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<b>Course Code</b>	:	<b>BCSL-063</b>
<b>Course Title</b>	:	<b>Operating System Networking Management Lab</b>
<b>Assignment Number</b>	:	<b>BCA(6)/L-063/Assignment/2021-22</b>
<b>Maximum Marks</b>	:	<b>50</b>
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**Note: Answer all the questions in the assignment having 40 marks in total. 10 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation. Make suitable assumption if necessary.**

**Q1:** Run the following commands and write its outputs and its uses. **(10 Marks)**

(i) Ping (ii) Ipconfig (iii) nslookup (iv) finger (v) nettime

**Q2: (i)** Write and run a simple shell script that takes a path of a directory as a command line argument and list all files and folders inside the given directory. **(5 Marks)**

**(ii)** Write and run a simple shell script which displays each of the command line arguments, one at a time and stops displaying command line arguments when it gets an argument whose value is "stop". **(5 Marks)**

**Q3:** Write the procedures for the following tasks:

- (i) To configure a DNS server as a sort name server in windows 2000. **(6 Marks)**
- (ii) Configure a window client as a VPN client in windows 2000. **(6 Marks)**
- (iii) Installation and configuration of a DHCP server services in windows 2000. **(8 Marks)**

Course Code :- BCL-063.

Course Name :- Operating System  
Networking Management Lab.

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Ques:

Run the following commands and write its output and its users.

(i) Ping

Purpose

Sends an echo request to network host.

Syntax

ping [-d] [-D] [-n] [-q] [-r] [-v] [-R] [-a address family]  
[-c count] [-w timeout] [-f] [-i wait] [-l preload]  
[-p pattern] [-s packetsize] [-S hostname/IP address] [-L]  
[-a | a.b.c.d] [-o interface] [-T ttl] Host [Packet  
Size.] [count]

To check the network connection to host Canopus and specify the No. of echo requests to send, enter ↓

ping -c 5 Canopus

OK

ping Canopus 56 5

(ii) IP Config

At the most basic, the ipConfig displays a computer's IP address, subnet mask and the default gateway (which is typically the IP address of your router or network firewall).

(iii) nslookup

```
PING canopus.austin.century.com: (128.116.1.5): 56 data bytes
```

```
64 bytes from 128.116.1.5: icmp_seq=0 ttl=255 time=2 ms
```

```
64 bytes from 128.116.1.5: icmp_seq=1 ttl=255 time=2 ms
```

```
64 bytes from 128.116.1.5: icmp_seq=2 ttl=255 time=3 ms
```

```
64 bytes from 128.116.1.5: icmp_seq=3 ttl=255 time=2 ms
```

```
64 bytes from 128.116.1.5: icmp_seq=4 ttl=255 time=2 ms
```

```
----canopus.austin.century.com PING Statistics----
```

```
5 packets transmitted, 5 packets received, 0% packet loss
```

```
round-trip min/avg/max = 2/2/3 ms
```

```
C:\>ipconfig
```

```
Windows IP Configuration
```

```
Wireless LAN adapter Local Area Connection* 2:
```

```
Media State . . . . . : Media disconnected  
Connection-specific DNS Suffix . . . . . :
```

```
Wireless LAN adapter Local Area Connection* 3:
```

```
Media State . . . . . : Media disconnected  
Connection-specific DNS Suffix . . . . . :
```

```
Wireless LAN adapter Wi-Fi:
```

```
Connection-specific DNS Suffix . . . . . : hitronhub.home  
IPv6 Address. . . . . : 2607:fea8:3d20:949::2a  
IPv6 Address. . . . . : 2607:fea8:3d20:949:fd03:b57e:3676:2037  
IPv6 Address. . . . . : fd00:6477:7d99:6612:fd03:b57e:3676:2037  
Temporary IPv6 Address. . . . . : 2607:fea8:3d20:949:ad4f:576c:5f2b:b1f0  
Temporary IPv6 Address. . . . . : fd00:6477:7d99:6612:ad4f:576c:5f2b:b1f0  
Link-local IPv6 Address . . . . . : fe80::fd03:b57e:3676:2037%8  
IPv4 Address. . . . . : 192.168.0.98  
Subnet Mask . . . . . : 255.255.255.0  
Default Gateway . . . . . : fe80::6677:7dff:fe99:6612%8  
192.168.0.1
```

```
Ethernet adapter Bluetooth Network Connection:
```

```
Media State . . . . . : Media disconnected  
Connection-specific DNS Suffix . . . . . :
```

```
C:\>
```

```
C:\> nslookup
```

```
Server: resolver1.opendns.com
```

```
Address: 208.67.222.222
```

```
>
```

The nslookup (which stands for name server lookup) commands finds name server information for domains by querying the domain Name System.

(iv)

finger  
shows user information. This command is the same as the f command.

Syntax

$\$ \text{finger} / f \{ [+b] [-h] [-l] [-p] [-i] [-q] [-s] [-w] [-f] [-m] [user] \text{User} @ \text{Host} | @ \text{Host} \}$

Examples: To get information about all users logged in to host alcatraz, enter:  
finger@alcatraz

(v) nettime

Net time can be used to display the current time and date of another computer on network.

Ques

1) Write and run a simple shell script that takes a path of directory as a command line argument & list all files and folders inside the given directory.

Ans

Shell Script



[alcatraz.austin.ibm.com]

Login	Name	TTY	Idle	When	Site Info
brown	Bob Brown	console	2d	Mar 15 13:19	
smith	Susan Smith	pts0	11:	Mar 15 13:01	
jones	Joe Jones	tty0	3	Mar 15 13:01	

```
# ./bin/bash
echo "enter directory name"
read dir
if [-d $dir]
then
echo "list of files in the directory"
ls -l $dir | egrep '^d'
else
echo "enter proper directory name"
fi
```

Output:

```
quest - glcbls @ ubuntu: ~ $ sh lprg1.sh
enter directory name
dir 1
list of files in directory
drwxrwxr-x 4 quest - glcbls quest - glcbls 140 2021-
10-02 14:40 dir 1
```

(ii) Write and run a simple shell script which displays each of command line arguments, one at a time & stops displaying command line arguments when it gets an argument whose value is "stop"

```
#!/bin/bash
# Counting the no. of lines in list of files.
```

```
# for loop over arguments
# count only those files I am owner of
```

```
if [ $# -lt 1 ]
```

```
then
```

```
echo "usage : $0 file ..."
```

```
stop 1
```

```
fi
```

```
echo "$0 counts the lines of code"
```

```
n=0
```

```
s=0
```

```
for f in *
```

```
do
```

```
if [ -O $f ] # checks whether file owner is running
the script then
```

```
l='wc -l $f | sed 's/^ \([0-9]*\) .* $/ \1/'
```

```
echo "$f : $l"
```

```
n=$((n+l))
```

```
s=$((s+l))
```

```
else
```

```
continue
```

```
fi
```

```
done
```

```
echo "$n files in total with $s lines in total"
```

Ques 3:

Write the procedure of following tasks:

- (i) To configure a DNS Server as host name server in Windows 2000.
- (ii) Configure a windows client as VPN client in windows 2000
- (iii) Installation and Configuration of DHCP Server services in windows 2000
- (iv) As many of you are probably aware, DNS is now the Name Resolution System of choice in windows 2000. However most windows NT Administrators are used to relying on WINS for name resolution on local area networks and some them have little or no experience with DNS.

You can install a DNS Server from Control panel, follows these steps:-

- 1) From the ~~set~~ Start menu, select settings/control panel/ Add/Remove programs.
- 2) Click the add/Remove programme, Components button open the window components wizard window.
- 3) Select Networking service and click the details button.
- 4) click Domain Name System checkbox.
- 5) click OK and then click Next.

## Configuring DNS

After installing DNS, you can find the DNS Console from Start Programs | Administrative Tools | DNS. Windows 2000 provides a wizard to help configure your DNS.

When configuring your DNS server, you must be familiar with the following concepts:

- Forward lookup zone
- Reverse lookup zone
- Zone types

A forward lookup zone is simply a way to resolve host name to IP address. A reverse lookup zone allow DNS server to determine the DNS name of host. Basically, it is exact opposite of forward lookup zone. A reverse lookup zone is not required, but it is easy to configure and will allow for your Windows 2000 server to have full DNS functionality.

A standard primary zone stores the database in text file. The text file can be shared with other DNS servers that store their information in a text file. Finally, a standard secondary

Simply creates a copy of existing databases from another DNS server. This is primarily used for load balancing.

To open the DNS Server Configuration tool:-

1. Select DNS
2. Highlight your Computer name
3. click next and choose appropriate host server
4. click next and then click yes
5. Repeat Select the appropriate radio buttons
6. click next
7. click next and then click yes
8. Repeat step 5
9. click next and enter the info.
10. click next and review your selection.
11. click finish

### Managing DNS records.

You have now installed and configured your first DNS server and you are ready to add records to Zone, you created. There are various types of DNS records available. Commonly DNS records are:

1. start of Authority (SOA)

2. Name Server
3. Host (A)
4. Pointer (PTR)
5. Canonical Name or Alias
6. Mail Exchange

### Start of Authority Record

The SOA record is always first in any standard zone. The SOA tab allows you to make any adjustments necessary. You can change the primary servers that hold the SOA record, and you can change the person responsible for managing the SOA.

### Name Servers

It specifies all Name Servers for specific domain. You set up all primary & secondary servers through this record.

To create a Name Server.

1. Select DNS
2. Expand the forward lookup zone
3. Right click on appropriate domain
4. Select the Name Servers tab
5. Enter appropriate FQDN server name & IP address

(iii)

Configure a window client as a VPN client to windows 2000.

VPNs and tunnels are powerful, convenient & secure ways to access resources remotely. You can implement a secure tunnel / VPN btw your company & remote users by enabling the RAS VPN Services in window 2000 server. window 2000 server can support both L2TP and PPTP based clients and is very easy to set up.

### The procedure

To enable RAS VPN services on window 2000 server, go to start / programs / administration / routing & remote access and right-click the name of your server and choose configure and enable routing & remote access from the shortcut menu.

On the website screen for the wizard, click next to continue.

The wizard provides you with six different configuration options for RAS (Remote Access Service) on window 2000, for the purpose of this article, choose to set up a VPN server.

The next screen provides a list of protocols active on VPN server. Since window 2000 uses TCP/IP by default, that is all I have installed.



If you run IPX/SPX, you will see this option listed as well, click next to move on.

The Next screen asks you to choose the adapter that you want to use to provide VPN services. You will need 2 network adapters; the VPN Services wizard will install a strong Security Controls on VPN adapter to help protect it from attack, since it will have to be exposed to outside world.

The next screen, asks you how you want to handle addressing of remote clients. Since these incoming clients will be coming in through a VPN tunnel, they will be viewed as an ext. of your network and, as such, will require local IP addressing. You can specify a range of addresses or allow your DHCP server to automatically assign the address.

If you specify a range of addresses, the screen will ask you for that info. To add a range of addresses, click New and type in range that you wish to use. Even if your network is based on RFC 1918 private addresses. These packets will be encapsulated inside IP packets going over the net and broken down once they reach your VPN server.

Windows 2000 ~~XP~~ also has the ability to provide RADIUS (Remote Authentication Dial-In User Service). RADIUS is a service that allows you to centrally administer user A/c's for remote users. Finally, you are finished and wizard installs your settings. You will get a message indicating that you must enable the relay of DHCP messages across the VPN server, which DHCP requests are not able to transverse the VPN server to your internal DHCP server if you don't this.

In order for users to be able to make use of this service, they must be explicitly allowed to do so is make a change on dial-in properties page.

### Establishing a client session.

At this point, you have a fully functional remote access tunnel VPN server. In order to use it, you need PPTP or L2TP client software. All recent versions of windows include a PPTP client, and windows 2000 and XP both include full L2TP / IPsec-based clients for additional security.

To begin with, start the new networks connection wizard in windows XP and choose

Connect to the network. At my workplace, which is windows XP's way to set up a VPN.

You will see the Network Connection screen. This screen asks whether this will be a dial-up or VPN connection.

The next screen is Connection Name screen. As you can probably guess, all you have to do is give a name for the connection.

Next, you need to specify the IP address for the public VPN interface that you set up on your windows 2000 server. Enter the address in the Host Name field. My public address is 192.168.1150. When you are done, the connection dialog box will come up and ask for authentication information. I will use the credentials for user for whom I granted ability to dial into VPN server.

(ii) Installation and Configuration of a DHCP Server services in window 2000.

Installing DHCP on window 2000 server or advanced server is fairly simple process. During installation, you might get prompted for user

your window 2003 server or Advanced server  
CD

To install DHCP service :-

- (a) Open the Control Panel
- (b) Click Add/Remove Windows Components
- (c) Highlight Networking services & click Details
- (d) Select Dynamic Host Configuration protocol.
- (e) Click finish.

Configuring your DHCP server.

After you install a DHCP server, go to Start | Programs | Administrative tools | DHCP to open the window. 2003 console for managing the DHCP service when service up a DHCP server, the first thing you have to do is define a scope. A scope is a list of valid IP addresses you want the DHCP server to be able to assign to clients. There are 2 types of scope options :- Global & scope. Global options are propagated to all scopes that you create on that DHCP server, while scope options are only for the individual scope that you are working with.

To define a scope using the Create scope wizard :-

1. From the Action Menu, select New Scope
2. Type a Name and description of your scope & click Next.

Enter the start and end IP address of your scope. Remember to also assign the appropriate Subnet mask as well click Next

The window is where you specify all of your static IP addresses to Exclude from your scope and click Next.

Enter the Amnt. of time the lease is Active & click Next

The next screen ask you whether you want to configure your DHCP options now or later. In this article, we will select Yes, I want to configure these options Now & click Next

Enter your domain Name and add the IP address of any WINS Servers you configured on your Network of adding NetBIOS Names into IP address.

Enter the addresses of any WINS Servers

Choose Yes or No to indicate whether to activate your scope. Click Finish.

### Adding Reservations

In addition to specifying exclusions, you can add reservation to your DHCP server.

To add reservation:

1. From the DHCP console,
2. click Reservation and select Action | New Reservation
3. Enter a friendly name for reservation.
4. Enter the MAC address
5. Enter a description and then choose the reservation type: DHCP, BOOTP, click Add.

Authorizing the DHCP Server & Activating Scopes  
After install and configure your DHCP server, you will need to authorize your scope before it can be activated.

To authorize your DHCP server:

1. From the DHCP console, click on DHCP icon.
2. From Action menu, select Manage Authorized Servers.

click Authorise and enter the name or IP address for your server. Now you are ready to activate your DHCP server and bring it online. click the scope you created and choose Activate from the Action menu.

### Troubleshooting DHCP.

After configuring DHCP, the easiest way to troubleshoot is to use ipconfig from a command prompt in windows XP/2000. To view all TCP/IP info. on a machine just type ipconfig /all from a command prompt. To release DHCP lease, type ipconfig /release, to renew a lease, type ipconfig /renew.

On windows 98/9x you must use the winipcfg utility to access TCP/IP info. you can access this utility by choosing start / run & typing winipcfg. From there, you can click the Release and Renew buttons to access other options.

C:\WINDOWS\system32\cmd.exe

Microsoft Windows [Version 10.0.18363.720]

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C:\Users\Storm>net time \\localhost

Current time at \\localhost is '4/ 2/ 2020 12:11:15 PM

The command completed successfully.

C:\Users\Storm>