



WORKSHEET 2

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Subject Name: Computer Networks

Subject Code: 22CSH-312

1. Aim: Study of basic network command and Network configuration commands.

2. Requirements (Hardware/Software):

1) Software Requirements: CommandPrompt.

2) Hardware Requirements:

- Processor-any suitable processor e.g.Celeron
- Hard Disk-minimum 20 GB IDE Hard Disk
- Main Memory:- 128 MB RAM
- Removable Drivers-1.44 MB Floppy Disk Drive-52X IDE CD-ROM Drive
- PS/2 HCL Keyboard and Mouse

3. Procedure:

Students have to understand basic networking commands eg. Ping, tracertetc.

Go to command prompt and type the commands.

- Ping
- Ipconfig
- Tracert
- Nslookup
- Netstat
- Arp
- Rarp
- Hostname
- Pathping

4. Output:

Hostname:

```
Microsoft Windows [Version 10.0.22631.3880]
(c) Microsoft Corporation. All rights reserved.

C:\Users\ishur>hostname
ISHU

C:\Users\ishur>
```

Ipconfig:

```
C:\Users\ishur>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet 2:

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

Ethernet adapter Ethernet 3:

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

Wireless LAN adapter Local Area Connection* 1:

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

Wireless LAN adapter Local Area Connection* 2:

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

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    IPv4 Address. . . . . : 192.168.0.108
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.0.1
```

Nslookup:

```
C:\Users\ishur>nslookup
Default Server:  UnKnown
Address:  192.168.0.1

> www.google.com
Server:  UnKnown
Address:  192.168.0.1

Non-authoritative answer:
Name:     www.google.com
Addresses: 2404:6800:4002:80b::2004
          172.217.167.228
```

Ping:

```
C:\Users\ishur>ping www.google.com

Pinging www.google.com [172.217.167.36] with 32 bytes of data:
Reply from 172.217.167.36: bytes=32 time=12ms TTL=116
Reply from 172.217.167.36: bytes=32 time=16ms TTL=116
Reply from 172.217.167.36: bytes=32 time=14ms TTL=116
Reply from 172.217.167.36: bytes=32 time=14ms TTL=116

Ping statistics for 172.217.167.36:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 12ms, Maximum = 16ms, Average = 14ms
```

Tracert:

```
C:\Users\ishur>tracert www.google.com

Tracing route to www.google.com [172.217.167.36]
over a maximum of 30 hops:

  1     2 ms     2 ms     1 ms    192.168.0.1
  2     4 ms     2 ms     1 ms    192.168.100.1
  3     6 ms     4 ms     4 ms    172.26.0.1
  4     6 ms     6 ms     5 ms    202.164.51.225
  5     8 ms     4 ms    13 ms    202.164.51.36
  6    15 ms    12 ms    12 ms    72.14.213.36
  7    15 ms    12 ms    13 ms    192.178.83.243
  8    13 ms    14 ms    14 ms    72.14.233.217
  9    13 ms    12 ms    11 ms    del03s16-in-f4.1e100.net [172.217.167.36]

Trace complete.
```

Netstat:

```
C:\Users\ishur>netstat
```

Active Connections

Proto	Local Address	Foreign Address	State
TCP	127.0.0.1:49680	ISHU:49681	ESTABLISHED
TCP	127.0.0.1:49681	ISHU:49680	ESTABLISHED
TCP	127.0.0.1:49682	ISHU:49683	ESTABLISHED
TCP	127.0.0.1:49683	ISHU:49682	ESTABLISHED
TCP	127.0.0.1:49686	ISHU:49687	ESTABLISHED
TCP	127.0.0.1:49687	ISHU:49686	ESTABLISHED
TCP	127.0.0.1:49689	ISHU:49690	ESTABLISHED
TCP	127.0.0.1:49690	ISHU:49689	ESTABLISHED
TCP	127.0.0.1:49714	ISHU:49715	ESTABLISHED
TCP	127.0.0.1:49715	ISHU:49714	ESTABLISHED
TCP	127.0.0.1:53113	ISHU:53114	ESTABLISHED
TCP	127.0.0.1:53114	ISHU:53113	ESTABLISHED
TCP	127.0.0.1:53119	ISHU:53142	ESTABLISHED
TCP	127.0.0.1:53142	ISHU:53119	ESTABLISHED
TCP	192.168.0.108:49519	20.198.119.143:https	ESTABLISHED
TCP	192.168.0.108:64513	20.198.119.84:https	ESTABLISHED
TCP	192.168.0.108:64702	40.99.9.66:https	ESTABLISHED
TCP	192.168.0.108:64769	20.212.88.117:https	ESTABLISHED

Route Print:

```
C:\Users\ishur>route print
```

```
=====
Interface List
17...00 09 0f fe 00 01 .....Fortinet Virtual Ethernet Adapter (NDIS 6.30)
 6...00 09 0f aa 00 01 .....Fortinet SSL VPN Virtual Ethernet Adapter
10...38 7a 0e 04 2a 4b .....Microsoft Wi-Fi Direct Virtual Adapter
18...3a 7a 0e 04 2a 4a .....Microsoft Wi-Fi Direct Virtual Adapter #2
16...38 7a 0e 04 2a 4a .....Intel(R) Wi-Fi 6E AX211 160MHz
 1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway           Interface        Metric
0.0.0.0                    0.0.0.0          192.168.0.1       192.168.0.108    55
127.0.0.0                  255.0.0.0        On-link           127.0.0.1        331
127.0.0.1                  255.255.255.255  On-link           127.0.0.1        331
127.255.255.255            255.255.255.255  On-link           127.0.0.1        331
192.168.0.0                255.255.255.0    On-link           192.168.0.108    311
192.168.0.108              255.255.255.255  On-link           192.168.0.108    311
192.168.0.255              255.255.255.255  On-link           192.168.0.108    311
224.0.0.0                  240.0.0.0        On-link           127.0.0.1        331
224.0.0.0                  240.0.0.0        On-link           192.168.0.108    311
255.255.255.255            255.255.255.255  On-link           127.0.0.1        331
255.255.255.255            255.255.255.255  On-link           192.168.0.108    311
=====

Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
1 331 ::1/128                On-link
1 331 ff00::/8                On-link
=====

Persistent Routes:
None
```

Curl:

```
C:\Users\ishur>curl www.google.com
<!doctype html><html itemscope="" itemtype="http://schema.org/WebPage" lang="en-IN"><head><meta content="text/html; charset=UTF-8" http-equiv="Content-Type"><meta content="/images/branding/google/1x/google_standard_color_128dp.png" itemprop="image"><title>Google</title><script nonce="tEjRBF9vZg3xvknS4h33Q">(function(){var _g={kEI:'gJmsZvHkJuSm2roPjbTnsA4',kEXPI:'0,2504524,1195772,653,432,5,538659,2872,2891,8348,3406,61296,6397,27869,60058,85640,2,16737,23024,6700,41942,57740,2,2,1,24626,2006,8155,23350,8702,13734,9779,12414,33187,17056,33566,10943,28670,3030,15816,1804,7734,13278,14257,13448,13493,15783,11106,15977,5209427,3249,996,29,37,18,3,20,5,5989461,1861,2840783,5,5,10,2,7,2,8,2,183,27,7441162,19266000,1273939,16672,43887,3,318,4,1281,3,2124363,23029351,6869,1081,1,212,10336,10736,2728,24584,9352,47381,11523,11100,12951,2213,8181,154,20561,26875,1840,10085,7766,3821,47,2438,2,519,3746,155,2,2482,13504,7735,6598,2,2540,4599,207,121,1543,1674,4,1225,5,1774,1117,6469,5,12082,409,519,7389,5634,687,2928,3748,615,504,3,5,1766,1244,2695,4446,33,970,4259,853,217,4858,710,548,134,451,213,3126,2718,337,3033,6,4482,1493,433,287,2,9,623,2589,2,1,782,3,5,619,211,361,6,3,1512,1850,294,4547,665,985,731,367,3,194,918,799,182,306,222,1706,152,2,907,1968,2028,93,366,1929,564,22,2025,425,4,248,2518,3,480,254,30,3,2,877,1690,37,277,2019,83,1101,126,258,385,462,915,1048,127,572,98,2236,391,2,9,881,26,6,5,1518,701,1124,306,411,2538,422,385,3,3,357,575,24,112,60,440,622,167,29,175,71,122,602,3,1132,3,2,214,74,385,226,4,3,501,101,2,1029,245,350,4710,4,2119,248,30,181,322,1,8,1,1,4,1,27,750,118,39,376,1302,738,370,55,1066,2,5,2,258,146,511,28,75,2,1486,1078,289,91,260,7,13,332,207,240,3,38,50,504,1,395,43,3,187,239,117,164,41,89,12,186,1,6,1840,3,304,2,504,83,504,4,2,3,245,334,205,129,158,370,223,74,473,375,278,105,72,213,1,1194,432,21147340,365636,3,14475,3,7053,1112,47,616,2773,167,116,475,1270',kBL:'_QjW',kOPI:89978449};(function(){var a;(a=window.google)==null?a:stvsc)?google.kEI=g.kEI:window.google=_g;}).call(this);})();(function(){google.sn='webhp';google.kHL='en-IN';})();(function(){var h=this||self;function l(){return window.google!==void 0&&window.google.kOPI!==void 0&&window.google.kOPI!==0?window.google.kOPI:null;var r,m,n=[];function p(a){for(var b;a&&(!a.getAttribute)||!(b=a.getAttribute("eid")));)a=a.parentNode;return b||m}function q(a){for(var b=null;a&&(!a.getAttribute)||!(b=a.getAttribute("leid")));)a=a.parentNode;return b}function r(a){/^http:\/i.test(a)&&window.location.protocol=="https:"&&(google.ml&&google.ml(Error("a"),!l,{src:a,glmm:1}),a="");return a}function t(a,b,c,d,k){var e="";b.search("&ei=")===-1&&(e="&ei="+p(d),b.search("&lei=")===-1&&(d=q(d))&&(e+="&lei="+d));d="";var g=b.search("&csid=")===-1&&a!=="slh",f=[];f.push(["zx",Date.now().toString()]);h._csid&&g&&f.push(["csid",h._csid]);c=c();c!=null&&f.push(["opi",c.toString()]);for(c=0;c<f.length;c++){if(c===0||c>0)d+="&";d+=f[c][0]+"="+f[c][1];return"/"+(k||"gen_204")+"?atyp=i&ct="+String(a)+"&cad="+(b+e+d)};m=google.kEI;google.getEI=p;google.getLEI=q;google.ml=function(){return null};google.log=function(a,b,c,d,k,e){e===void 0?l:e;c||!(c=t(a,b,e,d,k));if(c=r(c)){a=new Image;var g=n.length;n[g]=a;a.onerror=a.onload=a.onabort=function(){delete n[g];a.src=c};google.logUrl=function(a,b){b===void 0?l:b;return t("",a,b)}};}).call(this);(function(){google.y=[];google.sy=[];var d;(d=google.x)||!(d.x=function(a,b){if(a)var c=a.id;else do c=Math.random();while(!google.y[c]);google.y[c]=[a,b];return 1});var e;(e=google.x)||!(e.sx=function(a){google.sy.push(a)});google.lm=[];var f;(f=google).plm||(f.plm=function(a){google.lm.push.apply(google.lm,a)});google.lq=[];var g;(g=google).load||(g.load=function(a,b){google.lq.push([a,b,c]);var h;(h=google).loadAll||(h.loadAll=function(a,b){google.lq.push([a,b]);});google.bx=1;var k;(k=google).lx||(k.lx=function()){var l=[];m;(m=google).fce||(m.fce=function(a,b,c,n){l.push([a,b,c,n]);});google.qce=l;}).call(this);google.f={};(function(){
```

Arp:

```
C:\Users\ishur>arp -a

Interface: 192.168.0.108 --- 0x10
    Internet Address      Physical Address         Type
    192.168.0.1           10-27-f5-a8-c2-4b       dynamic
    192.168.0.255         ff-ff-ff-ff-ff-ff       static
    224.0.0.2             01-00-5e-00-00-02       static
    224.0.0.22            01-00-5e-00-00-16       static
    224.0.0.251           01-00-5e-00-00-fb       static
    224.0.0.252           01-00-5e-00-00-fc       static
    239.255.255.250       01-00-5e-7f-ff-fa       static
    255.255.255.255       ff-ff-ff-ff-ff-ff       static
```




5. Learning Outcome:

- i) Understand how to display and configure IP addresses, subnet masks, and other interface settings.
- ii) Learn to manage network interfaces, routing tables, and IP addresses.
- iii) Identify active connections and troubleshoot network issues.
- iv) Verify the reachability of a network device and measure round-trip time for messages sent.
- v) Diagnose routing issues and identify the path packets take across the network.