

EXPERIMENT NO: 05**DATE:22-07-2019****NAME OF THE STUDENT: N.S.S.Hemanth****REGD NO: 5C3**

AIM: Familiarization with basic networking commands and their variants on Windows platform

DISCRPTION:

The basic networking commands are :

1. ncpa.cpl
2. ipconfig
3. ping
4. arp
5. route print
6. tracert
7. pathping
8. nslookup

All above commands must be executed in command prompt only.

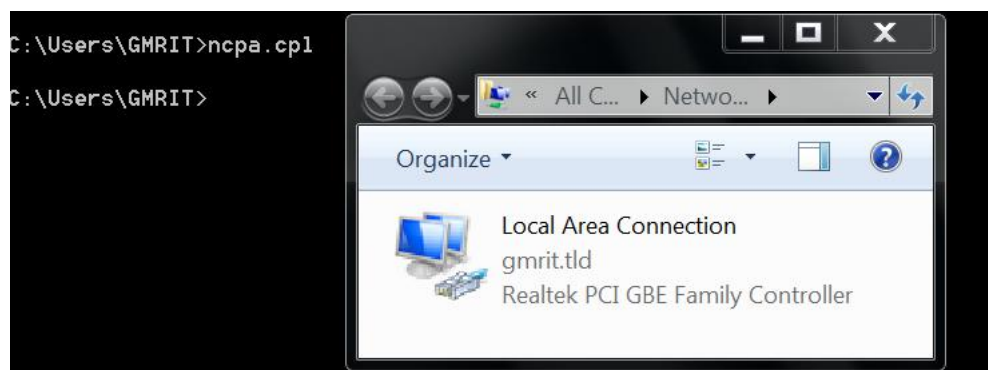
Ncpa.cpl:

- This command used to access network settings easily.
- It is a module belonging to Microsoft® Windows® Operating System from Microsoft Corporation
- By using this command you can unable or disable the network settings.

Syntax: ncpa.cpl

When you type this command in command prompt the result is displayed like

Output:



Ipconfig:

- This command is used to display the TCP/IP configuration of all adapters.

- Used to identify the machines in the network uniquely.
- Used to refresh Dynamic Host configuration protocol (DHCP) and Domain Name System (DNS) settings.

Syntax: ipconfig

Output:

```

Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\GMRIT>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . : gmr.it.tld
    Link-local IPv6 Address . . . . . : fe80::1095:20db:5378:4d14%11
    IPv4 Address. . . . . : 172.30.101.20
    Subnet Mask . . . . . : 255.255.254.0
    Default Gateway . . . . . : 172.30.100.1

Tunnel adapter isatap.gmr.it.tld:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : gmr.it.tld
  
```

Fig:4.1

Ipconfig/all:

This command is used to display full TCP/IP configuration all adapters.

Syntax: ipconfig /all

Output:

```

C:\Users\GMRIT>ipconfig /all

Windows IP Configuration

Host Name . . . . . : CALAB-33
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : gmr.it.tld

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . : gmr.it.tld
    Description . . . . . : Realtek PCI GBE Family Controller
    Physical Address. . . . . : 00-1D-7D-BF-9A-A6
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::1095:20db:5378:4d14%11(Preferred)
    IPv4 Address. . . . . : 172.30.101.20(Preferred)
    Subnet Mask . . . . . : 255.255.254.0
    Lease Obtained. . . . . : 29 July 2019 10:06:04
    Lease Expires . . . . . : 30 July 2019 10:36:05
    Default Gateway . . . . . : 172.30.100.1
    DHCP Server . . . . . : 172.30.48.11
    DHCPv6 IAID . . . . . : 234888573
    DHCPv6 Client DUID. . . . . : 00-01-00-01-22-FF-DD-96-00-1D-7D-BF-9A-A6

    DNS Servers . . . . . : 172.30.48.10
                           : 172.30.48.11
    NetBIOS over Tcpip. . . . . : Enabled

Tunnel adapter isatap.gmr.it.tld:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . : gmr.it.tld
    Description . . . . . : Microsoft ISATAP Adapter
    Physical Address. . . . . : 00-00-00-00-00-00-E0
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . . : Yes
  
```

Ipconfig /allcompartments:

It displays the information about all active commands.

Syntax: `ipconfig /allcompartments`

Output:

```
C:\Users\GHRIT>ipconfig /allcompartments

Windows IP Configuration

=====
Network Information for Compartment 1 (ACTIVE)
=====

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : grrit.tld
    Link-local IPv6 Address . . . . . : fe80::1095:20db:5378:4d14%11
    IPv4 Address. . . . . : 172.30.101.20
    Subnet Mask . . . . . : 255.255.254.0
    Default Gateway . . . . . : 172.30.100.1

Tunnel adapter isatap.grrit.tld:

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

Command	Description
<code>ipconfig /?</code>	Displays help message
<code>ipconfig /all</code>	Displays full configuration information
<code>ipconfig /release</code>	Release IPV4 address to specific adapter
<code>ipconfig /release6</code>	Release IPV6 address to specific adapter
<code>ipconfig /renew</code>	Renew IPV4 address for specific adapter
<code>Ipconfig /renew6</code>	Release IPV6 address for specific adapter
<code>Ipconfig /flushdns</code>	Purges the DNS resolver cache
<code>Ipconfig /showclassid</code>	Displays all dhcp class ids allowed for adapter
<code>Ipconfig /setclassid</code>	Modifies the dhcp class ids

PING:

- Packet Internet Gopher
- This command is used to check the connectivity between the machines.

- It works based on Internet Control Message Protocol (ICMP)
- Default sends 4 packets.
- A packet is a unit of data that is shared between source and destination in a network.

Syntax: ping ip-address

Output:

```
C:\Users\GMRIT>ping 172.30.101.45

Pinging 172.30.101.45 with 32 bytes of data:
Reply from 172.30.101.20: Destination host unreachable.
Reply from 172.30.101.20: Destination host unreachable.
Reply from 172.30.101.20: Destination host unreachable.
Reply from 172.30.101.20: Destination host unreachable.

Ping statistics for 172.30.101.45:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

Ping -a:

This command is used to resolve address to host name.

Syntax: ping -a

Output:

```
C:\Users\GMRIT>ping -a 172.30.101.45

Pinging 172.30.101.45 with 32 bytes of data:
Reply from 172.30.101.20: Destination host unreachable.
Reply from 172.30.101.20: Destination host unreachable.
Reply from 172.30.101.20: Destination host unreachable.
Reply from 172.30.101.20: Destination host unreachable.

Ping statistics for 172.30.101.45:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

Some of ping commands and usage are:

```

C:\Users\GMRIT>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] [-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 Head
er).
  -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).
  -S srcaddr     Source address to use.
  -4            Force using IPv4.
  -6            Force using IPv6.

```

ARP:

- Address Resolution Protocol
- Displays and modifies the entries in address resolution protocol(ARP)
- ARP contains one or more tables used to store ip address.
- Used to convert ip address to physical address
- Used to map ip network address to hardware address used by data link protocol

Syntax:

```
arp [-a [InetAddr] [-N IfaceAddr]] [-g [InetAddr] [-N IfaceAddr]] [-d InetAddr [IfaceAddr]]
[-s InetAddr EtherAddr [IfaceAddr]]
```

some of arp commands and their functions are:

```

C:\Users\Dharani>arp

Displays and modifies the IP-to-Physical address translation tables used by
address resolution protocol (ARP).

ARP -s inet_addr eth_addr [if_addr]
ARP -d inet_addr [if_addr]
ARP -a [inet_addr] [-N if_addr] [-v]

-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.
-g          Same as -a.
-v          Displays current ARP entries in verbose mode. All invalid
            entries and entries on the loop-back interface will be shown.
inet_addr   Specifies an internet address.
-N if_addr  Displays the ARP entries for the network interface specified
            by if_addr.
-d          Deletes the host specified by inet_addr. inet_addr may be
            wildcarded with * to delete all hosts.
-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.

```

OBSERVATION:

All the above commands are executed. these commands should be used in command prompt only. When the commands are typed the result is displayed as command syntax followed by result in above description.

REFERNCES:

Basic Networking commands with examples

<https://www.computernetworkingnotes.com › Networking Tutorials>

