# Computer Networks Lab

## Windows commands related to network configuration, management, and troubleshooting:

1. **ipconfig**: Displays the current TCP/IP network configuration values.
   - Usage: `ipconfig`
2. **ipconfig /all**: Displays detailed TCP/IP configuration information for all adapters.
   - Usage: `ipconfig /all`
3. **ipconfig /release**: Releases the current DHCP lease.
   - Usage: `ipconfig /release`
4. **ipconfig /renew**: Renews the DHCP lease.
   - Usage: `ipconfig /renew`
5. **ping**: Tests the connectivity to a specific IP address or hostname.
   - Usage: `ping www.google.com`
6. **tracert**: Traces the route packets take to a specific IP address or hostname.
   - Usage: `tracert www.google.com`
7. **netstat**: Displays active TCP connections, ports on which the computer is listening, and other network statistics.
   - Usage: `netstat`
8. **netstat -an**: Displays all active connections and listening ports in numerical form.
   - Usage: `netstat -an`
9. **nslookup**: Queries DNS servers for domain name or IP address information.
   - Usage: `nslookup www.google.com`
10. **arp -a**: Displays the ARP cache, which contains mappings of IP addresses to MAC addresses.
    - Usage: `arp -a`
11. **route print**: Displays the routing table.
    - Usage: `route print`
12. **route add**: Adds a new route to the routing table.
    - Usage: `route add 192.168.2.0 mask 255.255.255.0 192.168.1.1`
13. **netsh**: A versatile command-line scripting utility that allows you to display or modify the network configuration of a computer currently running.
    - Usage: `netsh interface ip show config`

14. **netsh wlan show profiles**: Displays a list of wireless profiles saved on the computer.
    - Usage: `netsh wlan show profiles`
15. **netsh interface ip set address**: Configures the IP address for a network interface.
    - Usage: `netsh interface ip set address name="Ethernet" static 192.168.1.100 255.255.255.0 192.168.1.1`
16. **netsh interface ip set dns**: Configures the DNS server for a network interface.
    - Usage: `netsh interface ip set dns name="Ethernet" static 8.8.8.8`
17. **net use**: Connects or disconnects a computer from a shared resource or displays information about computer connections.
    - Usage: `net use Z: \\servername\sharename`
18. **net user**: Displays user account information and allows for user account management.
    - Usage: `net user`
19. **nbtstat**: Displays protocol statistics and current TCP/IP connections using NBT (NetBIOS over TCP/IP).
    - Usage: `nbtstat -a <hostname>`
20. **Get-NetAdapter** (PowerShell): Gets the network adapter configuration of the computer.
    - Usage: `Get-NetAdapter`
21. **ipconfig /flushdns**: Flushes the DNS resolver cache.
    - Usage: `ipconfig /flushdns`
22. **ipconfig /displaydns**: Displays the contents of the DNS resolver cache.
    - Usage: `ipconfig /displaydns`
23. **ping -t**: Continuously pings a specific IP address or hostname until stopped.
    - Usage: `ping -t www.google.com`
24. **ping -l**: Sends a ping request with a specified buffer size.
    - Usage: `ping -l 1024 www.google.com`
25. **pathping**: Combines the functionality of ping and tracert to provide information about network latency and packet loss.
    - Usage: `pathping www.google.com`
26. **net view**: Displays a list of network resources or computers.
    - Usage: `net view \\servername`

27. **net use \ip_address\sharename**: Maps a network drive using the IP address of the server.
    - Usage: `net use Z: \\192.168.1.10\sharename`
28. **net share**: Displays or manages shared resources.
    - Usage: `net share sharename=C:\path\to\folder`
29. **net start**: Starts a network service.
    - Usage: `net start servicename`
30. **net stop**: Stops a network service.
    - Usage: `net stop servicename`
31. **telnet**: Connects to remote computers using the Telnet protocol.
    - Usage: `telnet hostname port`
32. **ftp**: Transfers files to and from a remote computer running an FTP server.
    - Usage: `ftp hostname`
33. **Get-NetIPAddress** (PowerShell): Retrieves the IP address configuration.
    - Usage: `Get-NetIPAddress`
34. **Get-NetRoute** (PowerShell): Retrieves the IP routing table.
    - Usage: `Get-NetRoute`
35. **Set-DnsClientServerAddress** (PowerShell): Configures the DNS server addresses.
    - Usage: `Set-DnsClientServerAddress -InterfaceAlias "Ethernet" -ServerAddresses ("8.8.8.8","8.8.4.4")`
36. **Get-DnsClientCache** (PowerShell): Retrieves the contents of the DNS client cache.
    - Usage: `Get-DnsClientCache`
37. **Get-NetAdapterStatistics** (PowerShell): Displays traffic statistics for network adapters.
    - Usage: `Get-NetAdapterStatistics`
38. **Test-Connection** (PowerShell): Sends ICMP echo request packets (pings) to test network connectivity.
    - Usage: `Test-Connection -ComputerName www.google.com`
39. **Enable-NetAdapter** (PowerShell): Enables a network adapter.
    - Usage: `Enable-NetAdapter -Name "Ethernet"`
40. **Disable-NetAdapter** (PowerShell): Disables a network adapter.
    - Usage: `Disable-NetAdapter -Name "Ethernet"`

41. **Get-NetFirewallProfile** (PowerShell): Retrieves the configuration of the Windows Firewall profiles.
    - Usage: `Get-NetFirewallProfile`
42. **Set-NetFirewallProfile** (PowerShell): Configures the Windows Firewall profiles.
    - Usage: `Set-NetFirewallProfile -Profile Domain,Public,Private -Enabled False`
43. **Get-NetConnectionProfile** (PowerShell): Displays the network connection profile.
    - Usage: `Get-NetConnectionProfile`
44. **New-NetIPAddress** (PowerShell): Configures a new IP address.
    - Usage: `New-NetIPAddress -InterfaceAlias "Ethernet" -IPAddress 192.168.1.100 -PrefixLength 24 -DefaultGateway 192.168.1.1`
45. **net statistics workstation**: Displays statistics about the workstation service.
    - Usage: `net statistics workstation`
46. **net statistics server**: Displays statistics about the server service.
    - Usage: `net statistics server`
47. **Get-NetTCPConnection** (PowerShell): Retrieves active TCP connections.
    - Usage: `Get-NetTCPConnection`
48. **Resolve-DnsName** (PowerShell): Resolves DNS names.
    - Usage: `Resolve-DnsName www.google.com`
49. **Get-NetIPConfiguration** (PowerShell): Displays the IP configuration for all network interfaces.
    - Usage: `Get-NetIPConfiguration`
50. **Get-NetIPAddress -InterfaceAlias** (PowerShell): Displays IP addresses for a specific network interface.
    - Usage: `Get-NetIPAddress -InterfaceAlias "Ethernet"`
51. **Invoke-WebRequest** (PowerShell): Sends HTTP and HTTPS requests to a web page or web service.
    - Usage: `Invoke-WebRequest -Uri http://www.google.com`
52. **netsh wlan connect**: Connects to a wireless network.
    - Usage: `netsh wlan connect name="NetworkName"`
53. **netsh wlan disconnect**: Disconnects from a wireless network.

- Usage: `netsh wlan disconnect`

54. **netsh wlan show interfaces**: Displays information about wireless interfaces.
    - Usage: `netsh wlan show interfaces`
55. **netsh advfirewall set allprofiles state**: Configures the state of the Windows Firewall.
    - Usage: `netsh advfirewall set allprofiles state off`
56. **Get-Help** (PowerShell): Displays help about PowerShell cmdlets and commands.
    - Usage: `Get-Help Get-NetIPAddress`
57. **net config**: Displays or configures a server service.
    - Usage: `net config server`
58. **ping -a**: Resolves addresses to hostnames.
    - Usage: `ping -a 192.168.1.1`
59. **netsh interface ipv4 show dns**: Displays DNS configuration for IPv4 interfaces.
    - Usage: `netsh interface ipv4 show dns`
60. **Set-NetIPInterface** (PowerShell): Configures IP interface properties.
    - Usage: `Set-NetIPInterface -InterfaceAlias "Ethernet" -Dhcp Disabled`