Sending Web Push Notifications from Node.js

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Using service workers, you can send push notifications to Chrome straight from your Node.js app. The excellent `web-push` npm module lets you send push notifications without going through an intermediary service like PubNub. This article will walk you through setting up a "Hello, World" example of web push notifications using a vanilla JavaScript frontend and Express on the backend. The final result will look like what you see below. The full source for this project is available on GitHub.

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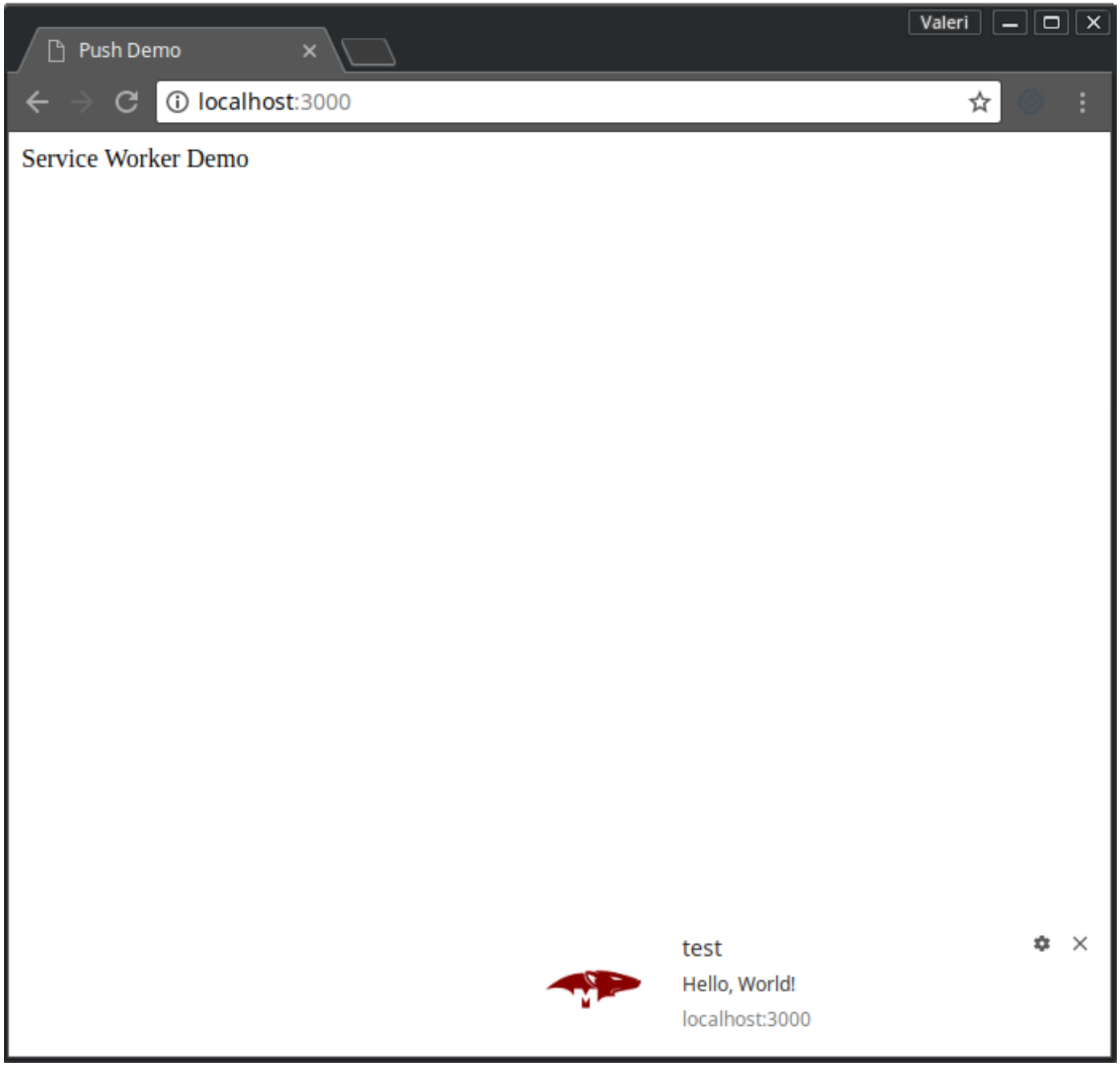

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Credentials and Server Setup

In order to set up web push, you need to create a set of VAPID keys. VAPID keys identify who is sending the push notification. The `web-push` npm module can generate VAPID keys for you, so let's install `web-push` along with some other dependencies and use `web-push generate-vapid-keys` to create the keys.

```
$ npm install express@4.16.3 web-push@3.3.0 body-parser@1.18.2 express-static@1.2.5

+ express@4.16.3
+ web-push@3.3.0
+ body-parser@1.18.2
+ express-static@1.2.5
added 62 packages in 1.42s
$
$ ./node_modules/.bin/web-push generate-vapid-keys

=======================================

Public Key:
BOynOrGhgkj8Bfk4hsFENAQYbnqqLSigUUkCNaBsAmNuH6U9EWywR1JIdxBVQOPDbIuTaj0tVAQbczNLkC5zftw

Private Key:
<OMITTED>

=======================================

$
```

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In order to support older browsers you may need to also get a GCM API key, but you don't need this in desktop Chrome 63 or higher.

Next, create a file called `index.js` that will contain your server. You'll need to `require()` and configure the web-push module with your VAPID keys. In the interest of simplicity, put the VAPID keys in the `PUBLIC_VAPID_KEY` and `PRIVATE_VAPID_KEY` environment variables.

```
const webpush = require('web-push');

const publicVapidKey = process.env.PUBLIC_VAPID_KEY;
const privateVapidKey = process.env.PRIVATE_VAPID_KEY;

// Replace with your email
webpush.setVapidDetails('mailto:val@karpov.io', publicVapidKey, privateVapidKey);
```

Next, add a `/subscribe` endpoint to your Express app. Your browser JavaScript will send an HTTP request to this endpoint with a `PushSubscription` object in the request body. You need the `PushSubscription` object in order to send a push notification via `webpush.sendNotification()`.

```
const app = express();

app.use(require('body-parser').json());

app.post('/subscribe', (req, res) => {
  const subscription = req.body;
  res.status(201).json({});
```

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```
  const payload = JSON.stringify({ title: 'test' });

  console.log(subscription);

  webpush.sendNotification(subscription, payload).catch(error => {
    console.error(error.stack);
  });
});
```

That's all you need on the server side. You can find the complete source on GitHub. Now, you need to create a client `client.js` and a service worker `worker.js`.

Client and Service Worker

First, in order to serve up your static assets to the client, use the `express-static` npm module to configure your Express app to serve static files from the top-level directory. Just make sure you put this `app.use()` call **after** your `/subscribe` route handler, otherwise Express will look for a `subscribe.html` file instead of using your route handler.

```
app.use(require('express-static')('./'));
```

Next, create an `index.html` file that will serve as an entry point for your application. The only part of this file that really matters is the `<script>` tag that pulls in the client-side JavaScript, the rest is a placeholder.

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```
<html>
  <head>
    <title>Push Demo</title>
    <script type="application/javascript" src="/client.js"></script>
  </head>

  <body>
    Service Worker Demo
  </body>
</html>
```

Now that you have an entry point, create a JavaScript file called `client.js`. This file will be responsible for telling the browser to initialize your service worker and making the HTTP request to `/subscribe`. The below example uses async/await, because if your browser supports service workers it should support async/await as well.

```
// Hard-coded, replace with your public key
const publicVapidKey = 'BOynOrGhgkj8Bfk4hsFENAQYbnqqLSigUUkCNaBsAmNuH6U9EWywR1JIdxBVQOP

if ('serviceWorker' in navigator) {
  console.log('Registering service worker');

  run().catch(error => console.error(error));
}

async function run() {
  console.log('Registering service worker');
  const registration = await navigator.serviceWorker.
    register('/worker.js', {scope: '/'});
  console.log('Registered service worker');

  console.log('Registering push');
```

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```
  const subscription = await registration.pushManager.
    subscribe({
      userVisibleOnly: true,
      // The `urlBase64ToUint8Array()` function is the same as in
      // https://www.npmjs.com/package/web-push#using-vapid-key-for-applicationserverke
      applicationServerKey: urlBase64ToUint8Array(publicVapidKey)
    });
  console.log('Registered push');

  console.log('Sending push');
  await fetch('/subscribe', {
    method: 'POST',
    body: JSON.stringify(subscription),
    headers: {
      'content-type': 'application/json'
    }
  });
  console.log('Sent push');
}
```

Finally, you need to implement the `worker.js` file that `client.js` loads. This is where your service worker logic lives. In a service worker, you get a 'push' event when your subscription receives a push notification.

```
console.log('Loaded service worker!');

self.addEventListener('push', ev => {
  const data = ev.data.json();
  console.log('Got push', data);
  self.registration.showNotification(data.title, {
    body: 'Hello, World!',
    icon: 'http://mongoosejs.com/docs/images/mongoose5_62x30_transparent.png'
```

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```
  });
});
```

And that's it! Start your server with the correct environment variables:

```
$ env PUBLIC_VAPID_KEY='OMITTED' env PRIVATE_VAPID_KEY='OMITTED' node .
```

Navigate to `http://localhost:3000` in Chrome, and you should see the below push notification!

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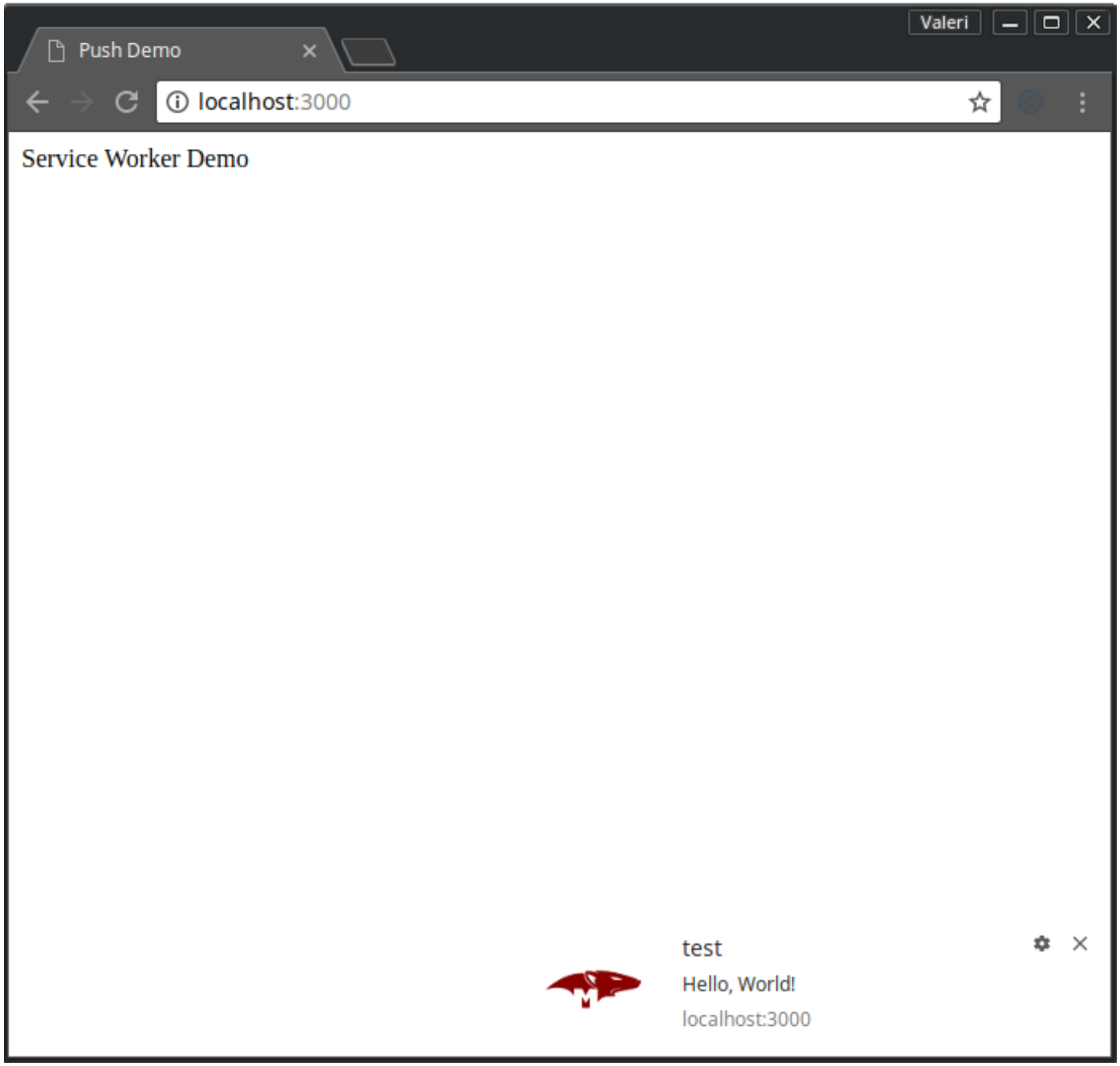

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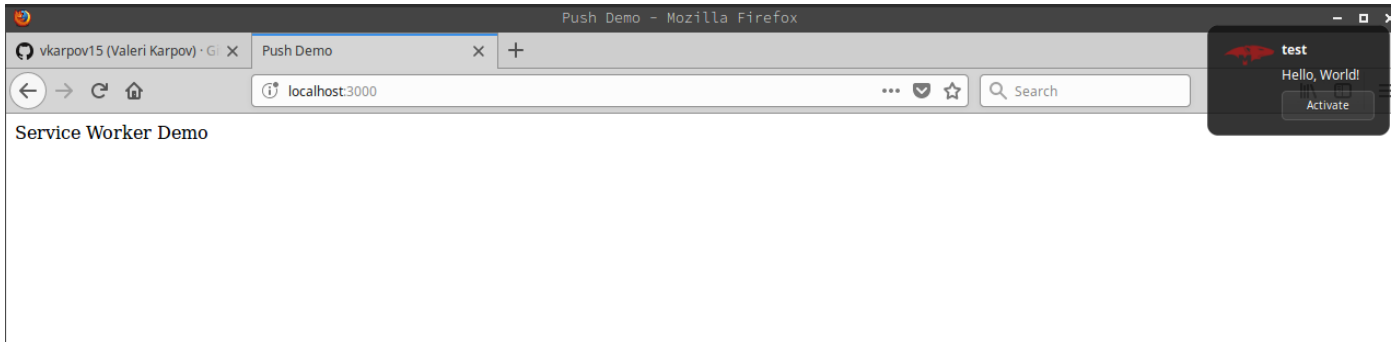
These notifications aren't just limited to Chrome, this same code works with Firefox as well.



Moving On

Web push is just one of numerous advantages service workers provide. With a single npm module, you can send push notifications to most modern browsers. Give service workers a shot next time you want to add push notifications to your web app!

Found a typo or error? Open up a pull request! This post is available as markdown on Github

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