Internet Network and Services

Assignment 2

Group Project

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Assignment 2

As a systems administrator we have been asked to implement the following Internet & Network Services using Ubuntu for a company called KhufuNet.

Web Server (Apache) with Virtual Hosting two Sites.
DNS (Bind), Primary & Secondary.
DHCP Server for Ubuntu clients.
eMail Server (Postfix) & POP/IMAP Server (Dovecot)
FTP Server
SSH Server
File Server (Samba)
Network Printing (CUPS)

The domain name KhufuNet.com has already been registered. Apache will host www.KhufuNet.com and a Wordpress instance; blog.Khufu.com

Other issue that we need to address include but are not limited to:

User & groups
Disk Quotas
Monitoring
Ease of Administration

Lab Topology
The lab topology is made up of two PCs running VMware in "Bridged Mode" and connected via a hub. The virtual machines are specified as follows:

VM1 – Ubuntu desktop (DHCP client)
VM2 – Apache Server/Name Server 1/Print Server/Samba Server
VM3 – eMail Server/Name Server 2/DHCP Server/SSH Server/FTP Server
VM4 – Ubuntu desktop (DHCP client)

A single final report and a practical demonstration is required from each group. The report should be posted on your blog so that it can be easily downloaded. The final report should be readable by someone who has little or no experience in this area.
The assignment will be marked as follows:
Practical Demonstration (15)
Demonstration of a fully working system is required and you will be expected to demonstrate full knowledge of the operation of your group solution.
Final Report (25)
A final group report is required and the following will be assessed:
Quality of Report (10)
Quality and clarity of your group report, presentation, layout links, spelling, grammar, punctuation, use of appropriate graphics/media and references.
Customisation & Integration of Solution (10)
The degree of customisation and value added by your group. How have you excelled in the delivery of your solution? What value have you added to the basic requirements as set out above?

Summary & Conclusion (5)
In depth analysis of project, what you have learned, what you would do differently if you were to start again, etc. This section should also be included in your Blog under a posting titled "Final Report – Summary & Conclusions".

Ian Lee (VM1 & VM2)

VM1 - Ubuntu desktop (DHCP client)

To figure out the ip addresses I enter the command **ifconfig** once I found this out I pinged the desktop to the server and vice versa. The ip address for the desktop is 192.168.18.129 and the ip address for the server is 192.168.18.128.

I then proceeded to ping the machines to see if they were connected and the pings were successful.

```
root@ubuntu:~# ping 192.168.18.128
PING 192.168.18.128 (192.168.18.128) 56(84) bytes of data.
64 bytes from 192.168.18.128: icmp_req=1 ttl=64 time=21.3 ms
64 bytes from 192.168.18.128: icmp_req=2 ttl=64 time=0.100 ms
64 bytes from 192.168.18.128: icmp_req=3 ttl=64 time=0.041 ms
64 bytes from 192.168.18.128: icmp_req=4 ttl=64 time=0.046 ms
```

VM2 – Apache Server

The first thing I set up on the second virtual machine was the Apache Server.
The Apache HTTP Server, commonly referred to as Apache, is web server software notable for playing a key role in the initial growth of the World Wide Web. In 2009 it became the first web server software to surpass the 100 million website milestone. Apache was the first viable alternative to the Netscape Communications Corporation web server (currently known as Oracle iPlanet Web Server), and has since evolved to rival other web servers in terms of functionality and performance. Typically Apache is run on a Unix-like operating system.

Apt-get install apache2

This installs the apache server. Once this is done I must enter the info.php file and edit it so that the desktop can read it.

Nano /var/www/info.php

<?php
Phpinfo();
?>

/etc/init.d/apache2 restart

What this does is set up the apache2 server and once the file info.php is set up then the user can log into the desktop and view the outcome. The outcome will be that the user can view the rules which are held in info.php
To find out if the addresses are working we enter the servers IP address into the web browser of the dhcp client and if you receive a page which states IT WORKS then you are connected.

Once this was installed I proceded to install phpmyadmin and Mysql.

Apt-get install php5 libapache2-mod-php5

Apt-get install MySQL-server MySQL-client

When these are installed I must once again restart apache2. When it has restarted I must configure Mysql, create a database called wordpress, create a user admin and password 'password'. Then once all this is entered, the user can view their phpmyadmin.

Apt-get install wordpress

Find / -name wordpress

Ls /usr/share

Mv /usr/share/wordpress /var/www

This will allow you to view the wordpress site.

It is possible to allow some IP addresses to access to the files. To test it we deny one IP address to access the www file in the var directory. I have disallowed the ip 192.168.18.117 which I edited in the /etc/apache2/site-enabled/000-default.

```
<Directory /var/www/>
        Order allow, deny
        Deny from 192.168.18.117
        Allow from all
</Directory>
```

VM2 – DNS Server

The DNS server I installed was bind9

Apt-get install bind9

To configure the file we must edit the /etc/bind/named.conf.local. This site gives us a list of the domains that the server can use. We add khufunet.com to it

```
#domain zone

zone "KhufuNet.con"{
type master;
file "/etc/bind/db.khufunet.com;
};

#reverse DNS
zone "18.168.192.in-addr.arpa"{
type master;
notify no;
file "/etc/bind/db.192";
};
```

Once that is configured you must make a the file /etc/bind/db.khufunet.com so copying the db.local file:

Cp db.local db.khufunet.com

And edit the file to look like this:

```
;
; BIND data file for local loopback interface
;
$TTL    604800
@       IN      SOA     ns2.khufunet.com. root.khufunet.com. (
                           0428         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      ns1.khufunet.com.
ns2     IN      A       192.168.18.2
ns1     IN      A       192.168.1.1
client2 IN      A       192.168.18.128




                        [ Read 15 lines ]
```

Translations

IN: the name of the protocol
SOA: server is the master of the zone
NS: DNS server for this zone
A: link between the name and the IP

Then we must proceed to create the file db.192.

Cp db.127 db.192

Then I must edit db.192 to look like this

```
;
; BIND reverse data file for local loopback interface
;
$TTL    604800
@       IN      SOA     ns2.khufunet.com. root.khufunet.com. (
                         20110427               ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      ns2.khufunet.com.
2       IN      PTR     ns2.khufunet.com.
128     IN      PTR     client2.khufunet.com.
```

Then I must restart DNS,

Service bind9 restart

Then edit the resolv.conf file

```
  GNU nano 2.2.4                File: /etc/re

nameserver 192.168.18.2
domain localdomain
search localdomain
```

VM2 – Print Server

The print server I install was CUPS

Apt-get install CUPS CUPS-client

I then configured the /etc/cups/cupsd.conf file to look like this:

```
MaxLogSize 0

# Administrator fuser
systemGroup lpadmin
serverAdmin ian.lee@mycit.ie
```

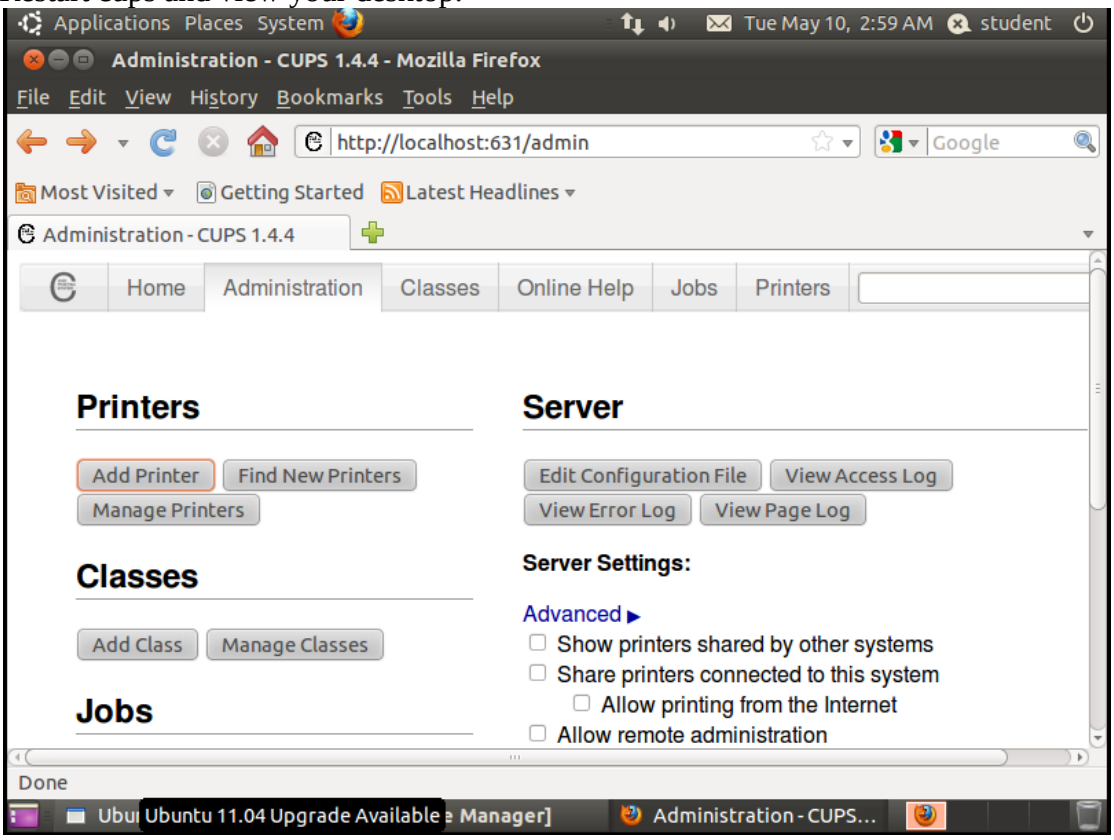
```
Listen localhost:631
Listen /var/run/cups/cups.sock

# Show shared printers on the local network.
Browsing On
BrowseOrder allow,deny
BrowseAllow @LOCAL
BrowseLocalProtocols CUPS dnssd
BrowseAddress @LOCAL

# Default authentication type, when authentication is required...
#DefaultAuthType Basic

# Restrict access to the server...
<Location />
  Order allow,deny
Allow localhost
Allow 192.168.18.*
</Location>
```

Restart cups and view your desktop.



VM2 – File Server

Apt-get install samba smbfs

I created a user named student

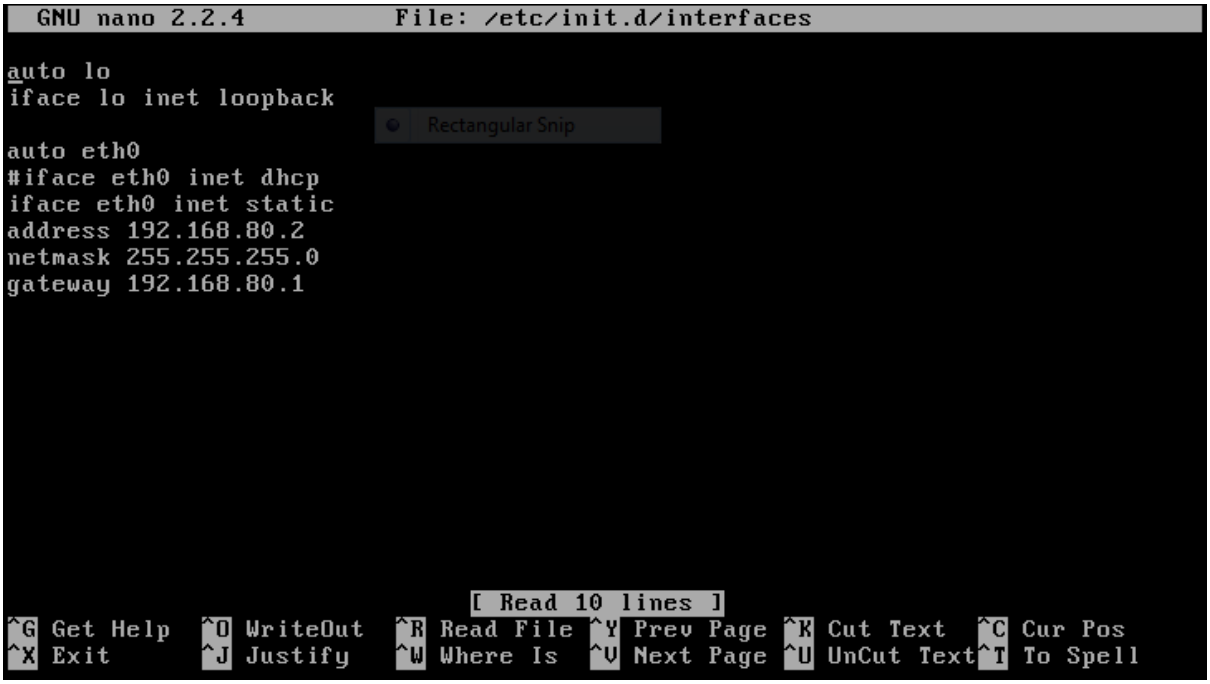
Username map = /etc.samba/smbusers
Smbpasswd –a student password=“student”

Restart smbd

Paul Manning (VM3 & VM4)

DHCP setup :

1st i entered the command nano /etc/init.d/interfaces and edited the file as follows :



And then restarted by entering /etc/init.d/networking restart
I then edited /etc/dhcp3/dhcpd.conf as follows :

```
subnet 192.168.1.0 netmask 255.255.255.0 {
  range 192.168.1.10 192.168.1.100;
  option routers 192.168.1.1;
  option domain-name-servers 192.168.1.2, 192.168.1.3;
  default-lease-time 6000;
  max-lease-time 72000;
}
```

I then also added static addresses for the client2 and the server :

```
host client2{
  hardware ethernet 00:0c:29:ed:97:aa;
  option host-name "client2";
  fixed-address 192.168.1.20;
#  filename "vmunix.passacaglia";
#  server-name "toccata.fugue.com";
}
host ns2{
hardware ethernet 00:0c:29:7b:10:10;
option host-name "ns2";
fixed-address 192.168.1.2;
}
```

Next i edited /etc/default/dhcp3-server by setting interfaces to eth0:
INTERFACES=”eth0”
I restarted the dhcp server by entering service dhcp3-server restart

Installing SSH

To install SSH i used the following commands
Apt-get install openssh-server
Apt-get install openssh-client

Installing the FTP server
To install the FTP server i entered
Apt-get install vsftpd
I then edited the /etc/vsftpd.conf by changing the following
Anonymous_enable=YES
I then restarted the server by entering service vsftpd restart

Installing the DNS server :

Apt-get install bind9
I edited the /etc/bind/named.conf.local as follows :

```
zone "khufunet.com" {
        type master;
        file "/etc/bind/db.khufunet.com";
};

zone "1.168.192.in-addr.arpa" {
        type master;
        notify no;
        file "/etc/bind/db.192";
};
```

I then created the khufunet db from the local by entering :
Sudo cp /etc/bind/db.local /etc/bind/db.khufunet.com

```
;
; BIND data file for local loopback interface
;
$TTL    604800
@       IN      SOA     ns2.khufunet.com. root.khufunet.com.  (
                          0428          ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      ns2.khufunet.com.
ns2     IN      A       192.168.1.2
ns1     IN      A       192.168.1.1
client2 IN      A       192.168.1.128
```

Edit /etc/bind/named.conf.local as follows :

```
zone "khufunet.com" {
        type master;
        file "/etc/bind/db.khufunet.com";
};

zone "1.168.192.in-addr.arpa" {
        type master;
        notify no;
        file "/etc/bind/db.192";
};
```

Then sudo cp /etc/bind/db.127 /etc/bind/db.192

```
; BIND reverse data file for local loopback interface
;
$TTL    604800
@       IN      SOA     ns2.khufunet.com. root,khufunet.com. (
                        20110427        ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      ns2.khufunet.com.
2       IN      PTR     ns2.khufunet.com.
128     IN      PTR     client2.khufunet.com.
```

Then restart bind by entering service bind9 restart

Installing Postfix

Apt-get install postfix sasl2-bin
You will be asked questions. For General type leave as Internet Site, System name enter ns2.khufunet.com, Where should mail ; leave blank, Force sync ; No, Local networks; default, Use procmail; yes, mailbox size limit; 0, local address ext; +, Internet prot; all.
Adding a layer of security, enter the following
Mkdir /etc/postfix/ssl
Cd /etc/postfix/ssl/
Openssl genrsa –des3 –rand /etc/hosts –out smtpd.key 1024
Chmod 600 smtpd.key
Openssl req –new –key smtpd.key –out smtpd.csr
Questions will be asked answer the following and leave the others blank :
Organization Name (0) : Khufunet
Common Name (CN) : ns2.khufunet.com
openssl x509 -req -days 3650 -in smtpd.csr -
signkey smtpd.key -out smtpd.crt
openssl rsa -in smtpd.key -out smtpd.key.unencrypted
mv -f smtpd.key.unencrypted smtpd.key
openssl req -new -x509 -extensions v3_ca -keyout cakey.pem -
out cacert.pem -days 3650
add in the following to the /etc/postfix/main.cf
smtp_use_tls = yes

smtp_tls_note_starttls_offer = yes
smtpd_tls_auth_only = no
smtpd_use_tls = yes
smtpd_tls_key_file = /etc/postfix/ssl/smtpd.key
smtpd_tls_cert_file = /etc/postfix/ssl/smtpd.crt
smtpd_tls_CAfile = /etc/postfix/ssl/cacert.pem
smtpd_tls_loglevel = 1
smtpd_tls_received_header = yes
smtpd_tls_session_cache_timeout = 3600s
tls_random_source = dev:/dev/urandom
smtpd_recipient_limit = 100
smtpd_helo_restrictions = reject_invalid_hostname
smtpd_sender_restrictions = reject_unknown_address
smtpd_recipient_restrictions = permit_sasl_authenticated,
permit_mynetworks,
reject_unauth_destination,
reject_unknown_sender_domain,
reject_unknown_client,
reject_rbl_client zen.spamhaus.org,
reject_rbl_client bl.spamcop.net,
reject_rbl_client cbl.abuseat.org,
permit
SASL :
Add to /etc/postfix/:
smtpd_sasl_local_domain = $myhostname
smtpd_sasl_auth_enable = yes
smtpd_sasl_security_options = noanonymous
broken_sasl_auth_clients = yes
also edit /etc/default/saslauthd:
smtpd_sasl_local_domain = $myhostname
smtpd_sasl_auth_enable = yes
smtpd_sasl_security_options = noanonymous
broken_sasl_auth_clients = yes
also edit /etc/postfix/sasl/smtpd.conf:
pwcheck_method: saslauthd
mech_list: login plain

Enter the following in the command prompt:

mkdir -p /var/spool/postfix/var/run/saslauthd
dpkg-statoverride --add root sasl 710 /var/spool/postfix/var/
run/saslauthd
adduser postfix sasl
/etc/init.d/saslauthd start