Computer Networks

Lab # 05:

Network Commands

Objective:

The objective of this lab is to learn different network related commands.

Scope:

On the completion of this lab students shall be familiar with basic networking commands.

Useful Concept:

Learn various network related commands

To know and learn about various network related commands i.e. **route**, **arp** and **netsh.**

Exercises for lab

5.1 ROUTE Command

This command manipulates network routing tables.

ROUTE [-f] [command [destination] [MASK netmask] [gateway]]

Various options available in the ROUTE command:

-f -> Clears the routing tables of all gateway entries. If this is used in conjunction with one of the commands, the tables are cleared prior to running the command.

Command	Specifies one of four commands
PRINT	Prints a route
ADD	Adds a route
DELETE	Deletes a route
CHANGE	Modifies an existing route

Destination -> Specifies the host to send command.

MASK -> If the MASK keyword is present, the next parameter is interpreted as the netmask parameter.

Netmask -> if provided, specifies a subnet mask value to be associated with this route entry. If not specified, it defaults to 255.255.255.255.

Gateway -> Specifies gateway.

All symbolic names used for destination or gateway is looked up in the network and host name database files NETWORKS and HOSTS, respectively. If the command is print or delete, wildcards may be used for the destination and gateway, or the gateway argument may be omitted.

Example:

- To display the routing table.

  route PRINT

- To add a route a destination

  route add <destination> mask <subnetmask> <gateway> metric <number> IF <number>

- destination is the destination network or ip address [200.20.20.0].
- subnetmask is the subnet mask to be used [255.255.255.0].
- gateway is the next hop through which the packet goes [192.168.230.254].
- number after metric indicates the metric value [3].
- number after IF indicates interface number [2].

  route add 200.20.20.0 mask 255.255.255.0 192.168.230.254 metric 3 if 2

Exercise:

- Create a route entry in the routing table for a network 210.20.23.0 with the gateway 192.168.230.254 metric of 5.

5.2 ARP Command

The address resolution protocol (ARP) is a protocol used by the Internet Protocol (IP), specifically IPv4, 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 interface between the OSI network and OSI link layer.

ARP -s inet_addr eth_addr [if_addr]

ARP -d inet_addr [if_addr]

ARP -a [inet_addr] [-N if_addr]

Various options available in the ARP command:

-a Displays current ARP entries by interrogating the current protocol data. If inet_addr is specified, the IP and Physical addresses for only the specified computer are displayed. If more than one network interface uses ARP, entries for each ARP table are displayed.

-d Deletes the host specified by inet_addr.

-s Adds the host and associates the Internet address inet_addr with the Physical address eth_addr. The Physical address is given as 6 hexadecimal bytes separated by hyphens. The entry is permanent.

eth_addr: Specifies a physical address.

if_addr: If present, this specifies the Internet address of the interface whose address translation table should be modified. If not present, the first applicable interface will be used.

Example:

- To display the entries in ARP cache

  arp –a

  arp -g

- To delete an ARP entry in the cache

  arp –d 192.168.230.1

- To delete the Unused ARP entries from cache

  arp –d *

Exercise:

- Remove all the entries in the ARP cache and then generate a PING command to a specific PC [192.168.230.1]. Then, display all the entries in the ARP cache.

5.3 IPCONFIG Command

This command is used to get IP configurations present in your PC.

IPCONFIG /all	Display full configuration information.
IPCONFIG /release [adapter]	Release the IP address for the specified adapter.
IPCONFIG /renew [adapter]	Renew the IP address for the specified adapter.
IPCONFIG /flushdns	Purge the DNS Resolver cache. ##
IPCONFIG /registerdns	Refresh all DHCP leases and re-register DNS names. ##
IPCONFIG /displaydns	Display the contents of the DNS Resolver Cache. ##
IPCONFIG /showclassid adapter	Display all the DHCP class IDs allowed for adapter. ##
IPCONFIG /setclassid adapter [classid]	Modify the dhcp class id. ##

works on Windows XP & 2K

Examples:

> ipconfig ... Show information.

> ipconfig /all ... Show detailed information

> ipconfig /renew ... renew all adapters

> ipconfig /renew EL* ... renew any connection that has its name starting with EL

> ipconfig /release *Con* ... release all matching connections, eg. "Local Area Connection 1" or "Local Area Connection 2"

Exercise:

Get to know about the TCP/IP configuration on your PC using **ipconfig /all**.

5.4 NETSH Command

Configure interfaces, routing protocols, filters, routes, RRAS.

Usage:

netsh [-a AliasFile] [-c Context] [-r RemoteMachine] [-u [DomainName\]UserName] [-p Password | *] [Command | -f ScriptFile]

Examples:

- Enter the netsh command.

  netsh

- Dump all the network information as a script to the screen. Can also be sent to a file by doing netsh dump > file.txt . This script can then be executed using the exec command.

  netsh dump > data.txt

- View network IP configuration. Below is an example of what may be seen.

  netsh interface ip show config

  netsh interface ip show address

- View **TCP** Connections. Below is an example of what may be seen.

  netsh interface ip show tcpconnections

- View **UDP** Connections. Below is an example of what may be seen.

  netsh interface ip show udpconnections

Exercise:

1) Get the information about the various interfaces present in your PC.