



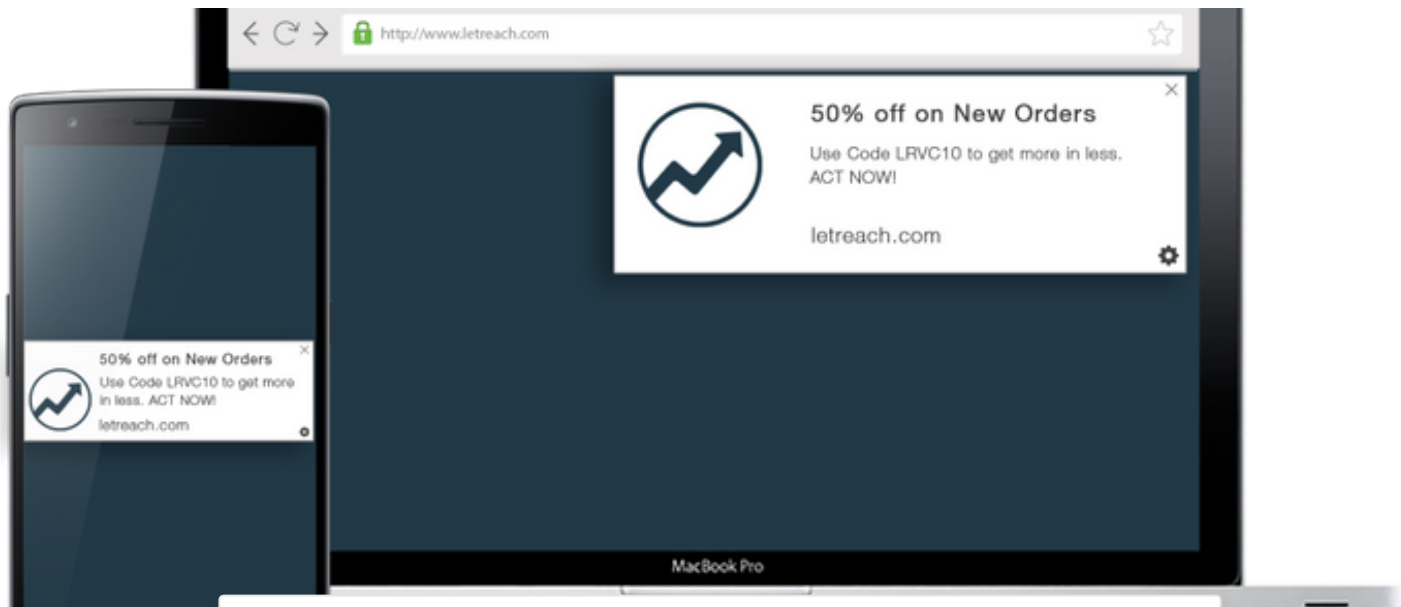
Saurabh Kashyap

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I am a @full stack developer , tech enthusiast , tech saviour , and learner

Web Push Notification Full Stack Application With Node Js Restful API

Published Sep 24, 2018 Last updated Sep 25, 2018



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*It's helps in broadcasting short messages to the subscriber of the web application and as well as help to support in user engagement with your application to notify the every subscribers, It is really hard to any organisation send email notification for a short messaging event loop or broadcast messages like offers and updates of short messages and it also increases the cost of server operations so the solution is **Web Push Notification** .it help your the maximum post reachability and getting more consumer engagement on web application.*

let me tell you how it's works.

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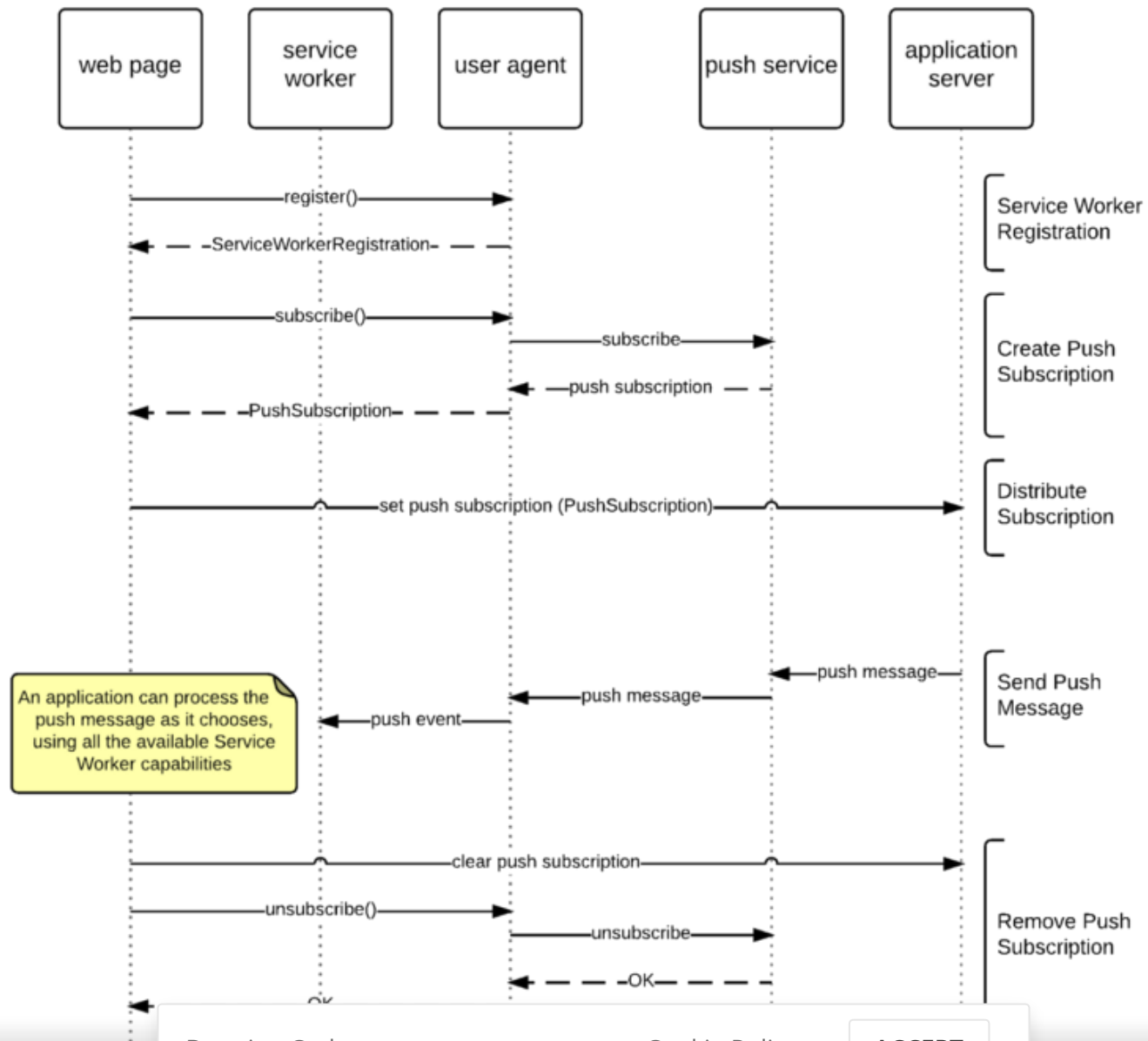
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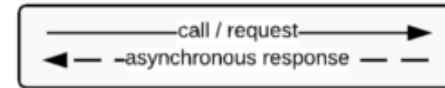


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service worker is main key ingredient and knight of this feature which install in client browser and run independently as application after installing in browser as service worker which regularly send a query to the provider server and ask for any new event happening and then respond to the client if any new event is happening in the server it popup a message like

click on allow button service worker start to install in client browser and send a promise request for subscriber with **Public VAPID key** and check on server for whether user is already subscribe notification or not if it's already subscribe it sent back request with false statement otherwise server sent a true request. and done that's it.

Now let's come to the Coding section and how to implement this feature in your application without using third party paid services and use as long as you.

Step 1

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Need Prequest which are listed below if you don't have in your System.

Prequiests:

1. IDE [Visual Studio Code](#)
2. [Nodejs](#)
3. [Git](#)
4. [MongoDB](#)
5. [Postman](#)

Now Let's Beigin with next Step

Step 2

open your IDE [Visual Studio Code](#)

and than run command in integrated terminal with your IDE

```
git init
```

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than add the all fields or skip as you want
and than run command again to intall all the dependency with

```
npm install express web-push body-parser mongoose q --save
```

and hit the Enter and wait for install all the dependency will install correcty in your project than run again run command for creat new application running file in same project folder by

```
touch server.js
```

and again need to create three folders in same project directory by commands as below

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```
mkdir config  
cd config  
touch keys.js  
touch keys_prod.js  
touch keys_dev.js
```

```
mkdir model  
cd model  
touch subscribers_model.js
```

```
mkdir router  
cd router  
touch push.js  
touch subscriber.js  
touch index.js
```

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now all the essential folders and file are created and in this project we move to next coding parts in next step.

Step 3

The file structure of this project is as below

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```
|
|
|_____./config
|
|      |
|      |___keys_prod.js
|      |___keys_dev.js
|      |___keys.js
|
|_____./public
|
|      |
|      |___index.html
|      |___sw.js
|      |___app.js
|
|_____./model
|
|      |___subscribers_model.js
|
|_____./router
|
|      |___push.js
|      |___subscribe.js
|
|_____server.js
```

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now start with create database model for mongodb database. so now i am using **Mongoose** ODM ORM library for **MongoDB** which is already installed in project

```
const mongoose = require('mongoose');
const Schema = mongoose.Schema;

const SubscriberSchema = new Schema({
  endpoint: String,
  keys: Schema.Types.Mixed,
  createDate: {
    type: Date,
    default: Date.now
  }
});

mongoose.model('subscribers', SubscriberSchema, 'subscribers');
```

so now let's come to the config file

```
cd config
```

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```
if (process.env.NODE_ENV === 'production') {  
  module.exports = require('./keys_prod');  
} else {  
  module.exports = require('./keys_dev');  
}
```

and update your keys.js file with this code , actually this code provide smart switch database authentication address between production and development application. Before update the keys_prod.js and keys_dev.js file generate the VAPID keys for client device browser and between the server running application. by using this command

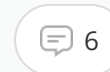
```
./node_modules/.bin/web-push generate-vapid-keys
```

you will see a two keys are generated one is private and another one is public key which is show in below.

copy both the

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```
module.exports = {  
  //i used mlab database for fast and realiable pace development enviroment  
  mongoURI: 'mongodb://web-push:webpush123@ds213053.mlab.com:13053/web-push',  
  privateKey: 'ayTIBl3f0gcI-koFq-ZXPxSR4qicC0GcMNHA1dpHaj0' || process.env.VAF  
  publicKey: 'BK3Q7j8fcGFws03RiU5XakzDJ7KGEiRhdIX2H5U8eNmhhkdHT_j0_SD09KL96aFZ'  
}
```

`process.env.VAPID_PUBLIC_KEY` or `process.env.VAPID_PRIVATE_KEY` understand as production server running environment configuration.

***Note:** Please Make sure you always use or generate your own VAPID keys for your application for more secure your application and make sure your private keys is not expose on the web.*

so now all the important application structure setting is done now start coding in `server.js` which is exist on top of the project folder

```
const expres
```

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```
const bodyParser = require('body-parser');

require('./model/subscribers_model');

// Load Routes
const index = require('./router');

// subscriber route load push
const push = require('./router/push');

// subscriber route load
const subscribe = require('./router/subscribe');
// Load Keys
const keys = require('./config/keys');
//Handlebars Helpers

mongoose.Promise = global.Promise;

// Mongoose Connect
mongoose.connect(keys.mongoURI, {
  useMongoClient: true
})
.then(() => console.log('MongoDB Connected'))
.catch(err => console.log(err));

//Create Express middleware
const app = express();
app.set('trust proxy', true);
// parse app
```

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```
app.use(bodyParser.urlencoded({
  extended: true
}));

// Set static folder
app.use(express.static(path.join(__dirname, 'public')));
// app.set('views', __dirname + '/public/js');

// Set global vars
app.use((req, res, next) => {
  res.locals.user = req.user || null;
  next();
});

// Use Routes

app.use('/', index);
app.use('/subscribe', subscribe);
app.use('/push', push);

// catch 404 and forward to error handler
app.use(function (req, res, next) {
  var err = new Error('Not Found');
  err.status = 404;
  next(err);
});
```

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```
// development error handler
// will print stacktrace
if (app.get('env') === 'development') {
  app.use(function (err, req, res, next) {
    res.status(err.status || 500);
    res.render('error', {
      message: err.message,
      error: err
    });
  });
}

// production error handler
// no stacktraces leaked to user
app.use(function (err, req, res, next) {
  res.status(err.status || 500);
  res.render('error', {
    message: err.message,
    error: {}
  });
});

const port = process.env.PORT || 3000;

app.listen(port, () => {
  console.log(`Server started on port ${port}`);
});
```

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and now come to the folder **router** first start with subscribe.js which is already created by command. open this file in new tab and than paste this code in your **subscribe.js** file

```
const express = require('express');
const router = express.Router();
const mongoose = require('mongoose');
const Subscription = mongoose.model('subscribers');

//Post route of subscribe url is as http://host:3000/subscribe
router.post('/', (req, res) => {
  const subscriptionModel = new Subscription(req.body);
  subscriptionModel.save((err, subscription) => {
    if (err) {
      console.error(`Error occurred while saving subscription. Err: ${err}`);
      res.status(500).json({
        error: 'Technical error occurred'
      });
    } else {
      res.json({
        data: 'Subscription saved.'
      });
    }
  });
});
```

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```
router.get('/', (req, res) => {  
    res.json({  
        data: 'Invalid Request Bad'  
    });  
});  
module.exports = router;
```

save the changes and move to next file **push.js** and paste this code in your already created **push.js** file by command line

```
const express = require('express');  
const router = express.Router();  
const mongoose = require('mongoose');  
const Subscription = mongoose.model('subscribers');  
const q = require('q');  
const webPush = require('web-push');  
const keys = require('../config/keys');  
//Post route of push url is as http://host:3000/push  
router.post('/', (req, res) => {  
    const payload = {  
        title: req.body.title,  
        message: req.body.message,  
        url: req.body.url,  
        ttl:
```

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```
    tag: req.body.tag
  };

Subscription.find({}, (err, subscriptions) => {
  if (err) {
    console.error(`Error occurred while getting subscriptions`);
    res.status(500).json({
      error: 'Technical error occurred'
    });
  } else {
    let parallelSubscriptionCalls = subscriptions.map((subscription) =>
      return new Promise((resolve, reject) => {
        const pushSubscription = {
          endpoint: subscription.endpoint,
          keys: {
            p256dh: subscription.keys.p256dh,
            auth: subscription.keys.auth
          }
        };

        const pushPayload = JSON.stringify(payload);
        const pushOptions = {
          vapidDetails: {
            subject: "http://example.com",
            privateKey: keys.privateKey,
            publicKey: keys.publicKey
          },

```

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```

        webPush.sendNotification(
            pushSubscription,
            pushPayload,
            pushOptions
        ).then((value) => {
            resolve({
                status: true,
                endpoint: subscription.endpoint,
                data: value
            });
        }).catch((err) => {
            reject({
                status: false,
                endpoint: subscription.endpoint,
                data: err
            });
        });
    });
});
q.allSettled(parallelSubscriptionCalls).then((pushResults) => {
    console.info(pushResults);
});
res.json({
    data: 'Push triggered'
});
}
});
});

```

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```
res.json({  
  data: 'Invalid Request Bad'  
});  
});  
module.exports = router;
```

again make sure save this code changes in your **push.js** file with this code now again move to the **index.js** file and update the code with this below code

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```
const express = require('express');
const router = express.Router();

router.get('/', (req, res) => {
  res.locals.metaTags = {
    title: 'web-push-api',
    description: 'Web Push Notification Full Stack Application With Node Js',
    keywords: 'Web Push Notification Full Stack Application With Node Js Re',
    generator: '0.0.0.1',
    author: 'Saurabh Kashyap'
  };
  res.json({
    status: 'ok',
    message: 'Server is running'
  });
});

module.exports = router;
```

and save the changes in server.js file with above code in **server.js** file and run command hit this run command

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```
node server.js
```

please make sure you will see these messages after hitting this command.

press again close the application after checking your application is running correct.
so now server side running application code is done.

Now Let's Begin with next Step

Step 4

creat a new folder in with public name and create file with these commands as below

```
mkdir public  
cd public  
touch index.html  
touch sw.js  
touch app.js
```

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now lets beign the basic html code in **index.html** file

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <meta http-equiv="X-UA-Compatible" content="ie=edge">
  <title>Web-Push Application with Restful Api</title>
</head>
<body>
  <h1>This is a web-push notification example</h1>
  <!-- call service worker for register and send subscribe request to the serv
<script src="app.js"></script>
</body>
</html>
```

save this code and move to next file **app.js** where service worker browser check and register service worker in browser and also send a ajax request to the application API **http://host:3000/subscribe** for subscribe the service in client browser.

Let isSubscr

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```
// Url Encryption
function urlB64ToUint8Array(base64String) {
  const padding = '='.repeat((4 - base64String.length % 4) % 4);
  const base64 = (base64String + padding)
    .replace(/\-/g, '+')
    .replace(/_/g, '/');

  const rawData = window.atob(base64);
  const outputArray = new Uint8Array(rawData.length);

  for (let i = 0; i < rawData.length; ++i) {
    outputArray[i] = rawData.charCodeAt(i);
  }
  return outputArray;
}

// Installing service worker
if ('serviceWorker' in navigator && 'PushManager' in window) {
  console.log('Service Worker and Push is supported');

  navigator.serviceWorker.register('sw.js')
    .then(function (swReg) {
      console.log('service worker registered');

      swRegistration = swReg;
    });
}
```

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```
    if (isSubscribed) {
      console.log('User is subscribed');
    } else {
      swRegistration.pushManager.subscribe({
        userVisibleOnly: true,
        applicationServerKey: urlB64ToUint8Array(applic
      })
      .then(function (subscription) {
        console.log(subscription);
        console.log('User is subscribed');

        saveSubscription(subscription);

        isSubscribed = true;
      })
      .catch(function (err) {
        console.log('Failed to subscribe user: ', err);
      })
    }
  })
  .catch(function (error) {
    console.error('Service Worker Error', error);
  });
} else {
  console.warn('Push messaging is not supported');
}
```

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```

let xmlHttp = new XMLHttpRequest();
//put here API address
xmlHttp.open("POST", "/subscribe");
xmlHttp.setRequestHeader("Content-Type", "application/json;charset=UTF-8");
xmlHttp.onreadystatechange = function () {
    if (xmlHttp.readyState != 4) return;
    if (xmlHttp.status != 200 && xmlHttp.status != 304) {
        console.log('HTTP error ' + xmlHttp.status, null);
    } else {
        console.log("User subscribed to server");
    }
};

xmlHttp.send(JSON.stringify(subscription));
}

```

and now save the all files and start coding for a service worker let's begin now

```

let notificationUrl = '';
//notification registered feature for getting update automatically from server
self.addEventListener('push', function (event) {
    console.log('Push received: ', event);
    let _data = event.data ? JSON.parse(event.data.text()) : {};
    notifica

```

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```

        body: _data.message,
        icon: _data.icon,
        tag: _data.tag
    })
    );
});

//notification url redirect event click
self.addEventListener('notificationclick', function (event) {
    event.notification.close();

    event.waitUntil(
        clients.matchAll({
            type: "window"
        })
        .then(function (clientList) {
            if (clients.openWindow) {
                return clients.openWindow(notificationUrl);
            }
        })
    );
});

```

Rest Web Services

Websocket Notification

Node.js

Express

MongoDB

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Just saved the code. YEAH!! I did it so now we have to check wheater is it working or not. So age

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 **6 Replies**

Leave a reply

Pankaj Singh 22 days ago

When hitting post service from postman below error show on console .please help to resolve

state: 'rejected', reason: TypeError: Cannot read property 'p256dh' of undefined
at Promise (D:\Push\push-rest-master\push-rest-master\router\push.js:32:55)

at new Promise () at subscriptions map (D:\Push\push-rest-master\push-rest-

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 Reply

toanbom 3 months ago

Hi Saurabh,

I want to send specific person or list array of person with pushSubscription not send all , Hope this help

 Rep

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Thanks for this tutorial. It really helped get my head around push notifications. I was able to get most of the project working but I was stopped short when sending the actual push message. The error i received was "MismatchSenderId Error 403". I have confirmed my data is retrieved but there is some issue still. I am concerned that i need to setup a webpush.setGCMAPIKey from google. Do you know if this should be a requirement to successfully do this project?

♡ Reply

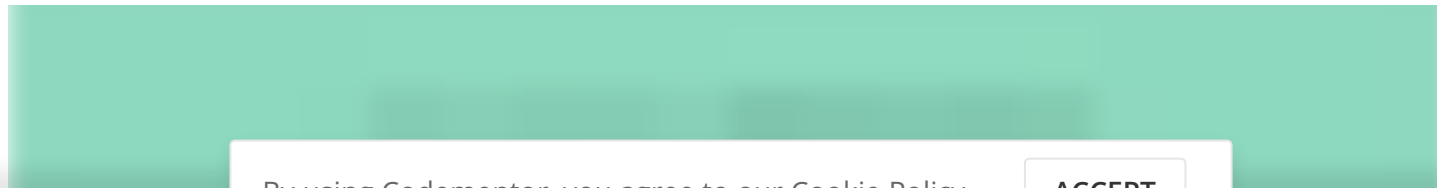
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Handling Errors in Express




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I had a hard time learning how to handle errors in Express when I started. Nobody seemed to have written the answers I needed, so I had to learn it the hard way.

Today, I want to share everything I know about handling errors in an Express app.

Let's begin with synchronous errors.

Handling synchronous errors

If you want to handle a synchronous error, you can `throw` the error in an Express request handler. (Note: Request handlers are also called controllers. I prefer saying request handlers because they're explicit and easy to understand).

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```
app.post('/testing', (req, res) => {  
  thro ...
```

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