Implement Secure Apache Web Server On Cloud

(Secure Apache Web Server Using Third Party Certificates)

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www.linuxexpert.in

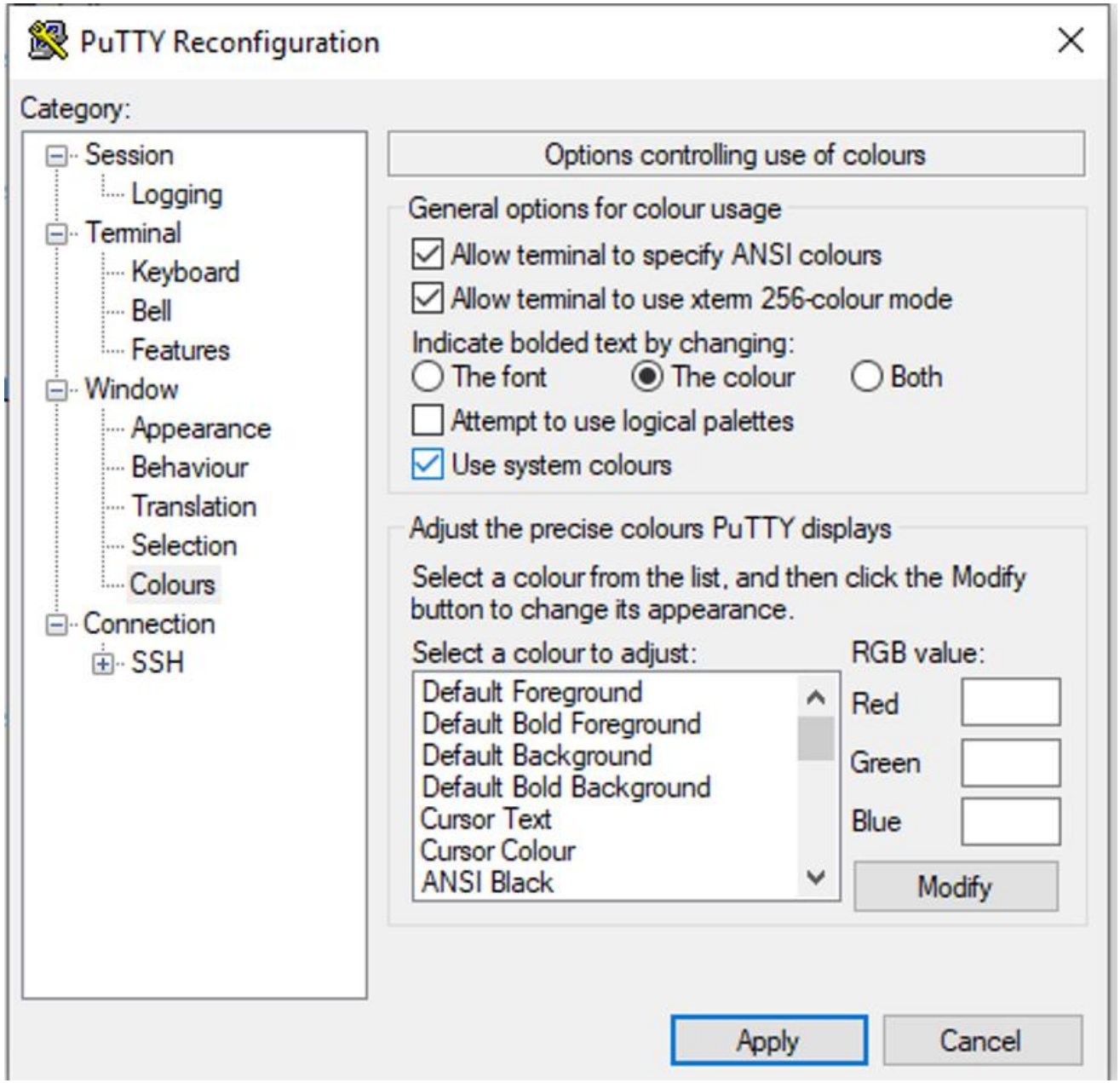
Understand Apache Directory/File Structure

```
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# pwd
/home/ec2-user
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# cd
[root@ip-172-31-10-197 ~]#
[root@ip-172-31-10-197 ~]# tree /etc/httpd/
bash: tree: command not found
[root@ip-172-31-10-197 ~]#
[root@ip-172-31-10-197 ~]# yum -q -y install tree
[root@ip-172-31-10-197 ~]#
```

Understand Apache Directory/File Structure

```
[root@ip-172-31-10-197 ~]# tree /etc/httpd/
/etc/httpd/
├── conf
│   ├── httpd.conf
│   └── magic
├── conf.d
│   ├── autoindex.conf
│   ├── README
│   ├── userdir.conf
│   └── welcome.conf
├── conf.modules.d
│   ├── 00-base.conf
│   ├── 00-dav.conf
│   ├── 00-lua.conf
│   ├── 00-mpm.conf
│   ├── 00-optional.conf
│   ├── 00-proxy.conf
│   ├── 00-systemd.conf
│   ├── 01-cgi.conf
│   ├── 10-h2.conf
│   ├── 10-proxy_h2.conf
│   └── README
├── logs -> ../../var/log/httpd
├── modules -> ../../usr/lib64/httpd/modules
├── run -> /run/httpd
```

Change Color Settings in Putty



Check and Install Required Packages

```
[root@ip-172-31-10-197 ~]# rpm -q openssl
openssl-1.0.2k-19.amzn2.0.6.x86_64
[root@ip-172-31-10-197 ~]#
[root@ip-172-31-10-197 ~]# rpm -q mod_ssl
package mod_ssl is not installed
[root@ip-172-31-10-197 ~]#
[root@ip-172-31-10-197 ~]# yum -q install mod_ssl

================================================================================
 Package          Arch          Version                    Repository        Size
================================================================================
Installing:
 mod_ssl          x86_64        1:2.4.46-1.amzn2           amzn2-core       115 k
Installing for dependencies:
 libtalloc        x86_64        2.1.16-1.amzn2             amzn2-core        42 k
 sscg             x86_64        2.3.3-2.amzn2.0.1          amzn2-core        51 k

Transaction Summary
================================================================================
Install  1 Package (+2 Dependent packages)

Is this ok [y/d/N]: y
[root@ip-172-31-10-197 ~]# rpm -q mod_ssl
mod_ssl-2.4.46-1.amzn2.x86_64
```

Location of Critical Files Such As “ssl.conf”

```
[root@ip-172-31-10-197 ~]# tree /etc/httpd/
/etc/httpd/
├── conf
│   ├── httpd.conf
│   └── magic
├── conf.d
│   ├── autoindex.conf
│   ├── README
│   ├── ssl.conf
│   ├── userdir.conf
│   └── welcome.conf
├── conf.modules.d
│   ├── 00-base.conf
│   ├── 00-dav.conf
│   ├── 00-lua.conf
│   ├── 00-mpm.conf
│   ├── 00-optional.conf
│   ├── 00-proxy.conf
│   ├── 00-ssl.conf
```

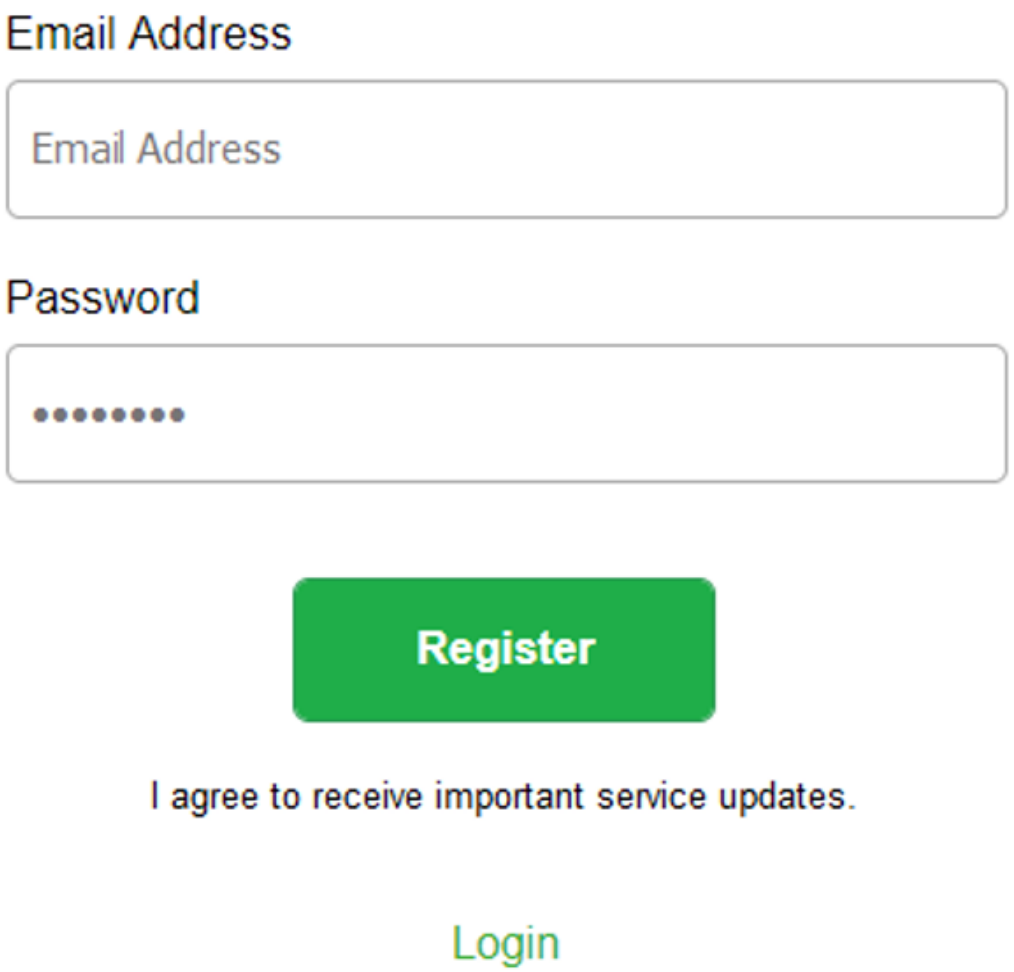
Location Of SSL Certificate Files

```
[root@ip-172-31-10-197 ~]#
[root@ip-172-31-10-197 ~]# cat /etc/httpd/conf.d/ssl.conf |grep ^SSLCertificate
SSLCertificateFile /etc/pki/tls/certs/localhost.crt
SSLCertificateKeyFile /etc/pki/tls/private/localhost.key
[root@ip-172-31-10-197 ~]#
[root@ip-172-31-10-197 ~]# cat /etc/httpd/conf.d/ssl.conf |grep ^#SSLCertificate
#SSLCertificateChainFile /etc/pki/tls/certs/server-chain.crt
[root@ip-172-31-10-197 ~]#
```

Location Of SSL Certificate Files

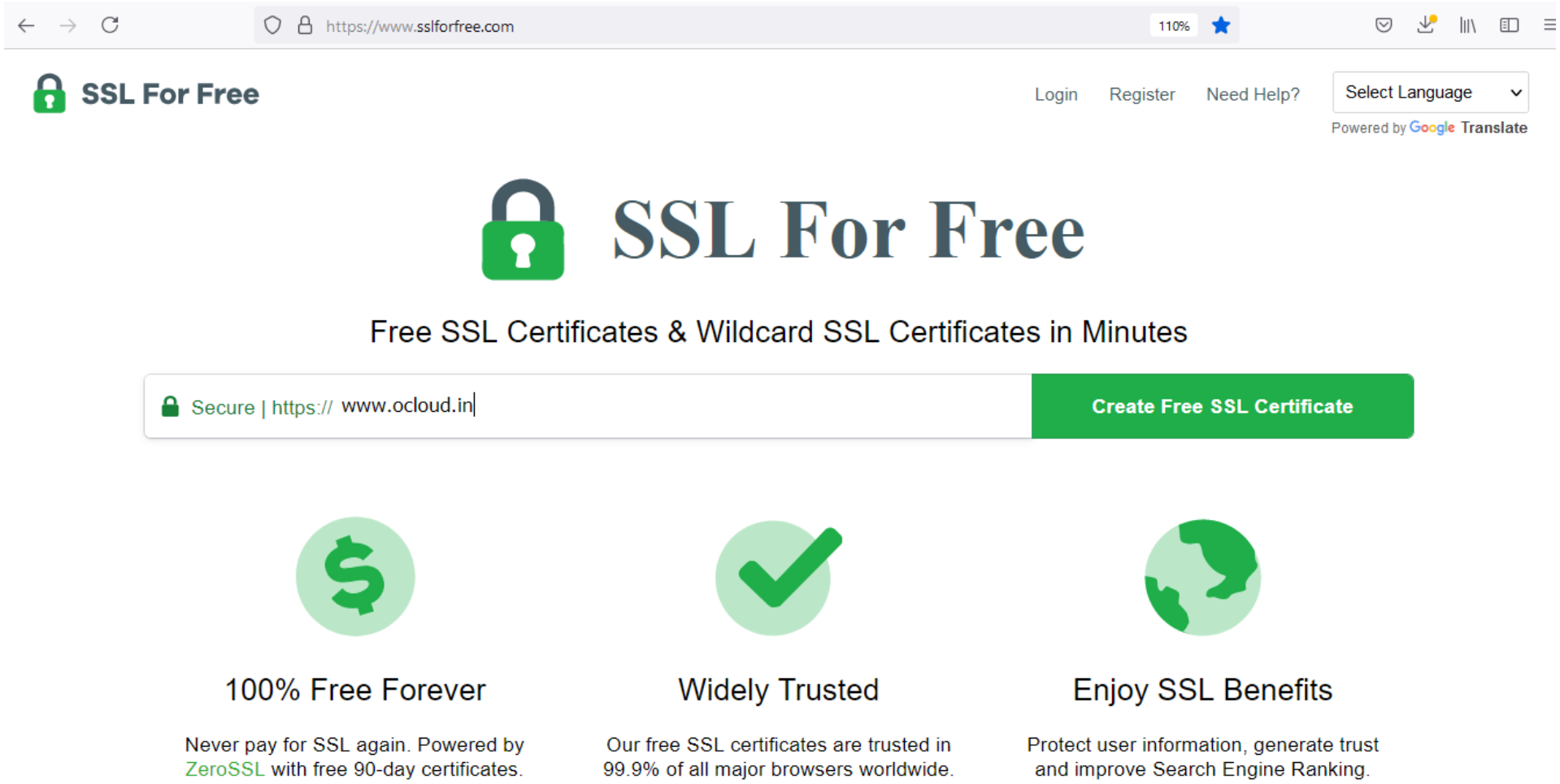
```
[root@ip-172-31-10-197 ~]# ls -l /etc/pki/tls/certs
total 12
lrwxrwxrwx 1 root root   49 Jun  3 20:19 ca-bundle.crt -> /etc/pki/ca-trust/extracted/pem/
tls-ca-bundle.pem
lrwxrwxrwx 1 root root   55 Jun  3 20:19 ca-bundle.trust.crt -> /etc/pki/ca-trust/extracte
d/openssl/ca-bundle.trust.crt
-rwxr-xr-x 1 root root  610 Feb 18 20:24 make-dummy-cert
-rw-r--r-- 1 root root 2516 Feb 18 20:24 Makefile
-rwxr-xr-x 1 root root  829 Feb 18 20:24 renew-dummy-cert
[root@ip-172-31-10-197 ~]#
[root@ip-172-31-10-197 ~]# ls -l /etc/pki/tls/private
total 0
```

Register On www.sslforfree.com For Free Certificate



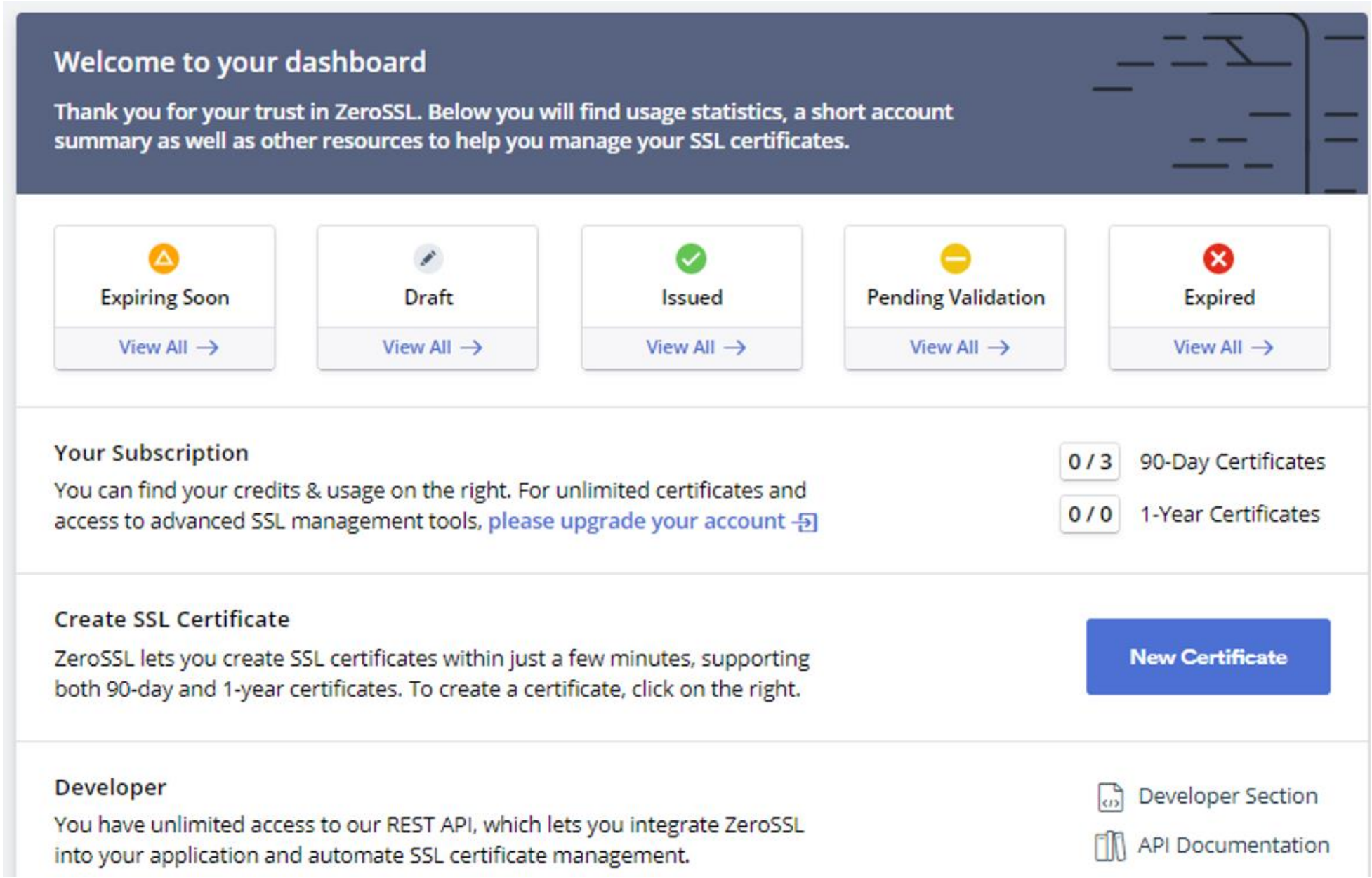
Register with your email address and use some strong password

Specify Domain For Free Certificate

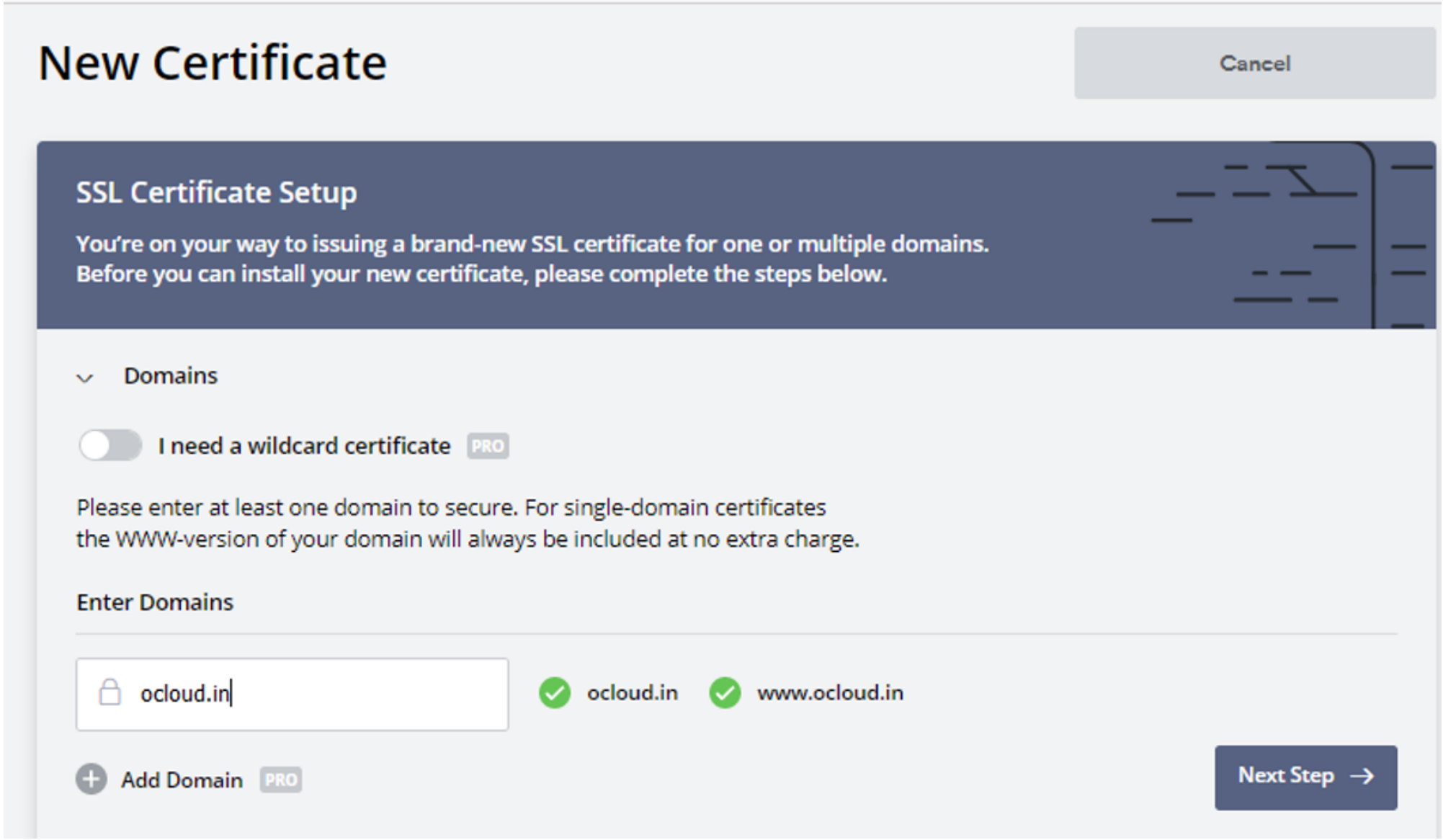


Specify domain for which you want to get certificate.

Certificate Dashboard

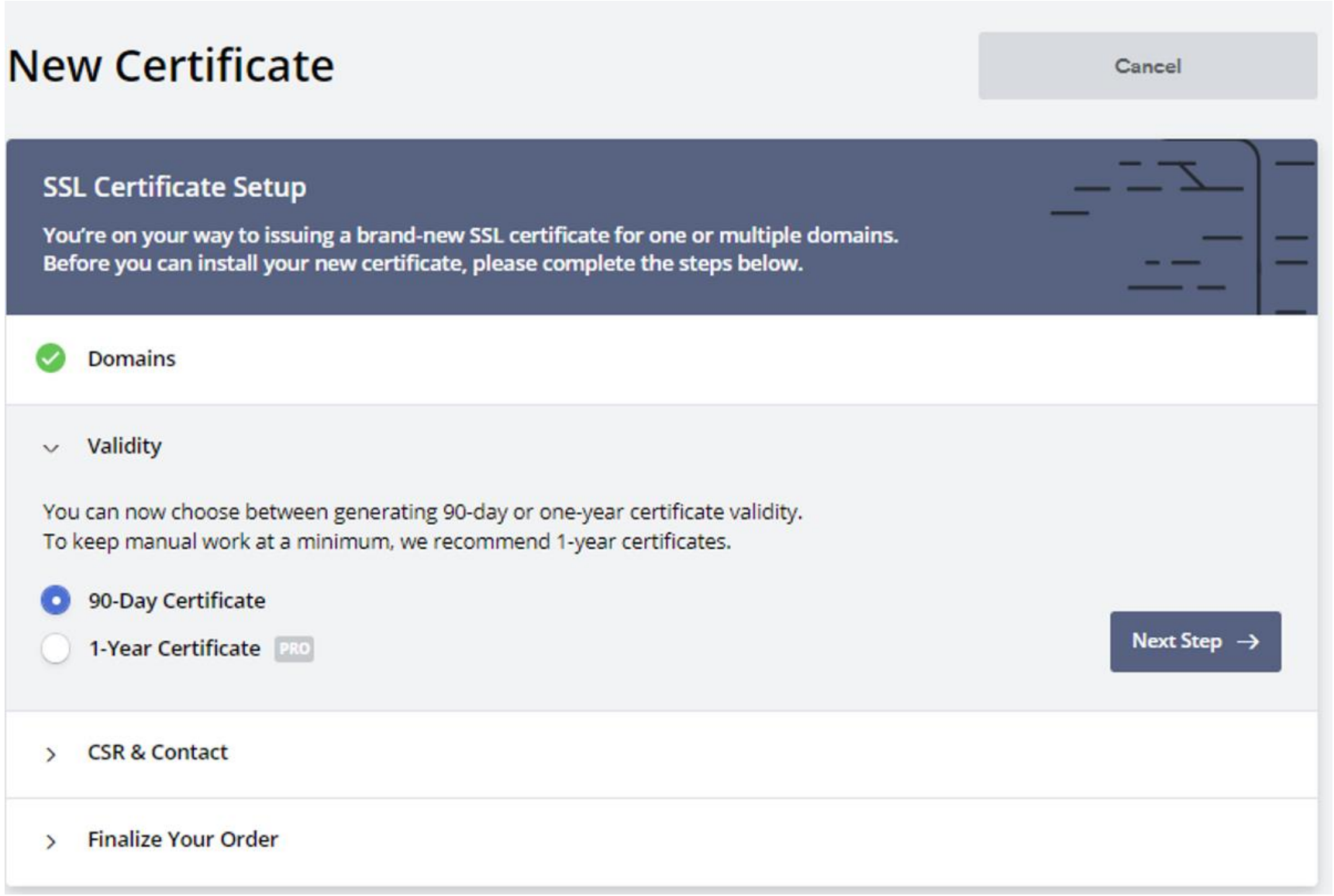


Create New Certificate



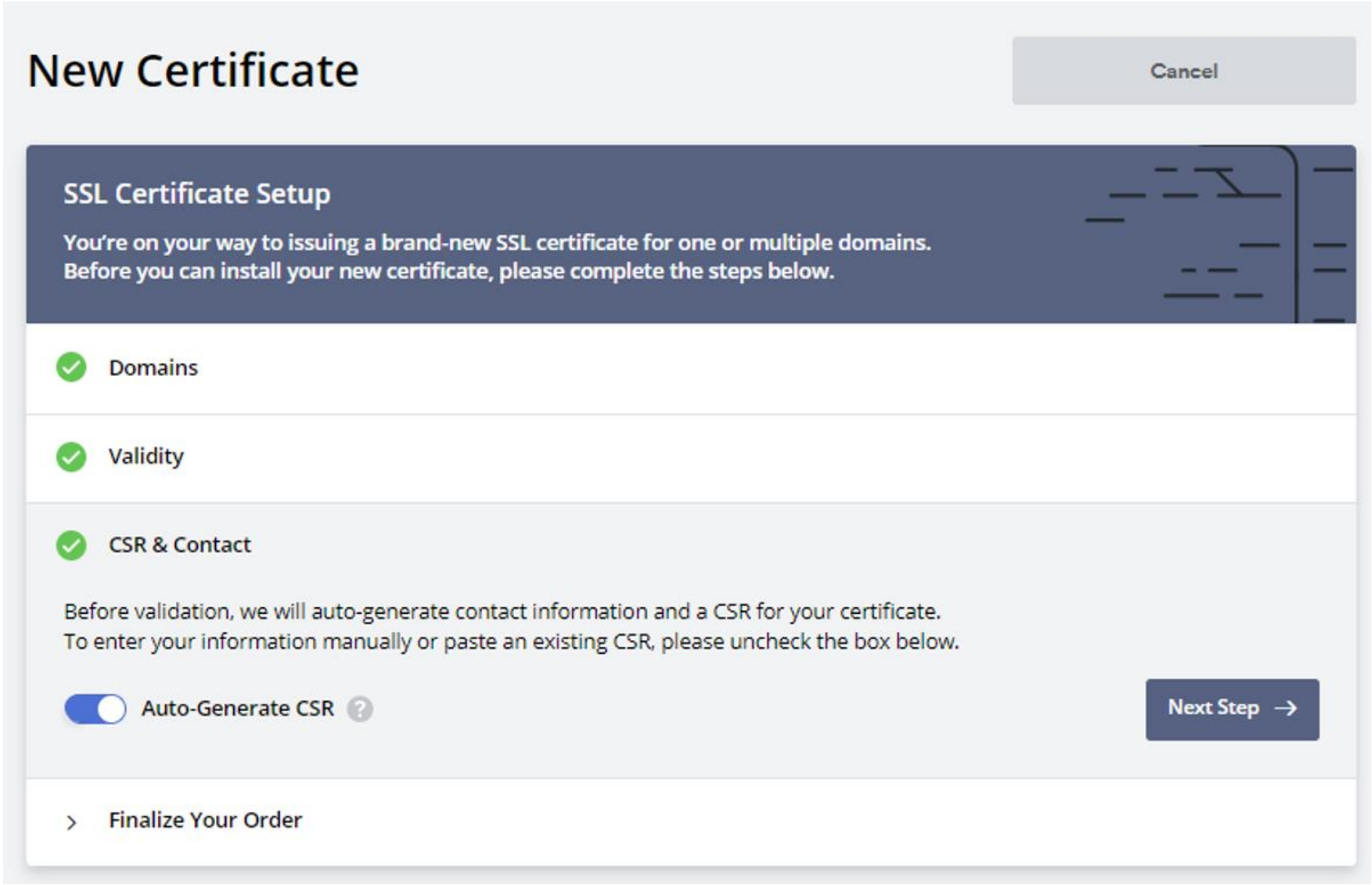
Specify domain for which you want to get certificate.

Create New Certificate



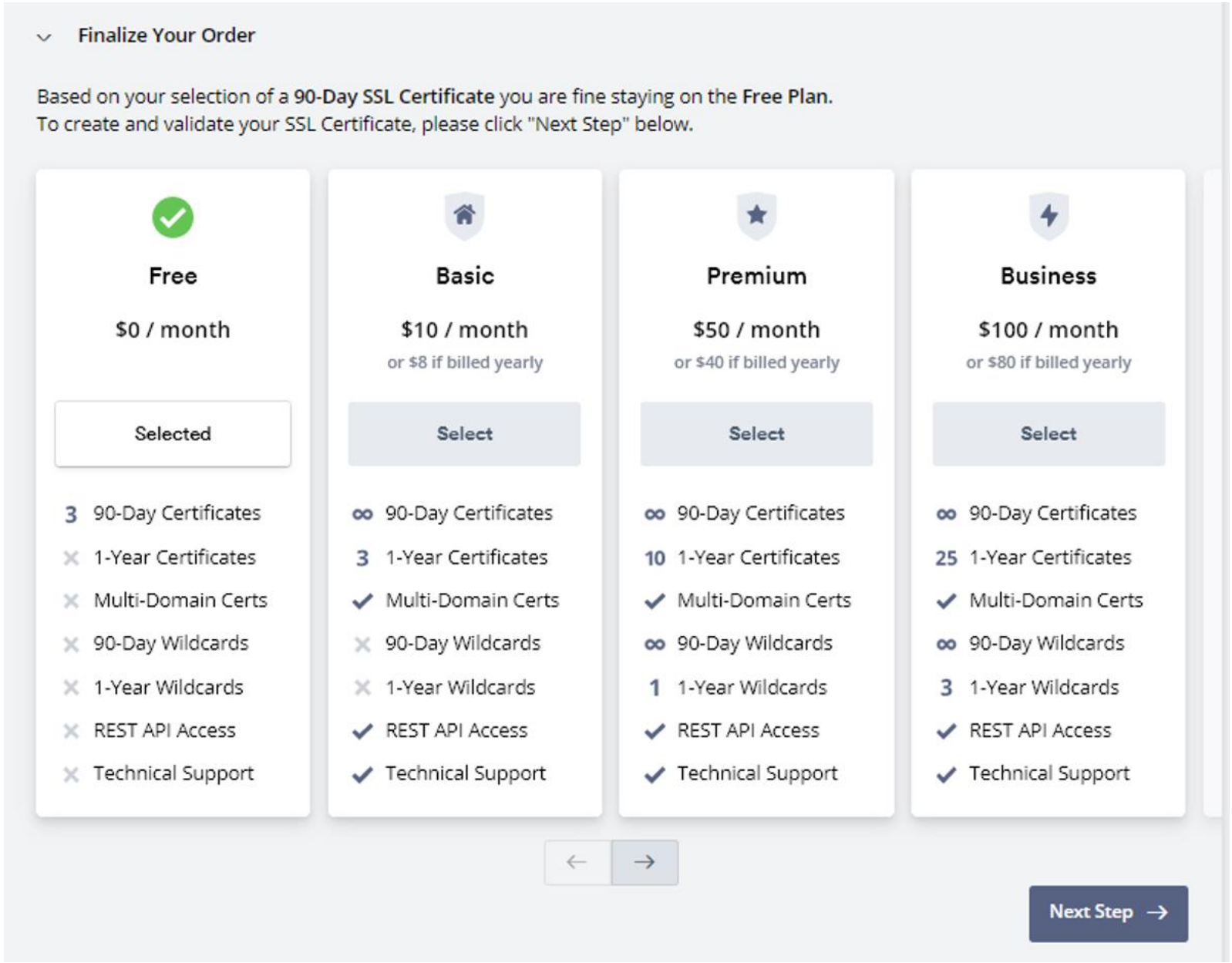
Specify validity period.

Create New Certificate



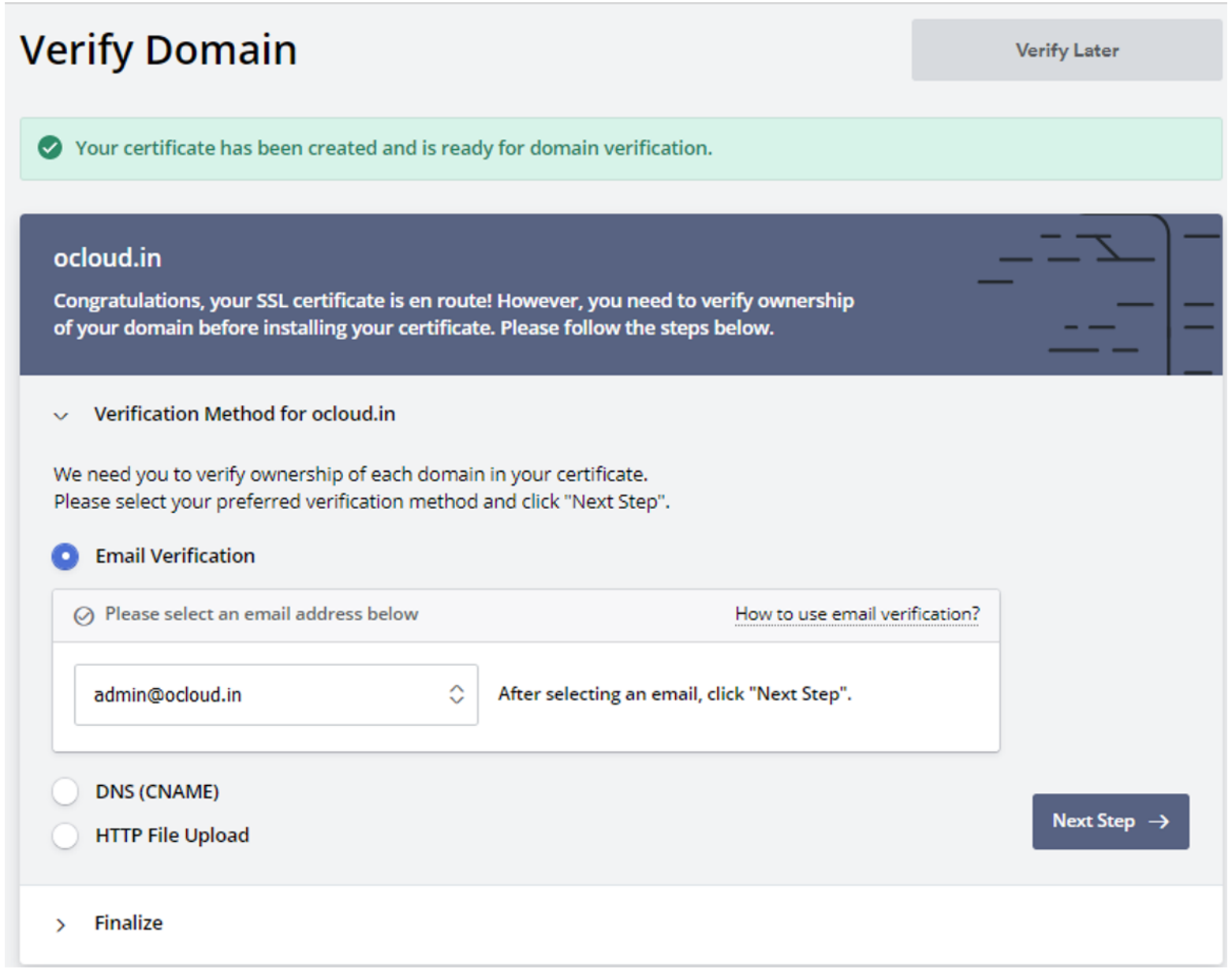
Auto generate CSR

Create New Certificate



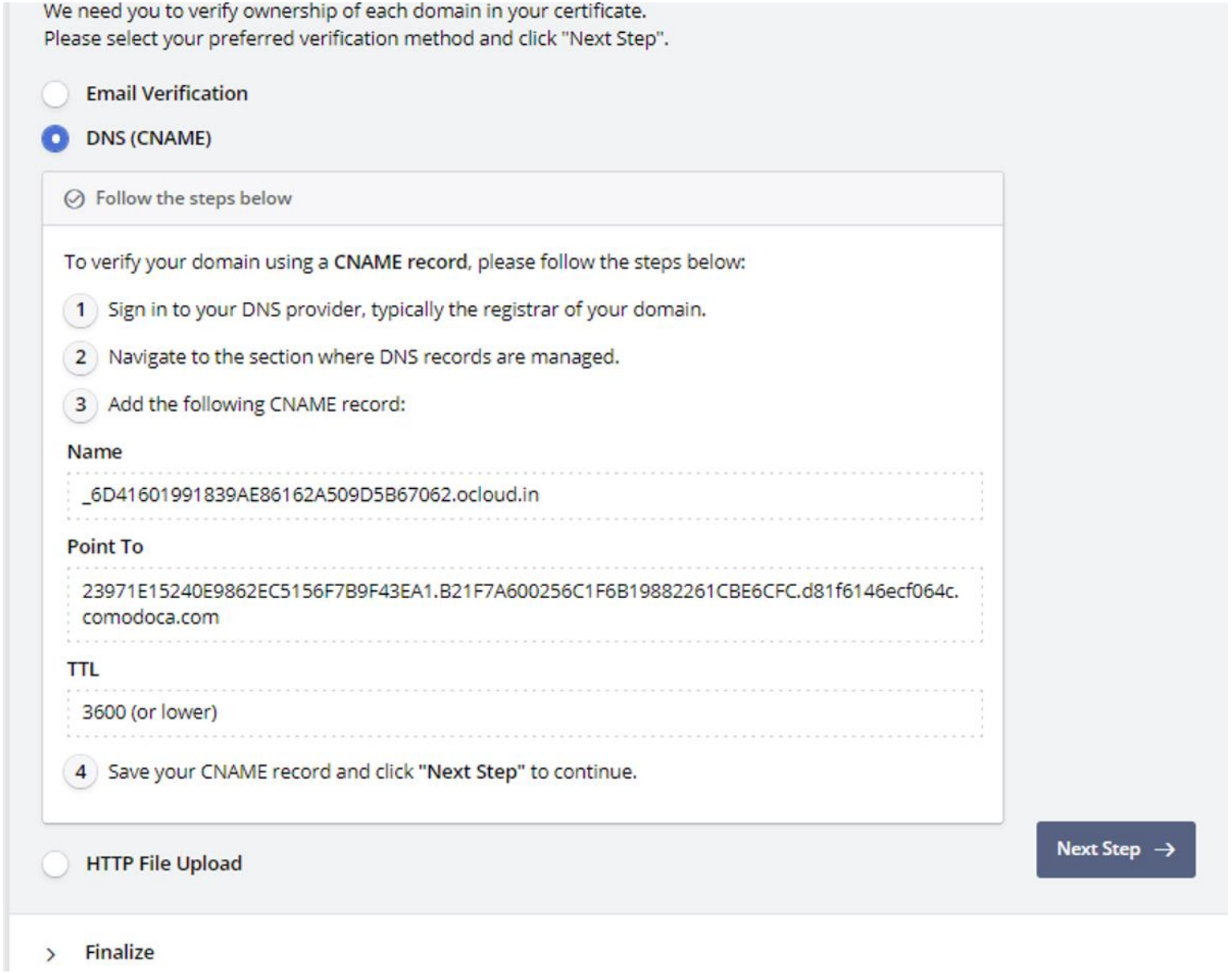
Select Free Plan

Choose Domain Verification Method



Select domain verification Method.

Choose Domain Verification Method



Select “DNS (CNAME)” as domain verification Method.

Add Record Using GoDaddy DNS Manager

Records

Last updated 18-06-2021 22:29 PM

Type	Name	Value	TTL
A	@	52.15.85.32	1 Hour
A	www	52.15.85.32	1 Hour
NS	@	ns03.domaincontrol.com	1 Hour
NS	@	ns04.domaincontrol.com	1 Hour
SOA	@	Primary nameserver: ns03.domaincontrol.co...	1 Hour

Type *
CNAME

Host *
162A509D5B67062.ocloud.in

Points to *
'6146ecf064c.comodoca.com

TTL *
1 Hour

Save Cancel

Add Record Using GoDaddy DNS Manager

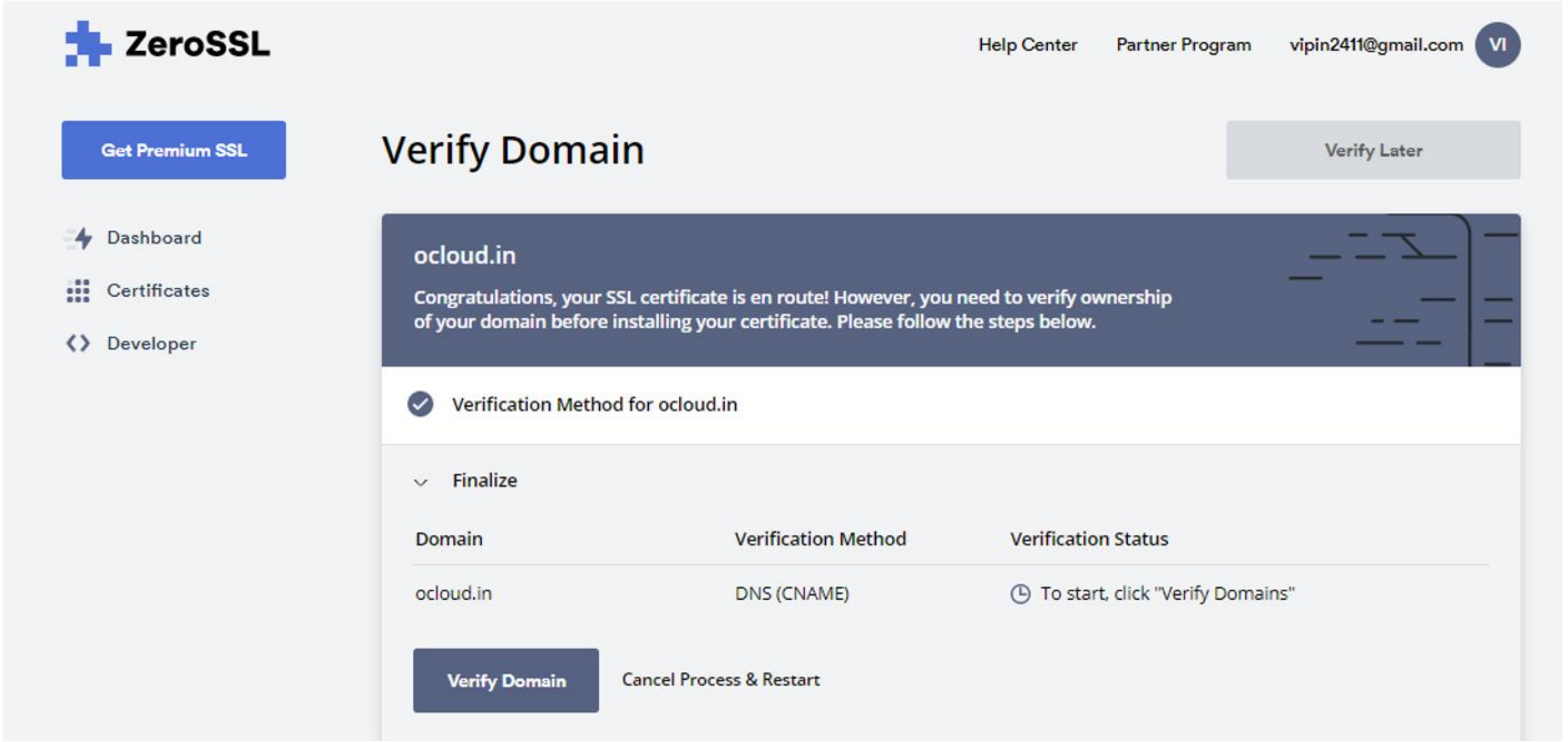
Records

Last updated 19-06-2021 11:08 AM

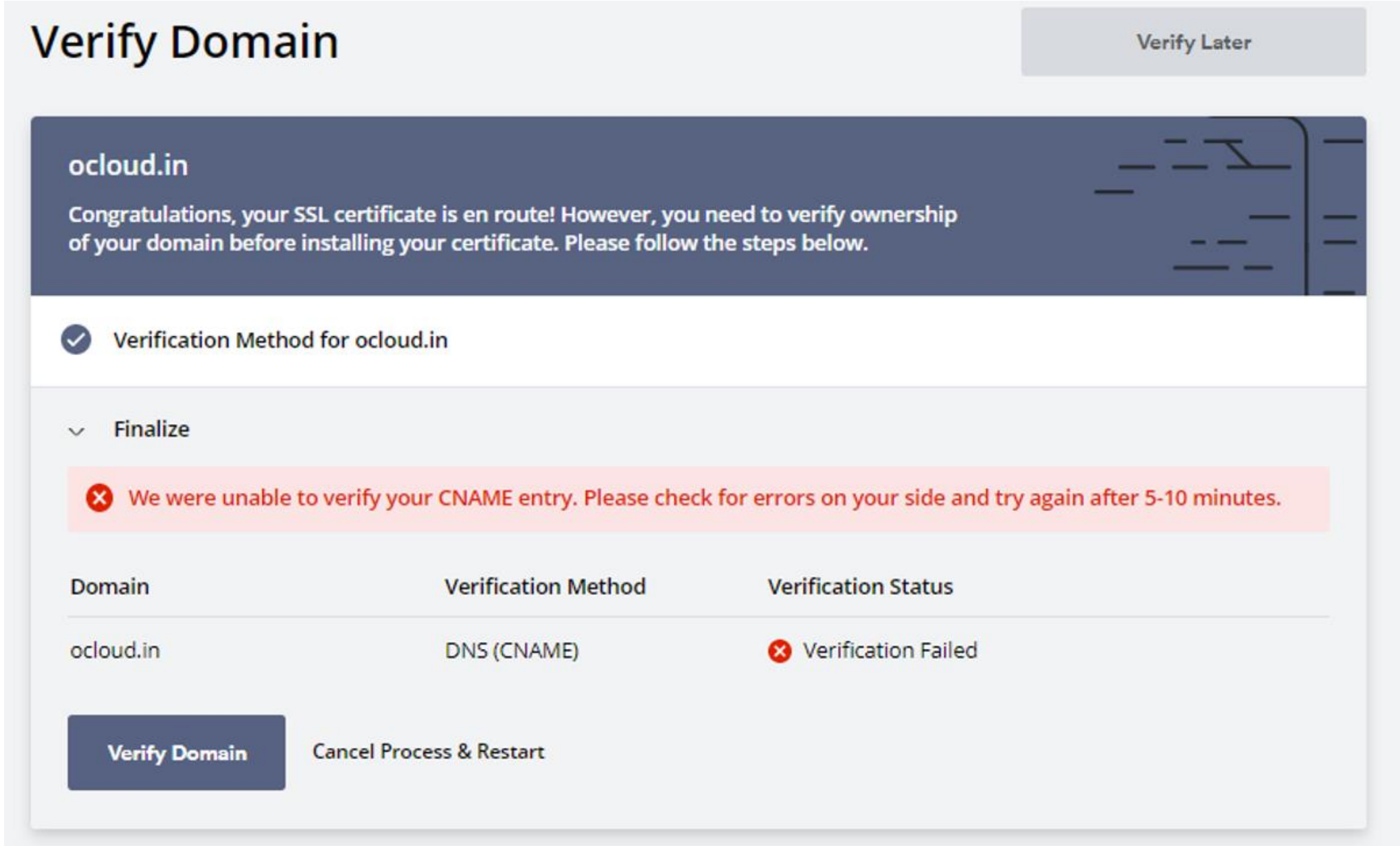
Type	Name	Value	TTL	
A	@	52.15.85.32	1 Hour	
A	www	52.15.85.32	1 Hour	
NS	@	ns03.domaincontrol.com	1 Hour	
NS	@	ns04.domaincontrol.com	1 Hour	
SOA	@	Primary nameserver: ns03.domaincontrol.co...	1 Hour	
CNAME	_6d41601991839ae86...	23971e15240e9862ec5156f7b9f43ea1.b21f7a...	1 Hour	

ADD

Verify Domain



Troubleshoot Domain Verification



Troubleshoot Domain Verification

Last updated 19-06-2021 11:17 AM

Type	Name	Value	TTL
A	@	52.15.85.32	1 Hour
A	www	52.15.85.32	1 Hour
NS	@	ns03.domaincontrol.com	1 Hour
NS	@	ns04.domaincontrol.com	1 Hour
SOA	@	Primary nameserver: ns03.domaincontrol.co...	1 Hour

CNAME

Host *

)1839ae86162a509d5b67062

Points to *

23971e15240e9862ec5156f7t

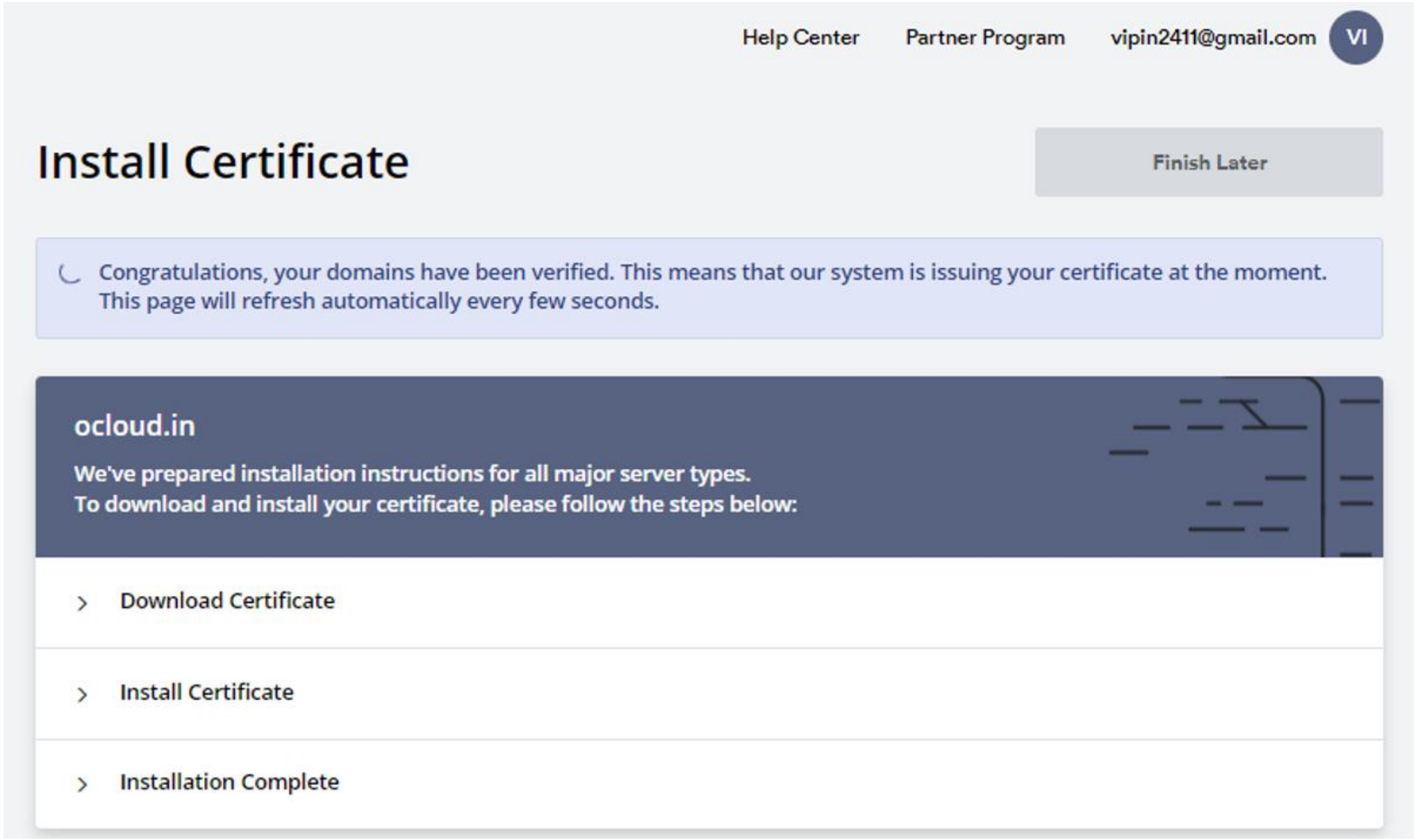
TTL *

1 Hour

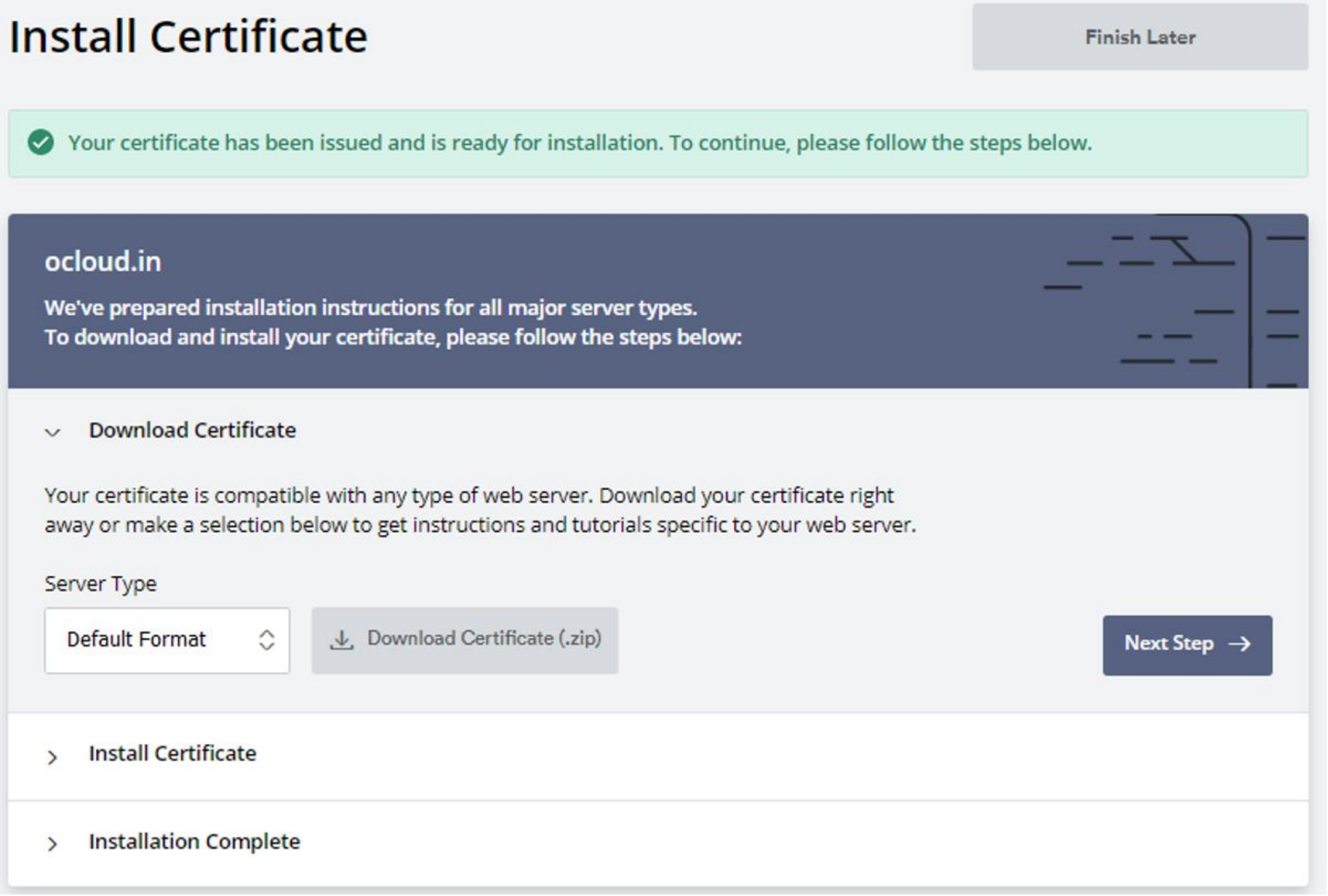
Save

Cancel

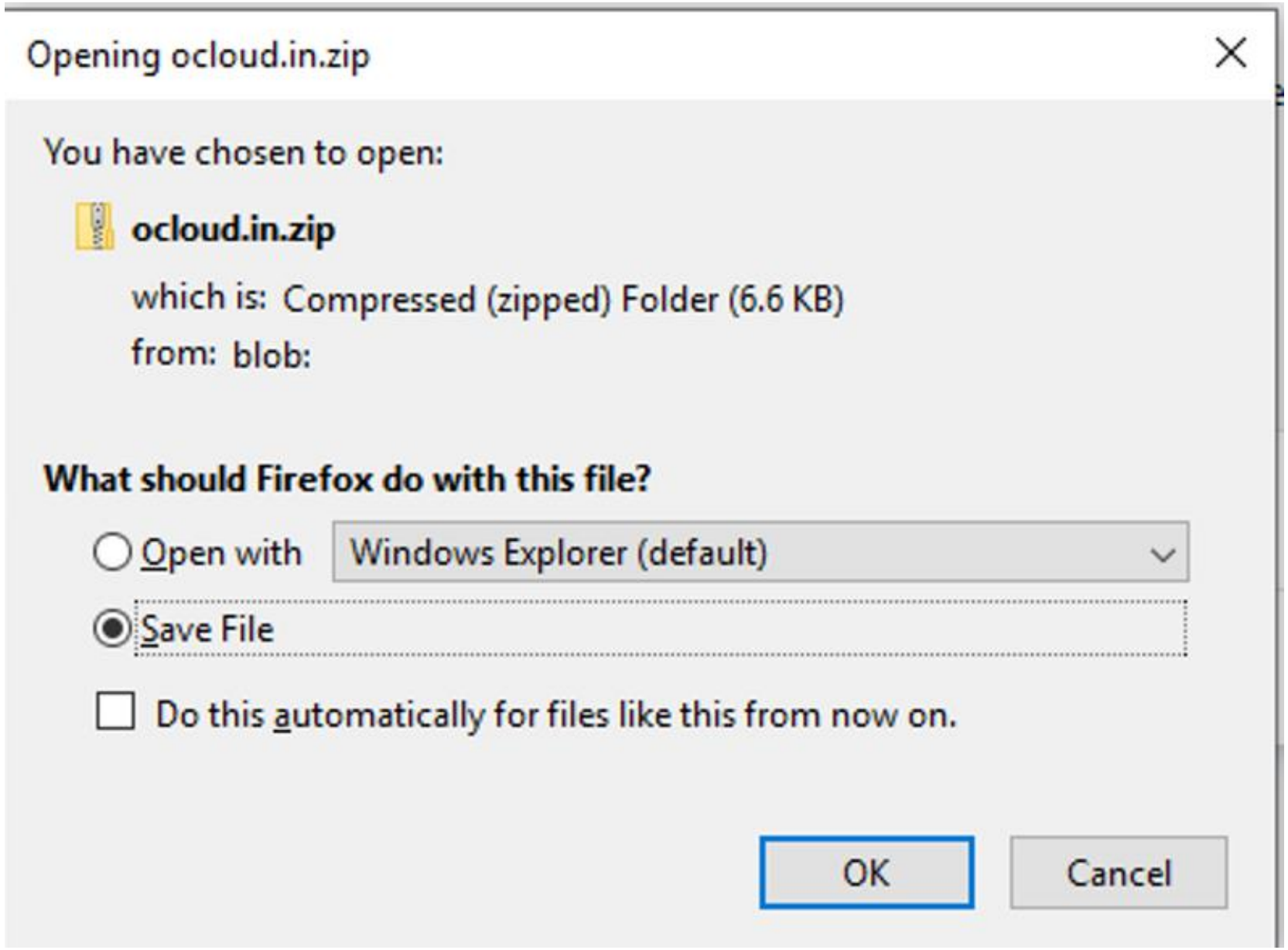
Troubleshoot Domain Verification



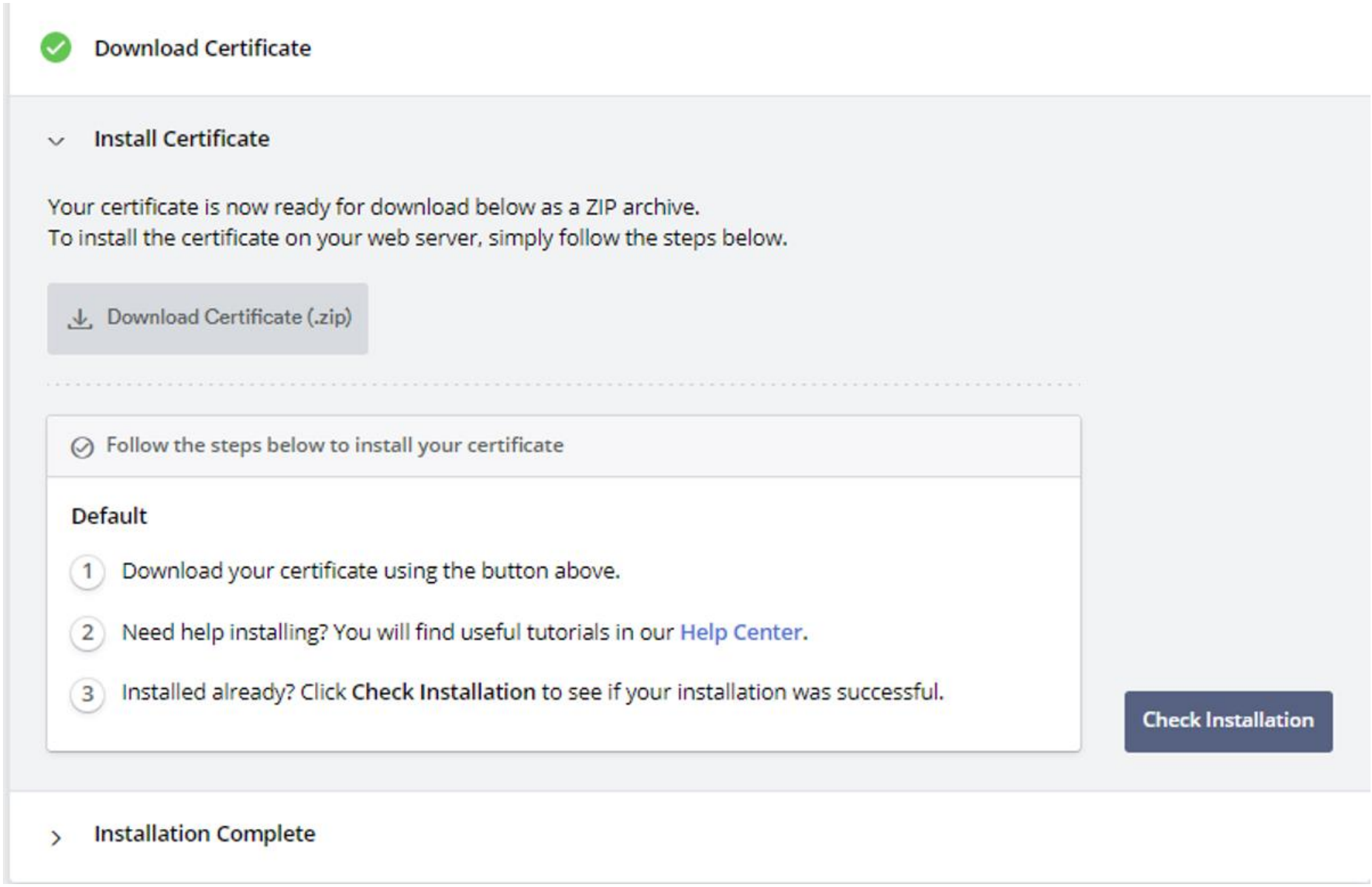
Install Certificate



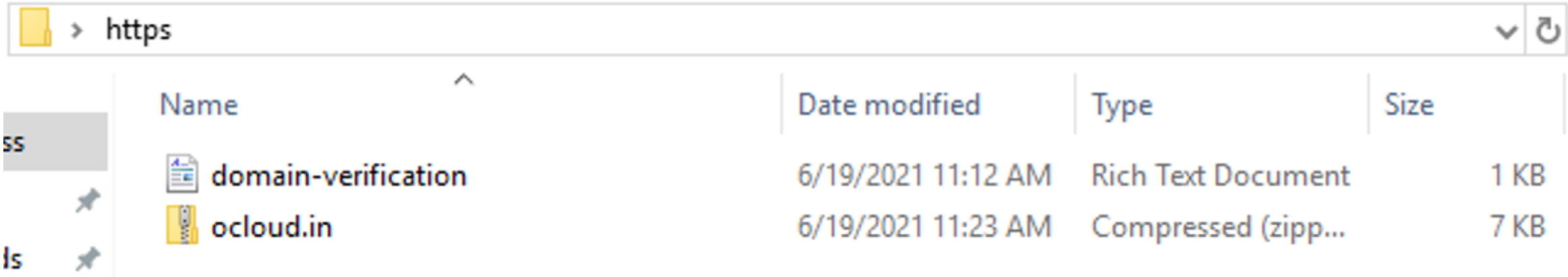
Download Certificate



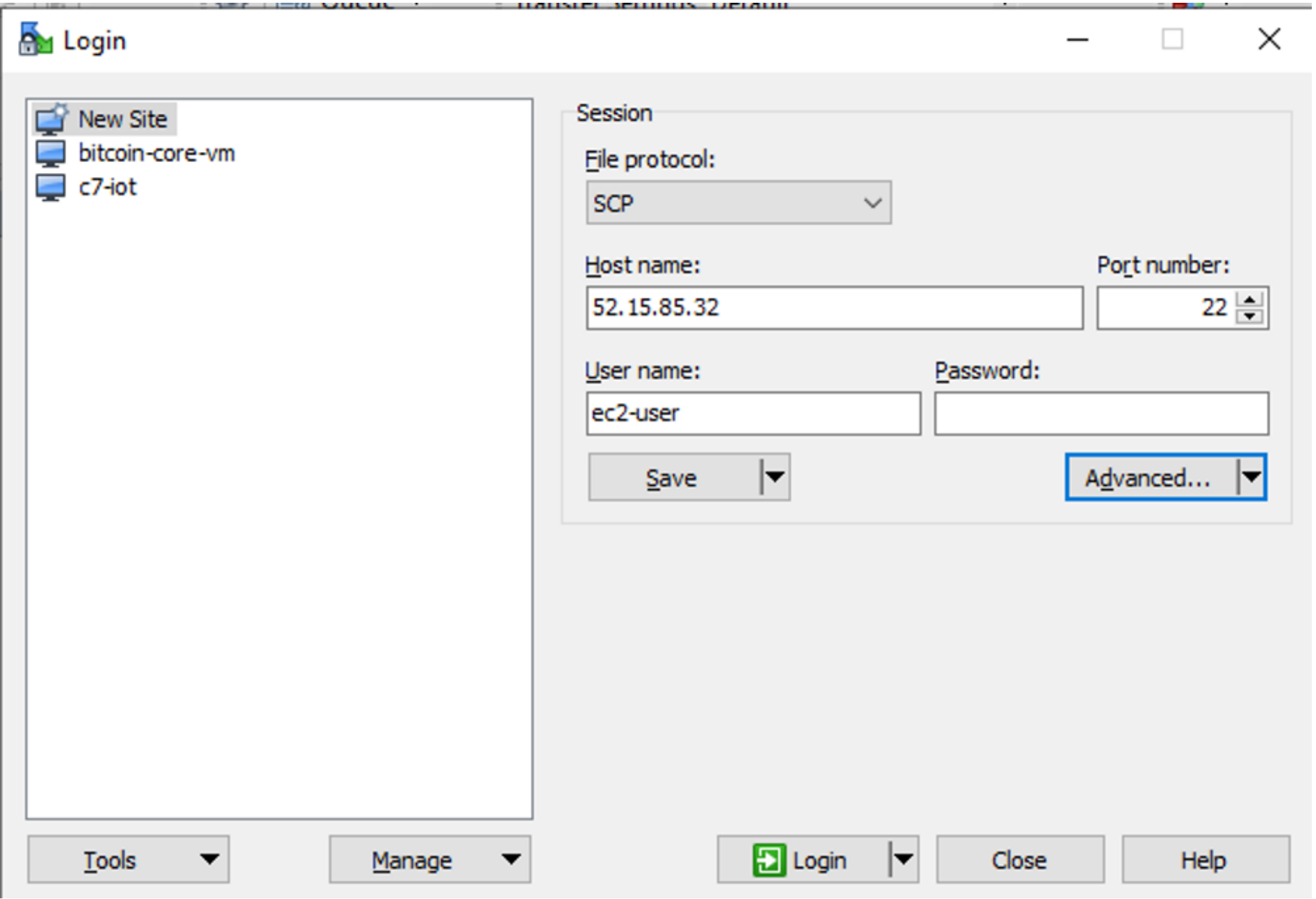
Download Certificate



Certificate Installation Hands On

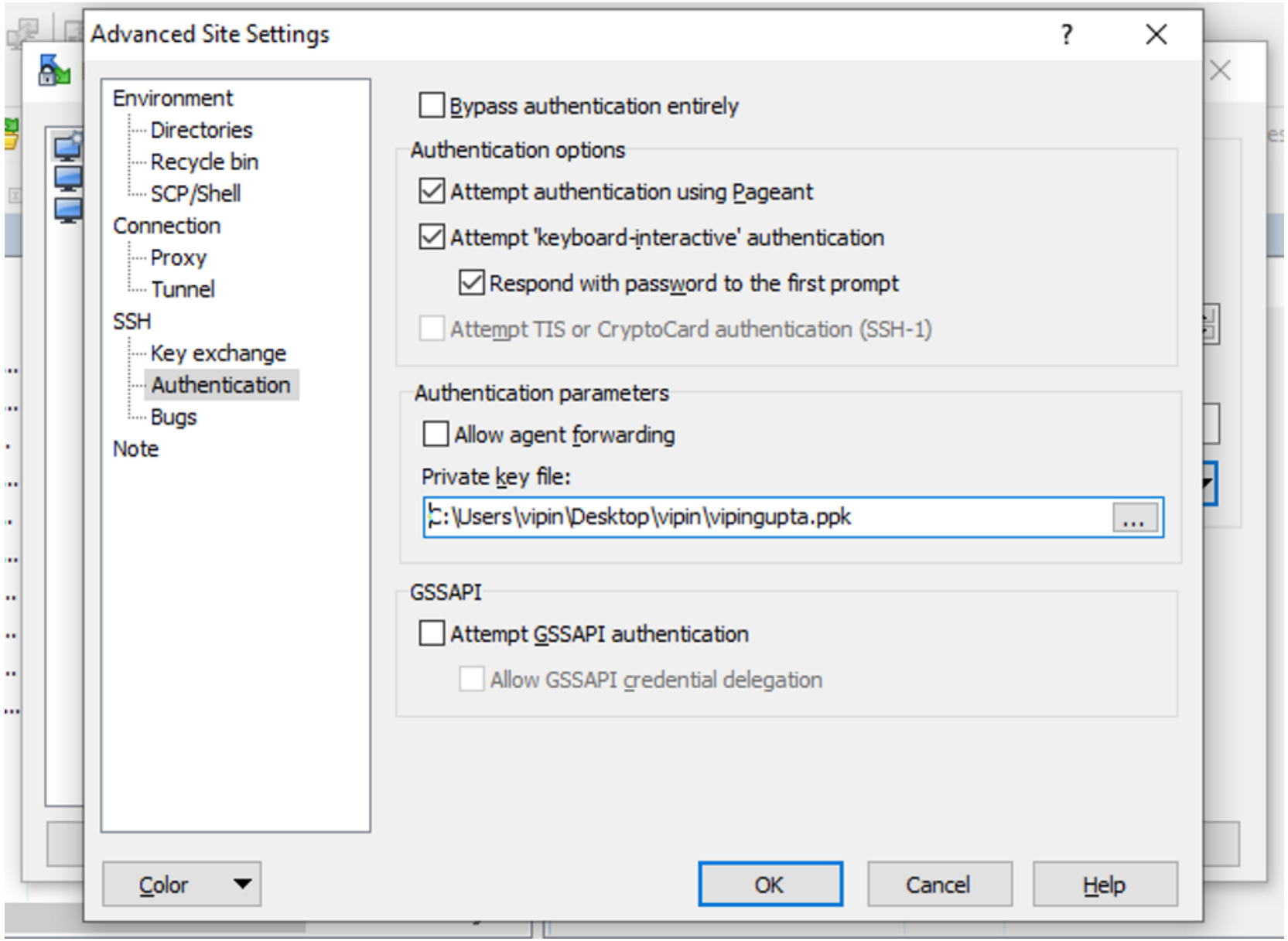


Certificate Installation Hands On



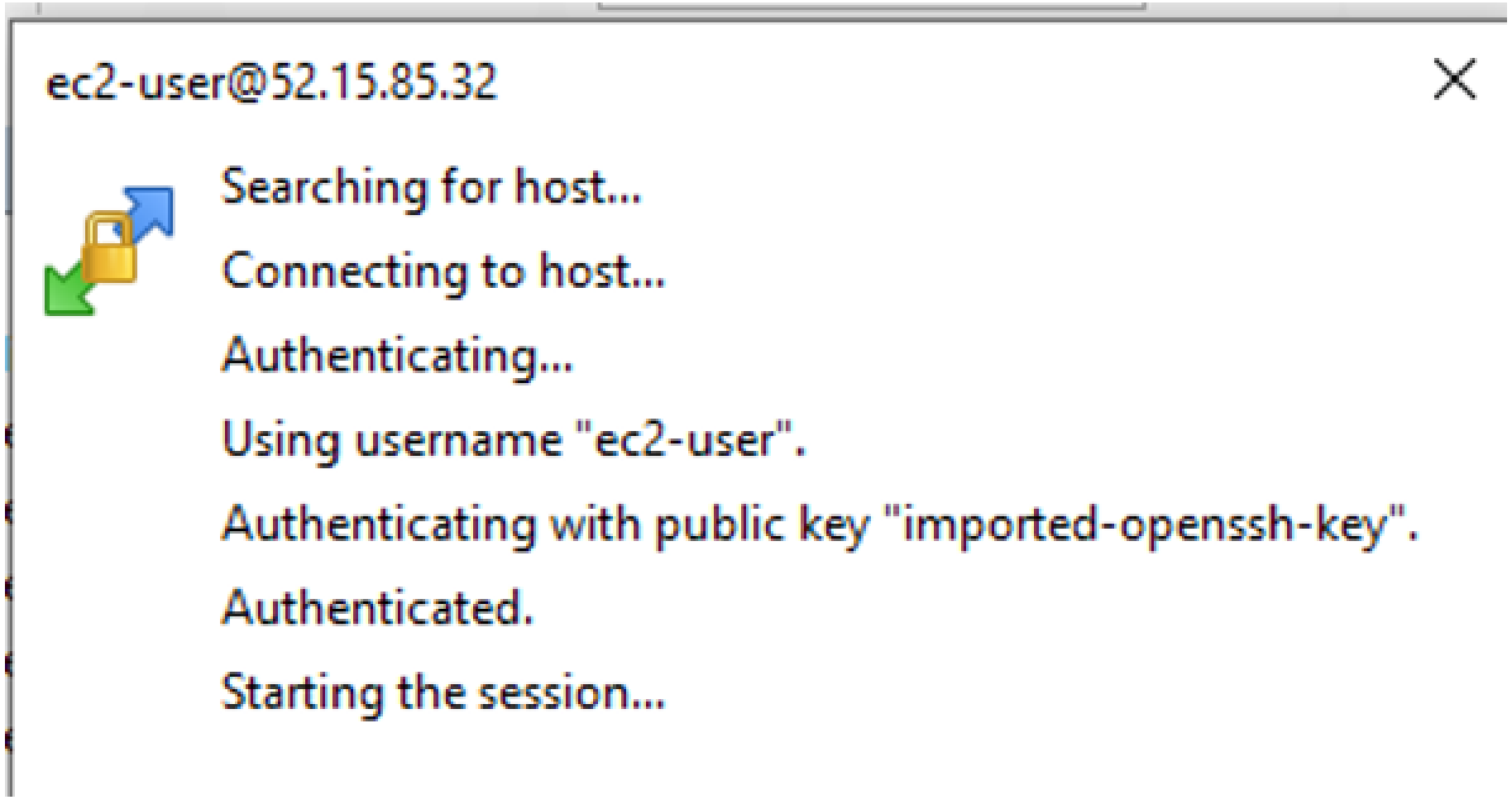
Use WinSCP to upload certificate to AWS EC2 Instance.

Certificate Installation Hands On



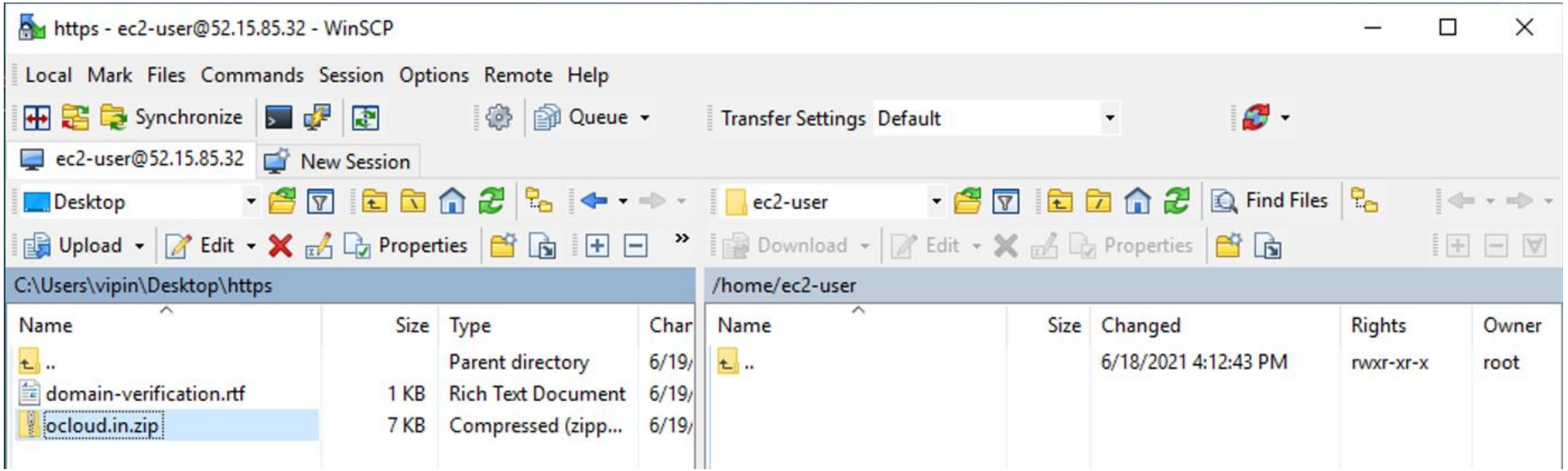
Use WinSCP to upload certificate to AWS EC2 Instance.

Certificate Installation Hands On



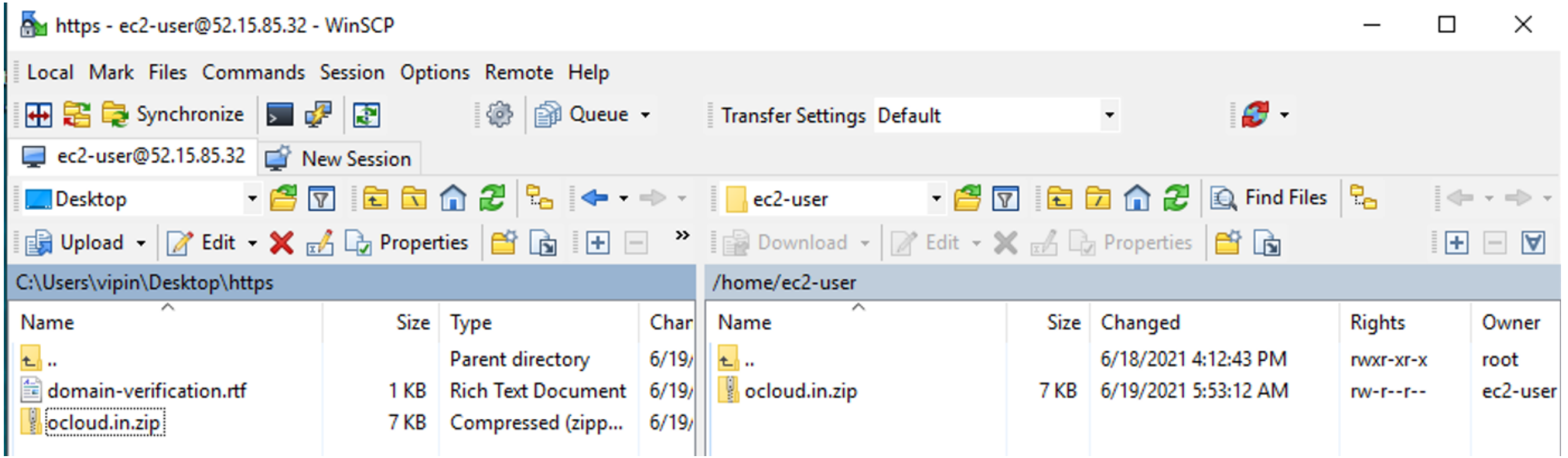
Use WinSCP to upload certificate to AWS EC2 Instance.

Certificate Installation Hands On



Use WinSCP to upload certificate to AWS EC2 Instance.

Certificate Installation Hands On



Use WinSCP to upload certificate to AWS EC2 Instance.

Certificate Installation Hands On

root@ip-172-31-10-197:/home/ec2-user

```
[root@ip-172-31-10-197 ~]#
[root@ip-172-31-10-197 ~]# cd -
/home/ec2-user
[root@ip-172-31-10-197 ec2-user]# pwd
/home/ec2-user
[root@ip-172-31-10-197 ec2-user]# ls
ocloud.in.zip
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# unzip ocloud.in.zip
Archive:  ocloud.in.zip
 extracting: certificate.crt
 extracting: ca_bundle.crt
 extracting: private.key
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# ls
ca_bundle.crt  certificate.crt  ocloud.in.zip  private.key
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]#
```

Unzip certificate file.

Move Certificate Files and Private Key

```
[root@ip-172-31-10-197 ec2-user]# ls
ca_bundle.crt  certificate.crt  ocloud.in.zip  private.key
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# mv ca_bundle.crt certificate.crt /etc/pki/tls/certs/
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# mv private.key /etc/pki/tls/private/
[root@ip-172-31-10-197 ec2-user]# _
```

Move Certificate Files and Private Key.

View Certificate Files and Private Key

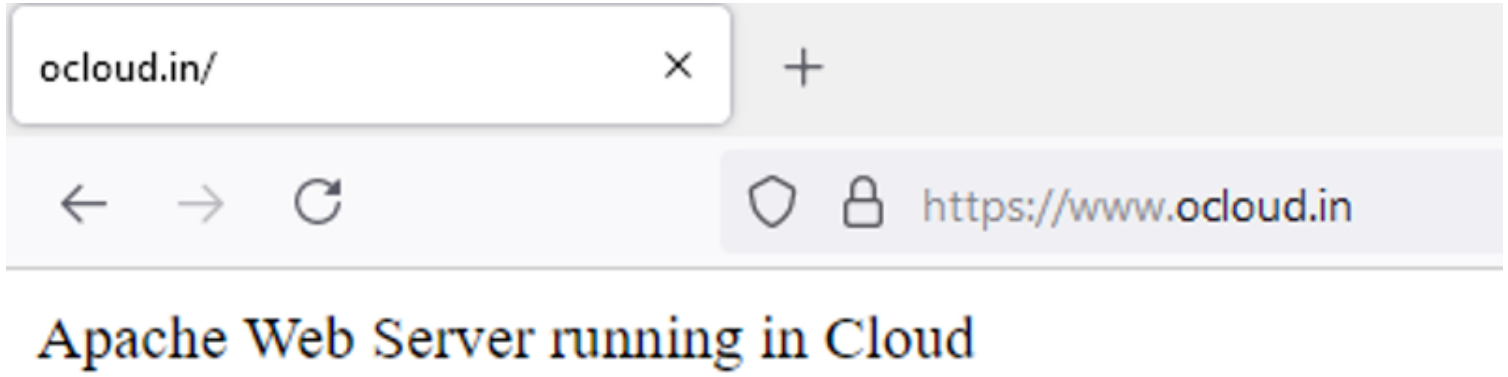
```
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# ls -l /etc/pki/tls/private/
total 4
-rw-r--r-- 1 root root 1706 Jun 19 05:52 private.key
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# ls -l /etc/pki/tls/certs/
total 20
-rw-r--r-- 1 root root 2431 Jun 19 05:52 ca_bundle.crt
lrwxrwxrwx 1 root root   49 Jun  3 20:19 ca-bundle.crt -> /etc/
tls-ca-bundle.pem
lrwxrwxrwx 1 root root   55 Jun  3 20:19 ca-bundle.trust.crt ->
d/openssl/ca-bundle.trust.crt
-rw-r--r-- 1 root root 2293 Jun 19 05:52 certificate.crt
```

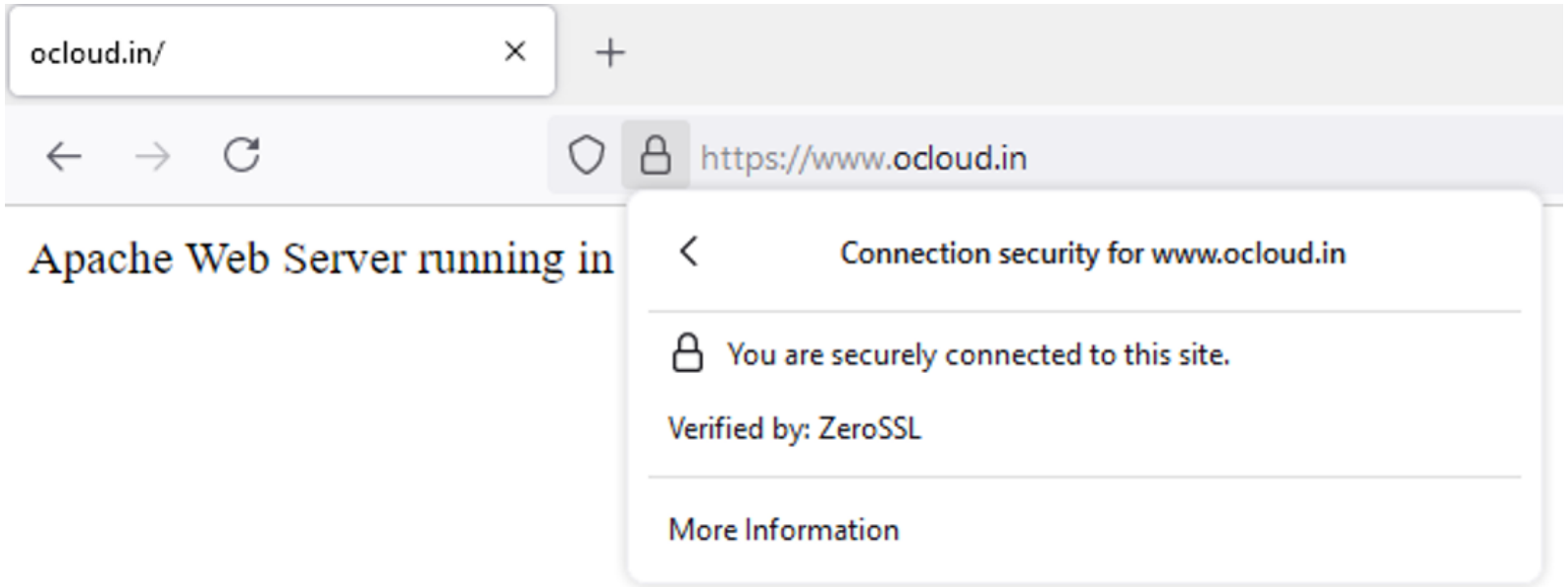
View Certificate Files and Private Key.

Edit “ssl.conf” and Restart Apache

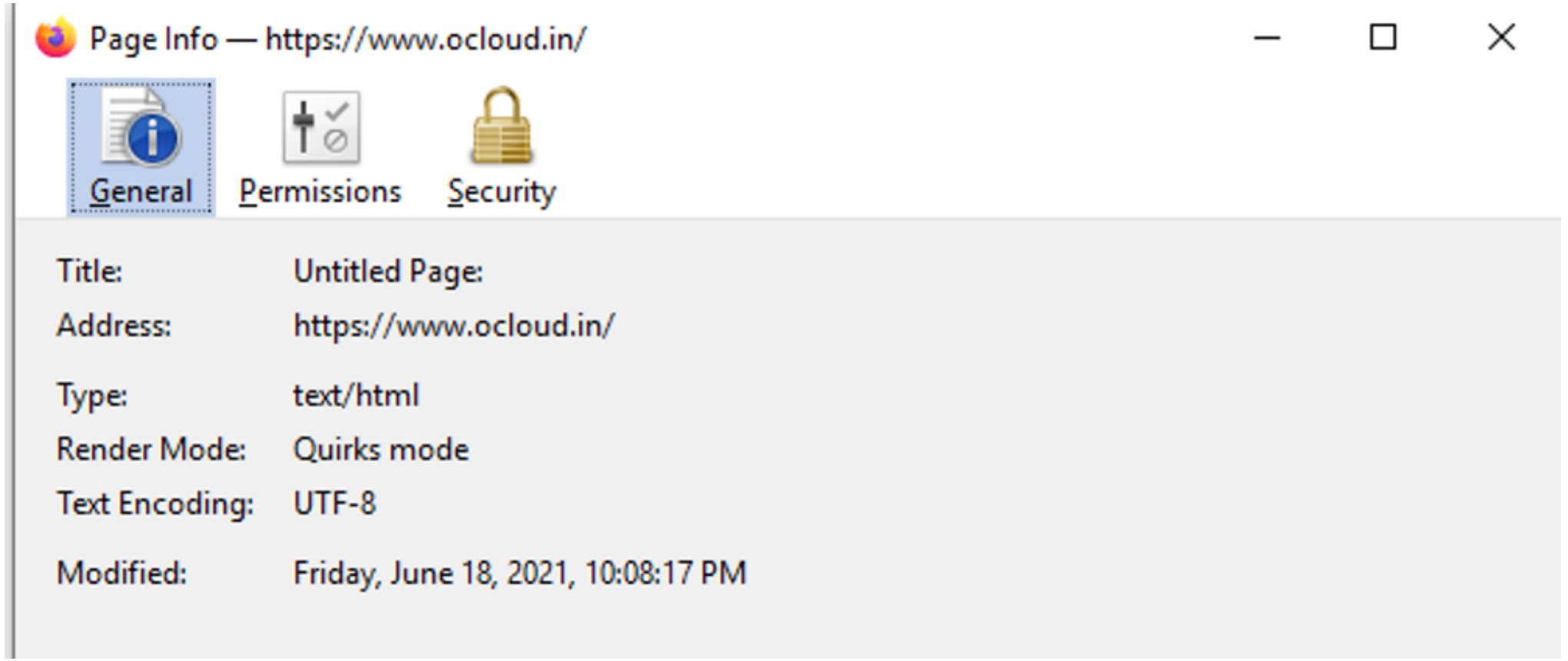
```
[root@ip-172-31-10-197 ec2-user]# nano /etc/httpd/conf.d/ssl.conf
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# cat /etc/httpd/conf.d/ssl.conf |grep ^SSLCertificate
SSLCertificateFile /etc/pki/tls/certs/certificate.crt
SSLCertificateKeyFile /etc/pki/tls/private/private.key
SSLCertificateChainFile /etc/pki/tls/certs/ca_bundle.crt
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]#
[root@ip-172-31-10-197 ec2-user]# systemctl restart httpd
[root@ip-172-31-10-197 ec2-user]#
```

Verify

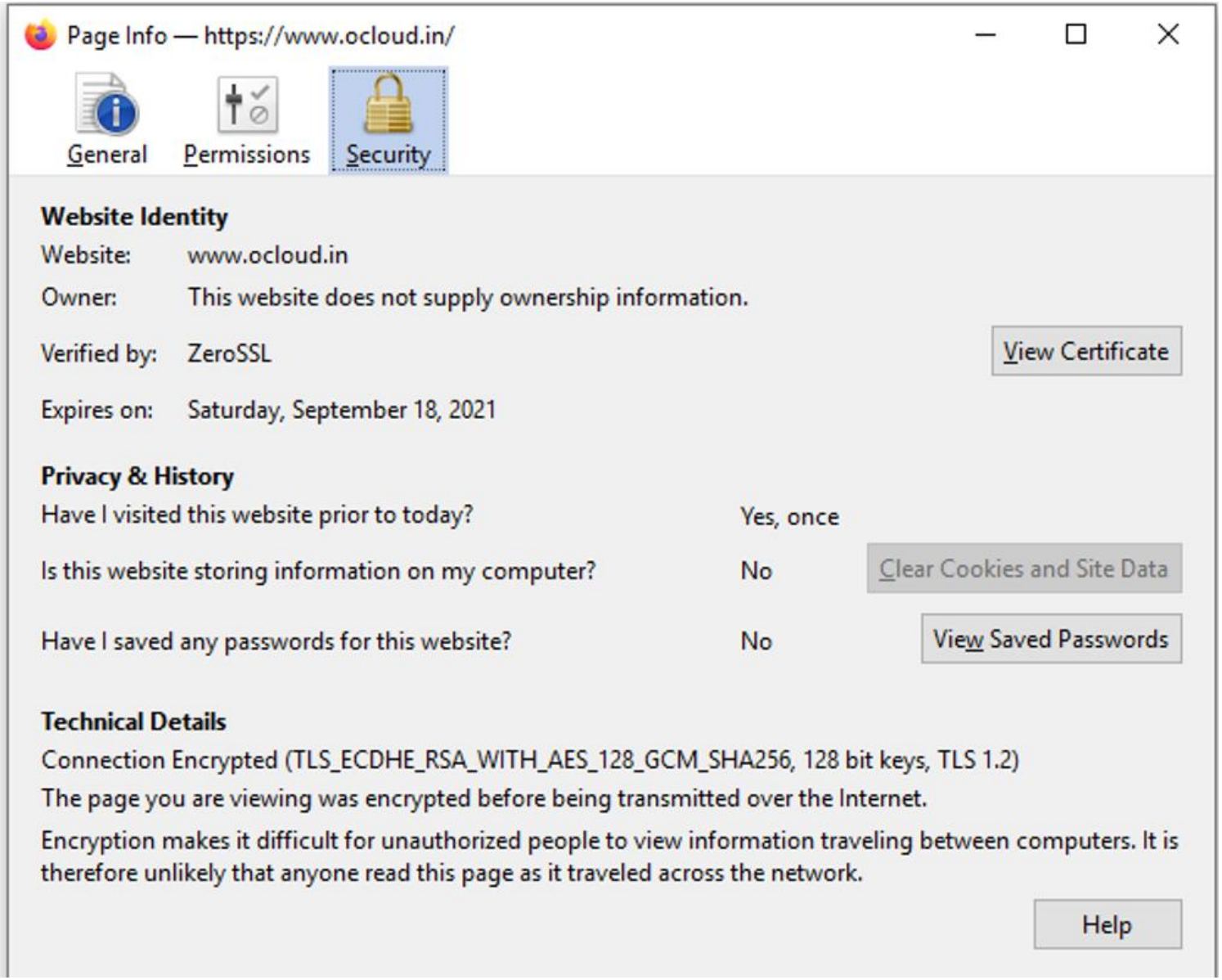

ocloud.in/
https://www.ocloud.in
Apache Web Server running in Cloud


ocloud.in/
https://www.ocloud.in
Apache Web Server running in
Connection security for www.ocloud.in
You are securely connected to this site.
Verified by: ZeroSSL
More Information

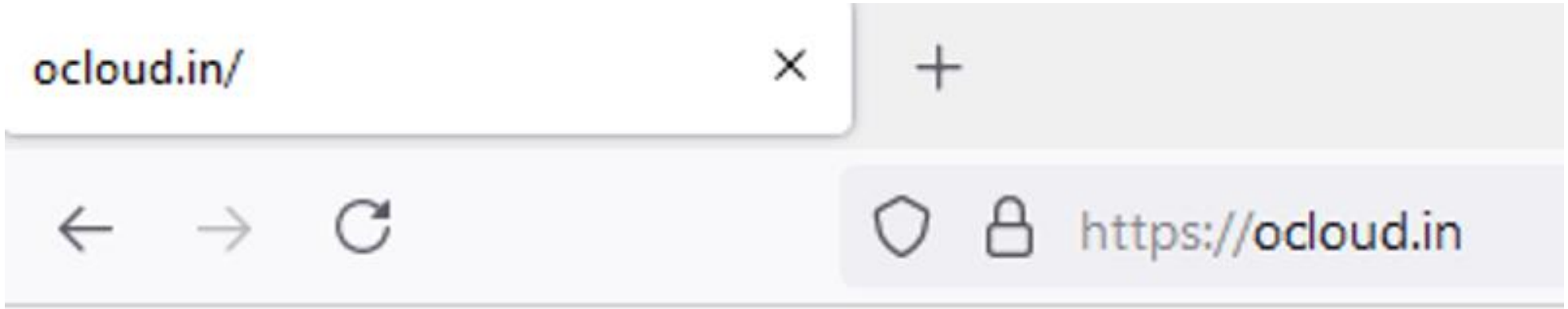
Verify


Page Info — https://www.ocloud.in/
General
Permissions
Security
Title: Untitled Page:
Address: https://www.ocloud.in/
Type: text/html
Render Mode: Quirks mode
Text Encoding: UTF-8
Modified: Friday, June 18, 2021, 10:08:17 PM

Verify

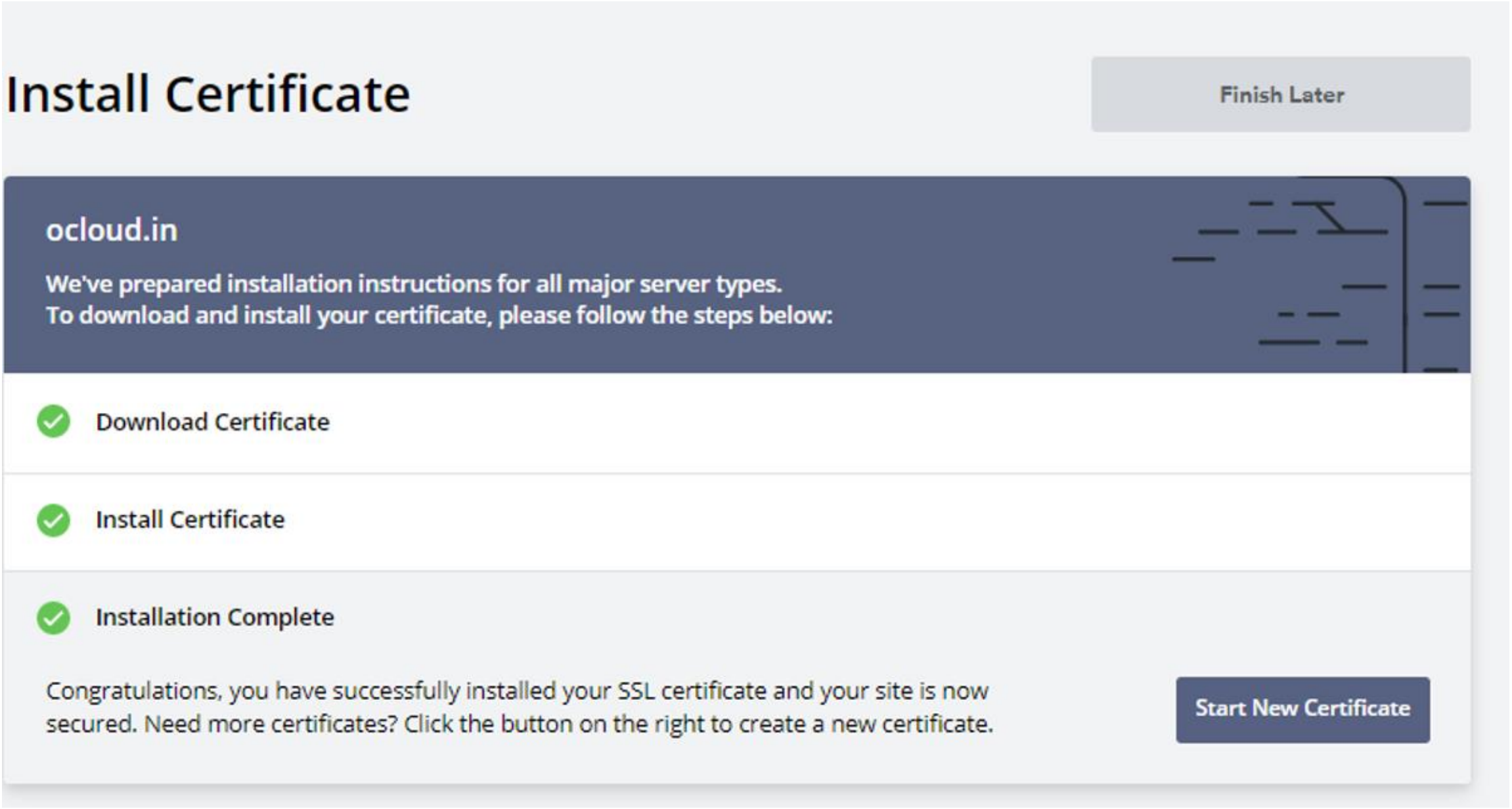

Page Info — https://www.ocloud.in/
General
Permissions
Security
Website Identity
Website: www.ocloud.in
Owner: This website does not supply ownership information.
Verified by: ZeroSSL
View Certificate
Expires on: Saturday, September 18, 2021
Privacy & History
Have I visited this website prior to today? Yes, once
Is this website storing information on my computer? No
Clear Cookies and Site Data
Have I saved any passwords for this website? No
View Saved Passwords
Technical Details
Connection Encrypted (TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256, 128 bit keys, TLS 1.2)
The page you are viewing was encrypted before being transmitted over the Internet.
Encryption makes it difficult for unauthorized people to view information traveling between computers. It is therefore unlikely that anyone read this page as it traveled across the network.
Help

Verify

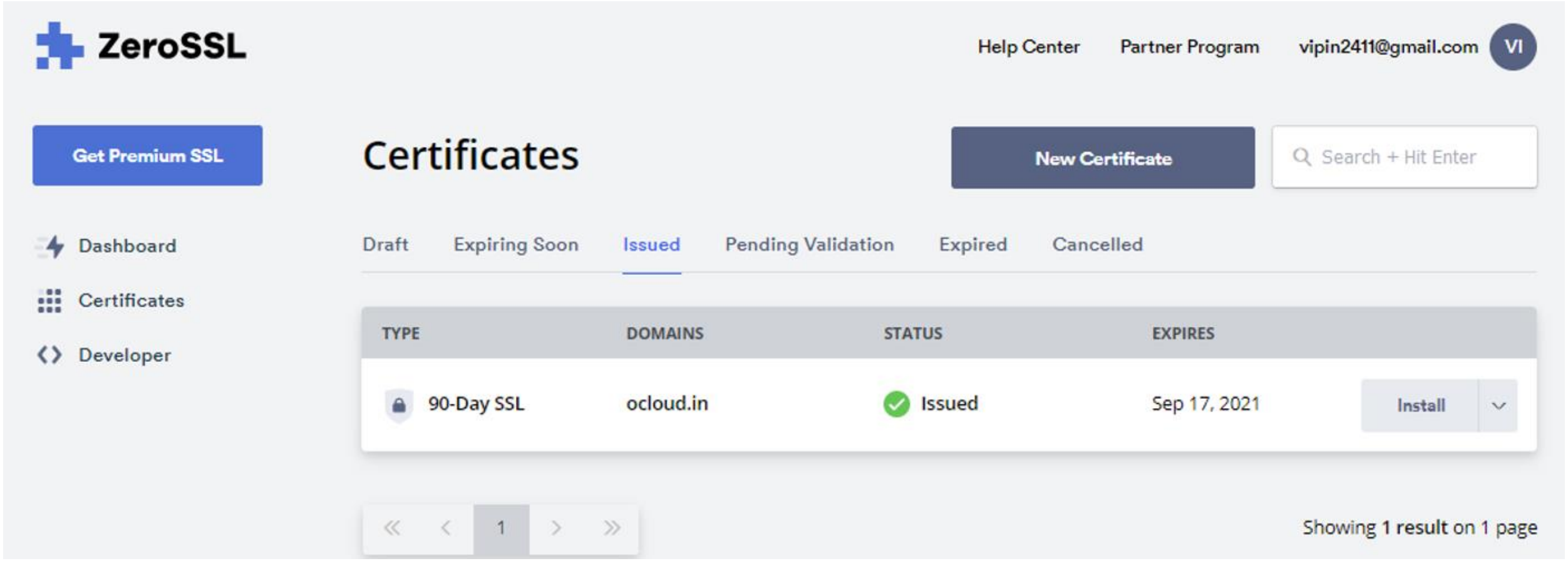


Apache Web Server running in Cloud

Verify


Install Certificate
Finish Later
ocloud.in
We've prepared installation instructions for all major server types.
To download and install your certificate, please follow the steps below:
Download Certificate
Install Certificate
Installation Complete
Congratulations, you have successfully installed your SSL certificate and your site is now secured. Need more certificates? Click the button on the right to create a new certificate.
Start New Certificate

Verify


ZeroSSL
Help Center
Partner Program
vipin2411@gmail.com
VI
Get Premium SSL
Certificates
New Certificate
Search + Hit Enter
Dashboard
Certificates
Developer
Draft
Expiring Soon
Issued
Pending Validation
Expired
Cancelled
TYPE
DOMAINS
STATUS
EXPIRES
90-Day SSL
ocloud.in
Issued
Sep 17, 2021
Install
1
Showing 1 result on 1 page