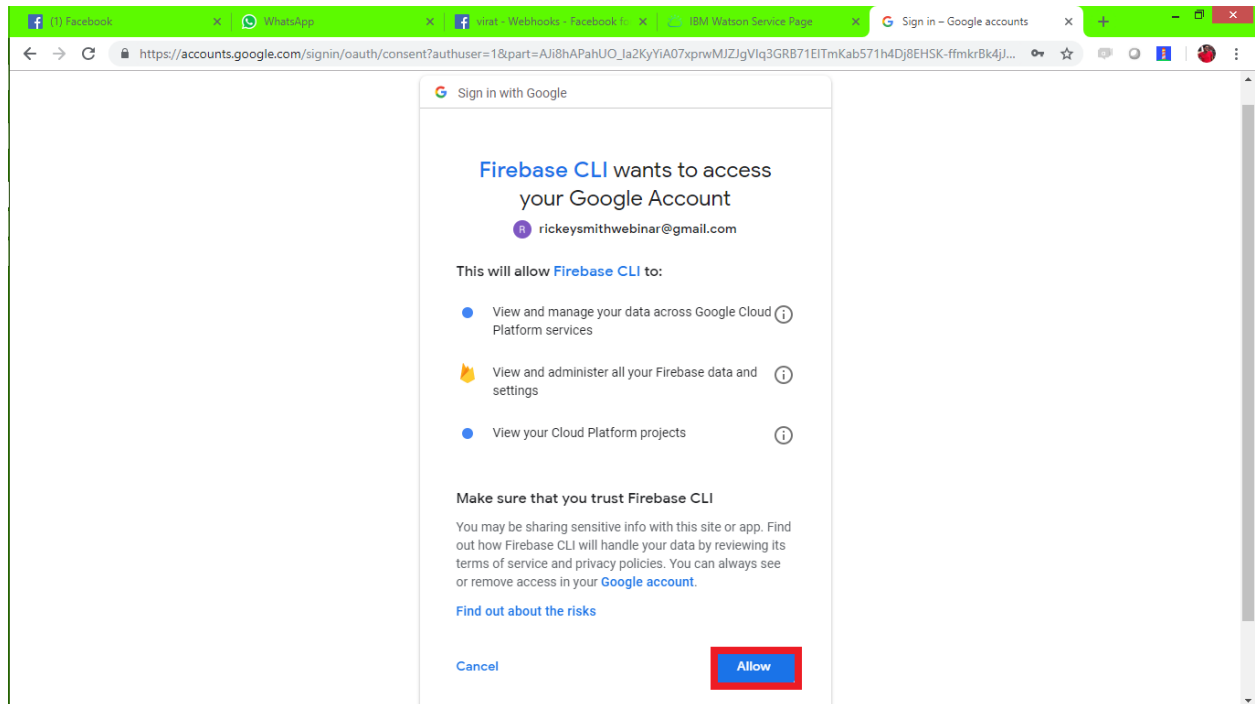
Now it asks "Allow Firebase to collect anonymous CLI usage and error reporting information?". Give Y and enter



You will be routed to a web browser and asks to login for Firebase authentication. Enter your Firebase account credentials.



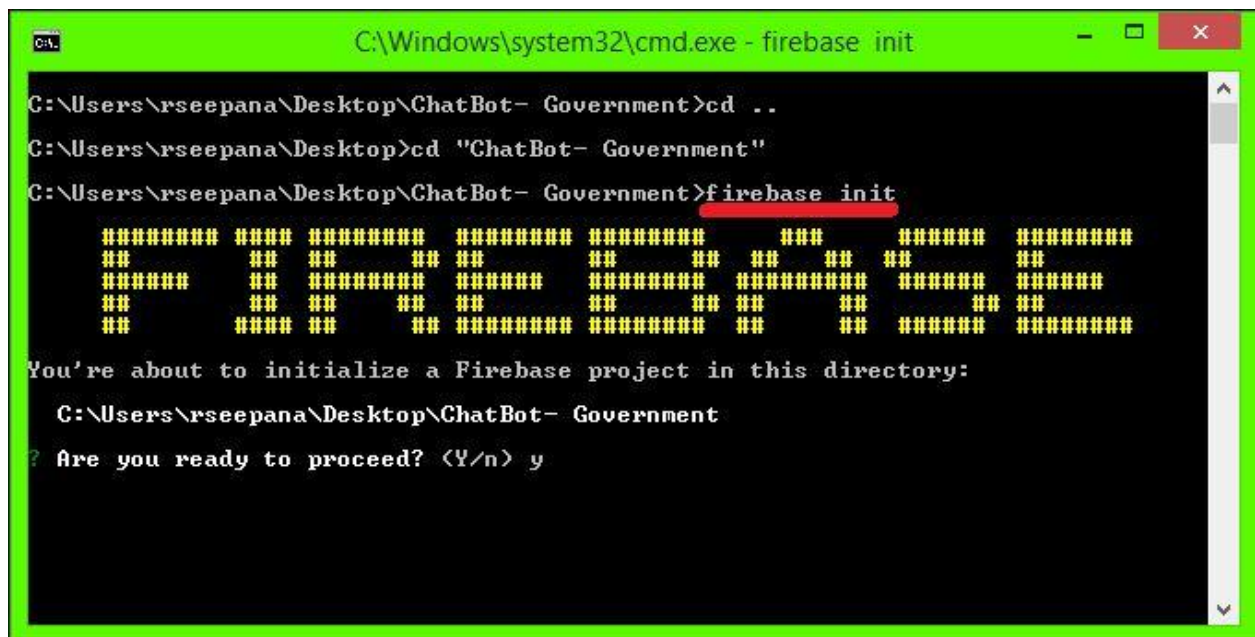
After successful login, you will be asked to allow the access to your Google account. Click on **Allow**.




Step #5 | Configuring Firebase in the App

As of now, you are done with authentication for Firebase account through command prompt. Now we need to initialize Firebase configuration.

For that we need to give the following command: **firebase init**



It asks "Are you ready to proceed?" enter Y




```
C:\Windows\system32\cmd.exe - firebase init

C:\Users\rseepana\Desktop\ChatBot- Government>cd ..
C:\Users\rseepana\Desktop>cd "ChatBot- Government"
C:\Users\rseepana\Desktop\ChatBot- Government>firebase init

*****
**                **                **                **                **
**                **                **                **                **
**                **                **                **                **
**                **                **                **                **

You're about to initialize a Firebase project in this directory:
  C:\Users\rseepana\Desktop\ChatBot- Government
? Are you ready to proceed? (Y/n) y
```

It asks to select feature. Select **Hosting** and enter



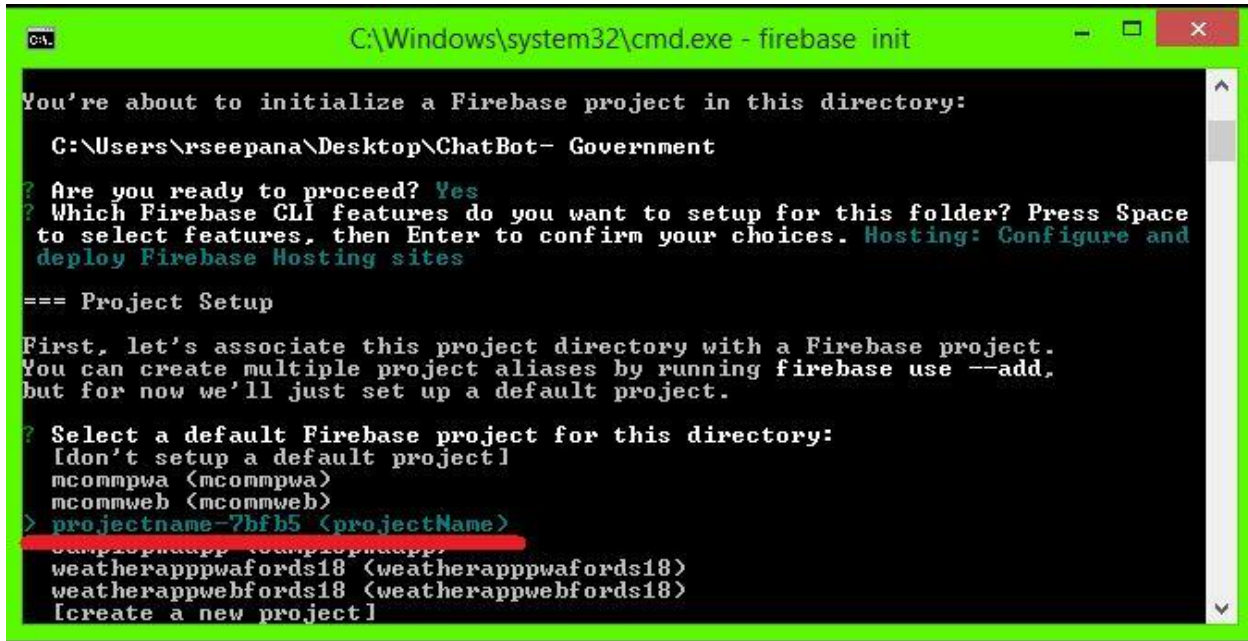
```
C:\Windows\system32\cmd.exe - firebase init

C:\Users\rseepana\Desktop\ChatBot- Government>cd ..
C:\Users\rseepana\Desktop>cd "ChatBot- Government"
C:\Users\rseepana\Desktop\ChatBot- Government>firebase init

*****
**                **                **                **                **
**                **                **                **                **
**                **                **                **                **
**                **                **                **                **

You're about to initialize a Firebase project in this directory:
  C:\Users\rseepana\Desktop\ChatBot- Government
? Are you ready to proceed? Yes
? Which Firebase CLI features do you want to setup for this folder? Press Space
to select features, then Enter to confirm your choices.
( ) Database: Deploy Firebase Realtime Database Rules
( ) Firestore: Deploy rules and create indexes for Firestore
( ) Functions: Configure and deploy Cloud Functions
>(*) Hosting: Configure and deploy Firebase Hosting sites
( ) Storage: Deploy Cloud Storage security rules
```

It asks to select Firebase project to deploy the app. Select the project name that we have created in the account.



```
C:\Windows\system32\cmd.exe - firebase init

You're about to initialize a Firebase project in this directory:

  C:\Users\rseepana\Desktop\ChatBot- Government

? Are you ready to proceed? Yes
? Which Firebase CLI features do you want to setup for this folder? Press Space
to select features, then Enter to confirm your choices. Hosting: Configure and
deploy Firebase Hosting sites

=== Project Setup

First, let's associate this project directory with a Firebase project.
You can create multiple project aliases by running firebase use --add,
but for now we'll just set up a default project.

? Select a default Firebase project for this directory:
[don't setup a default project]
mcompwa <mcompwa>
mcommweb <mcommweb>
> projectname-7bfb5 <projectName>
[create a new project]
```

It asks to enter the directory path. Enter **dist/WeatherBot** and hit enter



```
C:\Windows\system32\cmd.exe - firebase init

C:\Users\rseepana\Desktop\ChatBot- Government

? Are you ready to proceed? Yes
? Which Firebase CLI features do you want to setup for this folder? Press Space
to select features, then Enter to confirm your choices. Hosting: Configure and
deploy Firebase Hosting sites

=== Project Setup

First, let's associate this project directory with a Firebase project.
You can create multiple project aliases by running firebase use --add,
but for now we'll just set up a default project.

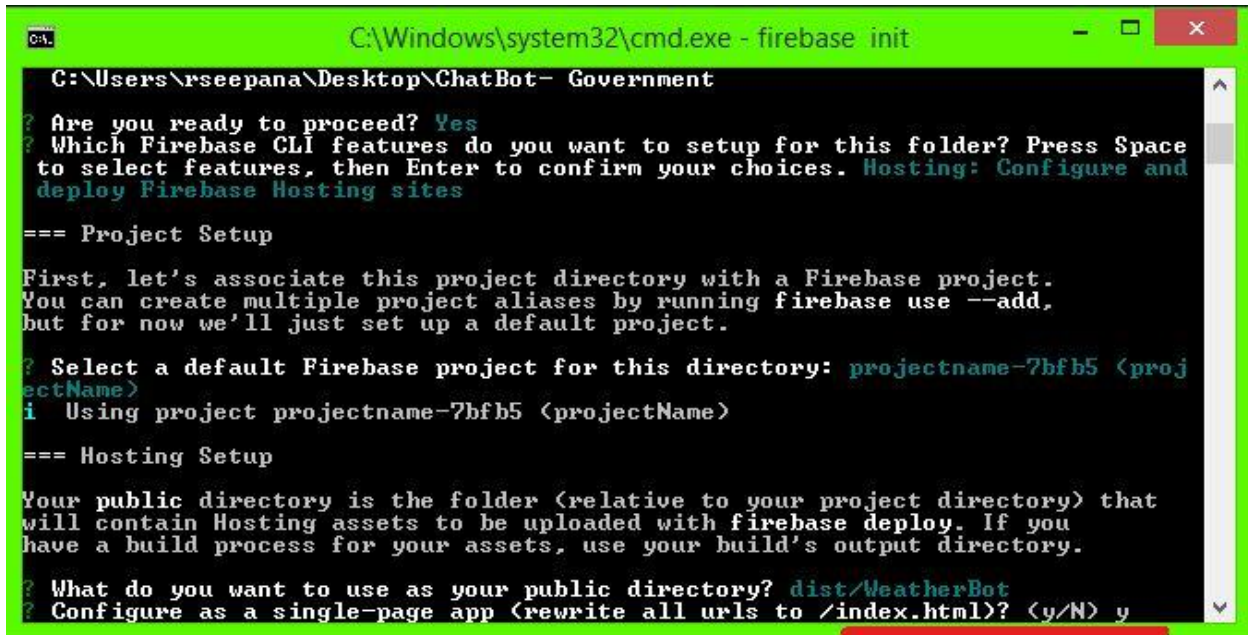
? Select a default Firebase project for this directory: projectname-7bfb5 <proj
ectName>
i Using project projectname-7bfb5 <projectName>

=== Hosting Setup

Your public directory is the folder <relative to your project directory> that
will contain Hosting assets to be uploaded with firebase deploy. If you
have a build process for your assets, use your build's output directory.

? What do you want to use as your public directory? <public> dist/WeatherBot_
```

Then, it asks to **Configure as a single page app?** Type **Y** and enter



```
C:\Windows\system32\cmd.exe - firebase init

C:\Users\rseepana\Desktop\ChatBot- Government

? Are you ready to proceed? Yes
? Which Firebase CLI features do you want to setup for this folder? Press Space
to select features, then Enter to confirm your choices. Hosting: Configure and
deploy Firebase Hosting sites

=== Project Setup

First, let's associate this project directory with a Firebase project.
You can create multiple project aliases by running firebase use --add,
but for now we'll just set up a default project.

? Select a default Firebase project for this directory: projectname-7bfb5 <proj
ectName>
i Using project projectname-7bfb5 <projectName>

=== Hosting Setup

Your public directory is the folder <relative to your project directory> that
will contain Hosting assets to be uploaded with firebase deploy. If you
have a build process for your assets, use your build's output directory.

? What do you want to use as your public directory? dist/WeatherBot
? Configure as a single-page app (rewrite all urls to /index.html)? <y/N> y
```

Now if it asks to overwrite the index.html file, type **N** and enter.

Step #6 | Build and Deploy the Application

As of now, we are done with configuring the Firebase initialization. We need to deploy the application into Fireabase. For that we need to build the application and deploy it.

To build the application, give the below command,

ng build --prod

```

C:\Windows\system32\cmd.exe - ng build --prod

You can create multiple project aliases by running firebase use --add,
but for now we'll just set up a default project.

? Select a default Firebase project for this directory: projectname-7bfb5 <proj
ectName>
i Using project projectname-7bfb5 <projectName>

=== Hosting Setup

Your public directory is the folder <relative to your project directory> that
will contain Hosting assets to be uploaded with firebase deploy. If you
have a build process for your assets, use your build's output directory.

? What do you want to use as your public directory? dist/WeatherBot
? Configure as a single-page app <rewrite all urls to /index.html>? Yes
+ Wrote dist/WeatherBot/index.html

i Writing configuration info to firebase.json...
i Writing project information to .firebaserc...
i Writing gitignore file to .gitignore...

+ Firebase initialization complete!

C:\Users\rseepana\Desktop\ChatBot- Government>ng build --prod

```

After successful build of the app you will be displayed like this,

```

ng

49% building modules 326/327 modules 1 active .les\@angular\compiler\fesm5\comp
49% building modules 326/328 modules 2 active .s\core-js\modules\_to-absolute-i
49% building modules 327/328 modules 1 active .les\@angular\compiler\fesm5\comp
92% after chunk asset optimization SourceMapDevToolPlugin main.js generate Sour
92% after chunk asset optimization SourceMapDevToolPlugin polyfills.js generate
92% after chunk asset optimization SourceMapDevToolPlugin runtime.js generate S
92% after chunk asset optimization SourceMapDevToolPlugin styles.js generate So
92% after chunk asset optimization SourceMapDevToolPlugin vendor.js generate So
92% after chunk asset optimization SourceMapDevToolPlugin main.js attach Sourc
92% after chunk asset optimization SourceMapDevToolPlugin polyfills.js attach S
92% after chunk asset optimization SourceMapDevToolPlugin runtime.js attach Sou
92% after chunk asset optimization SourceMapDevToolPlugin styles.js attach Sour
92% after chunk asset optimization SourceMapDevToolPlugin vendor.js attach Sour

Date: 2018-12-12T18:05:04.327Z
Hash: 2518602605588c82474a
Time: 22374ms
chunk <main> main.js, main.js.map <main> 17.2 kB [initial] [rendered]
chunk <polyfills> polyfills.js, polyfills.js.map <polyfills> 227 kB [initial] [r
rendered]
chunk <runtime> runtime.js, runtime.js.map <runtime> 5.22 kB [entry] [rendered]
chunk <styles> styles.js, styles.js.map <styles> 15.6 kB [initial] [rendered]
chunk <vendor> vendor.js, vendor.js.map <vendor> 3.63 MB [initial] [rendered]
i ?wdm?: Compiled successfully.

```

Now to deploy our application into firebase, give the below command,
firebase deploy

```
firebase deploy

? Select a default Firebase project for this directory: projectname-7bfb5 <proj
ectName>
i Using project projectname-7bfb5 <projectName>

=== Hosting Setup

Your public directory is the folder <relative to your project directory> that
will contain Hosting assets to be uploaded with firebase deploy. If you
have a build process for your assets, use your build's output directory.

? What do you want to use as your public directory? dist/WeatherBot
? Configure as a single-page app <rewrite all urls to /index.html>? Yes
+ Wrote dist/WeatherBot/index.html

i Writing configuration info to firebase.json...
i Writing project information to .firebaserc...
i Writing gitignore file to .gitignore...

+ Firebase initialization complete!

C:\Users\rseepana\Desktop\ChatBot- Government>ng build --prod
^CTerminate batch job (Y/N)? y

C:\Users\rseepana\Desktop\ChatBot- Government>firebase deploy
```

If the app is deployed in Firebase then you will be given with the hosted URL as shown below:

```
C:\Windows\System32\cmd.exe

chunk {1} styles.3ff695c00d717f2d2a11.css <styles> 0 bytes [initial] [rendered]
chunk {2} polyfills.7fb637d055581aa28d51.js <polyfills> 59.6 kB [initial] [rende
red]
chunk {3} main.f8931a119bb3dea3a971.js <main> 247 kB [initial] [rendered]

C:\Users\rseepana\Desktop\WeatherApp\WeatherWeb\WeatherBot>firebase deploy

=== Deploying to 'weatherappwebfords18' ...

i deploying hosting
i hosting[weatherappwebfords18]: beginning deploy...
i hosting[weatherappwebfords18]: found 13 files in dist/WeatherBot
+ hosting[weatherappwebfords18]: file upload complete
i hosting[weatherappwebfords18]: finalizing version...
+ hosting[weatherappwebfords18]: version finalized
i hosting[weatherappwebfords18]: releasing new version...
+ hosting[weatherappwebfords18]: release complete

+ Deploy complete!

Project Console: https://console.firebase.google.com/project/weatherappwebfords18/overview
Hosting URL: https://weatherappwebfords18.firebaseio.com

C:\Users\rseepana\Desktop\WeatherApp\WeatherWeb\WeatherBot>
```

We are done with deploying a web application in the Firebase. Open the URL and check if the application is working properly or not.

Step #7 | Converting Web App to PWA

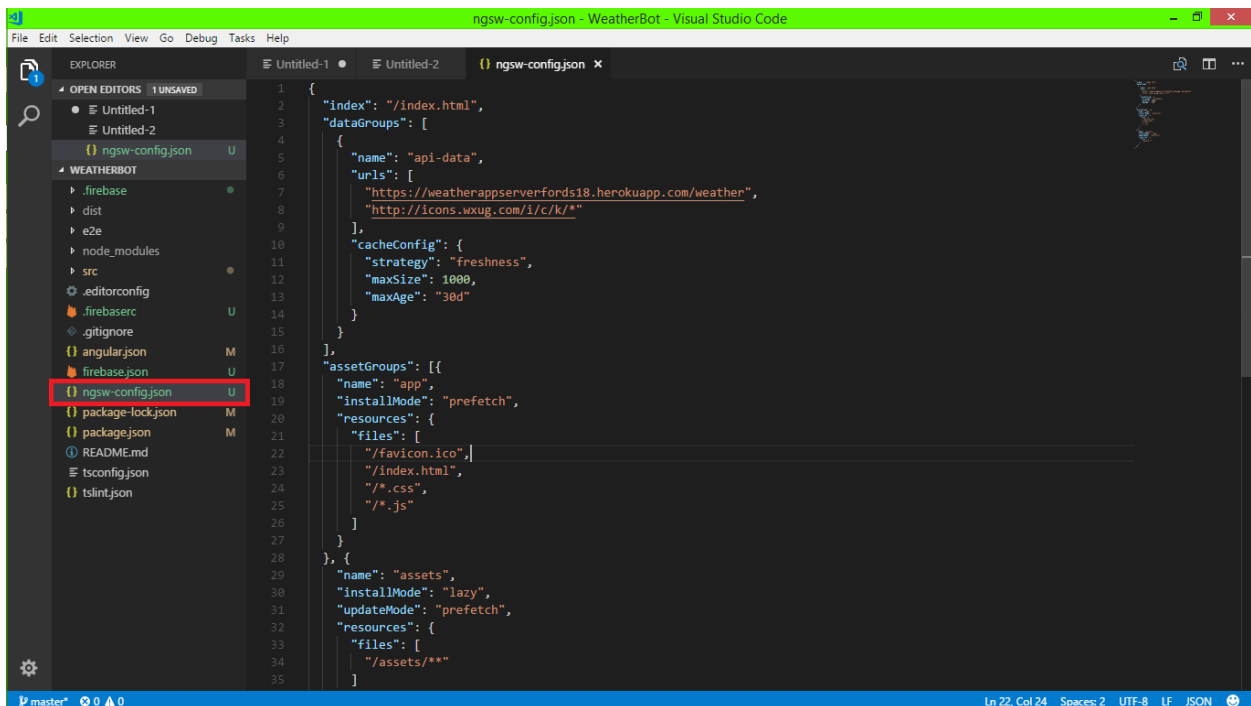
Let us see how to convert an Angular Application to PWA. Give the below command,
ng add @angular/pwa

Now, you will be added with required files to support the service worker. So that we will be able to use the features of Progressive enhancements. To enhance the application, follow the below step.

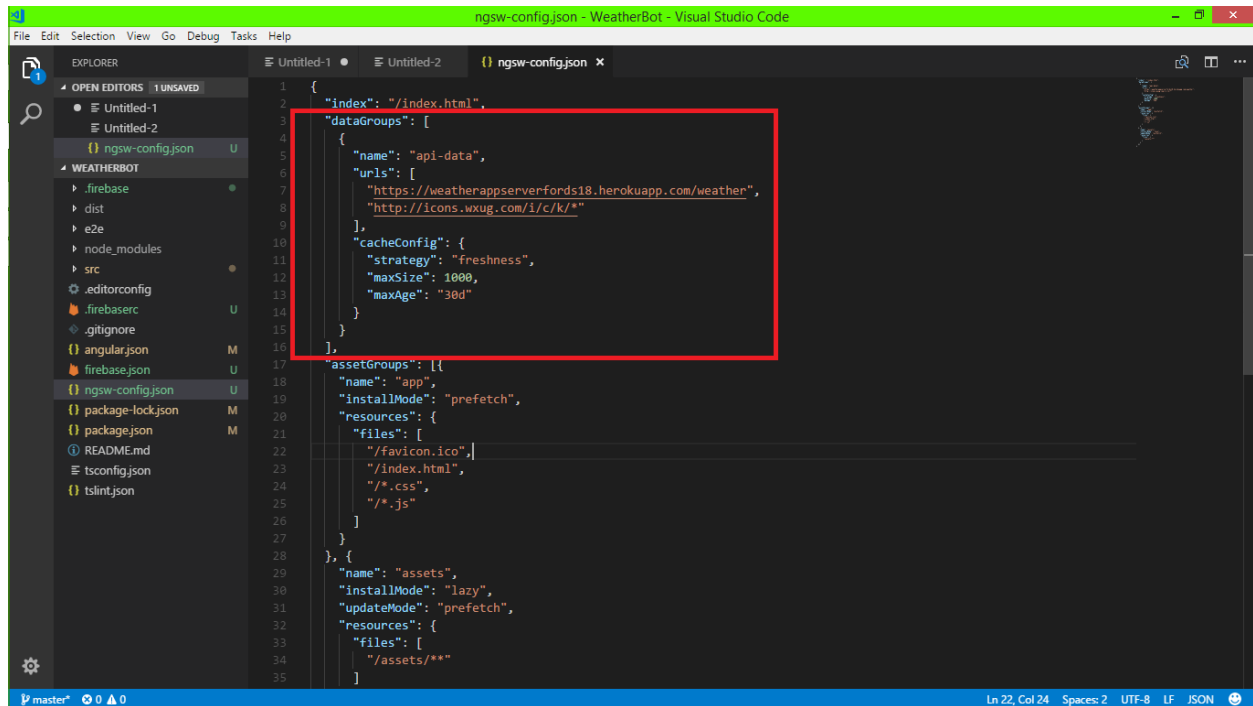
Step #8 | PWA Features Enhancements

Open **app.component.ts** file and replace the code available in **#app.component.ts** in **cheat sheet** file. This updated code is to enhance the PWA by adding code for Updating App and Subscribe/Unsubscribe notifications.

To enhance the offline capability, we need to add the urls which we are going to use in the application in **ngsw-config.json** file. For this open **cheet sheet** file and copy the code in **#ngsw-config.json** and replace in this file. With the above code, we have enhanced the offline capability for **GET** APIs.



```
1 {
2   "index": "/index.html",
3   "dataGroups": [
4     {
5       "name": "api-data",
6       "urls": [
7         "https://weatherappserverfor18.herokuapp.com/weather",
8         "http://icons.wxug.com/i/c/k/*"
9       ],
10      "cacheConfig": {
11        "strategy": "freshness",
12        "maxSize": 1000,
13        "maxAge": "30d"
14      }
15    }
16  ],
17  "assetGroups": [
18    {
19      "name": "app",
20      "installMode": "prefetch",
21      "resources": {
22        "files": [
23          "/favicon.ico",
24          "/index.html",
25          "/*.css",
26          "/*.js"
27        ]
28      }
29    },
30    {
31      "name": "assets",
32      "installMode": "lazy",
33      "updateMode": "prefetch",
34      "resources": {
35        "files": [
36          "/assets/**"
37        ]
38      }
39    }
40  ]
41 }
```



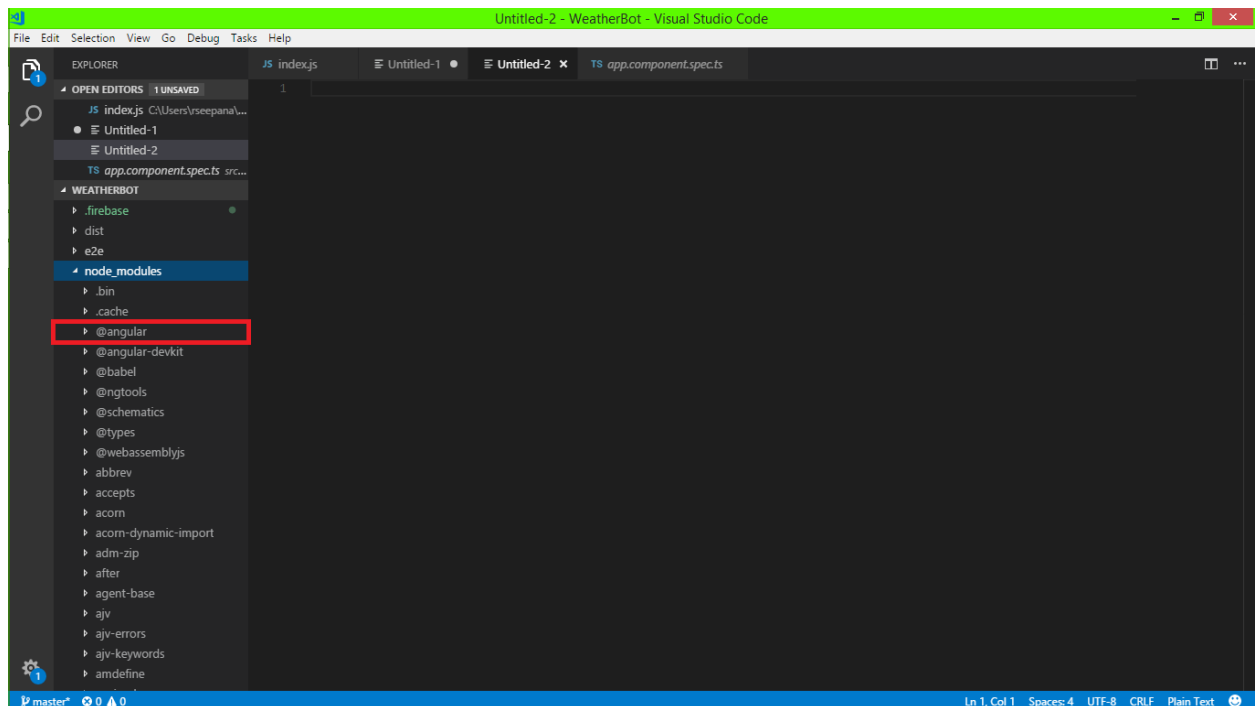
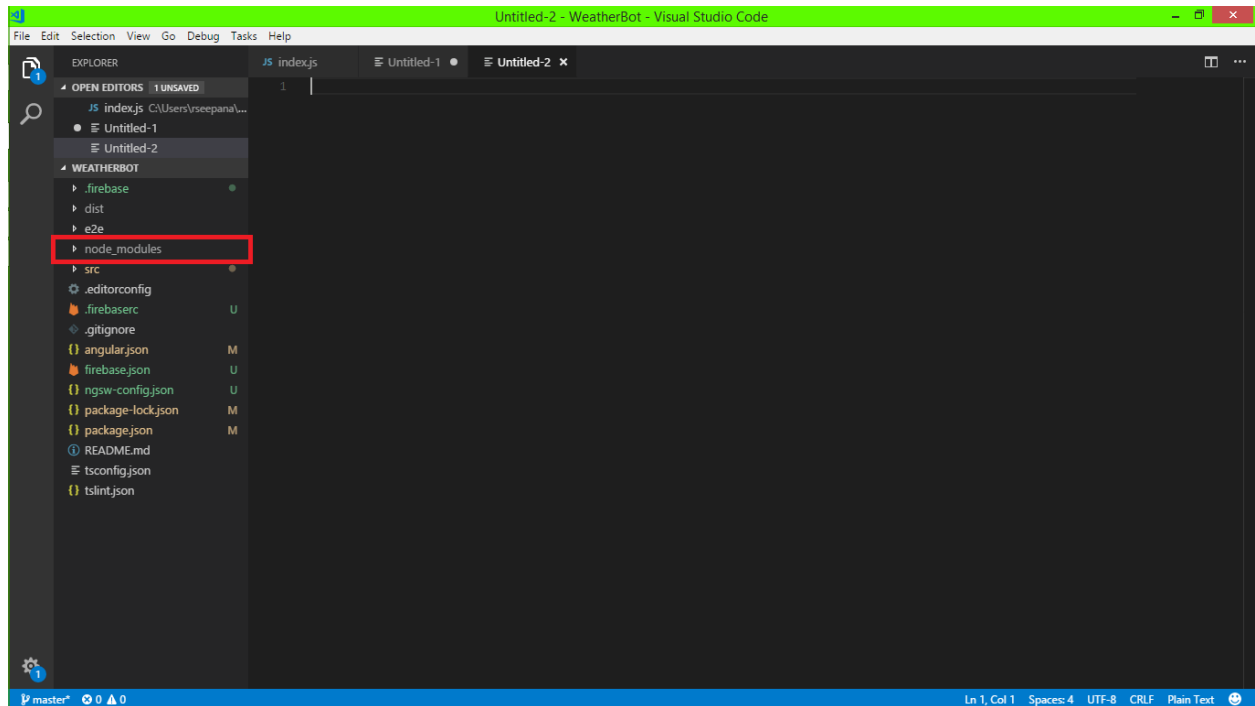
```
1 {
2   "index": "/index.html",
3   "dataGroups": [
4     {
5       "name": "api-data",
6       "urls": [
7         "https://weatherappserverfords18.herokuapp.com/weather",
8         "http://icons.wxug.com/i/c/k/*"
9       ],
10      "cacheConfig": {
11        "strategy": "freshness",
12        "maxSize": 1000,
13        "maxAge": "30d"
14      }
15    },
16    {
17      "name": "app",
18      "installMode": "prefetch",
19      "resources": {
20        "files": [
21          "/favicon.ico",
22          "/index.html",
23          "/*.css",
24          "/*.js"
25        ]
26      }
27    },
28    {
29      "name": "assets",
30      "installMode": "lazy",
31      "updateMode": "prefetch",
32      "resources": {
33        "files": [
34          "/assets/**"
35        ]
36      }
37    }
38  ]
39 }
```

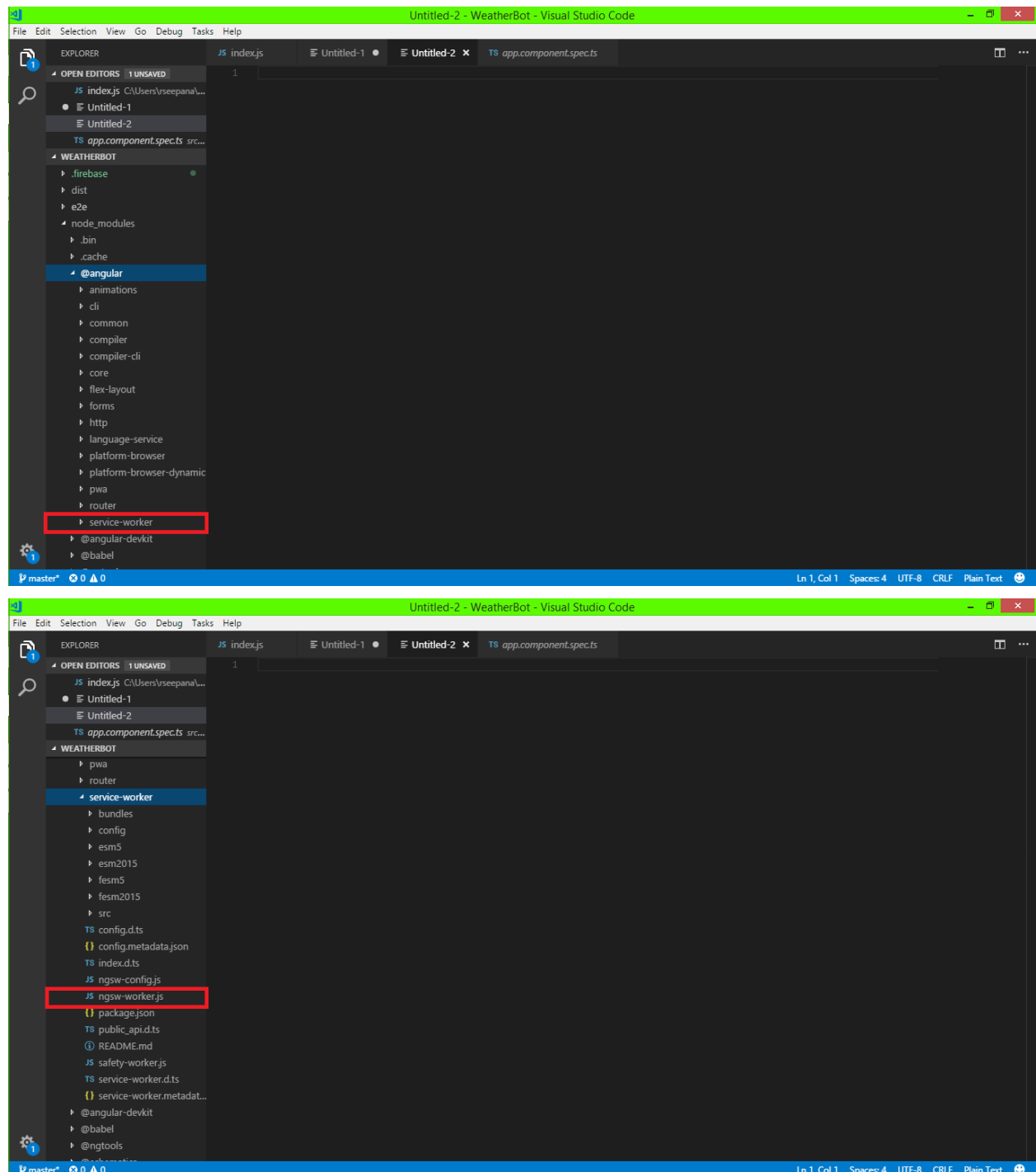
Step #9 | Adding event Listeners in Node Modules

As of now Angular 6 is not fully supported for notifications. When user clicks on the notification, it should redirect to the respective URL. For this, we need to add **notificationclick** eventListener in **ngsw-worker.ts**.

Note - As of now Angular Service Worker does not provide the functionality to handle the incoming push notifications. So, we have to add the following, **[project-name]\node_modules\@angular\service-worker\ngsw-worker.js**

Follow the following to add the event listener,





Now copy the **#ngsw-worker.js** code in **cheet sheet** and paste in **ngsw-worker.js** file. With this we are done with adding code for pwa functionality enhancements.

To deploy the updated code in firebase, run the following command again,
ng build --prod

firebase deploy

After successful app deployment we can open the app with the url. Now, we can see the application with home page like this:



Now, let us see the features of PWA and how the app works in mobile device.

For any questions regarding the lab please feel free to reach out to innovation@miraclesoft.com. We hope you enjoyed the workshop!