Using RedHat9 OS in VMware Fusion. Create five VMs [1]DHCP, [2]Web server, [3]DNS, [4]DNS2 and [5]client

DHCP:

1. subscription-manager register
2. sudo yum update
3. sudo yum install -y dhcp\*
4. sudo nano /etc/sysconfig/network-scripts/ifcfg-ens160
   1. DEVICE=ens160

BOOTPROTO=static

ONBOOT=yes

IPADDR=192.168.1.2

NETMASK=255.255.255.0

GATEWAY=192.168.1.1

DNS1=192.168.1.10 # Assuming your DNS server is at this address

* 1. Write and Close the file

1. Change the network adapter to ‘Private to my Mac’. RESTART
2. ip addr show
3. sudo nano /etc/dhcp/dhcpd.conf

default-lease-time 600;

max-lease-time 7200;

authoritative;

subnet 192.168.1.0 netmask 255.255.255.0 {

range 192.168.1.50 192.168.1.200;

option domain-name-servers 192.168.1.10;

option routers 192.168.1.1;

option broadcast-address 192.168.1.255;

option subnet-mask 255.255.255.0;

host dns-server {

hardware ethernet 00:0c:29:f8:22:ae; # MAC address of DNS server

fixed-address 192.168.1.10;

}

host web-server {

hardware ethernet 00:0c:29:5b:52:a5; # MAC address of Web server

fixed-address 192.168.1.20;

}

host slave-dns-server {

hardware ethernet 00:0c:29:19:3f:ad; # MAC address of Web server

fixed-address 192.168.1.11;

}

host backup-server {

hardware ethernet 00:0c:29:1b:d3:fa# MAC address of Web server

fixed-address 192.168.1.40;

}

}

1. sudo systemctl start dhcpd

sudo systemctl enable dhcpd

1. sudo firewall-cmd --add-service=dhcp –permanent

sudo firewall-cmd –reload

Web Server :

1. subscription-manager register
2. sudo yum update
3. sudo yum install httpd
4. sudo nano /etc/httpd/conf/httpd.conf
   1. ServerName www.tele5330.com:80
5. sudo systemctl start httpd

sudo systemctl enable httpd

1. sudo firewall-cmd --permanent --add-service=http

sudo firewall-cmd --permanent --add-service=https

sudo firewall-cmd --reload

1. Change the network adapter to ‘Private to my Mac’.
2. sudo cd /var/lib/NetworkManager
3. sudo rm \*.lease RESTART.
4. ip addr show (Must show the IPv4 address as 192.168.1.20)
5. Open Firefox and type 192.168.1.20. If you get webpage then, then check it in DHCP server

DHCP :

1. Open firefox, and type 192.168.1.20 (Web Server). If you get the webpage, then WebServer has successfully implemented. Now open terminal.
2. ssh <username-of-webserver>@192.168.1.20 (We are making a connection to Web server using SSH. You can observer that prompt string change to [webserver@localhost ~]. So DHCP can access and modify Web Server files. Type ‘exit’ to get back).
3. ping 192.168.1.20 (if you receive ping, then Web Server is also accessible using ICMP protocol i.e., ping. Press ‘ctrl+c’ to end this)

Web Server:

Web Server has weak security. It should only be accessed by http(in any browser or using telnet). SSH and ICMP permissions must be removed on the firewall of Web Server to block those requests.

1. sudo firewall-cmd --zone=public --remove-service=ssh –permanent
2. sudo firewall-cmd --direct --add-rule ipv4 filter INPUT 0 -p icmp -j DROP

sudo firewall-cmd --direct --add-rule ipv6 filter INPUT 0 -p icmpv6 -j DROP

DNS:

1. subscription-manager register
2. sudo yum update
3. sudo yum install bind bind-utils
4. Change the network adapter to ‘Private to my Mac’.
5. sudo cd /var/lib/NetworkManager
6. sudo rm \*.lease RESTART.
7. ip addr show (Must show the IPv4 address as 192.168.1.10)
8. sudo nano /etc/named.conf (only additions in green)

options {

listen-on port 53 { 127.0.0.1; 192.168.1.10; };

listen-on-v6 port 53 { ::1; };

directory "/var/named";

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";

allow-query { localhost; 192.168.1.0/24; };

allow-transfer { 192.168.1.11; };

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- If you are using firewall make sure to open the necessary ports

- Forward only for trusted clients

\*/

recursion yes;

dnssec-validation yes;

};

logging {

channel default\_debug {

file "data/named.run";

severity dynamic;

};

};

zone "." IN {

type hint;

file "named.ca";

};

zone "tele5330.com" IN {

type master;

file "forward.tele5330.com";

allow-update { none; };

allow-transfer { 192.168.1.11; }; // IP of your Slave DNS server

};

zone "1.168.192.in-addr.arpa" IN {

type master;

file "reverse.tele5330.com";

allow-update { none; };

allow-transfer { 192.168.1.11; }; // IP of your Slave DNS server

};

1. sudo nano /var/named/forward.tele5330.com

$TTL 86400

@ IN SOA ns1.tele5330.com. admin.tele5330.com. (

3 ; Serial

604800 ; Refresh

86400 ; Retry

2419200 ; Expire

86400 ) ; Negative Cache TTL

;

@ IN NS ns1.tele5330.com.

ns1 IN A 192.168.1.10

@ IN A 192.168.1.10

www IN A 192.168.1.20

1. sudo nano /var/named/reverse.tele5330.com

$TTL 86400

@ IN SOA ns1.tele5330.com. admin.tele5330.com. (

3 ; Serial

604800 ; Refresh

86400 ; Retry

2419200 ; Expire

86400 ) ; Negative Cache TTL

;

@ IN NS ns1.

10 IN PTR ns1.tele5330.com.

20 IN PTR www.example.com.

1. sudo named-checkconf

sudo named-checkzone example.com /var/named/forward.example.com

sudo named-checkzone 1.168.192.in-addr.arpa /var/named/reverse.example.com

1. sudo systemctl start named

sudo systemctl enable named

DNS2 :

This is the slave DNS server VM

1. subscription-manager register
2. sudo yum -y update
3. sudo yum install -y bind bind-utils
4. sudo nano /etc/named.conf
5. sudo nano /etc/named.conf (only additions in green)

options {

listen-on port 53 { 127.0.0.1; 192.168.1.11; };

listen-on-v6 port 53 { ::1; };

directory "/var/named";

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";

allow-query { localhost; 192.168.1.0/24; };

allow-transfer { 192.168.1.11; };

/\*

- If you are using firewall make sure to open the necessary ports

- Forward only for trusted clients

\*/

recursion yes;

dnssec-validation yes;

directory "/var/named/slaves";

};

logging {

channel default\_debug {

file "data/named.run";

severity dynamic;

};

};

zone "." IN {

type hint;

file "named.ca";

};

zone "tele5330.com" IN {

type slave;

file "forward.tele5330.com";

masters { 192.168.1.10; }; // IP of your Slave DNS server

};

zone "1.168.192.in-addr.arpa" IN {

type slave;

file "reverse.tele5330.com";

masters { 192.168.1.10; }; // IP of your Slave DNS server

};

Web server:

1. Make a dummy index.html file in /var/www/html

sudo chmod -R 755 /var/www/html

sudo chmod 644 /var/www/html/index.html

sudo chown -R apache:apache /var/www/html

sudo restorecon -Rv /var/www/html

DHCP :

1. Open firefox and type ‘www.tele5330.com’. It will fetch the new index.html page from Web Server’s /var/www/html directory.

Web Server :

Now, we need to implement SSH password less connection between Web Server