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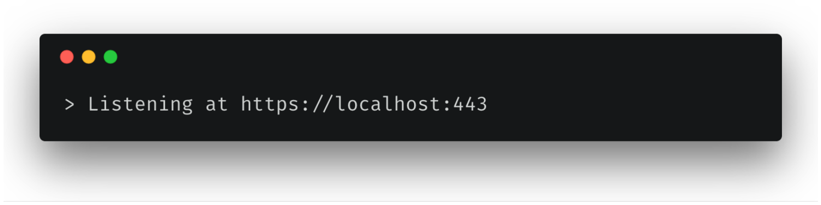
Building cool stuff with JavaScript at @GoPedalIndia
Jan 19 · 5 min read

How to get HTTPS working on your local development environment in 5 minutes

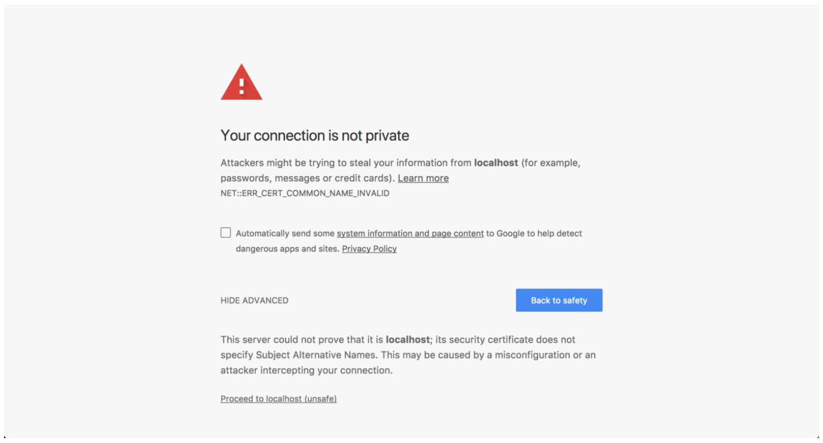


```
> Listening at https://localhost:443
```

Almost any website you visit today is protected by HTTPS. If yours isn't yet, it should be. Securing your server with HTTPS also means that you can't send requests to this server from one that isn't protected by HTTPS. This poses a problem for developers who use a local development environment because all of them run on `http://localhost` out-of-the-box.

At the startup I'm a part of, we decided to secure our AWS Elastic Load Balancer endpoints with HTTPS as part of a move to enhance security. I ran into a situation where my local development environment's requests to the server started getting rejected.

A quick Google search later, I found several articles like this, this or this one with detailed instructions on how I could implement HTTPS on `localhost`. None of these instructions seemed to work even after I followed them religiously. Chrome always threw a `NET::ERR_CERT_COMMON_NAME_INVALID` error at me.



Your connection is not private

Attackers might be trying to steal your information from **localhost** (for example, passwords, messages or credit cards). Learn more

NET::ERR_CERT_COMMON_NAME_INVALID

☐ Automatically send some system information and page content to Google to help detect dangerous apps and sites. Privacy Policy

This server could not prove that it is **localhost**; its security certificate does not specify Subject Alternative Names. This may be caused by a misconfiguration or an attacker intercepting your connection.

Proceed to localhost (unsafe)

The problem

All the detailed instructions I had found were correct for the time they were written. Not anymore.

After a ton of Googling, I discovered that the reason for my local certificate getting rejected was that Chrome had deprecated support for commonName matching in certificates, in effect, requiring a subjectAltName since January 2017.

The solution

We'll be using OpenSSL to generate all of our certificates.

Step 1: Root SSL certificate

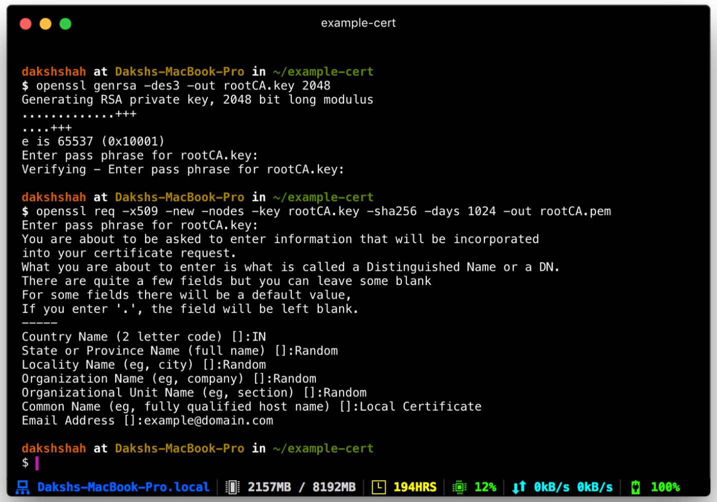
The first step is to create a Root Secure Sockets Layer (SSL) certificate. This root certificate can then be used to sign any number of certificates you might generate for individual domains. If you aren't familiar with the SSL ecosystem, this article from DNSimple does a good job of introducing Root SSL certificates.

Generate a RSA-2048 key and save it to a file `rootCA.key` . This file will be used as the key to generate the Root SSL certificate. You will be prompted for a pass phrase which you'll need to enter each time you use this particular key to generate a certificate.

```
openssl genrsa -des3 -out rootCA.key 2048
```

You can use the key you generated to create a new Root SSL certificate. Save it to a file named `rootCA.pem`. This certificate will have a validity of 1,024 days. Feel free to change it to any number of days you want. You'll also be prompted for other optional information.

```
openssl req -x509 -new -nodes -key rootCA.key -sha256 -days
1024 -out rootCA.pem
```



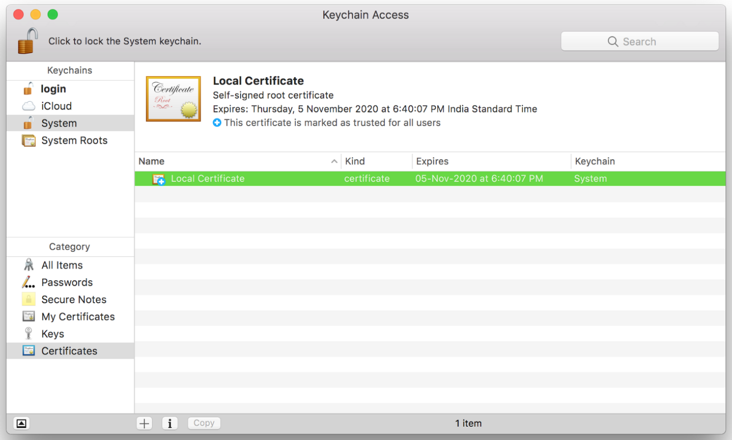
```
dakshshah at Dakshs-MacBook-Pro in ~/example-cert
$ openssl genrsa -des3 -out rootCA.key 2048
Generating RSA private key, 2048 bit long modulus
.............+++
....+++
e is 65537 (0x10001)
Enter pass phrase for rootCA.key:
Verifying - Enter pass phrase for rootCA.key:

dakshshah at Dakshs-MacBook-Pro in ~/example-cert
$ openssl req -x509 -new -nodes -key rootCA.key -sha256 -days 1024 -out rootCA.pem
Enter pass phrase for rootCA.key:
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) []:IN
State or Province Name (full name) []:Random
Locality Name (eg, city) []:Random
Organization Name (eg, company) []:Random
Organizational Unit Name (eg, section) []:Random
Common Name (eg, fully qualified host name) []:Local Certificate
Email Address []:example@domain.com

dakshshah at Dakshs-MacBook-Pro in ~/example-cert
$
Dakshs-MacBook-Pro.local | 2157MB / 8192MB | 194HRS | 12% | 0kB/s 0kB/s | 100%
```

Step 2: Trust the root SSL certificate

Before you can use the newly created Root SSL certificate to start issuing domain certificates, there's one more step. You need to to tell your Mac to trust your root certificate so all individual certificates issued by it are also trusted.

Open Keychain Access on your Mac and go to the Certificates category in your System keychain. Once there, import the `rootCA.pem` using File > Import Items. Double click the imported certificate and change the "When using this certificate:" dropdown to **Always Trust** in the Trust section.

Your certificate should look something like this inside Keychain Access if you've correctly followed the instructions till now.



Local Certificate
Self-signed root certificate
Expires: Thursday, 5 November 2020 at 6:40:07 PM India Standard Time
This certificate is marked as trusted for all users

Name	Kind	Expires	Keychain
Local Certificate	certificate	05-Nov-2020 at 6:40:07 PM	System

Step 2: Domain SSL certificate

The root SSL certificate can now be used to issue a certificate specifically for your local development environment located at `localhost` .

Create a new OpenSSL configuration file `server.csr.cnf` so you can import these settings when creating a certificate instead of entering them on the command line.

```
[req]
default_bits = 2048
prompt = no
default_md = sha256
distinguished_name = dn

[dn]
C=US
ST=RandomState
L=RandomCity
O=RandomOrganization
OU=RandomOrganizationUnit
emailAddress=hello@example.com
CN = localhost
```

Create a `v3.ext` file in order to create a X509 v3 certificate. Notice how we're specifying `subjectAltName` here.

```
authorityKeyIdentifier=keyid,issuer
basicConstraints=CA:FALSE
keyUsage = digitalSignature, nonRepudiation,
keyEncipherment, dataEncipherment
```

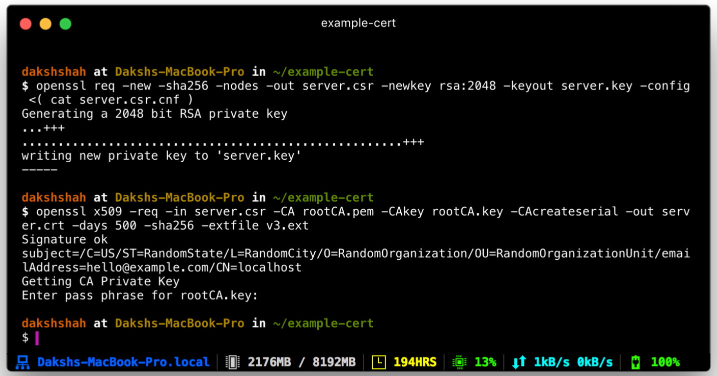
```
subjectAltName = @alt_names

[alt_names]
DNS.1 = localhost
```

Create a certificate key for `localhost` using the configuration settings stored in `server.csr.cnf`. This key is stored in `server.key`.

```
openssl req -new -sha256 -nodes -out server.csr -newkey
rsa:2048 -keyout server.key -config <( cat server.csr.cnf )
```

A certificate signing request is issued via the root SSL certificate we created earlier to create a domain certificate for `localhost`. The output is a certificate file called `server.crt`.

```
openssl x509 -req -in server.csr -CA rootCA.pem -CAkey
rootCA.key -CAcreateserial -out server.crt -days 500 -sha256
-extfile v3.ext
```



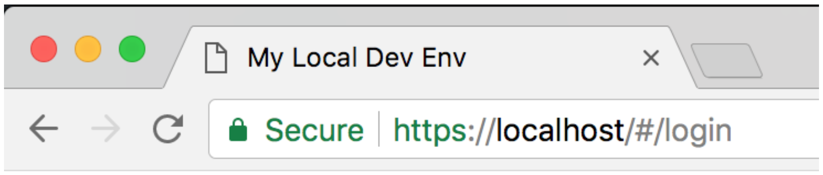
```
example-cert

dakshshah at Dakshs-MacBook-Pro in ~/example-cert
$ openssl req -new -sha256 -nodes -out server.csr -newkey rsa:2048 -keyout server.key -config
 <( cat server.csr.cnf )
Generating a 2048 bit RSA private key
...+++
.....................................................+++
writing new private key to 'server.key'
-----

dakshshah at Dakshs-MacBook-Pro in ~/example-cert
$ openssl x509 -req -in server.csr -CA rootCA.pem -CAkey rootCA.key -CAcreateserial -out serv
er.crt -days 500 -sha256 -extfile v3.ext
Signature ok
subject=/C=US/ST=RandomState/L=RandomCity/O=RandomOrganization/OU=RandomOrganizationUnit/emai
lAddress=hello@example.com/CN=localhost
Getting CA Private Key
Enter pass phrase for rootCA.key:

dakshshah at Dakshs-MacBook-Pro in ~/example-cert
$
Dakshs-MacBook-Pro.local | 2176MB / 8192MB | 194HRS | 13% | 1kB/s 0kB/s | 100%
```

Use your new SSL certificate

You're now ready to secure your `localhost` with HTTPS. Move the `server.key` and `server.crt` files to an accessible location on your server and include them when starting your server.

In an Express app written in Node.js, here's how you would do it. Make sure you do this only for your local environment. **Do not use this in**

production.



I hope you found this tutorial useful. If you're not comfortable with running the commands given here by yourself, I've created a set of handy scripts you can run quickly to generate the certificates for you. More details can be found on the GitHub repo.

I love helping fellow web developers. Follow me on Twitter to let me know if you have any suggestions or feedback.