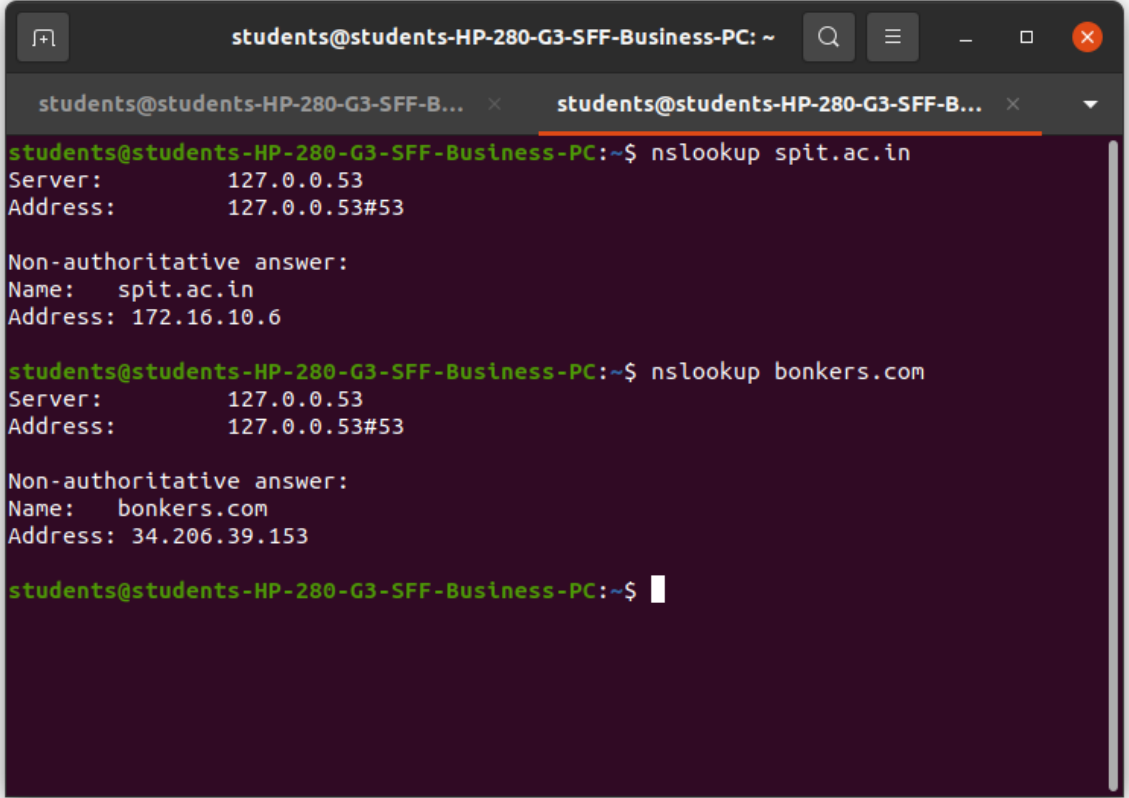




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Department Of Computer Engineering

Name	Manish Shashikant Jadhav
UID	2023301005
Subject	Computer Communication and Networks (CCN)
Experiment No.	1
Aim	Use and Interpret basic Networking Utilities.
Command No.1	<p>nslookup:</p>  <pre>students@students-HP-280-G3-SFF-Business-PC: ~\$ nslookup spit.ac.in Server: 127.0.0.53 Address: 127.0.0.53#53 Non-authoritative answer: Name: spit.ac.in Address: 172.16.10.6 students@students-HP-280-G3-SFF-Business-PC: ~\$ nslookup bonkers.com Server: 127.0.0.53 Address: 127.0.0.53#53 Non-authoritative answer: Name: bonkers.com Address: 34.206.39.153 students@students-HP-280-G3-SFF-Business-PC: ~\$</pre>
	<p>Application:</p> <p>Nslookup is a command-line tool that allows querying DNS servers to retrieve domain name or IP addresses. It is largely used in order to debug and diagnose DNS-related problems, just by checking the resolution of domain names into IP addresses and vice versa. Nslookup is used by network administrators since it allows verifying the accuracy of DNS records, suspicious domains, and ensuring correct domain resolution. The command may be useful in resolving DNS errors during the process of debugging network configuration issues as it offers information regarding the status of DNS servers along with their responses. In summary, nslookup is a useful utility for gaining a better understanding of and getting help with DNS-related problems.</p>



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**Command
No.2**

Ipconfig:

```
students@students-HP-280-G3-SFF-Business-PC: ~  
students@students-HP-280-G3-SFF-B... x students@students-HP-280-G3-SFF-B... x  
students@students-HP-280-G3-SFF-Business-PC:~$ ifconfig  
enp1s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
inet 172.16.30.58 netmask 255.255.255.0 broadcast 172.16.30.255  
inet6 fe80::56e1:1421:362:78c1 prefixlen 64 scopeid 0x20<link>  
ether 8a:99:3d:b0:fc:46 txqueuelen 1000 (Ethernet)  
RX packets 169419 bytes 132177990 (132.1 MB)  
RX errors 0 dropped 689 overruns 0 frame 0  
TX packets 112805 bytes 25749923 (25.7 MB)  
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
inet 127.0.0.1 netmask 255.0.0.0  
inet6 ::1 prefixlen 128 scopeid 0x10<host>  
loop txqueuelen 1000 (Local Loopback)  
RX packets 17234 bytes 2067450 (2.0 MB)  
RX errors 0 dropped 0 overruns 0 frame 0  
TX packets 17234 bytes 2067450 (2.0 MB)  
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
students@students-HP-280-G3-SFF-Business-PC:~$
```

```
students@students-HP-280-G3-SFF-Business-PC: ~  
students@students-HP-280-G3-SFF-B... x students@students-HP-280-G3-SFF-B... x  
students@students-HP-280-G3-SFF-Business-PC:~$ iwconfig  
lo no wireless extensions.  
  
enp1s0 no wireless extensions.  
  
students@students-HP-280-G3-SFF-Business-PC:~$
```

Application:

The **ifconfig** command shows network interface configuration and network interface information that includes the IP address and network-relevant parameters. This works on systems with Unix-like operating systems. Alternatively, the use of the **iwconfig** commands allows configuration and disclosure of information about the wireless network interfaces, which include parameters such as signal strength and encryption if needed.



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**Command
No.3**

Ping:

```
students@students-HP-280-G3-SFF-Business-PC: ~  
students@students-HP-280-G3-SFF-B... x students@students-HP-280-G3-SFF-B... x  
students@students-HP-280-G3-SFF-Business-PC:~$ ping instagram.com  
PING instagram.com (31.13.79.174) 56(84) bytes of data.  
64 bytes from instagram-p42-shv-02-bom1.fbcdn.net (31.13.79.174): icmp_seq=1 ttl  
=56 time=1.43 ms  
64 bytes from instagram-p42-shv-02-bom1.fbcdn.net (31.13.79.174): icmp_seq=2 ttl  
=56 time=0.816 ms  
64 bytes from instagram-p42-shv-02-bom1.fbcdn.net (31.13.79.174): icmp_seq=3 ttl  
=56 time=0.828 ms  
64 bytes from instagram-p42-shv-02-bom1.fbcdn.net (31.13.79.174): icmp_seq=4 ttl  
=56 time=0.848 ms  
64 bytes from instagram-p42-shv-02-bom1.fbcdn.net (31.13.79.174): icmp_seq=5 ttl  
=56 time=1.19 ms  
64 bytes from instagram-p42-shv-02-bom1.fbcdn.net (31.13.79.174): icmp_seq=6 ttl  
=56 time=0.949 ms  
^C  
--- instagram.com ping statistics ---  
6 packets transmitted, 6 received, 0% packet loss, time 5086ms  
rtt min/avg/max/mdev = 0.816/1.010/1.429/0.226 ms  
students@students-HP-280-G3-SFF-Business-PC:~$
```

```
students@students-HP-280-G3-SFF-Business-PC: ~  
students@students-HP-280-G3-SFF-B... x students@students-HP-280-G3-SFF-B... x  
students@students-HP-280-G3-SFF-Business-PC:~$ ping google.com  
PING google.com (216.239.38.120) 56(84) bytes of data.  
64 bytes from any-in-2678.1e100.net (216.239.38.120): icmp_seq=1 ttl=59 time=2.8  
7 ms  
64 bytes from any-in-2678.1e100.net (216.239.38.120): icmp_seq=2 ttl=59 time=2.9  
8 ms  
64 bytes from any-in-2678.1e100.net (216.239.38.120): icmp_seq=3 ttl=59 time=6.0  
5 ms  
64 bytes from any-in-2678.1e100.net (216.239.38.120): icmp_seq=4 ttl=59 time=2.6  
7 ms  
64 bytes from any-in-2678.1e100.net (216.239.38.120): icmp_seq=5 ttl=59 time=2.7  
1 ms  
^C  
--- google.com ping statistics ---  
5 packets transmitted, 5 received, 0% packet loss, time 4005ms  
rtt min/avg/max/mdev = 2.674/3.456/6.052/1.302 ms  
students@students-HP-280-G3-SFF-Business-PC:~$
```

Application:

The ping command is used to check the possible links between two network devices through sending a small data packet and measuring the round-trip time of how data travels from a source to a destination and back. It is widely used for troubleshooting network errors and host response analysis in a network.



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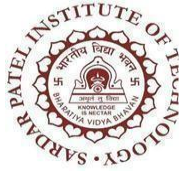
Command
No. 4

Traceroute:

```
students@students-HP-280-G3-SFF-Business-PC: ~  
students@students-HP-280-G3-SFF-B... x students@students-HP-280-G3-SFF-B... x  
students@students-HP-280-G3-SFF-Business-PC:~$ traceroute google.com  
traceroute to google.com (216.239.38.120), 64 hops max  
 1  172.16.30.1  0.368ms  0.385ms  0.350ms  
 2  103.124.122.209  0.659ms  0.452ms  0.445ms  
 3  10.10.54.65  0.811ms  0.616ms  0.700ms  
 4  103.167.177.201  1.584ms  1.456ms  1.106ms  
 5  103.77.108.82  2.529ms  2.966ms  30.556ms  
 6  * * *  
 7  216.239.38.120  1.544ms  1.485ms  1.412ms  
students@students-HP-280-G3-SFF-Business-PC:~$ traceroute instagram.com  
traceroute to instagram.com (31.13.79.174), 64 hops max  
 1  172.16.30.1  0.366ms  0.365ms  0.371ms  
 2  103.124.122.209  0.673ms  0.465ms  0.448ms  
 3  10.10.54.65  0.793ms  0.524ms  0.525ms  
 4  103.167.177.201  2.046ms  1.170ms  1.216ms  
 5  103.77.108.135  1.286ms  1.673ms  0.928ms  
 6  157.240.52.209  1.118ms  1.124ms  0.950ms  
 7  157.240.36.21  1.185ms  0.940ms  0.913ms  
 8  31.13.79.174  1.087ms  1.139ms  0.948ms  
students@students-HP-280-G3-SFF-Business-PC:~$
```

Application:

Traceroute is a command that allows you to trace the path that packets followed from your destination as you seen the intermediate network devices (routers) they linked through. It enables network troubleshooting by pinpointing the precise points of fault or delay in the communication channel.



What is Topology?

Network Topology is an arrangement with which computer systems or network devices are connected to each other.

There are two types of Topologies:-

a)Physical Topology:-

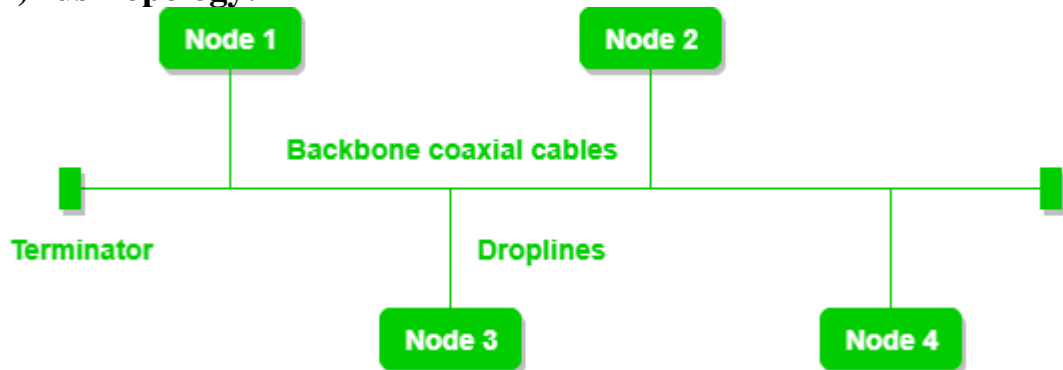
A Physical Topology describes the way in which the computers or nodes are connected with each other in a computer network.

b)Logical Topology:-

A logical Topology describes the way, data flows from one computer to another.

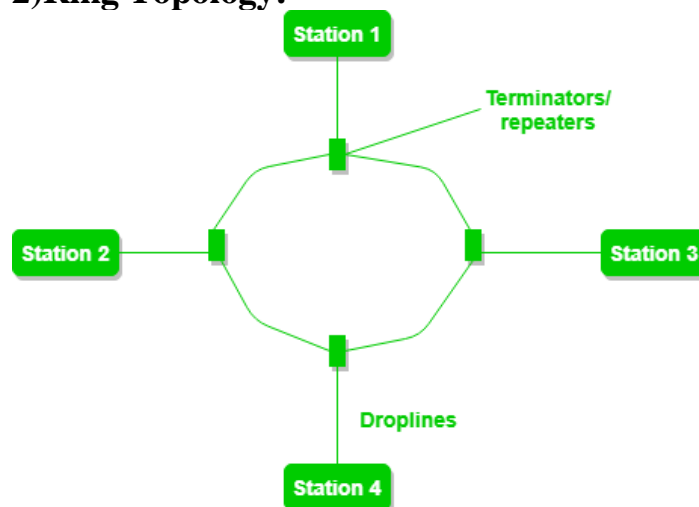
There are mainly six types of Network Topology:-

1)Bus Topology:-

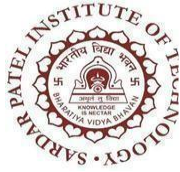


Bus topology is a network type in which every computer and network device is connected to a single cable.

2)Ring Topology:-

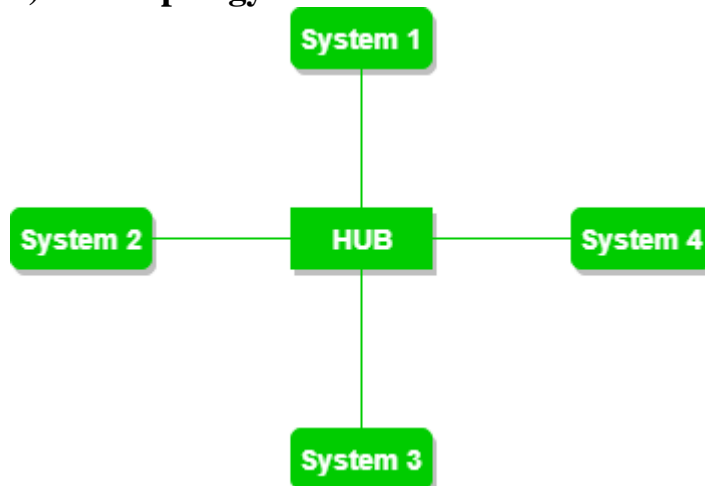


In Ring Topology, each computer is connected to exactly two other computers.



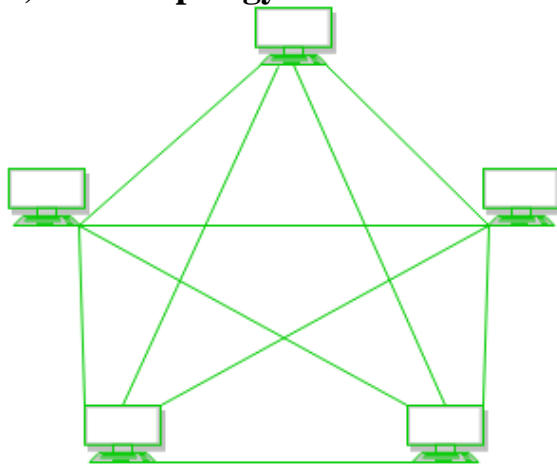
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3)Star Topology:-



In Star Topology, all the nodes are connected to a centralized hub. In this, Centralized Hub is 'The Server' and other peripheral devices are 'Clients'.

4)Mesh Topology:-

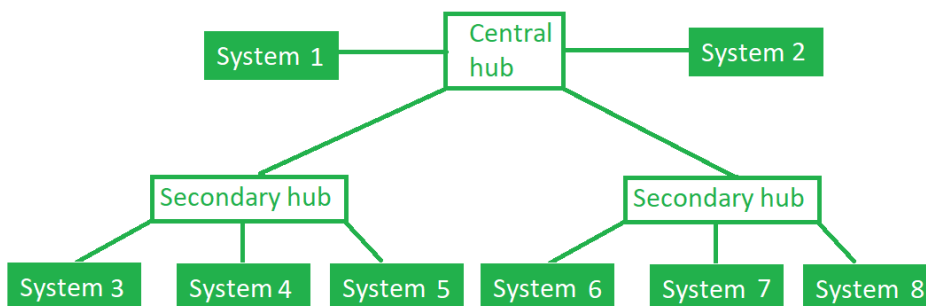


In Mesh Topology, all the nodes are interconnected with each other.



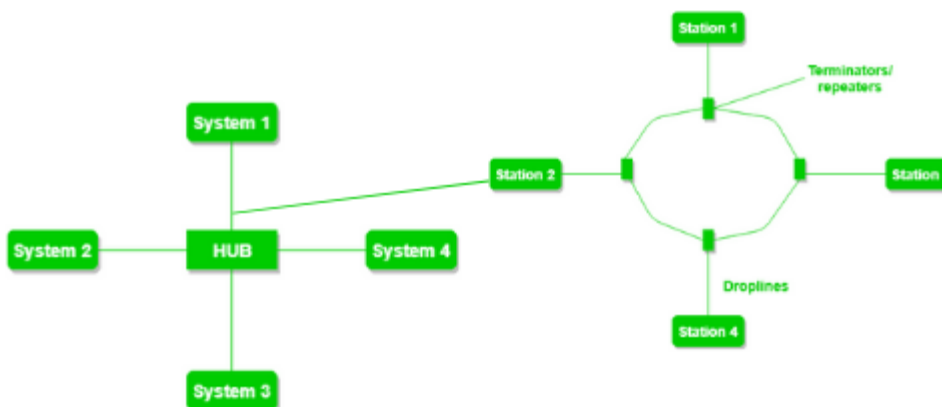
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5)Tree Topology:-



In Tree Topology, all the nodes are directly or indirectly connected to main bus cable. It is the combination of Bus Topology and Star Topology.

6)Hybrid Topology:-



In Hybrid Topology, a computer topology is combination of two or more topologies.

Conclusion

Hence by completing this experiment I came to know about basic networking commands and network topologies in communication networks.