

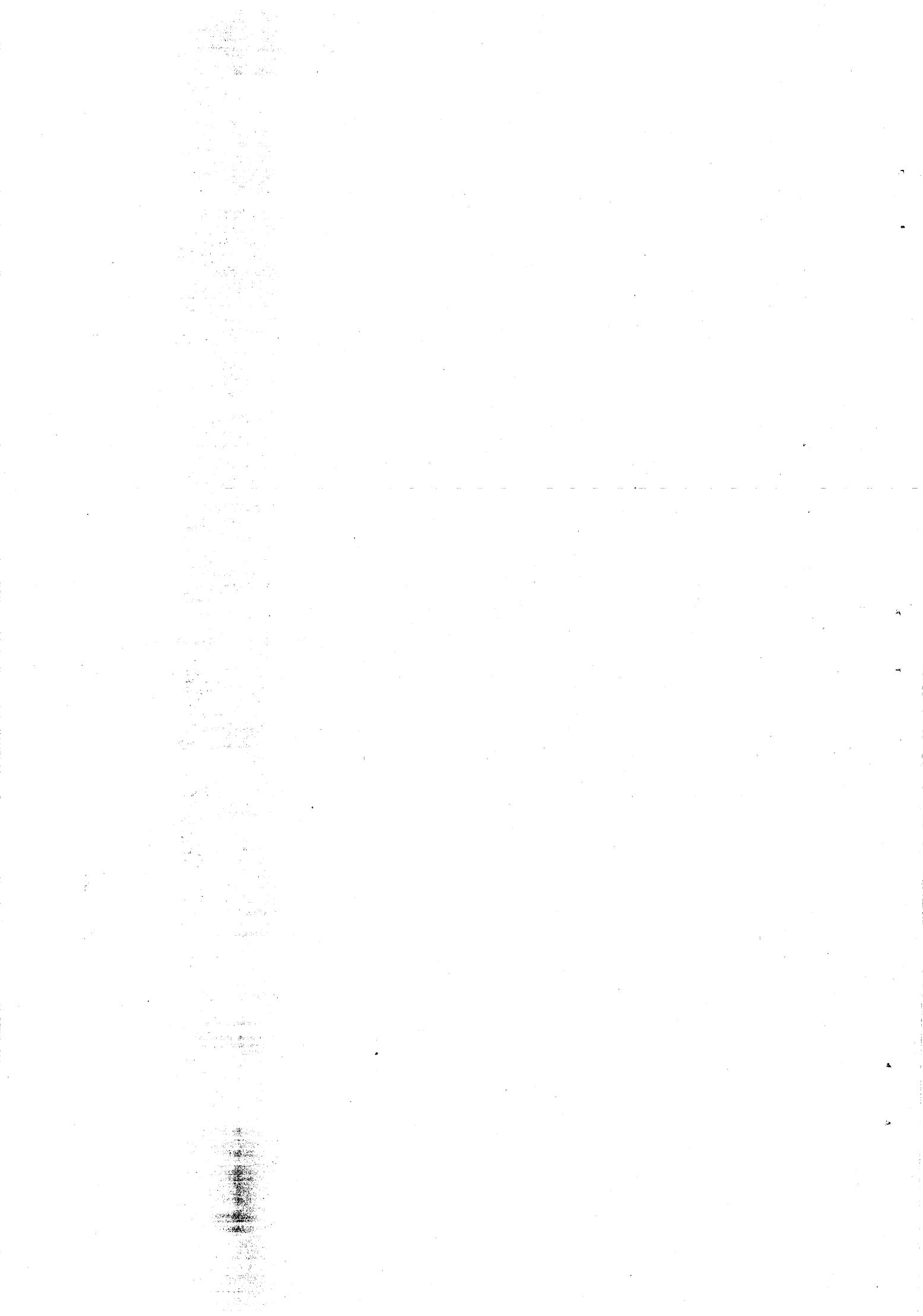
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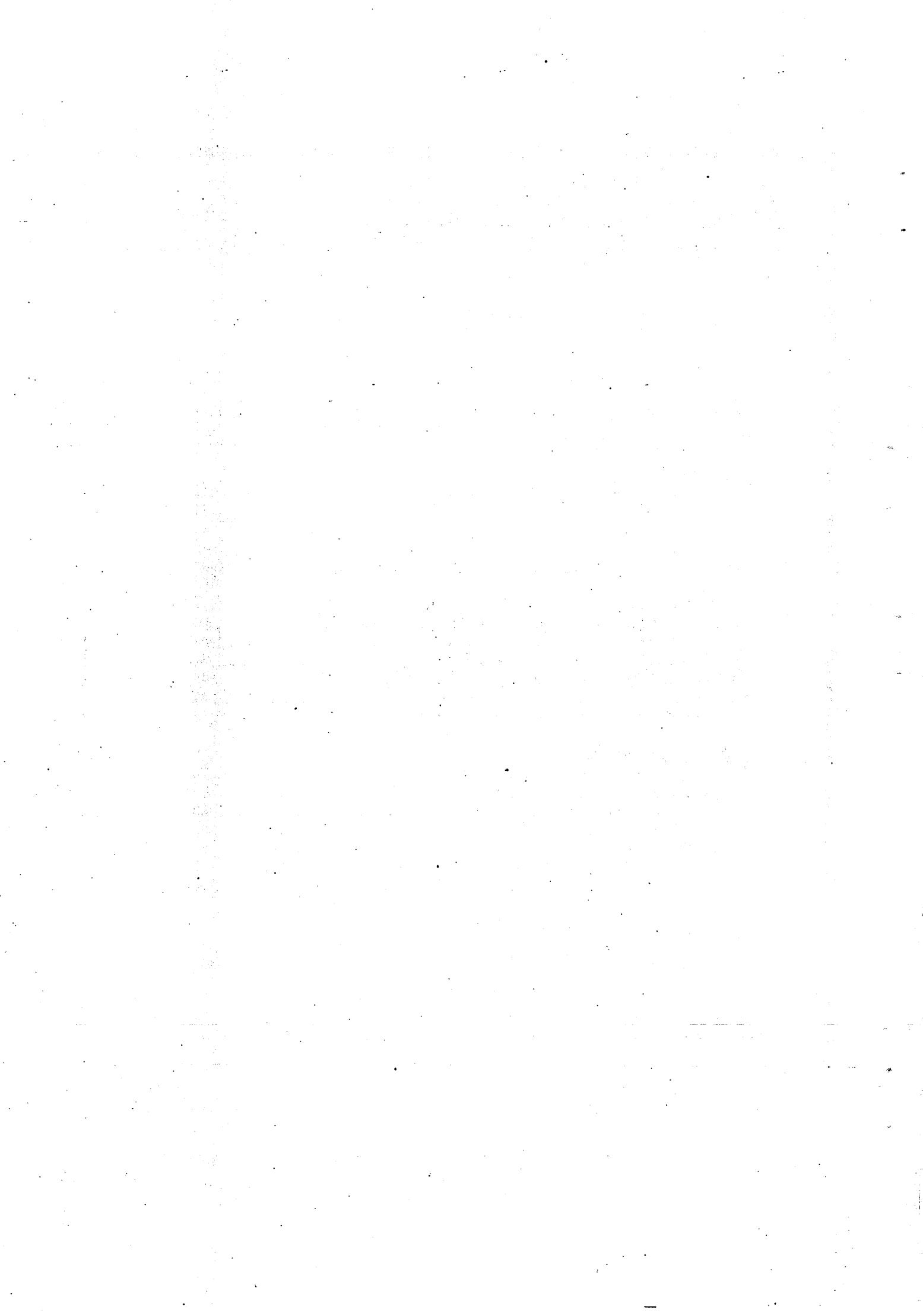
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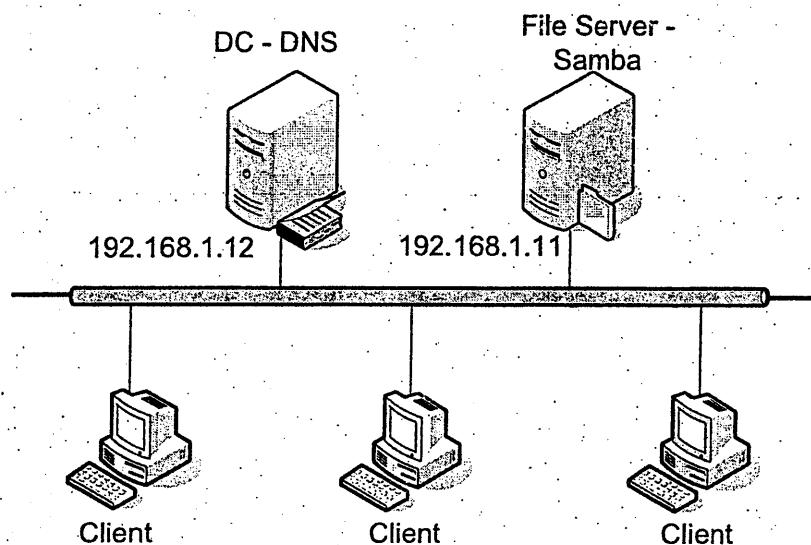
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## Phần I: Active Directory and Linux

## ACTIVE DIRECTORY AND SAMBA

Cách xác định Samba



### Máy 2k3:

- Nâng cấp lên domain: nhatnghe1.com
- DNS: dynamic update – secure and nonsecure, trong vùng phân giải thuận, nghịch, tạo record cho máy samba
- Tạo user: kt1,kt2,kd1,kd2
- Tạo group: g-ketoan(kt1,kt2)
- Tạo group: g-kinhdoanh(kd1,kd2)

### Máy samba:

- Đặt tên máy samba.nhatnghe1.com
- Sửa file /etc/hosts (thêm dòng)  
192.168.1.11 samba.nhatnghe1.com samba
- Chỉ dns về máy DC
- Cài ntp
- Crontab -e  
0 2 \* \* \* /usr/sbin/ntpdate -s -b -p 8 -u 192.168.1.12

service ntpd restart (khi sửa file /etc/ntp.conf)

- mkdir -p /home/NHATNGHE1/{ kt1,kt2, kd1,kd2}
- chmod -R 777 /home/NHATNGHE1

### B1: Cài đặt Kerberos và samba :

### Installing Kerberos

```
pam_krb5-2.3.11-9.el6.x86_64.rpm
krb5-libs-1.10.3-33.el6.x86_64.rpm
krb5-devel-1.10.3-33.el6.x86_64.rpm
krb5-server-1.10.3-33.el6.x86_64.rpm
```

### Installing Samba 4.0 (gồm các gói samba 3.6 trước)

```
samba4-winbind-clients-4.0.0-64.el6.rc4.x86_64
samba4-common-4.0.0-64.el6.rc4.x86_64
samba4-libs-4.0.0-64.el6.rc4.x86_64
samba4-client-4.0.0-64.el6.rc4.x86_64
samba4-swat-4.0.0-64.el6.rc4.x86_64
samba4-4.0.0-64.el6.rc4.x86_64
samba4-winbind-4.0.0-64.el6.rc4.x86_64
samba4-winbind-krb5-locator-4.0.0-64.el6.rc4.x86_64
```

### b2. Cấu hình kerberos

vi /etc/krb5.conf

```
[logging]
default = FILE:/var/log/krb5libs.log
kdc = FILE:/var/log/krb5kdc.log
admin_server = FILE:/var/log/kadmind.log

[libdefaults]
default_realm = NHATNGHE1.COM
dns_lookup_realm = false
dns_lookup_kdc = false
ticket_lifetime = 24h
renew_lifetime = 7d
forwardable = true

[realms]
NHATNGHE1.COM = {
    kdc = may1.nhatnghe1.com
    admin_server = may1.nhatnghe1.com
}

[domain_realm]
.nhatnghe1.com = NHATNGHE1.COM
nhatnghe1.com = NHATNGHE1.COM
```

### - Chỉ DNS về máy DC

vi /etc/resolv.conf

```
; generated by /sbin/dhclient-script
nameserver 192.168.1.12
```

- Chỉnh thời gian giữa 2 máy không chênh nhau quá 5 phút
- Chạy lệnh kinit và klist để kiểm tra file /etc/krb5.conf và lấy tickets từ DC

```
[root@samba ~]# kinit administrator@NHATNGHE1.COM
Password for administrator@NHATNGHE1.COM:
[root@samba ~]# klist
Ticket cache: FILE:/tmp/krb5cc_0
```

Default principal: administrator@NHATNGHE1.COM

```
Valid starting Expires Service principal
03/16/15 15:05:37 03/17/15 01:05:33
krbtgt/NHATNGHE1.COM@NHATNGHE1.COM
renew until 03/23/15 15:05:37
[root@samba ~]#
```

Kiểm tra sự chứng thực Kerberos authentication với lệnh *smbclient*

```
[root@samba ~]# smbclient -L /may1 -k
OS=[Windows Server 2003 3790 Service Pack 1] Server=[Windows Server
2003 5.2]

Sharename      Type   Comment
-----        ----
C$            Disk   Default share
IPC$          IPC    Remote IPC
ADMIN$         Disk   Remote Admin
SYSVOL        Disk   Logon server share
NETLOGON       Disk   Logon server share
OS=[Windows Server 2003 3790 Service Pack 1] Server=[Windows Server
2003 5.2]

Server          Comment
-----
Workgroup      Master
-----
[root@samba ~]#
```

### B3: Cấu hình Samba

- Cấu hình file /etc/xinetd.d/swat

```
[root@samba ~]# vi /etc/xinetd.d/swat
service swat
{
    port      = 901
    socket_type = stream
    wait      = no
    only_from = 192.168.1.0/24
    user      = root
    server    = /usr/sbin/swat
    log_on_failure += USERID
    disable   = no
}
```

- Khởi động xinetd  
`[root@samba ~]# service xinetd restart`  
- ie: <http://192.168.1.11:901/>

**Chọn Globals, advanced**

Khai báo các thông tin: (chú ý real, security và netbios name)

**Base Options**

<u>Help</u>	dos charset	CP850	<input type="button" value="Set Default"/>
<u>Help</u>	unix charset	UTF-8	<input type="button" value="Set Default"/>
<u>Help</u>	workgroup	NHATNGHE1	<input type="button" value="Set Default"/>
<u>Help</u>	realm	NHATNGHE1.COM	<input type="button" value="Set Default"/>
<u>Help</u>	netbios name	SAMBA	<input type="button" value="Set Default"/>
<u>Help</u>	netbios aliases		<input type="button" value="Set Default"/>
<u>Help</u>	netbios scope		<input type="button" value="Set Default"/>
<u>Help</u>	server string	Samba Server Version %v	<input type="button" value="Set Default"/>
<u>Help</u>	interfaces		<input type="button" value="Set Default"/>
<u>Help</u>	bind interfaces only	No	<input type="button" value="Set Default"/>
<u>Help</u>	server role	auto	<input type="button" value="Set Default"/>

**Security Options**

<u>Help</u>	security	ADS	<input type="button" value="Set Default"/>
<u>Help</u>	auth methods		<input type="button" value="Set Default"/>
<u>Help</u>	encrypt passwords	Yes	<input type="button" value="Set Default"/>
<u>Help</u>	template homedir	/home/%D/%U	<input type="button" value="Set Default"/>
<u>Help</u>	template shell	/bin/bash	<input type="button" value="Set Default"/>
<u>Help</u>	winbind separator	\	<input type="button" value="Set Default"/>
<u>Help</u>	winbind cache time	300	<input type="button" value="Set Default"/>
<u>Help</u>	winbind reconnect delay	30	<input type="button" value="Set Default"/>
<u>Help</u>	winbind max clients	200	<input type="button" value="Set Default"/>
<u>Help</u>	winbind enum users	Yes	<input type="button" value="Set Default"/>
<u>Help</u>	winbind enum groups	Yes	<input type="button" value="Set Default"/>
<u>Help</u>	winbind use default domain	No	<input type="button" value="Set Default"/>
<u>Help</u>	winbind trusted domains only	No	<input type="button" value="Set Default"/>
<u>Help</u>	winbind nested groups	Yes	<input type="button" value="Set Default"/>
<u>Help</u>	winbind expand groups	1	<input type="button" value="Set Default"/>
<u>Help</u>	winbind nss info	template	<input type="button" value="Set Default"/>
<u>Help</u>	winbind refresh tickets	Yes	<input type="button" value="Set Default"/>

**Chọn commit change**

**Chọn thẻ status, nhấn Start All**



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The screenshot shows the SWAT interface with the following elements:

- Top Navigation Bar:** Includes icons for HOME, GLOBALS, SHARES, PRINTERS, WIZARD, and STATUS, along with a PASSWORD button.
- Server Status Section:** Displays "Auto Refresh" and "Refresh Interval: 30".
- System Status:** Shows "version: 3.0.33-3.14.el5".
- Service Status:** Shows services like smbd, nmbd, and winbindd as "not running".
- Action Buttons:** Buttons for Start, Restart, and Start All for each service.

Xem file cấu hình Samba:

#vi /etc/samba/smb.conf

```
# Samba config file created using SWAT
# from UNKNOWN (192.168.1.20)
# Date: 2015/03/16 15:28:30

[global]
workgroup = NHATNGHE1
realm = NHATNGHE1.COM
server string = Samba Server Version %v
security = ADS
log file = /var/log/samba/log.%m
max log size = 50
template shell = /bin/bash
winbind enum users = Yes
winbind enum groups = Yes
winbind refresh tickets = Yes
idmap config * : range =
idmap config * : backend = tdb
cups options = raw
```

```
[homes]
comment = Home Directories
read only = No
browseable = No
```

## [printers]

```
comment = All Printers
path = /var/spool/samba
printable = Yes
print ok = Yes
browseable = No
```

## [printers]

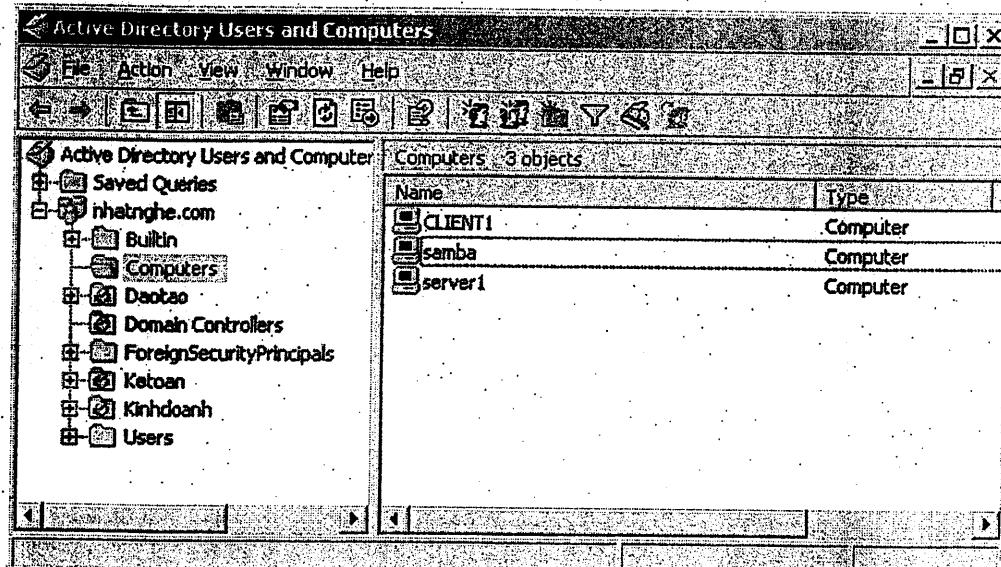
```
comment = All Printers
path = /var/spool/samba
printable = Yes
browseable = No
```

Tiến hành join domain:

```
#kinit administrator@NHATNGHE1.COM
#net ads join -U Administrator
```

```
[root@samba ~]# net ads join -U Administrator
Administrator's password:
Using short domain name -- NHATNGHE
Joined 'SAMBA' to realm 'NHATNGHE.COM'
[root@samba ~]#
```

Trên máy 2k3 quan sát thấy đã có máy samba



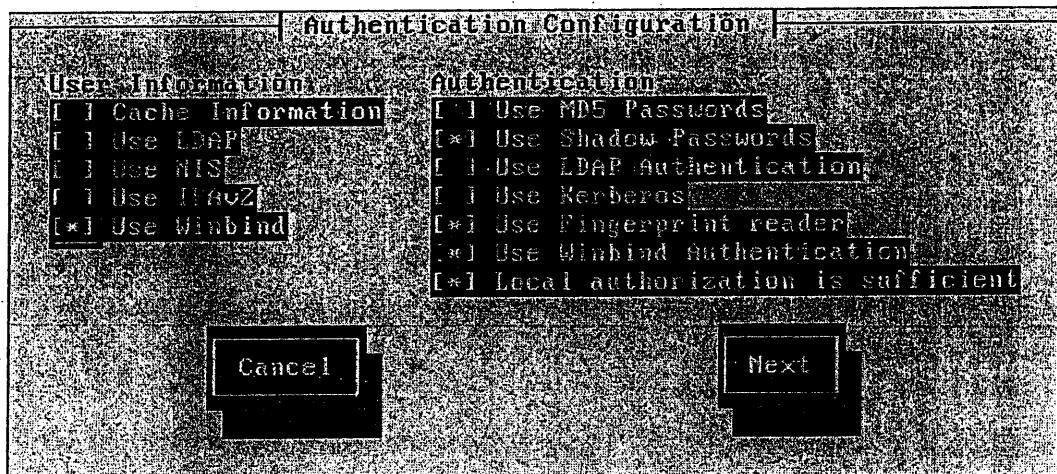
Cấu hình winbind:

Setup, Authentication configuration

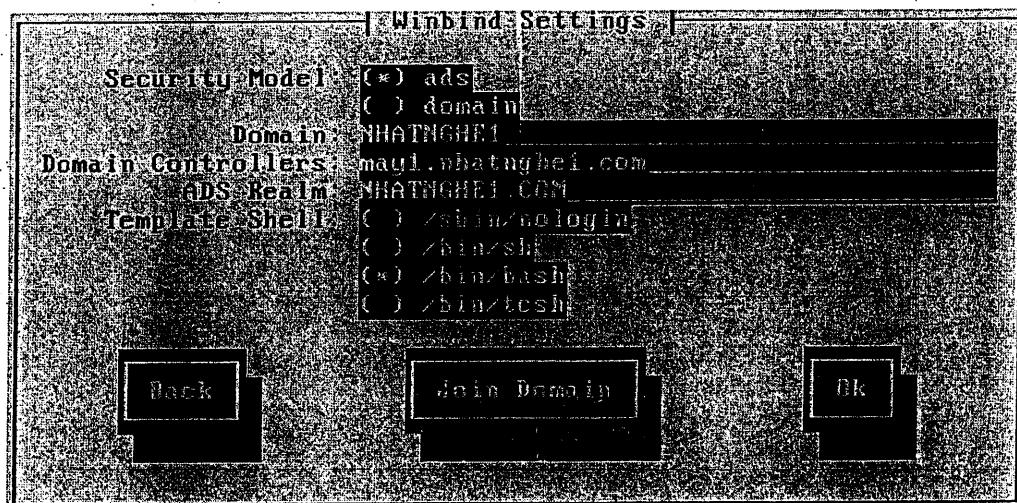
Chọn 2 mục

[\*] Use Winbind

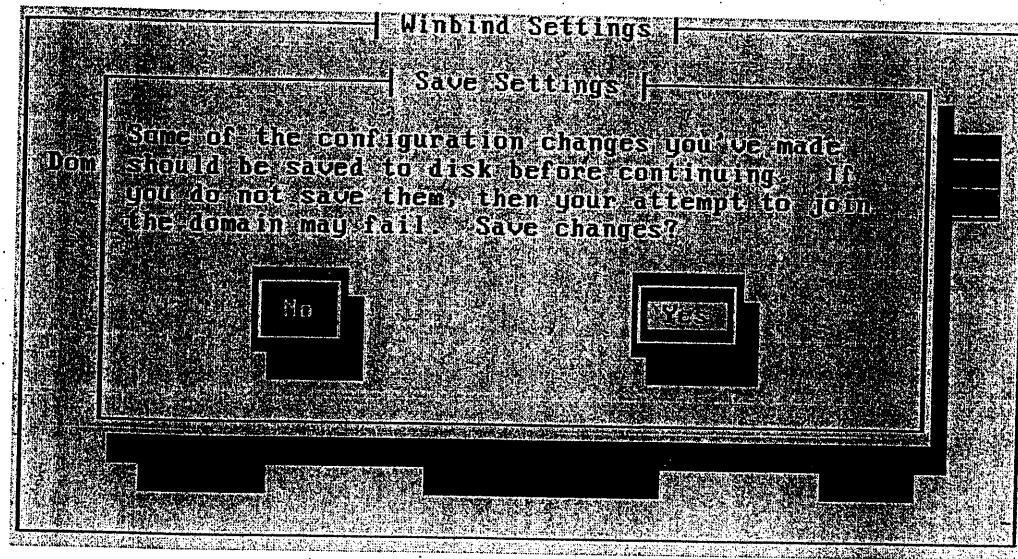
[\*] Use Winbind Authentication



Khai báo các thông tin:



Chọn Join domain, chọn Yes



Quan sát:

```
@vi /etc/nsswitch.conf
33 passwd: files winbind
34 shadow: files winbind
35 group: files winbind
```

```
@vi /etc/pam.d/system-auth
#%PAM-1.0
# This file is auto-generated.
# User changes will be destroyed the next time authconfig is run.
auth required pam_env.so
auth sufficient pam_unix.so nullok try_first_pass
auth requisite pam_succeed_if.so uid >= 500 quiet
auth sufficient pam_winbind.so use_first_pass
auth required pam_deny.so

account required pam_unix.so broken_shadow
account sufficient pam_succeed_if.so uid < 500 quiet
account [default=bad success=ok user_unknown=ignore]
pam_winbind.so
account required pam_permit.so

password requisite pam_cracklib.so try_first_pass retry=3
password sufficient pam_unix.so md5 shadow nullok try_first_pass
use_authtok
password sufficient pam_winbind.so use_authtok
password required pam_deny.so
```



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```
session optional pam_keyinit.so revoke
session required pam_limits.so
session [success=1 default=ignore] pam_succeed_if.so service in crond
quiet use_uid
session required pam_unix.so
```

```
#Service winbindd restart
#Service smb restart
#Service ntpd restart
```

```
[root@samba ~]# wbinfo -u
NHATNGHE1\administrator
NHATNGHE1\guest
NHATNGHE1\support_388945a0
NHATNGHE1\krbtgt
NHATNGHE1\u1
NHATNGHE1\ngoc
NHATNGHE1\hung
NHATNGHE1\u2
NHATNGHE1\u3
NHATNGHE1\iusr_may1
NHATNGHE1\iwam_may1
NHATNGHE1\fpsense
NHATNGHE1\fpsense
```

```
[root@samba ~]# wbinfo -g
NHATNGHE1\helpservicesgroup
NHATNGHE1\telnetclients
NHATNGHE1\domain computers
NHATNGHE1\domain controllers
NHATNGHE1\schema admins
NHATNGHE1\enterprise admins
NHATNGHE1\cert publishers
NHATNGHE1\domain admins
NHATNGHE1\domain users
NHATNGHE1\domain guests
NHATNGHE1\group policy creator owners
NHATNGHE1\ras and ias servers
NHATNGHE1\dnsadmins
NHATNGHE1\dnssupdateproxy
NHATNGHE1\internet
NHATNGHE1\iis_wpg
```

```
[root@samba ~]# getent passwd | more
NHATNGHE1\administrator:*:16777216:16777222:Administrator:/home/NHATNGHE1/administrator:/bin/bash
NHATNGHE1\guest:*:16777217:16777223:Guest:/home/NHATNGHE1/guest:/bin/bash
NHATNGHE1\support_388945a0:*:16777218:16777222:SUPPORT_388945a0:/home/NHATNGHE1/support_388945a0:/bin/bash
NHATNGHE1\krbtgt:*:16777219:16777222:krbtgt:/home/NHATNGHE1\krbtgt:/bin/bash
NHATNGHE1\u1:*:16777220:16777222:u1:/home/NHATNGHE1/u1:/bin/bash
NHATNGHE1\ngoc:*:16777221:16777222:ngoc:/home/NHATNGHE1/ngoc:/bin/bash
NHATNGHE1\hung:*:16777222:16777222:hung:/home/NHATNGHE1\hung:/bin/bash
NHATNGHE1\u2:*:16777223:16777222:u2:/home/NHATNGHE1/u2:/bin/bash
```



```
NHATNGHE1\u3:::16777224:16777222:u3:/home/NHATNGHE1/u3/bin/bash
NHATNGHE1\iusr_may1:::16777225:16777222:\USR_MAY1:/home/NHATNGHE1/usr_may1/bin/bash
NHATNGHE1\wam_may1:::16777226:16777222:\WAM_MAY1:/home/NHATNGHE1/wam_may1/bin/bash
NHATNGHE1\psense:::16777227:16777222:\psense:/home/NHATNGHE1/psense/bin/bash
NHATNGHE1\kt1:::16777228:16777222:\kt1:/home/NHATNGHE1/kt1/bin/bash
NHATNGHE1\kt2:::16777229:16777222:\kt2:/home/NHATNGHE1/kt2/bin/bash
NHATNGHE1\kd1:::16777230:16777222:\kd1:/home/NHATNGHE1/kd1/bin/bash
NHATNGHE1\kt3:::16777231:16777222:\kt3:/home/NHATNGHE1/kt3/bin/bash
[root@samba ~]# service smb
```

#getent group

```
NHATNGHE1\helpservicesgroup:x:16777225:NHATNGHE1\support_388945a0
NHATNGHE1\telnetclients:x:16777226:
NHATNGHE1\domain computers:x:16777227:
NHATNGHE1\domain controllers:x:16777228:
NHATNGHE1\schema admins:x:16777229:NHATNGHE1\administrator
NHATNGHE1\enterprise admins:x:16777230:NHATNGHE1\administrator
NHATNGHE1\cert publishers:x:16777231:
NHATNGHE1\domain admins:x:16777232:NHATNGHE1\administrator
NHATNGHE1\domain users:x:16777222:
NHATNGHE1\domain guests:x:16777223:
NHATNGHE1\group policy creator owners:x:16777233:NHATNGHE1\administrator
NHATNGHE1\ras and las servers:x:16777234:NHATNGHE1\may1$  

NHATNGHE1\dnsadmins:x:16777235:
NHATNGHE1\dnssupdateproxy:x:16777236:
NHATNGHE1\internet:x:16777237:NHATNGHE1\u1,NHATNGHE1\u2,NHATNGHE1\u3
NHATNGHE1\iis_wpg:x:16777238:NHATNGHE1\iwas_may1
NHATNGHE1\g-kinhdoanh:x:16777239:NHATNGHE1\kd1
NHATNGHE1\g-ketoan:x:16777224:NHATNGHE1\kt1,NHATNGHE1\kt2
```

#Thêm các dòng sau nếu getent passwd không thấy user  
vì /etc/samba/smb.conf  
[global]

```
ldap ssl = no
idmap uid = 16777216-33554431
idmap gid = 16777216-33554431
```

```
# chkconfig smb on
# chkconfig winbind on
# chkconfig ntpd on
```

- Reboot computer
- Chia sẻ tài nguyên:

```
mkdir -p /data/{ketoan,kinhdoanh,dungchung,software}
```

```
#chmod -R 777 /data/ketoan/
#chmod -R 777 /data/kinhdoanh/
#chmod -R 777 /data/dungchung/
```

Cấp quyền truy cập:

```
# vi /etc/samba/smb.conf
```

**[ketoan]**

path = /data/ketoan  
valid users = +NHATNGHE\g-ketoan  
write list = +NHATNGHE\g-ketoan

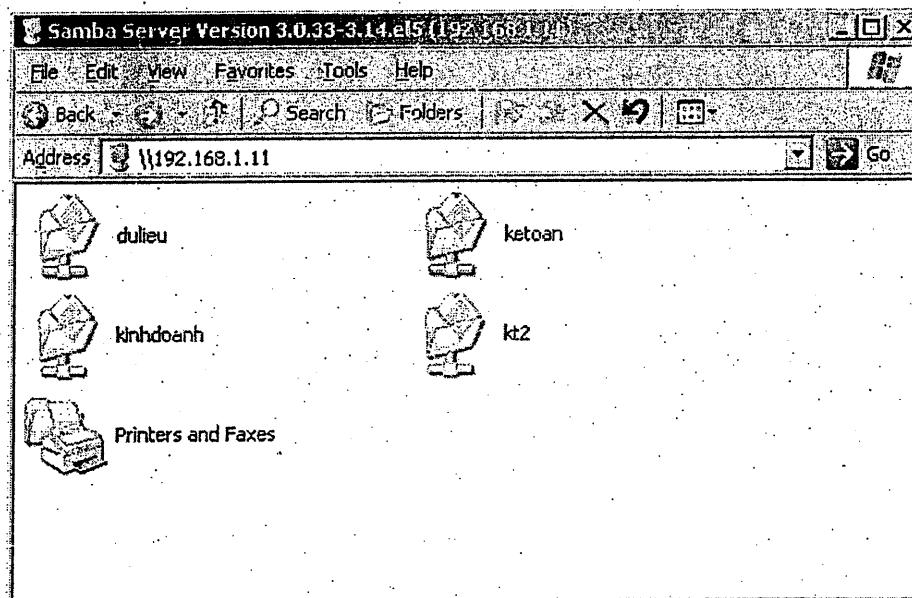
**[kinhdoanh]**

path = /data/kinhdoanh  
valid users = +NHATNGHE\g-kinhdoanh  
write list = +NHATNGHE\g-kinhdoanh

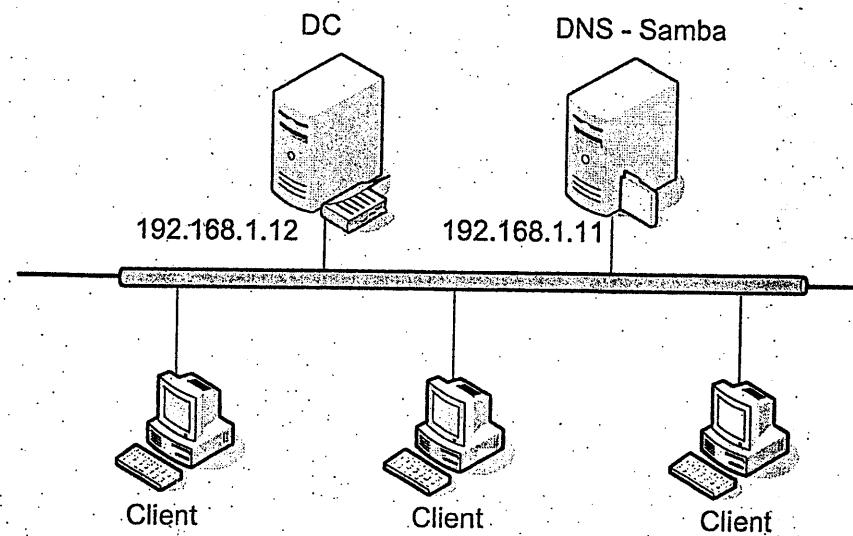
**[dulieu]**

path = /data/dulieu  
valid users = +NHATNGHE\g-kinhdoanh +NHATNGHE\g-ketoan  
write list = +NHATNGHE\g-kinhdoanh +NHATNGHE\g-ketoan

Tại client, login với user kt1 và truy cập dữ liệu

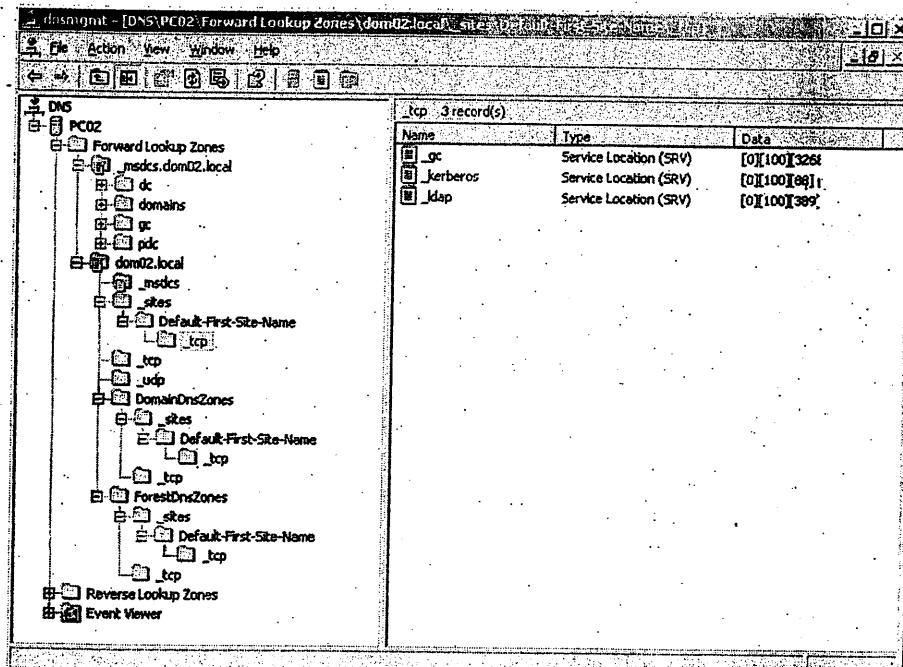


## ACTIVE DIRECTORY AND BIND



### Mục đích

- Tích hợp AD vào DNS của Linux
- Hình ảnh sau là cấu trúc DNS của windows sau khi cài AD, khi sử dụng Linux làm DNS thì tất cả các cấu trúc này phải được thể hiện trên Linux



Chuẩn bị

- Đặt tên 2 máy là: Linux: DNS
- Đặt ip cho 2 máy, chỉ dns về máy linux

**Các bước thực hiện**

B1: cài đặt bind

```
bind-9.8.2-0.30.rc1.el6.x86_64
bind-chroot-9.8.2-0.30.rc1.el6.x86_64
```

B2: cấu hình dns

soạn file named.conf

#vi /var/named/chroot/etc/named.conf

```
acl mynet {
    192.168.1.0/24;
    127.0.0.1;
};

options {
    allow-transfer {none;};
    directory "/var/named";
    query-source port 53;
    query-source-v6 port 53;
    dump-file      "var/named/data/cache_dump.db";
    statistics-file "var/named/data/named_stats.txt";
    memstatistics-file "var/named/data/named_mem_stats.txt";
    notify        yes;
};
include "/etc/rndc.key";

zone "." IN {
    type hint;
    file "named.root";
};

zone "nhatnghe.com" IN {
    type master;
    file "nhatnghe.db";
    allow-update { any; };
};

zone "DomainDNSZones.nhatnghe.com" IN {
    type master;
    file "DomainDNSZones.nhatnghe.db";
    allow-update { any; };
};

zone "ForestDNSZones.nhatnghe.com" IN {
    type master;
    file "ForestDNSZones.nhatnghe.db";
    allow-update { any; };
};
```

```
};  
zone "_msdcs.nhatnghe.com" IN {  
    type master;  
    file "_msdcs.nhatnghe.db";  
    allow-update { any; };  
};  
zone "_tcp.nhatnghe.com" IN {  
    type master;  
    file "_tcp.nhatnghe.db";  
    allow-update { any; };  
};  
zone "_udp.nhatnghe.com" IN {  
    type master;  
    file "_udp.nhatnghe.db";  
    allow-update { any; };  
};  
zone "_sites.nhatnghe.com" IN {  
    type master;  
    file "_sites.nhatnghe.db";  
    allow-update { any; };  
};  
zone "localhost" IN {  
    type master;  
    file "localhost.db";  
};  
zone "0.0.127.in-addr.arpa" IN {  
    type master;  
    file "0.0.127.in-addr.arpa.db";  
};  
zone "1.168.192.in-addr.arpa" {  
    type master;  
    file "1.168.192.in-addr.arpa.db";  
};
```

- Soạn file DomainDNSZones.nhatnghe.db  
#vi /var/named/chroot/var/named/DomainDNSZones.nhatnghe.db

```
$TTL 86400  
DomainDNSZones.nhatnghe.com.    IN SOA dns.nhatnghe.com. root (  
                                42      ; serial (d. adams)  
                                3H      ; refresh  
                                15M     ; retry  
                                1W      ; expiry  
                                1D )    ; minimum  
IN NS      dns.nhatnghe.com.  
$ORIGIN DomainDNSZones.nhatnghe.com.
```



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Tel: 39.322.734 - 39.322.735 – Website: www.nhatnghe.com



- Soạn file ForestDNSZones.nhatnghe.db  
#vi /var/named/chroot/var/named/ForestDNSZones.nhatnghe.db

```
$TTL 86400
ForestDNSZones.nhatnghe.com. IN SOA dns.nhatnghe.com.
root.nhatnghe.com. (
    42      ; serial (d. adams)
    3H      ; refresh
    15M     ; retry
    1W      ; expiry
    1D )    ; minimum
IN NS      dns.nhatnghe.com.
$ORIGIN ForestDNSZones.nhatnghe.com.
```

- Soạn file \_msdcs.nhatnghe.db  
#vi /var/named/chroot/var/named/\_msdcs.nhatnghe.db

```
$TTL 86400
_msdcs.nhatnghe.com. IN SOA dns.nhatnghe.com. root.nhatnghe.com. (
    42      ; serial (d. adams)
    3H      ; refresh
    15M     ; retry
    1W      ; expiry
    1D )    ; minimum
IN NS      dns.nhatnghe.com.
$ORIGIN _msdcs.nhatnghe.com.
```

- Soạn file \_sites.nhatnghe.db  
#vi /var/named/chroot/var/named/\_sites.nhatnghe.db

```
$TTL 86400
_sites.nhatnghe.com. IN SOA dna.nhatnghe.com. root.nhatnghe.com. (
    42      ; serial (d. adams)
    3H      ; refresh
    15M     ; retry
    1W      ; expiry
    1D )    ; minimum
IN NS      dna.nhatnghe.com.
$ORIGIN _sites.nhatnghe.com.
```

- Soạn file \_tcp.nhatnghe.db  
#vi /var/named/chroot/var/named/\_tcp.nhatnghe.db

```
$TTL 86400
_tcp.nhatnghe.com. IN SOA dns.nhatnghe.com. root.nhatnghe.com. (
    42      ; serial (d. adams)
    3H      ; refresh
    15M     ; retry
    1W      ; expiry
    1D )    ; minimum
IN NS      dns.nhatnghe.com.
$ORIGIN _tcp.nhatnghe.com.
```



- Soạn file \_udp.nhatnghe.db

#vi /var/named/chroot/var/named/\_udp.nhatnghe.db

```
$TTL 86400
_udp.nhatnghe.com. IN SOA dns.nhatnghe.com. root.nhatnghe.com. (
    42 ; serial (d. adams)
    3H ; refresh
    15M ; retry
    1W ; expiry
    1D ) ; minimum
    IN NS dns.nhatnghe.com.
$ORIGIN udp.nhatnghe.com.
```

- Soạn file nhatnghe.db

#vi /var/named/chroot/var/named/nhatnghe.db

```
$TTL 86400
@ IN SOA dns.nhatnghe.com. root (
    42 ; serial (d. adams)
    3H ; refresh
    15M ; retry
    1W ; expiry
    1D ) ; minimum
    IN NS dns.nhatnghe.com.
    1D IN A 192.168.1.11
dns 1D IN A 192.168.1.11
www 1D IN CNAME dns
mail 1D IN CNAME dns
ftp 1D IN CNAME dns
```

- Soạn file 1.168.192.in-addr.arpa.db

vi /var/named/chroot/var/named/1.168.192.in-addr.arpa.db

```
$TTL 86400
@ IN SOA dns.nhatnghe.com. root. (
    3 ; serial
    28800 ; refresh
    7200 ; retry
    604800 ; expire
    86400 ; ttl
)
@ IN NS dns.nhatnghe.com.
11 IN PTR dns.nhatnghe.com.
```

Khởi động dns

```
#service named start
#chkconfig named on
#chown -R named.named /var/named/chroot/
```

Kiểm tra:

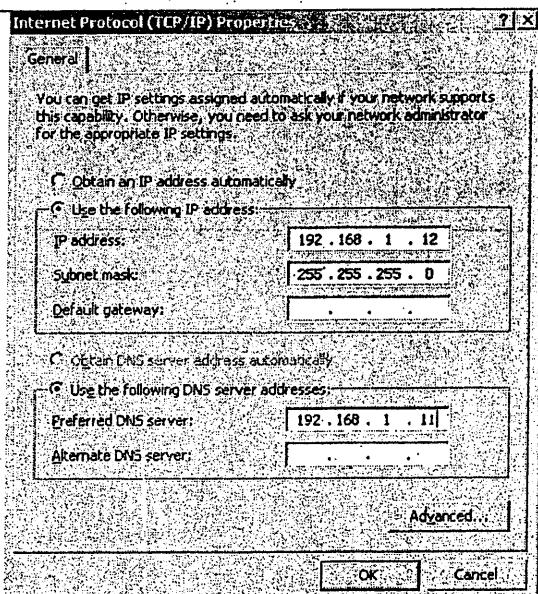
[root@dns named]# ping dns.nhatnghe.com

PING dns.nhatnghe.com (192.168.1.11) 56(84) bytes of data.

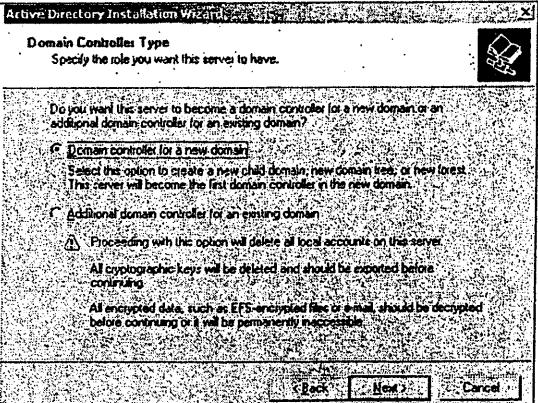
64 bytes from dns.nhatnghe.com (192.168.1.11): icmp\_seq=1 ttl=64 time=3.92 ms

64 bytes from dns.nhatnghe.com (192.168.1.11): icmp\_seq=2 ttl=64 time=0.080 ms

### B3: Nâng cấp máy DC lên domain



Start, run, dcpromo, next, next  
 Chọn Domain controller for a new domain

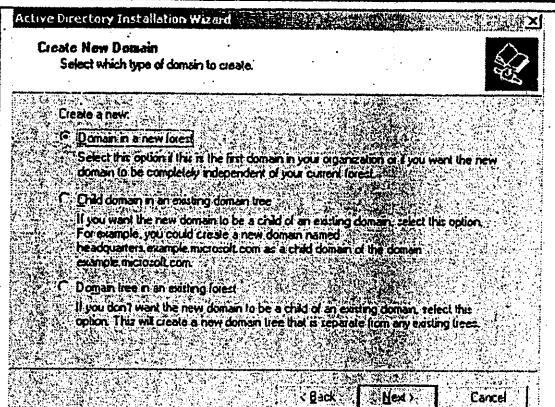




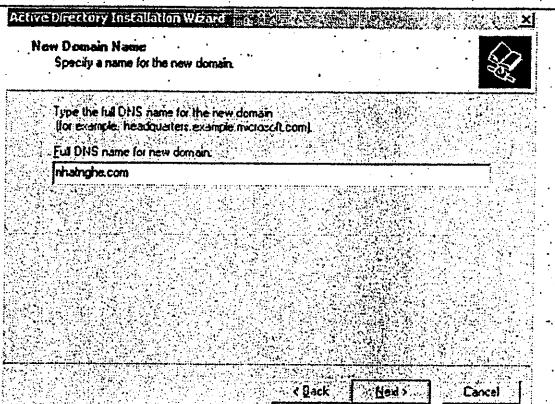
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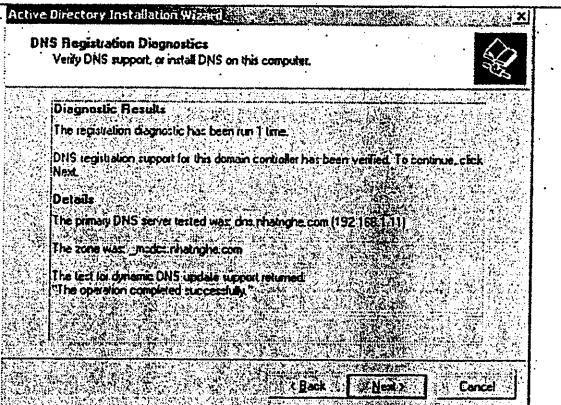
### Chọn Domain in new forest, next

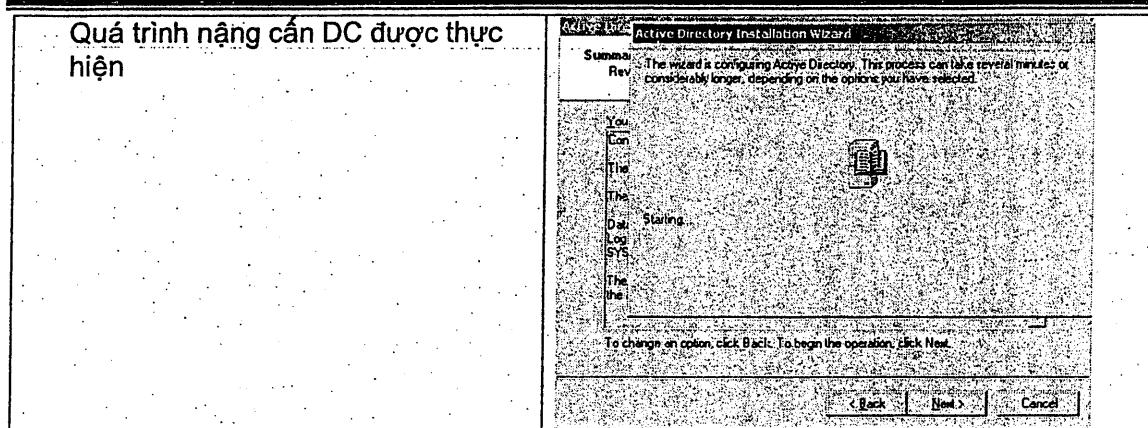


### Nhập tên domain: nhatnghe.com

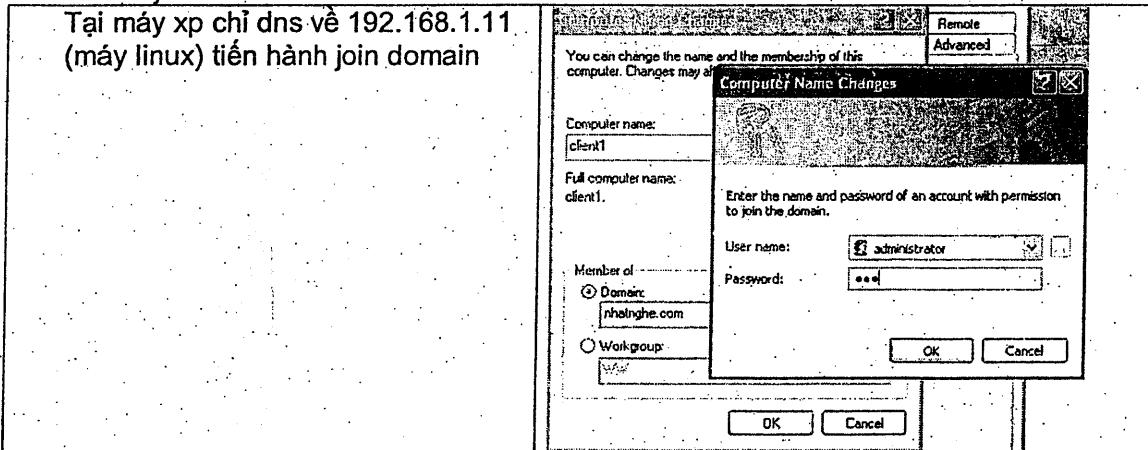


### Thông tin kiểm tra DNS trên máy Linux thành công, next để bắt đầu nâng cấp





#### B4: Client join domain



#### B5: kiểm tra

#Service named restart | reload

```
[root@dns named]# cat nhatnghe.db
$ORIGIN .
$TTL 86400 ; 1 day
nhatnghe.com. IN SOA dns.nhatnghe.com. root.nhatnghe.com. (
        44 ; serial
        10800 ; refresh (3 hours)
        900 ; retry (15 minutes)
        604800 ; expire (1 week)
        86400 ; minimum (1 day)
        )
        NS dns.nhatnghe.com.
$TTL 600 ; 10 minutes
        A 192.168.1.11
        A 192.168.1.12
$ORIGIN nhatnghe.com.
$TTL 1200 ; 20 minutes
dcsvr A 192.168.1.12
$TTL 86400 ; 1 day
dns A 192.168.1.11
```

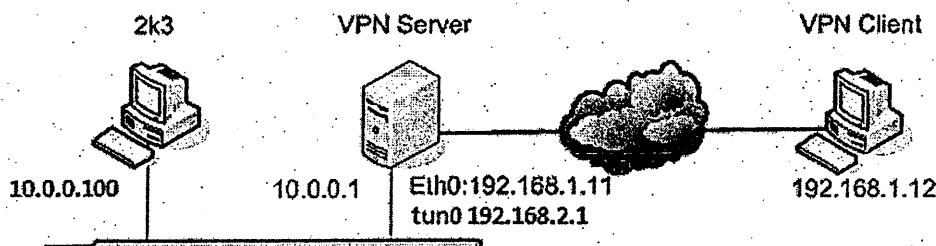


```
ftp          CNAME dns
mail         CNAME dns
www          CNAME dns
[root@dns named]#
```

```
[root@dns named]# cat _udp.nhatnghe.db
$ORIGIN .
$TTL 86400 ; 1 day
_udp.nhatnghe.com IN SOA dns.nhatnghe.com. root.nhatnghe.com. (
        44      ; serial
        10800   ; refresh (3 hours)
        900     ; retry (15 minutes)
        604800  ; expire (1 week)
        86400   ; minimum (1 day)
)
NS dns.nhatnghe.com.
$ORIGIN _udp.nhatnghe.com.
$TTL 600 ; 10 minutes
_kerberos SRV 0 100 88 dcsvr.nhatnghe.com.
_kpasswd  SRV 0 100 464 dcsvr.nhatnghe.com.
[root@dns named]#
```

```
[root@dns named]# cat _msdcs.nhatnghe.db
$ORIGIN .
$TTL 86400 ; 1 day
_msdcs.nhatnghe.com IN SOA dns.nhatnghe.com. root.nhatnghe.com. (
        51      ; serial
        10800   ; refresh (3 hours)
        900     ; retry (15 minutes)
        604800  ; expire (1 week)
        86400   ; minimum (1 day)
)
NS dns.nhatnghe.com.
$ORIGIN _tcp.Default-First-Site-Name._sites.dc._msdcs.nhatnghe.com.
$TTL 600 ; 10 minutes
_kerberos SRV 0 100 88 dcsvr.nhatnghe.com.
_ldap      SRV 0 100 389 dcsvr.nhatnghe.com.
$ORIGIN _tcp.dc._msdcs.nhatnghe.com.
_kerberos SRV 0 100 88 dcsvr.nhatnghe.com.
_ldap      SRV 0 100 389 dcsvr.nhatnghe.com.
$ORIGIN _msdcs.nhatnghe.com.
_ldap._tcp.0646466c-9f88-44a0-b3d3-eff08c367765.domains SRV 0 100
389 dcsvr.nhatnghe.com.
e9f93555-3d28-4065-998e-98cc6fa1d38a CNAME dcsvr.nhatnghe.com.
$ORIGIN gc._msdcs.nhatnghe.com.
_ldap._tcp.Default-First-Site-Name._sites SRV 0 100 3268
dcsvr.nhatnghe.com.
_ldap._tcp      SRV 0 100 3268 dcsvr.nhatnghe.com.
$ORIGIN _msdcs.nhatnghe.com.
_ldap._tcp.pdc  SRV 0 100 389 dcsvr.nhatnghe.com.
[root@dns named]#
```

## OPENVPN



### 1. client to site: tunnel mode

#### 1.1. Cài đặt openvpn

B1. Cài gói Izo:

```
#rpm -ivh /media/Packages/Izo-2.03-3.1.el6_5.1.x86_64.rpm
```

B2. Cài openvpn

Download RPMForge Repo

```
#wget http://pkgs.repoforge.org/rpmforge-release/rpmforge-release-0.5.2-2.el6.rf.x86_64.rpm
```

```
#yum install openvpn
```

```
Transaction Summary
Install      2 Package(s)

Total download size: 550 k
Installed size: 1.4 M
Is this ok [y/N]: y
Downloading Packages:
(1/2): openvpn-2.2.2-1.el6.rf.x86_64.rpm
(2/2): pkcs11-helper-1.03-1.el6.rf.x86_64.rpm

Total
Running rpm_check_debug
Running Transaction Test
Transaction Test Succeeded
```

B3. Cài EasyRSA

From the version 2.3 easy-rsa is an independent project so it has to be downloaded separately

```
#cd /etc/openvpn
#wget https://github.com/OpenVPN/easy-
rsa/releases/download/2.2.2/EasyRSA-2.2.2.tgz
#tar -zxf EasyRSA-2.2.2.tgz
#cd EasyRSA-2.2.2
```

B4. Configure Public Key Infrastructure Variables

```
[root@samba EasyRSA-2.2.2]# vi vars
```

```
export KEY_COUNTRY="VN"
export KEY_PROVINCE="HCM"
```

```
export KEY_CITY="HCM"
export KEY_ORG="Fort-Funston"
export KEY_EMAIL="me@myhost.mydomain"
export KEY_OU="Nhatnghe"
```

#### B5. Build CA:

```
source ./vars
./clean-all
./pkitool --initca
```

```
[root@samba EasyRSA-2.2.2]# ./pkitool --initca
Using CA Common Name: Fort-Funston CA
Generating a 2048 bit RSA private key
.....+++
..+++
writing new private key to 'ca.key'
[root@samba EasyRSA-2.2.2]# ll keys/
total 12
-rw-r--r-- 1 root root 1736 Mar 19 09:05 ca.crt
-rw----- 1 root root 1704 Mar 19 09:05 ca.key
-rw-r--r-- 1 root root 0 Mar 19 09:03 index.txt
-rw-r--r-- 1 root root 3 Mar 19 09:03 serial
```

#### B6. Build key server:

```
#./build-key-server server
```

```
The Subject's Distinguished Name is as follows
countryName :PRINTABLE:'VN'
stateOrProvinceName :PRINTABLE:'HCM'
localityName :PRINTABLE:'HCM'
organizationName :PRINTABLE:'Fort-Funston'
organizationalUnitName :PRINTABLE:'Nhatnghe'
commonName :PRINTABLE:'server'
name :PRINTABLE:'EasyRSA'
emailAddress :IA5STRING:'me@myhost.mydomain'
Certificate is to be certified until Mar 16 02:08:18 2025 GMT (3650 days)
Sign the certificate? [y/n]:y
```

```
1 out of 1 certificate requests certified, commit? [y/n]y
Write out database with 1 new entries
```

#ll kers

```
-rw-r--r-- 1 root root 5485 Mar 19 09:08 server.crt
-rw-r--r-- 1 root root 1074 Mar 19 09:08 server.csr
-rw----- 1 root root 1704 Mar 19 09:08 server.key
```

B7. Tạo Certificates cho client

```
# ./pkitool client
```

B8. Tạo Diffie Hellman Parameters

```
# ./build-dh
```

B9 Chép key

```
# cp keys/{ca.crt,ca.key,server.crt,server.key,dh2048.pem} /etc/openvpn/
```

## 1.2. cấu hình openvpn

### B1. Server.conf

```
# cp /usr/share/doc/openvpn-2.3.6/sample/sample-config-files/server.conf /etc/openvpn/
# vi /etc/openvpn/server.conf

25 ;local a.b.c.d
36 proto udp
53 dev tun
78 ca ca.crt
79 cert server.crt
80 key server.key
85 dh dh2048.pem
101 server 192.168.2.0 255.255.255.0
141 push "route 10.0.0.0 255.255.255.0"
256 comp-lzo
260 max-clients 100
280 status openvpn-status.log
289 log      openvpn.log
290 log-append openvpn.log
```

Thêm vào cuối file dòng

```
plugin /usr/lib64/openvpn/plugin/lib/openvpn-auth-pam.so /etc/pam.d/login
```

Nếu không yêu cầu cert tại client, thêm dòng

```
client-cert-not-required
```

#### chú ý:

# IF you want your all of your clients traffic though your vpn out your connection then add this:

```
push redirect-gateway 192.168.2.1
```

### B2. enable IP forwarding

```
# vi /etc/sysctl.conf
7    net.ipv4.ip_forward = 1
```

```
# sysctl -p
# echo 1 > /proc/sys/net/ipv4/ip_forward
```

### B3 start openvpn

```
# service openvpn restart
# chkconfig openvpn on
```

## 2. Cấu hình vpn client

### B1. Cài openvpn GUI

```
openvpn-install-2.3.6-i002-i686.exe
```

### B2. chép file

client.crt, client.key, và ca.crt đến thư mục C:\Program Files\OpenVPN\config

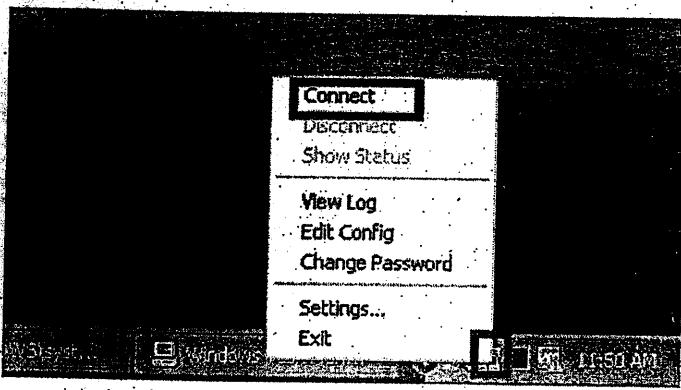
### B3. Tạo file C:\Program Files\OpenVPN\config\ client.ovpn

```
client
```

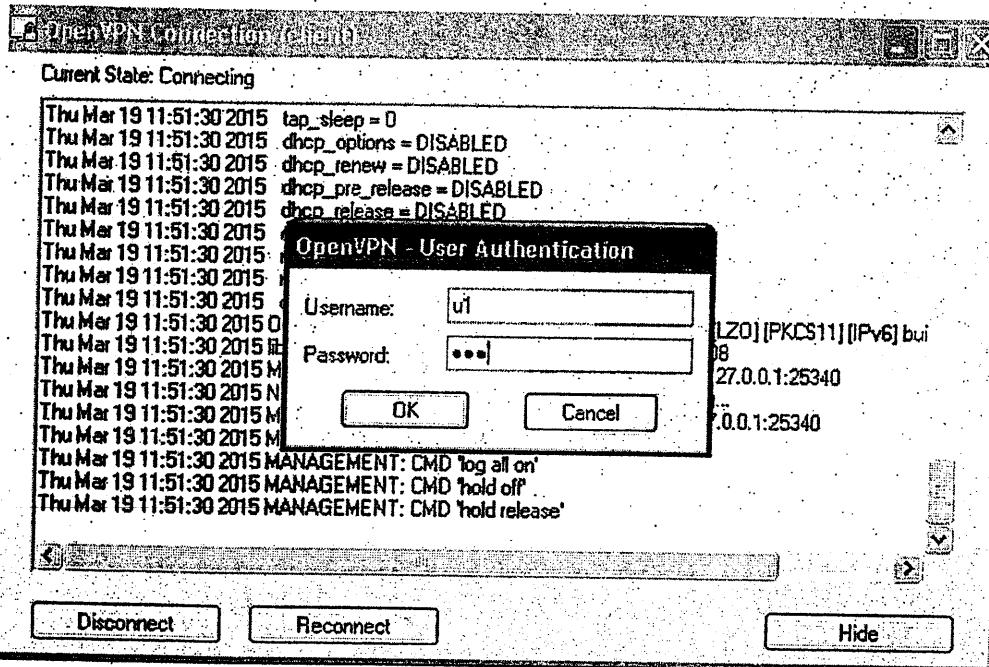
```
dev tun
proto udp
remote 192.168.1.11 1194
resolv-retry infinite
nobind
persist-key
persist-tun
```

ca ca.crt  
cert client.crt  
key client.key  
comp-lzo  
verb 4  
auth-user-pass

#### B4. Kết nối



Nhập user u1, pass 123



Truy cập máy bên trong mạng LAN

```
C:\Documents and Settings\Administrator>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection 0:
  Connection-specific DNS Suffix . .
  IP Address . . . . . 192.168.1.101
  Subnet Mask . . . . . 255.255.255.0
  Default Gateway . . . . .

Ethernet adapter Local Area Connection 1:
  Connection-specific DNS Suffix . .
  IP Address . . . . . 192.168.2.6
  Subnet Mask . . . . . 255.255.255.0
  Default Gateway . . . . .

C:\Documents and Settings\Administrator>ping 10.0.0.100

Pinging 10.0.0.100 with 32 bytes of data:
Reply from 10.0.0.100: bytes=32 time=1ms TTL=127
Reply from 10.0.0.100: bytes=32 time=1ms TTL=127
Reply from 10.0.0.100: bytes=32 time=1ms TTL=127
```

## 2. openvpn site to site

172.16.0.1 ——server1——192.168.1.11——192.168.1.12——server2——10.0.0.0/24

### Cài đặt openvpn trên server1 server2

B1. Cài gói Izo:

```
#rpm -ivh /media/Packages/izo-2.03-3.1.el6_5.1.x86_64.rpm
```

B2. Cài openvpn

Download RPMForge Repo

```
#wget http://pkgs.repoforge.org/rpmforge-release/rpmforge-release-0.5.2-
2.el6.rf.x86_64.rpm
```

#yum install openvpn

Transaction Summary	
Install	2 Package(s)
Total download size:	550 k
Installed size:	1.4 M
Is this ok [y/N]:	y
Downloading Packages:	
(1/2):	openvpn-2.2.2-1.el6.rf.x86_64.rpm
(2/2):	pkcs11-helper-1.08-1.el6.rf.x86_64.rpm
Total	
Running rpm_check_debug	
Running Transaction Test	
Transaction Test Succeeded	

B3. Enable IP forward

```
#vi /etc/sysctl.conf
```

dòng 7: Thay giá trị 0 thành 1

```
#echo "1" > /proc/sys/net/ipv4/ip_forward
```



## 2.1. Simple VPN

server1:

```
openvpn --remote 192.168.1.12 --dev tun1 --ifconfig 192.168.2.21 192.168.2.22
```

server2:

```
openvpn --remote 192.168.1.11 --dev tun1 --ifconfig 192.168.2.22 192.168.2.21
```

**Định tuyến:**

server1:

```
route add -net 10.0.0.0 netmask 255.255.255.0 gw 192.168.2.22
```

server2:

```
route add -net 172.16.0.0 netmask 255.255.255.0 gw 192.168.2.21
```

## 2.2. Static Key VPN

b1:Tạo VPN key:

Thực hiện việc tạo key trên 1 server sau đó chép qua server kia

Đến thư mục sẽ lưu static key

```
#cd /etc/openvpn/
```

Tạo file key chứa static key

```
#openvpn --genkey --secret key
```

Chép file key qua server bên kia

```
#scp key root@192.168.1.11:/usr/share/doc/openvpn-2.0.9/
```

b2: Creating the VPN link

server1:

```
/usr/sbin/openvpn --remote 192.168.1.12 --dev tun1 --ifconfig 192.168.2.21  
192.168.2.22 --secret /etc/openvpn/key
```

server2:

```
/usr/sbin/openvpn --remote 192.168.1.11 --dev tun1 --ifconfig 192.168.2.22  
192.168.2.21 --secret /etc/openvpn/key
```

server1:

```
route add -net 10.0.0.0 netmask 255.255.255.0 gw 192.168.2.22
```

server2:

```
route add -net 172.16.0.0 netmask 255.255.255.0 gw 192.168.2.21
```

```
netstat -anp | grep :1194  
pkill openvpn
```

## 2.3. TLS-enabled VPN

**Cấu hình trên server1**  
server1 đóng vai trò CA

B1. Cài EasyRSA.

From the version 2.3 easy-rsa is an independent project so it has to be downloaded separately

```
#cd /etc/openvpn  
#wget https://github.com/OpenVPN/easy-  
rsa/releases/download/2.2.2/EasyRSA-2.2.2.tgz  
#tar -zvxf EasyRSA-2.2.2.tgz  
#cd EasyRSA-2.2.2
```

## B2. Configure Public Key Infrastructure Variables

```
[root@samba EasyRSA-2.2.2]# vi vars
```

```
export KEY_COUNTRY="VN"  
export KEY_PROVINCE="HCM"  
export KEY_CITY="HCM"  
export KEY_ORG="Fort-Funston"  
export KEY_EMAIL="me@myhost.mydomain"  
export KEY_OU="Nhatnghethe"
```

Thiết đặt các biến môi trường

```
# source ./vars
```

B3: xóa mọi thứ trong /etc/openvpn/easy-rsa/keys

```
# ./clean-all
```

b4: Tạo CA

```
# ./build-ca
```

```
Country Name (2 letter code) [US]:vn  
State or Province Name (full name) [CA]:hcm  
Locality Name (eg, city) [SanFrancisco]:hcm  
Organization Name (eg, company) [Fort-Funston]:nhatnghethe  
Organizational Unit Name (eg, section) []:daotao  
Common Name (eg, your name or your server's hostname) [Fort-Funston  
CA]:server ; nhập cái gì thích
```

Quá trình tạo ra 2 file: ca.crt ca.key

b5: Create Server Certificate

```
# ./build-key-server Server1
```

```
countryName :PRINTABLE:'vn'  
stateOrProvinceName :PRINTABLE:'hcm'  
localityName :PRINTABLE:'hcm'  
organizationName :PRINTABLE:'nhatnghethe'  
organizationalUnitName:PRINTABLE:'daotao'  
commonName :PRINTABLE:'server1'  
emailAddress :IA5STRING:'me@myhost.mydomain'  
Certificate is to be certified until Nov 5 13:17:14 2020 GMT (3650 days)  
Sign the certificate? [y/n]:y
```

b6: Create Client Certificate (server2)

```
# ./build-key Server2
```

```
countryName :PRINTABLE:'vn'  
stateOrProvinceName :PRINTABLE:'hcm'  
localityName :PRINTABLE:'hcm'  
organizationName :PRINTABLE:'nhatnghethe'  
organizationalUnitName:PRINTABLE:'daotao'
```

```
commonName      :PRINTABLE:'server2'  
emailAddress    :IA5STRING:'me@myhost.mydomain'  
Certificate is to be certified until Nov 5 13:18:40 2020 GMT (3650 days)  
Sign the certificate? [y/n]:y
```

b7: Create Diffie Hellman Keys

```
# ./build-dh
```

b8: Copy Keys

```
[root@ EasyRSA-2.2.2]# cp keys/{ca.crt, dh2048.pem,Server1.crt,Server1.key}  
/etc/openvpn/  
chèp cert về server2  
# scp keys/{ca.crt,Server2.crt,Server2.key} 192.168.1.12:/etc/openvpn/
```

b9: Create VPN Link

server1:

```
# /usr/sbin/openvpn --remote 192.168.1.12 --dev tun1 --ifconfig 192.168.2.21  
192.168.2.22 --tls-server \  
--dh /etc/openvpn/dh2048.pem --ca /etc/openvpn/ca.crt \  
--cert /etc/openvpn/Server1.crt --key /etc/openvpn/Server1.key \  
--reneg-sec 60 --verb 5
```

server2:

```
# /usr/sbin/openvpn --remote 192.168.1.11 --dev tun1 --ifconfig 192.168.2.22  
192.168.2.21 --tls-client \  
--ca /etc/openvpn/keys/ca.crt --cert /etc/openvpn/Server2.crt --key  
/etc/openvpn/Server2.key \  
--reneg-sec 60 --verb 5
```

b10: Server Script - server1

```
vi /etc/openvpn/server.conf  
local 192.168.1.11  
port 1194  
proto udp  
dev tun  
ca /etc/openvpn/ca.crt  
cert /etc/openvpn/Server1.crt  
key /etc/openvpn/Server1.key  
dh /etc/openvpn/dh2048.pem  
tls-server  
ifconfig 192.168.2.21 192.168.2.22  
push "route 10.0.0.0 255.255.255.0"  
route 10.0.0.0 255.255.255.0  
keepalive 10 120  
comp-lzo  
user nobody  
group nobody  
status openvpn-status.log  
verb 3
```

b11: Client Script - server2

```
vi /etc/openvpn/client.conf
client
dev tun
local 192.168.1.12
port 1194
proto udp
tls-client
remote 192.168.1.11
ifconfig 192.168.2.22 192.168.2.21
persist-key
persist-tun
ca /etc/openvpn/ca.crt
cert /etc/openvpn/Server2.crt
key /etc/openvpn/Server2.key
comp-lzo
verb 3
push "route 172.16.0.0 255.255.255.0"
route 172.16.0.0 255.255.255.0
```

service openvpn start

B12. Các máy client liên lạc thành công

blood banking — F5: Grscce, IBM

HAPrcxy: Cân bằng tải

## Phần II: Web server

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## 1. Apache, php, Mysql

B1. Cài các gói sau

```
php-mysql-5.3.3-38.el6.x86_64
mysql-5.1.73-3.el6_5.x86_64
php-5.3.3-38.el6.x86_64.rpm
mysql-server-5.1.73-3.el6_5.x86_64
```

B2. Chép file web vào thư mục /var/www/html

B3. # vi /etc/httpd/conf/httpd.conf

```
402 DirectoryIndex index.php index.html index.html.var
```

B4. Khởi động httpd

```
# service httpd restart
```

B5. Khởi động mysql

```
# service mysqld restart
```

B6. Đặt password cho root

```
# mysqladmin -u root password 123456
```

B7. Login mysql, tạo csdl

```
# mysql -p -u root
mysql> create database sitenbac;
mysql> exit
```

B8. Import csdl

```
# mysql -u root -p sitenbac < /var/www/html/sitenbac.db
```

B9. Kết nối với csdl

# vi /var/www/html/Connections/dbconnect.php

```
[root@samba ~]# vi /var/www/html/Connections/dbconnect.php
<?php
# FileName="Connection_php_mysql.htm"
# Type="MYSQL"
# HTTP="true"
$hostname_dbconnect = "localhost";
$database_dbconnect = "sitenbac";
$username_dbconnect = "root";
$password_dbconnect = "123456";
$dbconnect = mysql_pconnect($hostname_dbconnect,
$username_dbconnect, $password_dbconnect) or
trigger_error(mysql_error(),E_USER_ERROR);
mysql_query("SET NAMES 'UTF8'");
?>
```

B10. Truy cập web



## 2. phpMyAdmin

```
# yum install php-mbstring
# yum install php5-mcrypt
# tar -xjvf phpMyAdmin-4.0.10.6-english.tar.bz2
# mv phpMyAdmin-4.0.10.6-english /var/www/html/phpmyadmin
# cd /var/www/html/phpmyadmin
#mv config.sample.inc.php config.inc.php

# vi config.inc.php
 29 $cfg['Servers'][$i]['auth_type'] = 'http';
#service httpd restart
```

IE: <http://192.168.1.12/phpmyadmin>

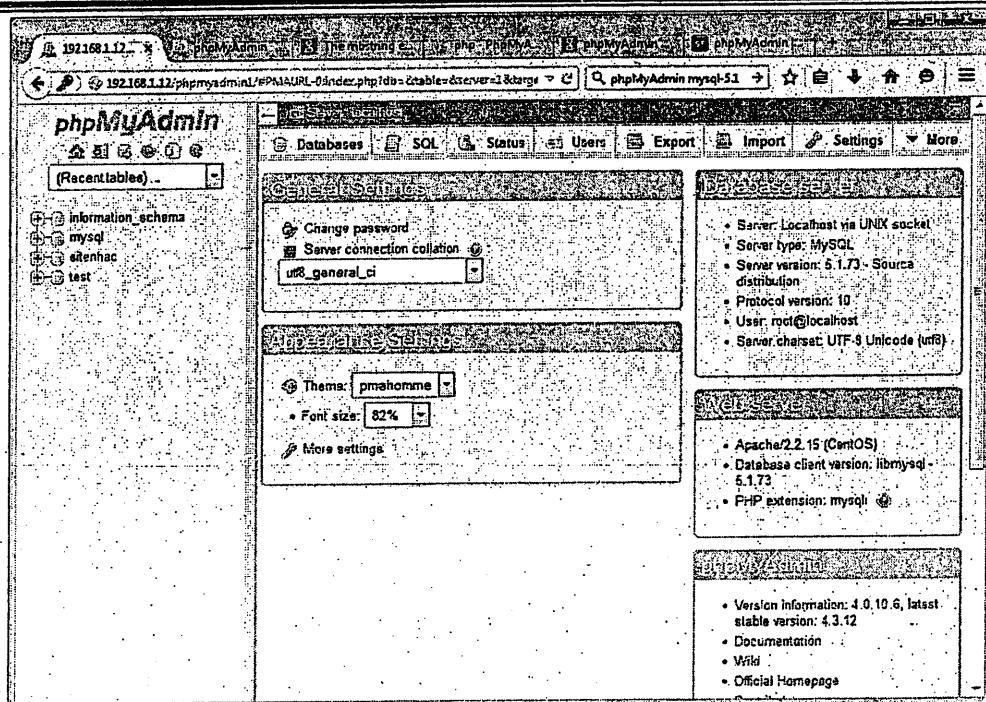
Backup tự động

crontab -e

Thứ 7 hàng ngày thay thư

0 17 \* \* \* <-- 1-5 (tùy ý đến TC)

/usr/bin/mysqldump -u root -p sitenam > /root/bakupdb



### 3. Web ssl

#### B1. Cài gói

```
mod_ssl-2.2.15-39.el6.centos.x86_64.rpm
```

#### b2: Tạo 1024-bit RSA private key cho Apache server

```
cd /etc/pki/tls/certs/  
make server.key
```

Kết quả: file server.key được tạo ra

Remove key trong file server.key

```
#openssl rsa -in server.key -out server.key
```

#### b3: Tạo 1 Certificate Signing Request (CSR) kết hợp với file server.key vừa tạo : make server.csr

.....  
Common Name (eg, your name or your server's hostname)

[www.nhatnghe.com](http://www.nhatnghe.com)

A challenge password []: bỏ trống

Kết quả tạo file server.csr được tạo

#### b4: tạo certificate

```
#openssl x509 -in server.csr -out server.crt -req -signkey server.key -days 3650
```

#### b5: cấu hình httpd.conf

```
#vi /etc/httpd/conf.d/ssl.conf
```

77 DocumentRoot "/var/www/html"

78 ServerName [www.nhatnghe.com](http://www.nhatnghe.com):443

105 SSLCertificateFile /etc/pki/tls/certs/server.crt

112 SSLCertificateKeyFile /etc/pki/tls/certs/server.key

B6. Truy cập thử với tên <https://www.nhatnghe.com>  
hoặc  
<http://www.nhatnghe1.com>

b7. Apache Redirect HTTP to HTTPS using mod\_rewrite:  
vi /etc/httpd/conf/httpd.conf

Thêm vào cuối file:

```
RewriteEngine On
RewriteCond %{HTTPS} off
RewriteRule (.*) https://%{HTTP_HOST}%{REQUEST_URI}
```

```
service httpd restart
http://www.nhatnghe1.com/
```

## 4. nginx

Cấu hình nginx căn bản

B1. Cài đặt

```
#yum install epel-release
#yum install nginx
```

B2. Cấu hình

```
# vi /etc/nginx/nginx.conf
```

Quan sát các dòng

```
5 user    nginx;
6 worker_processes 1;
28   access_log /var/log/nginx/access.log main;
40   include /etc/nginx/conf.d/*.conf;
```

```
# vi /etc/nginx/conf.d/default.conf
```

Quan sát các dòng

```
5 listen 80
6 server_name 192.168.1.12;
15 location / {
16   root /usr/share/nginx/html;
17   index index.php index.htm;
18 }
```

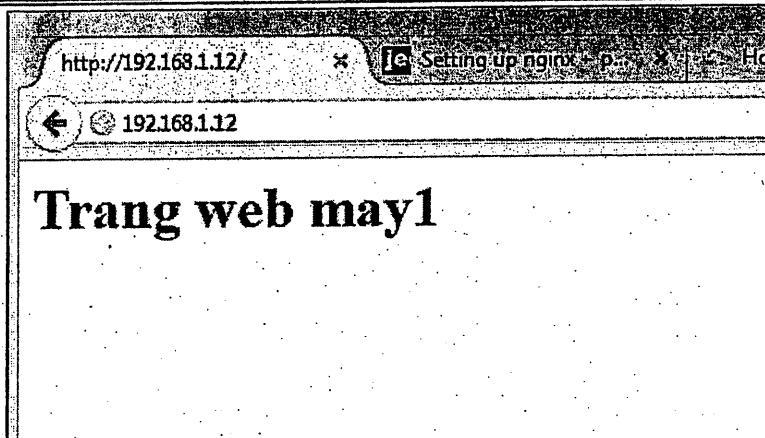
B4. Tạo trang web

Tạo trang web

```
# echo "<h1>Trang web may1</h1>" > /usr/share/nginx/html/index.html
```

B5. Khởi động nginx và truy cập

```
# service nginx restart
```



## 5. nginx, php, Mysql

B1. Cài php, mysql

B2. Cấu hình file /etc/php.ini

```
# vi /etc/php.ini
841cgi.fix_pathinfo=0
```

B3. Cấu hình file /etc/nginx/conf.d/default.conf

```
# vi /etc/nginx/conf.d/default.conf
```

Quan sát, sửa các dòng

```
5 listen      80
6 server_name 192.168.1.12;
15 location / {
16     root /usr/share/nginx/html;
17     index index.php index.htm;
18 }
40 location ~ \.php$ {
41     root      /usr/share/nginx/html;
42     fastcgi_pass 127.0.0.1:9000;
43     fastcgi_index index.php;
44     fastcgi_param SCRIPT_FILENAME
$document_root$fastcgi_script_name;
45     include    fastcgi_params;
46 }
```

B4. Cấu hình file /etc/php-fpm.d/www.conf

```
#vi /etc/php-fpm.d/www.conf
```

```
39 user = nginx
41 group = nginx
```

B5. Tạo file php

```
#vi /usr/share/nginx/html/info.php
<?php
```

```
phpinfo();
```

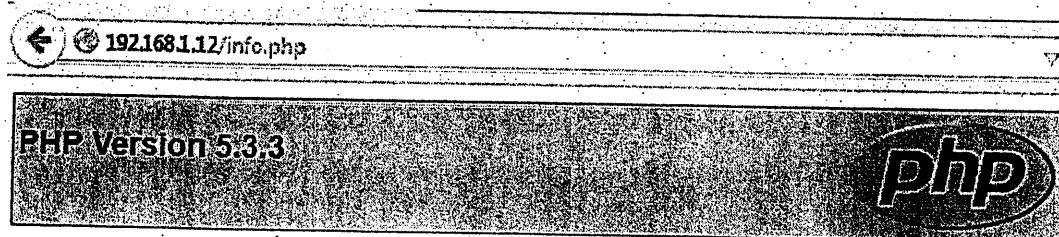
```
?>
```

### B6. Khởi động service

```
#service nginx restart
#service php-fpm restart

#chkconfig mysqld on
#chkconfig nginx on
#chkconfig php-fpm on
```

IE: <http://192.168.1.12/info.php>



System	Linux samba.nhatnghe.com 2.6.32-504.el6.x86_64 #1 SMP Wed Oct 15 04:27:16 UTC 2014 x86_64
Build Date	Oct 30 2014 20:14:36
Configure Command	'configure' '--build=x86_64-redhat-linux-gnu' '--host=x86_64-redhat-linux-gnu' '--target=x86_64-redhat-linux-gnu' '--program-prefix=' --prefix='/usr' --exec-prefix='/usr' --bindir='/usr/bin' --sbindir='/usr/sbin' --sysconfdir='/etc' --datadir='/usr/share' --includedir='/usr/include' --libdir='/usr/lib64' --libexecdir='/usr/libexec' --localstatedir='/var' --sharedstatedir='/var/lib' --mandir='/usr/share/man' --infodir='/usr/share/info' --cache-file='/config.cache' --with-libdir=lib64' --with-config-file-path='/etc' --with-config-file-scan-dir='/etc/php.d' --disable-debug' --with-pic' --disable-roothash' --without-pecl' --with-bz2' --with-exec-dir='/usr/bin' --with-freetype-dir='/usr' --with-png-dir='/usr' --with-xpm-dir='/usr' --enable-gd-native-ttf' --without-gdxml' --with-gettext' --with-gmp' --with-iconv' --with-jpeg-dir='/usr' --with-openssl' --with-pcre-regex='/usr' --with-zlib' --with-layout=GNU' --enable-exif' --enable-fini' --enable-magic-quotes' --enable-sockets' --enable-sysvsem' --enable-

### B7. Chép file web

```
# cp -rv /var/www/html/* /usr/share/nginx/html/
```

IE: <http://192.168.1.12>



## Phần III: Mail server

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## CONFIGURE POSTFIX

### 1. configure postfix

#### Chuẩn bị:

- Cài và cấu hình dns cho domain: nhatnghe1.com
- Tạo 2 user: nv1, nv2

#### Cài và cấu hình postfix

- Kiểm tra và cài đặt gói phần mềm postfix  
# rpm -ivh /media/Packages/postfix-2.6.6-6.el6\_5.x86\_64.rpm
- Cấu hình Mail Server - Postfix

Chỉnh sửa các dòng sau trong file cấu hình /etc/postfix/main.cf

```
Dòng 76    myhostname = mail.nhatnghe1.com
Dòng 83    mydomain = nhatnghe.com
Dòng 99    myorigin = $mydomain ; bỏ #
Dòng 113   inet_interfaces = all ; bỏ #
Dòng 116   #inet_interfaces = localhost ; Thêm #
Dòng 164   #mydestination = $myhostname, localhost.$mydomain, localhost
           ; Thêm #
Dòng 165   mydestination = $myhostname, localhost.$mydomain, localhost,
$mydomain ; bỏ #
Dòng 264 mynetworks = 127.0.0.0/8 ; sửa lại my network
Dòng 419 home_mailbox = Maildir/ ; bỏ #
```

- Khởi động dịch vụ  
#service postfix start  
#chkconfig --level 35 postfix on

#### Cài đặt và cấu hình DOVECOT

- Cài đặt gói dovecot:  
# rpm -ivh /media/Packages/dovecot-2.0.9-7.el6\_5.1.x86\_64.rpm

- Cấu hình file /etc/dovecot/conf.d/10-mail.conf

```
24 mail_location = maildir:~/Maildir
```

- Cấu hình file /etc/dovecot/conf.d/20-pop3.conf

```
51 pop3_uidl_format = %08Xu%08Xv
pop3_client_workarounds = outlook-no-nuls oe-ns-eoh
```

- Cấu hình file /etc/dovecot/dovecot.conf

```
21 disable_plaintext_auth=no
```

- Khởi động dịch vụ

```
#service dovecot start
#chkconfig dovecot on
```

## 2. Cài đặt và cấu hình Webmail SSL

- Cài package squirrelmail

```
# rpm -ivh squirrelmail-1.4.22-2.el6.noarch.rpm
```

- Cấu hình file /etc/squirrelmail/config.php

```
Dòng 28 $domain = 'nhatnghe.com';
```

- Tạo certificate cho web site www.nhatnghe1.com

b1: yum install mod\_ssl hoặc cài từ cd

b2: Tạo 1024-bit RSA private key cho Apache server

```
cd /etc/pki/tls/certs/
```

```
[root@node1 certs]# make server.key
umask 77 ; \
/usr/bin/openssl genrsa -des3 1024 > server.key
Generating RSA private key, 1024 bit long modulus
.....+++++
...+++++
e is 65537 (0x10001)
Enter pass phrase:
Verifying - Enter pass phrase:
```

Kết quả: file server.key được tạo ra

Remove key trong file server.key

```
#openssl rsa -in server.key -out server.key
```

b3: Tạo 1 Certificate Signing Request (CSR) kết hợp với file server.key vừa tạo :

```
[root@node1 certs]# make server.csr
umask 77 ; \
/usr/bin/openssl req -utf8 -new -key server.key -out server.csr
Enter pass phrasé for server.key:
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '', the field will be left blank.

Country Name (2 letter code) [GB]:vn
State or Province Name (full name) [Berkshire]:hcm
Locality Name (eg, city) [Newbury]:hcm
Organization Name (eg, company) [My Company Ltd]:Nhat nghe
Organizational Unit Name (eg, section) []:dao tao
Common Name (eg, your name or your server's hostname)
[]:www.nhatnghe1.com
```

Email Address []:

Please enter the following 'extra' attributes

to be sent with your certificate request

A challenge password []: **bỏ trống**

An optional company name []:

[root@node1 certs]#

Kết quả tạo file **server.csr** được tạo

b4: tạo certificate

#openssl x509 -in server.csr -out server.crt -req -signkey server.key -days 3650

```
[root@node1 certs]# openssl x509 -in server.csr -out server.crt -req -signkey
server.key -days 3650
Signature ok
subject=/C=vn/ST=hcm/L=hcm/O=Nhat nghe/OU=dao
tao/CN=www.nhatnghe1.com
Getting Private key
Enter pass phrase for server.key:
[root@node1 certs]# ll
total 1784
-rw-r--r--. 1 root root 786601 Jul 14 2014 ca-bundle.crt
-rw-r--r--. 1 root root 1005005 Jul 14 2014 ca-bundle.trust.crt
-rw-----. 1 root root 1525 Mar 21 09:35 localhost.crt
-rwxr-xr-x. 1 root root 610 Oct 15 18:01 make-dummy-cert
-rw-r--r--. 1 root root 2242 Oct 15 18:01 Makefile
-rwxr-xr-x. 1 root root 829 Oct 15 18:01 renew-dummy-cert
-rw-r--r--. 1 root root 1176 Mar 21 09:39 server.crt
-rw-----. 1 root root 989 Mar 21 09:38 server.csr
-rw-----. 1 root root 1675 Mar 21 09:38 server.key
[root@node1 certs]#
```

b5: cấu hình httpd.conf

```
#vi /etc/httpd/conf.d/ssl.conf
    77 DocumentRoot "/var/www/html"
    78 ServerName www.example.com:443
    105 SSLCertificateFile /etc/pki/tls/certs/server.crt
    112 SSLCertificateKeyFile /etc/pki/tls/certs/server.key
```

B6. Quan sát file /etc/httpd/conf.d/squirrelmail.conf

```
Alias /webmail /usr/share/squirrelmail

<Directory "/usr/share/squirrelmail/plugins/squirrelspell/modules">
  Deny from all
</Directory>

# this section makes squirrelmail use https connections only, for this you
# need to have mod_ssl installed. If you want to use unsecure http
# connections, just remove this section:
<Directory /usr/share/squirrelmail>
```

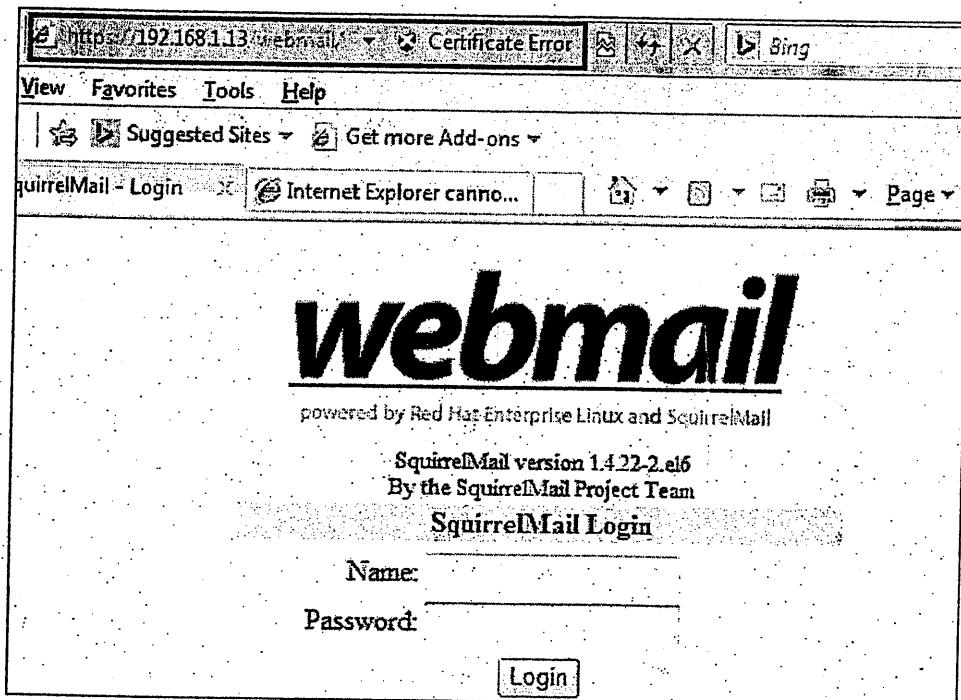
```
RewriteEngine on
RewriteCond %{HTTPS} !=on
RewriteRule (.*) https:// %{HTTP_HOST} %{REQUEST_URI}
</Directory>
```

Mục đích: Khi gửi mail sẽ tự động chuyển sang https

# service httpd restart

Truy cập thử với tên http://www.nhatnghe.com/webmail

Kết nối được chuyển hướng đến https://www.nhatnghe.com/webmail



### Cài đặt plugins:

b1: Down load và giải nén các file sau:

```
#cd /usr/share/squirrelmail/plugins/
#tar zxvf compatibility-1.3.tar.gz
# tar zxvf change_passwd-4.0.tar.gz
```

b2: Cấu hình web mail và các plug in

```
#/usr/share/squirrelmail/config/conf.pl
```

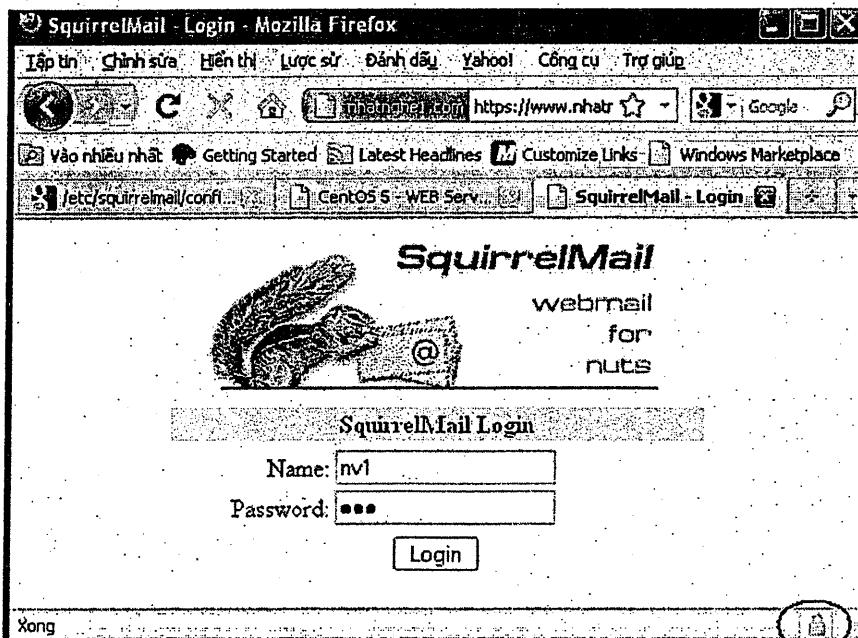
chọn 8. Plugins

lần lượt chọn: change\_passwd, compatibility

q: lưu và thoát

```
# vi /etc/httpd/conf/httpd.conf
redirect /mail https://www.nhatnghe1.com/webmail
#service httpd restart
```

<https://www.nhatnghe1.com/mail>



### 3. Configure Postfix and Dovecot for SSL

SSL: Secure Sockets Layer,

TLS: Transport Layer Security

Kỹ thuật hỗ trợ mã hóa thông tin đường truyền giữa 2 host

```
# vi /etc/postfix/main.cf
```

Thêm các dòng sau vào cuối file

```
smtpd_use_tls = yes
smtpd_tls_cert_file = /etc/pki/tls/certs/server.crt
smtpd_tls_key_file = /etc/pki/tls/certs/server.key
smtpd_tls_session_cache_database = btree:/etc/postfix/smtpd_scache
```

```
# vi /etc/postfix/master.cf
```

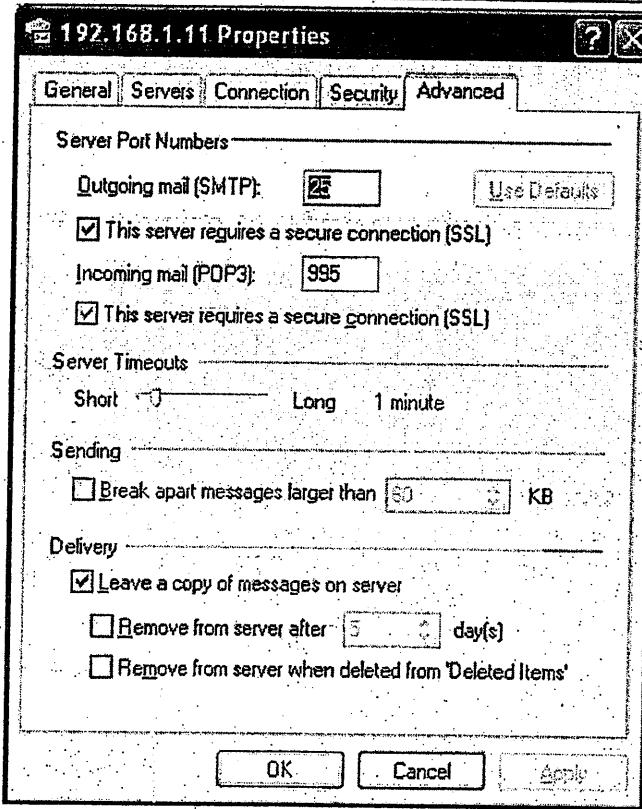
Bỏ dấu # dòng 17-19:

```
smtps  inet n - n - - smtpd
-o smtpd_tls_wrappermode=yes
-o smtpd_sasl_auth_enable=yes
```

```
#service postfix restart
```

```
#service dovecot restart
```

Mở Outlook Express và cấu hình sau đó khởi động lại



```
# tail /var/log/maillog
```

```
Mar 22 12:53:43 samba dovecot: pop3-login: Login: user=<u1>, method=PLAIN,  
rip=192.168.1.15, lip=192.168.1.13, mpid=3679, TLS  
Mar 22 12:53:43 samba dovecot: pop3(u1): Disconnected: Logged out top=0/0,  
retr=0/0, del=0/3, size=4785  
[root@samba certs]# cat /var/log/maillog
```

#### 4. SMTP Authentication using Dovecot SASL

SASL (Simple Authentication and Security Layer)

kỹ thuật hỗ trợ chứng thực user sử dụng username và password

B1: Cấu hình SASL cho postfix

```
#vi /etc/postfix/main.cf
```

Thêm các dòng sau:

```
smtpd_sasl_auth_enable = yes  
broken_sasl_auth_clients = yes  
smtpd_sasl_type = dovecot  
smtpd_sasl_path = private/auth  
smtpd_sasl_security_options = noanonymous
```

```
smtpd_recipient_restrictions =  
    permit_mynetworks,  
    permit_sasl_authenticated,
```

reject\_unauth\_destination

```
#vi /etc/dovecot.conf
Sử các dòng
758 auth default {
762   mechanisms = plain login
796     passdb pam {
897       userdb passwd {
960         user = root
978         socket listen { ; bỏ #
990           client { ; bỏ #
994             path = /var/spool/postfix/private/auth
995             mode = 0660
996             user = postfix
997             group = postfix
           } ; bỏ #
           } ; bỏ #
         }
       }
     }
```

```
#service dovecot restart
#service postfix reload
```

b2: kiểm tra

Tiến hành encode user:nv2, password:123

```
[root@node1 ~]# perl -MMIME::Base64 -e 'print
encode_base64("\000nv2\000123");
AG52MgAxMjM=
```

Nv2 tiến hành gửi mail cho nv1

Chép AG52MgAxMjM= dùng chứng thực

```
[root@node1 ~]# telnet localhost 25
Trying 127.0.0.1...
Connected to localhost.localdomain (127.0.0.1).
Escape character is '^].
220 mail.nhatnghe1.com ESMTP Postfix
EHLO nhatnghe1.com
250-mail.nhatnghe1.com
250-PIPELINING
250-SIZE 10240000
250-VRFY
250-ETRN
250-STARTTLS
250-AUTH PLAIN LOGIN
250-AUTH=PLAIN LOGIN
250-ENHANCEDSTATUSCODES
```

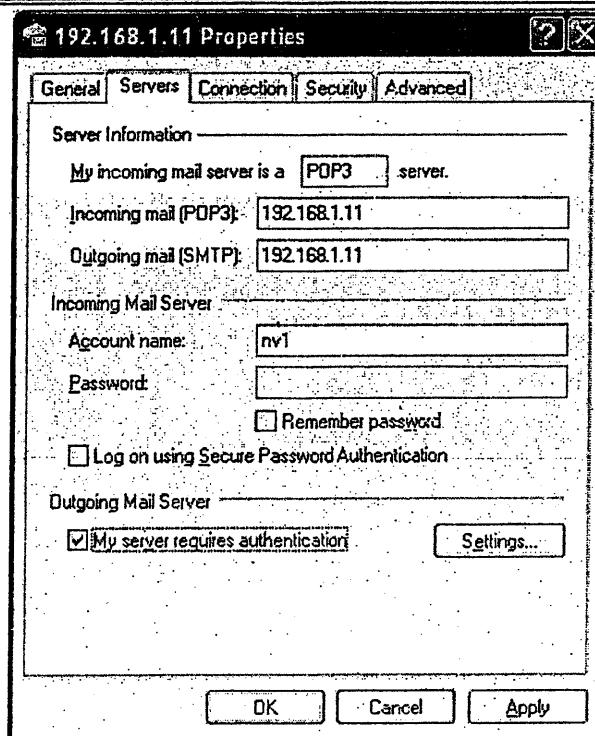
```
250-8BITMIME
250 DSN
AUTH PLAIN AG52MgAxMjM=
235 2.0.0 Authentication successful
mail from:nv2@nhatnghe1.com
250 2.1.0 Ok
rcpt to:nv1@nhatnghe1.com
250 2.1.5 Ok
data
354 End data with <CR><LF>.<CR><LF>
chao nv1
.
250 2.0.0 Ok: queued as 92A9A195B3B
quit
221 2.0.0 Bye
Connection closed by foreign host.
[root@node1 ~]#
```

Kiểm tra log

```
[root@node1 ~]# tail /var/log/maillog

Oct 15 18:35:52 node1 postfix/smtpd[3472]: connect from
localhost.localdomain[127.0.0.1]
Oct 15 18:36:36 node1 postfix/smtpd[3472]: warning: Illegal address syntax from
localhost.localdomain[127.0.0.1] in RCPT command: nv1@nhatnghe1.com?[D
Oct 15 18:36:57 node1 postfix/smtpd[3472]: 92A9A195B3B:
client=localhost.localdomain[127.0.0.1], sasl_method=PLAIN,
sasl_username=nv2
Oct 15 18:37:03 node1 postfix/cleanup[3478]: 92A9A195B3B: message-
id=<20101015113657.92A9A195B3B@mail.nhatnghe1.com>
Oct 15 18:37:03 node1 postfix/qmgr[3126]: 92A9A195B3B:
from=<nv2@nhatnghe1.com>, size=364, nrcpt=1 (queue active)
Oct 15 18:37:03 node1 postfix/local[3479]: 92A9A195B3B:
to=<nv1@nhatnghe1.com>, relay=local, delay=4.1, delays=41/0.04/0/0.01,
dsn=2.0.0, status=sent (delivered to maildir)
Oct 15 18:37:03 node1 postfix/qmgr[3126]: 92A9A195B3B: removed
Oct 15 18:37:06 node1 postfix/smtpd[3472]: disconnect from
localhost.localdomain[127.0.0.1]
[root@node1 ~]#
```

Trong outlook express phải check mục **My server requires authentication** mới gửi mail được



## Virtual Users and Multiple Domains

Chuẩn bị:

Cài và cấu hình dns cho các domain:

nhatnghe.local  
nhatnghe1.com  
nhatnghe2.com

### Phần 1: Cài đặt Postfix with MySQL in CentOS 5

- Cài Base.repo

# yum install epel-release

- Cài php-5,mysql-5, mysql-server,php-mysql

- Remove postfix đang tồn tại nếu có

#yum remove postfix

- Tiến hành cài đặt

# yum install postfix dovecot dovecot-mysql

- Kiểm tra quá trình cài hợp lệ, (postfix package support the mysql) nếu có mysql

[root@localhost ~]# yum install postfix dovecot dovecot-mysql

[root@localhost ~]# postconf -m

btree

cidr

environ

hash

ldap

mysql

nis

pcre

proxy

regexp

static

unix

### Phần 2: Tao Mysql Username, Password và Postfixadmin database

b1: Khởi động mysql

#service mysqld start

#chkconfig mysqld on

b2: Tạo pass cho user root

#mysqladmin -u root password '123456'

b3: Tạo database postfix và user mail

#mysql -u root -p

mysql> CREATE DATABASE postfix;

mysql> CREATE USER mail@localhost IDENTIFIED BY '123456';

mysql> GRANT ALL PRIVILEGES ON postfix.\* TO mail;

mysql> show databases;

**b4: Tạo Create Postfixadmin User**

```
#useradd vmail -s /sbin/nologin  
#passwd vmail  
#id vmail  
uid=500(vmail) gid=500(vmail) groups=500(vmail)
```

**Phần 3: Cấu hình postfix****b1: Configure the postfix main.cf file**

```
#vi /etc/postfix/main.cf
```

```
76 myhostname = mail.nhatnghe.com  
83 mydomain = nhatnghe.com  
99 myorigin = $mydomain  
113 inet_interfaces = all  
116 #inet_interfaces = localhost  
155 mydestination = $myhostname, localhost.$mydomain, localhost  
264 mynetworks = 192.168.1.0/24, 127.0.0.0/8
```

Thêm các dòng sau vào cuối file: 500 là uid, gid của user vmail  
postfix configuration, là virtual domains, virtual users and aliases.

```
virtual_mailbox_domains = mysql:/etc/postfix/mysql-domains.cf  
virtual_mailbox_maps = mysql:/etc/postfix/mysql-users.cf  
virtual_alias_maps = mysql:/etc/postfix/mysql-aliases.cf  
virtual_mailbox_base = /home/vmail  
virtual_uid_maps = static:500  
virtual_gid_maps = static:500
```

**b2: Cấu hình postfix mysql-domians.cf**

Tạo file mysql-users.cf. cho phép postfixadmin tạo virtual domain

```
#vi /etc/postfix/mysql-domains.cf  
host = localhost  
user = mail  
password = 123456 ;<your-mysql-password-here>  
dbname = postfix  
table = domain  
select_field = domain  
where_field = domain  
additional_conditions = and backupmx = '0' and active = '1'
```

**b3: Cấu hình postfix mysql-users.cf**

create mysql-users.cf. cho phép postfixadmin tạo virtual users

```
#vi /etc/postfix/mysql-users.cf  
host = localhost  
user = mail  
password = 123456 ;<your-mysql-password-here>  
dbname = postfix  
table = mailbox  
select_field = maildir  
where_field = username
```

```
additional_conditions = and active = '1'  
result_format = %sMaildir/
```

b4: Cấu hình postfix mysql-alias.cf file  
connect the postfixadmin to mysql

```
#vi /etc/postfix/mysql-aliases.cf
```

```
host = localhost  
user = mail  
password = 123456 ;<your-mysql-password-here>  
dbname = postfix  
table = alias  
select_field = goto  
where_field = address  
additional_conditions = and active = '1'
```

```
#service postfix start  
#chkconfig postfix on
```

#### Phần 4: Cấu hình dovecot

b1: Cài đặt dovecot

dovecot đã cài ở phần trên

b2: Tạo file mysql config cho postfixadmin

```
#vi /etc/dovecot-mysql.conf
```

Thêm các dòng sau:

```
driver = mysql
```

```
connect = host=localhost dbname=postfix user=mail password=123456
```

```
default_pass_scheme = PLAIN
```

```
password_query = SELECT password FROM mailbox WHERE username = '%u'
```

```
# vi /etc/dovecot/dovecot.conf
```

```
20 protocols = imap imaps pop3 pop3s
```

```
#vi /etc/dovecot/conf.d/10-auth.conf
```

```
9 disable_plaintext_auth = yes
```

```
50 auth_username_format = %Lu
```

```
97 auth_mechanisms = plain login
```

```
119 #include auth-system.conf.ext
```

```
120 !include auth-sql.conf.ext
```

```
# vi /etc/dovecot/conf.d/auth-sql.conf.ext
```

```
5 passdb {
```

```
6 driver = sql
```

```
9 args = /etc/dovecot-mysql.conf
```

```
10 }
```

```
19 userdb {
```

```
20 driver = static
```

```
21 args = uid=500 gid=500 home=/home/vmail/%d/%n
```

```
22 }
```

```
#service dovecot start  
#chkconfig dovecot on
```

#### **Phần 5: Cài đặt Postfixadmin**

- Download postfixadmin\_2.3.tar.gz
- Giải nén:  

```
#tar -zxvf postfixadmin_2.3.tar.gz
```
- Đổi tên:  

```
#mv postfixadmin-2.3 postfixadmin
```
- Lưu lại 1 bản:  

```
#cp postfixadmin/config.inc.php postfixadmin/config.inc.php_ori
```
- #vi postfixadmin/config.inc.php
- 26 \$CONF['configured'] = true;  
36 \$CONF['postfix\_admin\_url'] = '/postfixadmin';  
49 \$CONF['database\_type'] = 'mysql';  
50 \$CONF['database\_host'] = 'localhost';  
51 \$CONF['database\_user'] = 'mail';  
52 \$CONF['database\_password'] = '123456';  
53 \$CONF['database\_name'] = 'postfix';  
100 \$CONF['encrypt'] = 'cleartext';  
145 \$CONF['domain\_path'] = 'YES';  
151 \$CONF['domain\_in\_mailbox'] = 'NO';  
272 \$CONF['emailcheck\_resolve\_domain']='NO';

```
#mv postfixadmin /var/www/html/
```

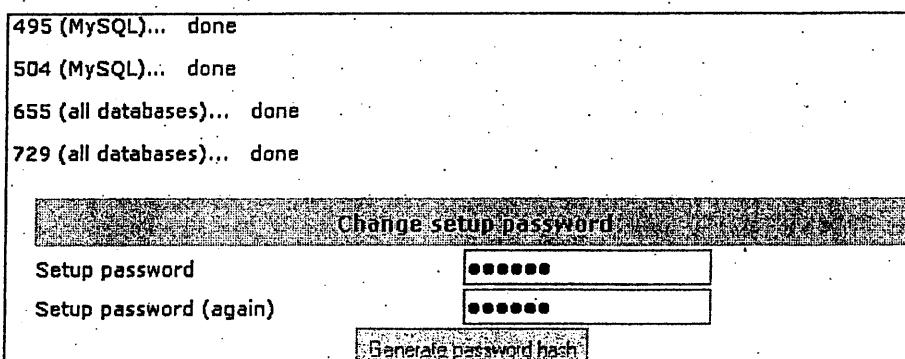
- Tạo file /etc/httpd/conf.d/postfixadmin.conf chứa dòng: Alias /postfixadmin /var/www/html/postfixadmin

```
#echo "Alias /postfixadmin /var/www/html/postfixadmin" >  
/etc/httpd/conf.d/postfixadmin.conf
```

```
#service httpd restart
```

IE: <http://192.168.1.20/postfixadmin/setup.php>

Nhập và xác nhận password:123456 (passwd setup)



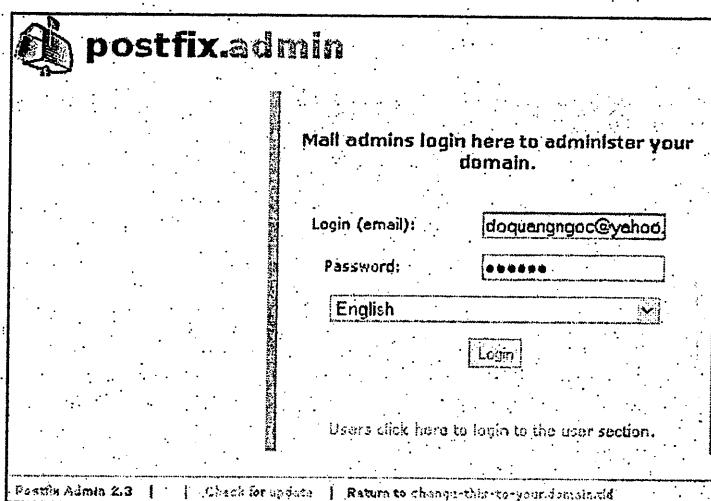
Chép pass mã hóa

Mở file /var/www/html/postfixadmin/config.inc.php. và đặt passwd vào dòng 31:

```
31 $CONF['setup_password'] =  
'5d2fc88aca697a96534cb890307049ba:00aef3c6bcc1de03dc3169e747b5191f62e84055'  
;  
save
```

Nhập: setup password: 123456  
admin:doquangngoc@yahoo.com  
pass:123456  
pass:123456

Mở trang quản trị:  
<http://192.168.1.20/postfixadmin>  
Login với user: [doquangngoc@yahoo.com/132456](mailto:doquangngoc@yahoo.com)



### Phần 6: Tao Virtual Domains và Users sử dụng Postfixadmin

<http://192.168.1.10/postfixadmin>  
admin:doquangngoc@yahoo.com  
pass:123456

#### b1: Multiple Domains

Domain List> New Domain

domain: nhatnghe1.com  
Description: nhatnghe  
chọn Add domain

**postfix.admin**

Admin List Domain List Virtual List Fetch Email Send Email Password Backup View Log Logout

Add a new domain

Domain:	nhatnghe1.com
Description:	nhatnghe1
Aliases:	10
Mailboxes:	10
Add default mail aliases:	<input type="checkbox"/>
Mail server is backup MX:	<input type="checkbox"/>

-1 = disable | 0 = unlimited

Lặp lại cho domain: nhatnghe2.com

Admin List Domain List Virtual List Fetch Email Send Email Password Backup View Log Logout

doquangngoc@yahoo.com Go

Domain	Description	Aliases	Mailboxes	Backup MX	Last Modified	Active
nhatnghe1.com	nhatnghe1	0 / 10	0 / 10	NO	2010-10-16 22:45:37	YES edit del
nhatnghe2.com	nhatnghe2	0 / 10	0 / 10	NO	2010-10-16 22:45:44	YES edit del

Chọn Domain list, thấy có 2 domain đã được tạo

b2: Tạo User Mailbox cho các domain khác nhau

Virtual List > Add Mailbox

user: nv1 @nhatnghe1.com  
 Pass: 123  
 name: nv1

Admin List Domain List Virtual List Fetch Email Send Email Password Backup View Log Logout

Create a new mailbox for your domain.

Username:	nv1	<input checked="" type="radio"/> nhatnghe1.com
Password:	***	Password for POP3/IMAP
Password (again):	***	
Name:	nv1	Full name
Active:	<input checked="" type="checkbox"/>	
Send Welcome mail:	<input checked="" type="checkbox"/>	

Lặp lại cho nv2@nhatnghe2.com

## Phần 7: Cài đặt squirrelmail

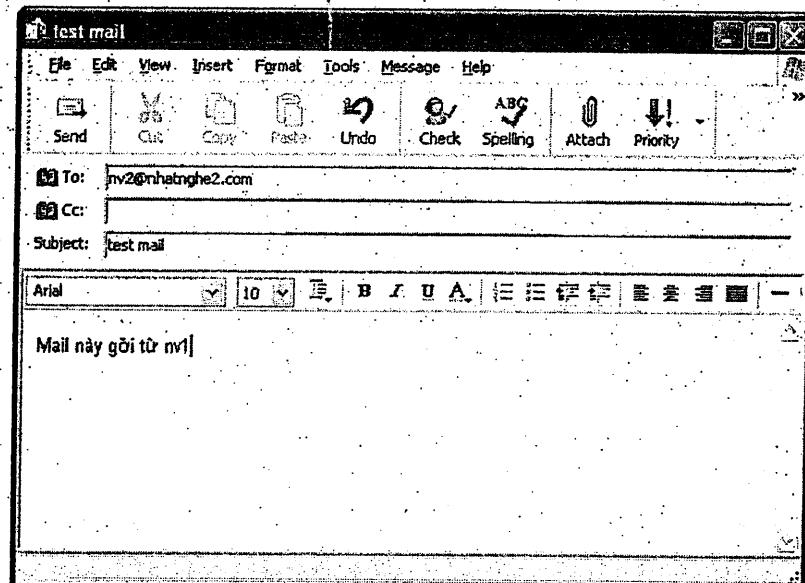
- Cài đặt

```
yum -y install squirrelmail
- Cấu hình
  /usr/share/squirrelmail/config/conf.pl
Hoặc vi /etc/squirrelmail/config.php
12 $org_name      = "Truong tin hoc Nhat Nghe";
22 $provider_name = 'Nhat Nghe';
28 $domain        = 'nhatnghe.com'; chỉ sửa 1 dòng

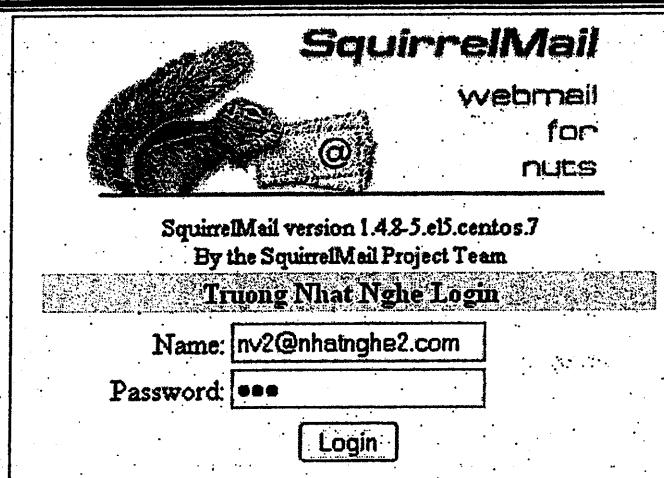
#service httpd start
#chkconfig httpd on
http://nhatnghe.local/webmail

#vi /etc/httpd/conf.d/squirrelmail.conf
14 <Directory /usr/share/squirrelmail>
15 # RewriteEngine on
16 # RewriteCond %{HTTPS} !=on
17 # RewriteRule (.*) https:// %{HTTP_HOST}%{REQUEST_URI}
18 </Directory>
#service httpd restart
http://nhatnghe.local
```

### b3: Cấu hình outlook express cho nv1 tiến hành gửi mail cho nv2



ie:<http://nhatnghe.local/webmail>  
Login với [nv2@nhatnghe2.com](mailto:nv2@nhatnghe2.com)



Nhận được mail do nv1 gửi

```
# mysql -p
mysql> use postfix;
```



```
mysql> show tables;
+-----+
| Tables_in_postfix |
+-----+
| admin           |
| alias           |
| alias_domain   |
| config          |
| domain          |
| domain_admins  |
| fetchmail       |
| log             |
| mailbox         |
| quota           |
| quota2          |
| vacation        |
| vacation_notification |
+-----+
13 rows in set (0.00 sec)

mysql> select * from domain;
+-----+-----+-----+-----+-----+-----+-----+
| domain | description | aliases | mailboxes | maxquota | quota | transport |
+-----+-----+-----+-----+-----+-----+-----+
| ALL   |           | 0 | 0 | 0 | 0 |           |
| nhatnghe1.com | nhatnghe | 10 | 10 | 10 | 0 | virtual |
| nhatnghe2.com |           | 10 | 10 | 10 | 0 | virtual |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> select * from mailbox;
+-----+-----+-----+-----+-----+-----+-----+
| username | password | name | maildir | quota | local_part | domain |
+-----+-----+-----+-----+-----+-----+-----+
| u1@nhatnghe1.com | 123 | u1 | nhatnghe1.com/u1/ | 0 | u1 | nhatnghe1.com |
| u2@nhatnghe2.com | 123 | u2 | nhatnghe2.com/u2/ | 0 | u2 | nhatnghe2.com |
+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

## Zimbra

1. Chuẩn bị
2. Installing Zimbra 7 Opensource
3. Quản trị Zimbra
4. Zimbra và openldap
5. Policy
6. Khởi động Zimbra

Mailbox: /opt/zimbra/store

### 1: Chuẩn bị

#### B1. Vi /etc/sysconfig/network

```
NETWORKING=yes
NETWORKING_IPV6=no
HOSTNAME= zimbra.nhatnghe1.com
```

#### B2. vi /etc/hosts

```
127.0.0.1      localhost.localdomain localhost
192.168.1.11    zimbra.nhatnghe1.com zimbra
```

```
# service postfix stop
# chkconfig postfix off
```

#### B3. Cài và cấu hình dns cho domain nhatnghe1.com

```
# cat /etc/resolv.conf
search nhatnghe1.com
nameserver 192.168.1.12
#host -t mx nhatnghe1.com
```

nhatnghe1.com mail is handled by 10 zimbra.nhatnghe1.com.

chú ý: tên host A trong DNS phải trùng với hostname

### Installing Packages

```
yum install -y sysstat perl sudo sqlite
```

### 2. Installing Zimbra 7 Opensource

```
# tar -zvxf zcs-8.6.0_GA_1153.RHEL6_64.20141215151155.tgz
# cd zcs-8.6.0_GA_1153.RHEL6_64.20141215151155
# ./install.sh --platform-override
```

```
./install.sh --platform-override
zimbra-ldap...NOT FOUND
zimbra-logger...NOT FOUND
```

zimbra-mta...NOT FOUND  
zimbra-dnscache...NOT FOUND  
zimbra-snmp...NOT FOUND  
zimbra-store...NOT FOUND  
zimbra-apache...NOT FOUND  
zimbra-spell...NOT FOUND  
zimbra-convertd...NOT FOUND  
zimbra-memcached...NOT FOUND  
zimbra-proxy...NOT FOUND  
zimbra-archiving...NOT FOUND  
zimbra-core...NOT FOUND.....

Do you agree with the terms of the software license agreement? [N] Y

#### Checking for installable packages

Select the packages to install

Install zimbra-ldap [Y] y  
Install zimbra-logger [Y] y  
Install zimbra-mta [Y] y  
Install zimbra-dnscache [Y] n :nếu cài local dns thì không chọn mục này  
Install zimbra-snmp [Y] y  
Install zimbra-store [Y] y  
Install zimbra-apache [Y] y  
Install zimbra-spell [Y] y  
Install zimbra-memcached [Y] y  
Install zimbra-proxy [Y] y

The system will be modified. Continue? [N] y

Removing /opt/zimbra

Removing zimbra crontab entry...done.

.....

Installing packages

zimbra-core.....zimbra-core-7.2.7\_GA\_2942.RHEL5-20140314190034.i386.rpm...done  
zimbra-ldap.....zimbra-ldap-7.2.7\_GA\_2942.RHEL5-20140314190034.i386.rpm...done  
zimbra-logger.....zimbra-logger-7.2.7\_GA\_2942.RHEL5-20140314190034.i386.rpm...done  
zimbra-mta.....zimbra-mta-7.2.7\_GA\_2942.RHEL5-20140314190034.i386.rpm...done  
zimbra-snmp.....zimbra-snmp-7.2.7\_GA\_2942.RHEL5-20140314190034.i386.rpm...done  
zimbra-store.....zimbra-store-7.2.7\_GA\_2942.RHEL5-20140314190034.i386.rpm...done  
zimbra-apache.....zimbra-apache-7.2.7\_GA\_2942.RHEL5-20140314190034.i386.rpm...done  
zimbra-spell.....zimbra-spell-7.2.7\_GA\_2942.RHEL5-20140314190034.i386.rpm...done

DNS ERROR resolving MX for may1.nhatnghe1.com

It is suggested that the domain name have an MX record configured in DNS

DNS ERROR resolving MX for zimbra.nhatnghe1.com

It is suggested that the domain name have an MX record configured in DNS

Change domain name? [Yes] yes

Create domain: [zimbra.nhatnghe1.com] nhatnghe1.com

MX: zimbra.nhatnghe1.com (192.168.1.12)

Interface: 192.168.1.12

Interface: 10.0.0.1

Interface: 127.0.0.1

Interface: ::1

### Main menu

1) Common Configuration:

2) zimbra-ldap:	Enabled
3) zimbra-logger:	Enabled
4) zimbra-mta:	Enabled
5) zimbra-snmp:	Enabled
6) zimbra-store:	Enabled
+Create Admin User:	yes
+Admin user to create:	admin@nhatnghe1.com
***** +Admin Password	UNSET
+Anti-virus quarantine user:	virus-quarantine.jztyt5dc9@nhatnghe1.com
+Enable automated spam training:	yes
+Spam training user:	spam.dqzloo_h9q@nhatnghe1.com
+Non-spam(Ham) training user:	ham.dztlfcut@nhatnghe1.com
+SMTP host:	zimbra.nhatnghe1.com
+Web server HTTP port:	8080
+Web server HTTPS port:	8443
+Web server mode:	https
+IMAP server port:	7143
+IMAP server SSL port:	7993
+POP server port:	7110
+POP server SSL port:	7995
+Use spell check server:	yes
+Spell server URL:	http://zimbra.nhatnghe1.com:7780/aspell.php
+Enable version update checks:	TRUE
+Enable version update notifications:	TRUE
+Version update notification email:	admin@nhatnghe1.com
+Version update source email:	admin@nhatnghe1.com
+Install mailstore (service webapp):	yes
+Install UI (zimbra,zimbraAdmin webapps):	yes

7) zimbra-spell: Enabled

8) zimbra-proxy: Enabled

9) Default Class of Service Configuration:

s) Save config to file

x) Expand menu

q) Quit

Address unconfigured (\*\*) items (? - help) 6



1) Status:	Enabled
2) Create Admin User:	yes
3) Admin user to create:	admin@zimbra.nhatnghe1.com
** 4) Admin Password	UNSET
5) Anti-virus quarantine user:	virus-
quarantine.kijpsys25@zimbra.nhatnghe1.com	
6) Enable automated spam training:	yes
7) Spam training user:	spam.j7atxfcqr@zimbra.nhatnghe1.com
8) Non-spam(Ham) training user:	ham.qdcqpdnonh@zimbra.nhatnghe1.com
9) SMTP host:	zimbra.nhatnghe1.com
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://zimbra.nhatnghe1.com:7780/aspell.php
19) Enable version update checks:	TRUE
20) Enable version update notifications:	TRUE
21) Version update notification email:	admin@zimbra.nhatnghe1.com
22) Version update source email:	admin@zimbra.nhatnghe1.com
23) Install mailstore (service webapp):	yes
24) Install UI (zimbra,zimbraAdmin webapps):	yes

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

Password for admin@zimbra.nhatnghe1.com (min 6 characters): [xwFsb\_e4nG] 123456

4) Admin Password set

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

#### Main menu

- 1) Common Configuration:
- 2) zimbra-ldap: Enabled
- 3) zimbra-store: Enabled
- 4) zimbra-mta: Enabled
- 5) zimbra-snmp: Enabled
- 6) zimbra-logger: Enabled
- 7) zimbra-spell: Enabled
- 8) Default Class of Service Configuration:
- r) Start servers after configuration yes
- s) Save config to file
- x) Expand menu
- q) Quit

\*\*\* CONFIGURATION COMPLETE - press 'a' to apply

Select from menu, or press 'a' to apply config (? - help) a

Save configuration data to a file? [Yes] yes

Save config in file: [/opt/zimbra/config.12105]

Saving config in /opt/zimbra/config.12017...done.

The system will be modified - continue? [No] y

Operations logged to /tmp/zmsetup.05152014-080714.log

Setting spell check URL...done.

Setting service ports on may1.nhatnghe1.com...done.

Adding may1.nhatnghe1.com to zimbraMailHostPool in default COS...done.

Installing webclient skins...

oasis...done.

bones...done.

smoke...done.

hotrod...done.

carbon...done.

waves...done.

Notify Zimbra of your installation? [Yes]Y

Configuration complete - press return to exit

Chkconfig postfix off

Không cài zimbra-dns

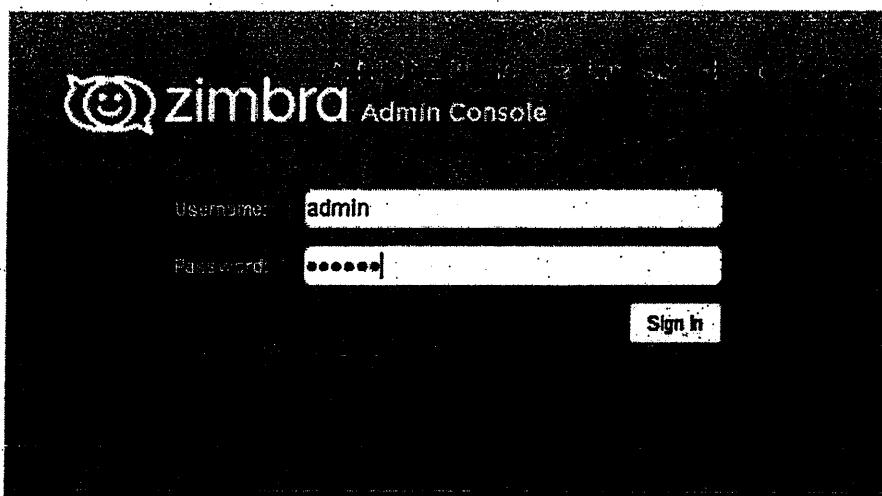
Reboot để ko chạy postfix hoặc stop nó

### 3. Quản trị Zimbra

#### 3.1 login

<https://zimbratest.nhatnghe.com:7071> or

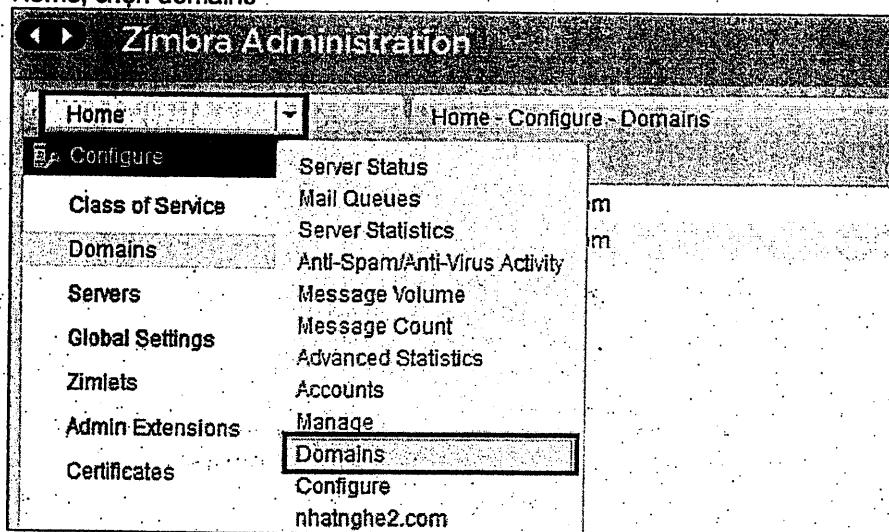
<https://192.168.1.11:7071>



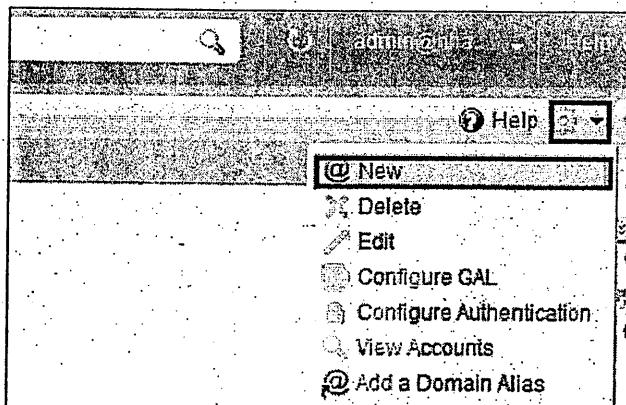
#### 3.2 Tạo mới domain

Nhatnghe2.com  
Nhatnghe3.com

Home, chọn domains



Chọn New



Nhập domain: nhatnghe3.com, IP của mail server 192.168.1.1  
2, Next

New Domain

General Information

GAL Mode Settings

SSO

Authentication Mode

Virtual Hosts

Advanced

Feature

Domain Configuration Complete

— General Information —

Domain name: **nhatnghe3.com**

Public service host name: **192.168.1.12**

Public service protocol: **http**

Public service port: **80**

If your MX records point to a spam-relay or any other external non-zimbra server in "Inbound SMTP host name" field.

Inbound SMTP host name:

Description:

Default Class of Service: **enter search term**

Status: **Active**

Notes:

Cancel Previous Next Finish

Help

Mail server: chọn máy zimbra.nhatnghe1.com, Finish

New Domain

General Information

**GAL Mode Settings**

SSO

Authentication Mode

Virtual Hosts

Advanced

Feature

Domain Configuration Complete

GAL mode: **Internal**

Most results returned by GAL search:

Create GAL Sync account (recommended)

GAL sync account name: **galsync** @ **nhatnghe3.co**

Mail Server: **zimbra.nhatnghe1.com**

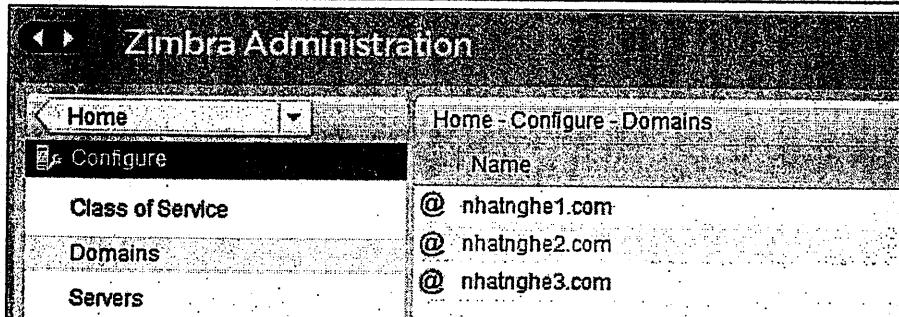
Datasource name for Internal GAL: **zimbra**

Internal GAL polling interval: **1** days

Cancel Previous Next Finish

Help

Danh sách domain được tạo



### 3.3 Tạo mới mailbox

Tạo mailbox u1,u2

Home, chọn Account

Zimbra Administration

- Home
- Configure
- Class of Service
- Domains
- Servers
- Global Settings
- Zimlets
- Admin Extensions
- Certificates

Home - Configure - Domains

Name:

- @ nhatnghe1.com
- @ nhatnghe2.com
- @ nhatnghe3.com

Chọn New

- @ New
- Delete
- Edit
- Configure GAL
- Configure Authentication
- View Accounts
- @ Add a Domain Alias

Nhập thông tin tài khoản, finish

**Account Name**

Account name:	<input type="text" value="u3"/>	@ <input type="text" value="nhatnghe3.com"/>
First name:	<input type="text"/>	
Middle initial:	<input type="text"/>	
Last name:	<input type="text" value="u3"/>	
Display name:	<input type="text" value="u3"/>	<input checked="" type="checkbox"/> auto
<input type="checkbox"/> Hide in GAL:		

**Password**

Note: These settings do not affect the passwords set by users in domains that are configured to use external authentication.

Password:	<input type="password" value="*****"/>
Confirm password:	<input type="password" value="*****"/>
<input type="checkbox"/> Must change password	

**Cancel** **Previous** **Next** **Finish**

### 3.4 Kiểm tra

u1,u2,u3 gửi mail qua lại thành công

The screenshot shows the Zimbra webmail interface. At the top, there's a navigation bar with links for Mail, Contacts, Calendar, Tasks, Briefcase, and Preferences. Below the navigation bar is a toolbar with buttons for New Message, Reply, Reply to All, Forward, Archive, Delete, and Spam. On the left, there's a sidebar titled 'Mail Folders' with options for Inbox, Sent, and Drafts. The main area shows the inbox with one visible message from 'u3' with the subject 'chAOUR - test mail'. Other messages in the inbox are partially visible.

### 3.5 spam, anti virus

U1 gửi mail qua u2 với nội dung chứa:

XJS\*C4JDBQADN1.NSBN3\*2IDNEN\*GTUBE-STANDARD-ANTI-UBE-TEST-EMAIL\*C.34X

You should send this test mail from an account outside of your network, or directly by IP:

u2 sẽ không nhận được do mail là spam nên bị xóa

#### 4. Policy

Nhập tên policy1

New COS

General Information

Features

Preferences

Themes

Zimlets

Server Pool

Advanced

Display name:

Description:

Notes:

Help Cancel Previous Next Finish

Next tới phần Advanced, chọn quota nếu muốn giới hạn dung lượng disk

New COS

Server Pool

Advanced

Quotas

Limit user-specified forwarding addresses field to (chars):

Maximum number of user-specified forwarding addresses:

Account quota (MB):

Maximum number of contacts allowed in folder:

Percentage threshold for quota warning messages (%):

Minimum duration of time between quota warnings:  days

Quota warning message template:

Help Cancel Previous Next Finish

Minimum password length:

Maximum password length:

Minimum upper case characters:

Minimum lower case characters:

Minimum punctuation symbols:

Minimum numeric characters:

— Failed Login Policy —

Enable failed login lockout

Number of consecutive failed logins allowed:

Time to lockout the account  hours

Time window in which the failed logins must occur to lock the account  hours

Nhấn finish

Tạo user với policy mới:

New Account

Aliases:  @

Member Of:

Forwarding:

Features:

Preferences:

Themes:   auto

Zimlets:  Hide in GAL

Advanced:

— Account Setup —

Status:

Class of Service:   auto

Global Administrator

Server:   auto

Help Cancel

## 5. Khởi động Zimbra

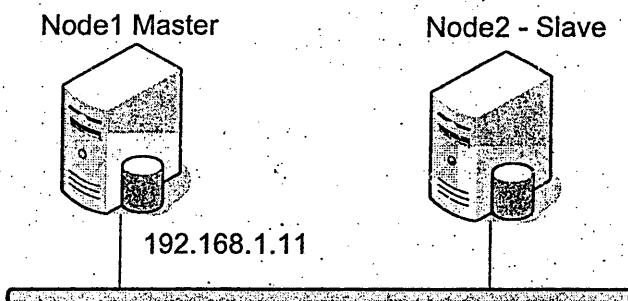
xem trạng thái và khởi động lại Zimbra ta làm như sau:

```
# su - zimbra
$ zmcontrol status
$ zmcontrol restart
```

## Phần IV: High Available

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## MySQL Master-Slave replication



Mô hình gồm 2 máy:

Node1: đóng vai trò Master, mọi sự thay đổi trên Master sẽ được thực hiện trên slave, đảm bảo dữ liệu luôn giống nhau. Mọi yêu cầu truy xuất dữ liệu sẽ được thực hiện tại máy master.

Node2: đóng vai trò Slave, thực hiện việc lưu trữ dự phòng thông qua việc log file do node1 tạo ra.

Thực hiện

B1: Chuẩn bị

- Đặt tên 2 máy lần lượt là node1.nhatnghe1.com và node2.nhatnghe1.com

- Thêm 2 dòng sau vào cuối file /etc/hosts

192.168.1.11 node1.nhatnghe1.com  
192.168.1.12 node2.nhatnghe1.com

B2: Cài đặt mysql trên 2 máy

Cài các gói sau từ đĩa CentOS

libdbi-dbd-mysql-0.8.1a-1.2.2  
mysql-bench-5.0.77-3.el5  
mysql-5.0.77-3.el5  
mysql-server-5.0.77-3.el5  
mysql-connector-odbc-3.51.26r1127-1.el5  
php-mysql-5.1.6-23.2.el5\_3  
mysql-devel-5.0.77-3.el5

Khởi động mysqld

```
#service mysqld start
#chkconfig mysqld on
```

b3: Cấu hình node1 – master

Logon vào mysql bằng lệnh

```
#mysql
```

Tạo user repl và gán quyền REPLICATION cho user này có thể truy xuất từ bất cứ máy nào trong domain nhatnghe1.com (có thể thay '%.nhatnghe1.com' bằng '%')

GRANT REPLICATION SLAVE ON \*.\* TO 'repl'@'%.nhatnghe1.com' IDENTIFIED BY '123456';

```
[root@node1 ~]# mysql
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 3
Server version: 5.0.77 Source distribution

Type 'help;' or '\h' for help. Type '\c' to clear the buffer.

mysql> GRANT REPLICATION SLAVE ON *.* TO
'replication'@'%nhatnghe1.com' IDENTIFIED BY '123456';
Query OK, 0 rows affected (0.00 sec)

mysql> exit
Bye
```

- Thêm các dòng sau vào file /etc/my.cnf (chữ in đậm)

```
[mysqld]
datadir=/var/lib/mysql
socket=/var/lib/mysql/mysql.sock
user=mysql
# Default to using old password format for compatibility with mysql 3.x
# clients (those using the mysqlclient10 compatibility package).
old_passwords=1

log-bin=mysql-bin
server-id=1
innodb_flush_log_at_trx_commit=1
sync_binlog=1

[mysqld_safe]
log-error=/var/log/mysqld.log
pid-file=/var/run/mysqld/mysqld.pid
```

- Khởi động lại mysql

#service mysqld restart

B4: cấu hình node2 – slave

- Thêm dòng sau vào file /etc/my.cnf

[mysqld]

server-id=2

- tại node1 dùng lệnh sau để xem trạng thái mysql master:

#mysql ; logon.

sql> FLUSH TABLES WITH READ LOCK; tạm ngừng mọi hoạt động trên  
master

mysql> SHOW MASTER STATUS; xem trạng thái database

```
mysql> FLUSH TABLES WITH READ LOCK;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> SHOW MASTER STATUS;
```

File	Position	Binlog_Do_DB	Binlog_Ignore_DB
mysql-bin.000001	106		

```
1 row in set (0.00 sec)
```

Quan sát thấy logfile ở đây là mysql-bin.000001

Và log\_position là 106

Tại máy node2 thực hiện các truy vấn sau

Mysql

```
mysql> CHANGE MASTER TO
-> master_host='node1.nhatnghe1.com',
-> master_user='repl',
-> master_password='123456',
-> master_log_file='mysql-bin.000001',
-> master_log_pos=106;
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> START SLAVE;
```

```
mysql> SHOW SLAVE STATUS\G;
```

```
Query OK, 0 rows affected (0.00 sec)
```

- Kiểm tra trạng thái kết nối giữa master và slave.

```
mysql> SHOW SLAVE STATUS\G;
***** 1. row *****
Slave_IO_State: Waiting for master to send event
Master_Host: node1.nhatnghe1.com
Master_User: repl
Master_Port: 3306
Connect_Retry: 60
Master_Log_File: mysql-bin.000001
Read_Master_Log_Pos: 98
Relay_Log_File: mysqld-relay-bin.000002
Relay_Log_Pos: 235
Relay_Master_Log_File: mysql-bin.000001
Slave_IO_Running: Yes
Slave_SQL_Running: Yes
...
Seconds_Behind_Master: 0
1 row in set (0.00 sec)
```

- Tại máy node1 thực hiện lệnh sau để đưa các tables về tình trạng bình thường:  
**mysql>UNLOCK TABLES;**

**b5: kiểm tra**

- Thực hiện việc tạo database nhansu, ketoan tại máy node1

```
mysql> create database nhansu;
Query OK, 1 row affected (0.02 sec)

mysql> create database ketoan;
Query OK, 1 row affected (0.01 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| ketoan |
| mysql |
| nhansu |
| test |
+-----+
5 rows in set (0.00 sec)

mysql>
```

- Tại máy 2 xem các database thì thấy đã được đồng bộ từ máy 1 qua

```
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| ketoan |
| mysql |
| nhansu |
| test |
+-----+
5 rows in set (0.01 sec)

mysql>
```

**Chú ý:**

- khi cấu hình lại mysql phải thực hiện các lệnh như sau:  
**stop slave;**  
**reset slave;**  
**start slave**
- Việc thay đổi trên node2 sẽ không được cập nhật qua node1

- **Master đã có dữ liệu:** nếu trước khi thực hiện replication, trên node1 đã có dữ liệu thì phải import dữ liệu từ node1 sang node2 trước khi thực hiện replicate.

Các bước thực hiện như sau:

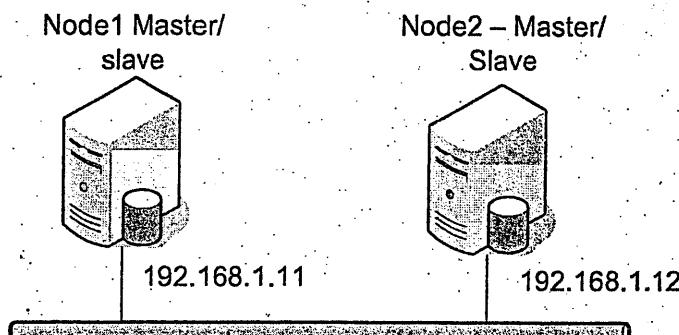
Node1:

```
#mysql  
mysql > FLUSH TABLES WITH READ LOCK;  
mysql >exit  
#mysqldump --all-databases --master-data > dbdump.db
```

Node2:

- Import cơ sở dữ liệu dbdump.db vào MySQL.

## MySQL Master- Master replication



Mô hình master-slave replication chỉ có tính dự phòng, dữ liệu chỉ được ghi từ master sang slave, không thể thực hiện theo chiều ngược lại.  
 Mô hình master- master: dữ liệu được ghi trên 2 chiều.

Node1: master/slave: 192.168.1.11

Node2: master/slave: 192.168.1.12

Các bước thực hiện:

B1: Cấu hình node1 làm master

Thêm các dòng sau vào trong file /etc/my.cnf

[mysqld]

log-bin

binlog-do-db=sitenhac # database sẽ be replicated

binlog-ignore-db=mysql # database không replication

binlog-ignore-db=test

server-id=1

B2: Gán quyền replication trên node2 cho node1 cho user replication

#mysql

'mysql > grant replication slave on \*.\* to 'replication'@192.168.1.12

identified by 'slave';

B3: Cấu hình node2 làm slave

Thêm các dòng sau vào trong file /etc/my.cnf

[mysqld]

server-id=2

master-host= 192.168.1.11

master-user=replication

master-password=slave

master-port=3306

Trên 2 máy khởi động lại dịch vụ mysql

#Service mysqld restart

B4: kiểm tra trạng thái trên node2 - slave

```
[root@node2 ~]# mysql
mysql> start slave;
mysql> show slave status\G;
***** 1. row *****
Slave_IO_State: Waiting for master to send event
Master_Host: node1.nhatnghe1.com
Master_User: replication
Master_Port: 3306
Connect_Retry: 60
Master_Log_File: mysql-bin.000009
Read_Master_Log_Pos: 98
Relay_Log_File: mysql-relay-bin.000018
Relay_Log_Pos: 236
Relay_Master_Log_File: mysql-bin.000009
Slave_IO_Running: Yes
Slave_SQL_Running: Yes
.....
Seconds_Behind_Master: 0
1 row in set (0.00 sec)

ERROR:
No query specified

mysql>
```

B5: Tại máy node1  
Quản sát thông tin cấu trúc master-slave

```
[root@node1 ~]# mysql
mysql> show master status;
+-----+-----+-----+
| File | Position | Binlog_Do_DB | Binlog_Ignore_DB |
+-----+-----+-----+
| mysql-bin.000009 | 98 | sitenhac | mysql,test |
+-----+-----+-----+
1 row in set (0.00 sec)
```

Tiếp tục thực hiện cho cấu trúc slave master  
B6: node2 thêm các dòng sau.

[mysqld]

```
log-bin          #node 2 trở thành master
binlog-do-db=sitenhac
```

B7: Gán quyền replication trên node2 cho node1 cho user replication  
#mysql  
mysql> grant replication slave on \*.\* to 'replication'@192.168.1.11 identified by 'slave2';

B8: Node1 thêm các dòng sau:

## [mysqld]

```
#node1 thành slave.  

master-host=192.168.1.12  

master-user= replication  

master-password=slave2  

master-port=3306
```

## B9: Khởi động mysql trên 2 node

```
service mysqld restart  

mysql
```

Trên node1:

```
mysql> start slave;
```

Trên node2:

```
mysql > show master status;  

mysql> show master status;
```

File	Position	Binlog_Do_DB	Binlog_Ignore_DB
mysqld-bin.000012	98	sitenhac	

```
1 row in set (0.01 sec)
```

Trên node1:

```
mysql> show slave status\G;
***** 1. row *****
Slave_IO_State: Waiting for master to send event
Master_Host: node2.nhatnghe1.com
Master_User: replication
Master_Port: 3306
Connect_Retry: 60
Master_Log_File: mysqld-bin.000012
Read_Master_Log_Pos: 98
Relay_Log_File: mysqld-relay-bin.000022
Relay_Log_Pos: 236
Relay_Master_Log_File: mysqld-bin.000012
Slave_IO_Running: Yes
Slave_SQL_Running: Yes
.....
Replicate_Wild_Do_Table:
Replicate_Wild_Ignore_Table:
Last_Error: 0
Seconds_Behind_Master: 0
1 row in set (0.00 sec)
```

**ERROR:**  
**No query specified**

## B10: Kiểm tra

Trên node1:

Mysql

```
create database sitenhac;
CREATE TABLE example (
    id INT,
    data VARCHAR(100)
);
```

```
mysql> use sitenhac
```

Reading table information for completion of table and column names  
You can turn off this feature to get a quicker startup with -A

Database changed

```
mysql> show tables;
```

+-----+
Tables_in_idc1
+-----+
example
+-----+

1 row in set (0.00 sec)

```
mysql>
```

Trên node2: kiểm tra thấy database sitenhac và table example đã được đồng bộ.

```
mysql> use sitenhac
```

Reading table information for completion of table and column names  
You can turn off this feature to get a quicker startup with -A

Database changed

```
mysql> show tables;
```

+-----+
Tables_in_sitenhac
+-----+
example
+-----+

1 row in set (0.00 sec)

```
mysql>
```

Thêm 2 dòng sau vào bảng example

```
mysql> insert into example (id,data) values("10","nhatnghe");
```

Query OK, 1 row affected (0.01 sec)

```
mysql> insert into example (id,data) values("20","daotao");
```

Query OK, 1 row affected (0.00 sec)

Trên node1 thực hiện truy vấn:

```
mysql> select * from example;
+----+-----+
| id | data |
+----+-----+
| 10 | nhatnghe |
| 20 | daotao |
+----+-----+
2 rows in set (0.00 sec)
```

Kết quả dữ liệu đã được đồng bộ 2 chiều từ node1 sang node2 và ngược lại.

## HA proxy

Cân bằng tải cho web server bằng Haproxy

### 1. lab1

Mô hình 3 máy

Proxy server : 192.168.11.51  
Web1 : 192.168.11.53  
Web2 : 192.168.11.54

b1 cài đặt ha proxy

```
#rpm -ivh /media/Packages/haproxy-1.5.2-2.el6.x86_64.rpm
```

b2. Cấu hình

```
vi /etc/haproxy/haproxy.cfg
```

```
#-----
```

```
# Global settings
```

```
#-----
```

```
global
```

```
log    127.0.0.1 local2
chroot /var/lib/haproxy
pidfile /var/run/haproxy.pid
maxconn 4000
user    haproxy
group   haproxy
daemon
```

```
#-----
```

```
# common defaults that all the 'listen' and 'backend' sections will
# use if not designated in their block
```

```
#-----
```

```
defaults
```

```
mode    http
log     global
option  dontlognull
option  httpclose
option  httplog
option  forwardfor
option  redispach
```

```
timeout connect 10000 # default 10 second time out if a backend is not found
#Set the maximum time to wait for a connection attempt to a
server to succeed.
```

```
timeout client 300000 #milliseconds
timeout server 300000
maxconn 60000
retries 3             #number of connection retries experienced by this session
when trying to connect to the server
```

```
#-----
```

```
# main frontend which proxys to the backends
```

```
#-----
```

```
frontend main *:5000
acl url_static path_beg -i /static /images /javascript /stylesheets
```

```
acl url_static    path_end    -i .jpg .gif .png .css .js

use_backend static      if url_static
default_backend        app
#
# static backend for serving up images, stylesheets and such
#
backend static
    balance roundrobin
    server static 127.0.0.1:4331 check

#
# round robin balancing between the various backends
#
backend app
    balance roundrobin
    server app1 192.168.11.53:80 check
    server app2 192.168.11.54:80 check

listen http_proxy 192.168.11.51:80
    balance roundrobin
    option httpchk
    option forwardfor
    ## Define your servers to balance
    server server1 192.168.11.53:80 weight 1 maxconn 512 check# nhận 1 request
    server server2 192.168.11.54:80 weight 2 maxconn 512 check# nhận 2 request
```

### b3. Kiểm tra

Khởi động haproxy

```
service haproxy start
web1,web2:
```

```
    service httpd start
```

Tại máy client, ie: http://19.168.1.51

Nhấn f5 nhiều lần để thấy quá trình load balance giữa các web server

### b4. Statistics and monitoring

vi /etc/haproxy/haproxy.cfg

```
defaults #Thêm trong phần defaults
stats enable
stats hide-version
stats scope
stats realm Haproxy\ Statistics
stats uri /monitor          #tạo alias or : stats uri /
stats auth ngoc:123456       #username:password
```

Tại client:

```
http://19.168.1.51/monitor
```

### b5. Configure log

```
log global
log 127.0.0.1:514 local0 notice      # only send important events
log 127.0.0.1:514 local0 notice notice # same but limit output level
```



## HA Proxy – Heartbeat

node1, node2: heartbeat, haproxy:

node3, node4: web server

vip: 192.168.1.100

/etc/hosts

192.168.1.11 node1.nhatnghe1.com node1  
192.168.1.12 node2.nhatnghe1.com node2

### 1. Cài các gói heartbeat package

#### Cài đặt

yum install heartbeat

Hoặc download và cài đặt các gói sau:

heartbeat-stonith-2.1.3-3.el5.centos.i386.rpm  
heartbeat-pils-2.1.3-3.el5.centos.i386.rpm  
heartbeat-2.1.3-3.el5.centos.i386.rpm ; cài 2 lần

#### Cấu hình heartbeat (thực hiện trên cả 2 node)

Chép các file ha.cf, haresources, authkeys vào thư mục /etc/ha.d

cp /usr/share/doc/heartbeat-3.0.4 /authkeys /etc/ha.d/  
cp /usr/share/doc/heartbeat-3.0.4 /ha.cf /etc/ha.d/  
cp /usr/share/doc/heartbeat-3.0.4 /haresources /etc/ha.d/

+ vi /etc/ha.d/authkeys

Thêm 2 dòng sau:

auth 2  
2 sha1 loadbalancing-ha  
chmod 600 /etc/ha.d/authkeys

+ vi /etc/ha.d/ha.cf

logfile /var/log/ha-log

logfacility local0

keepalive 2

deadtime 30

initdead 120

bcast eth1

udpport 694

auto\_failback on

node node1.nhatnghe1.com

node node2.nhatnghe1.com

+ vi /etc/ha.d/haresources

thêm dòng sau

node1.nhatnghe1.com 192.168.1.100

+vi /etc/sysctl.conf # configure HAProxy to utilize the Shared IP

```
net.ipv4.ip_nonlocal_bind=1  
sysctl =p
```

#Set this if you want your applications to be able to bind to an address which doesn't belong to a device on your system. This can be useful when your machine is on a non-permanent (or even dynamic) link, so your services are able to start up and bind to a specific address when your link is down

## 2. Cài và cấu hình haproxy

Thực hiện trên node1,2

```
rpm -vh haproxy-1.3.26-1.el5.i386.rpm
```

```
vi /etc/haproxy/haproxy.cfg  
backend app
```

```
balance roundrobin  
server app1 192.168.1.13:80 check  
server app2 192.168.1.14:80 check
```

```
listen http_proxy 192.168.1.100:80  
balance roundrobin  
option httpchk  
option forwardfor  
## Define your servers to balance  
server server1 192.168.1.13:80 cookie A check  
server server2 192.168.1.14:80 cookie B check
```

Khởi động các service

```
service haproxy start
```

```
service heartbeat start
```

```
[root@node1 ~]# ip addr  
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast  
state UP qlen 1000  
link/ether 00:0c:29:b5:d3:e5 brd ff:ff:ff:ff:ff:ff  
inet 192.168.1.14/24 brd 192.168.1.255 scope global eth0  
inet 192.168.1.100/24 brd 192.168.1.255 scope global secondary eth0  
inet6 fe80::20c:29ff:feb5:d3e5/64 scope link  
    valid_lft forever preferred_lft forever  
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast  
state UP qlen 1000  
link/ether 00:0c:29:b5:d3:ef brd ff:ff:ff:ff:ff:ff  
inet 10.0.0.4/24 brd 10.0.0.255 scope global eth1  
inet6 fe80::20c:29ff:feb5:d3ef/64 scope link  
    valid_lft forever preferred_lft forever
```

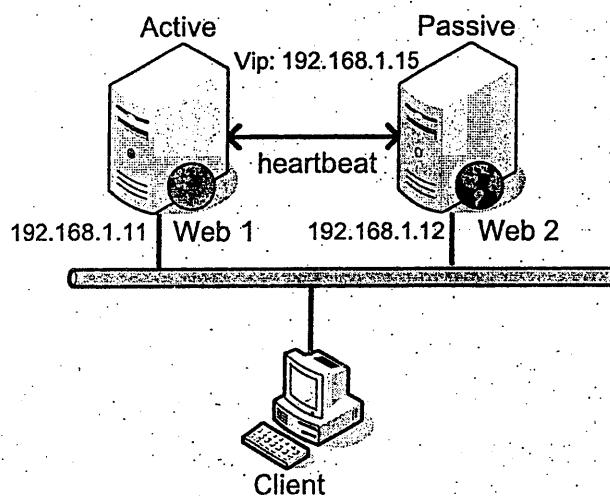
## 3. cài web server

node3,4 cài và start httpd

## 4. test

ie: 192.168.1.100

## HA: Web Cluster - Web synchronization



- Cấu hình web cluster trên 2 node sử dụng heartbeat – đáp ứng tính sẵn sàng cao
- Đồng bộ web giữa 2 node

Chuẩn bị:

Cấu hình địa chỉ IP

```
node1.nhatnghe1.com [eth0:192.168.1.12] [eth1:172.16.1.1]
node2.nhatnghe1.com [eth0:192.168.1.12] [eth1:172.16.1.2]
```

Trong file /etc/hosts , bổ sung thêm tên hostname và địa chỉ IP để hai nút có thể giao tiếp được với nhau.

```
192.168.1.11 node1.nhatnghe1.com node1
192.168.1.12 node2.nhatnghe1.com node2
```

### Phần 1: web cluster

#### b1: Cài các gói heartbeat package

```
#yum install heartbeat
```

Hoặc download và cài đặt các gói sau:

```
heartbeat-3.0.4-2.el6.x86_64
heartbeat-libs-3.0.4-2.el6.x86_64
```

#### b2: Cấu hình heartbeat (thực hiện trên cả 2 node)

Chép các file ha.cf, haresources, authkeys vào thư mục /etc/ha.d

```
#cp /usr/share/doc/heartbeat-2.1.3/authkeys /etc/ha.d/
#cp /usr/share/doc/heartbeat-2.1.3/ha.cf /etc/ha.d/
```

```
#cp /usr/share/doc/heartbeat-2.1.3/haresources /etc/ha.d/
```

+ vi /etc/ha.d/authkeys

Thêm 2 dòng sau:

```
auth 1 ; use authentication method 2 (sha1)
1 sha1 test-ha
```

```
#chmod 600 /etc/ha.d/authkeys
```

+ vi /etc/ha.d/ha.cf

Thêm các dòng sau vào cuối file

```
!debugfile /var/log/ha-debug #file nhật ký ha
logfile /var/log/ha-log #file nhật ký ha
logfacility local0 # tiện ích sử dụng cho syslog hoặc logger
keepalive 2 # thời gian giữa các heartbeat
deadtime 30 # thời gian đến khi host được đưa ra 'chết'
initdead 120 # thời gian chết đầu tiên (initdead)
bcast eth1 # Card mạng để gửi tín hiệu heartbeat, hoặc
udpport 694 # Port để gửi tín hiệu heartbeat
auto_fallback on # tự động gửi tài nguyên sai trở lại nút chính
node node1.nhatnghe1.com # tên của nút đầu tiên
node node2.nhatnghe1.com # tên của nút thứ hai
```

+ vi /etc/ha.d/haresources

Thêm dòng sau

```
node1.nhatnghe1.com 192.168.1.15 httpd
```

Định nghĩa: tên nút chính, địa chỉ IP ảo (cluster IP) và tài nguyên dùng để bắt đầu.

### b3: Cấu hình httpd

#vi /etc/httpd/conf/httpd.conf

```
dong135: Listen 192.168.1.15 :80
```

```
dong136: #Listen
```

Tạo web site:

Node1

```
echo "<h1>node01 apache test server" > /var/www/html/index.html
```

Node2

```
echo "<h1>node02 apache test server" > /var/www/html/index.html
```

```
#service heartbeat start
```

; dịch vụ httpd sẽ được gọi từ đây

```
#chkconfig httpd off
```

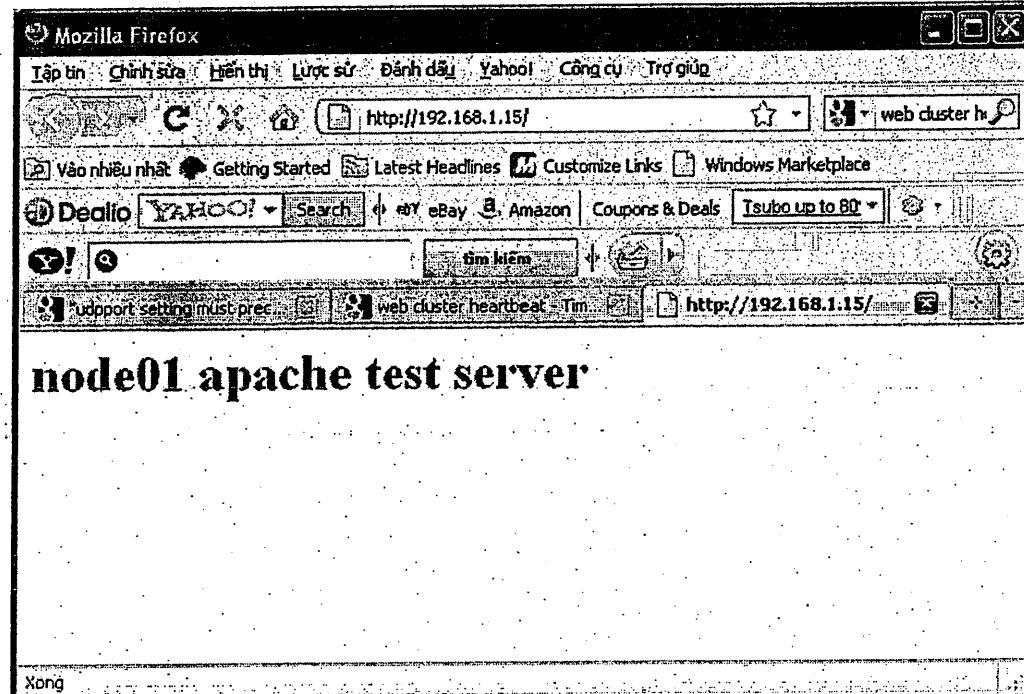
```
#chkconfig heartbeat on
```

Tại node 1 ifconfig | more sẽ thấy ip

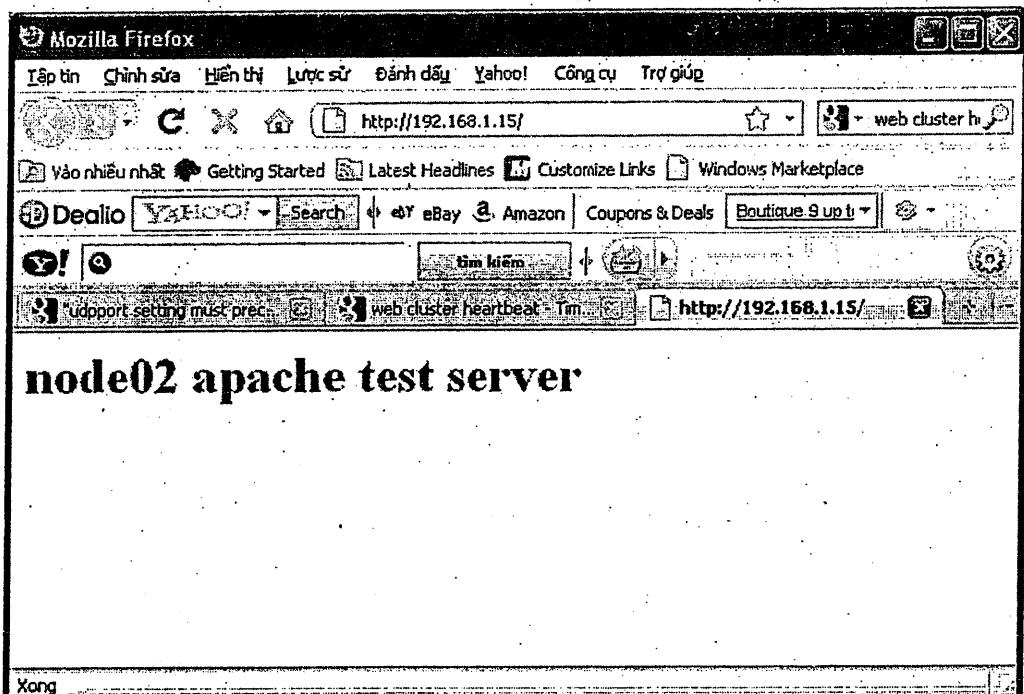
```
[root@node1 ~]# ifconfig eth0:0
eth0:0 Link encap:Ethernet HWaddr 00:0C:29:02:C5:9B
      inet addr:192.168.1.15 Bcast:192.168.1.255 Mask:255.255.255.0
              UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
              Interrupt:169 Base address:0x2000
```

```
[root@node1 ~]#
```

Tại máy 2k3 truy cập sẽ thấy web trên node1



node 1: #service heartbeat stop  
2k3 truy cập sẽ thấy web trên node2



node 2: ifconfig | more sẽ thấy ip 192.168.1.30

## Phần 2: Đồng bộ web

### b1: Trên 2 máy cài rsync-3.0.6-12.el6.x86\_64

```
[root@node1 ~]# # rpm -ivh /media/Packages/rsync-3.0.6-12.el6.x86_64.rpm
Preparing... #####################################
[100%]
package rsync-3.0.6-12.el6.x86_64 is already installed [root@node1 ~]#
```

### b2: Trên node1, tạo unprivilege user

```
#useradd backup
#passwd backup
```

```
[root@node1 ~]# useradd backup
[root@node1 ~]# passwd backup
Changing password for user backup.
New UNIX password:
BAD PASSWORD: it is too simplistic/systematic
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
[root@node1 ~]#
```

### b3: Tại node2, kiểm tra sự đồng bộ

```
#rsync -avz -e ssh backup@192.168.1.11:/var/www/html/ /var/www/html/
[root@node2 ha.d]# rsync -avz -e ssh
backup@192.168.1.11:/var/www/html/ /var/www/html/
backup@192.168.1.13's password:
receiving file list ... done
/.
check.txt
index.html
index.htmix

sent 104 bytes received 270 bytes 83.11 bytes/sec
total size is 54 speedup is 0.14
[root@node2 ha.d]#
```

Kiểm tra sẽ thấy nội dung /var/www/html/ giống như trên node 1  
 Ý nghĩa các thông số:

- a, --archive archive mode;
- v, --verbose increase verbosity
- z, --compress compress file data during the transfer

### b4- Tạo keys

Tại node2:

```
#mkdir /root/rsync
#ssh-keygen -t dsa -b 1024 -f /root/rsync/mirror-rsync-key
```

Không nhập passphrase, nhấn enter 2 lần.

```
[root@node2 ha.d]# ssh-keygen -t dsa -b 1024 -f /root/rsync/mirror-
rsync-key
Generating public/private dsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/rsync/mirror-rsync-key.
Your public key has been saved in /root/rsync/mirror-rsync-key.pub.
The key fingerprint is:
88:d2:6c:9d:e2:ab:ca:d0:f8:f3:94:93:a5:ce:07:62
root@node2.nhatnghe1.com
[root@node2 ha.d]#
```

Chép file public key lên node1, vào thư mục home của user backup

```
#scp /root/rsync/mirror-rsync-key.pub backup@192.168.1.11:/home/backup/
```

```
[root@node2 ha.d]# scp /root/rsync/mirror-rsync-key.pub
backup@192.168.1.11:/home/backup/
backup@192.168.1.13's password:
mirror-rsync-key.pub                                100% 614    0.6KB/s  00:00
[root@node2 ha.d]#
```

### b5: Cấu hình node1

Thực hiện các công việc sau với user backup  
su - backup

```
#mkdir ~/.ssh
#chmod 700 ~/.ssh
#mv ~/mirror-rsync-key.pub ~/.ssh/
#cd ~/.ssh
#touch authorized_keys
#chmod 600 authorized_keys
#cat mirror-rsync-key.pub >> authorized_keys
```

Soạn thảo file authorized\_keys

```
#vi authorized_keys
```

Thêm dòng sau vào trước ssh-dss (trên cùng dòng và có khoảng trắng), nhớ nhập ip của node2:

```
command="/home/backup/rsync/checkrsync",from="192.168.1.12",no-port-
forwarding,no-X11-forwarding,no-pty
```

Kết quả:

```
command="/home/backup/rsync/checkrsync",from="192.168.1.12",no-
port-forwarding, no-X11-forwarding,no-pty ssh-
dssAAAAAB3NzaC1kc3MA
AACBAKInOJCh1r/5 Nuc9Yb gfmqGRssxxuk3j6JAc6O8/hEzt0VS6Y
h3nk/ou+ih5HMQJIVMr +mqow6Ce0B5YFULyVU ogtGdm/jZv55
QrADJe3GBQWtUGtHq0j/E VU6D/6rBY2/
```

Sử dụng vi soạn script checkrsync để reject tất cả các câu lệnh ngoại trừ rsync, đảm bảo an toàn cho hệ thống

```
#mkdir ~/rsync
#vi ~/rsync/checkrsync
#!/bin/sh

case "$SSH_ORIGINAL_COMMAND" in
  *(&*)
    echo "Rejected"
    ;;
  */(*)
    echo "Rejected"
    ;;
  */(*)
    echo "Rejected"
    ;;
  */;(*)
    echo "Rejected"
    ;;
  */<(*)
    echo "Rejected"
    ;;
  */(*)
    echo "Rejected"
    ;;
  rsync\ --server*)
    $SSH_ORIGINAL_COMMAND
    ;;
  *)
    echo "Rejected"
    ;;
esac

#chmod 700 ~/rsync/checkrsync
```

### b6: Kiểm tra rsync trên node2

Tại node 2:

```
#rsync -avz --delete --exclude=**/stats --exclude=**/error -e "ssh -i /root/rsync/mirror-rsync-key" backup@192.168.1.11:/var/www/html/ /var/www/html/
```

```
[root@node2 ha.d]# rsync -avz --delete --exclude=**/stats --exclude=**/error -e
"ssh
-i /root/rsync/mirror-rsync-key" backup@192.168.1.11:/var/www/html/
/var/www/html/
receiving file list ... done
```

```
sent 48 bytes received 103 bytes 302.00 bytes/sec
total size is 54 speedup is 0.36
[root@node2 ha.d]#
```

--delete: xóa các file trên node2 khi các file đó trên node1 bị xóa  
--exclude: không mirror thư mục, trong trường hợp này là --exclude=\*\*/error means "do not mirror /var/www/html/error".

### b7: Lập lịch

Tại node2:

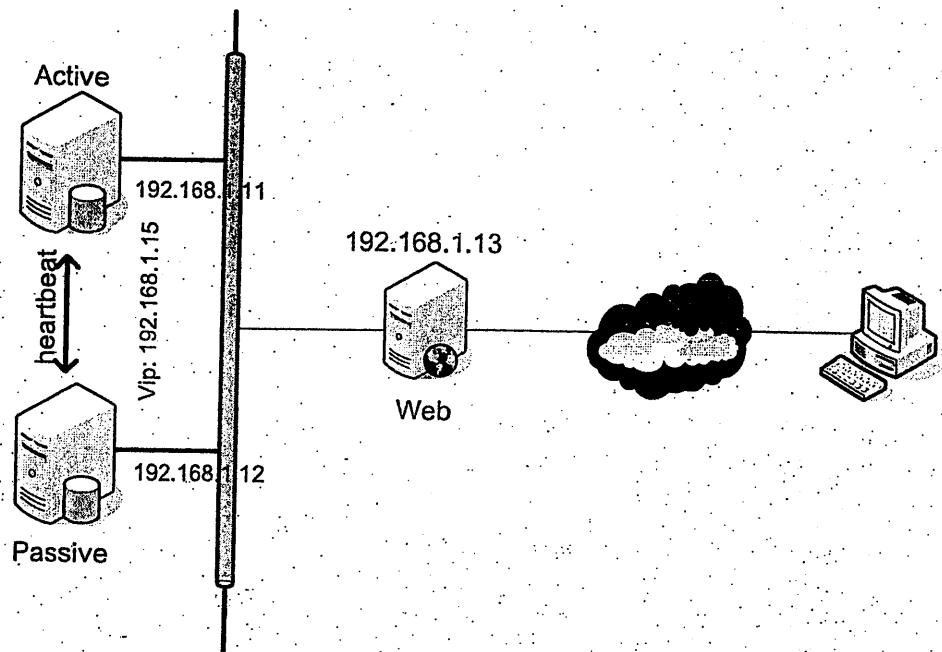
#crontab -e

Thêm dòng sau vào:

```
*/1 * * * * /usr/bin/rsync -azq --delete --exclude=**/stats --exclude=**/error -e "ssh -i /root/rsync/mirror-rsync-key" backup@192.168.1.11:/var/www/html/ /var/www/html/
```

Script sẽ tự động backup trong mỗi phút 1 lần. Sử dụng full path để chỉ ra nơi chạy rsync, để biết nơi chứa ta có thể sử dụng lệnh “which rsync”

## High Availability Mysql Cluster - DRBD



### Phần 1: Cài đặt và cấu hình heartbeat

#### Chuẩn bị

- Mỗi máy gắn 1 harddisk 1G (đồng bộ database)
- Cấu hình địa chỉ IP

```
node1.nhatnghe1.com [eth0:192.168.1.21] [eth1:172.16.1.1]
node2.nhatnghe1.com [eth0:192.168.1.22] [eth1:172.16.1.2]
```

- Trong file /etc/hosts, bổ sung thêm tên hostname và địa chỉ IP để hai nút có thể giao tiếp được với nhau.

```
192.168.1.11 node1.nhatnghe1.com node1
192.168.1.12 node2.nhatnghe1.com node2
```

#### b1: Cài các gói heartbeat package

```
#yum install heartbeat
```

Hoặc download và cài đặt các gói sau:

```
heartbeat-3.0.4-2.el6.x86_64
```

```
heartbeat-libs-3.0.4-2.el6.x86_64
```

#### b2:Cấu hình heartbeat (thực hiện trên 2 node)

Chép các file ha.cf, haresources, authkeys vào thư mục /etc/ha.d

```
#cp /usr/share/doc/heartbeat-2.1.3/authkeys /etc/ha.d/  
#cp /usr/share/doc/heartbeat-2.1.3/ha.cf /etc/ha.d/  
#cp /usr/share/doc/heartbeat-2.1.3/haresources /etc/ha.d/
```

+ vi /etc/ha.d/authkeys

Thêm 2 dòng sau:

```
auth 1 ; use authentication method 2 (sha1)
```

```
1 sha1 test-ha
```

```
#chmod 600 /etc/ha.d/authkeys
```

+ vi /etc/ha.d/ha.cf

Thêm các dòng sau vào cuối file

```
ldebugfile /var/log/ha-debug
```

```
logfile /var/log/ha-log
```

```
logfacility local0
```

```
keepalive 2
```

```
deadtime 30
```

```
initdead 120
```

```
bcast eth1
```

```
udpport 694
```

```
auto_fallback on
```

```
node node1.nhatnghe1.com
```

```
node node2.nhatnghe1.com
```

+ vi /etc/ha.d/haresources

```
node1.nhatnghe1.com IPaddr::192.168.1.30/24/eth0 drbddisk::disk1
```

```
Filesystem::/dev/drbd0::/var/lib/mysql::ext3::defaults mysqld
```

ý nghĩa: tên nút chính, địa chỉ IP ảo (cluster IP) và tài nguyên dùng để bắt đầu.

## Phần 2: Cài đặt và cấu hình drbd (trên 2 node)

### b1: Trên 2 node cài đặt drbd

Cài các gói trên 2 node

```
mysql-5.1.73-3.el6_5.x86_64  
mysql-server-5.1.73-3.el6_5.x86_64  
drbd83-utils-8.3.16-1.el6.elrepo.x86_64  
kmod-drbd83-8.3.16-3.el6.elrepo.x86_64.rpm
```

### b2: Tạo chục phân khu đĩa

```
fdisk /dev/sdb
```

Tạo logical volume (1gb dùng chứa database đồng bộ giữa 2 node)

```
/dev/sdb5
```

### b3: Cấu hình drbd

Create the Distributed Replicated Block Device resource file (/etc/drbd.d/disk1.res)

- Quan sát file cấu hình:

```
# cat /etc/drbd.conf
include "drbd.d/global_common.conf";
include "drbd.d/*.res";
```

- Cấu hình drbd:

```
# vi /etc/drbd.d/disk1.res
resource disk1
{
    startup {
        wfc-timeout 30;
        outdated-wfc-timeout 20;
        degr-wfc-timeout 30;
    }

    net {
        cram-hmac-alg sha1;
        shared-secret sync_disk;
    }

    syncer {
        rate 100M;
        verify-alg sha1;
    }

    on node1 {
        device /dev/drbd0;
        disk /dev/sdb5;
        address 192.168.1.13:7789;
        meta-disk internal;
    }

    on node2 {
        device /dev/drbd0;
        disk /dev/sdb5;
        address 192.168.1.14:7789;
        meta-disk internal;
    }
}
```

#Nạp module drbd vào kernel

```
modprobe drbd minor_count=1
```

#Kiểm tra module drbd có được nạp:

```
lsmod |grep drbd
```

Chú ý: 2 máy đồng bộ thời gian

Khởi tạo DRBD metadata trên cả 2 node

```
#drbdadm create-md disk1
```

Trên 2 node bây giờ đã có DRBD metadata

```
#chkconfig heartbeat on
reboot 2 máy, dịch vụ: drbd và mysqld sẽ tự động khởi động
```

```
[root@node1 ~]# service drbd status
drbd driver loaded OK; device status:
version: 8.3.16 (api:88/proto:86-97)
GIT-hash: a798fa7e274428a357657fb52f0ecf40192c1985 build by phil@Build64R6,
2014-11-24 14:51:37
m:res cs ro ds p mounted fstype
0:disk1 Connected Secondary/Secondary Inconsistent/Inconsistent C
```

Xem thông tin bằng lệnh

```
#drbd-overview
kq: 0:mysql Connected Secondary/Secondary Inconsistent/Inconsistent C r---
```

Quan sát sẽ thấy cả 2 node là secondary, chạy lệnh sau trên node1 để gán node này là master:

```
#drbdadm --overwrite-data-of-peer primary disk1
```

Trên cả 2 node, kiểm tra lại:

```
#drbd-overview
```

Tại node1:

```
[root@node1 ~]# drbd-overview
0:disk1 SyncSource Primary/Secondary UpToDate/Inconsistent C r---
[=====> .....] sync'ed: 38.1% (650876/1044092)K
```

Đợi quá trình đồng bộ thành công

Tại node2:

```
[root@node2 ~]# drbd-overview
0:disk1 Connected Secondary/Primary UpToDate/UpToDate C r----
```

Định dạng và mount (chỉ làm tại node1)

```
#mkfs.ext3 /dev/drbd0
#mount /dev/drbd0 /var/lib/mysql/ ; ko phải tạo mount trong /etc/fstab,
```

```
[root@node1 ~]# mkfs.ext3 /dev/drbd0
mke2fs 1.39 (29-May-2006)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
130560 inodes, 261023 blocks
13051 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
```

8 block groups

32768 blocks per group, 32768 fragments per group

16320 inodes per group

Superblock backups stored on blocks:

32768, 98304, 163840, 229376

Writing inode tables: done

Creating journal (4096 blocks): done

Writing superblocks and filesystem accounting information: done

This filesystem will be automatically checked every 34 mounts or  
180 days; whichever comes first. Use tune2fs -c or -i to override.

[root@node1 ~]# mount /dev/drbd0 /var/lib/mysql/

[root@node1 ~]#

Mounted point sẽ tự động được tạo

#df -h /var/lib/mysql

```
[root@node1 ~]# df -h /var/lib/mysql
Filesystem      Size  Used Avail Use% Mounted on
/dev/drbd0     1004M  18M  936M  2% /var/lib/mysql
[root@node1 ~]#
```

```
[root@node1 ~]# drbd-overview
0:mysql! Connected Primary/Secondary UpToDate/Diskless C r—
/var/lib/mysql ext3 1004M 18M 936M 2%
[root@node1 ~]#
```

Cấu hình mysql

#vi /etc/my.cnf  
 datadir=/var/lib/mysql/ ; chỉ đến nơi chứa dữ liệu, mặc định ko cần thay đổi

#service heartbeat restart  
 node1: ifconfig | more

```
eth0:0  Link encap:Ethernet HWaddr 00:0C:29:02:C5:9B
inet addr:192.168.1.15 Bcast:192.168.1.255 Mask:255.255.255.0
      UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
      Interrupt:169 Base address:0x2000
```

```
[root@node1 ha.d]# service mysqld status
mysqld (pid 5520) is running...
[root@node1 ha.d]#
```

Mysqld được gọi tự động bởi heartbeat

Đặt password cho tài khoản root của mysql:

#mysqladmin -u root password '123456'  
tạo database: nhansu

```
[root@node1 ha.d]# mysql -p
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 3
Server version: 5.0.77 Source distribution

Type 'help;' or '\h' for help. Type '\c' to clear the buffer.

mysql> create database nhansu;
Query OK, 1 row affected (0.02 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| lost+found |
| mysql |
| nhansu |
| test |
+-----+
5 rows in set (0.02 sec)

mysql> exit;
```

II /var/lib/mysql/ ; sẽ thấy nhansu

```
[root@node1 ha.d]# ll /var/lib/mysql/
total 20548
-rw-rw---- 1 mysql mysql 10485760 Sep 21 18:41 ibdata1
-rw-rw---- 1 mysql mysql 5242880 Sep 21 18:41 ib_logfile0
-rw-rw---- 1 mysql mysql 5242880 Sep 21 18:40 ib_logfile1
drwx----- 2 mysql mysql 16384 Sep 21 18:37 lost+found
drwx----- 2 mysql mysql 4096 Sep 21 18:40 mysql
srwxrwxrwx 1 mysql mysql 0 Sep 21 18:41 mysql.sock
drwx----- 2 mysql mysql 4096 Sep 21 18:45 nhansu
drwx----- 2 mysql mysql 4096 Sep 21 18:40 test
[root@node1 ha.d]#
```

#service heartbeat stop

node2: ifconfig | more ; quan sát 192.168.1.15

```
#mysql -p
mysql > show databases;
mysql > exit
```

```
[root@node2 ~]# service mysqld status
mysqld (pid 5330) is running...
[root@node2 ~]# mysql -p
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 2
Server version: 5.0.77 Source distribution

Type 'help;' or '\h' for help. Type '\c' to clear the buffer.

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| lost+found |
| mysql |
| nhansu |
| test |
+-----+
5 rows in set (0.04 sec)

mysql>
```

#ll /var/lib/mysql/ ; sẽ thấy nhansu

### Phần 3: Cài đặt và cấu hình forum

Tại máy web: 192.168.1.13

- Cài httpd
- Tạo database forum

mysql> create database forum;  
- Gán quyền cho truy cập từ xa

- Cho các host khác kết nối đến mysql:

GRANT ALL PRIVILEGES ON forum.\* to 'admin'@'%' IDENTIFIED BY '123456'  
with Grant option;

FLUSH PRIVILEGES;

Từ host khác thử kết nối

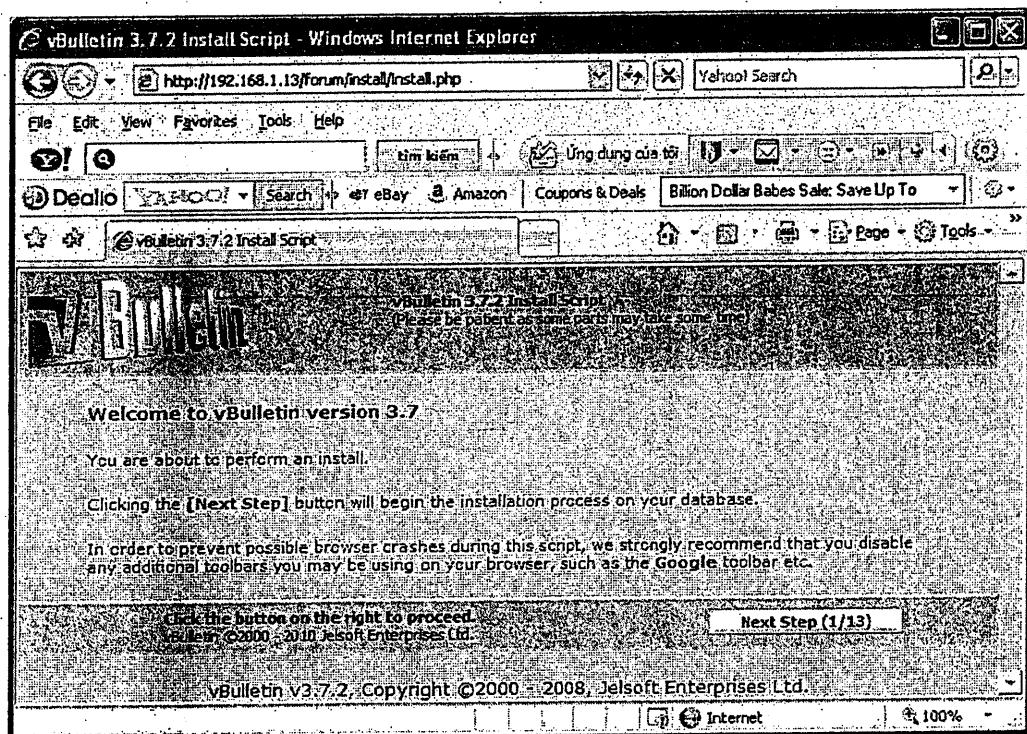
mysql -h 192.168.1.15 -u root -p

- Chép thư mục forum vào /var/www/html
- Cấu hình forum:

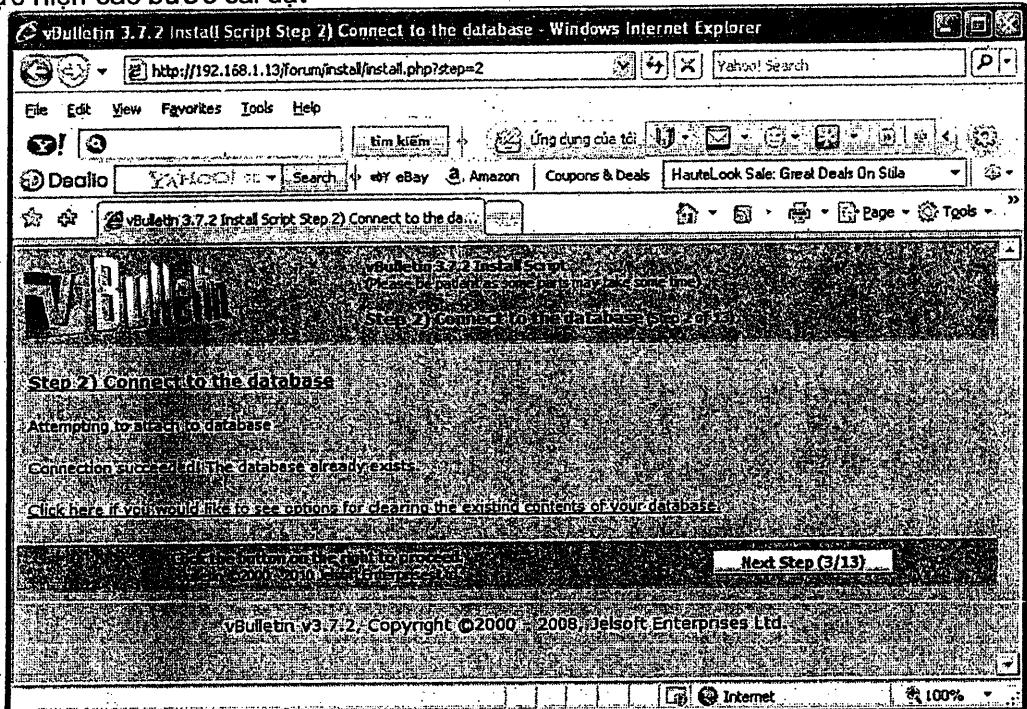
```
#cd /var/www/html/forum/
#mv includes/config.php.new includes/config.php
#vi includes/config.php
```

```
53 $config['MasterServer']['servername'] = '192.168.1.15' ; virtual ip của cluster
54 $config['MasterServer']['port'] = 3306;
59 $config['MasterServer']['username'] = 'admin';
60 $config['MasterServer']['password'] = '123456';
```

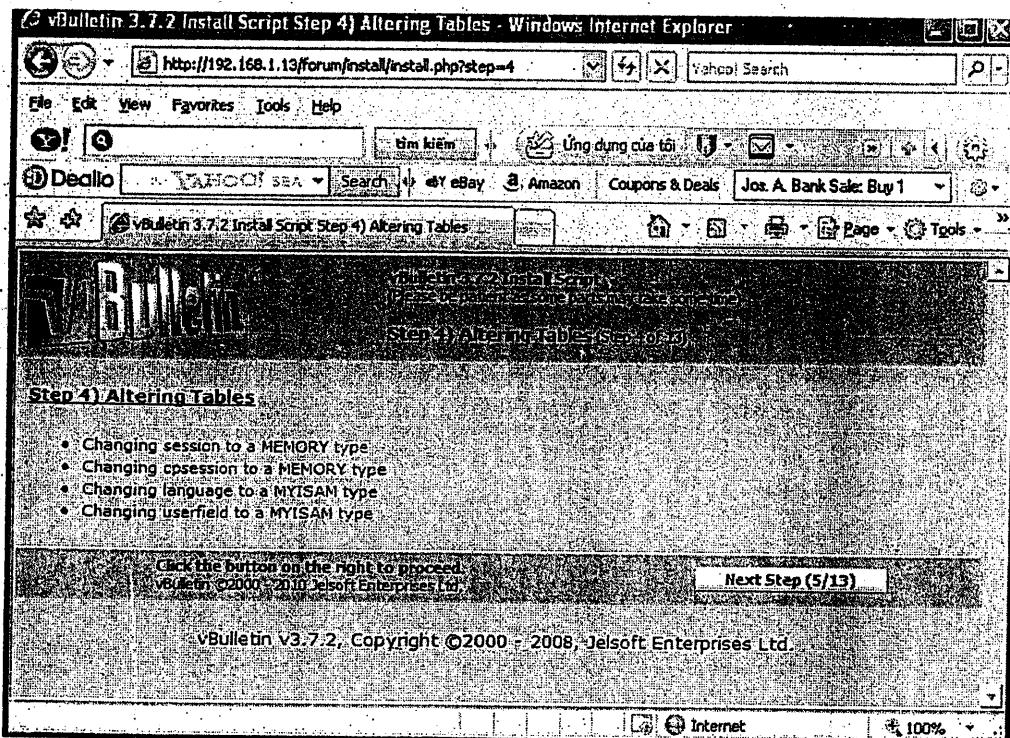
- Từ máy 2k3: ie  
<http://192.168.1.13/forum/install/install.php> ; Địa chỉ của máy web



#### Thực hiện các bước cài đặt



Nhấn Next



Nhập tiêu đề:

vBulletin 3.7.2 Install Script Step 9) Obtain Some Default Settings - Windows Internet Explorer

File Edit View Favorites Tools Help

tim kiem

YAHOO! SEA Search eBay Amazon Coupons & Deals Baby Age Fall Clearance

Step 9) Obtain Some Default Settings

General Settings

**BB Title**  
Title of board. Appears in the title of every page.  
Thời trang

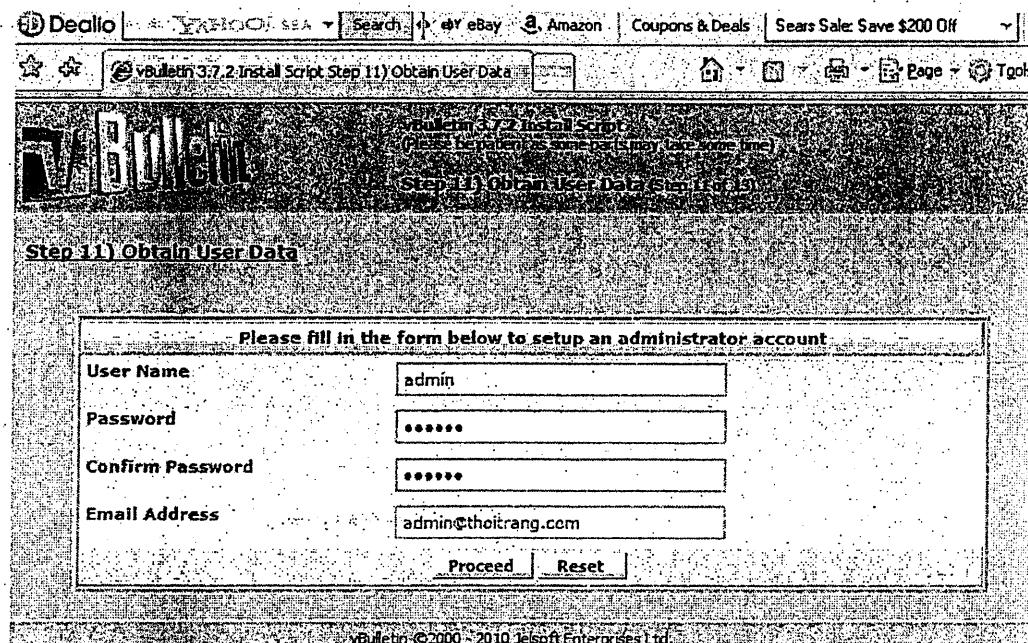
**Homepage Title**  
Name of your homepage. Appears at the bottom of every page.

**BB URL**  
URL (with no final "/") of the BB. For example, <http://www.example.com/forums>  
<http://192.168.1.13/forum>

**Home URL**  
<http://192.168.1.13>

Done

Nhập thông tin tài khoản quản trị:



Please fill in the form below to setup an administrator account.

User Name:

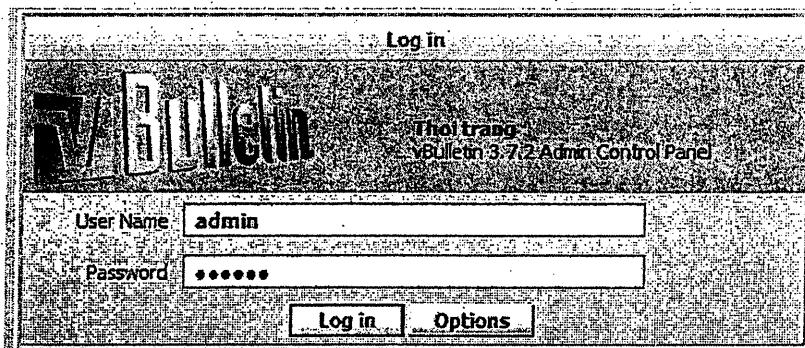
Password:

Confirm Password:

Email Address:

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- Sau đó phải xóa hoặc đổi tên file install.php  
`#rm forum/install/init.php`
- Login vào trang quản trị  
<http://192.168.1.13/forum/admincp>



Log In

Thoi trang  
VBulletin 3.7.2 Admin Control Panel

User Name:

Password:

- Chạy thử forum:  
<http://www.nhatnghelab.com/forum/>
- Trang quản trị  
<http://www.nhatnghelab.com/forum/admincp>
- Hiển thị tiếng việt:  
 Languages & Phrases==>Download / Upload Languages==> import, chọn file vbulletin-language.xml, chọn import, done

Languages & Phrases

- Language Manager
- Phrase Manager
- Search in Phrases
- Download / Upload Languages
- Find Updated Phrases
- FAQ
- Notices
- Announcements
- Forums & Moderators
- Calendars

Import Language XML File

EITHER upload the XML file from your computer

OR import the XML file from your server

/install/vbulletin-language.xml

(Create New Language) ▾

Title for Uploaded Language

(Leave blank to use the language title specified in)

### Chọn Set Default

Language Manager

Language	Actions	Default
English (US) Edit / Translate English (US) Phrases	[Edit Settings] [Delete] [Download]	<input type="button" value="Set Default"/>
Vietnamese 1 Edit / Translate Vietnamese 1 Phrases	[Edit Settings] [Delete] [Download]	<input type="button" value="Set Default"/>

[Search Phrases] [View QuickRef] [Rebuild All Languages]

Add New Language      Download / Upload Language

### - Thay đổi Banner cho forum:

style manager, <tiếp tục>, Title Image : images/Banner1.jpg

Image Paths

Title Image  
This is the image located in the 'header' template, used as the main logo for your forum.

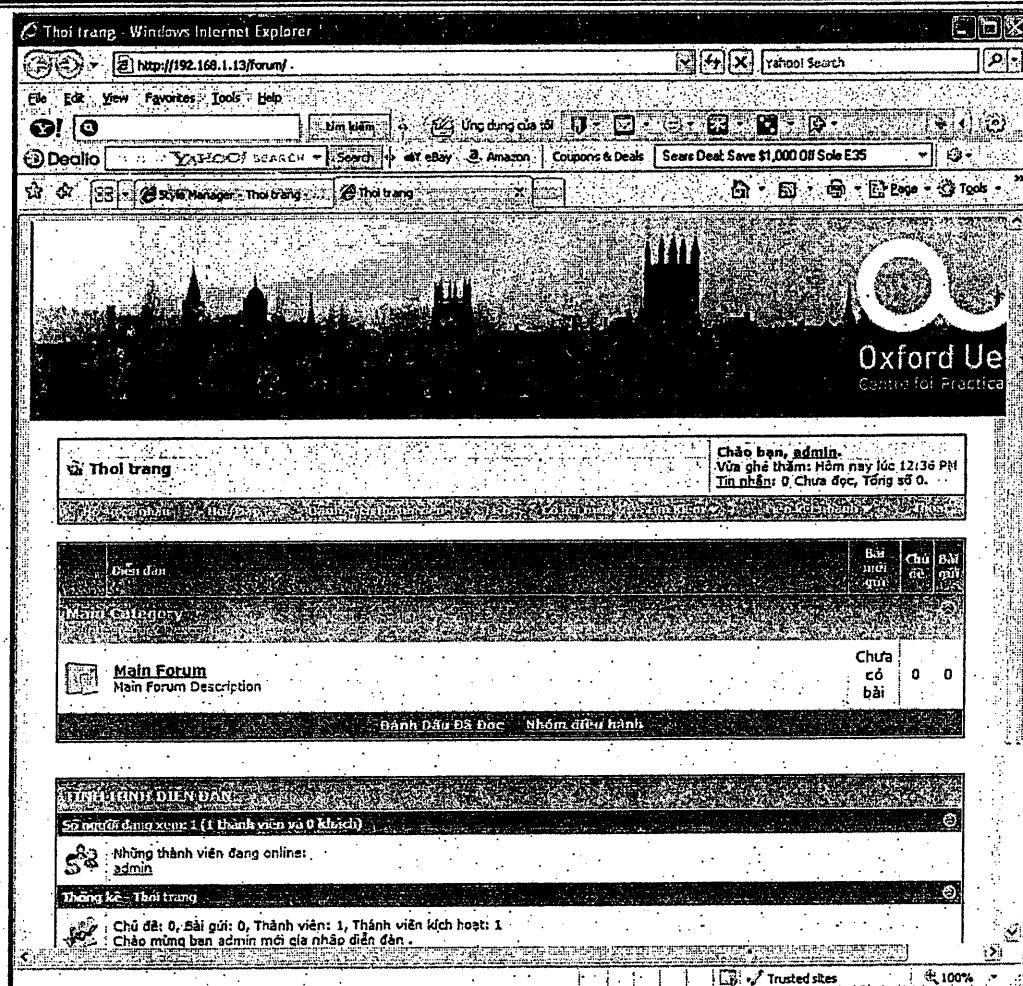
Button Images Folder  
This is the folder containing all the button images for this style.  
The location of this folder can be overridden by a language setting.

Item Status Icon Folder  
This folder contains all the icons representing the status of forums, threads, posts etc.  
For example: announcement\_old.gif / announcement\_new.gif

Attachment Icons Folder  
This folder contains the various icons used to represent different attachment file types such as txt, jpg, zip etc.

Miscellaneous Images Folder  
This folder contains the various images that do not fit into other category.

### - Truy cập forum



- Tạo Category (thư mục lớn).

- Admincp -->Forums & Moderators -->Add New Forum, Posting option,  
- act as forum, chọn no

Add New Forum

Tiêu đề	Thời trang hè
Miêu tả	
Forum Link (Entering a URL here will cause anyone clicking the forum link to be redirected to that URL)	
Hiển thị sắp xếp Đặt là '0' để không hiển thị item này	1

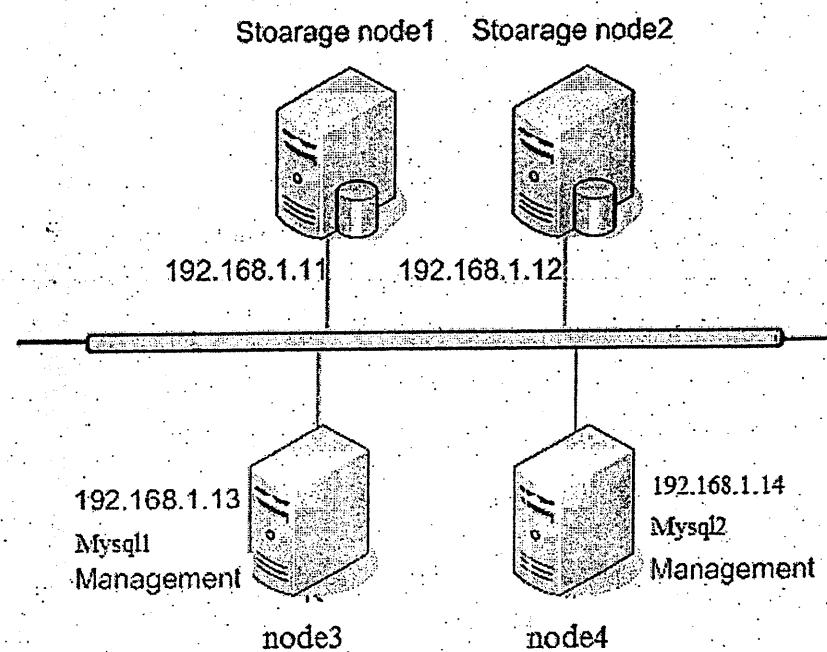
- Tạo Forum con

Admincp -->Forums & Moderators -->Forum Manager

Chọn một Category cần thêm forum con chọn Add Child Forum

Main Category	Main Category Description	Bài	Chủ đề	Bài
Main Forum	Main Forum Description	Chưa có bài	0	0
Áo ngắn		Chưa có bài	0	0
Áo ngủ		Chưa có bài	0	0
Quần Áo thể thao		Chưa có bài	0	0
Đá banh		Chưa có bài	0	0

## MYSQL CLUSTER



Management: quản lý cluster  
 Storage1,2: lưu trữ database  
 Mysql1,2: cài đặt ứng dụng mysql

### Phần 1 Cài máy management node (node3)

b1:cài 2 gói sau:

```
MySQL-Cluster-gpl-management-7.1.34-1.el6.x86_64.rpm
MySQL-Cluster-gpl-tools-7.1.34-1.el6.x86_64.rpm
```

b2: Soạn file cấu hình

```
mkdir -p /var/lib/mysql-cluster ; chứa cluster log
mkdir -p /usr/local/mysql-cluster ; chứa file cấu hình
cd /usr/local/mysql-cluster
```

#vi config.ini

Soạn nội dung sau:

```
[ndb_mgmd]
Nodeld=1
HostName=192.168.1.13      # IP address of the management node
DataDir=/var/lib/mysql-cluster

[ndbd default]
NoOfReplicas=2
DataDir=/var/lib/mysql-cluster
```

```
[ndbd]
NodeId=3
HostName=192.168.1.11
```

```
[ndbd]
NodeId=4
HostName=192.168.1.12
```

```
[mysqld]
HostName=192.168.1.13
```

```
[mysqld]
HostName=192.168.1.14
```

```
[mysqld]
[mysqld]
```

b3: Khởi động management node

```
#ndb_mgmd --config-file=/usr/local/mysql-cluster/config.ini
#echo $? ; kiểm tra lệnh có thành công ko, 0: là thành công
```

Kiểm tra các node trong cluster đã kết nối( hiện tại nodo1 và node2 chưa cài đặt)

```
#ndb_mgm
ndb_mgm> SHOW
```

```
[root@node3 mysql-cluster]# ndb_mgm
-- NDB Cluster – Management Client --
ndb_mgm> show
Connected to Management Server at: localhost:1186
Cluster Configuration

[ndbd(NDB)] 2 node(s)
id=3 (not connected, accepting connect from 192.168.1.11)
id=4 (not connected, accepting connect from 192.168.1.12)
```

```
[ndb_mgmd(MGM)] 1 node(s)
id=1 @192.168.1.13 (mysql-5.1.47 ndb-7.1.5)
```

```
[mysqld(API)] 4 node(s)
id=5 (not connected, accepting connect from 192.168.1.11)
id=6 (not connected, accepting connect from 192.168.1.12)
id=7 (not connected, accepting connect from any host)
id=8 (not connected, accepting connect from any host)
```

```
ndb_mgm>
```

**Phần 2 Cài máy 1.2 storage nodes (node 1.2)**

b1: Cài các gói

```
MySQL-Cluster-gpl-storage-7.1.34-1.el6.x86_64.rpm
MySQL-Cluster-gpl-tools-7.1.34-1.el6.x86_64.rpm
```

b2: Tạo file my.cnf cho phép các storage nodes tìm kiếm management nodes

```
#vi /etc/my.cnf
[mysqld] ;phần khai báo sql node - (sql node và
ndbcluster ;storage node cài trên cùng một máy
ndb_connectstring=192.168.1.13

[mysql_cluster] ;phần khai báo storage node
ndb_connectstring=192.168.1.13

#mkdir -p /var/lib/mysql-cluster
# ndbd --initial
```

### Phần 3 - kiểm tra

Tại máy 3

```
ndb_mgm> show
Connected to Management Server at: localhost:1186
Cluster Configuration

[ndbd(NDB)] 2 node(s)
id=3  @192.168.1.11 (mysql-5.1.73 ndb-7.1.34, Nodegroup: 0, *)
id=4  @192.168.1.12 (mysql-5.1.73 ndb-7.1.34, Nodegroup: 0)

[ndb_mgmd(MGM)] 1 node(s)
id=1  @192.168.1.13 (mysql-5.1.73 ndb-7.1.34)
```

### Phần 4 - Cài đặt và khởi động SQL nodes (node 3,4)

Trong bài này sử dụng 2 máy storage node làm 2 máy SQL nodes

b1: Cài đặt các gói sau:

```
MySQL-Cluster-gpl-server-7.1.34-1.el6.x86_64
MySQL-Cluster-gpl-client-7.1.34-1.el6.x86_64
```

Trong file /etc/my.cnf phải có các dòng sau

```
[mysqld]
ndbcluster
ndb_connectstring=192.168.1.13
```

Khởi động:

```
#service mysql start
#chkconfig mysql on
```

```
#mysqladmin -u root password '123456'
#mysqladmin -u root -h node1.nhatnghe1.com password '123456'
```

Tại máy 3, kiểm tra:

```
ndb_mgm> show
Connected to Management Server at: localhost:1186
Cluster Configuration
```

```
[ndbd(NDB)] 2 node(s)
id=3  @192.168.1.11 (mysql-5.1.73 ndb-7.1.34, Nodegroup: 0, *)
id=4  @192.168.1.12 (mysql-5.1.73 ndb-7.1.34, Nodegroup: 0)

[ndb_mgmd(MGM)] 1 node(s)
id=1  @192.168.1.13 (mysql-5.1.73 ndb-7.1.34)

[mysqld(API)] 4 node(s)
id=5  @192.168.1.13 (mysql-5.1.73 ndb-7.1.34)
id=6  @192.168.1.14 (mysql-5.1.73 ndb-7.1.34)
id=7 (not connected, accepting connect from any host)
id=8 (not connected, accepting connect from any host)
```

### Phần 5 - Tao database (node 3,4)

Tại máy1:

```
[root@node3 ~]# mysql -p
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 5
Server version: 5.1.47-ndb-7.1.5-cluster-gpl MySQL Cluster Server (GPL)

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This software comes with ABSOLUTELY NO WARRANTY. This is free software,
and you are welcome to modify and redistribute it under the GPL v2 license.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE nhansu;
Query OK, 1 row affected (0.75 sec)

mysql> use nhansu;
Database changed
mysql> CREATE TABLE phongban (tenp char(12)) ENGINE=NDBCLUSTER;
Query OK, 0 rows affected (0.52 sec)

mysql> INSERT INTO phongban () VALUES ("Ke toan");
Query OK, 1 row affected (0.19 sec)

mysql> INSERT INTO phongban () VALUES ("Kinh doanh");
Query OK, 1 row affected (0.02 sec)

mysql> INSERT INTO phongban () VALUES ("Ky thuat");
Query OK, 1 row affected (0.01 sec)

mysql> SELECT * FROM phongban ;
+-----+
| tenp |
+-----+
| Ky thuat |
+-----+
```

```
| Kinh doanh      |
| Ke toan        |
+-----+
3 rows in set (0.04 sec)

mysql>
```

Tại node4:

```
mysql>
```

```
mysql> show databases;
+-----+
| Database          |
+-----+
| information_schema |
| mysql              |
| ndbinfo            |
| nhansu             |
| test               |
+-----+
5 rows in set (0.01 sec)

mysql> use nhansu;
Reading table information for completion of table and column names.
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> SELECT * FROM phongban;
+-----+
| tenp           |
+-----+
| Ky thuat       |
| Kinh doanh     |
| Ke toan         |
+-----+
3 rows in set (0.00 sec)

mysql>
```

### Giám sát:

Tại máy management

Chạy lệnh sau để kết thúc tiến trình trước khi khởi động lại

```
kill $(pidof ndb_mgmd)
```

```
ndb_mgmd --config-file=config.ini
```

Tại các máy 1,2:

Kết thúc ndbd:

```
ps aux | grep ndbd
```

```
pkill -9 ndbd
```

khởi động lại

ndbd ; ko cần –initial!, thông số này chỉ cần khi máy management thay đổi cấu hình file config.ini

Khởi động ndbd khi start máy:

```
echo "ndbd" > /etc/rc.d/init.d/ndbd
chmod +x /etc/rc.d/init.d/ndbd
chkconfig --add ndbd
```

## Phần 6. Mở rộng 2 máy management

### **Node4:**

b1: Cài 2 gói sau:

```
MySQL-Cluster-gpl-management-7.1.34-1.el6.x86_64.rpm
MySQL-Cluster-gpl-tools-7.1.34-1.el6.x86_64.rpm
```

b2: Tạo thư mục

```
mkdir -p /var/lib/mysql-cluster ; chứa cluster log
mkdir -p /usr/local/mysql-cluster ; chứa file cấu hình
cd /usr/local/mysql-cluster
```

**Node 3,4:** Soạn file cấu hình /usr/local/mysql-cluster/config.ini

```
[ndb_mgmd]
Id=1
HostName=192.168.1.11
DataDir=/var/lib/mysql-cluster
:[ndb_mgmd]
Id=2
HostName=192.168.1.12
DataDir=/var/lib/mysql-cluster
```

**Node 1,2:** —————storage—————

```
vi /etc/my.cnf
[mysqld]
ndb-connectstring=192.168.1.13,192.168.1.14
```

```
#vi /etc/my.cnf
[mysqld]
ndbcluster
    ndb_connectstring=192.168.1.13,192.168.1.14
[mysql_cluster]
    ndb_connectstring=192.168.1.13,192.168.1.14
```

————sql node—————

SQL nodes (máy 3,4)

Trong file /etc/my.cnf phải có các dòng sau

```
[mysqld]
ndbcluster
ndb_connectstring=192.168.1.13,192.168.1.14
```

————Khoi dong—————

**may1:**  
kill \$(pidof ndb\_mgmd)  
cd /usr/local/mysql-cluster  
ndb\_mgmd --config-file=config.ini --initial --ndb-nodeid=1

**may2:**  
kill \$(pidof ndb\_mgmd)  
cd /usr/local/mysql-cluster  
ndb\_mgmd --config-file=config.ini --initial --ndb-nodeid=2

Tại các máy 1,2:

Kết thúc ndbd:  
pkill -9 ndbd

Khởi động lại  
ndbd  
ndb\_mgm,show

ndb\_mgm> show  
Cluster Configuration

[ndbd(NDB)] 2 node(s)  
id=3 @192.168.4.121 (mysql-5.1.47 ndb-7.1.5, Nodegroup: 0)  
id=4 @192.168.4.221 (mysql-5.1.47 ndb-7.1.5, Nodegroup: 0, Master)

[ndb\_mgmd(MGM)] 2 node(s)  
id=1 @192.168.4.181 (mysql-5.1.47 ndb-7.1.5)  
id=2 @192.168.4.151 (mysql-5.1.47 ndb-7.1.5)

[mysqld(API)] 4 node(s)  
id=5 @192.168.4.51 (mysql-5.1.47 ndb-7.1.5)  
id=6 @192.168.4.81 (mysql-5.1.47 ndb-7.1.5)  
id=7 (not connected, accepting connect from any host)  
id=8 (not connected, accepting connect from any host)

ndb\_mgm> SHOW

[ndbd(NDB)] 2 node(s)  
id=3 (not connected, accepting connect from machine-3)  
id=4 (not connected, accepting connect from machine-4)

[ndb\_mgmd(MGM)] 2 node(s)  
id=1 @machine-1 (mysql-5.1.35 ndb-7.0.7)  
id=2 (not connected, accepting connect from machine-2)

**Important:** The fact that you don't see the second management node connect is because you did not start data nodes.

Management nodes 'see' each other through connected data nodes!

Now start the data nodes, but for fun, point the 2nd one to the 2nd management node.

**may1:**  
ndbd -c may5  
**may2:**  
ndbd -c may6

ndb\_mgm> SHOW

[ndbd(NDB)] 2 node(s)  
id=3 @machine-3 (mysql-5.1.35 ndb-7.0.7, Nodegroup: 0, Master)  
id=4 @machine-4 (mysql-5.1.35 ndb-7.0.7, Nodegroup: 0)

```
[ndb_mgmd(MGM)] 2 node(s)
id=1  @may5 (mysql-5.1.35 ndb-7.0.7)
id=2  @may6 (mysql-5.1.35 ndb-7.0.7)
```

Setting up Heartbeat on cluster nodes means configuring three files. In /etc/ha.d:

```
$ cat authkeys
auth 1
1 md5 WorldDominationFast!

$ more haresources
DB-A 172.17.0.103/24/eth0:1

DB-A:/etc/ha.d # more ha.cf
logfacility local0
keepalive 2
deadtime 10
wartime 5
initdead 120
nice_failback off
udpport 694
bcast eth0
node DB-A
node DB-B
```

Make sure that files both exist and are identical on both nodes.

Heartbeat does not monitor the state of the application. You can still be able to ping a DB, but its mysqld might be completely dysfunctional. That's why we added mon to our setup.

The next change is to mon.cf in /etc/mon/:

```
hostgroup mysql-node 127.0.0.1

#
# watch definitions
watch mysql-node
    service mysql
    interval 10s
    monitor mysql-mysql.monitor --mode mysql --database=your database \
        --password=yourpasswordgoeshere
    period wd {Mon-Sun}
    alert stop-heartbeat.alert
```

## Phần IV: Network monitoring- VPS

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## Nagios - Monitor Network Services

### 1. Nagios Server

#### B1: Cài đặt nagios và plugin

```
rpm -Uvh http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-  
8.noarch.rpm  
rpm -Uvh http://rpms.famillecollet.com/enterprise/remi-release-6.rpm  
yum -y install nagios nagios-plugins-all nagios-plugins-nrpe nrpe php httpd
```

#### B2: cấu hình

```
#vi /etc/nagios/nagios.cfg  
đòng 52: bỏ #  
cfg_dir=/etc/nagios/servers  
  
#vi /etc/httpd/conf.d/nagios.conf  
16 Allow from all  
33 Allow from all  
  
#mkdir /etc/nagios/servers  
#chown nagios. /etc/nagios/servers  
#vi /etc/nagios/objects/contacts.cfg  
sửa dòng 35:  
email webmaster@localhost
```

#### B3: Đặt mật khẩu cho tài khoản quản trị:

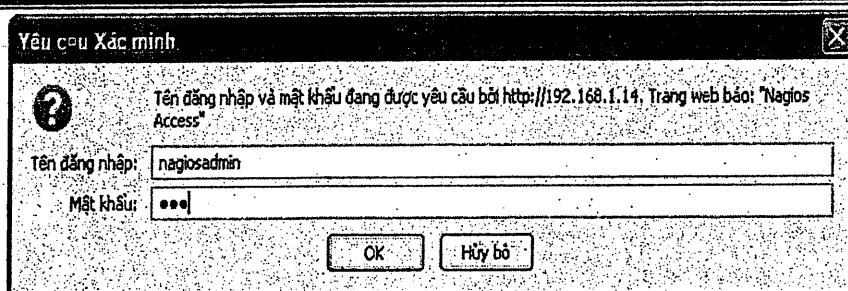
```
# htpasswd -c /etc/nagios/passwd nagiosadmin  
New password:  
Re-type new password:  
Adding password for user nagiosadmin
```

#### B4: Khởi động

```
service nagios start  
service httpd start  
chkconfig httpd on  
chkconfig nagios on
```

#### B5: Quản trị và kiểm tra

mở IE: <http://192.168.1.12/nagios>



Màn hình Nagios

Chọn service notification của dịch vụ 'HTTP' và 'SSH' bị disabled để enable. Chọn bell-icon

The screenshot shows the Nagios Core web interface. On the left, there's a sidebar with links like General, Home, Documentation, Current Status, and Reports. The main area displays the "Current Network Status" and "Service Status Details For All Hosts". The service status table lists various services with their last check times, duration, attempt counts, and status information. Most services are in a CRITICAL state.

Host	Service	Status	Last Check	Duration	Attempt	Status Information
localhost	Current Load	CRITICAL	03-28-2015 06:28:28	0d 0h 8m 31s	4/4	(Return code of 127 is out of bounds - plugin may be missing)
	Current Users	CRITICAL	03-28-2015 06:27:04	0d 0h 7m 53s	4/4	(Return code of 127 is out of bounds - plugin may be missing)
	HTTP	CRITICAL	03-28-2015 06:27:41	0d 0h 7m 16s	4/4	(Return code of 127 is out of bounds - plugin may be missing)
	PING	CRITICAL	03-28-2015 06:28:19	0d 0h 6m 38s	4/4	(Return code of 127 is out of bounds - plugin may be missing)
	Root Partition	CRITICAL	03-28-2015 06:28:55	0d 0h 6m 1s	4/4	(Return code of 127 is out of bounds - plugin may be missing)
	SSH	CRITICAL	03-28-2015 06:29:34	0d 0h 5m 23s	4/4	(Return code of 127 is out of bounds - plugin may be missing)
	Swap Usage	CRITICAL	03-28-2015 06:25:11	0d 0h 4m 46s	1/4	(Return code of 127 is out of bounds - plugin may be missing)
	Total Processes	CRITICAL	03-28-2015 06:25:49	0d 0h 4m 8s	1/4	(Return code of 127 is out of bounds - plugin may be missing)

Chọn "Enable notifications for this service". Sau đó chọn commit, done

**Service State Information**

**CRITICAL** (for 0d 0h 7m 41s)  
 (Return code of 127 is out of bounds - plugin may be missing)

**4/4 (HARD state)**  
 03-28-2015 06:27:41

**ACTIVE**  
 0.047 / 0.007 seconds  
 03-28-2015 06:32:41

**N/A (notification 0)**  
**NO** (6.12% state change)

**Service Commands**

- Disable active checks of this service
- Re-schedule the next check of this service
- Submit passive check result for this service
- Stop accepting passive checks for this service
- Stop obsessing over this service
- Acknowledge this service problem
- Enable notifications for this service
- Set custom service notification
- Schedule downtime for this service
- Disable event handler for this service
- Disable flap detection for this service

Lặp lại các thao tác trên cho dịch vụ SSH

## 2. Linux Clients

### B1: Install NRPE on Linux Clients (máy 2 – Linux)

```
rpm -Uvh http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-8.noarch.rpm
rpm -Uvh http://rpms.famillecollet.com/enterprise/remi-release-6.rpm
yum -y install nagios nagios-plugins-all nrpe
```

chkconfig nrpe on

## B2. Cấu hình nrpe:

# vi /etc/nagios/nrpe.cfg

Thêm các dòng sau vào cuối file:

```
command[check_users]=/usr/lib64/nagios/plugins/check_users -w 5 -c 10
command[check_load]=/usr/lib64/nagios/plugins/check_load -w 15,10,5 -c
30,25,20
command[check_disk]=/usr/lib64/nagios/plugins/check_disk -w 20% -c 10% -p
/dév/sda3ll
command[check_zombie_procs]=/usr/lib64/nagios/plugins/check_procs -w 5 -c
10 -s Z
command[check_total_procs]=/usr/lib64/nagios/plugins/check_procs -w 150 -c
200
command[check_procs]=/usr/lib64/nagios/plugins/check_procs -w $ARG1$ -c
$ARG2$ -s $ARG3$
```

#service nrpe restart

## B3. Thêm máy client vào Nagios server

Tại máy Nagios server

# vi /etc/nagios/servers/may2.cfg

```
define host {
    use           linux-server
    host_name     may2
    alias         may2
    address       192.168.1.12
}

define service {
    use           generic-service
    host_name     may2
    service_description   PING
    check_command  check_ping!100.0,20%!500.0,60%
}

define service {
    use           generic-service
    host_name     may2
    service_description   SSH
    check_command  check_ssh
    notifications_enabled  0
}

define service {
    use           generic-service
    host_name     may2
```



service_description	Current Load
check_command	
check_local_load!5.0,4.0,3.0!10.0,6.0,4.0	
}	

# service nagios restart

Kiểm tra

<http://192.168.1.11/nagios/>

The screenshot shows the Nagios web interface with the following sections:

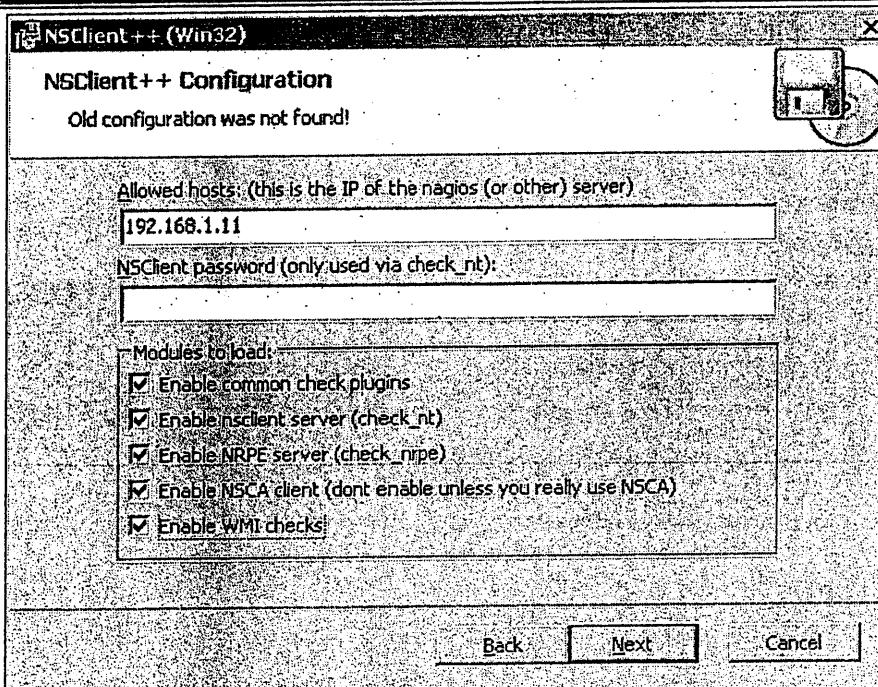
- General:** Current Network Status, Last Updated: Sat Mar 28 11:45:29 ICT 2015, Updated every 90 seconds, Nagios® Core™ 3.5.1 - www.nagios.org, Logged in as neglosedmin.
- Current Status:** View History For All hosts, View Notifications For All Hosts, View Host Status Detail For All Hosts.
- Tactical Overview:** Map, Hosts, Services, Host Groups, Service Groups, Problems, Services (Unhandled), Hosts (Unhandled), Network Outages, Quick Search: may2.
- Host Status Totals:** Up: 2, Down: 0, Unreachable: 0, Pending: 0, Ok: 10.
- All Problems All Types:** 0 problems, 2 notifications.
- Service Status Details:** A table showing service status for various hosts and services. The table includes columns: Host, Service, Status, Last Check, Duration, Attempt. Key data points from the table:
 

Host	Service	Status	Last Check	Duration	Attempt
localhost	Current Load	OK	03-28-2015 11:42:36	0d 1h 9m 38s	1/4
localhost	Current Users	OK	03-28-2015 11:43:14	0d 1h 9m 0s	1/4
HTTP		WARNING	03-28-2015 11:43:51	0d 0h 50m 23s	4/4
PING		OK	03-28-2015 11:44:29	0d 1h 7m 45s	1/4
Root Partition		OK	03-28-2015 11:45:06	0d 1h 7m 6s	1/4
SSH		OK	03-28-2015 11:40:44	0d 1h 8m 30s	1/4
Swap Usage		OK	03-28-2015 11:41:21	0d 1h 5m 53s	1/4
Total Processes		OK	03-28-2015 11:41:59	0d 1h 5m 15s	1/4
may2	Current Load	OK	03-28-2015 11:42:09	0d 0h 3m 20s	1/3
may2	PING	OK	03-28-2015 11:43:18	0d 0h 2m 11s	1/3
may2	SSH	OK	03-28-2015 11:44:28	0d 0h 1m 1s	1/3

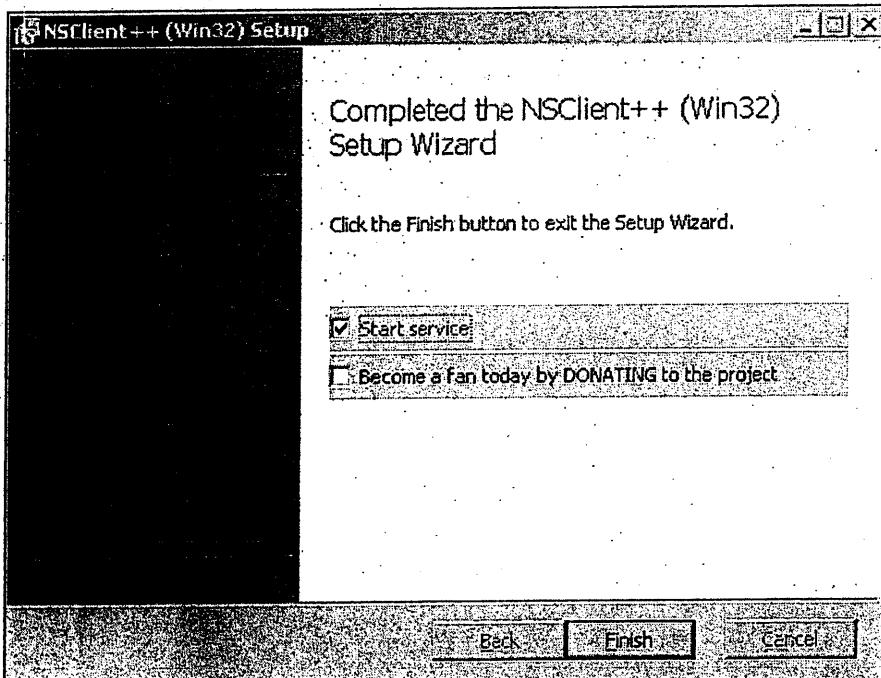
### 3. Windows Clients

B1. Máy windows cài file: NSClient++-0.3.8-Win32.msi

Chọn các thành phần như hình sau



Chọn start service



## B2. Thêm máy client vào Nagios server

Tại máy Nagios server

```
# cp /etc/nagios/objects/windows.cfg /etc/nagios/servers/windows.cfg
# vi /etc/nagios/servers/windows.cfg
```

## Sửa tên máy, IP của máy windows server

```

25 define host{
26     use           windows-server ; Inherit default values from a template
27     host_name    winserver      ; The name we're giving to this host
28     alias         My Windows Server ; A longer name associated with the
host
29     address      192.168.1.21 ; IP address of the host
30 }
31

```

# service nagios restart

Kiểm tra

<http://192.168.1.11/nagios/>

Limit Results: 100						
Host	Service	Status	Last Check	Duration	Attempt	Status Information
localhost	Current Load	OK	03-28-2015 11:52:36	0d 1h 18m 35s	1/4	OK - load average: 0.00,
	Current Users	OK	03-28-2015 11:53:14	0d 1h 17m 57s	1/4	USERS OK - 2 users curr
	HTTP	WARNING	03-28-2015 11:53:51	0d 0h 59m 20s	4/4	HTTP WARNING: HTTP/1.1 response time
	PING	OK	03-28-2015 11:49:29	0d 1h 16m 42s	1/4	PING OK - Packet loss = 0
	Root Partition	OK	03-28-2015 11:50:06	0d 1h 16m 5s	1/4	DISK OK - free space: / 2
	SSH	OK	03-28-2015 11:50:44	0d 1h 15m 27s	1/4	SSH OK - OpenSSH_5.3
	Swap Usage	OK	03-28-2015 11:51:21	0d 1h 14m 50s	1/4	SWAP OK - 100% free (5)
	Total Processes	OK	03-28-2015 11:51:59	0d 1h 14m 12s	1/4	PROCS OK 101 processes
may2	Current Load	OK	03-28-2015 11:52:09	0d 0h 12m 17s	1/3	OK - load average: 0.01,
	PING	OK	03-28-2015 11:53:18	0d 0h 11m 8s	1/3	PING OK - Packet loss = 0
	SSH	OK	03-28-2015 11:44:28	0d 0h 9m 58s	1/3	SSH OK - OpenSSH_5.3
winserver	C:\ Drive Space	OK	03-28-2015 11:53:03	0d 0h 1m 23s	1/3	c: - total: 39.99 Gb - used
	CPU Load	OK	03-28-2015 11:54:21	0d 0h 0m 5s	1/3	CPU Load 0% (5 min aver
	Explorer	PENDING	N/A	0d 0h 2m 40s+	1/3	Service check scheduled
	Memory Usage	PENDING	N/A	0d 0h 2m 40s+	1/3	Service check scheduled
	NIS Client++	PENDING	N/A	0d 0h 2m 40s+	1/3	Service check scheduled
	Version	PENDING	N/A	0d 0h 2m 40s+	1/3	Service check scheduled
	Uptime	PENDING	N/A	0d 0h 2m 40s+	1/3	Service check scheduled
	W3SVC	CRITICAL	03-28-2015 11:53:29	0d 0h 0m 57s	1/3	W3SVC: Not found

## 4. Giám sát thêm các service trên máy linux

### B1. Tại máy Nagios server

vi /etc/nagios/objects/commands.cfg

Thêm vào cuối file

```

define command{
command_name check_nrpe
command_line $USER1$/check_nrpe -H $HOSTADDRESS$ -c $ARG1$
}

```

#service nagios restart

### B2. Thêm các service

define service{

```
use      generic-service ; Inherit default values from a template
host_name    may2
service_description POP
check_command check_pop
}

define service{
use      generic-service ; Inherit default values from a template
host_name    may2
service_description FTP
check_command check_ftp
}

define service{
use      generic-service ; Inherit default values from a template
host_name    may2
service_description IMAP
check_command check_imap
}

define service{
use      generic-service ; Inherit default values from a template
host_name    may2
service_description HTTP
check_command check_http
}

define service{
use      generic-service
host_name    may2
service_description Current Users
check_command check_local_users!20!50
}

define service{
use      generic-service ; Name of service template to use
host_name    may2
service_description Root Partition
check_command check_local_disk!20%!10%!
}
```

## Cacti – Network Monitoring

### B1: Cài đặt

Cài php, mysql, mysql-server

```
#rpm -Uvh http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-
```

```
8.noarch.rpm
```

```
#rpm -Uvh http://rpms.famillecollet.com/enterprise/remi-release-6.rpm
```

```
#yum -y install cacti net-snmp rrddtool
```

Hoặc cài gói cacti-0.8.8b-7.el6.noarch.rpm từ software

### B2: Cấu hình

```
#vi /etc/snmp/snmpd.conf
```

Thêm # trước dòng 41

```
#com2sec notConfigUser default public
```

Thêm vào dòng 42

```
42 com2sec local localhost private
```

```
43 com2sec mynetwork 192.168.4.0/24 public
```

Thêm # vào dòng 48,49, thêm 4 dòng mới

```
48 #group notConfigGroup v1 notConfigUser
```

```
49 #group notConfigGroup v2c notConfigUser
```

```
group MyROGroup v1 mynetwork
```

```
group MyROGroup v2c mynetwork
```

```
group MyROGroup v1 local
```

```
group MyROGroup v2c local
```

Thêm # vào dòng 59,60, và thêm 1 dòng mới

```
59 #view systemview included .1.3.6.1.2.1.1
```

```
60 #view systemview included .1.3.6.1.2.1.25.1.1
```

```
61 view all included .1 80
```

Thêm # vào dòng 66, và thêm 2 dòng mới

```
66 #access notConfigGroup "" any noauth exact systemview none none
```

```
67 access MyROGroup "" any noauth exact all none none
```

```
68 access MyRWGroup "" any noauth exact all all none
```

thêm dòng sau đây vào /etc/crontab

```
crontab -e
```

```
*/1 * * * * /usr/bin/php /usr/share/cacti/poller.php > /dev/null 2>&1
```

### B3: khởi động snmpd

```
# service snmpd start
```

```
#chkconfig snmpd on
```

```
[root@localhost ~]# service snmpd start
Starting snmpd:
[root@localhost ~]#chkconfig snmpd on
```

[ OK ]

### B4: tạo database

```
service mysqld start
```

```
mysqladmin -u root -p create cacti ; password trắng
```

Import database:

```
mysql -p cacti < /usr/share/doc/cacti-0.8.8b/cacti.sql
Login mysql
```

```
mysql -u root -p
```

Xem database và đặt password cho user: cactiuser

```
mysql> show databases;
```

```
+-----+
| Database      |
+-----+
```

```
| information_schema |
| cacti           |
| mysql          |
| nhansu         |
| test           |
+-----+
```

```
5 rows in set (0.00 sec)
```

```
mysql> grant all on cacti.* to cactiuser@localhost identified by 'password';
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> exit
```

```
Bye
```

B5: Cấu hình thông tin quản trị

```
#vi /var/www/cacti/include/config.php
# vi /usr/share/cacti/include/config.php
28 $database_hostname = "localhost";
29 $database_username = "cactiuser";
30 $database_password = "password";
```

```
# chown -R apache. /usr/share/cacti/
# vi /etc/httpd/conf.d/cacti.conf
```

```
23           Allow from all
```

```
#service httpd start
#chkconfig httpd on
```

B6: cấu hình

ie: <http://192.168.4.101/cacti/>



TRUNG TÂM ĐÀO TẠO CNTT NHẤT NGHỆ  
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### Cacti Installation Guide

Thanks for taking the time to download and install cacti, the complete graphing solution for your network. Before you can start making cool graphs, there are a few pieces of data that cacti needs to know.

Make sure you have read and followed the required steps needed to install cacti before continuing. Install information can be found for Unix and Win32-based operating systems.

Also, if this is an upgrade, be sure to reading the Upgrade information file.

Cacti is licensed under the GNU General Public License, you must agree to its provisions before continuing:

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

**Next >>**

Nhấn Next

### Cacti Installation Guide

Please select the type of installation

New Install

The following information has been determined from Cacti's configuration file. If it is not correct, please edit 'include/config.php' before continuing.

Database User: cactiuser  
Database Hostname: localhost  
Database: cacti  
Server Operating System Type: unix

**Next >>**

Nhấn Next

/usr/bin/snmpgetnext  
[OK: FILE FOUND]

[FOUND] Cacti Log File Path: The path to your Cacti log file.  
/usr/share/cacti/log/cacti.log  
[OK: FILE FOUND]

SNMP Utility Version: The type of SNMP you have installed. Required if you are using SNMP v2c or don't have embedded SNMP support in PHP.  
NET-SNMP 5x ▼

RRDTool Utility Version: The version of RRDTool that you have installed.  
RRDTool 1.3.x ▼

NOTE: Once you click "Finish", all of your settings will be saved and your database will be upgraded if this is an upgrade. You can change any of the settings on this screen at a later time by going to "Cacti Settings" from within Cacti.

**Finish**

Chọn finish, các thông số được cấu hình mặc định khi cài gói rpm



**User Login**

Please enter your Cacti user name and password below:

User Name:

Password:

**Login**

Nhập user: admin  
Password: admin

User Login

\*\*\* Forced Password Change \*\*\*

Please enter a new password for cacti:

Password:

Confirm:

Đổi password lần đầu logon

Console - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Go Links

Address http://192.168.4.101/cacti/

Console graphs

You are now logged into Cacti. You can follow these basic steps to get started.

Version 0.8.7g

- Create devices for network
- Create graphs for your new devices
- View your new graphs

New Graphs

Graph Management

Graph Trees

Data Sources

Devices

Data Queries

Data Input Methods

Graph Templates

Host Templates

Data Templates

Import/Export

Import Templates

Export Templates

Logout User

Trusted sites

Màn hình cacti

Setting: giảm thời gian lấy mẫu:

Console -> Cacti Settings.

**General**

**Enabled**  
If you wish to stop the polling process, uncheck this box.

**Poller Type**  
The poller type to use. This setting will take effect at next polling interval.

**Poller Interval**  
The polling interval in use. This setting will effect how often rrd's are checked and updated. **NOTE:** If you change this value, you must re-create the poller cache. Failure to do so, may result in lost data.

**Cron Interval**  
The cron interval in use. You need to set this setting to the interval that your cron or scheduled task is currently running.

**Maximum Concurrent Poller Processes**  
The number of concurrent processes to execute. Using a higher number when using cmd.php will improve performance. Performance improvements in spine are best resolved with the threads parameter.

**Balance Process Load**  
If you choose this option, Cacti will attempt to balance the load of each poller process by equally distributing poller items per process.

## B7: Giám sát máy Linux

Chọn create device, chọn localhost

Console -> Devices

Description	ID	Graph	Data	Source
localhost	1	4	5	

**SNMP Version:** chọn Version 1

**SNMP Community :** nhập private

Chọn save

SNMP Options

**SNMP Version**  
Choose the SNMP version for this device.

**SNMP Community**  
SNMP read community for this device.

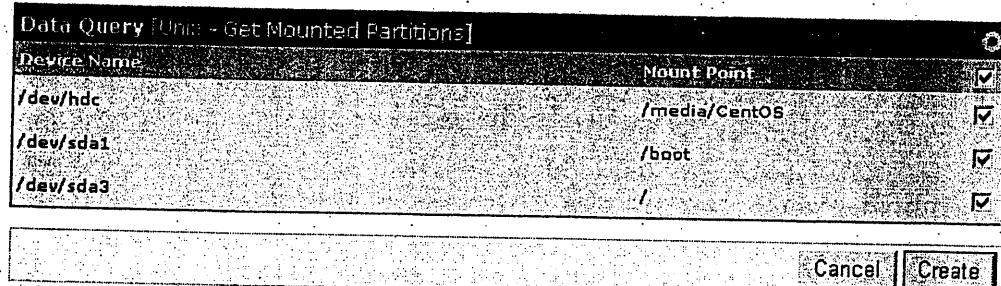
**SNMP Port**  
Enter the UDP port number to use for SNMP (default is 161).

**SNMP Timeout**  
The maximum number of milliseconds Cacti will wait for an SNMP response (does not work with php-snmp support).

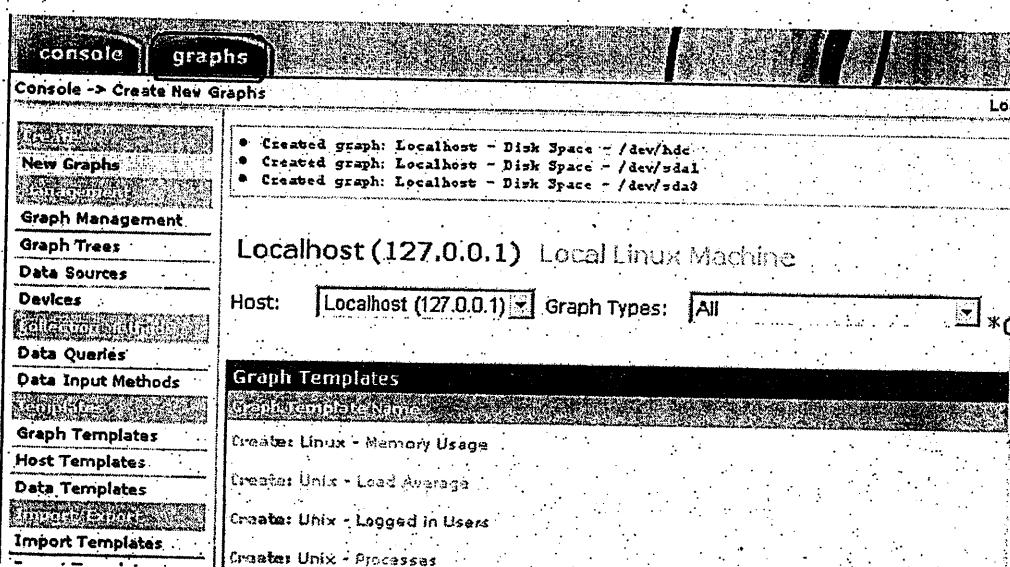
**Maximum OID's Per Get Request**  
Specified the number of OID's that can be obtained in a single SNMP Get request.

**Additional Options**

### Chọn New Graphs

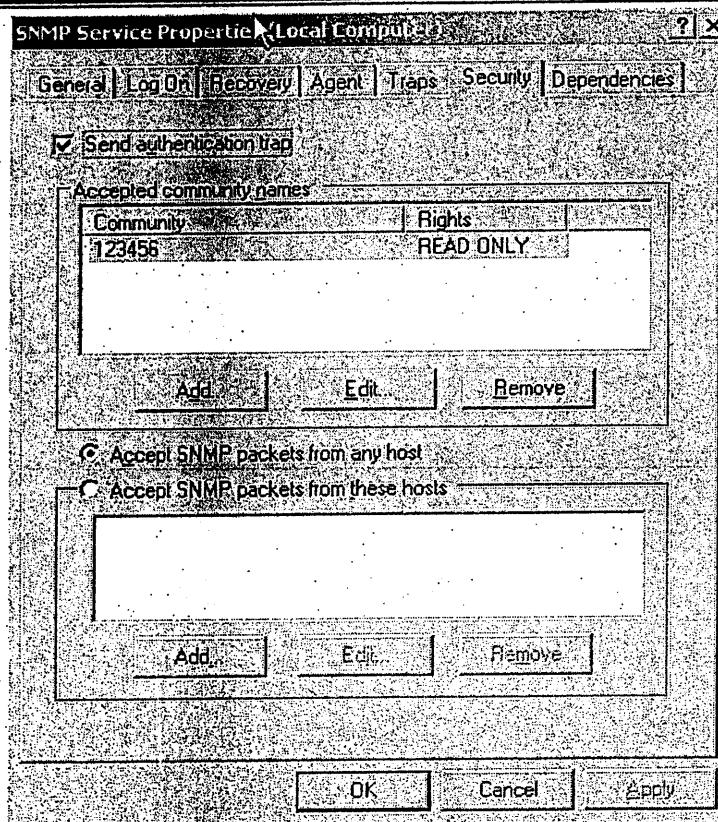


Check vào các mục chọn, Chọn create



### B8: Giám sát windows 2003

Máy windows cài snmp  
services.msc enter -> chọn properties cho snmp service



Trên web cacti, Device, Add New device, nhập các thông tin như hình

**Devices [edit: win2k3]**

**General Host Options**

**Description**  
Give this host a meaningful description.

**Hostname**  
Fully qualified hostname or IP address for this device.

**Host Template**  
Choose what type of host, host template this is. The host template will govern what kinds of data should be gathered from this type of host.

**Disable Host**  
Check this box to disable all checks for this host.

**Availability, Reachability Options**

**Downed Device Detection**  
The method Cacti will use to determine if a host is available for polling.

**NOTE:** It is recommended that, at a minimum, **SNMP** always be selected.

**Ping Timeout Value**  
The timeout value to use for host ICMP and UDP pinging. This host SNMP timeout value applies for SNMP pings.

**Ping Retry Count**  
After an initial failure, the number of ping retries Cacti will attempt before failing.

**SNMP Options**

**SNMP Version**  
Choose the SNMP version for this device.

**SNMP Community**  
SNMP read community for this device.

**SNMP Port**  
Enter the UDP port number to use for SNMP (default is 161).

Chọn các thành phần cần giám sát  
 Chọn save

Chọn Create Graphs for this Host

#### B9: Giám sát router

- Import Templates: chọn import, lần lượt import các template của Cisco
- Cài GNS3, cấu hình các thông tin cho router 2600
- Nối Cloud với router trên f0/0
- Khởi động và cấu hình cho router:

```
Router>enable
Router#configure terminal
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip address 192.168.1.10 255.255.255.0
Router(config-if)#no shutdown
Router(config)#end
```

```
Router#show interfaces fastEthernet 0/0
FastEthernet0/0 is up, line protocol is up
  Hardware is AmdFE, address is c800.01e4.0000 (bia c800.01e4.0000)
  Internet address is 192.168.1.10/24
    MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
      reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
```

```
Router#show ip interface brief
Interface          IP-Address      OK? Method Status      Protocol
FastEthernet0/0     192.168.1.10   YES NVRAM up           up
FastEthernet0/1     192.168.3.2   YES manual up        up
FastEthernet1/0     unassigned     YES unset administratively down
down
FastEthernet1/1     unassigned     YES unset administratively down
down
FastEthernet1/2     unassigned     YES unset administratively down
```

Kích hoạt snmp trap trên router:

```
Router#configure terminal
Router(config)#snmp-server community public ro
```

Lưu cấu hình:

```
copy running-config startup-config
```

Trên web cacti, Device, Add New device

Khai báo các thông tin:

Devices [edit: router 2600]

General Host Options

Description: router 2600  
Give this host a meaningful description.

Hostname: 192.168.1.10  
Fully qualified hostname or IP address for this device.

Host Template: Cisco - 2600/3600  
Choose what type of host host template this is. The host template will govern what kinds of data should be gathered from this type of host.

Disable Host:  Disable Host  
Check this box to disable all checks for this host.

Availability/Reachability Options

Downed Device Detection: SNMP  
The method Cacti will use to determine if a host is available for polling.  
NOTE: It is recommended that, at a minimum, SNMP always be selected.

Ping Timeout Value: 400  
The timeout value to use for host ICMP and UDP pinging. This host SNMP timeout value applies for SNMP pings.

Ping Retry Count: 1  
After an initial failure, the number of ping retries Cacti will attempt before failing.

SNMP Options

SNMP Version: Version 1  
Choose the SNMP version for this device.

SNMP Community: public  
SNMP read community for this device.

SNMP Port: 161  
Enter the UDP port number to use for SNMP (default is 161).

SNMP Timeout: 500  
The maximum number of milliseconds Cacti will wait for an SNMP response (does not work with php-snmp support).

Maximum OID's Per Get Request: 10  
Specified the number of OID's that can be obtained in a single SNMP Get request.

Chọn các thành phần cần giám sát

Chọn save

Chọn Create Graphs for this Host

#### B10: Giám sát máy Linux

Cài gói: yum install net-snmp net-snmp-utils

Cấu hình:

#vi /etc/snmp/snmpd.conf

Thêm và cuối file dòng sau:

rocommunity public

Khởi động:

```
#chkconfig snmpd on
#service snmpd start
```

Trên web cacti, Device, Add New device

Khai báo các thông tin:

Devices [edit: node1]

General Host Options

Description: Give this host a meaningful description.

Hostname: Fully qualified hostname or IP address for this device.

Host Template: Choose what type of host host template this is. The host template will govern what kinds of data should be gathered from this type of host.

Disable Host: Check this box to disable all checks for this host.

Availability/Reachability Options

Downed Device Detection: The method Cacti will use to determine if a host is available for polling. NOTE: It is recommended that, at a minimum, SNMP always be selected.

Ping Timeout Value: The timeout value to use for host ICMP and UDP pinging. This host SNMP timeout value applies for SNMP pings.

Ping Retry Count: After an initial failure, the number of ping retries Cacti will attempt before failing.

SNMP Options

SNMP Version: Choose the SNMP version for this device.

SNMP Community: SNMP read community for this device.

B11: Quản lý các thiết bị  
Graph Trees, add, nhập windows 2k3 server, chọn Create

Graph Trees [new...]

Name: windows 2k3 server

Sorting Type: Manual Ordering (No Sorting)

Cancel Create

Lắp lại cho các đề mục Linux server, Switch cisco

Graph Trees

Add

Default Tree

Linux server

Switch Cisco

Windows 2k3 server

Phân bố các device theo đề mục  
Chọn windows 2k3 server, add, nhập thông tin cho host cần add, create

Parent Item: Choose the parent for this header/graph. root

Tree Item Type: Choose what type of tree item this is. Host

Host: Choose a host here to add it to the tree. win2k3 (192.168.1.11)

Graph Grouping Style: Choose how graphs are grouped when drawn for this particular host on the tree.

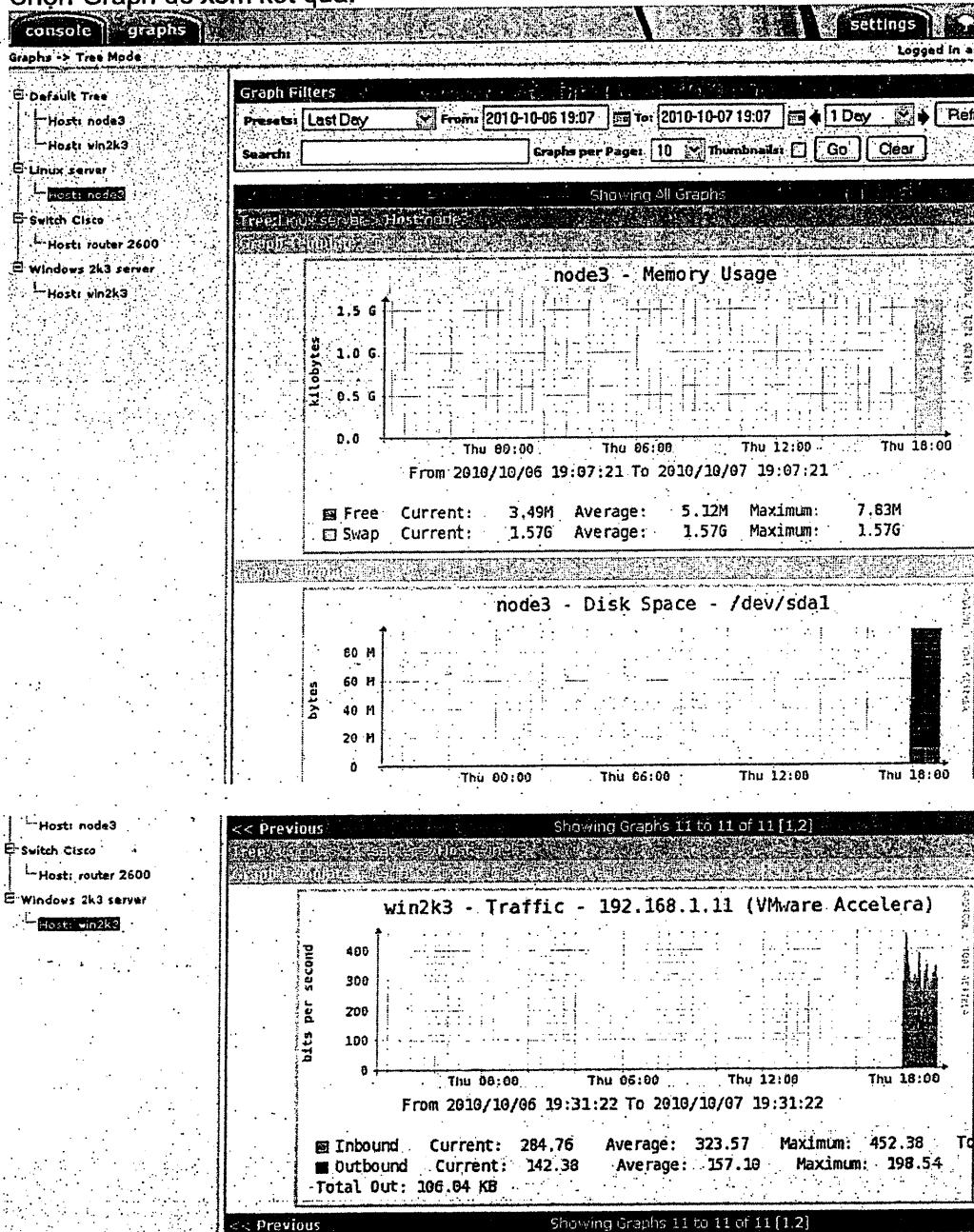
Round Robin Archive: Choose a round robin archive to control how Graph Thumbnails are displayed when using Tree Export.

Graph Template: Hourly (1 Minute Average)

Cancel Create

Lắp lại cho các thiết bị và đề mục khác

Chọn Graph để xem kết quả:



## OpenVZ

OpenVZ consists of a kernel, user-level tools and templates. Kernel and tools are needed to install OpenVZ, and templates are needed to create containers.

### 1. Cài đặt

#### B1. yum pre-setup

```
wget -P /etc/yum.repos.d/ http://ftp.openvz.org/openvz.repo
```

Import OpenVZ GPG key used for signing RPM packages:

```
rpm --import http://ftp.openvz.org/RPM-GPG-Key-OpenVZ
```

#### b2. Kernel installation

```
yum install vzkernel
```

#### b3. System configuration

```
#vi /etc/sysctl.conf
```

Sửa và thêm các dòng sau:

```
# On Hardware Node we generally need
# packet forwarding enabled and proxy arp disabled
net.ipv4.ip_forward = 1
net.ipv6.conf.default.forwarding = 1
net.ipv6.conf.all.forwarding = 1
net.ipv4.conf.default.proxy_arp = 0

# Enables source route verification
net.ipv4.conf.all.rp_filter = 1

# Enables the magic-sysrq key
kernel.sysrq = 1

# We do not want all our interfaces to send redirects
net.ipv4.conf.default.send_redirects = 1
net.ipv4.conf.all.send_redirects = 0
```

#### SELinux

```
echo "SELINUX=disabled" > /etc/sysconfig/selinux
```

#### b4. Tools installation

OpenVZ needs some user-level tools installed:

```
yum install vzctl vzquota ploop
```

Chú ý:

Có thể cài các gói thủ công:

```
kernel-firmware-2.6.32-504.12.2.el6.noarch.rpm
vzkernel-2.6.32-042stab105.14.x86_64.rpm
```

e2fsprogs-resize2fs-static-1.42.11-1.ovz.x86\_64.rpm  
ploop-1.12.2-1.x86\_64.rpm  
ploop-lib-1.12.2-1.x86\_64.rpm  
vzctl-4.8-1.x86\_64.rpm  
vzctl-core-4.8-1.x86\_64.rpm  
vzquota-3.1-1.x86\_64.rpm  
vzstats-0.5.3-1.noarch.rpm

Quá trình cài đặt sẽ thay đổi menu grub  
#vi /boot/grub/menu.lst

```
#boot=/dev/sda
default=0
timeout=5
splashimage=(hd0,0)/grub/splash.xpm.gz
hiddenmenu
title OpenVZ (2.6.32-042stab105.14)
    root (hd0,0)
    kernel /vmlinuz-2.6.32-042stab105.14 ro root=UUID=7eb70bfe-611e-460e-b21f-
8c9acb6d91fc rd_NO_LUKS rd_NO_LVM LANG=en_US.UTF-8 rd_NO_MD
SYSFONT=tatarcyrheb-sun16 crashkernel=128M KEYBOARDTYPE=pc KEYTABLE=us
rd_NO_DM rhgb quiet
    initrd /initramfs-2.6.32-042stab105.14.img
title CentOS 6 (2.6.32-504.el6.x86_64)
    root (hd0,0)
    kernel /vmlinuz-2.6.32-504.el6.x86_64 ro root=UUID=7eb70bfe-611e-460e-b21f-
8c9acb6d91fc rd_NO_LUKS rd_NO_LVM LANG=en_US.UTF-8 rd_NO_MD
SYSFONT=tatarcyrheb-sun16 crashkernel=128M KEYBOARDTYPE=pc KEYTABLE=us
rd_NO_DM rhgb quiet
    initrd /initramfs-2.6.32-504.el6.x86_64.img
```

### B5. Reboot into OpenVZ

Now reboot the machine and choose "OpenVZ" on the boot loader menu (it should be default choice).

### Download OS templates

<http://download.openvz.org/template/precreated/>

basic operations in OpenVZ environment

[http://openvz.org/Basic\\_operations\\_in\\_OpenVZ\\_environment](http://openvz.org/Basic_operations_in_OpenVZ_environment)

kiểm tra:

```
# uname -r
2.6.18-194.17.1.el5.0.028stab070.7
```

## 2. Tạo máy ảo

- Cần phải có template của distribution cần tạo máy ảo chép vào thư mục /vz/template/cache

- Các template download từ:

<http://wiki.openvz.org/Download/template/precreated>

vd: download và chép file centos-5-x86\_64.tar.gz vào /vz/template/cache

- Để setup VPS từ default CentOS 5 template:

```
# cd /etc/vz/conf/  
# mv ve-basic.conf-sample ve-vps.basic.conf-sample  
#vzctl create 101 --ostemplate centos-5-x86_64 --config vps.basic
```

```
# vzctl create 101 --ostemplate centos-5-x86_64 --config vps.basic  
Creating container private area (centos-5-i386-default)  
Performing postcreate actions  
Container private area was created
```

Hoặc :

```
vzctl create 101 \  
--ostemplate centos-5-x86_64 \  
--conf vps.basic \  
--ipadd 192.168.1.10 \  
--hostname may1.nhatnghe1.com
```

Mỗi virtual machine có 1 unique ID, máy vừa tạo có ID là 101

Máy được boot khi khởi động:

```
# vzctl set 101 --onboot yes --save
```

Đặt IP và tên máy:

```
# vzctl set 101 --hostname may1.nhatnghe1.com --save  
# vzctl set 101 --ipadd 192.168.1.10 --save
```

Set số socket 120 và nameserver

```
# vzctl set 101 --numothersock 120 --save  
# vzctl set 101 --nameserver 203.162.4.191 --nameserver 8.8.8.8 --save
```

Start máy ảo

```
# vzctl start 101
```

Đặt password

```
# vzctl exec 101 passwd
```

Kết nối đến máy ảo bằng ssh

```
# vzctl enter 101
```

To leave the vm's console, type

Exit

To stop a vm, run

```
vzctl stop 101
```

To restart a vm, run

```
vzctl restart 101
```

To delete a vm from the hard drive

```
vzctl destroy 101
```

To get a list of your vms and their statuses

```
vzlist --a
```

To find out about the resources allocated to a vm, run

Mount resources from physcal machine:

```
vzctl set 101 --devnodes sdb:rw --save
```

```
vzctl set 101 --devnodes hdc:r --save
```

### Disk Quota Parameters

--diskspace.num[:num]

sets soft and hard disk quota limits, in blocks. First parameter is soft limit, second is hard limit. One block is currently equal to 1Kb. Suffixes G, M, K can also be specified (see Resource limits section for more info on suffixes).

--diskinodes num[:num]

sets soft and hard disk quota limits, in i-nodes. First parameter is soft limit, second is hard limit.

--quotatime.seconds

sets quota grace period. Container is permitted to exceed its soft limits for the grace period, but once it has expired, the soft limit is enforced as a hard limit.

Ví dụ:

```
vzctl set 101 --diskspace 1500000:1900000 --save
```

```
vzctl set 101 --diskinodes 90000:91000 --save
```

```
vzctl set 101 --quotatime 600 --save
```

Kiểm tra disk cấp phát

```
vzctl exec 101 df ; thực thi lệnh df trong máy 101
```

Kiểm tra trạng thái quota

```
vzctl exec 101 stat -f /
```

resource	usage	softlimit	hardlimit	grace
1k-blocks	522132	1500000	1900000	
inodes	26534	90000	91000	

### Managing CPU Share

#### cpuunits

This is a positive integer number that determines the minimal guaranteed V share of the CPU time the corresponding Virtual Private Server will receive.

#### cpulimit

This is a positive number indicating the CPU time in per cent the corresponding VPS is not allowed to exceed

Lấy thông số share mặc định gán chp VPS

```
#vzcpuchcheck
```

```
Current CPU utilization: 2000
```

Power of the node: 150000

Ví dụ: máy 101 được phép dùng tối thiểu 2% ( $150000 \times 2\% = 7500$ ) ngay cả khi CPU đã dùng hết công suất và không vượt quá 4%CPU time

```
#vzctl set 101 --cpuunits 7500 --cpulimit 4 --save
```

Kiểm tra

```
#vzcpuchcheck
```

Current CPU utilization: 8575

Power of the node: 150000

limit memory for VE on openvz mem:swap

```
vzctl set 101 --oomguarpages 128M:2147483647 --save
```

Theo dõi tài nguyên hệ thống được dùng

```
vzctl exec 101 cat /proc/user_beancounter
```

### 3. ovz-web-panel

Quản trị openvz bằng web

```
#wget -O - http://ovz-web-panel.googlecode.com/svn/installer/ai.sh | sh
```

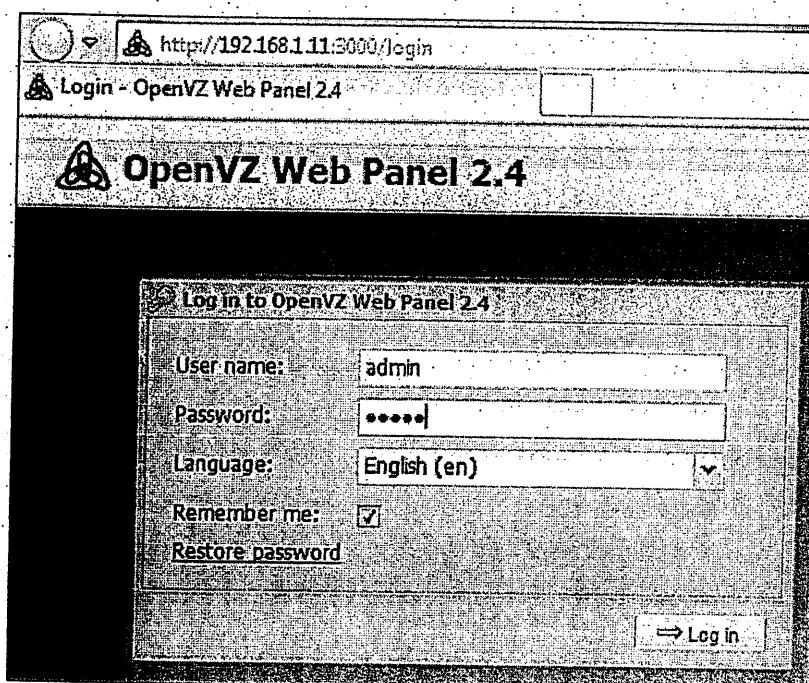
```
# service owpd status
```

```
http://ip-address:3000
```

Username: admin

Password: admin

B1. Đăng nhập



B2. Quan sát máy ảo đã tạo

## OpenVZ Web Panel 2.4

**Physical Server localhost**

**OS Templates** **Server Templates**

**Physical server statistics**

Parameter	Value
OS version	Linux 2.6.32-042stab105
CPU load average	0.00, 0.03, 0.05
Disk usage, partition /	18
Disk usage, partition /boot	39
Memory usage	19

**Virtual servers list**

Create virtual server	Remove virtual server	Change settings	
State	VETH	IP Address	Host Name
<input checked="" type="checkbox"/>	101	192.168.1.10	may1.nhatnghe1....

**OS templates:** các file image của OS có thể download về trước vào down tại đây

**Server template:** các file cấu hình mẫu cho server sẽ tạo mới

**Physical Server localhost**

**OS Templates** **Server Templates**

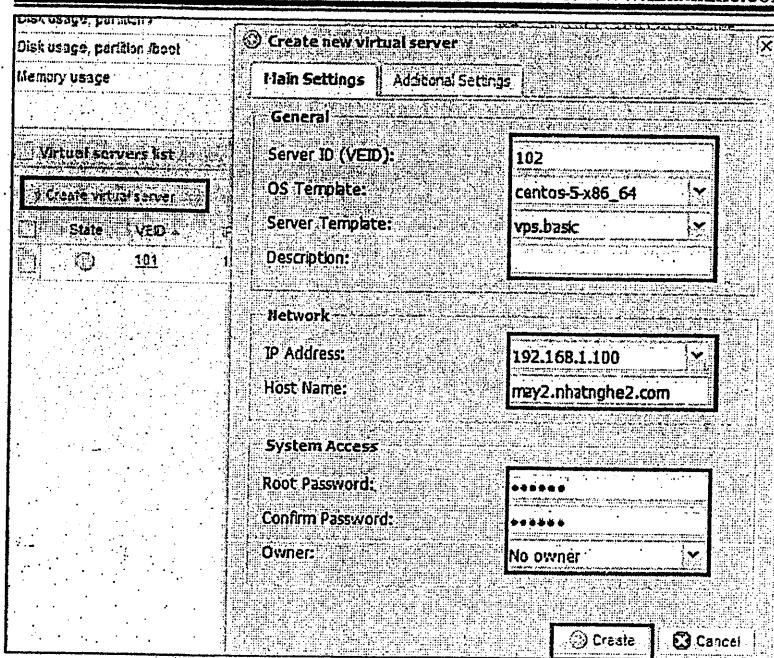
**Physical server statistics**

Parameter	Value
OS version	Li
CPU load average	0.

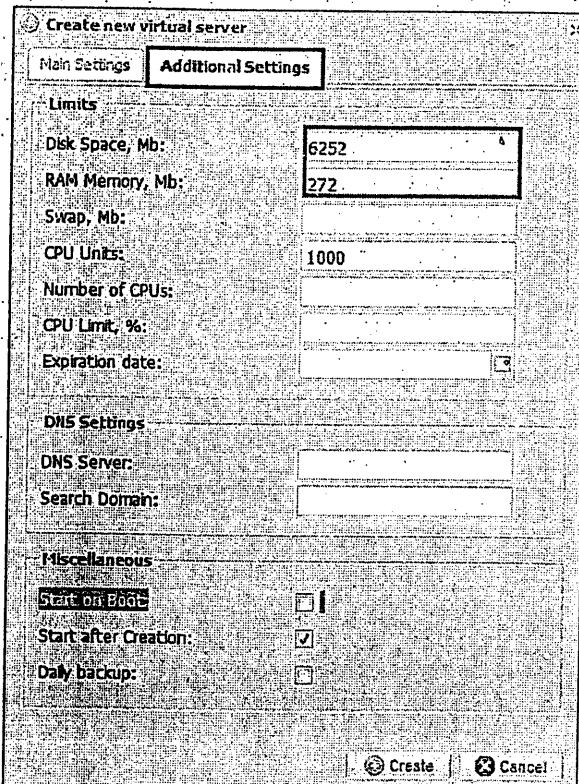
Tạo mới máy ảo

Nhấn Create virtual machine, main setting

Khai báo các thông số



Chọn Additional Setting, khai báo ram, harddisk ..



Nhấn create

Máy ảo mới đã được tạo và khởi động

The screenshot shows a web-based management interface for a physical server. On the left is a sidebar menu with the following items:

- General
  - Dashboard
  - Physical Servers
    - localhost
  - IP Addresses
  - My Profile
  - Users
  - Requests
  - Tasks
  - Events Log
  - Logout
- Help
- Documentation
- Support

The main content area is titled "Physical Server localhost". It contains two tabs: "OS templates" (selected) and "Server templates". Below this is a section titled "Physical server statistics" with a table showing the following data:

Parameter	Value
OS version	Linux 2.6.32-042stab105.1
CPU load average	0.00, 0.04, 0.03
Disk usage, partition /	23%
Disk usage, partition /boot	39%
Memory usage	12%

Below the statistics is a "Virtual servers list" section. It includes buttons for "Create virtual server", "Remove virtual server", and "Change settings". A table lists three virtual servers:

	State	Veid	IP Address	Host Name
<input type="checkbox"/>		101	192.168.1.10	may1.nhatnghe1.com
<input checked="" type="checkbox"/>		102	192.168.1.100	may2.nhatnghe2.com
<input type="checkbox"/>		103	192.168.1.101	node1

Change setting: có thể thay đổi dung lượng RAM, disk cho máy ảo

Ping kiểm tra

```
[root@localhost ~]# ping 192.168.1.100
PING 192.168.1.100 (192.168.1.100) 56(84) bytes of data.
64 bytes from 192.168.1.100: icmp_seq=1 ttl=64 time=0.184 ms
64 bytes from 192.168.1.100: icmp_seq=2 ttl=64 time=0.051 ms
```



NHẤT NGHỆ

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## Phần V: Database

## Install Oracle 11G

### Phần 1: Chuẩn bị:

Đặt tên máy

```
vi /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=may1.nhatnghe1.com
```

Sửa file hosts

```
192.168.1.10 may1.nhatnghe1.com may1
```

### b1: Cài đặt các gói phụ thuộc

c1. Cài từ internet

```
yum -y install binutils compat-libstdc++-33 elfutils-libelf elfutils-libelf-devel glibc glibc-common glibc-devel gcc gcc-c++ libaio libaio-devel libgcc libstdc++ libstdc++-devel make sysstat unixODBC unixODBC-devel
```

c2. Cài từ dvd

Chạy các lệnh sau để cài thư viện từ DVD

```
mkdir /media/cdrom
mount /dev/cdrom /media/cdrom
rpm --import /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-6
```

```
yum --disablerepo='*' --enablerepo=c6-media groupinstall "Compatibility libraries" -y
yum --disablerepo='*' --enablerepo=c6-media groupinstall "Development tools" -y
yum --disablerepo='*' --enablerepo=c6-media install /media/cdrom/Packages/perl-*.rpm -y
yum --disablerepo='*' --enablerepo=c6-media groupinstall "Server Platform Development" -y
```

hoặc:

```
bash install.lib
rpm -ivh pdksh-5.2.14-37.el5_8.1.i386.rpm
rpm -ivh /media/cdrom/Packages/unixODBC-2.2.14-11.el6.i686.rpm
rpm -ivh /media/cdrom/Packages/unixODBC-devel-2.2.14-11.el6.i686.rpm
rpm -ivh /media/cdrom/Packages/elfutils-libelf-devel-0.152-1.el6.i686.rpm
rpm -ivh /media/cdrom/Packages/libaio-devel-0.3.107-10.el6.i686.rpm
```

### b2: Chỉnh sửa các thông số hệ thống

```
vi /etc/sysctl.conf
# thêm các dòng sau vào cuối file
```

```
kernel.sem = 250 32000 100 128
fs.file-max = 6815744
net.ipv4.ip_local_port_range = 9000 65500
net.core.rmem_default = 262144
net.core.rmem_max = 4194304
net.core.wmem_default = 262144
net.core.wmem_max = 1048576
```

fs.aio-max-nr = 1048576

Lưu lại, và nhập lệnh sysctl -p để các thông số có hiệu lực  
sysctl -p

**b3: Tạo users, groups và thiết đặt môi trường cho Oracle**

```
groupadd oinstall
groupadd dba
useradd -m -g oinstall -G dba -s /bin/bash oracle
passwd oracle
```

**b4. Chính sửa file /etc/pam.d/login**

```
vi /etc/pam.d/login
Dòng13: session required /lib/security/pam_limits.so
Dòng14: session required pam_limits.so
```

**B5. Chính sửa file /etc/security/limits.conf**

```
vi /etc/security/limits.conf
# them cac dong sau vao cuoi file
oracle soft nproc 2047
oracle hard nproc 16384
oracle soft nofile 1024
oracle hard nofile 65536
```

**b6. Tạo profile mới custom.sh**

```
vi /etc/profile.d/custom.sh
if [ $USER == "oracle" ]; then
    if [ $SHELL == "/bin/ksh" ]; then
        ulimit -p 16384
        ulimit -n 65536
    else
        ulimit -u 16384 -n 65536
    fi
fi
```

**b7. Tạo thư mục cài đặt và gán quyền**

```
mkdir -p /opt/app/oracle/product/11.2.0
chown -R oracle:oinstall /opt/app
chmod -R 775 /opt/app
```

**b8. sửa bash\_profile của user oracle**

```
su - oracle
vi ~/.bash_profile
# them cac dong sau vao cuoi file
umask 022

export ORACLE_BASE=/opt/app/oracle
export ORACLE_HOME=$ORACLE_BASE/product/11.2.0/db_1
export LD_LIBRARY_PATH=$ORACLE_HOME/lib:/lib:/usr/lib
export PATH=$ORACLE_HOME/bin:$PATH
```

## Phần 2: Cài đặt Oracle

### 1. Login voi user oracle(X11)

Chép các file cài đặt vào thư mục /soft

mkdir ~/database

cd soft

unzip linux\_11gR2\_database\_1of2.zip

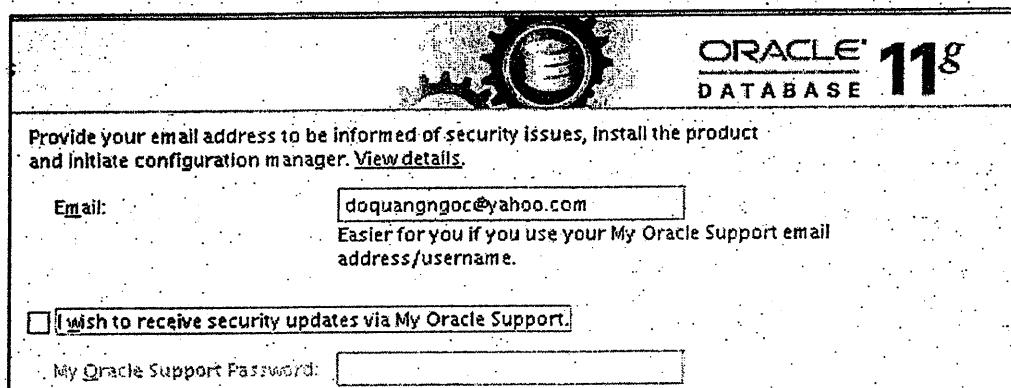
unzip linux\_11gR2\_database\_2of2.zip

cd database

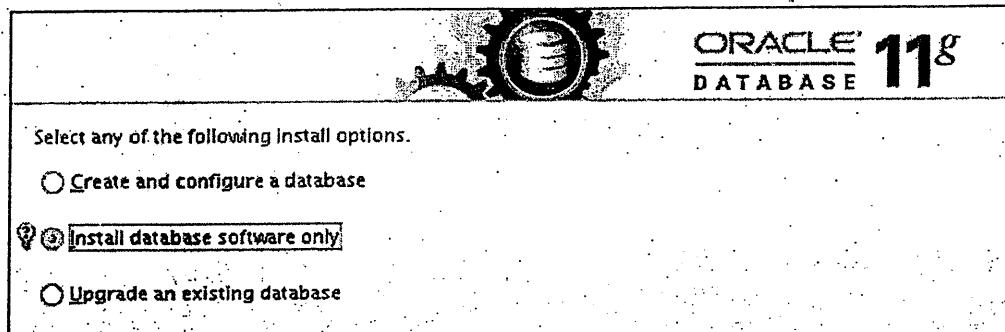
chmod -R 777 \*

./runInstaller

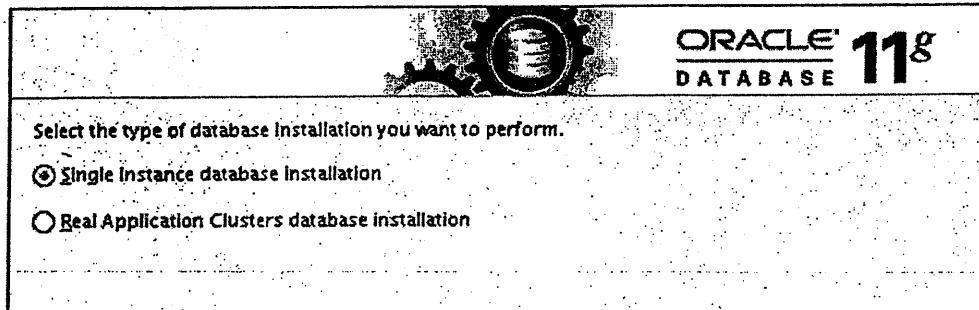
### 2. Nhập địa chỉ mail, nhấn Next



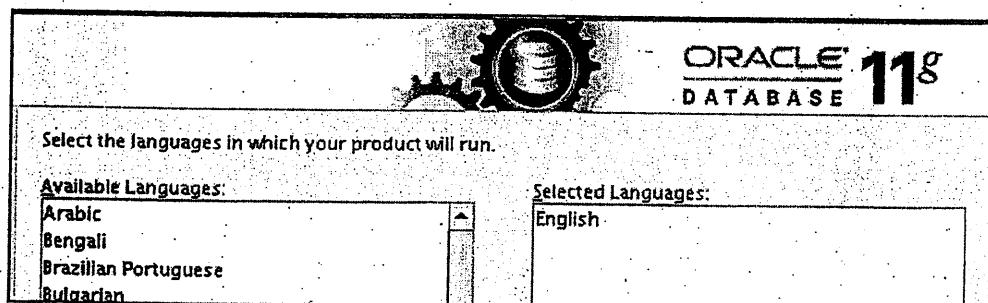
### 3. Chọn Install database software only



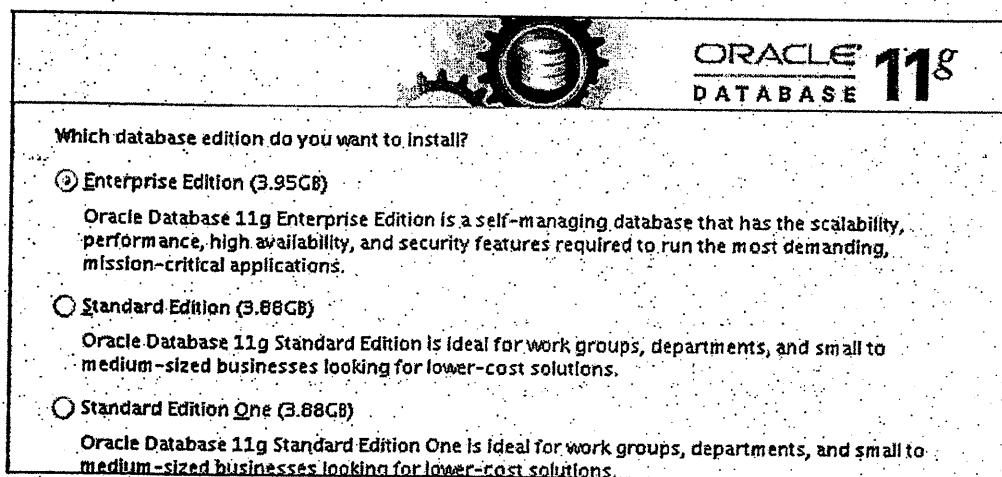
### 4. Chọn Single instance database installation, Next



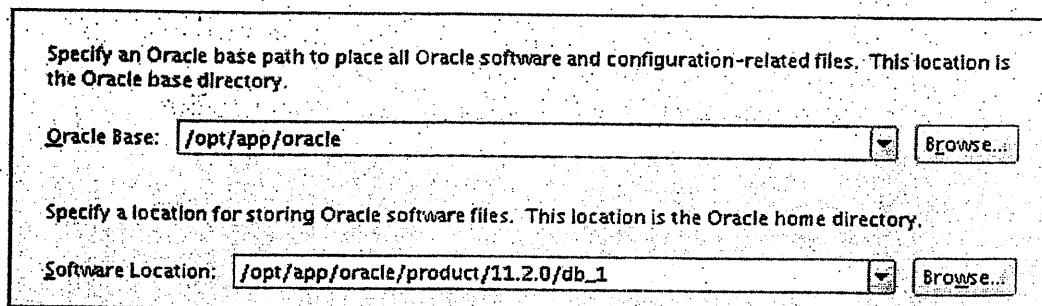
## 5. Ngôn ngữ sử dụng



## 6. Xác nhận phiên bản cài đặt, next



## 7. Vị trí cài đặt



## 8. Nơi chứa inventory

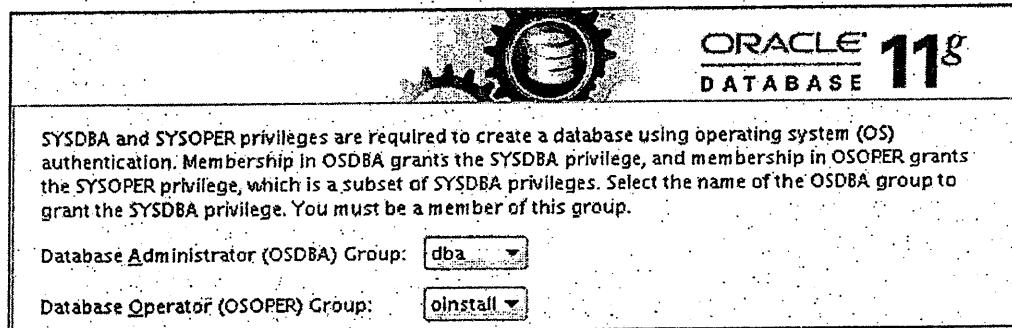
You are starting your first installation on this host. Specify a directory for installation files. This directory is called the "inventory directory". The installer automatically sets up subdirectories for each product to contain inventory data. The subdirectory for each product typically requires 150 kilobytes of disk space.

Inventory Directory:

Specify an operating system group whose members have write permission to the inventory directory (orainventory).

orainventory Group Name:

## 9. Quyền quản trị

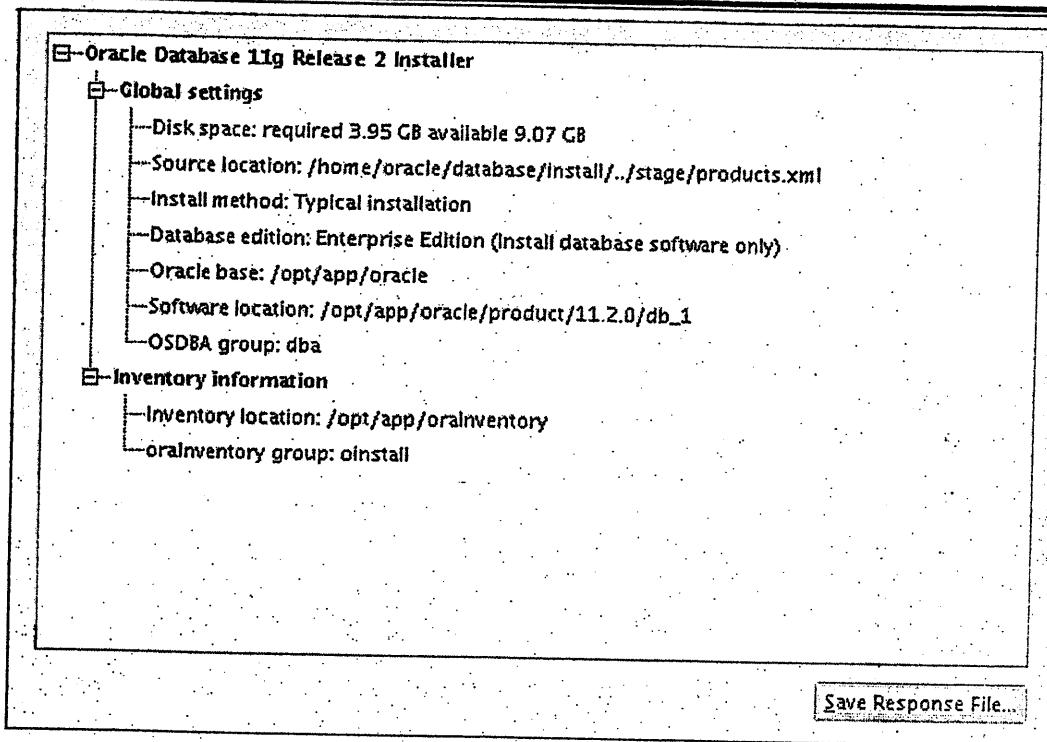


## 10. Kiểm tra cấu hình cài đặt

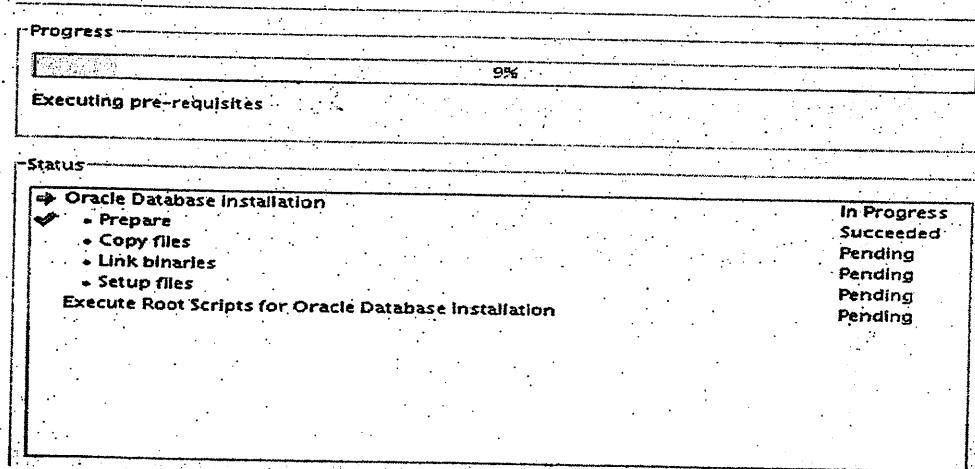
Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

<input type="button" value="Check Again"/>	<input type="button" value="Fix &amp; Check Again"/>	<input type="button" value="Show Failed"/>	<input type="checkbox"/> Ignore All	
		Checks	Status	Fixable
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Checks		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Packages		
		Package: elfutils-libelf-devel-0.9.7		
		Package: libaio-devel-0.3.105	Failed	

## 11. Summary

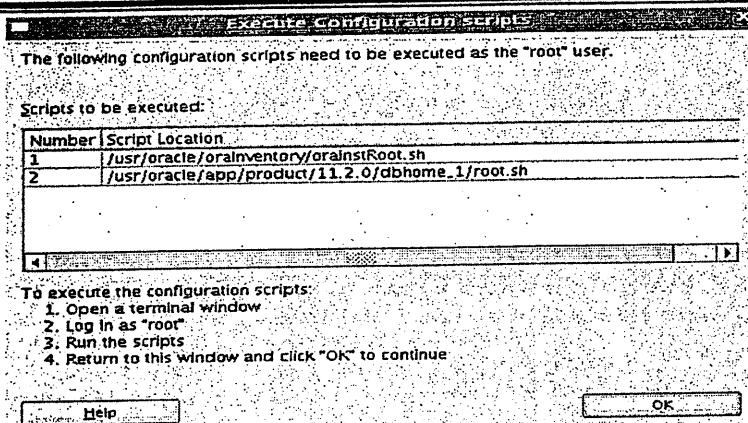


## 12. Quá trình cài đặt bắt đầu

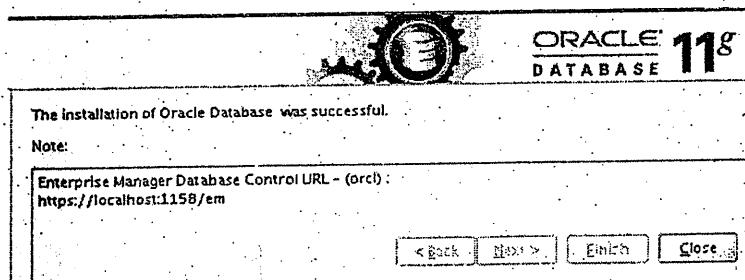


Khi xuất hiện màn hình sau, thực hiện:

```
#su - root  
/opt/app/orainventory/orainstRoot.sh  
/opt/app/oracle/product/11.2.0/db_1/root.sh  
#exit
```



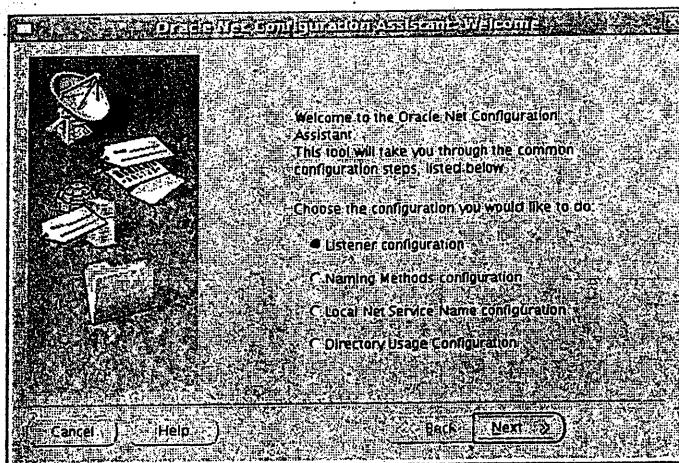
Nhấn OK



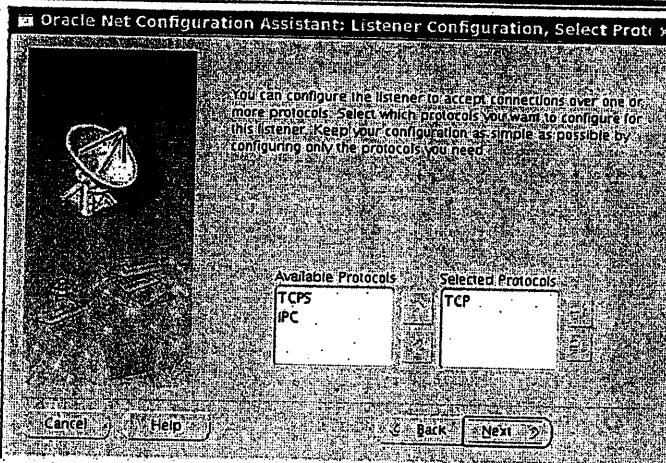
Nhấn close, quá trình cài đặt kết thúc

### Phần 3: Tao listener

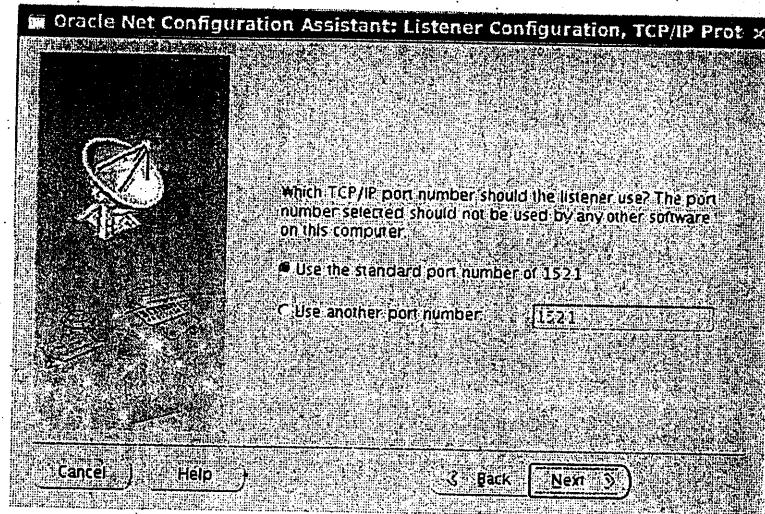
1. ./opt/app/oracle/product/11.2.0/dbhome\_1/bin/netca
- Next,next



2.Chọn giao thức tcp



### 3. Xác nhận port



### 4. No, Next, finish

### 5. lsnrctl stop LISTENER

```
lsnrctl start LISTENER
lsnrctl status LISTENER
tnsping localhost 1521
tnsping myserver 1521
```

### 6. Thêm vào bash\_profile của user oracle

```
su - oracle
vi ~/.bash_profile
export ORACLE_SID=orcl
export ORACLE_HOME_LISTNER=LISTENER
```

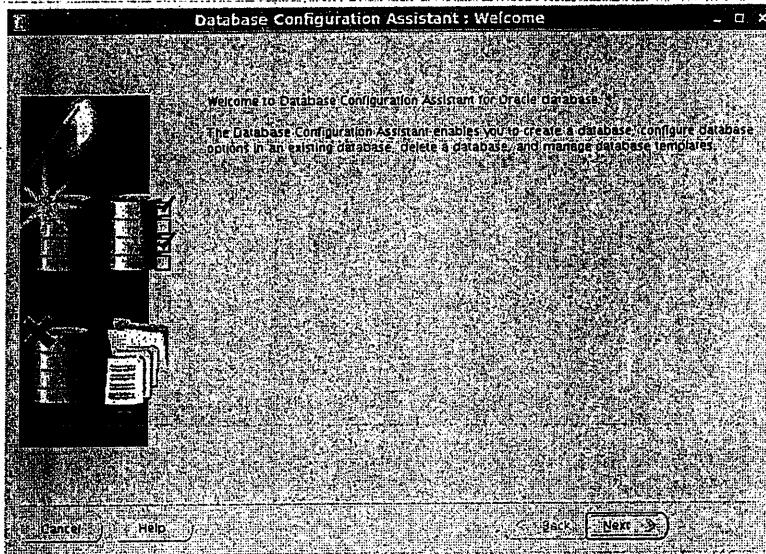
Thực thi:

```
..bash_profile
```

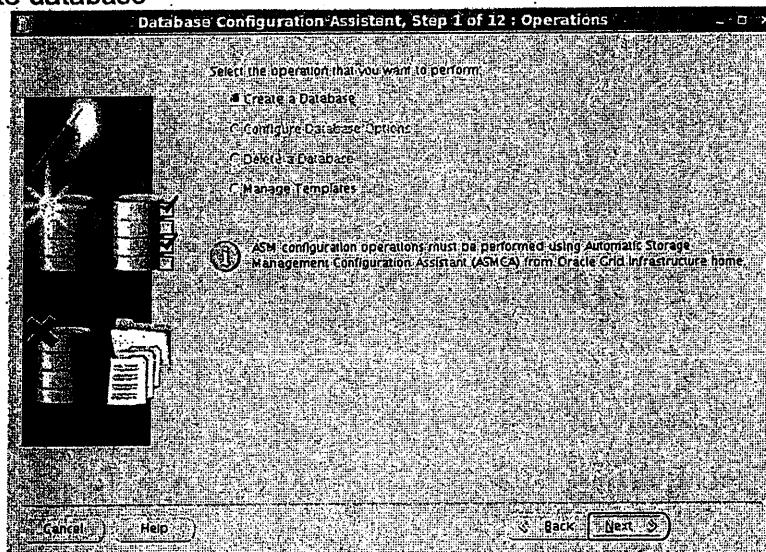
### Phần 4: Tao database

```
/opt/app/oracle/product/11.2.0/dbhome_1/bin/dbca
```

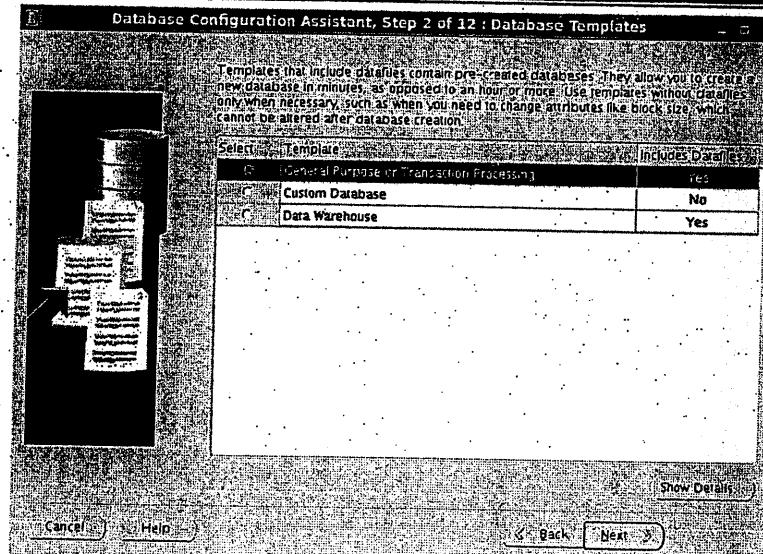
### 1. Nhấn Next



### 2. Chọn create database



### 3. Chọn Template : General purpose or ...



#### 4. Nhập thông tin cho database

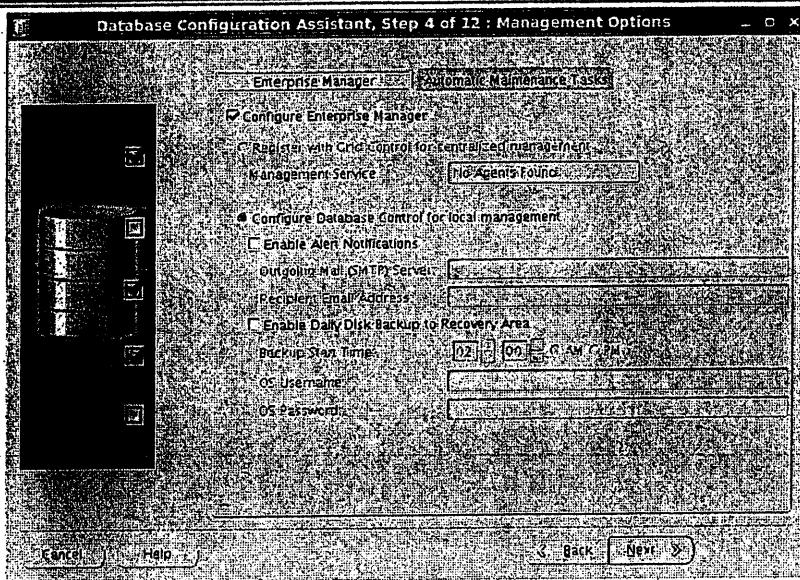
An Oracle database is uniquely identified by a Global Database Name, typically of the form "name.domain".

Global Database Name: orcl.quangngoc.com

A database is referenced by at least one Oracle instance which is uniquely identified from any other instance on this computer by an Oracle System Identifier (SID).

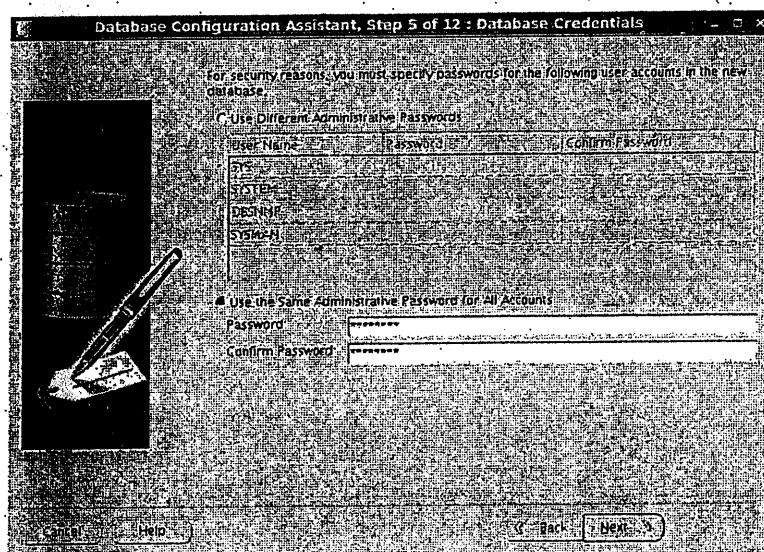
SID:	orcl
------	------

#### 5. Thiết đặt tùy chọn quản trị

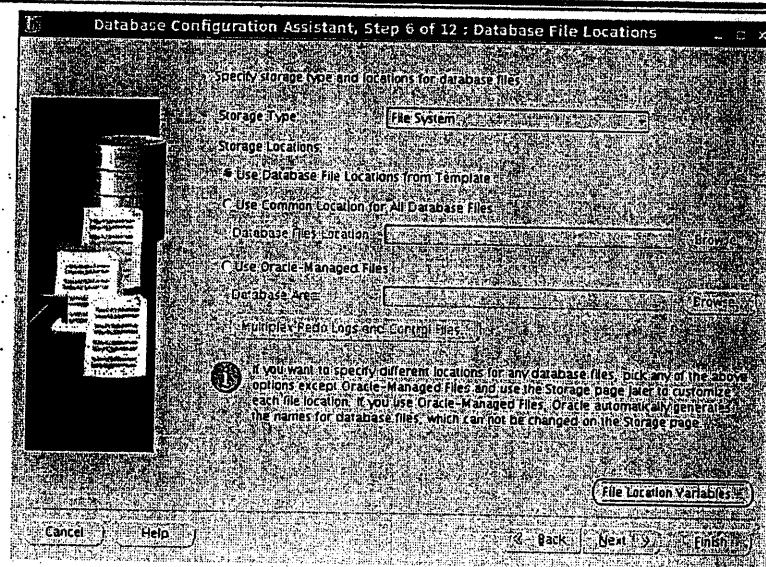


## 6. Mật khẩu quản trị database

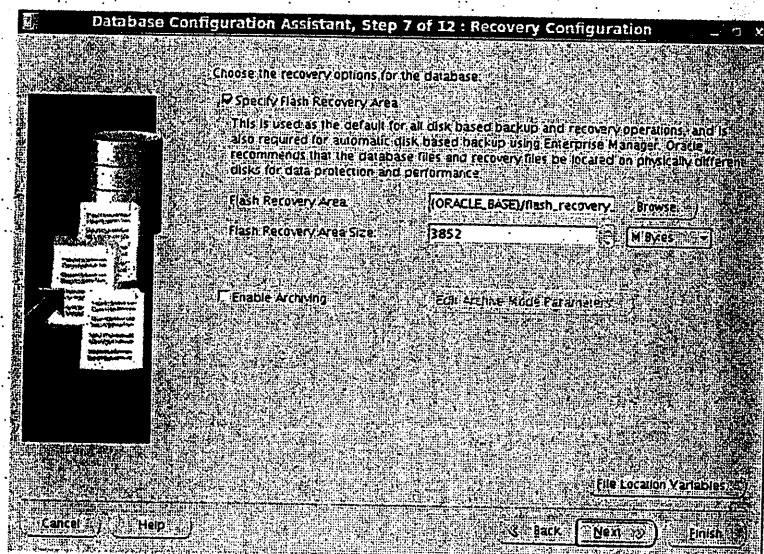
Ví dụ: Quangngoc70



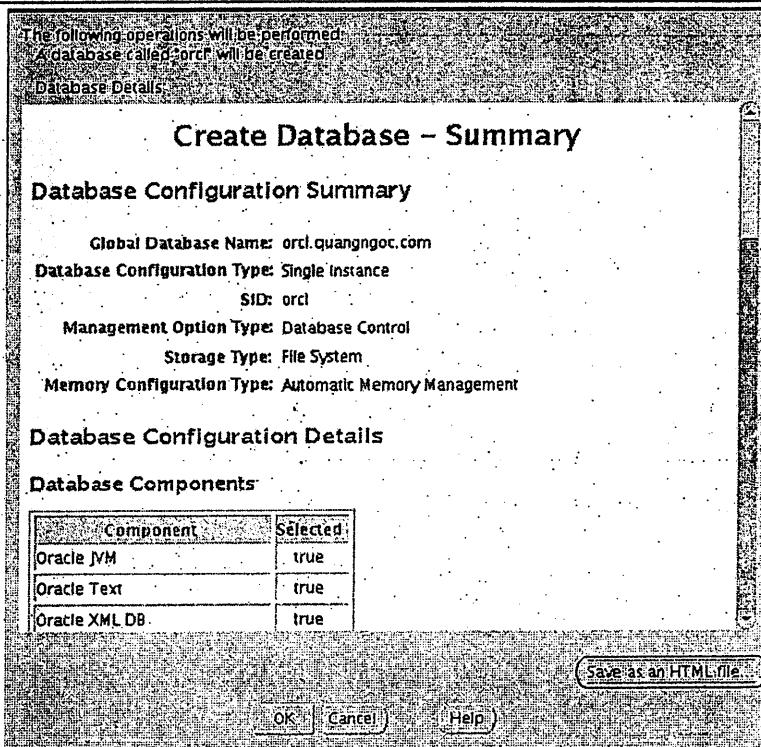
## 7. Nơi lưu database



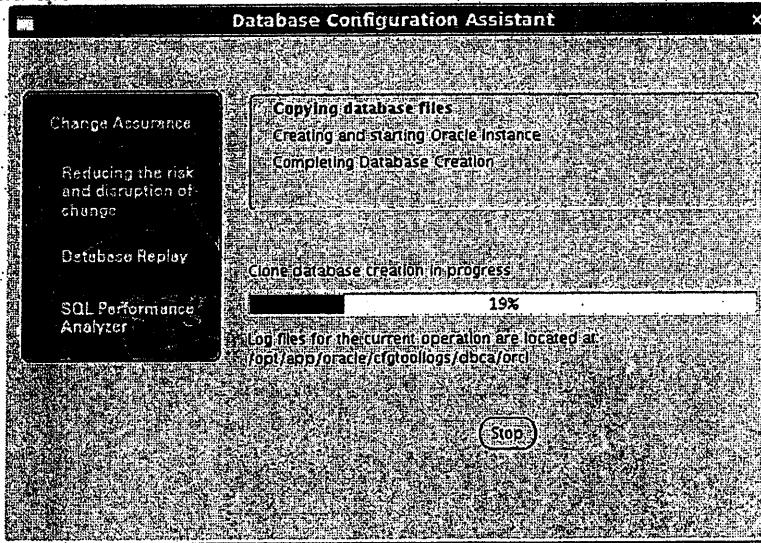
## 8. Cấu hình Recovery



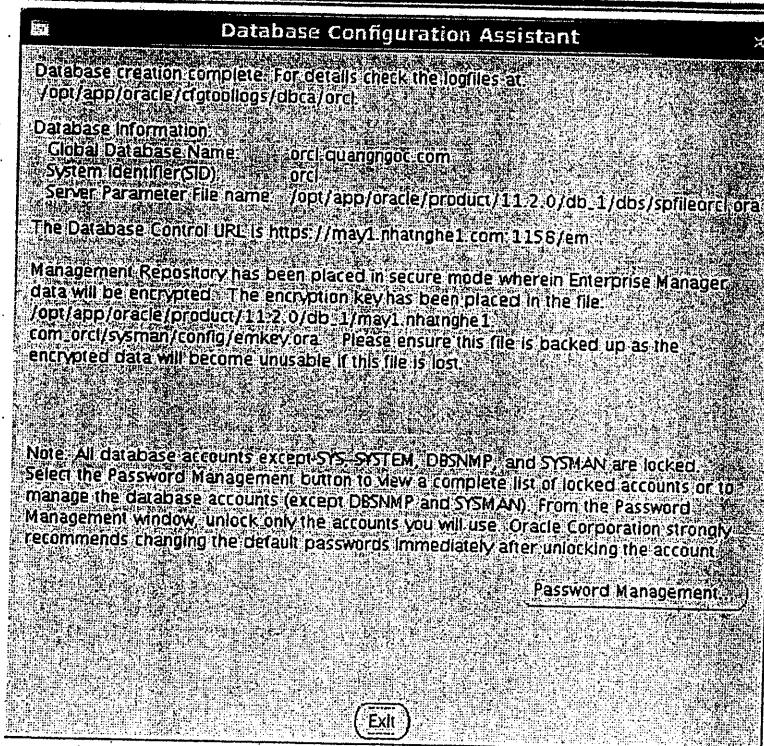
## 9. Database content, Chọn Sample Schemas



#### 14. Ok, bắt đầu tạo database



Nhấn Exit để kết thúc



### 15. autostart mode

vì /etc/oratab  
orcl:/opt/app/oracle/product/11.2.0/db\_1:Y

16. Một điều cuối cùng cần làm là kiểm tra 3 thành phần chính được cài đặt: listener, database and enterprise manager. Đăng nhập như oracle người sử dụng và kiểm tra các dịch vụ đã được khởi động chưa, nếu chưa thì tiến hành khởi động:  
Login oracle:

khởi động listener  
lsnrctl start

khởi động database  
dbstart \$ORACLE\_HOME

khởi động Enterprise Manager:  
emctl start dbconsole

17. Để kiểm tra xem bạn có thể kết nối với cơ sở dữ liệu  
sqlplus sys@orcl AS SYSDBA

Thử truy vấn:

SQL> select \* from dual;

D  
-  
X

18. Để kiểm tra xem listener, database và enterprise manager đang chạy

Từ máy windows, mở IE, nhập địa chỉ:  
<https://192.168.1.10:1158/em>  
 Nhập thông tin login:  
 User name: SYS  
 Password: Quangngoc70  
 Connect As: SYSDBA

Address: https://192.168.9.213:1158/em/console/logon/logon

ORACLE Enterprise Manager 11g Database Control

Login

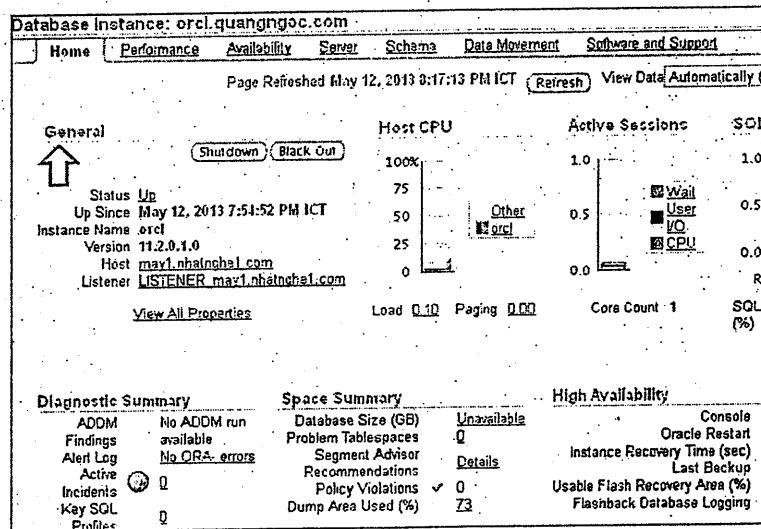
\* User Name: SYS

\* Password:

Connect As: SYSDBA

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### Màn hình quản trị



### Phần 4: start – script (Booting Oracle 11g R2 Database Server on CentOS 6.2)

Cấu hình tự khởi động Oracle 11g R2 Database Server trên CentOS 6.2.

Để chạy ba thành phần đã cài đặt như daemon của Linux. Các thành phần này là: **listener**, **database** và **enterprise manager**. Các chương trình chính liên quan đến việc start và stop cho các thành phần này có thể được tìm thấy tại **\$ORACLE\_HOME/bin**:

- **listener:** lsnrctl {start|stop|...}
- **database:** dbstart / dbshut
- **ent. manager:** emctl {start|stop|...}

#### 1. Login in với user root

```
vi /etc/rc.d/init.d/oracle
Tạo nội dung sau cho file
#!/bin/bash
```

```
# oracle: Start/Stop Oracle Database 11g R2
#
# chkconfig: 345 90 10
# description: The Oracle Database Server is an RDBMS created by Oracle Corporation
#
# processname: oracle

/etc/rc.d/init.d/functions

LOCKFILE=/var/lock/subsys/oracle
ORACLE_HOME=/opt/app/oracle/product/11.2.0/db_1/
ORACLE_USER=oracle

case "$1" in
'start')
    if [ -f $LOCKFILE ]; then
        echo $0 already running.
        exit 1
    fi
    echo -n $"Starting Oracle Database:"
    su - $ORACLE_USER -c "$ORACLE_HOME/bin/lsnrctl start"
    su - $ORACLE_USER -c "$ORACLE_HOME/bin/dbstart $ORACLE_HOME"
    su - $ORACLE_USER -c "$ORACLE_HOME/bin/emctl start dbconsole"
    touch $LOCKFILE
    ;;
'stop')
    if [ ! -f $LOCKFILE ]; then
        echo $0 already stopping.
        exit 1
    fi
    echo -n $"Stopping Oracle Database:"
    su - $ORACLE_USER -c "$ORACLE_HOME/bin/lsnrctl stop"
    su - $ORACLE_USER -c "$ORACLE_HOME/bin/dbshut $ORACLE_HOME"
    su - $ORACLE_USER -c "$ORACLE_HOME/bin/emctl stop dbconsole"
    rm -f $LOCKFILE
    ;;
'restart')
    $0 stop
    $0 start
    ;;
'status')
    if [ -f $LOCKFILE ]; then
        echo $0 started.
    else
        echo $0 stopped.
    fi
    ;;
*)
    echo "Usage: $0 [start|stop|status]"
    exit 1
esac
```

esac

exit 0

## 2. Gán quyền thực thi

```
chmod 755 /etc/rc.d/init.d/oracle
/etc/rc.d/init.d/oracle start
/etc/rc.d/init.d/oracle stop
```

## 3. Cấu hình oracle khởi động khi boot máy

```
chkconfig --add oracle
chkconfig oracle on
```

## 4. Reboot lại máy

<https://192.168.9.213:1158/em>

<https://192.168.9.213:1158/em/console/aboutApplication>