CS19541_COMPUTER NETWORKS

Experiment:1

AIM: - Study of various Network commands used in Linux and Windows:

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arp –a:- ARP is short form of address resolution protocol, It will show the IP address of your computer along with the IP address and MAC address of your router.

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hostname: This is the simplest of all TCP/IP commands. It simply displays the name of your computer.

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ipconfig /all: This command displays detailed configuration information about your TCP/IP connection including Router, Gateway, DNS, DHCP, and type of Ethernet adapter in your system

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nbtstat –a: This command helps solve problems with NetBIOS name resolution. (Nbt stands for NetBIOS over TCP/IP)

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netstat: (network statistics) netstat displays a variety of statistics about a computers active TCP/IP connections. It is a command line tool for monitoring network connections both incoming and outgoing as well as viewing routing tables, interface statistics etc.

e.g.:- netstat -r

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nslookup: (name server lookup) is a tool used to perform DNS lookups in Linux. It is used to display DNS details, such as the IP address of a particular computer, the MX records for a domain or the NS servers of a domain. nslookup can operate in two modes: interactive and non-interactive.

e.g.:- nslookup www.google.com

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pathping: Pathping is unique to Window's, and is basically a combination of the Ping and Tracert commands. Pathping traces the route to the destination address then launches a 25 second test of each router along the way, gathering statistics on the rate of data loss along each hop.

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ping: (Packet INternet Groper) command is the best way to test connectivity between two nodes. Ping use ICMP (Internet Control Message Protocol) to communicate to other devices.

1. #ping hostname(ping localhost)
2. #ping ip address (ping 4.2.2.2)
3. #ping fully qualified domain name(ping www.facebook.com

Route: route command is used to show/manipulate the IP routing table. It is primarily used to setup static routes to specific host or networks via an interface.

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PS C:\Users\HDC0422076> arp -a

Interface: 172.16.53.46 --- 0xb
  Internet Address      Physical Address      Type
  172.16.52.1           7c-5a-1c-cf-be-3e     dynamic
  172.16.52.71          30-d0-42-14-73-b5     dynamic
  172.16.52.115         88-ae-dd-12-e2-2f     dynamic
  172.16.52.117         88-ae-dd-15-ef-08     dynamic
  172.16.52.118         88-ae-dd-15-ee-2e     dynamic
  172.16.52.120         88-ae-dd-15-ee-31     dynamic
  172.16.52.127         88-ae-dd-15-ef-09     dynamic
  172.16.52.128         88-ae-dd-14-6e-81     dynamic
  172.16.52.130         88-ae-dd-15-e5-c9     dynamic
  172.16.52.133         88-ae-dd-15-eb-a2     dynamic
  172.16.52.134         88-ae-dd-15-ee-0f     dynamic
  172.16.52.137         88-ae-dd-14-6e-91     dynamic
  172.16.52.143         88-ae-dd-15-ed-c6     dynamic
  172.16.52.145         88-ae-dd-15-ed-91     dynamic
  172.16.52.152         88-ae-dd-15-db-24     dynamic
  172.16.52.155         88-ae-dd-12-7e-1c     dynamic
  172.16.52.166         88-ae-dd-15-ed-2b     dynamic
  172.16.52.167         88-ae-dd-15-ed-47     dynamic
  172.16.52.171         88-ae-dd-15-ee-38     dynamic
  172.16.52.172         88-ae-dd-15-eb-cc     dynamic
  172.16.52.176         88-ae-dd-15-ed-85     dynamic
  172.16.52.181         e0-d0-45-84-5a-5d     dynamic
  172.16.53.41          88-ae-dd-15-ed-70     dynamic
  172.16.53.42          88-ae-dd-15-ec-aa     dynamic
  172.16.53.44          88-ae-dd-15-ee-6c     dynamic
  172.16.53.47          88-ae-dd-15-ed-0b     dynamic
  172.16.53.48          88-ae-dd-14-6e-0c     dynamic
  172.16.53.49          88-ae-dd-15-ee-3c     dynamic
  172.16.53.50          88-ae-dd-15-ed-1f     dynamic
  172.16.53.51          88-ae-dd-14-8a-32     dynamic
```

```
PS C:\Users\HDC0422076> hostname
DESKTOP-MEKQ8BG
PS C:\Users\HDC0422076> ipconfig /all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : DESKTOP-MEKQ8BG
   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Realtek PCIe GbE Family Controller
   Physical Address. . . . . . . . . : 88-AE-DD-14-75-FA
   DHCP Enabled. . . . . . . . . . . : No
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::5dfc:3bef:fab1:94c3%11(Preferred)
   IPv4 Address. . . . . . . . . . . : 172.16.53.46(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.254.0
   Default Gateway . . . . . . . . . : 172.16.52.1
   DHCPv6 IAID . . . . . . . . . . . : 109620957
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-2D-8E-14-A7-88-AE-DD-14-75-FA
   DNS Servers . . . . . . . . . . . : 172.16.52.1
   NetBIOS over Tcpip. . . . . . . . : Enabled
PS C:\Users\HDC0422076> nbtstat -a

Displays protocol statistics and current TCP/IP connections using NBT
(NetBIOS over TCP/IP).

NBTSTAT [ [-a RemoteName] [-A IP address] [-c] [-n]
        [-r] [-R] [-RR] [-s] [-S] [interval] ]

  -a   (adapter status) Lists the remote machine's name table given its name
  -A   (Adapter status) Lists the remote machine's name table given its
                        IP address.
  -c   (cache)          Lists NBT's cache of remote [machine] names and their IP addresses
  -n   (names)          Lists local NetBIOS names.
  -r   (resolved)       Lists names resolved by broadcast and via WINS
  -R   (Reload)         Purges and reloads the remote cache name table
  -S   (Sessions)       Lists sessions table with the destination IP addresses
  -s   (sessions)       Lists sessions table converting destination IP
                        addresses to computer NETBIOS names.
  -RR  (ReleaseRefresh) Sends Name Release packets to WINS and then, starts Refresh

  RemoteName   Remote host machine name.
  IP address   Dotted decimal representation of the IP address.
  interval     Redisplays selected statistics, pausing interval seconds
               between each display. Press Ctrl+C to stop redisplaying
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```
PS C:\Users\HDC0422076> pathping

Usage: pathping [-g host-list] [-h maximum_hops] [-i address] [-n]
                [-p period] [-q num_queries] [-w timeout]
                [-4] [-6] target_name

Options:
    -g host-list     Loose source route along host-list.
    -h maximum_hops  Maximum number of hops to search for target.
    -i address       Use the specified source address.
    -n               Do not resolve addresses to hostnames.
    -p period        Wait period milliseconds between pings.
    -q num_queries   Number of queries per hop.
    -w timeout       Wait timeout milliseconds for each reply.
    -4               Force using IPv4.
    -6               Force using IPv6.
PS C:\Users\HDC0422076> ping

Usage: ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]
            [-r count] [-s count] [[-j host-list] | [-k host-list]]
            [-w timeout] [-R] [-S srcaddr] [-c compartment] [-p]
            [-4] [-6] target_name

Options:
    -t             Ping the specified host until stopped.
                   To see statistics and continue - type Control-Break;
                   To stop - type Control-C.
    -a             Resolve addresses to hostnames.
    -n count       Number of echo requests to send.
    -l size        Send buffer size.
    -f             Set Don't Fragment flag in packet (IPv4-only).
    -i TTL         Time To Live.
    -v TOS         Type Of Service (IPv4-only. This setting has been deprecated
                   and has no effect on the type of service field in the IP
                   Header).
    -r count       Record route for count hops (IPv4-only).
    -s count       Timestamp for count hops (IPv4-only).
    -j host-list   Loose source route along host-list (IPv4-only).
    -k host-list   Strict source route along host-list (IPv4-only).
    -w timeout     Timeout in milliseconds to wait for each reply.
    -R             Use routing header to test reverse route also (IPv6-only).
                   Per RFC 5095 the use of this routing header has been
                   deprecated. Some systems may drop echo requests if
                   this header is used.
    -S srcaddr     Source address to use.
    -c compartment Routing compartment identifier.
    -p             Ping a Hyper-V Network Virtualization provider address.
    -4             Force using IPv4.
    -6             Force using IPv6.
```

Result: The Study of various Network commands used in Linux and Windows has been successfully done.