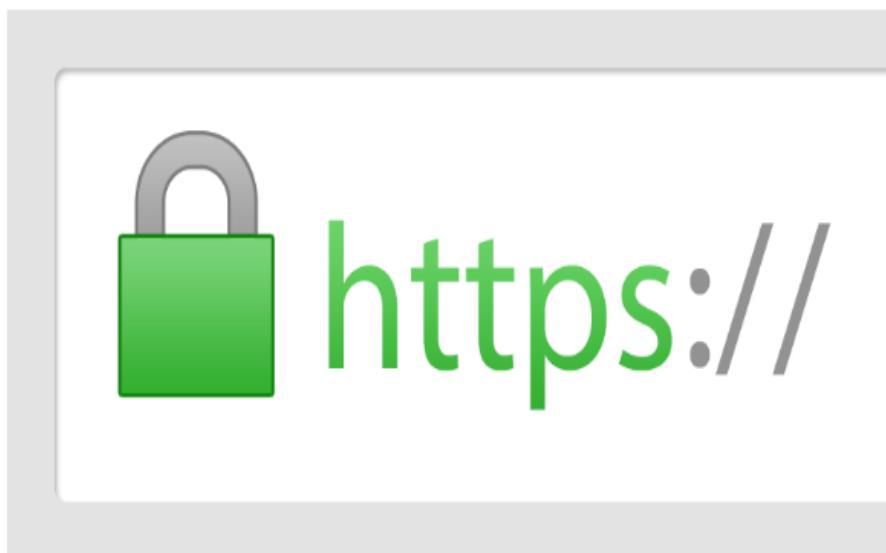


Tema 4

Configuración De



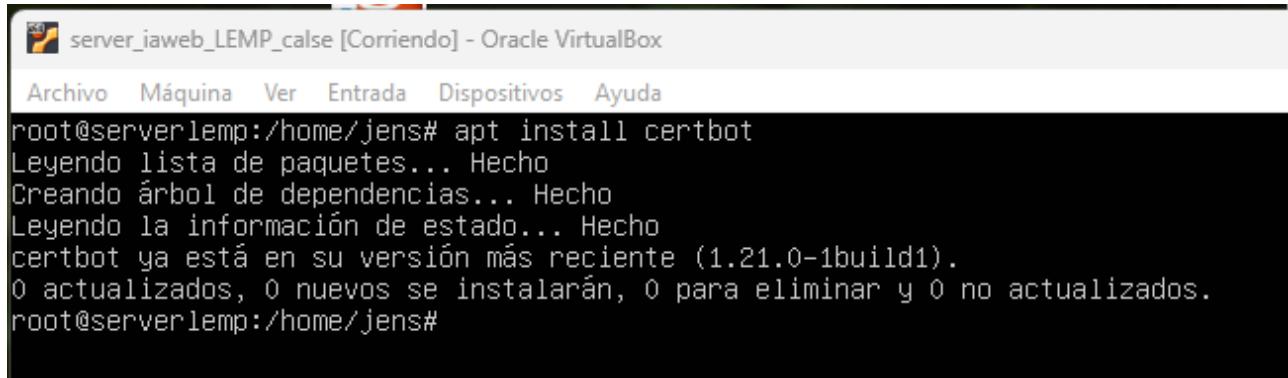
en



1) Objetivo

Emitir e instalar un certificado válido de Let's Encrypt usando el desafío DNS-01 (registro TXT en DNS), y servir una web por HTTPS en Apache2.

1º paso: Instalar el certbot en el servidor, para poder generar los certificados



```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
root@serverlemp:/home/jens# apt install certbot
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias... Hecho
Leyendo la información de estado... Hecho
certbot ya está en su versión más reciente (1.21.0-1build1).
0 actualizados, 0 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
root@serverlemp:/home/jens#
```

2º paso: Instalar y activar el dnsmasq:



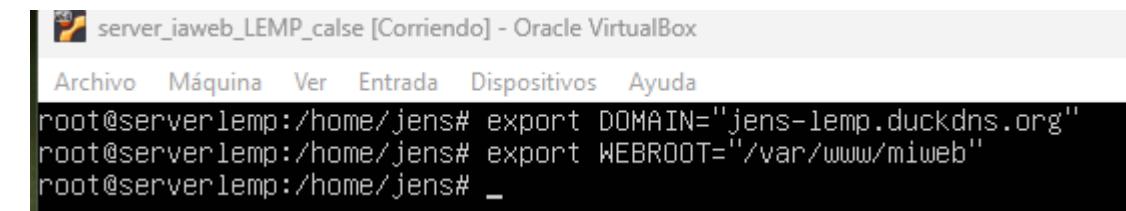
```
root@serverlemp:/home/jens# systemctl restart dnsmasq
root@serverlemp:/home/jens# systemctl status dnsmasq
● dnsmasq.service - dnsmasq - A lightweight DHCP and caching DNS server
   Loaded: loaded (/lib/systemd/system/dnsmasq.service; enabled; vendor preset: enabled)
     Active: active (running) since Thu 2025-11-06 18:04:27 UTC; 5s ago
       Process: 1953 ExecStartPre=/etc/init.d/dnsmasq checkconfig (code=exited, status=0/SUCCESS)
       Process: 1961 ExecStart=/etc/init.d/dnsmasq systemd-exec (code=exited, status=0/SUCCESS)
       Process: 1970 ExecStartPost=/etc/init.d/dnsmasq systemd-start-resolvconf (code=exited, status=0/SUCCESS)
     Main PID: 1969 (dnsmasq)
        Tasks: 1 (limit: 4555)
       Memory: 580.0K
          CPU: 58ms
        CGroup: /system.slice/dnsmasq.service
                └─1969 /usr/sbin/dnsmasq -x /run/dnsmasq/dnsmasq.pid -u dnsmasq -7 /etc/dnsmasq.d/,.dpk
```

2) Prerrequisitos

- Ubuntu 22.04+ (Desktop/Server/WSL) con acceso a Internet.
- Usuario con permisos sudo.
- Navegador web para acceder a DuckDNS.
- No hace falta IP pública ni abrir puertos.

3) Variables (para copiar/pegar, solución de chat para no escribirlo siempre...)

- Sustituye por tu subdominio de DuckDNS.
- export DOMAIN="tu-nombre.duckdns.org"
- export WEBROOT="/var/www/miweb"



```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
root@serverlemp:/home/jens# export DOMAIN="jens-lemp.duckdns.org"
root@serverlemp:/home/jens# export WEBROOT="/var/www/miweb"
root@serverlemp:/home/jens# _
```

4) Pasos secuenciados

4.1 Crear subdominio gratuito en DuckDNS

Entra en <https://www.duckdns.org> e inicia sesión (Google/GitHub).

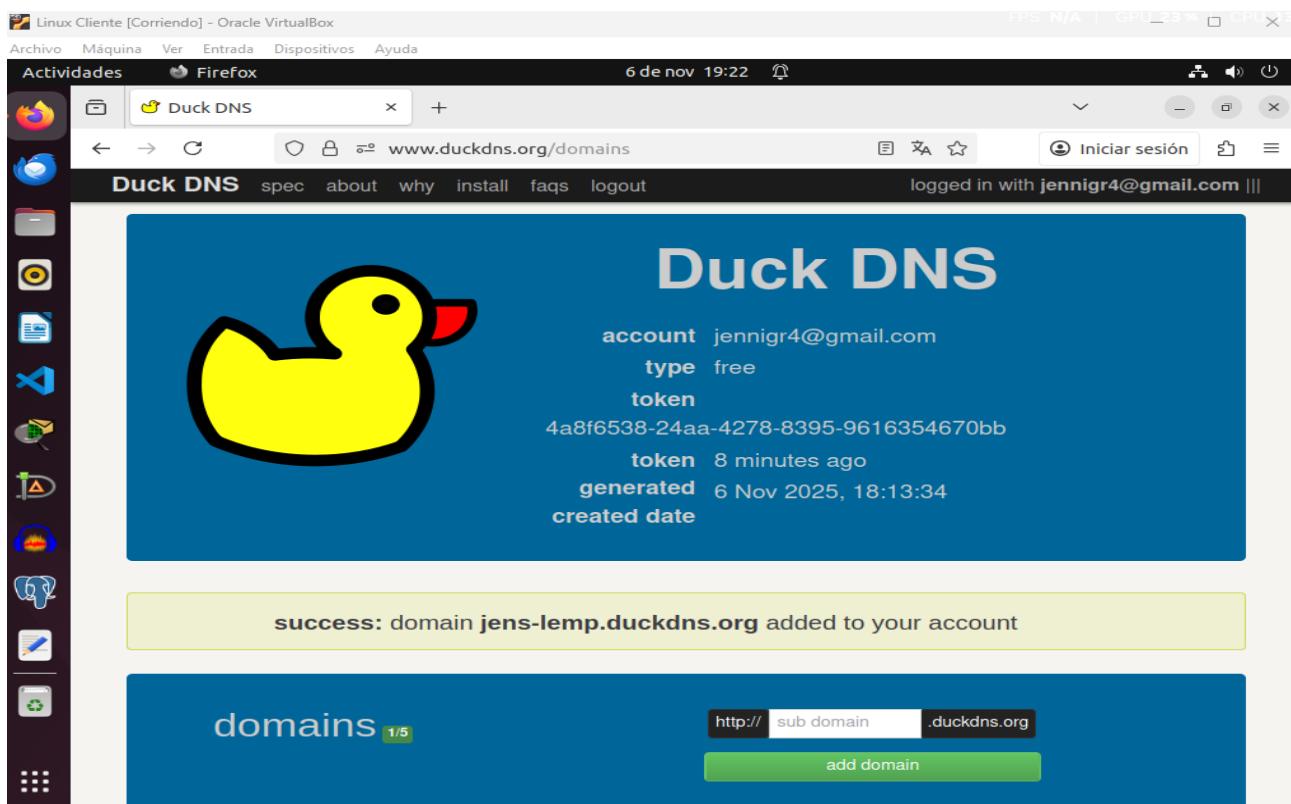
En add domain, escribe tu-nombre → tendrás tu-nombre.duckdns.org.

(Opcional) En current ip deja la IP pública que aparezca por defecto. No es crítica para DNS-01.

Comprobación rápida:

```
ping -c 1 $DOMAIN / ping -c 1 tu-nombre-duckdns.org
```

(Que resuelva un valor no es imprescindible para DNS-01, pero confirma que existe el dominio.)



4.2 Instalar Apache2 y preparar una web mínima (o si ya estas gastando una que tengas hecha de una práctica anterior, cosa que te aconsejo, este punto deberías saltartelo)

```
sudo apt update sudo apt install -y apache2
```

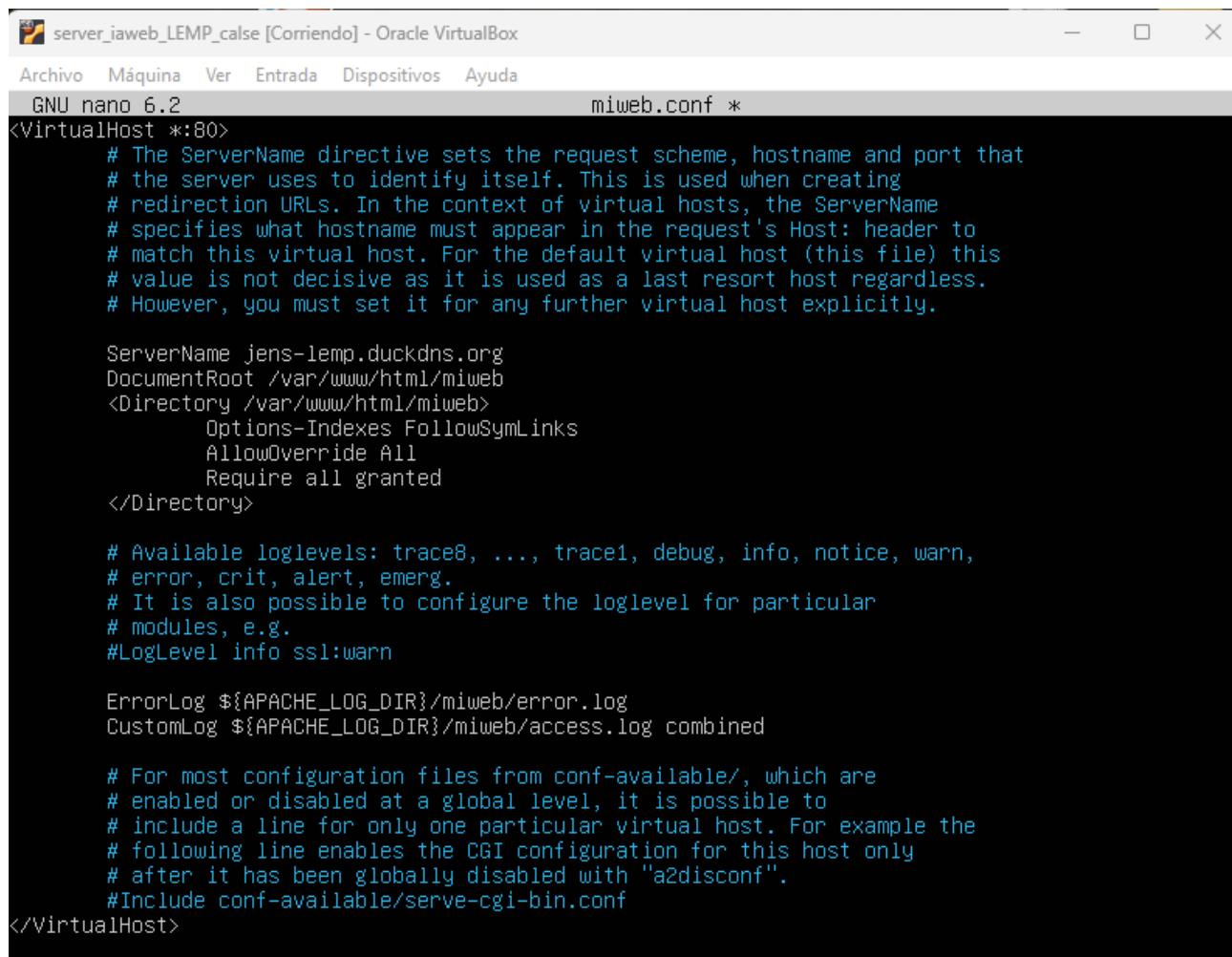
```
sudo mkdir -p $WEBROOT
```

```
echo "<h1>HTTPS con Let's Encrypt (DNS-01)</h1>" | sudo tee $WEBROOT/index.html
```

```
root@serveriaweb:~# echo "<h1> HTTPS con Let's Encrypt (DNS-01)</h1>" | tee $WEBROOT/index.html
<h1> HTTPS con Let's Encrypt (DNS-01)</h1>
root@serveriaweb:~# echo "<p>Dominio: $DOMAIN</p>" | tee -a $WEBROOT/index.html
<p>Dominio: jens-lemp.duckdns.org</p>
root@serveriaweb:~#
```

Crear VirtualHost HTTP básico:

```
sudo tee /etc/apache2/sites-available/miweb.conf >/dev/null
<<'EOF' <
VirtualHost *:80>
ServerName tu-nombre.duckdns.org
DocumentRoot /var/www/miweb
<Directory /var/www/miweb>
Options -Indexes +FollowSymLinks
AllowOverride All
Require all granted
</Directory>
ErrorLog ${APACHE_LOG_DIR}/miweb_error.log
CustomLog ${APACHE_LOG_DIR}/miweb_access.log combined
</VirtualHost>
```



```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
GNU nano 6.2 miweb.conf *
<VirtualHost *:80>
    # The ServerName directive sets the request scheme, hostname and port that
    # the server uses to identify itself. This is used when creating
    # redirection URLs. In the context of virtual hosts, the ServerName
    # specifies what hostname must appear in the request's Host: header to
    # match this virtual host. For the default virtual host (this file) this
    # value is not decisive as it is used as a last resort host regardless.
    # However, you must set it for any further virtual host explicitly.

    ServerName jens-lemp.duckdns.org
    DocumentRoot /var/www/html/miweb
    <Directory /var/www/html/miweb>
        Options-Indexes FollowSymLinks
        AllowOverride All
        Require all granted
    </Directory>

    # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
    # error, crit, alert, emerg.
    # It is also possible to configure the loglevel for particular
    # modules, e.g.
    #LogLevel info ssl:warn

    ErrorLog ${APACHE_LOG_DIR}/miweb/error.log
    CustomLog ${APACHE_LOG_DIR}/miweb/access.log combined

    # For most configuration files from conf-available/, which are
    # enabled or disabled at a global level, it is possible to
    # include a line for only one particular virtual host. For example the
    # following line enables the CGI configuration for this host only
    # after it has been globally disabled with "a2disconf".
    #Include conf-available/serve-cgi-bin.conf
</VirtualHost>
```

```
sudo sed -i "s/tu-nombre.duckdns.org/$DOMAIN/" /etc/apache2/sites-available/miweb.conf
sudo a2ensite miweb.conf
sudo systemctl reload apache2
```



```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
root@serverlemp:/var/www/html# sed -i "s/jens-lemp.duckdns.org/$DOMAIN/" /etc/apache2/sites-available/miweb.conf
root@serverlemp:/var/www/html# a2ensite miweb.conf
Enabling site miweb.
To activate the new configuration, you need to run:
  systemctl reload apache2
```

```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
root@serverlemp:/etc/apache2/sites-available# systemctl start apache2
root@serverlemp:/etc/apache2/sites-available# systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2025-11-06 19:04:44 UTC; 6min ago
     Docs: https://httpd.apache.org/docs/2.4/
     Main PID: 3338 (apache2)
        Tasks: 55 (limit: 4555)
       Memory: 4.8M
          CPU: 69ms
        CGroup: /system.slice/apache2.service
                  ├─3338 /usr/sbin/apache2 -k start
                  ├─3340 /usr/sbin/apache2 -k start
                  ├─3341 /usr/sbin/apache2 -k start

nov 06 19:04:44 serverlemp systemd[1]: Starting The Apache HTTP Server...
nov 06 19:04:44 serverlemp apachectl[3337]: AH00557: apache2: apr_sockaddr_info_get() failed for se>
nov 06 19:04:44 serverlemp apachectl[3337]: AH00558: apache2: Could not reliably determine the serv>
nov 06 19:04:44 serverlemp systemd[1]: Started The Apache HTTP Server.
```

Comprobación local:

curl -I <http://127.0.0.1>

Debe devolver 200 OK.

```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
root@serverlemp:/etc/apache2/sites-available# curl -I http://127.0.0.1
HTTP/1.1 200 OK
Date: Thu, 06 Nov 2025 19:12:09 GMT
Server: Apache/2.4.52 (Ubuntu)
Last-Modified: Thu, 06 Nov 2025 19:04:42 GMT
ETag: "29af-642f1bcd123c1"
Accept-Ranges: bytes
Content-Length: 10671
Vary: Accept-Encoding
Content-Type: text/html

root@serverlemp:/etc/apache2/sites-available#
```

4.3 Instalar Certbot

sudo apt install -y certbot

```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
root@serverlemp:/home/jens# apt install certbot
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias... Hecho
Leyendo la información de estado... Hecho
certbot ya está en su versión más reciente (1.21.0-1build1).
0 actualizados, 0 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
root@serverlemp:/home/jens#
```

4.4 Emitir certificado con DNS-01 (manual)

Lanzar certbot:

```
sudo certbot -d $DOMAIN --manual --preferred-challenges dns certonly
```

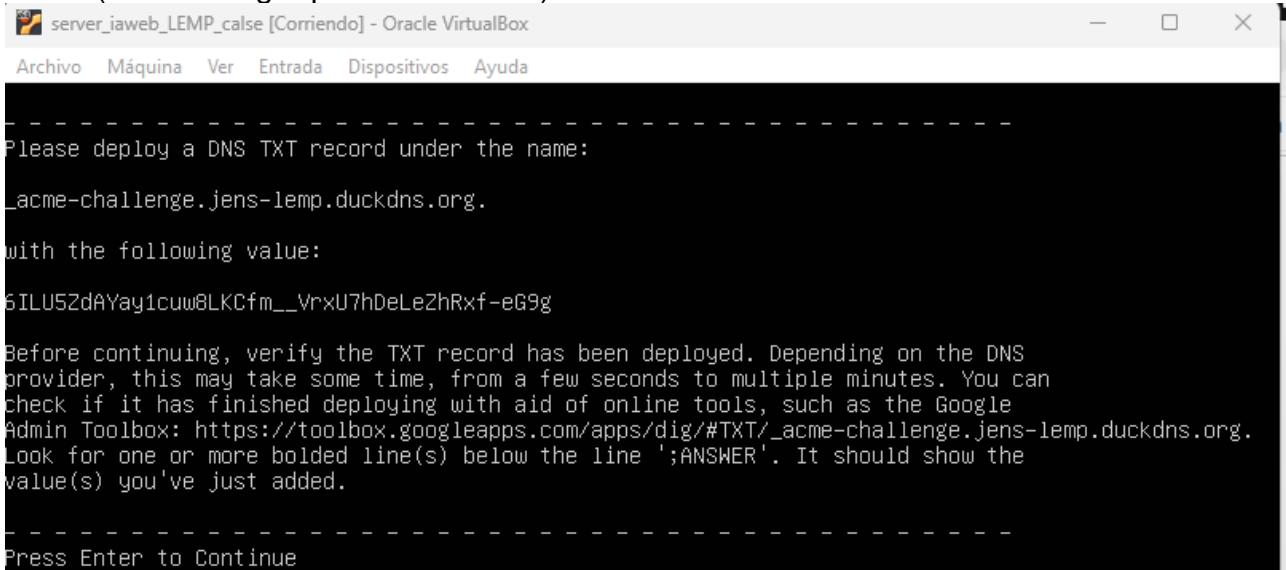
Qué ocurrirá: (LEE CON DETENIMIENTO ¡!!)

Certbot mostrará un valor TXT y te pedirá crear un registro DNS:

Nombre (host): _acme-challenge.tu-nombre.duckdns.org

Tipo: TXT

Valor: (cadena larga que te da certbot)



```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
-----
Please deploy a DNS TXT record under the name:
_acme-challenge.jens-lemp.duckdns.org.

with the following value:
6ILU5ZdAYay1cuw8LKCfm__VrxU7hDeLeZhRxf-eG9g

Before continuing, verify the TXT record has been deployed. Depending on the DNS provider, this may take some time, from a few seconds to multiple minutes. You can check if it has finished deploying with aid of online tools, such as the Google Admin Toolbox: https://toolbox.googleapps.com/apps/dig/#TXT/_acme-challenge.jens-lemp.duckdns.org. Look for one or more bolded line(s) below the line ';ANSWER'. It should show the value(s) you've just added.

Press Enter to Continue
```

Dónde crear el TXT en DuckDNS:

En la página de tu dominio, baja a la sección TXT.

En txt pega el valor que muestra certbot.

En subdomain escribe _acme-challenge.

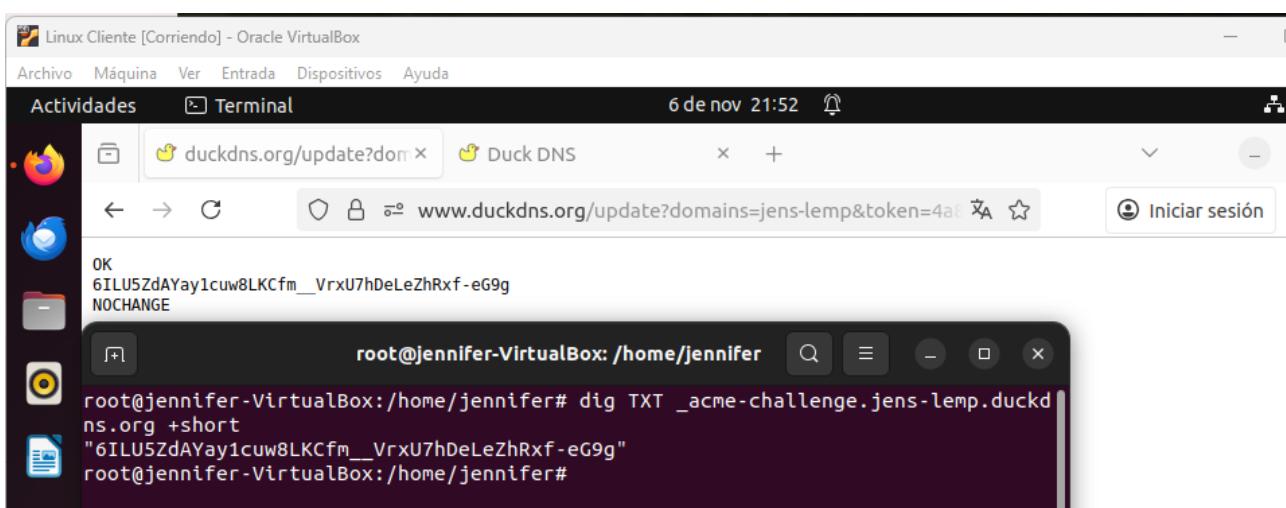
Pulsa update TXT.

é NOTA : Si esto no va, copia y pega esta URL en el navegador y cuando le des a enter te debe aparecer un OK en una esquina. Ya lo tendrías.

[https://www.duckdns.org/update?domains=tu-nombre&token=9a4778ef-4cbf-4775-a809-b8d206d6cd4f&txt=VALOR_TXT&verbose=true"](https://www.duckdns.org/update?domains=tu-nombre&token=9a4778ef-4cbf-4775-a809-b8d206d6cd4f&txt=VALOR_TXT&verbose=true)

Esperar propagación (30–120 s) y verificar en terminal:

dig TXT _acme-challenge.\$DOMAIN +short



```
Linux Cliente [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
Actividades Terminal 6 de nov 21:52
duckdns.org/update?dom... Duck DNS
OK
6ILU5ZdAYay1cuw8LKCfm__VrxU7hDeLeZhRxf-eG9g
NOCHANGE
root@jennifer-VirtualBox: /home/jennifer
root@jennifer-VirtualBox:/home/jennifer# dig TXT _acme-challenge.jens-lemp.duckdns.org +short
"6ILU5ZdAYay1cuw8LKCfm__VrxU7hDeLeZhRxf-eG9g"
root@jennifer-VirtualBox:/home/jennifer#
```

Debe devolver exactamente el valor que pidió certbot.

Vuelve a la terminal de certbot y pulsa Enter.

Si todo está correcto verás:

Congratulations! Your certificate and chain have been saved at:

/etc/letsencrypt/live/tu-nombre.duckdns.org/fullchain.pem

Your key file has been saved at:

/etc/letsencrypt/live/tu-nombre.duckdns.org/privkey.pem

```
Press Enter to Continue

Successfully received certificate.
Certificate is saved at: /etc/letsencrypt/live/jens-lemp.duckdns.org/fullchain.pem
Key is saved at:      /etc/letsencrypt/live/jens-lemp.duckdns.org/privkey.pem
This certificate expires on 2026-02-04.
These files will be updated when the certificate renews.

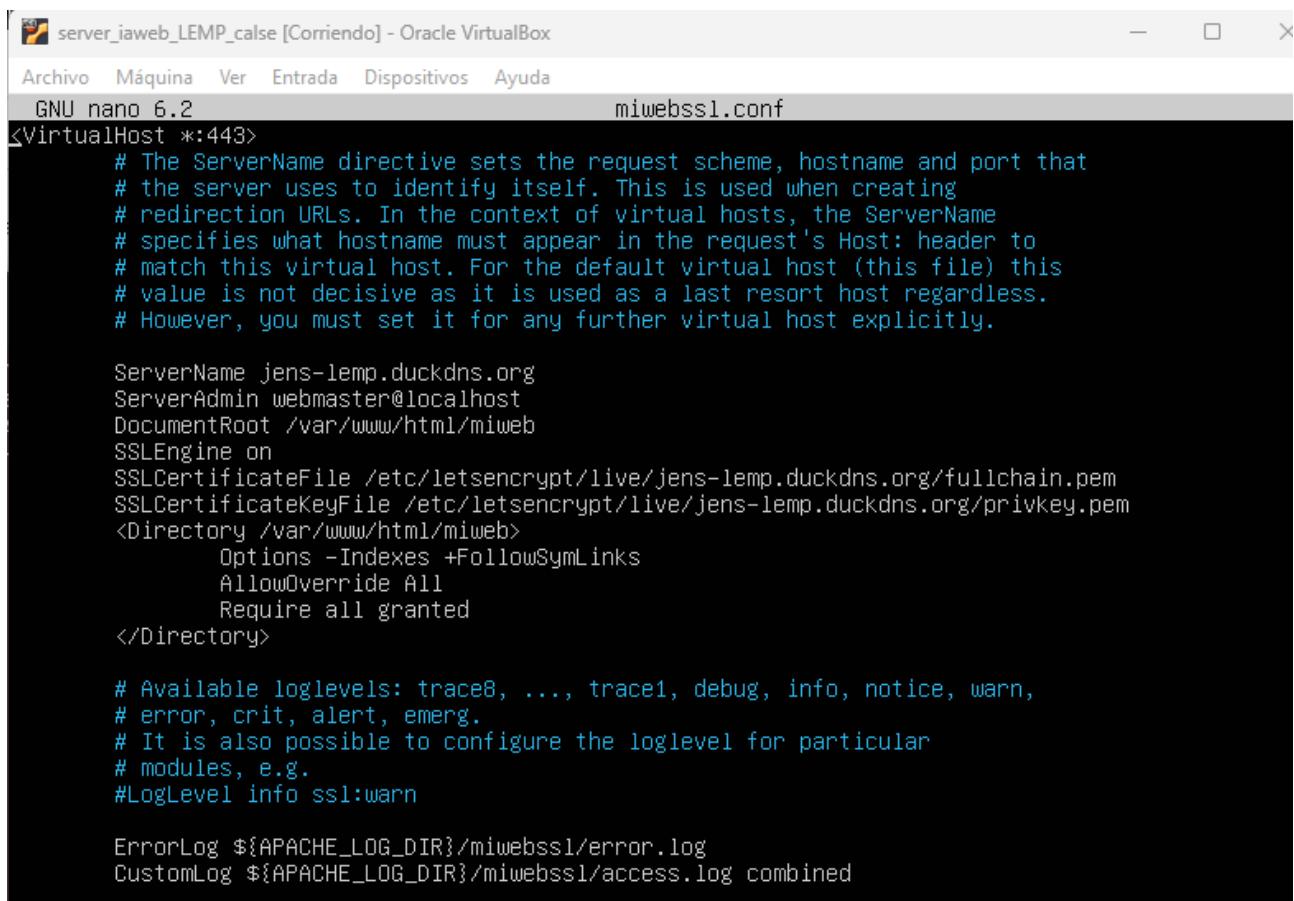
NEXT STEPS:
- This certificate will not be renewed automatically. Autorenewal of --manual certificates requires
the use of an authentication hook script (--manual-auth-hook) but one was not provided. To renew thi
s certificate, repeat this same certbot command before the certificate's expiry date.

-----
If you like Certbot, please consider supporting our work by:
 * Donating to ISRG / Let's Encrypt:  https://letsencrypt.org/donate
 * Donating to EFF:                  https://eff.org/donate-le
-----
root@serverlemp:~#
```

4.5 Activar HTTPS en Apache (VirtualHost :443)

```
sudo a2enmod ssl
```

```
sudo tee /etc/apache2/sites-available/miweb-ssl.conf
```



```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
GNU nano 6.2                               miwebssl.conf
<VirtualHost *:443>
    # The ServerName directive sets the request scheme, hostname and port that
    # the server uses to identify itself. This is used when creating
    # redirection URLs. In the context of virtual hosts, the ServerName
    # specifies what hostname must appear in the request's Host: header to
    # match this virtual host. For the default virtual host (this file) this
    # value is not decisive as it is used as a last resort host regardless.
    # However, you must set it for any further virtual host explicitly.

    ServerName jens-lemp.duckdns.org
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/html/miweb
    SSLEngine on
    SSLCertificateFile /etc/letsencrypt/live/jens-lemp.duckdns.org/fullchain.pem
    SSLCertificateKeyFile /etc/letsencrypt/live/jens-lemp.duckdns.org/privkey.pem
    <Directory /var/www/html/miweb>
        Options -Indexes +FollowSymLinks
        AllowOverride All
        Require all granted
    </Directory>

    # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
    # error, crit, alert, emerg.
    # It is also possible to configure the loglevel for particular
    # modules, e.g.
    #LogLevel info ssl:warn

    ErrorLog ${APACHE_LOG_DIR}/miwebssl/error.log
    CustomLog ${APACHE_LOG_DIR}/miwebssl/access.log combined
```

```
EOF sudo sed -i "s/tu-nombre.duckdns.org/$DOMAIN/g" /etc/apache2/sites-available/miweb-ssl.conf sudo a2ensite miweb-ssl.conf
```

```
root@serverlemp:/etc/apache2/sites-available# sed -i "s/jens-lemp.duckdns.org/$DOMAIN/g" /etc/apache2/sites-available/miwebssl.conf
root@serverlemp:/etc/apache2/sites-available# a2ensite miwebssl.conf
Enabling site miwebssl.
To activate the new configuration, you need to run:
    systemctl reload apache2
```

```
sudo systemctl reload apache2
```

```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
root@serverlemp:/etc/apache2/sites-available# systemctl reload apache2
root@serverlemp:/etc/apache2/sites-available#
```

Verifica que los ficheros existen:

```
sudo certbot certificates
```

```
server_iaweb_LEMP_calse [Corriendo] - Oracle VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
root@serverlemp:/etc/apache2/sites-available# certbot certificates
Saving debug log to /var/log/letsencrypt/letsencrypt.log

-----
Found the following certs:
  Certificate Name: jens-lemp.duckdns.org
  Serial Number: 6d59afab428d746f4138d0af2ec677abc31
  Key Type: RSA
  Domains: jens-lemp.duckdns.org
  Expiry Date: 2026-02-04 19:52:35+00:00 (VALID: 89 days)
  Certificate Path: /etc/letsencrypt/live/jens-lemp.duckdns.org/fullchain.pem
  Private Key Path: /etc/letsencrypt/live/jens-lemp.duckdns.org/privkey.pem
-----
root@serverlemp:/etc/apache2/sites-available#
```

4.6 Pruebas

En el propio equipo:

```
curl -I https://$DOMAIN --insecure
```

Desde un navegador (si tiene acceso a tu equipo): <https://tu-nombre.duckdns.org>

(Si el equipo no es accesible, al menos el certificado es real y válido y Apache está sirviendo localmente.)

-Debido a que tengo ciertos puertos bloqueados en mi router, no puedo mostrarte que lo resuelva, pero el trabajo está hecho. 😞

-Hecho 😊