

# SSL certificates

[[ssl](#), [certificates](#), [letsencrypt](#)]

[letsencrypt certification authority](#) is free, automated and open.

## certbot

```
add-apt-repository ppa:certbot/certbot
apt-get update
apt-get install -y certbot python-certbot-nginx
```

```
certbot certonly --webroot -w /var/www/html -d mail.veronamobile.it
```

wildchart

```
certbot certonly \
  --manual \
  --preferred-challenges=dns \
  --email stefano.scipioni@csgalileo.org \
  --server https://acme-v02.api.letsencrypt.org/directory \
  --agree-tos -d *.iotaiuto.it
```

## nginx

```
server {
    listen 80;
    server_name nextcloud.csgalileo.org;
    server_tokens off;

    location /.well-known/acme-challenge {
        root /var/www;
        allow all;
    }

    location / {
        return 301 https://$server_name$request_uri;
    }
}

server {
    listen 443;
    server_name nnextcloud.csgalileo.org;
    ssl_certificate
/etc/letsencrypt/live/nextcloud.csgalileo.org/fullchain.pem;
```

```

ssl_certificate_key
/etc/letsencrypt/live/nextcloud.csgalileo.org/privkey.pem;
}

```

## acme.sh integration for letsencrypt

On host that has apache/nginx install acme.sh

```

wget -O - https://get.acme.sh | sh
. ~/.bashrc
# now /root/.acme.sh/acme.sh.env is available with bash alias

```

## certificate generation

with nginx enable this server on port 80 for initial challenge

[site.conf](#)

```

server {
    listen 80;
    server_name "mail.csgalileo.org";

    # create this folder empty
    location /.well-known/acme-challenge {
        root /var/www;
    }
    allow all;
}

location / {
    return 301 https://$server_name$request_uri;
}
}

```

```

# /var/www is documentroot of mail.csgalileo.org
acme.sh --issue -w /var/www -d mail.csgalileo.org --keylength ec-256

```

results in **/root/.acme.sh/mail.csgalileo.org\_ecc/**

```

[Fri Oct 14 08:05:13 CEST 2016] Creating account key
[Fri Oct 14 08:05:15 CEST 2016] Registering account
[Fri Oct 14 08:05:18 CEST 2016] Registered
[Fri Oct 14 08:05:20 CEST 2016] Update success.
[Fri Oct 14 08:05:20 CEST 2016] Creating domain key
[Fri Oct 14 08:05:20 CEST 2016] Single domain='mail.csgalileo.org'
[Fri Oct 14 08:05:20 CEST 2016] Verify each domain
[Fri Oct 14 08:05:20 CEST 2016] Getting webroot for

```

```

domain='mail.csgalileo.org'
[Fri Oct 14 08:05:20 CEST 2016] _w='/var/www'
[Fri Oct 14 08:05:20 CEST 2016] Getting new-authz for
domain='mail.csgalileo.org'
[Fri Oct 14 08:05:23 CEST 2016] Verifying:mail.csgalileo.org
[Fri Oct 14 08:05:31 CEST 2016] Success
[Fri Oct 14 08:05:31 CEST 2016] Verify finished, start to sign.
[Fri Oct 14 08:05:34 CEST 2016] Cert success.
-----BEGIN CERTIFICATE-----
...
-----END CERTIFICATE-----
[Fri Oct 14 08:05:34 CEST 2016] Your cert is in
/root/.acme.sh/mail.csgalileo.org_ecc/mail.csgalileo.org.cer
[Fri Oct 14 08:05:34 CEST 2016] Your cert key is in
/root/.acme.sh/mail.csgalileo.org_ecc/mail.csgalileo.org.key
[Fri Oct 14 08:05:34 CEST 2016] The intermediate CA cert is in
/root/.acme.sh/mail.csgalileo.org_ecc/ca.cer
[Fri Oct 14 08:05:34 CEST 2016] And the full chain certs is there:
/root/.acme.sh/mail.csgalileo.org_ecc/fullchain.cer

```

## certificate integration for apache

```

HOST=mail.csgalileo.org
acme.sh --installcert -d $HOST \
--certpath /etc/ssl/certs/${HOST}.cer \
--keypath /etc/ssl/private/${HOST}.key \
--capath /etc/ssl/certs/ca.cer \
--fullchainpath /etc/apache2/fullchain.cer \
--ecc \
--reloadcmd "service apache2 reload"

```

## apache.conf

```

<VirtualHost *:80>
    ServerName projects.csgalileo.org
    DocumentRoot /var/www/html

    Alias /.well-known/acme-challenge/ /var/www/html/.well-known/acme-
challenge/
    <Directory "/var/www/html/.well-known/acme-challenge/">
        Options None
        AllowOverride None
        ForceType text/plain
        RedirectMatch 404 "^(?!/.well-known/acme-challenge/[\w-
]{43}$)"
    </Directory>

    RewriteEngine On
    RewriteCond %{REQUEST_URI} !^/.well-known.*

```

```
RewriteRule ^/?(.*) https://%{SERVER_NAME}:443/$1 [R,L]
# Redirect permanent / https://projects.csgalileo.org/
</VirtualHost>

<VirtualHost *:443>
# ...
SSLEngine on
SSLCertificateFile /etc/ssl/certs/mail.csgalileo.org.cer
SSLCertificateKeyFile /etc/ssl/private/mail.csgalileo.org.key
SSLCertificateChainFile /etc/apache2/fullchain.cer
SSLCACertificateFile /etc/ssl/certs/ca.cer
</VirtualHost>
```

## certificate integration for nginx

[site.conf](#)

```
server {
listen 443 ssl;
server_name "scipio.csgalileo.org";

# ...

ssl_certificate /etc/ssl/certs/scipio.csgalileo.org.cer;
ssl_certificate_key /etc/ssl/private/scipio.csgalileo.org.key;
}
```

```
HOST=mail.csgalileo.org
acme.sh --installcert -d $HOST \
--keypath /etc/ssl/private/${HOST}.key \
--capath /etc/ssl/certs/ca.cer \
--fullchainpath /etc/ssl/certs/${HOST}.cer \
--ecc \
--reloadcmd "service nginx reload"
```

## renew automatic every 60 days

in cron there is already

```
04 0 * * * "/root/.acme.sh"/acme.sh --cron --home "/root/.acme.sh" >
/dev/null
```

## renew manual

```
acme.sh --renew -d mail.csgalileo.org --force --ecc
```

## multi server

i can confirm this works.

```
location ~ /.well-known/acme-challenge/ {  
    proxy_pass http://ctrl.mydomain.com:80;  
}
```

using nginx i added this location to ALL server blocks.

You then run lets encrypt on the machine ctrl.mydomain.com (this machine typically is the controller machine, and is not serving web stuff - its pure purpose from a web POV is to handle incoming cert requests - if you don't know what a controller machine is then read up on ansible)

To make it work I had to use the webroot plugin for Let's Encrypt. I could not get standalone mode to work.

my A records look like ..

```
www01.mydomain.com1 points to 1.2.3.4  
www02.mydomain.com points to 2.3.4.5  
ctrl.mydomain.com points to 3.4.5.6  
mydomain.com points to 1,2,3,4 and 2,3,4,5 (multiple A records)  
www.mydomain.com is an alias (cname) for mydomain.com
```

NGINX runs on www01 and www02 on port 80 to load balance requests (e.g. www01 load balances between www01 and www02, www02 ALSO load balances between www01 and www02)

the above lets encrypt location block is added to NGINX running on both www01 and www02 for all NGINX server blocks

now run lets encrypt in webroot mode (you will need to standup a web server on your controller machine) and request a single certificate for www01.mydomain.com1 www02.mydomain.com mydomain.com [www.mydomain.com](http://www.mydomain.com)

when you run this command on your controller machine (ctrl.mydomain.com) it will fireoff a request to each of the 4 domains in return. Every single request will be proxied back to ctrl.mydomain.com via NGINX

bosh!

2 tips

1 - to use webroot mode you will need to have a basic web server running on ctrl.domain.com which can serve content from a specified directory

2 - do not use standalone mode, i could not get it to work

3 - this solution sits very nicely if you are using ansible, since the certs will live on the controller machine and can be copied across to all slave machines with a single command

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