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(LINUX COMMANDS)

- **ifconfig**

  Configures network interfaces, checks IP address, netmask, and other network details.

```
DELL E5480's ~/
➤ wsl
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 172.20.186.236  netmask 255.255.240.0  broadcast 172.20.191.255
        inet6 fe80::215:5dff:fe38:eae8  prefixlen 64  scopeid 0x20<link>
        ether 00:15:5d:38:ea:e8  txqueuelen 1000  (Ethernet)
        RX packets 14  bytes 1452 (1.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 15  bytes 1082 (1.0 KB)
        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 4  bytes 591 (591.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 4  bytes 591 (591.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

- **ip**

  A more advanced and flexible tool to manage network interfaces and routing tables.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet 10.255.255.254/32 brd 10.255.255.254 scope global lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:38:ea:e8 brd ff:ff:ff:ff:ff:ff
    inet 172.20.186.236/20 brd 172.20.191.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe38:eae8/64 scope link
       valid_lft forever preferred_lft forever
```

- **traceroute**

Maps the path packets take to reach a destination and helps in diagnosing network issues.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# traceroute coeptech.ac.in
traceroute to coeptech.ac.in (103.53.40.13), 30 hops max, 60 byte packets
 1  172.20.176.1 (172.20.176.1)  1.116 ms  1.025 ms  0.981 ms
 2  10.200.56.1 (10.200.56.1)  2.016 ms  2.420 ms  2.488 ms
 3  10.1.1.1 (10.1.1.1)  7.954 ms  7.905 ms  8.205 ms
 4  210.212.183.1 (210.212.183.1)  6.490 ms  8.086 ms  8.924 ms
 5  172.24.220.162 (172.24.220.162)  7.347 ms  7.278 ms  8.538 ms
 6  218.248.255.20 (218.248.255.20)  10.406 ms  14.257 ms  14.225 ms
 7  218.248.255.21 (218.248.255.21)  52.443 ms * *
 8  115.110.229.45.static-mumbai.vsnl.net.in (115.110.229.45)  8.321 ms  8.162 ms  9.379 ms
 9  * * *
10  * * *
11  103.53.40.13 (103.53.40.13)  8.880 ms  8.863 ms  6.464 ms
```

- **tracepath**

Similar to traceroute, but doesn't require root privileges and provides simpler output for debugging.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# tracepath coeptech.ac.in
 1?: [LOCALHOST]                        pmtu 1500
 1:  DESKTOP-PS67T7L.mshome.net                           0.278ms
 1:  DESKTOP-PS67T7L.mshome.net                           0.399ms
 2:  10.200.56.1                                         20.181ms
 3:  10.1.1.1                                             1.719ms
 4:  210.212.183.1                                        2.165ms
 5:  172.24.220.162                                       5.750ms
 6:  no reply
 7:  no reply
 8:  115.110.229.45.static-mumbai.vsnl.net.in             5.896ms
 9:  no reply
10:  no reply
11:  103.53.40.13                                         6.231ms reached
     Resume: pmtu 1500 hops 11 back 11
```

- **ping**

  Sends ICMP echo requests to a host to check network connectivity and measure round-trip time.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# ping coeptech.ac.in
PING coeptech.ac.in (103.53.40.13) 56(84) bytes of data.
64 bytes from 103.53.40.13 (103.53.40.13): icmp_seq=1 ttl=54 time=4.69 ms
64 bytes from 103.53.40.13 (103.53.40.13): icmp_seq=2 ttl=54 time=5.58 ms
64 bytes from 103.53.40.13 (103.53.40.13): icmp_seq=3 ttl=54 time=4.97 ms
64 bytes from 103.53.40.13 (103.53.40.13): icmp_seq=4 ttl=54 time=4.78 ms
64 bytes from 103.53.40.13 (103.53.40.13): icmp_seq=5 ttl=54 time=5.40 ms
64 bytes from 103.53.40.13 (103.53.40.13): icmp_seq=6 ttl=54 time=5.48 ms
64 bytes from 103.53.40.13 (103.53.40.13): icmp_seq=7 ttl=54 time=8.25 ms
64 bytes from 103.53.40.13 (103.53.40.13): icmp_seq=8 ttl=54 time=5.63 ms
^C
--- coeptech.ac.in ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7012ms
```

- **netstat**

  Displays detailed network statistics, including active connections, routing tables, and more.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ]         DGRAM                    21514    /var/run/chrony/chronyd.sock
unix  3      [ ]         DGRAM      CONNECTED     21527    /run/systemd/notify
unix  2      [ ]         DGRAM                    21536    /run/systemd/journal/syslog
unix  8      [ ]         DGRAM      CONNECTED     21544    /run/systemd/journal/dev-log
unix  2      [ ]         DGRAM                    18755    /run/user/0/systemd/notify
unix  7      [ ]         DGRAM      CONNECTED     21546    /run/systemd/journal/socket
unix  3      [ ]         STREAM     CONNECTED     19806    /run/dbus/system_bus_socket
unix  3      [ ]         DGRAM      CONNECTED     1192
unix  2      [ ]         DGRAM      CONNECTED     20662
unix  3      [ ]         STREAM     CONNECTED     19956
unix  3      [ ]         STREAM     CONNECTED     19839
unix  3      [ ]         STREAM     CONNECTED     300      /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     22545
unix  3      [ ]         STREAM     CONNECTED     20694
unix  3      [ ]         STREAM     CONNECTED     19754
unix  3      [ ]         STREAM     CONNECTED     308
unix  3      [ ]         DGRAM      CONNECTED     21529
unix  3      [ ]         STREAM     CONNECTED     1146
unix  3      [ ]         STREAM     CONNECTED     20658
unix  3      [ ]         STREAM     CONNECTED     22673    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     19650
unix  3      [ ]         STREAM     CONNECTED     301      /run/systemd/journal/stdout
unix  2      [ ]         DGRAM      CONNECTED     21769
unix  2      [ ]         STREAM     CONNECTED     1108
unix  3      [ ]         STREAM     CONNECTED     257      /run/systemd/journal/stdout
```

- **nslookup**

  Queries DNS servers for domain name or IP address resolution, useful for troubleshooting DNS issues.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# nslookup coeptech.ac.in
Server:         10.255.255.254
Address:        10.255.255.254#53

Non-authoritative answer:
Name:   coeptech.ac.in
Address: 103.53.40.13
```

- **dig**

  A versatile tool for querying DNS servers, providing detailed query results.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# dig coeptech.ac.in

; <<>> DiG 9.18.18-0ubuntu0.22.04.1-Ubuntu <<>> coeptech.ac.in
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 64224
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4000
;; QUESTION SECTION:
;coeptech.ac.in.                        IN      A

;; ANSWER SECTION:
coeptech.ac.in.         11677   IN      A       103.53.40.13

;; Query time: 19 msec
;; SERVER: 10.255.255.254#53(10.255.255.254) (UDP)
;; WHEN: Sat Sep 07 10:39:39 IST 2024
;; MSG SIZE  rcvd: 59
```

- **route**

  Displays or modifies the kernel's routing table, which determines how data packets are forwarded.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         172.20.176.1    0.0.0.0         UG    0      0        0 eth0
172.20.176.0    0.0.0.0         255.255.240.0   U     0      0        0 eth0
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# route -n
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         172.20.176.1    0.0.0.0         UG    0      0        0 eth0
172.20.176.0    0.0.0.0         255.255.240.0   U     0      0        0 eth0
```

- **host**

  Simple DNS lookup utility to resolve domain names to IP addresses or vice versa.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# host coeptech.ac.in
coeptech.ac.in has address 103.53.40.13
coeptech.ac.in mail is handled by 0 coeptech-ac-in.mail.protection.outlook.com.
```

- **arp**

  Manages the ARP cache, which maps IP addresses to MAC addresses on the local network.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# arp
Address                  HWtype  HWaddress           Flags Mask            Iface
172.20.176.1             ether   00:15:5d:24:74:02   C                     eth0
```

- **iwconfig**

  Configures wireless network interfaces, allowing you to change SSID, frequency, and encryption settings.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# iwconfig
lo          no wireless extensions.

eth0        no wireless extensions.
```

- **curl**

  Transfers data from or to a server using various protocols (HTTP, FTP, etc.) and displays the server response.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# curl http://google.com
<HTML><HEAD><meta http-equiv="content-type" content="text/html;charset=utf-8">
<TITLE>301 Moved</TITLE></HEAD><BODY>
<H1>301 Moved</H1>
The document has moved
<A HREF="http://www.google.com/">here</A>.
</BODY></HTML>
```

- **wget**

  A non-interactive tool for downloading files from the web, supporting recursive downloads and resume.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# wget https://dlcdn.apache.org/maven/maven-3/3.9.9/binaries/apache-maven-3.
9.9-bin.zip
--2024-09-07 11:10:01--  https://dlcdn.apache.org/maven/maven-3/3.9.9/binaries/apache-maven-3.9.9-bin.zip
Resolving dlcdn.apache.org (dlcdn.apache.org)... 151.101.2.132, 2a04:4e42::644
Connecting to dlcdn.apache.org (dlcdn.apache.org)|151.101.2.132|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 9202456 (8.8M) [application/zip]
Saving to: 'apache-maven-3.9.9-bin.zip'

apache-maven-3.9.9-bin.zip    100%[===============================================>]   8.78M  8.11MB/s    in 1.1s

2024-09-07 11:10:02 (8.11 MB/s) - 'apache-maven-3.9.9-bin.zip' saved [9202456/9202456]
```

- **telnet**

  Connects to remote systems using the Telnet protocol, often used for testing network services.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# telnet google.com 80
Trying 142.250.183.110...
Connected to google.com.
Escape character is '^]'.
GET /index.html
HTTP/1.0 200 OK
Date: Sun, 08 Sep 2024 06:01:36 GMT
Expires: -1
Cache-Control: private, max-age=0
Content-Type: text/html; charset=ISO-8859-1
Content-Security-Policy-Report-Only: object-src 'none';base-uri 'self';script-src 'nonce-AnmfWu0M22DG3GUki_jQ-A' 'strict
-dynamic' 'report-sample' 'unsafe-eval' 'unsafe-inline' https: http:;report-uri https://csp.withgoogle.com/csp/gws/other
-hp
P3P: CP="This is not a P3P policy! See g.co/p3phelp for more info."
Server: gws
X-XSS-Protection: 0
X-Frame-Options: SAMEORIGIN
Set-Cookie: NID=517=5hGSj9F8TayZer_3YbqJkcKu7rYxBHB5b4rCUuMfRIpNfZNfL0gmHpg9aKoSp-SziRmnxt7JwW3GLqkOOseIFgHOiTVIrImCPdDz
exvILP8wVxLyKIuzEFAwCzbCHwsdXgrkss9nbVS8OC17Wm2kvanFtce6-ypudFLFODogECAYiAmV1v8zq9nb; expires=Mon, 10-Mar-2025 06:01:36
GMT; path=/; domain=.google.com; HttpOnly
Accept-Ranges: none
Vary: Accept-Encoding
```

- **whois**

  Retrieves information about domain registration, such as owner, registrar, and expiration date.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# whois coeptech.ac.in
Domain Name: coeptech.ac.in
Registry Domain ID: D72FE1EA1F184485EBC8CB90183727F32-IN
Registrar WHOIS Server:
Registrar URL: http://www.ernet.in
Updated Date: 2024-01-23T13:59:52Z
Creation Date: 2022-12-02T05:10:18Z
Registry Expiry Date: 2032-12-02T05:10:18Z
Registrar: ERNET India
Registrar IANA ID: 800068
Registrar Abuse Contact Email:
Registrar Abuse Contact Phone:
Domain Status: ok http://www.icann.org/epp#OK
Registry Registrant ID: REDACTED FOR PRIVACY
Registrant Name: REDACTED FOR PRIVACY
Registrant Organization: COEP Technological University
Registrant Street: REDACTED FOR PRIVACY
Registrant Street: REDACTED FOR PRIVACY
Registrant Street: REDACTED FOR PRIVACY
Registrant City: REDACTED FOR PRIVACY
Registrant State/Province:
Registrant Postal Code: REDACTED FOR PRIVACY
Registrant Country: IN
Registrant Phone: REDACTED FOR PRIVACY
Registrant Phone Ext: REDACTED FOR PRIVACY
Registrant Fax: REDACTED FOR PRIVACY
Registrant Fax Ext: REDACTED FOR PRIVACY
Registrant Email: Please contact the Registrar listed above
```

- **ifplugstatus**

  Checks the physical connection status of network interfaces (whether cable is plugged in or not).

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# ifplugstatus
lo: link beat detected
eth0: link beat detected
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# ifplugstatus lo
lo: link beat detected
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# ifplugstatus eth0
eth0: link beat detected
```

- **nload**

  Monitors incoming and outgoing traffic on a network interface, showing real-time bandwidth usage.

```
Device eth0 [172.20.186.236] (1/1):
=================================================================================================
Incoming:




                                                    Curr: 0.00 Bit/s
                                                    Avg: 80.00 Bit/s
                                                    Min: 0.00 Bit/s
                                                    Max: 1.04 kBit/s
                                                    Ttl: 36.58 MByte
Outgoing:




                                                    Curr: 0.00 Bit/s
                                                    Avg: 0.00 Bit/s
                                                    Min: 0.00 Bit/s
                                                    Max: 0.00 Bit/s
                                                    Ttl: 748.95 kByte
```

- **mail**

  Command-line mail client for sending and receiving emails from Unix/Linux systems.

```
root@DESKTOP-PS67T7L:/mnt/c/Users/DELL E5480# mail -s "Meeting Tommorrow" tejasvjadhav2004@gmail.com
Cc: tejasjadhav83724@gmail.com
Tommorow Meeting Scheduled at 3.00 pm. Everyone attend positively...
.
```

- **mail**