EXP:01	Study of various Network commands

Aim

To study and practice various network commands used in Linux and Windows operating systems for network configuration, troubleshooting, and analysis.

Algorithm / Procedure

1. **Identify** the operating system (Linux or Windows) to be used for the experiment.
2. **Execute** basic configuration commands (ipconfig/ip address show, hostname) to view the system's network identity.
3. **Test** connectivity using the pingcommand to a local host, an IP address, and a fully qualified domain name (FQDN).
4. **Analyze** network statistics and active connections using the netstatcommand.
5. **Perform** DNS lookups using the nslookupcommand to resolve FQDNs to IP addresses.
6. **Trace** the route to a remote host using tracert(Windows) or traceroute/mtr (Linux) to identify network path and latency.
7. **Examine** the ARP cache using arp -a.
8. **Document** the output of each command.

Commands:

Command	**Description**
ifconfig	Displays and configures network interfaces (use ip addr in modern systems).
ip addr show	Shows IP address and interface details.
ping <host>	Checks connectivity with another host.
netstat -an	Displays network connections, routing tables, and interface statistics.
ss -tuln	Shows listening ports and socket statistics (modern replacement for netstat).
traceroute <host>	Displays the route packets take to reach a host.
nslookup <domain>	Queries DNS to obtain domain name or IP address.
dig <domain>	Performs detailed DNS lookups (advanced alternative to nslookup).
route -n	Displays or modifies the IP routing table.
arp -a	Displays the ARP cache (IP-to-MAC address mapping).
iwconfig	Displays wireless network interface details.
curl <URL>	Transfers data from or to a server using HTTP, FTP, etc.
wget <URL>	Downloads files from the web via HTTP, HTTPS, or FTP.
hostname -I	Shows the system’s IP address.
ethtool eth0	Displays or changes Ethernet device settings.

Windows Network Commands

Command	Description
ipconfig	Displays IP configuration of all network interfaces.
ipconfig /all	Shows detailed network configuration (MAC, DNS, DHCP, etc.).
ping <host>	Tests connectivity to a specific IP or hostname.
tracert <host>	Traces the route taken by packets to reach a host.
netstat -ano	Displays active connections, ports, and associated process IDs.
nslookup <domain>	Resolves domain names to IP addresses and vice versa.
arp -a	Displays ARP cache entries.
route print	Displays the system's routing table.
getmac	Displays the MAC addresses of network interfaces.
hostname	Displays the system's hostname.
netsh interface show interface	Displays the list of network interfaces and their status.
telnet <host> <port>	Tests connectivity to a specific port (if Telnet is enabled).
net view	Displays shared resources on a network.
pathping <host>	Combines ping and tracert to identify packet loss and latency.
nbtstat -n	Displays NetBIOS name table of the local machine.

Result:

The various network commands in Linux and Windows were successfully studied and executed, demonstrating their use in network diagnostics and configuration.