King Fahd University of Petroleum & Minerals
Electrical Engineering Department
EE 400, Experiment # 1

Configuration of TCP/IP Parameters and Troubleshooting Network Connectivity using DOS Networking Utilities.

Objectives:

After this experiment, students shall know how to:

1. Install TCP/IP protocol

2. Manually configure TCP/IP parameters

3. Use *ipconfig* utility to view configured TCP/IP parameters.

4. Use *ping* utility to test TCP/IP communications.

5. Share a folder

6. Assign shared folder permissions to users and groups

7. Connect to the shared folder

8. Stop sharing a folder.

9. Use *arp* command

1. Peer to Peer Networking:

Network Addresses Settings

1. Log on to computer as a local *administrator*

2. Go to **Settings**, then **Network and Dial-up Connections**, then check the properties of **Local Area Network**

3. First, we will remove all the protocols, Click on **Internet Protocol (TCP/IP)** and then click on **uninstall** and *restart* the computer.

4. After restarting your computer, you log on again as local *administrator*, and again go to *Local Area Network Properties*, you will see there is no protocol installed and you can not access any network resources.

5. To add protocols, Click on **install**, select on *Protocol*, click on **Add**, select *Internet Protocol (TCP/IP)* and then click *OK*.

6. In *Local Area Connection Properties* window, select *Internet Protocol (TCP/IP)* then click **Properties**.

7. Either you check on *Obtain an IP address automatically* the IP address would be assigned to your computer automatically by DHCP (Dynamic Host Configuration Protocol) server, or if you check on *Use the following IP address* then you would have to enter the static IP address with proper subnet mask and gateway address. (The lab instructor will tell you the static IP address of the computer, subnet mask and default gateway).

8. Check *Use the following DNS server addresses*, Enter **10.140.3.165** in the *preferred DNS server* (Primary DNS server) and enter **10.140.1.160** in the *Alternate DNS server* (Secondary DNS server).

9. Click on **Advanced**, in *IP settings* tab you will see the computer IP address and gateway address, if there is no gateway address present, then click **Add**, enter the *default gateway address* and click **Add** again.

10. Click **DNS** tab, you will see the DNS server addresses.

11. Click **WINS** tab, if there is no WINS addresses, click on **Add**, and enter **196.15.32.158**, click **Add**.

12. Now click **OK**, click **OK** again on TCP/IP properties window.

13. Click close on Local Area Connection Properties window.

Network Identification Settings:

1. Right click on **My Computer** icon on desktop, click on **Properties**, Click on **Network Identification** tag, click on **Properties**.

2. Type computer name **ee400pcX** (where **X** is the number of computer written on your computer).

3. In peer-to-peer networking, the computer is standalone or a part of any Workgroup. Check *Workgroup* and type **ee400** in workgroup.

4. Click **OK**, and click **OK** again and restart your computer for new settings to take effect.

Now the TCP/IP and network settings have been completed, in the next exercise we will verify these settings by using *ping* and *ipconfig* DOS commands.

2. Using *ping* and *ipconfig*:

1. Start *command prompt*, click on **Start**, click **RUN**, and type **cmd** and press enter, you will enter in the DOS command prompt.

2. Type **ping 127.0.0.1** and then press enter. This internal loop-back test should give you four replies if TCP/IP is bound to the Network Adaptor.

3. Now we will test the TCP/IP connectivity, **ping** the EE-400 lab Gateway. Four replies messages from Gateway should appear if the configurations are OK.

4. Try **ping** other computers in the lab.

5. Try also **ping <ip address> -n <count>** for pinging for specified number of times.

6. Try also **ping <ip address> -t** for pinging indefinitely until stopped by the user. To see the statistics and continue, press ctrl-break. To stop it, press ctrl-C. Observe the statistics after stopping the process.

7. To verify the TCP/IP parameters, type **ipconfig** and press enter, you will see the IP address of your computer, subnet mask, and default gateway.

8. For a detailed configurations, type **ipconfig /all** and press enter, now you will see the host name of your computer, IP address of your computer, subnet mask, default gateway, MAC/Physical address, DNS servers, WINS server Ip addresses etc.

9. Type **ipconfig /release** to release the current IP address.

10. Type **ipconfig /renew** to get the new IP address form DHCP server.

3. Sharing a Folder

1. Log on as Local *Administrator*, and right click on **Start** button and then click on **Explorer** to start the Windows-2000 Explorer.

2. Create the folder named **Public** at the root directory level of drive D.

3. Right-click the newly created **Public** folder to display the menu and then click on **properties** option.

4. In folder properties window, click on **Sharing** tab. Click on **Share** this folder.

5. There is one option, **User limit**, you can limit the number of users to access this folder, and you can **allow maximum users** to access this shared folder.

6. Now click on **apply** and click **OK**. You will see hand symbol on the Public folder, that shows the sharing of Public folder.

4. Assigning Shared Folder Permissions:

1. Go to Windows-2000 explorer, right-click the **Public** folder, then click **sharing**, Click **Permissions**

2. Permissions for Public window will appear and you will see the permissions are assigned to Everyone. By default the permissions are assigned to Everyone that is all users can access this folder. Now we will modify the permissions settings.

3. Select **Everyone** and Click **Remove**.

4. Click **Add,** and select the **users** and/or **groups** to whom you want to assign the permission to access this public folder.

5. To assign permissions administrators group, select **Administrators**, then click **Add**.

6. To assign permissions to users group, select **Users**, then click **Add**.

7. Now click **OK**.

8. You will see the *Administrators* and *Users* group in the permissions window. Select *Administrators* and see the permissions assigned to this group. You will see the *Read* permission is assigned to the Administrator group by default. Here you can change the permissions to the administrator group, Check **Full Control** and click **Apply**.

9. Now select the *Users* group and see the permissions assigned to the Users group. By default Users group has Read permissions.

10. You can change the permissions for Users group and you can also assign permissions to a specific user with the same procedure.

5. Connecting to a Shared Folder using RUN command

1. Log on as a normal *user*.

2. Click **Start**, and then click **Run**

3. In the open box, type **\\<name of the computer>**.and then click **OK**. The **new** window appears and only the folders that are shared on that computer appear to network users.

4. Now you will have access to the shared folder contents.

6. Connecting to a Shared Folder using MAP Network Drive

1. On the desktop, Right-click **My Network Places**, then click on **Map Network Drive**.

2. Select Drive letter as **Z**. (You can select any available drive letter E through Z).

3. In Folder option, type the correct path as. **\\<name of the computer>\<share name>**.

4. Uncheck the option of *Reconnect at logon*. If you will check this option, the drive will be mapped whenever the computer re-starts.

5. Then click **Finish**.

6. Now Start the Windows Explorer and view the drives under *My Computer*. You will see a new directory has been added for the shared folder on that computer.

7. Disconnecting the Mapped Network Drive

1. Start the Windows Explorer, and right-click on the drive letter **Z**. (the drive letter which is mapped with network drive).

2. Click **Disconnect**. The mapped network drive would be removed from the left pane of the Windows Explorer.

8. Stopping a Shared Folder

1. Log on as local *administrator*, then Start Windows Explorer.

2. Locate the *shared* Folder, and right-click on the folder and click **Sharing**.

3. In the *Sharing* tab of shared folder Properties, Click on *Do not Share this folder*.

4. Then click on **Apply** and click **OK**.

5. Now you can delete the new folder.

9. ARP Cache

The address resolution protocol (ARP) is a protocol used by the Internet Protocol (IP) network layer protocol to map IP network addresses to the hardware addresses used by a data link protocol. The protocol operates below the network layer as a part of the OSI link layer, and is used when IP is used over Ethernet

1. Log on as a Local **Administrator**.

2. Start the command prompt, type **arp –a** and then press **Enter** to view the ARP cache.

4. **Ping** the IP address of any computer in the lab. This will add an entry to the arp cache.

5. View the new entry in arp cache.

6. To remove the any entry in the ARP cache, type **arp –d** IP_address. (where the IP_address is the one to be removed from the ARP cache).

Domain Name System (DNS)

The Domain Name System protocol provides a mapping between cryptic IP address and, easier to remember, host names. Host names are used because they are easier for humans to remember. For example, telnet itc.kfupm.edu.sa is easy to remember than telnet 196.15.32.8

The Internet Domain Name System (DNS) is an attempt to decentralize administration of the mapping of host names to host addresses by the use of name-servers, each of which controls part of name space. This becomes necessary partly because the static host table formerly used for that purpose most of the hosts in the Internet are on networks local to particular

organizations. It is desirable to allow the local administration to control that mapping. The DNS also implements a hierarchical naming scheme and provides protocols for communication with the name-servers. A set of top-level domains is administered by the Internet and is defined in the basic DNS specifications.

Top Level Domains:

The top level domains can be categorized as Organizational and Geographic:

com	Commercial
edu	Educational
gov	Governmental
mil	Military
net	Administrative organizations for network such as CSNET, BITNET etc.
org	Other Organizations
XX	two letter country code, e.g., sa for Saudi Arabia.