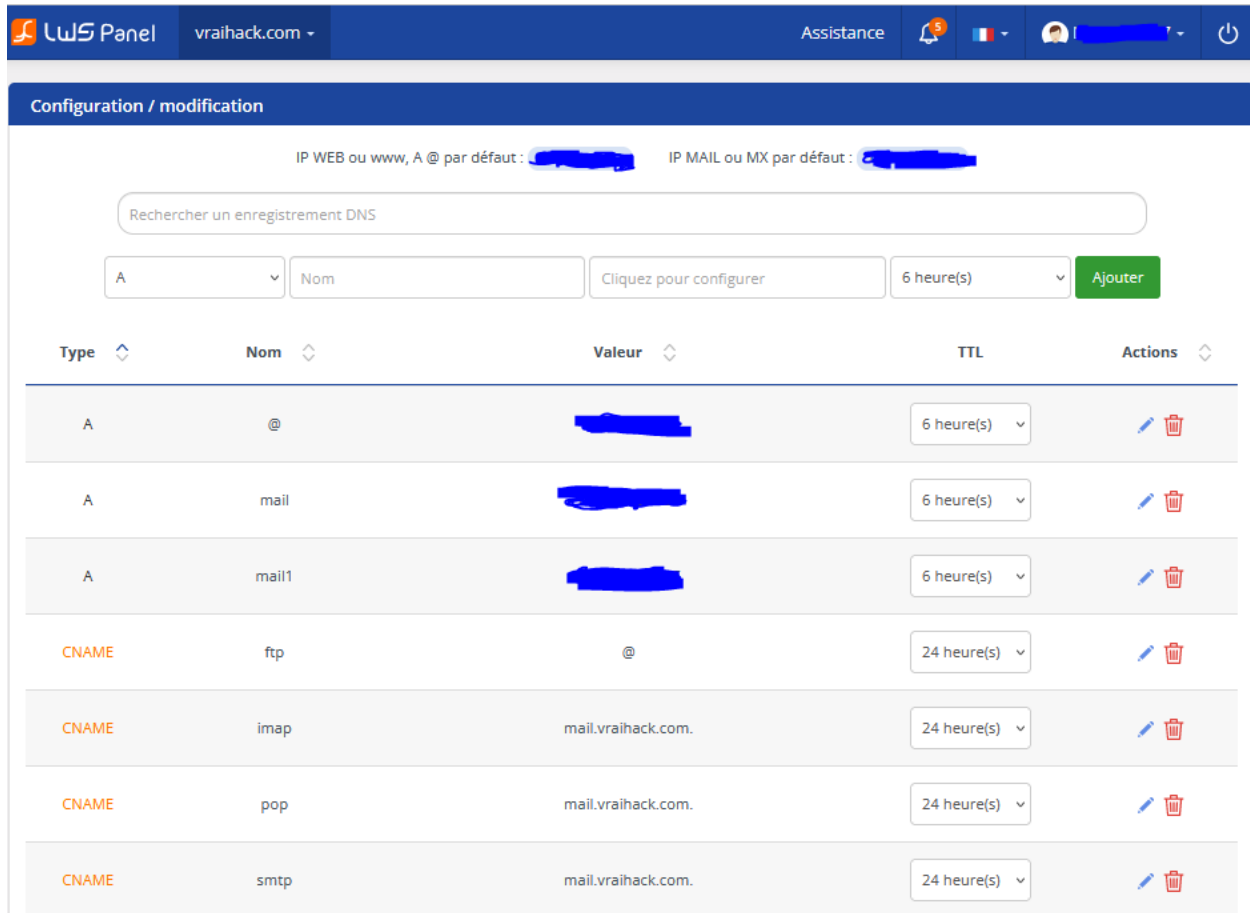


HOW TO IMPLEMENT RAINLOOP WEBMAIL ON UBUNTU

STEP 1: BUY A DOMAIN NAME

⇒ In my case I buy it a domain with the name "vraihack.com" from LWS Panel



Configuration / modification

IP WEB ou www, A @ par défaut : [redacted] IP MAIL ou MX par défaut : [redacted]

Rechercher un enregistrement DNS

A [v] Nom Cliquez pour configurer 6 heure(s) [v] Ajouter

Type	Nom	Valeur	TTL	Actions
A	@	[redacted]	6 heure(s)	[edit] [delete]
A	mail	[redacted]	6 heure(s)	[edit] [delete]
A	mail1	[redacted]	6 heure(s)	[edit] [delete]
CNAME	ftp	@	24 heure(s)	[edit] [delete]
CNAME	imap	mail.vraihack.com.	24 heure(s)	[edit] [delete]
CNAME	pop	mail.vraihack.com.	24 heure(s)	[edit] [delete]
CNAME	smtp	mail.vraihack.com.	24 heure(s)	[edit] [delete]

- ⇒ Please note that LWS Panel they already support webmail (rainloop) but in our case we need to build our own rainloop webmail server for our internal network on Ubuntu localhost as a server
- ⇒ Also note I am using an Ubuntu normal user machine not an Ubuntu server OS because the way to implement have a little of change in case of Ubuntu server!

STEP 2: INSTALL SQL DATABASE (mariadb server)

```
root@mail:~# apt install mariadb-server
```

STEP 3: CHANGE DEFAULT PASSOWRD OF MARIADB

```
root@mail:~# mysql -u root
MariaDB [(none)]> show databases;
MariaDB [(none)]> use mysql;
MariaDB [mysql]> select Host, User, Password from user;
MariaDB [mysql]> UPDATE mysql.user SET password=PASSWORD("password") where User="root" AND Host="localhost";
MariaDB [mysql]> select Host, User, Password, plugin from user;
MariaDB [mysql]> update user set plugin="" where User='root'
```

- **Note: if the first method not working so to change the password of mariadb we can do that to:**

<https://mariadb.com/kb/en/set-password/>

<https://www.ibm.com/docs/en/spectrum-lsf-rtm/10.2.0?topic=ssl-configuring-default-root-password-mysqlmariadb>

```
ALTER USER 'root'@'localhost' IDENTIFIED BY 'NewPassword';
flush privileges;
exit;
```

STEP 4: CREATE DATABASE SQL (messengerie)

```
root@mail:~# mysql -u root -p
```

```
MariaDB [(none)]> create database messengerie;
```

```
MariaDB [(none)]> GRANT ALL PRIVILEGES ON messengerie.* to 'messengerieAdmin'@'localhost' identified by 'osboxes';
```

```
MariaDB [(none)]> flush privileges;
```

STEP 5: CREATE USERS DATABASE SQL (virtual_domains + virtual_users)

```
root@mail : ~# mysql -u messengerieAdmin -p
```

```
root@mail:/etc/postfix# mysql -u messengerieAdmin -p < database_messengerie.sql
```

```
root@mail:/etc/postfix# mysql -u messengerieAdmin -p < users_messengerie.sql
```

```
=> database_messengerie.sql
```

```
use messengerie;
CREATE TABLE `virtual_domains` (
  `domain_id` INT NOT NULL AUTO_INCREMENT,
  `name` VARCHAR(50) NOT NULL,
  PRIMARY KEY (`domain_id`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

CREATE TABLE `virtual_users` (
  `id` INT NOT NULL AUTO_INCREMENT,
  `domain_id` INT NOT NULL,
  `password` VARCHAR(106) NOT NULL,
  `email` VARCHAR(120) NOT NULL,
  `maildir` VARCHAR(120) NOT NULL,
  PRIMARY KEY (`id`),
  UNIQUE KEY `email` (`email`),
  FOREIGN KEY (`domain_id`) REFERENCES virtual_domains(`domain_id`) ON DELETE CASCADE
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

```
=> users_messengerie.sql
```

```
INSERT INTO `messengerie`.`virtual_domains`
(`domain_id`,`name`)
VALUES
('5', 'vraihack.com');
INSERT INTO `messengerie`.`virtual_users`
(`id`,`domain_id`,`password`,`email`,`maildir`)
VALUES
('5', '5', ENCRYPT('admin', CONCAT('$6$', SUBSTRING(SHA(RAND()), -16))), 'admin@vraihack.com', 'vraihack.com/admin/');
```

STEP 6: CREAT VIRTUAL HOST REPOSITORY FOR MAIL USERS (vhosts)

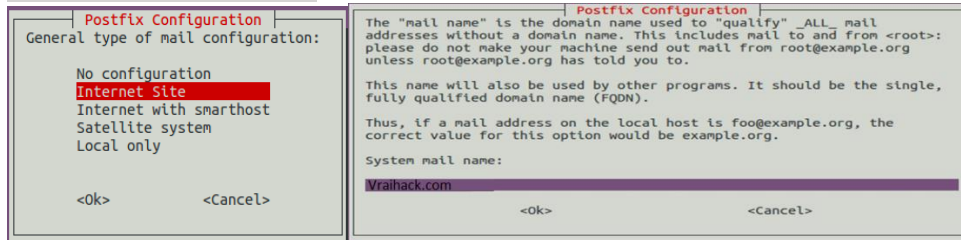
```
root@mail:/etc/postfix# groupadd -g 5000 vhosts
```

```
root@mail:/etc/postfix# useradd -g vhosts -u 5000 vhosts -d /var/mail/vhosts -s /bin/false -
```

STEP 7: INSTALL SMTP POSTFIX

```
root@mail:~# apt-get update
```

```
root@mail:~# apt-get install postfix
```



STEP 8: CONFIGURE POSTFIX (main.cf + mysql-virtual-mailbox-)

```
root@mail:/home/osboxes# cd /etc/postfix
root@mail:/etc/postfix# ll
total 160
d--x-x-x-x 5 root root 4096 Dec 26 16:03 /
drwxr-xr-x 148 root root 12288 Jan 3 04:04 /
-rw-r--r-- 1 root root 100 Dec 14 01:22 dynamicmaps.cf
drwxr-xr-x 2 root root 4096 Sep 7 11:36 dynamicmaps.cf.d/
-rw-r--r-- 1 root root 2638 Dec 26 16:03 main.cf
-rw-r--r-- 1 root root 27120 Dec 12 19:01 main.cf.proto
lrwxrwxrwx 1 root root 31 Dec 12 19:01 makedefs.out -> /usr/share/postfix/makedefs.out
-rw-r--r-- 1 root root 6466 Dec 25 23:01 master.cf
-rw-r--r-- 1 root root 6247 Dec 12 19:01 master.cf.proto
-rw-r--r-- 1 root root 136 Dec 14 01:16 mysql-virtual-mailbox-domains.cf
-rw-r--r-- 1 root root 141 Dec 14 01:34 mysql-virtual-mailbox-maps.cf
-rw-r--r-- 1 root root 10268 Sep 7 11:36 postfix-files
drwxr-xr-x 2 root root 4096 Dec 14 01:22 postfix-files.d/
-rwxr-xr-x 1 root root 11532 Sep 7 11:36 postfix-script*
-rwxr-xr-x 1 root root 29872 Sep 7 11:36 post-install*
drwxr-xr-x 2 root root 4096 Sep 7 11:36 post /
```

If these two files don't exist then creat them manually whith this content:

```
GNU nano 5.4 mysql-virtual-mailbox-domains.cf
user = messagerieAdmin
password = 
hosts = 127.0.0.1
dbname = messagerie
query = SELECT 1 FROM virtual_domains WHERE name='%s'
```

```
GNU nano 5.4 mysql-virtual-mailbox-maps.cf
user = messagerieAdmin
password = 
hosts = 127.0.0.1
dbname = messagerie
query = SELECT maildir FROM virtual_users WHERE email='%s'
```

Main.cf:

```
root@mail:/etc/postfix# cat main.cf
```

```
smtpd_banner = $myhostname ESMTP $mail_name (Ubuntu)
biff = no
append_dot_mydomain = no
readme_directory = no
compatibility_level = 2

# TLS parameters
smtpd_tls_cert_file=/etc/ssl/certs/ssl-cert-snakeoil.pem
smtpd_tls_key_file=/etc/ssl/private/ssl-cert-snakeoil.key
smtpd_tls_security_level = may

smtp_tls_CApath=/etc/ssl/certs
smtp_tls_security_level = may
smtp_tls_session_cache_database = btree:${data_directory}/smtp_scache

smtpd_relay_restrictions = permit_mynetworks permit_sasl_authenticated defer_unauth_destination
myhostname = mail.vraihack.com
alias_maps = hash:/etc/aliases
alias_database = hash:/etc/aliases
myorigin = /etc/mailname
mydestination = $myhostname, localhost.localdomain, localhost
relayhost =
mynetworks = 127.0.0.0/8 [::ffff:127.0.0.0]/104 [::1]/128
mailbox_size_limit = 0
```

```

recipient_delimiter = +
inet_interfaces = all
inet_protocols = all
message_size_limit = 52428800

virtual_mailbox_domains = mysql:/etc/postfix/mysql-virtual-mailbox-domains.cf
virtual_mailbox_base = /var/mail/vhosts
virtual_mailbox_maps = mysql:/etc/postfix/mysql-virtual-mailbox-maps.cf
virtual_minimum_uid = 100
virtual_uid_maps = static:5000
virtual_gid_maps = static:5000
virtual_mailbox_limit = 102400000

#Setting up SMTP authentication
smtpd_sasl_type = dovecot
smtpd_sasl_path = private/auth
smtpd_sasl_local_domain =
smtpd_sasl_security_options = noanonymous
broken_sasl_auth_clients = yes
smtpd_sasl_auth_enable = yes
smtpd_recipient_restrictions =
permit_sasl_authenticated,permit_mynetworks,reject_unauth_destination,reject_invalid_hostname,reject_non_fqdn_hostname,reject_no
n_fqdn_sender,reject_non_fqdn_recipient,reject_unknown_sender_domain,reject_rbl_client sbl.spamhaus.org,reject_rbl_client
cbl.abuseat.org,check_policy_service unix:private/policyd-spf
smtp_tls_note_starttls_offer = yes
smtpd_tls_loglevel = 1
smtpd_tls_received_header = yes
smtpd_helo_required = yes

smtpd_helo_restrictions = reject_non_fqdn_helo_hostname,reject_invalid_helo_hostname,reject_unknown_helo_hostname
disable_vrfy_command = yes

# Milter configuration
milter_default_action = accept
milter_protocol = 6
smtpd_milters = local:opendkim/opendkim.sock
non_smtpd_milters = $smtpd_milters

```

STEP 9: ALLOW POSTFIX TO SPEAK THE SQL LANGUAGE (postfix-mysql package)

```

root@mail:/etc/postfix# apt-get install postfix-mysql
root@mail:/etc/postfix# systemctl restart postfix

```

```

root@mail:/etc/postfix# postmap -q vraihack.com mysql:/etc/postfix/mysql-virtual-mailbox-domains.cf
1

```

```

root@mail:/etc/postfix# postmap -q admin@vraihack.com mysql:/etc/postfix/mysql-virtual-mailbox-maps.cf
Vraihack.com/admin/

```

STEP 10: FIRST MAIL TEST (email to internal user)

```

root@mail:/etc/postfix# telnet localhost 25
mail from: toto@toto.com
rcpt to: user4@vraihack.com
data
Subject: Hello user4
I am trying to send an email to internal user like you, I hope you received my msg
Quit

```

STEP 11: SECOND MAIL TEST (email to external user)

```
root@mail:/etc/postfix# telnet localhost 25
mail from: user4@vraihack.com
rcpt to: toto@gmail.com
data
Subject: Hello toto
I am trying to send an email to external user like you, I hope you received my msg
Quit
```

Note : for security reason maybe your domain mail will be blocked by (spamhaus)

Check the log : `tail -f /var/log/mail.log` where we can found in log a URL link spamhaus to unblock our domain from sending/receive external email

Solution:

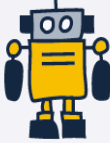
- Visit this page : https://check.spamhaus.org/?_cf_chl_tk=FGyTPiCS4eE9D6MHEk3RX3B2UE8TzncFmz_qPFJC8Xs-1643159933-0-gaNycGzNCX0
- Or directly the link will be present in the your log file `tail -f /var/log/mail.log`
- Then follow the instruction in that page (please use a valid email add related to your domain)

<https://check.spamhaus.org/listed/?searchterm=7>

Learn | Pentester | Telecom Hacking | App

SPAMHAUS PROJECT Search single IP, domain or hash **IP AND REPUTATION**

77.20.4 has 1 listing



Please don't be alarmed! We understand finding your IP address or domain on a blocklist can be worrying. This website will give you information about why you are listed, and what you can do to ensure you don't get listed again.

Where it is possible to request removal, we will help you through the process. However, if your IP is listed on the Spamhaus Blocklist (SBL), removal can only be requested by your Internet Service Provider (ISP).

[Close](#)

About The PBL

The Spamhaus Policy Block List (PBL) is an international anti-spam system maintained by The Spamhaus Project in conjunction with Internet Service Providers and is used by Internet networks to enforce inbound email policies. The PBL database lists end-user IP address ranges which should not be delivering unauthenticated email to any mail server except those provided for specifically for that customer's use. The PBL lists only IP addresses (not domains or email addresses).

For full information on how the PBL operates please see the [PBL Home page](#) and the [PBL Frequently Asked Questions](#).

☒ I am running my own mail server [Next Steps](#)

✓

2

3

ExplanationVerificationConclusion

Removing (7[REDACTED]) from PBL

We need your details to process your request

Please fill out and submit the form below. You will receive an email to verify your address (remember to check your junk folder!). Once you have confirmed your email address, we can begin reviewing your delisting request.

Full name*

Email*

Confirm email*

Please provide details regarding the issue* ⓘ

Your message

protected by reCAPTCHA
Privacy - Terms

Submit

Note: The Email should be a valid email related to your domain name

- For that reason we need to create a valid email address from your DNS provider like this in my case:

LWS Panelvraihack.comAssistance

Create email address

☒ Classic mailbox☐ Email forwarding

E-mail address@realhack.com

Password

Generate

Password Confirmation

Quota

1000

MB (2000 MB max)

To validate

- Connect with the new user

https://mail50.lwspanel.com/webmail/?_task=logout&_token=12fDCmECNZh0Sx3rwwXWvQ2I5rs0cAge

Learn | Pentester | Telecom Hacking | App

roundcube

Username

Password

Language English (US) ▼

Login

This version of Roundcube is deprecated. Please, use the current version.

[Access to the current version of Roundcube webmail](#)

[Access to webmail Rainloop \(mobile and PC\) \[BETA\]](#)

- Check if you received an email confirmation

Reply all Forward Delete Junk Mark More


Subject

- Spamhaus removal verification for 193
- Spamhaus removal verification for 193
- Ouverture du compte mail : user1@vraihack.com

Select Threads Messages 1 to 3 of 3

Spamhaus removal verification for 193.

From Spamhaus Date 26.12.2021 13:42

SPAMHAUS PROJECT

Case ID: ST1377057

Thank you for contacting Spamhaus removals.

The email address user1@vraihack.com has submitted a request for removal of from a Spamhaus list. This request was received from at 2021-12-26 12:42:53 UTC. If this was you, please verify your email address by clicking the following link:

https://check.spamhaus.org/verifying_email?a=ST1377057&b=7f5df5614

Best wishes,
The Spamhaus Project Team

STEP 12: CHECK LOGS & RECEIVED EMAIL

```
root@ mail:~# cat /var/mail/vhosts/VraiHack/user4
```

```
root@ mail:/etc/postfix# tail /var/log/mail.info
```

Note : if the `/var/log/mail.log` and `/var/mail/mail.info` not exist, please create them:

```
touch /var/log/mail.log /var/log/mail.err
```

```
chown syslog:adm /var/log/mail.log /var/log/mail.err
```

```
service postfix reload
```

STEP 13: INSTALL && CONFIGURE IMAP (DOVECOT)

```
root@ mail:~# apt-cache search dovecot
```

```
root@ mail:~# apt-get install dovecot-core dovecot-imapd dovecot-mysql
```

```
root@mail:/etc/dovecot# ll
```

```
total 48
d--x--x---  4 vhosts dovecot  4096 Jan 26 03:02 ./
drwxr-xr-x 148 root    root   12288 Jan  3 04:04 ../
drwxr-x---  2 vhosts dovecot  4096 Jan 26 03:08 conf.d/
-rw-r----- 1 vhosts dovecot  4401 Jun 16 2021 dovecot.conf
-rw-r----- 1 vhosts dovecot 1507 Dec 22 2020 dovecot-dict-auth.conf.ext
-rw-r----- 1 vhosts dovecot  852 Dec 22 2020 dovecot-dict-sql.conf.ext
-rw-r----- 1 vhosts dovecot 5974 Dec 15 02:22 dovecot-sql.conf.ext
drwx----- 2 vhosts dovecot  4096 Dec 14 19:36 private/
```

```
root@ mail:~# nano /etc/dovecot/conf.d/10-mail.conf
```

```
root@mail:/home/osboxes/Desktop# cat /etc/dovecot/conf.d/10-mail.conf
mail_location = maildir:/var/mail/vhosts/%d/%n
namespace inbox {
    inbox = yes
}

mail_privileged_group = mail
protocol lindexer-worker {}
}
```

```
root@ mail:~# nano /etc/dovecot/conf.d/10-auth.conf
```

```
disable_plaintext_auth = yes
auth_mechanisms = plain login
!include auth-sql.conf.ext
```

```
root@ mail:~# nano /etc/dovecot/conf.d/auth-sql.conf.ext
```

```
passdb {
    driver = sql
    args = /etc/dovecot/dovecot-sql.conf.ext
}
userdb {
    driver = static
    args = uid=vhosts gid=vhosts home=/var/mail/vhosts/%d/%n
}
```

```
root@ mail:~# nano /etc/dovecot/dovecot-sql.conf.ext
```

```
driver = mysql
connect = host=127.0.0.1 dbname=messagerie user=messagerieAdmin password=tryhackme
default_pass_scheme = SHA512-CRYPT
password_query = SELECT email as user, password FROM virtual_users WHERE email='%u';
```


STEP 14: TEST DOVECOT FUNCTIONALITY

```
root@ mail:~# systemctl restart dovecot
root@ mail:~# telnet localhost 143
. login admin@vraihack.com Password
. LIST "" *
```

STEP 14: INSTALL WEBSERVER (NGINX)

```
root@ mail:~# apt-get install nginx
root@ mail:~# apt-get -y install php7.4-fpm
```

```
root@mail:/etc/nginx# ll
total 88
d--x--x--x 10 root root 4096 Jan 3 03:44 ./
drwxr-xr-x 148 root root 12288 Jan 3 04:04 ../
drwxr-xr-x 2 root root 4096 Dec 25 17:59 certificate/
drwxr-xr-x 2 root root 4096 Dec 25 00:31 conf.d/
-rw-r--r-- 1 root root 1125 Aug 25 2020 fastcgi.conf
-rw-r--r-- 1 root root 1055 Aug 25 2020 fastcgi_params
-rw-r--r-- 1 root root 2837 Nov 6 2018 koi-utf
-rw-r--r-- 1 root root 2223 Nov 6 2018 koi-win
-rw-r--r-- 1 root root 3957 Nov 6 2018 mime.types
drwxr-xr-x 2 root root 4096 Dec 25 17:41 modsec/
drwxr-xr-x 2 root root 4096 May 25 2021 modules-available/
drwxr-xr-x 2 root root 4096 Dec 16 21:59 modules-enabled/
-rw-r--r-- 1 root root 1497 Dec 25 17:26 nginx.conf
-rw-r--r-- 1 root root 180 Nov 6 2018 proxy_params
-rw-r--r-- 1 root root 636 Nov 6 2018 scgi_params
drwxr-xr-x 2 root root 4096 Jan 3 03:45 sites-available/
drwxr-xr-x 2 root root 4096 Dec 25 02:10 sites-enabled/
drwxr-xr-x 2 root root 4096 Dec 17 00:35 snippets/
-rw-r--r-- 1 root root 664 Nov 6 2018 uwsgi_params
-rw-r--r-- 1 root root 3071 Nov 6 2018 win-utf
```

We still have to check that it correctly interprets PHP, because the webmail that we want to install is coded in PHP. For this, we will already have to tell our server that it can take into account the index pages in PHP.

We'll just add index.php as the default page, and that's done in the default virtualhost /etc/nginx/sites-available/default on the line that starts with index:

```
root@mail:/etc/nginx/sites-available# ll
total 16
drwxr-xr-x 2 root root 4096 Jan 3 03:45 ./
d--x--x--x 10 root root 4096 Jan 3 03:44 ../
-rw-r--r-- 1 root root 2721 Dec 25 18:12 default
-rw-r--r-- 1 root root 1040 Dec 25 18:13 rainloop
```

```
root@ mail:~# ln -s /etc/nginx/sites-available/ /etc/nginx/sites-enabled/
```

```
root@ mail:~# nano /etc/nginx/sites-available/default
```

```
server {
    listen 80 default_server;
    listen [::]:80 default_server;
    server_name _;
    return 301 https://$host$request_uri;
}

server {
    modsecurity on;
    modsecurity_rules_file /etc/nginx/modsec/main.conf;
    listen 443 ssl default_server;
    listen [::]:443 ssl default_server;
    ssl_certificate /etc/nginx/certificate/nginx-certificate.crt;
    ssl_certificate_key /etc/nginx/certificate/nginx.key;
    root /var/www/html;
    index index.php index.html index.htm index.nginx-debian.html;

    server_name _;
    location / {
        try_files $uri $uri/ =404;
    }

    location ~ \.php$ {
        include snippets/fastcgi-php.conf;
        fastcgi_pass unix:/run/php/php7.4-fpm.sock;
    }
}
```

```
}
root@mail:/etc/nginx/sites-available# cat rainloop

server {
    listen 82;
    listen [::]:82;
    server_name rainloop.vraihack.com;
    return 301 https://$host$request_uri;
}

server {
    listen 443 ssl;
    listen [::]:443 ssl;
    server_name rainloop.vraihack.com;
    ssl_certificate /etc/nginx/certificate/nginx-certificate.crt;
    ssl_certificate_key /etc/nginx/certificate/nginx.key;

    root /var/www/rainloop/public_html;
    access_log /var/www/rainloop/logs/access.log;
    error_log /var/www/rainloop/logs/error.log;
    index index.php;
    modsecurity on;
    modsecurity_rules_file /etc/nginx/modsec/main.conf;

    location / {
        try_files $uri $uri/ /index.php?$query_string;
    }

    location ~ \.php$ {
        include snippets/fastcgi-php.conf;
        fastcgi_pass unix:/var/run/php/php7.4-fpm.sock;
    }

    location ~ /\.ht {
        deny all;
    }

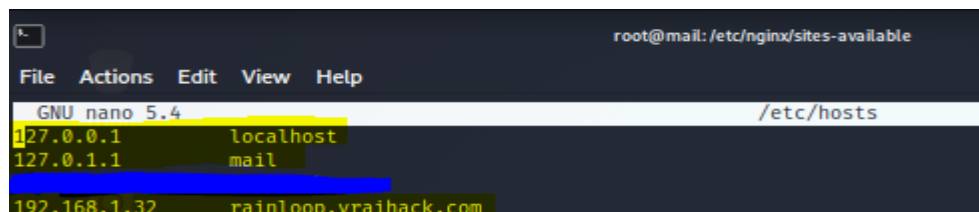
    location ^~/data {
        deny all;
    }
}
```

```
root@mail:~# systemctl restart nginx
```

STEP 15: INSTALL WEBMAIL (RAINLOOP)

```
root@mail:~# apt-get install php-curl php-xml curl
root@mail:~# mkdir -p /var/www/rainloop
root@mail:~# wget -qO- https://repository.rainloop.net/installer.php | php
root@mail:~# cd /var/www/rainloop
root@mail:~# find . -type d -exec chmod 755 {} \;
root@mail:~# find . -type f -exec chmod 644 {} \;
root@mail:~# chown -R www-data:www-data /var/www/rainloop
```

STEP 16: CONFIGURE RAINLOOP



```
root@mail: /etc/nginx/sites-available

File Actions Edit View Help

GNU nano 5.4 /etc/hosts
127.0.0.1 localhost
127.0.1.1 mail
192.168.1.32 rainloop.vraihack.com
```

Go to admin page and add our Domains: default username and password (admin, 12345)

Not secure | <https://rainloop.vraihack.com/?admin#/domains>

RainLoop — Admin Panel (rainloop.vraihack.com)

General
Domains
Login
Branding
Contacts
Security
Integrations
Plugins
Packages
Licensing
About

Edit Domain "vraihack.com"

IMAP		SMTP	
Server	Port	Server	Port
<input type="text" value="localhost"/>	<input type="text" value="143"/>	<input type="text" value="localhost"/>	<input type="text" value="25"/>
Secure		Secure	
<input type="text" value="None"/>		<input type="text" value="None"/>	
<input type="checkbox"/> Use short login (user@domain.com → user)		<input type="checkbox"/> Use short login (user@domain.com → user)	
<input checked="" type="checkbox"/> Sieve configuration (beta)		<input checked="" type="checkbox"/> Use authentication	
		<input type="checkbox"/> Use php mail() function (beta)	

RainLoop Webmail x New Tab x +

<https://rainloop.vraihack.com>

user we created

☐ Remember Me

[Mobile version](#)

STEP 17: Set Up SPF & DKIM with Postfix on Debian Server

- Please follow the instruction in this page:
<https://www.linuxbabe.com/mail-server/spf-dkim-postfix-debian-server>

STEP 18: enable-https-nginx

- Please follow the instruction in this page:
<https://techexpert.tips/nginx/enable-https-nginx/>

STEP 19: nginx-redirect-http-to-https

- Please follow the instruction in this page:
<https://techexpert.tips/nginx/nginx-redirect-http-to-https/>

STEP 20: INSTALL WAF (NGINX ModSecurity)

- Please follow the instruction in this page:
<https://techexpert.tips/nginx/nginx-modsecurity-installation/>