



## BÁO CÁO LAB 5

Sinh viên thực hiện	<b>Sinh viên 1</b> MSSV: Họ tên: Phan Võ Thiên Trường <b>Sinh viên 2</b> MSSV: Họ tên:
Lớp	NS011
Tổng thời gian thực hiện Lab trung bình	
Phân chia công việc (nếu là nhóm)	<b>[Sinh viên 1]:</b>  <b>[Sinh viên 2]:</b>
Link Video thực hiện (nếu có yêu cầu)	
Ý kiến (nếu có) + Khó khăn gặp phải + Đề xuất, góp ý...	
Điểm tự đánh giá (bắt buộc)	? /10

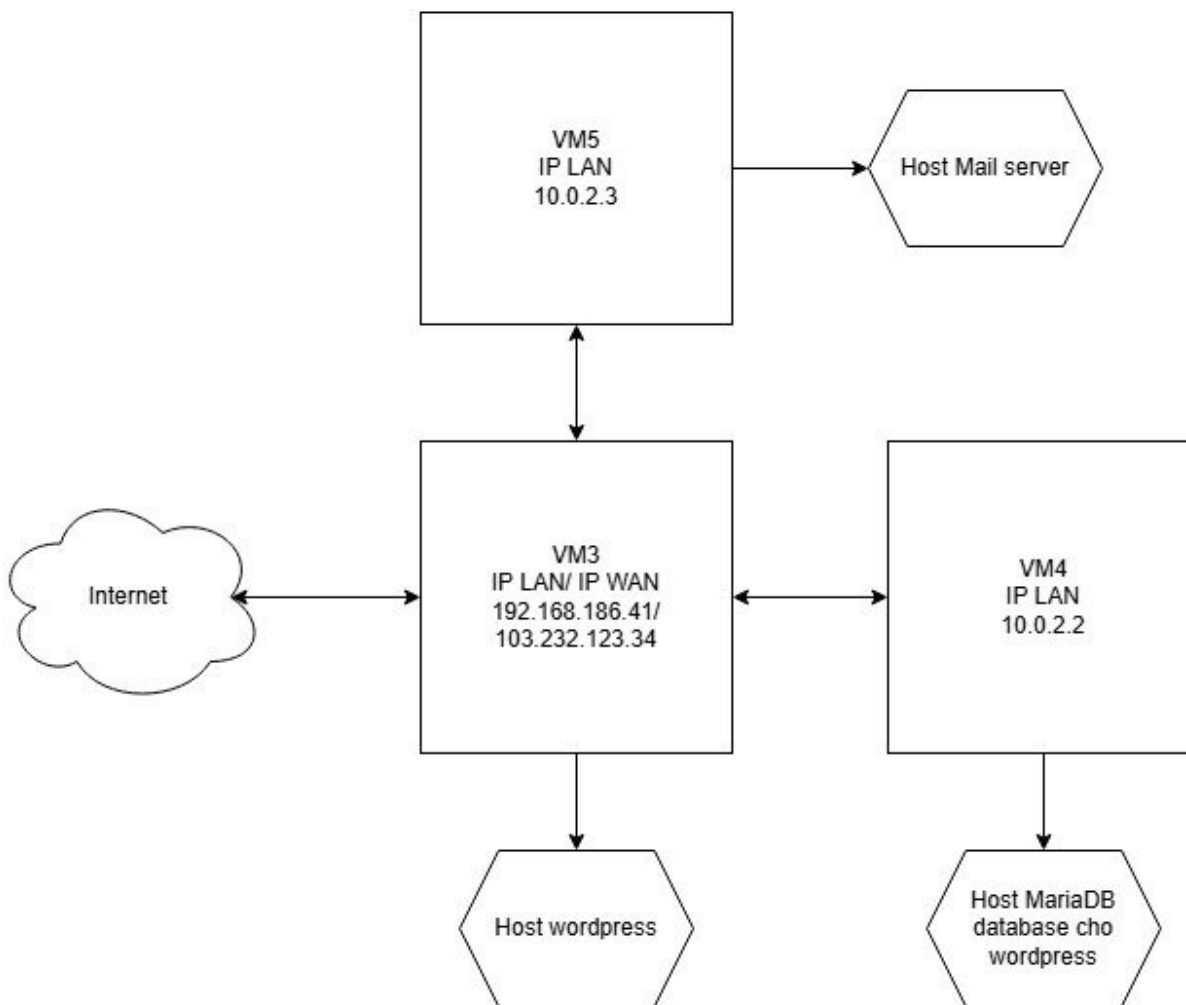


[Nội dung báo cáo chi tiết – Trình bày tùy sinh viên, Xuất file .PDF khi nộp]

Đầu tiên em sử dụng link: [Hướng dẫn cài đặt Zimbra trên Ubuntu 20.04 - vHost](#) để thực hiện cho các task 1 đến task 3.

Pass VM5: LionEl'Johnson\_!q@w#e

Mô hình của LAB



Task 1: Tìm hiểu cấu hình yêu cầu (requirement) của Zimbra Open Source Server bản 8.8.15 (bắt buộc).



The screenshot shows the vHost website with the URL <https://vhost.vn/huong-dan-cai-dat-zimbra-tren-ubuntu-20-04/>. The page is titled "Yêu cầu cấu hình" (Requirements) and lists the minimum server configuration for Zimbra to run smoothly. The requirements are:

- CPU: 8 core CPU
- Memory: 16GB tối thiểu
- Storage: tối thiểu 20GB cho hệ thống và dung lượng ổ cứng tùy thuộc theo nhu cầu lưu trữ mail của khách hàng.

Below the requirements, there is a section titled "Chuẩn bị môi trường trước khi cài đặt Zimbra" (Prepare environment before installing Zimbra) with a sub-section "Cài đặt package screen".

On the right side, there is a sidebar with various hosting services and their counts:

- DirectAdmin (61)
- Linux Hosting (12)
- Reseller Hosting (4)
- Windows Hosting (3)
- Internet Tips (3)
- Mautic (3)
- Network (10)
- Server (3)
- SSL Certificates (13)
- vDrive (2)
- VPS (39)

At the bottom right, there is a chat bubble with a user named "Ly" and a message: "Không biết em có thể hỗ trợ gì cho anh/chị không ạ?" (I don't know if I can help you or not?).

Task 2: Request IP WAN và yêu cầu leader (chị Ngọc) mở port SMTP, kiểm tra blacklist IP.

```
root@webmail:~/zcs-8.8.15_GA_4179.UBUNTU20_64.20211118033954# hostnamectl
Static hostname: webmail.truongpvt.id.vn
Icon name: computer-vm
Chassis: vm
Machine ID: 3395a3ac1aca4f05af5b34ddab84b100
Boot ID: fa55e7621b61480ba115379b079c4709
Virtualization: kvm
Operating System: Ubuntu 20.04.6 LTS
Kernel: Linux 5.4.0-190-generic
Architecture: x86-64
root@webmail:~/zcs-8.8.15_GA_4179.UBUNTU20_64.20211118033954#
```



```
root@webmail: ~
root@ns011-w03-truongpvt: ~
GNU nano 4.8 /etc/cloud/templates/hosts.debian.tpl
## template:jinja
{#
This file (/etc/cloud/templates/hosts.debian.tpl) is only utilized
if enabled in cloud-config. Specifically, in order to enable it
you need to add the following to config:
    manage_etc_hosts: True
-#}
# Your system has configured 'manage_etc_hosts' as True.
# As a result, if you wish for changes to this file to persist
# then you will need to either
# a.) make changes to the master file in /etc/cloud/templates/hosts.debian.tpl
# b.) change or remove the value of 'manage_etc_hosts' in
#    /etc/cloud/cloud.cfg or cloud-config from user-data
#
{# The value '{{hostname}}' will be replaced with the local-hostname -#}
10.0.2.3 {{fqdn}} {{hostname}}
127.0.0.1 localhost

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts

[ Read 26 lines ]
^G Get Help  ^O Write Out  ^W Where Is   ^K Cut Text   ^J Justify    ^C Cur Pos    M-U Undo      M-A Mark Text
^X Exit      ^R Read File  ^\ Replace    ^U Paste Text ^T To Spell   ^_ Go To Line   M-E Redo      M-6 Copy Text
```

```
GNU nano 4.8 /etc/hosts
# Your system has configured 'manage_etc_hosts' as True.
# As a result, if you wish for changes to this file to persist
# then you will need to either
# a.) make changes to the master file in /etc/cloud/templates/hosts.debian.tpl
# b.) change or remove the value of 'manage_etc_hosts' in
#    /etc/cloud/cloud.cfg or cloud-config from user-data
#
10.0.2.3 webmail.truongpvt.id.vn webmail
127.0.0.1 localhost

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts
```

```
root@ns011-w05-truongpvt:~# timedatectl
    Local time: Wed 2024-07-24 11:55:51 +07
    Universal time: Wed 2024-07-24 04:55:51 UTC
        RTC time: Wed 2024-07-24 04:55:52
    Time zone: Asia/Ho_Chi_Minh (+07, +0700)
System clock synchronized: yes
          NTP service: active
    RTC in local TZ: no
root@ns011-w05-truongpvt:~# systemctl disable systemd-resolved
Removed /etc/systemd/system/dbus-org.freedesktop.resolve1.service.
Removed /etc/systemd/system/multi-user.target.wants/systemd-resolved.service.
root@ns011-w05-truongpvt:~# systemctl stop systemd-resolved
root@ns011-w05-truongpvt:~# rm -rf /etc/resolv.conf
" > /etc/resolv.confroot@ns011-w05-truongpvt:~# echo "nameserver 8.8.8.8" > /etc/resolv.conf
```



Task 3: Cài đặt Ubuntu 20.04 và cài đặt Zimbra 8.8.15 trên VM ns011-w05.

```
root@ns011-w05-truongpvt: ~  
Select the packages to install  
Install zimbra-ldap [Y] y  
Install zimbra-logger [Y] y  
Install zimbra-mta [Y] y  
Install zimbra-dnscache [Y] y  
Install zimbra-snmp [Y] y  
Install zimbra-store [Y] y  
Install zimbra-apache [Y] y  
Install zimbra-spell [Y] y  
Install zimbra-memcached [Y]  
Install zimbra-proxy [Y]  
Install zimbra-drive [Y] n  
Install zimbra-imapd (BETA - for evaluation only) [N] n  
Install zimbra-chat [Y]  
Checking required space for zimbra-core  
Checking space for zimbra-store  
Checking required packages for zimbra-store  
zimbra-store package check complete.
```



```
root@webmail: ~/zcs-8.8.15.0
...done

Running Post Installation Configuration:
Installing zimbra-ldap-patch
Operations logged to /tmp/zmsetup.20240725-102947.log
Installing LDAP configuration database...done.
Setting defaults...

DNS ERROR resolving MX for webmail.truongpvt.id.vn
It is suggested that the domain name have an MX record configured in DNS
Change domain name? [Yes]
Create domain: [webmail.truongpvt.id.vn] truongpvt.id.vn
MX: s129d209.emailserver.vn (103.110.129.209)

Interface: 127.0.0.1
Interface: ::1
Interface: 10.0.2.3

DNS ERROR - none of the MX records for truongpvt.id.vn
resolve to this host
It is suggested that the MX record resolve to this host
Re-Enter domain name? [Yes] n
done.
Checking for port conflicts
Port conflict detected: 53 (zimbra-dnscache)
Port conflicts detected! - Press Enter/Return key to continue

Main menu
```

```
root@webmail: ~/zcs-8.8.15.0
q) Quit

Address unconfigured (**) items (? - help) 7

Store configuration

1) Status: Enabled
2) Create Admin User: yes
3) Admin user to create: admin@truongpvt.id.vn
** 4) Admin Password: UNSET
5) Anti-virus quarantine user: virus-quarantine.7lr530efh@truongpvt.id.vn
6) Enable automated spam training: yes
7) Spam training user: spam.1huxu_4vr@truongpvt.id.vn
8) Non-spam(Ham) training user: ham.w6stbwq5q@truongpvt.id.vn
9) SMTP host: webmail.truongpvt.id.vn
10) Web server HTTP port: 8080
11) Web server HTTPS port: 8443
12) Web server mode: https
13) IMAP server port: 7143
14) IMAP server SSL port: 7993
15) POP server port: 7110
16) POP server SSL port: 7995
17) Use spell check server: yes
18) Spell server URL: http://webmail.truongpvt.id.vn:7780/aspell.php
19) Enable version update checks: TRUE
20) Enable version update notifications: TRUE
21) Version update notification email: admin@truongpvt.id.vn
22) Version update source email: admin@truongpvt.id.vn
23) Install mailstore (service webapp): yes
24) Install UI (zimbra, zimbraAdmin webapps): yes

Select, or 'r' for previous menu [r] 4

Password for admin@truongpvt.id.vn (min 6 characters): [QqILMeRAY] LionEL'Johnson_lq@w#e

Store configuration

1) Status: Enabled
2) Create Admin User: yes
3) Admin user to create: admin@truongpvt.id.vn
```



```
root@webmail: ~/zcs-8.8.15.0
com_zimbra_attachmail...done.
com_zimbra_bulkprovision...done.
com_zimbra_attachcontacts...done.
com_zimbra_cert_manager...done.
com_zimbra_webex...done.
com_zimbra_adminversioncheck...done.
com_zimbra_srchhighlighter...done.
com_zimbra_date...done.
com_zimbra_viewmail...done.
com_zimbra_mallarchive...done.
com_zimbra_tooltip...done.
com_zimbra_ymemoticons...done.
Finished installing common zimlets.
Restarting mailbox...done.
Creating galsync account for default domain...done.

You have the option of notifying Zimbra of your installation.
This helps us to track the uptake of the Zimbra Collaboration Server.
The only information that will be transmitted is:
  The VERSION of zcs installed (8.8.15_GA_4179_UBUNTU20_64)
  The ADMIN EMAIL ADDRESS created (admin@truongpvt.id.vn)

Notify Zimbra of your installation? [Yes] no
Notification skipped
Checking if the NG started running...done.
Setting up zimbra crontab...done.

Moving /tmp/zasetup.20240725-102947.log to /opt/zimbra/log

Configuration complete - press return to exit

root@webmail:~/zcs-8.8.15_GA_4179_UBUNTU20_64.20211118033954#
```

Nhưng vì trong quá trình cài đặt em không tạo được admin account nên em phải đăng nhập bằng Zimbra và tạo nó.

```
Zmprov ca [tài khoản] [password] zimbraIsAdminAccount TRUE
```

```
Setting default domain name...done.
Creating domain truongpvt.id.vn...already exists.
Creating admin account admin@truongpvt.id.vn...failed.
Creating root alias...failed.
Creating postmaster alias...failed.
Creating user spam.ihuxu_4vr@truongpvt.id.vn...done.
Creating user ham.w6stbwq5q@truongpvt.id.vn...done.
```

Kiểm tra danh sách các tài khoản admin

([admin@truongpvt.id.vn](mailto:admin@truongpvt.id.vn), pass: LionElJohnson\_123)

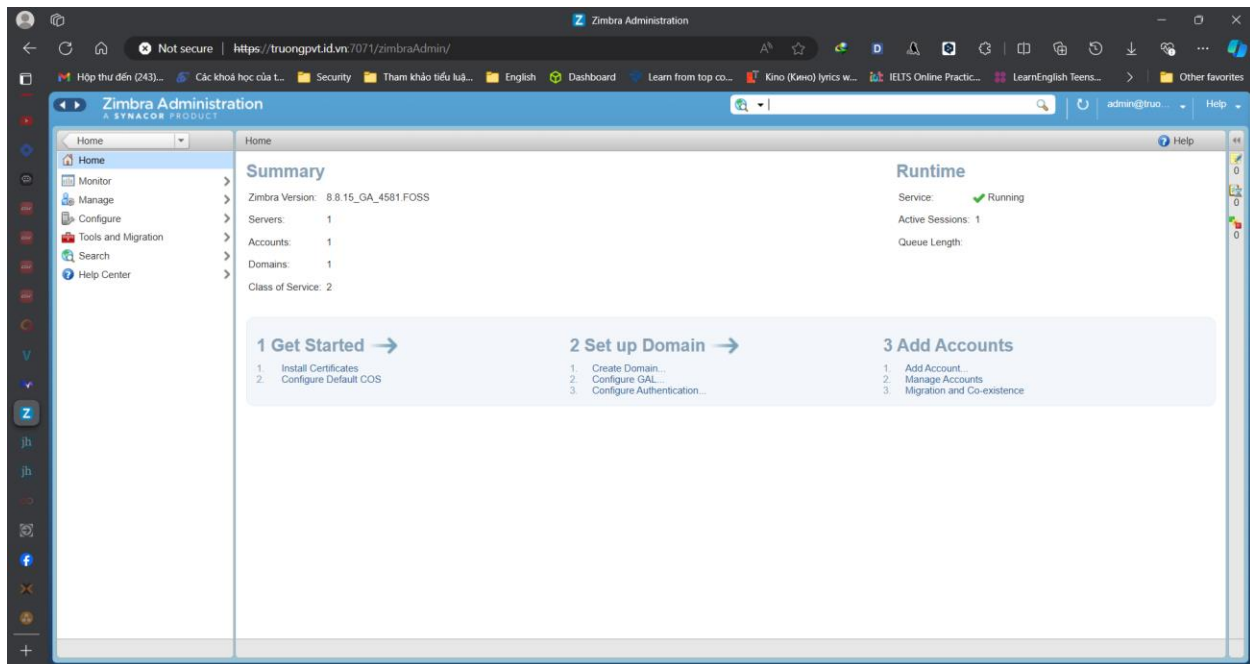
```
zmprov gaaa
```

```
zimbra@webmail:~$ zmprov ca admin@truongpvt.id.vn 'LionElJohnson_123' zimbraIsAdminAccount TRUE
6f6678cd-4306-413f-879a-4ea93941ee82
zimbra@webmail:~$ zmprov gaaa
admin@truongpvt.id.vn
zimbra@webmail:~$
```

(UUID=6f6678cd-4306-413f-879a-4ea93941ee82)

Cuối cùng kiểm tra bằng cách đăng nhập





\*Nếu như có phải khởi động lại và Zimbra không start đầy đủ các service:

-- Kiểm tra status

```
sudo su - zimbra
```

```
zmcontrol status
```

-- Khởi động lại zimbra, kiểm tra status lại nếu như tất cả service chạy đầy đủ thì đúng

```
zmcontrol restart
```

\*Thêm một trường hợp nếu như khởi động lại và file /etc/resolv.conf bị chỉnh nameserver về 127.0.0.1:

-- Vào file /etc/systemd/resolved.conf

```
sudo nano /etc/systemd/resolved.conf
```

-- Tìm DNS và FallbackDNS, thêm vào đó DNS mong muốn

-- Khởi động lại systemd-resolved

```
sudo systemctl restart systemd-resolved
```

-- Liên kết /etc/resolv.conf với systemd-resolved

```
sudo ln -sf /run/systemd/resolve/resolv.conf /etc/resolv.conf
```

-- Cuối cùng kiểm tra lại file /etc/resolv.conf xem có nameserver giống với DNS bên /etc/systemd/resolved.conf.





Cat /etc/resolv.conf

## Task 4: Cấu hình Zimbra Server và DNS đáp ứng các tiêu chí:

- PTR cho IP
- SPF, DKIM, DMARC cho domain

### PTR (Pointer Record)

```
root@webmail:~# dig truongpvt.id.vn

; <<>> DiG 9.18.28-0ubuntu0.20.04.1-Ubuntu <<>> truongpvt.id.vn
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 17074
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;truongpvt.id.vn.                IN      A

;; ANSWER SECTION:
truongpvt.id.vn.                933     IN      A      103.232.123.34

;; Query time: 60 msec
;; SERVER: 8.8.8.8#53(8.8.8.8) (UDP)
;; WHEN: Thu Jul 25 13:44:29 +07 2024
;; MSG SIZE rcvd: 60

root@webmail:~# nslookup truongpvt.id.vn
Server:                8.8.8.8
Address:                8.8.8.8#53

Non-authoritative answer:
Name:   truongpvt.id.vn
Address: 103.232.123.34
```

### SPF (Sender Policy Framework)



<input type="checkbox"/>	@	A	103.232.123.34	3600		
<input type="checkbox"/>	site1	A	103.232.123.34	3600		
<input type="checkbox"/>	site2	A	103.232.123.34	3600		
<input type="checkbox"/>	webmail	A	103.232.123.34	3600		
<input type="checkbox"/>	autoconfig	CNAME	s129d209.emailserver.vn	3600		
<input type="checkbox"/>	cpcontacts	CNAME	s129d209.emailserver.vn.	3600		
<input type="checkbox"/>	mail	CNAME	s129d209.emailserver.vn.	3600		
<input type="checkbox"/>	@	MX	10 truongpvt.id.vn.	3600		
<input type="checkbox"/>	@	NS	ns1.matbao.com. ns2.matbao.com.	3600		
<input type="checkbox"/>	_autodiscover._tcp	SRV	0 0 443 s129d209.emailserver.vn.	3600		
<input type="checkbox"/>	@	TXT	"v=spf1 mx ip4:103.232.123.34 -all"	3600		
<input type="checkbox"/>	_dmarc	TXT	"v=DMARC1; p=none; rua=mailto:admin@truongpvt.id.vn; ruf=mailto:admin@truongpvt.id.vn; sp=none; adkim..."	3600		
<input type="checkbox"/>	166ca964-4b6a-11ef-948c-47cea0e9141e._do mainkey	TXT	"v=DKIM1; k=rsa; p=MIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEA3VQlStQchQslaYabs3cbeUnl..."	3600		

Góp ý trải nghiệm

```
root@webmail:~# dig truongpvt.id.vn

; <<>> DiG 9.18.28-0ubuntu0.20.04.1-Ubuntu <<>> truongpvt.id.vn
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 17074
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
; truongpvt.id.vn.                IN      A

;; ANSWER SECTION:
truongpvt.id.vn.                933     IN      A      103.232.123.34

;; Query time: 60 msec
;; SERVER: 8.8.8.8#53(8.8.8.8) (UDP)
;; WHEN: Thu Jul 25 13:44:29 +07 2024
;; MSG SIZE rcvd: 60

root@webmail:~# nslookup truongpvt.id.vn
Server:                8.8.8.8
Address:                8.8.8.8#53

Non-authoritative answer:
Name:   truongpvt.id.vn
Address: 103.232.123.34
```



Network Tools: DNS, IP, Email

https://mxtoolbox.com/SuperTool.aspx?action=spf%3atruongpvt.id.vn&run=toolpage

**EMAILS BOUNCING? MxToolbox has your email delivery solutions**

v=spf1 mx ip4:10.0.2.3 -all

Prefix	Type	Value	PrefixDesc	Description
v	spf1			The SPF record version
+	mx		Pass	Match if IP is one of the MX hosts for given domain name.
+	ip4	10.0.2.3	Pass	Match if IP is in the given range.
-	all		Fail	Always matches. It goes at the end of your record.

Test	Result
SPF Record Published	SPF Record found
SPF Record Deprecated	No deprecated records found
SPF Multiple Records	Less than two records found
SPF Contains characters after ALL	No items after 'ALL'
SPF Syntax Check	The record is valid
SPF Included Lookups	Number of included lookups is OK
SPF Type PTR Check	No type PTR found
SPF Void Lookups	Number of void lookups is OK
SPF MX Resource Records	Number of MX Resource Records is OK
SPF Record Null Value	No Null DNS Lookups found

dns lookup dns check mx lookup dmarc lookup dns propagation

Reported by ns2.matbao.vn on 7/25/2024 at 7:34:45 PM (UTC -5), just for you.

Transcript

Your IP is: 113.163.51.210 Contact Terms & Conditions Site Map Security API Privacy Policy © Copyright 2004-2021 MxToolbox, Inc. All rights reserved. US Patents 10039353 B2 & 11461730 B2

Know if your campaigns will make the inbox!

- Recipient Complaints**  
Get feedback on how recipients perceive your email, complaints, unsubscribes, failures, and more...
- Adaptive Blacklist Monitoring**  
Real-time monitoring of all your domain's sending IPs
- Mailflow Monitoring**  
Round-trip monitoring of your email latency
- SPF Flattening**  
Prevent soft delivery failures and easily manage complex SPF configurations

## DKIM (DomainKeys Identified Mail)

Tạo DKIM key. Dưới quyền zimbra

```
/opt/zimbra/libexec/zmdkimkeyutil -a -d truongpvt.id.vn
```

```
zimbra@webmail:/root$ /opt/zimbra/libexec/zmdkimkeyutil -a -d truongpvt.id.vn
DKIM Data added to LDAP for domain truongpvt.id.vn with selector 166CA964-4B6A-11EF-948C-47CEA0E9141E
Public signature to enter into DNS:
166CA964-4B6A-11EF-948C-47CEA0E9141E._domainkey IN      TXT      ( "v=DKIM1; k=rsa; "
"p=MIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEAv3QIstQchQsIaYabs3cbeUnISP5I2NMfC16DdV7VJyogyJrz9G5iWq6D+QRYQHicvsP3+5bCmc/8HGxvfGPCe6WdkjoKG9UCRmL
Q0BeLDLKIwake6Cn2Iw05VayHNTF3tiyv8nnZvL3tZMvfzv1zH4V/pxHPJpmzWakWutAwKrr7rHZFQwZayZjYS/qoDIWIXJyCVmtzokuwCqqA"
"/9htGsVbDYlkmuhF5ZVncfGNE5LL8vwH0WZSH35dqJ+RzpWX0iAHyXjiB7CfyfUxXQMGiFPgKDuu4jiWe0TaP5DTcdLi9LbRMEvmNv+o37/HjdnisbhlRd0uhNSKJRfugODLBfwIDAQAB" )
; ----- DKIM key 166CA964-4B6A-11EF-948C-47CEA0E9141E for truongpvt.id.vn
zimbra@webmail:/root$ /opt/zimbra/libexec/zmdkimkeyutil -q -d truongpvt.id.vn
```

lấy key bằng lệnh

```
/opt/zimbra/libexec/zmdkimkeyutil -q -d truongpvt.id.vn
```



```
' DKIM key 166CA964-4B6A-11EF-948C-47CEA0E9141E for truongpvt.id.vn
zimbra@webmail:/root$ /opt/zimbra/libexec/zmdkimkeyutil -q -d truongpvt.id.vn

DKIM Domain:
truongpvt.id.vn

DKIM Selector:
166CA964-4B6A-11EF-948C-47CEA0E9141E

DKIM Private Key:
-----BEGIN PRIVATE KEY-----
MIIEvAIBADANBgkqhkiG9w0BAQEFAASCBKYwggSiAgEAAoIBAQDdVAiy1ByFCwhp
hpuzdxt5Schi/kjY0x8LXoN1XtUnKiDimvP0bmJaroP5BFhAchy+w/f7lskZz/wc
Ze9+ClwTrAOS0gob1QJGaVA4F4s0UojBqR7oKfYjDTLvrIc1MXe2LK/yedm8ve1k
y9/O/XMfhX+nEc8mmBNZqRa60DAqvusdkVDBkDJmNhL+qgMhZcnIJWa30is7AKqo
D/2G0axVsNiWsa6EXllWdx8Y0Tksvy/AfRZLIffl2on5H0LZfSIAfJe0IHsJ9h9S
sJdAwaIU+Ao067i0JZ45No/kNNx2WL0ttEwS+Y2/6jfv8eN2eKxuEut3S6E1IoLF
+6A4MsF/AgMBAAECggEAaxYGo2ena00+rTgYy4tceqGtS0vLOStLAN444qgAn9Nt
S0JVuLVt1yZK6kgk3wGXUOGGcW8vNrZ/98mGR8iBZm86xxxX2cGF0UYpLwqNGF/s
lS7bql7zHWh/jilMvfryPe1/L+Wu6PhIDRXrcr4EXol8EXy3aqjBMdyxv0+P7o3M
3JftMf7c6aiprjPZWg26gQIEh5zy6P03vmT+KN0Y64xo+I9KpGZrwkgV7oIZ7hHI
n4aTpIf8HbKWoupJnrdxch/ML/arHzNvcJNLtTh1g2JjFRHTDckACWyswIXayCOn
Ts1CuWRh8yhR24XYoUiGXb3lerlbgDeyGCvjJA0ocQKBgQDxmWJa7+hr54qj7YQu
K5kaKtgf/JrjV0Zy0n+0Hc84WiDgr+wLeblf8jzTQZL6mh33UMMDJoTn3Nh+dVXg
eLrFEjDQaFnm89m1Q3eSEXI4a799qdt5LEFFQwCwW50X7XXQXYQEfH0hZGG5H3gJ
9YudgNI7IQ8IyTfKxe6T7U4LiQKBgQDqhVTh/cSfV7P1NNbgoIT3H3L/wB/SBH8T
H515aHqMFKTRW4yfXuPZQv+wiR+RruWpSTBGLS0sb52NbZm0yQPJ5rieMXDa6Vbi
h+oWYPYfM36/cHXp4efnJJQSiCC04WI7LaAwaXj8pTWCmsnS26+litPZat+pFJ5I
vtQHGiT6xwKBgAd8uGaXDr3hVB0WdcU0hq8f6si6/FXVS5KdYWXEkprptWJ199j04
1vzZNfdaDhaVlh4nCHh9hhrLzJQtELc/JpKa6LZctVD4d609boQxYRwsqgezTuDq
rkcmN2w/upOWQVNuwnudG7xBrYgCjwzH9kawSLOYx61/Bq/UlWMyNHv5AoGAQS9e
MJKAnGmcLxFIyJbVXnr3U+7q6U0mpQIcmypXJah3R1nS9FLDq5fbyg3TIIMkgrE9
IeFCUSOU/0J/fqiaZRW8KvxDChXheIWeoynAP1vo1v1DSQbpjz0jLKMRTDURQLGL
3M700gURombLgjhdf2MdNon4K9Cb6Xa+T5jGPECgYB768FhKgITFLgHyKAhWGP3
29id7lAwj9Hh0+XQ9kFM8GE0g/tm4A9Shf7zMGcPrkM48S0MvevbuMHvmB1FRlxZ
x0rh608NRHJBmcEKZj2HEcW6KtLF06qeMkgkk0vZHpVBwJtVKhY2svd/+F5hi0eX
QaFTkckZ8HEu1u0zW3Ya2g==
-----END PRIVATE KEY-----

DKIM Public signature:
166CA964-4B6A-11EF-948C-47CEA0E9141E._domainkey IN      TXT      ( "v=DKIM1; k=rsa; "
```

```
29id7lAwj9Hh0+XQ9kFM8GE0g/tm4A9Shf7zMGcPrkM48S0MvevbuMHvmB1FRlxZ
x0rh608NRHJBmcEKZj2HEcW6KtLF06qeMkgkk0vZHpVBwJtVKhY2svd/+F5hi0eX
QaFTkckZ8HEu1u0zW3Ya2g==
-----END PRIVATE KEY-----

DKIM Public signature:
166CA964-4B6A-11EF-948C-47CEA0E9141E._domainkey IN      TXT      ( "v=DKIM1; k=rsa; "
"p=MIIEBjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBcGKCAQEAA3VQIstQchQsIaYabs3cbeUnISP5I2NMfC16DdV7VJyogyJrz9G5iWq6D+QRYQHicvsP3+5bCmc/8HGxvfpgpcE6wDkjoKG9UCRmL
Q0BeLDlKIwake6Cn2Iw05VayHNTF3tiyv8nnZL3tZMvfzv1zH4V/pxHPJpmzWakWutAwKr7rHZFQwZAYzjYS/qoDIWXJyCvmtzokuwCqqA"
"/9htGsVbDYlkmuhF5ZVncfGNE5LL8vwH0WZSH35dqJ+RzpwX0iAHyXjiB7CFYFurCXQMgiFPgKDu4jiWe0TaP5Dcdli9LbRMEvmNv+o37/HjdniSbhlRrd0uhNSKJRfugODLBFwIDAQAB" )
; ----- DKIM key 166CA964-4B6A-11EF-948C-47CEA0E9141E for truongpvt.id.vn

DKIM Identity:
truongpvt.id.vn
```

Kiểm tra xem DNS có được update chưa:

```
dig -t txt 166CA964-4B6A-11EF-948C-47CEA0E9141E._domainkey/[public signature].[tên
domain]
```



Kiểm tra xem khóa public có phù hợp với khóa private hay không. Nếu kết quả không trả về gì là hợp lệ.

```
/opt/zimbra/common/sbin/opendkim-testkey -d truongpvt.id.vn -s 166CA964-4B6A-11EF-948C-47CEA0E9141E -x /opt/zimbra/conf/opendkim.conf
```

```
zimbra@webmail:/root$
zimbra@webmail:/root$ /opt/zimbra/common/sbin/opendkim-testkey -d truongpvt.id.vn -s 166CA964-4B6A-11EF-948C-47CEA0E9141E -x /opt/zimbra/conf/opendkim.conf
zimbra@webmail:/root$ dig -t txt 166CA964-4B6A-11EF-948C-47CEA0E9141E._domainkey.truongpvt.id.vn

; <>> DiG 9.18.28-0ubuntu0.20.04.1-Ubuntu <>> -t txt 166CA964-4B6A-11EF-948C-47CEA0E9141E._domainkey.truongpvt.id.vn
; global options: +cmd
; Got answer:
; -->HEADER<-- opcode: QUERY, status: NOERROR, id: 54346
; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;166CA964-4B6A-11EF-948C-47CEA0E9141E._domainkey.truongpvt.id.vn. IN TXT

;; ANSWER SECTION:
166CA964-4B6A-11EF-948C-47CEA0E9141E._domainkey.truongpvt.id.vn. 3506 IN TXT "v=DKIM1; k=rsa; p=MIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEA3V0IstQchQsIaYab
s3cbeUnISP5I2NMfC16DdV7VJyogyJrz9G5iWq6D+QRYQHicvsP3+5bCmc/8HGxvfgpcE6wDkjoKG9UCRmLQ0BeLDLKIwake6Cn2Iw05VayHNTF3tiyv8nnZvL3tZMvfzv1zH4V/pxHPJpmzWakWutAwKr7r
HZFQwZAYzjYS/qoDIWxJy" "CVmtzokuwCqqA/9htGsVbDYlkmuhF5ZVncfGNE5LL8vmH0WZSH35dqJ+RzpxW0iAHyXjiB7CfYfUrCXQMGiFPgKDuu4jiWeOTaP5DTcdLi9LbRMEvmNv+o37/HjdniisbhLrd
0uhNSKJRfugODLBfwIDAQAB"

;; Query time: 52 msec
;; SERVER: 8.8.8.8#53(8.8.8.8) (UDP)
;; WHEN: Fri Jul 26 23:21:35 +07 2024
;; MSG SIZE rcvd: 516
```

## DMARC (Domain-based Message Authentication, Reporting, and Conformance)

```
v=DMARC1; p=none; rua=mailto:admin@truongpvt.id.vn; ruf=mailto:admin@truongpvt.id.vn;
sp=none; adkim=s; aspf=s;
```

v=DMARC1: phiên bản của DMARC

p=none: chính sách cho domain chính

rua=mailto:[admin@truongpvt.id.vn](mailto:admin@truongpvt.id.vn) (tổng hợp), ruf=mailto:[admin@truongpvt.id.vn](mailto:admin@truongpvt.id.vn) (thất bại):  
địa chỉ nơi email được báo cáo tổng hợp và thất bại của DMARC tới

sp=none: chính sách cho subdomain

adkim=s: chế độ căn chỉnh cho DKIM, 's' ở đây là strict => phải khớp chính xác

aspf=s: chế độ căn chỉnh cho SPF, 's' ở đây là strict => phải khớp chính xác



## Điều chỉnh bản ghi DNS

Thay đổi các giá trị và bấm Lưu khi hoàn tất.

Host

\_dmarc

Loại

TXT

Giá trị

"v=DMARC1; p=none; rua=mailto:admin@truongpvt.id.vn;  
ruf=mailto:admin@truongpvt.id.vn; sp=none; adkim=s; aspf=s;"

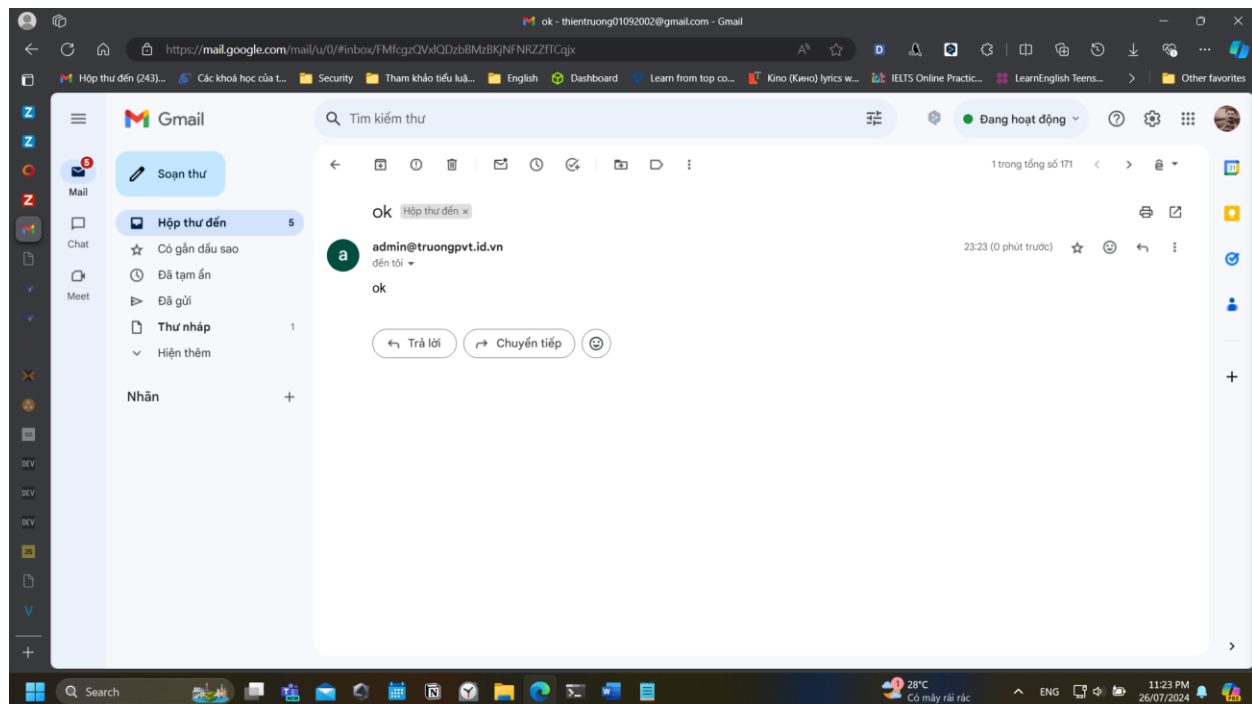
TTL

Mặc định TTL

+ Thêm giá trị vào bản ghi này

Lưu

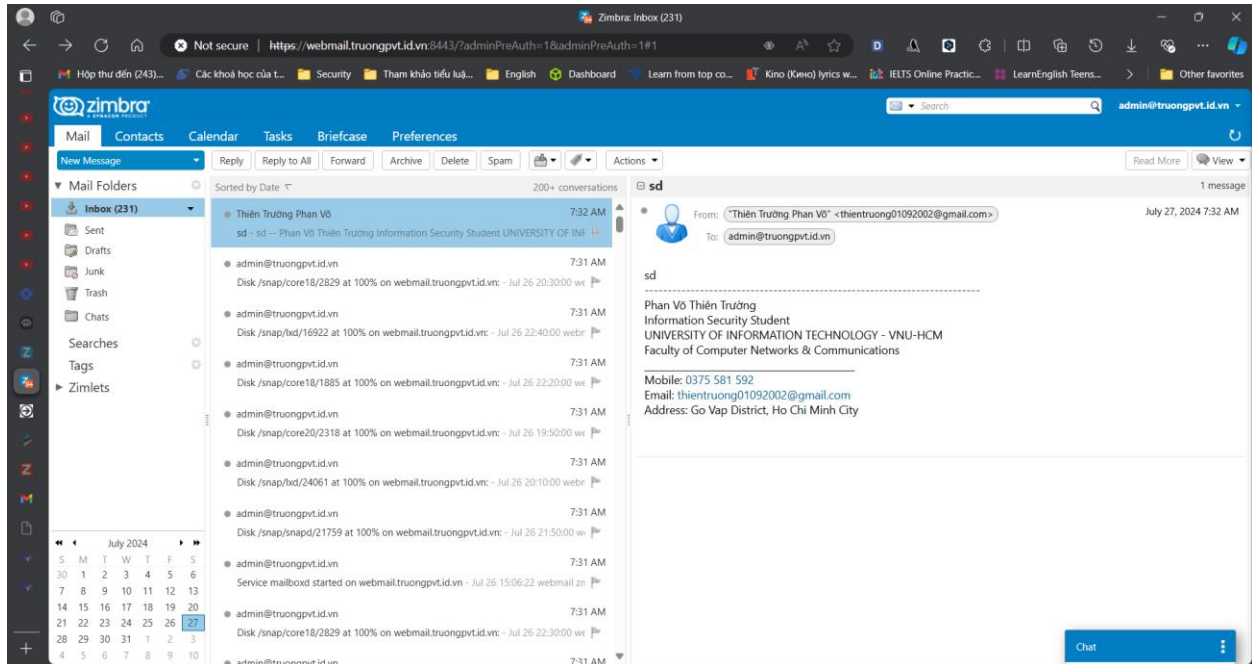
## Task 5: Gửi test email tới Gmail và đảm bảo vào inbox.







## Task 6: Email gmail gửi ngược lại và nhận được.



## Task 7: Cấu hình Zimbra đảm bảo hỗ trợ tự động config cho các client app như 2 video sau:

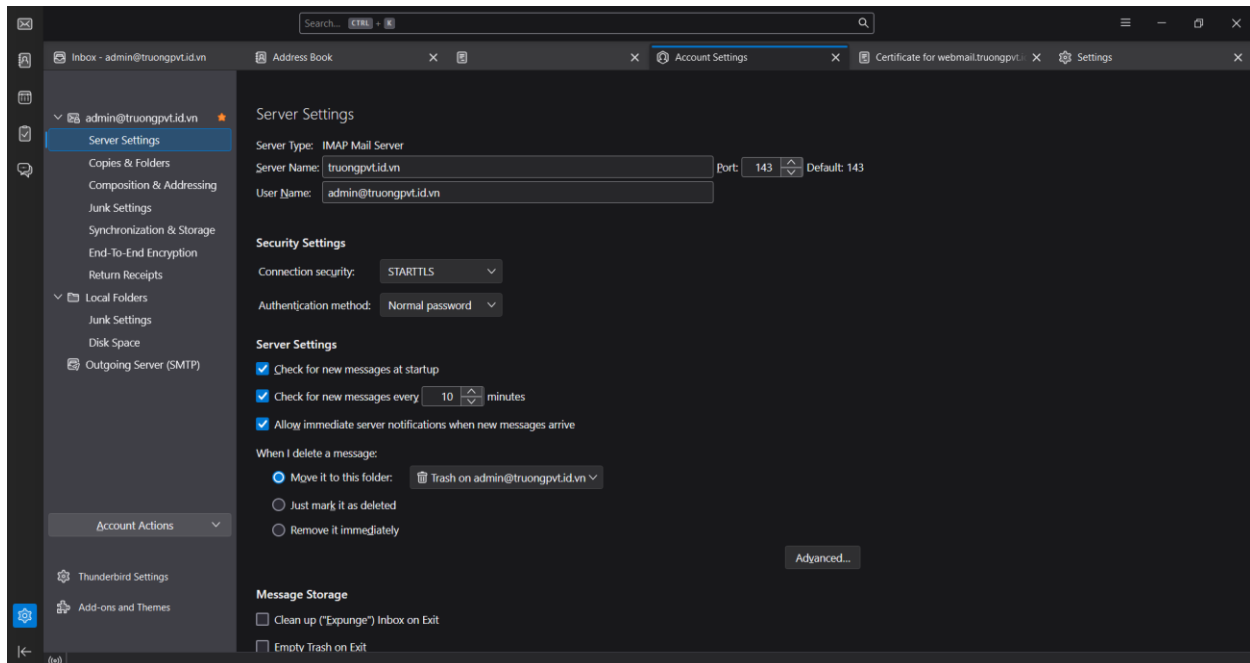
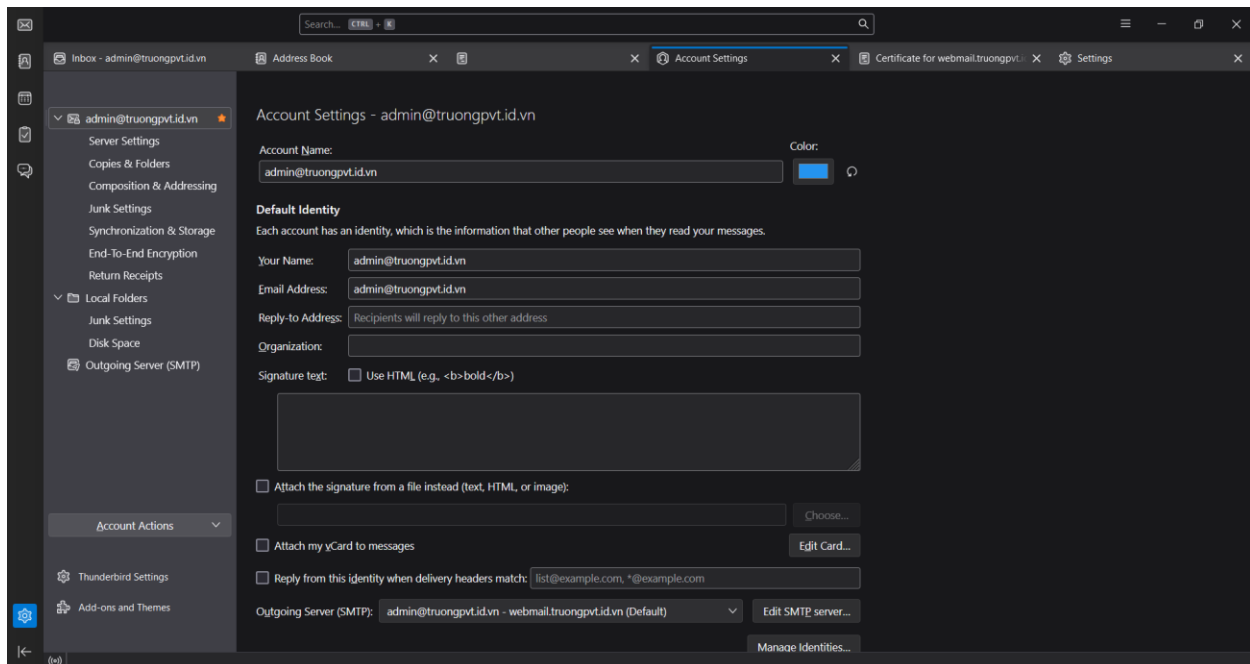
- Thunderbird: [https://www.youtube.com/watch?v=Z9dY0L2Bm\\_I&t=5s](https://www.youtube.com/watch?v=Z9dY0L2Bm_I&t=5s)
- Outlook: <https://www.youtube.com/watch?v=yi71uaMt6XU>

Khi config cho cả 2 app em chỉ việc set server về domain [webmail.truongpvt.id.vn](https://webmail.truongpvt.id.vn), add thêm email [admin@truongpvt.id.vn](mailto:admin@truongpvt.id.vn), password của email.

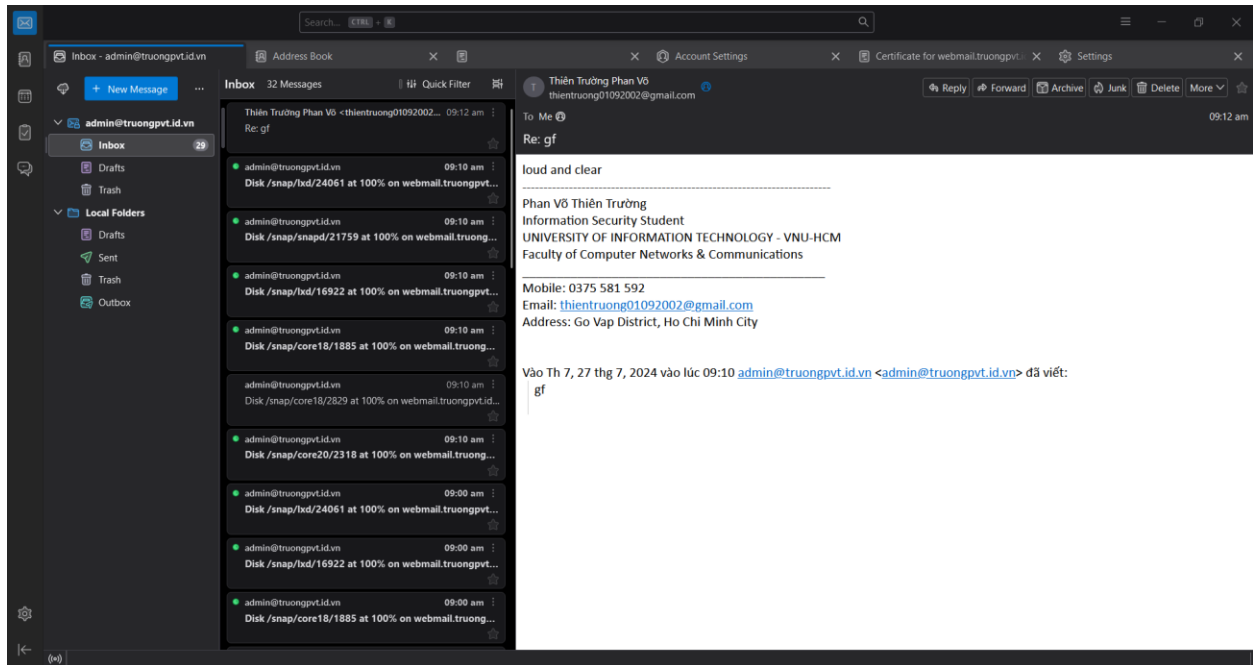
Thunderbird

Setting






Kết quả



Outlook

Setting





## IMAP Account Settings

admin@truongpvt.id.vn

**Incoming mail** ^

User name

admin@truongpvt.id.vn

Password

\*\*\*\*\*

☒ Remember password

Server

truongpvt.id.vn

Port

143

Encryption method

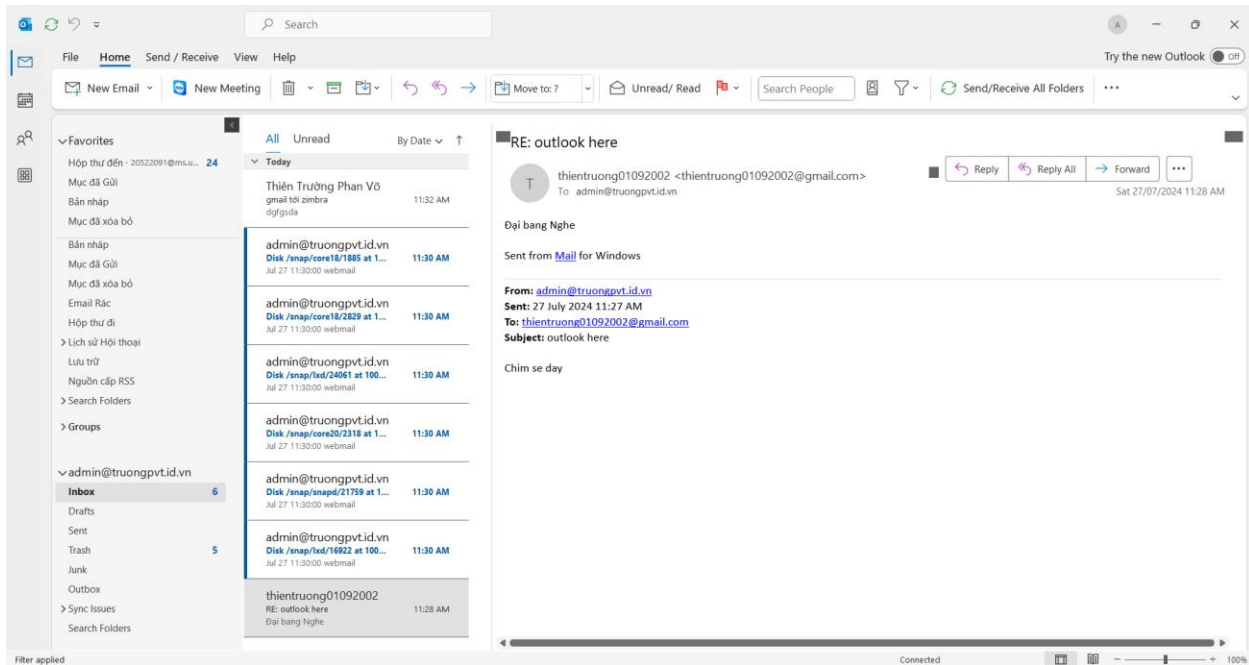
STARTTLS ▾

☒ Require logon using Secure Password Authentication (SPA)

**Outgoing mail** ▾

Next

Kết quả



## Task 8: Tích hợp SMTP cho website của tuần 4:

- Cài đặt plugin: WP SMTP + WP Form
- Cấu hình SMTP của Zimbra vào SMTP này và test việc gửi tin nhắn qua form thành công

Vì lần này em chưa cài đặt cert SSL cho zimbra nên khi thử test mail từ WP Form đến thì sẽ bị lỗi xác thực SSL giữa wordpress và zimbra. Nên em sẽ tắt tính năng verify peer của SSL trong file PHPMailer.php

```
y. Command not found
root@ns011-w03-truongpvt:/var/www/html/wordpress/wp-includes/PHPMailer# nano PHPMailer.php
root@ns011-w03-truongpvt:/var/www/html/wordpress/wp-includes/PHPMailer# nano PHPMailer.php
root@ns011-w03-truongpvt:/var/www/html/wordpress/wp-includes/PHPMailer#
```

```
'ssl' => [
    'verify_peer'    => false,
    'verify_peer_name' => false,
    'allow_self_signed' => true
]
```



```
root@webmail: ~
root@ns011-w03-truongpvt: /

GNU nano 6.2 PHPMailer.php

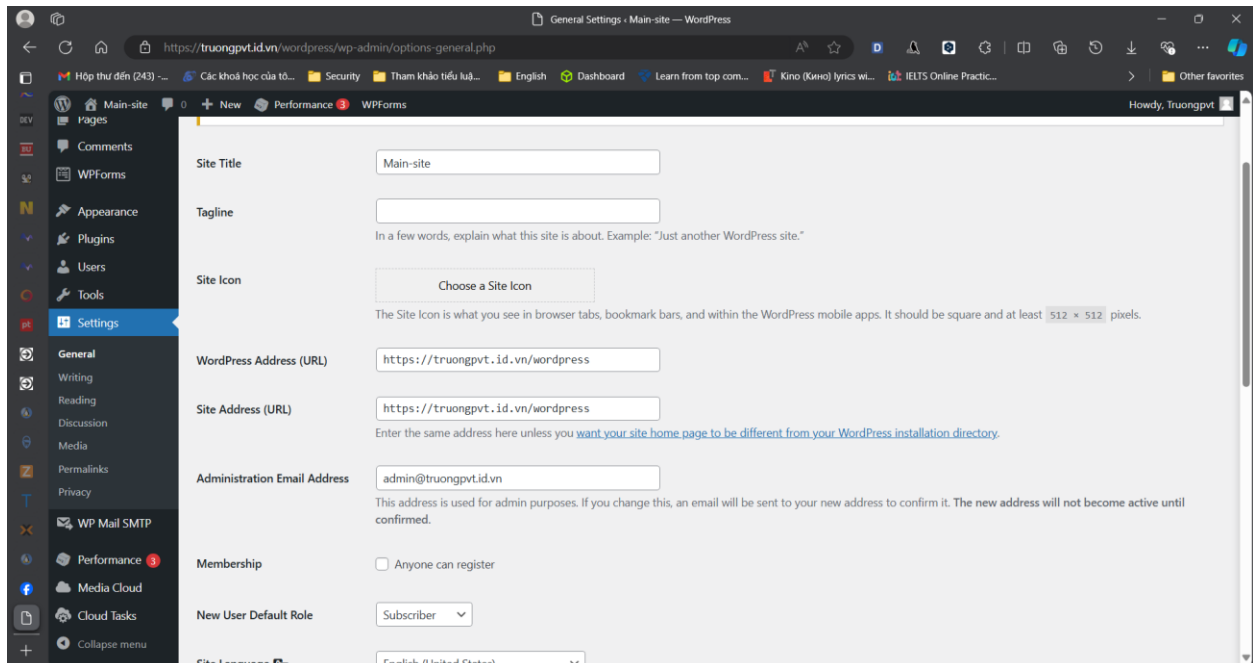
public $SMTPAutoTLS = true;

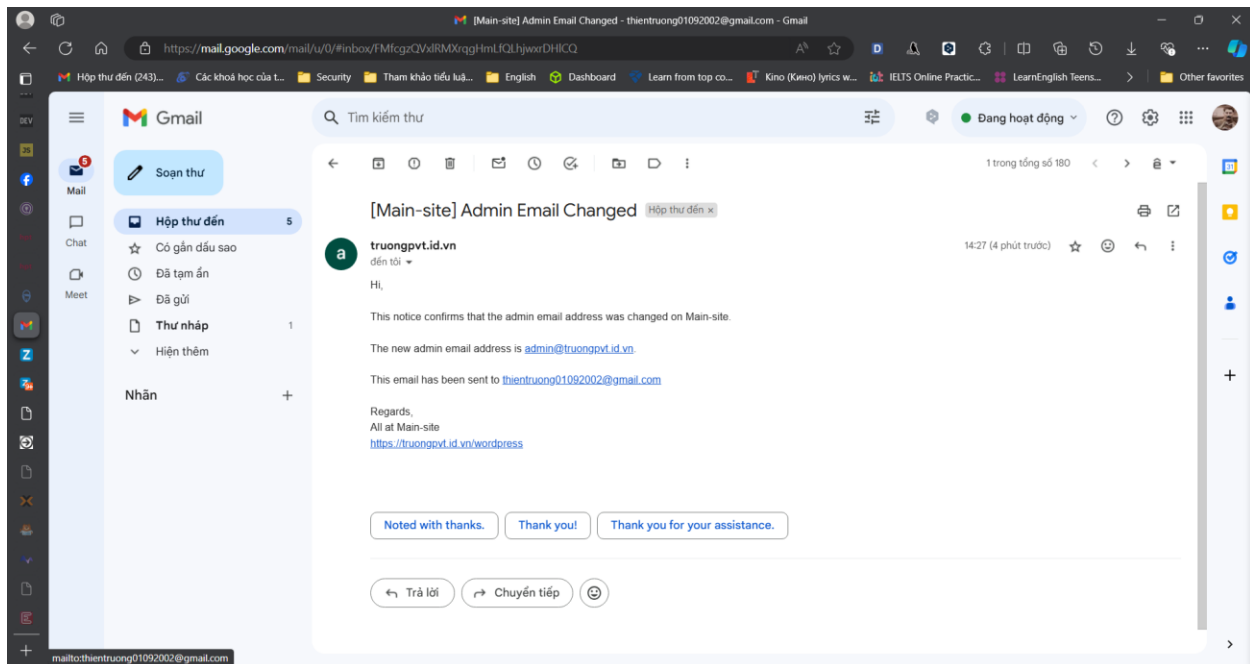
/**
 * Whether to use SMTP authentication.
 * Uses the Username and Password properties.
 *
 * @see PHPMailer::$Username
 * @see PHPMailer::$Password
 *
 * @var bool
 */
public $SMTPAuth = false;

/**
 * Options array passed to stream_context_create when connecting via SMTP.
 *
 * @var array
 */
public $SMTPOptions = [
    'ssl' => [
        'verify_peer' => false,
        'verify_peer_name' => false,
        'allow_self_signed' => true
    ]
];

1;
```

## Đổi mail admin





Thêm vào trường `admin_email` để mỗi khi form được gửi tới email chỉ định, `admin_email` sẽ được báo về nội dung đã được gửi đi



## Default Notification

Send To Email Address ?

Show Smart Tags

{admin\_email}, {field\_id="1"}

Email Subject Line

Show Smart Tags

New Entry: Simple Contact Form

From Name

Show Smart Tags

Main-site

From Email ?

Show Smart Tags

admin@truongpvt.id.vn

Reply-To ?

Show Smart Tags

{field\_id="1"}

Email Message

Show Smart Tags

{all\_fields}

Thực hiện việc gửi form





WP Form

Jul 27, 2024 — by Trungpvt in Uncategorized

**Name \***

Big Enjoyer

First Last

**Email \***

thientruong01092002@gmail.com

**Comment or Message**

Play some chess games?

Submit

Kiểm tra kết quả

Bên gmail

New Entry: Simple Contact Form - thientruong01092002@gmail.com - Gmail

https://mail.google.com/mail/u/0/#inbox/FMfcgQVxITfmlHTRWtBkqjHfHkq10z

Mail

Soạn thư

Hộp thư đến 5

Có gắn dấu sao

Đã tạm ẩn

Đã gửi

Thư nháp 1

Hiện thêm

Nhãn +

Tìm kiếm thư

Đang hoạt động

1 trong tổng số 190

New Entry: Simple Contact Form

Main-site đến tôi

15:30 (0 phút trước)

**Name**

Trương Phan Võ Thiện

**Email**

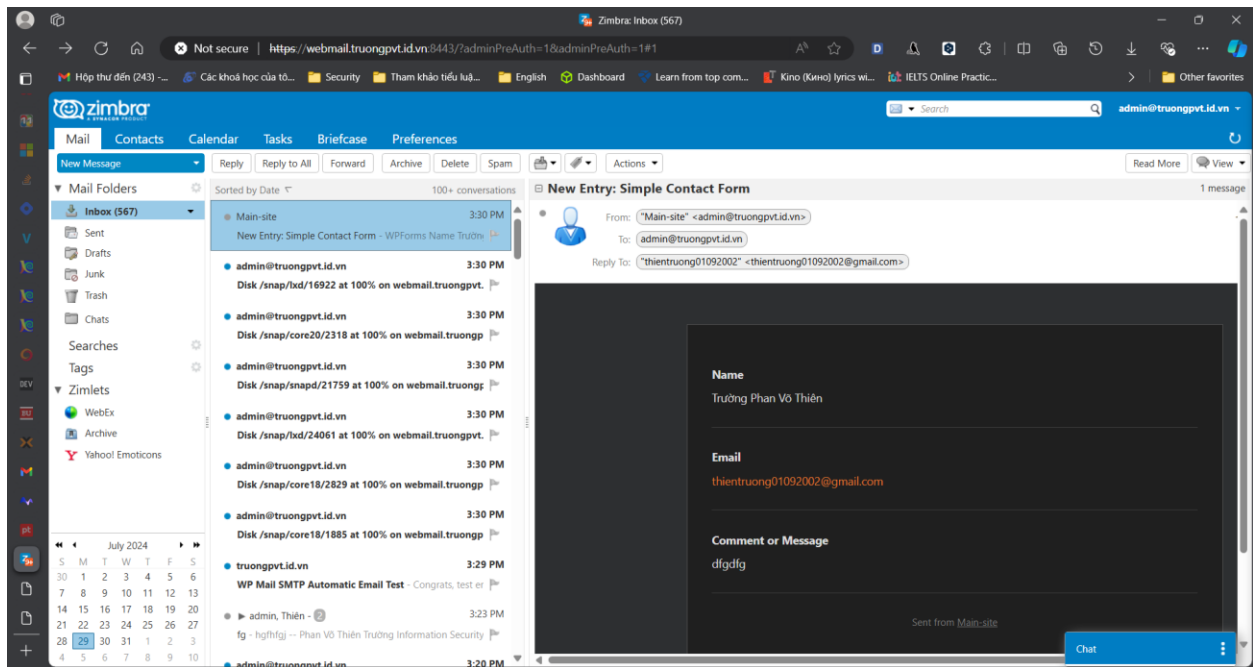
thientruong01092002@gmail.com

**Comment or Message**

dfgdfg

Sent from Main-site

Bên admin mail



Ký SSL certificate cho zimbra thông qua certbot

Vì certbot đã được ký sẵn SSL cho domain trungpvt.id.vn ở lab 4 nên em sẽ expand nó ra bằng câu lệnh dưới để thêm wildcard

```
sudo certbot certonly --manual --preferred-challenges dns -d *.trungpvt.id.vn -d trungpvt.id.vn
```



```
root@ns011-w03-truongpvt:/etc/ssl#
root@ns011-w03-truongpvt:/etc/ssl#
root@ns011-w03-truongpvt:/etc/ssl#
root@ns011-w03-truongpvt:/etc/ssl# sudo certbot certonly --manual --preferred-challenges dns -d *.example.com -d truongpvt.id.vn^C
root@ns011-w03-truongpvt:/etc/ssl# sudo certbot certonly --manual --preferred-challenges dns -d *.truongpvt.id.vn -d truongpvt.id.vn
Saving debug log to /var/log/letsencrypt/letsencrypt.log

-----
You have an existing certificate that contains a portion of the domains you
requested (ref: /etc/letsencrypt/renewal/truongpvt.id.vn.conf)

It contains these names: truongpvt.id.vn

You requested these names for the new certificate: *.truongpvt.id.vn,
truongpvt.id.vn.

Do you want to expand and replace this existing certificate with the new
certificate?
-----
(E)xpand/(C)ancel: e
Renewing an existing certificate for *.truongpvt.id.vn and truongpvt.id.vn
-----
Please deploy a DNS TXT record under the name:
_acme-challenge.truongpvt.id.vn.

with the following value:

Cnd098_08KkKw5aPccVpmUooCmwuiUiAr2jHNbeh_bJE

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.truongpvt.id.vn.
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

_acme-challenge.truongpvt.id.vn.

with the following value:

Cnd098_08KkKw5aPccVpmUooCmwuiUiAr2jHNbeh_bJE

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.truongpvt.id.vn.
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

Successfully received certificate.
Certificate is saved at: /etc/letsencrypt/live/truongpvt.id.vn/fullchain.pem
Key is saved at: /etc/letsencrypt/live/truongpvt.id.vn/privkey.pem
This certificate expires on 2024-10-27.
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 this 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@ns011-w03-truongpvt:/etc/ssl# cd /etc/letsencrypt/live/truongpvt.id.vn
root@ns011-w03-truongpvt:/etc/letsencrypt/live/truongpvt.id.vn# ls
README cert.pem chain.pem fullchain.pem privkey.pem
root@ns011-w03-truongpvt:/etc/letsencrypt/live/truongpvt.id.vn# sudo apt install vsftpd
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
vsftpd is already the newest version (3.0.5-0ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 97 not upgraded.
```

Tiếp theo, em dựa theo mục IV của link phía dưới để bắt đầu triển khai cert SSL cho zimbra

[How To Configure Let's Encrypt SSL Certificates on Zimbra Server | ComputingForGeeks](#)

Đầu tiên em copy các file cert và key bên VM3 qua VM5 chứa zimbra tại file  
/opt/zimbra/ssl/letsencrypt



```
root@webmail:/opt/zimbra/ssl/letsencrypt# nano README
root@webmail:/opt/zimbra/ssl/letsencrypt# ls
README cert.pem chain.pem fullchain.pem privkey.pem
root@webmail:/opt/zimbra/ssl/letsencrypt# nano zimbra_chain.pem
```

Tiếp theo em copy file chain.pem thành file zimbra-chain.pem và nối chúng với key của CA theo đường link cung cấp trong bài trên

<https://letsencrypt.org/certs/isrgrootx1.pem.txt>

Tiếp đến là set owner cho user zimbra

```
sudo chown -R zimbra:zimbra /opt/zimbra/ssl/letsencrypt/
```

```
root@webmail:/opt/zimbra/ssl/letsencrypt# ll
total 32
drwxr-xr-x 2 zimbra zimbra 4096 Jul 29 20:34 ./
drwxr-xr-x 9 zimbra zimbra 4096 Jul 29 20:27 ../
-rw-r--r-- 1 zimbra zimbra 692 Jul 29 20:31 README
-rw-r--r-- 1 zimbra zimbra 1801 Jul 29 20:29 cert.pem
-rw-r--r-- 1 zimbra zimbra 1801 Jul 29 20:30 chain.pem
-rw-r--r-- 1 zimbra zimbra 3602 Jul 29 20:29 fullchain.pem
-rw-r--r-- 1 zimbra zimbra 1704 Jul 29 20:30 privkey.pem
-rw-r--r-- 1 zimbra zimbra 3740 Jul 29 20:34 zimbra_chain.pem
```

Verify các file privkey.pem, cert.pem và zimbra\_key.pem

```
sudo su - zimbra -c '/opt/zimbra/bin/zmcertmgr verifycrt comm
/opt/zimbra/ssl/letsencrypt/privkey.pem /opt/zimbra/ssl/letsencrypt/cert.pem
/opt/zimbra/ssl/letsencrypt/zimbra_chain.pem'
```

```
-rw-r--r-- 1 zimbra zimbra 1801 Jul 29 20:30 chain.pem
-rw-r--r-- 1 zimbra zimbra 3602 Jul 29 20:29 fullchain.pem
-rw-r--r-- 1 zimbra zimbra 1704 Jul 29 20:30 privkey.pem
-rw-r--r-- 1 zimbra zimbra 3740 Jul 29 20:34 zimbra_chain.pem
root@webmail:/opt/zimbra/ssl/letsencrypt# sudo su - zimbra -c '/opt/zimbra/bin/zmcertmgr verifycrt comm /opt/zimbra/ssl/letsencrypt/privkey.pem /opt/zimbra/ssl/letsencrypt/cert.pem /opt/zimbra/ssl/letsencrypt/zimbra_chain.pem'
** Verifying '/opt/zimbra/ssl/letsencrypt/cert.pem' against '/opt/zimbra/ssl/letsencrypt/privkey.pem'
Certificate '/opt/zimbra/ssl/letsencrypt/cert.pem' and private key '/opt/zimbra/ssl/letsencrypt/privkey.pem' match.
** Verifying '/opt/zimbra/ssl/letsencrypt/cert.pem' against '/opt/zimbra/ssl/letsencrypt/zimbra_chain.pem'
Valid certificate chain: /opt/zimbra/ssl/letsencrypt/cert.pem: OK
root@webmail:/opt/zimbra/ssl/letsencrypt#
```

Tiếp đến là copy private key sang nơi chứa đường dẫn Zimbra SSL và set owner user zimbra cho file đó. Cuối cùng thì deploy SSL certificate.

```
sudo cp /opt/zimbra/ssl/letsencrypt/privkey.pem
/opt/zimbra/ssl/zimbra/commercial/commercial.key

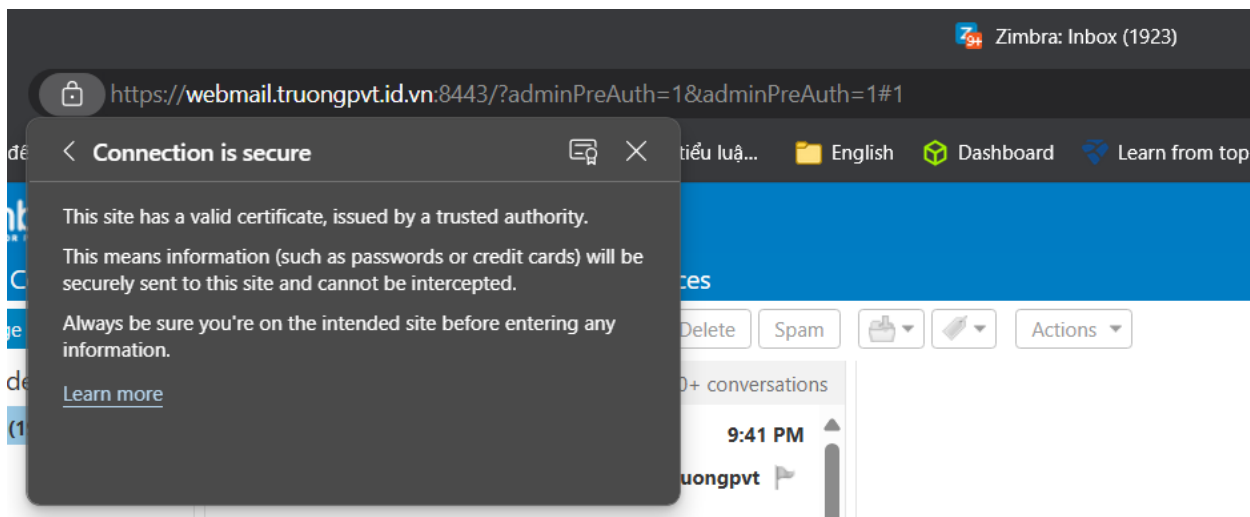
sudo chown zimbra:zimbra /opt/zimbra/ssl/zimbra/commercial/commercial.key

sudo su - zimbra -c '/opt/zimbra/bin/zmcertmgr deploycrt comm
/opt/zimbra/ssl/letsencrypt/cert.pem /opt/zimbra/ssl/letsencrypt/zimbra_chain.pem'
```



```
root@ns011-w03-truongpvt: /v ~
drwxr-xr-x 5 zimbra zimbra 4096 Jul 26 14:54 zimbra.20240727115214/
root@webmail:/opt/zimbra/ssl# sudo cp /opt/zimbra/ssl/letsencrypt/privkey.pem /opt/zimbra/ssl/zimbra/commercial/commercial.key
root@webmail:/opt/zimbra/ssl# sudo chown zimbra:zimbra /opt/zimbra/ssl/zimbra/commercial/commercial.key
root@webmail:/opt/zimbra/ssl# sudo su - zimbra -c '/opt/zimbra/bin/zmcertmgr deploycert comm /opt/zimbra/ssl/letsencrypt/cert.pem /opt/zimbra/ssl/letsencrypt/zimbra_chain.pem'
** Verifying '/opt/zimbra/ssl/letsencrypt/cert.pem' against '/opt/zimbra/ssl/zimbra/commercial/commercial.key'
Certificate '/opt/zimbra/ssl/letsencrypt/cert.pem' and private key '/opt/zimbra/ssl/zimbra/commercial/commercial.key' match.
** Verifying '/opt/zimbra/ssl/letsencrypt/cert.pem' against '/opt/zimbra/ssl/letsencrypt/zimbra_chain.pem'
Valid certificate chain: /opt/zimbra/ssl/letsencrypt/cert.pem: OK
** Copying '/opt/zimbra/ssl/letsencrypt/cert.pem' to '/opt/zimbra/ssl/zimbra/commercial/commercial.crt'
** Copying '/opt/zimbra/ssl/letsencrypt/zimbra_chain.pem' to '/opt/zimbra/ssl/zimbra/commercial/commercial_ca.crt'
** Appending ca chain '/opt/zimbra/ssl/letsencrypt/zimbra_chain.pem' to '/opt/zimbra/ssl/zimbra/commercial/commercial.crt'
** Importing cert '/opt/zimbra/ssl/zimbra/commercial/commercial_ca.crt' as 'zcs-user-commercial_ca' into cacerts '/opt/zimbra/common/lib/jvm/java/lib/security/cacerts'
** NOTE: restart mailboxd to use the imported certificate.
** Saving config key 'zimbraSSLCertificate' via zmprov modifyServer webmail.truongpvt.id.vn...ok
** Saving config key 'zimbraSSLPrivateKey' via zmprov modifyServer webmail.truongpvt.id.vn...ok
** Installing imapd certificate '/opt/zimbra/conf/imapd.crt' and key '/opt/zimbra/conf/imapd.key'
** Copying '/opt/zimbra/ssl/zimbra/commercial/commercial.crt' to '/opt/zimbra/conf/imapd.crt'
** Copying '/opt/zimbra/ssl/zimbra/commercial/commercial.key' to '/opt/zimbra/conf/imapd.key'
** Creating file '/opt/zimbra/ssl/zimbra/jetty.pkcs12'
** Creating keystore '/opt/zimbra/conf/imapd.keystore'
** Installing ldap certificate '/opt/zimbra/conf/slapd.crt' and key '/opt/zimbra/conf/slapd.key'
** Copying '/opt/zimbra/ssl/zimbra/commercial/commercial.crt' to '/opt/zimbra/conf/slapd.crt'
** Copying '/opt/zimbra/ssl/zimbra/commercial/commercial.key' to '/opt/zimbra/conf/slapd.key'
** Creating file '/opt/zimbra/ssl/zimbra/jetty.pkcs12'
** Creating keystore '/opt/zimbra/mailboxd/etc/keystore'
** Installing mta certificate '/opt/zimbra/conf/smtpd.crt' and key '/opt/zimbra/conf/smtpd.key'
** Copying '/opt/zimbra/ssl/zimbra/commercial/commercial.crt' to '/opt/zimbra/conf/smtpd.crt'
** Copying '/opt/zimbra/ssl/zimbra/commercial/commercial.key' to '/opt/zimbra/conf/smtpd.key'
** Installing proxy certificate '/opt/zimbra/conf/nginx.crt' and key '/opt/zimbra/conf/nginx.key'
** Copying '/opt/zimbra/ssl/zimbra/commercial/commercial.crt' to '/opt/zimbra/conf/nginx.crt'
** Copying '/opt/zimbra/ssl/zimbra/commercial/commercial.key' to '/opt/zimbra/conf/nginx.key'
** NOTE: restart services to use the new certificates.
** Cleaning up 3 files from '/opt/zimbra/conf/ca'
** Removing /opt/zimbra/conf/ca/5bd9e445.0
** Removing /opt/zimbra/conf/ca/ca.key
** Removing /opt/zimbra/conf/ca/ca.pem
** Copying CA to /opt/zimbra/conf/ca
** Copying '/opt/zimbra/ssl/zimbra/ca/ca.key' to '/opt/zimbra/conf/ca/ca.key'
** Copying '/opt/zimbra/ssl/zimbra/ca/ca.pem' to '/opt/zimbra/conf/ca/ca.pem'
```

Xong quay lại kiểm tra webmail.truongpvt.id.vn để kiểm tra certificate đã được deploy được chưa.



Quay lại thử form cũ notify về zimbra, gửi đến gmail

