
Q. STUDY OF DIFFERENT NETWORK COMMANDS?

—> Commands are as follows:

1. **color -a:** changes text color
2. **ifconfig -a:** displays Internet Protocol version 4 (IPv4) and IPv6 addresses, subnet mask, and default gateway for all adapters.

```
➔ ~ ifconfig -a
lo0: flags=8049<UP,LOOPBACK,RUNNING,MULTICAST> mtu 16384
    options=1203<RXCSUM,TXCSUM,TXSTATUS,SW_TIMESTAMP>
    inet 127.0.0.1 netmask 0xff000000
    inet6 ::1 prefixlen 128
    inet6 fe80::1%lo0 prefixlen 64 scopeid 0x1
    nd6 options=201<PERFORMNUD,DAD>
gif0: flags=8010<POINTOPOINT,MULTICAST> mtu 1280
stf0: flags=0<> mtu 1280
anpi1: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 2a:17:39:d9:dd:39
    inet6 fe80::2817:39ff:fed9:dd39%anpi1 prefixlen 64 scopeid 0x4
    nd6 options=201<PERFORMNUD,DAD>
    media: none
    status: inactive
anpi0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 2a:17:39:d9:dd:38
    inet6 fe80::2817:39ff:fed9:dd38%anpi0 prefixlen 64 scopeid 0x5
    nd6 options=201<PERFORMNUD,DAD>
    media: none
    status: inactive
en3: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 2a:17:39:d9:dd:18
    nd6 options=201<PERFORMNUD,DAD>
    media: none
    status: inactive
en4: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 2a:17:39:d9:dd:19
    nd6 options=201<PERFORMNUD,DAD>
    media: none
    status: inactive
en1: flags=8963<UP,BROADCAST,SMART,RUNNING,PROMISC,SIMPLEX,MULTICAST> mtu 1500
    options=460<TS04,TS06,CHANNEL_IO>
    ether 36:a8:71:9d:a4:80
    media: autoselect <full-duplex>
    status: inactive
en2: flags=8963<UP,BROADCAST,SMART,RUNNING,PROMISC,SIMPLEX,MULTICAST> mtu 1500
    options=460<TS04,TS06,CHANNEL_IO>
    ether 36:a8:71:9d:a4:84
    media: autoselect <full-duplex>
    status: inactive
bridge0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=63<RXCSUM,TXCSUM,TS04,TS06>
    ether 36:a8:71:9d:a4:80
    Configuration:
        id 0:0:0:0:0:0 priority 0 hellotime 0 fwddelay 0
        maxage 0 holdcnt 0 proto stp maxaddr 100 timeout 1200
        root id 0:0:0:0:0:0 priority 0 ifcost 0 port 0
        ipfilter disabled flags 0x0
    member: en1 flags=3<LEARNING,DISCOVER>
        ifmaxaddr 0 port 8 priority 0 path cost 0
    member: en2 flags=3<LEARNING,DISCOVER>
        ifmaxaddr 0 port 9 priority 0 path cost 0
    nd6 options=201<PERFORMNUD,DAD>
    media: <unknown type>
    status: inactive
ap1: flags=8802<BROADCAST,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 3e:91:80:f3:a0:ef
```

3. **nslookup:** A web based DNS client that queries DNS records for a given domain name. It allows us to view all the DNS records for a website.

```
[→ ~ nslookup www.ncit.edu.np
Server:          2400:1a00:0:32::165
Address:         2400:1a00:0:32::165#53

Non-authoritative answer:
Name:   www.ncit.edu.np
Address: 172.67.182.21
Name:   www.ncit.edu.np
Address: 104.21.51.152
```

4. **ping:** It's a simple way to verify that a computer can communicate with another computer or network device.

```
[→ ~ ping www.youtube.com
PING youtube-ui.l.google.com (142.250.193.14): 56 data bytes
64 bytes from 142.250.193.14: icmp_seq=0 ttl=53 time=24.759 ms
64 bytes from 142.250.193.14: icmp_seq=1 ttl=53 time=29.137 ms
64 bytes from 142.250.193.14: icmp_seq=2 ttl=53 time=26.096 ms
64 bytes from 142.250.193.14: icmp_seq=3 ttl=53 time=23.082 ms
64 bytes from 142.250.193.14: icmp_seq=4 ttl=53 time=31.966 ms
64 bytes from 142.250.193.14: icmp_seq=5 ttl=53 time=31.166 ms
64 bytes from 142.250.193.14: icmp_seq=6 ttl=53 time=25.672 ms
64 bytes from 142.250.193.14: icmp_seq=7 ttl=53 time=24.651 ms
64 bytes from 142.250.193.14: icmp_seq=8 ttl=53 time=29.630 ms
64 bytes from 142.250.193.14: icmp_seq=9 ttl=53 time=32.878 ms
64 bytes from 142.250.193.14: icmp_seq=10 ttl=53 time=31.720 ms
64 bytes from 142.250.193.14: icmp_seq=11 ttl=53 time=32.337 ms
64 bytes from 142.250.193.14: icmp_seq=12 ttl=53 time=31.982 ms
64 bytes from 142.250.193.14: icmp_seq=13 ttl=53 time=22.659 ms
64 bytes from 142.250.193.14: icmp_seq=14 ttl=53 time=23.296 ms
64 bytes from 142.250.193.14: icmp_seq=15 ttl=53 time=31.353 ms
64 bytes from 142.250.193.14: icmp_seq=16 ttl=53 time=33.392 ms
64 bytes from 142.250.193.14: icmp_seq=17 ttl=53 time=23.633 ms
64 bytes from 142.250.193.14: icmp_seq=18 ttl=53 time=27.561 ms
64 bytes from 142.250.193.14: icmp_seq=19 ttl=53 time=24.845 ms
64 bytes from 142.250.193.14: icmp_seq=20 ttl=53 time=32.874 ms
```

5. **traceroute:** command that's used to show several details about the path that a packet takes from the computer or device you're on to whatever destination you specify

```
[→ ~ traceroute www.onlinekhabar.com
traceroute: Warning: www.onlinekhabar.com has multiple addresses; using 104.21.62.119
traceroute to www.onlinekhabar.com (104.21.62.119), 64 hops max, 52 byte packets
 1 192.168.1.254 (192.168.1.254) 3.875 ms 3.319 ms 2.882 ms
 2 27.34.0.1 (27.34.0.1) 7.023 ms 8.030 ms 7.634 ms
 3 be-4-153.40.gw-jwl-core-03.wlink.com.np (202.79.40.153) 7.532 ms 6.710 ms 8.136 ms
 4 * * *
 5 103.211.151.11 (103.211.151.11) 6.885 ms 5.159 ms 5.869 ms
 6 104.21.62.119 (104.21.62.119) 7.648 ms 7.295 ms 7.129 ms
```


6. **pathping:** It combines ping and traceroute commands.
(NO such command for Mac.)
7. **hostname:** used to check the system name.

```
➔ ~ hostname  
Alishaaaaas-MacBook-Air.local
```

8. **netstat:** used to display very detailed information about how your computer is communicating with other computers or network devices.

```
➔ ~ netstat  
Active Internet connections  
Proto Recv-Q Send-Q Local Address Foreign Address (state)  
tcp6 0 0 2400-1a00-b010.i.64584 del12s08-in-x16..https ESTABLISHED  
tcp4 0 0 192.168.1.69.64583 del12s07-in-f14..https ESTABLISHED  
tcp4 0 0 192.168.1.69.64578 stackoverflow.co.https ESTABLISHED  
tcp4 0 0 192.168.1.69.64572 146.75.116.193.https ESTABLISHED  
tcp4 0 0 192.168.1.69.64558 151.101.193.69.https ESTABLISHED  
tcp4 0 0 192.168.1.69.64308 55.65.117.34.bc..https ESTABLISHED  
tcp6 0 0 alishaaaaas-macbo.64298 iphone-xs-2.63631 ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64300 whatsapp-chatd-m.jabbe ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64299 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64281 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64275 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64269 edge-star6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64266 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64256 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64246 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64237 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64229 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64217 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64170 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64163 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64154 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64153 edge-star6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64152 edge-star6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64151 edge-star6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64150 edge-star6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64149 edge-star6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64140 edge-star6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64138 edge-star6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64135 edge-star6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64124 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64112 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.64065 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.61943 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.61933 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.61925 edge-mqtt6-shv-0.https ESTABLISHED  
tcp6 0 0 2400-1a00-b010.i.61915 edge-mqtt6-shv-0.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61904 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61894 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61884 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61868 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61859 edge-mqtt-shv-02.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61848 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61839 edge-mqtt-shv-02.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61827 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61817 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61809 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61798 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61784 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61769 edge-mqtt-shv-02.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61739 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61715 edge-mqtt-shv-02.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61691 edge-mqtt-shv-02.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61648 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61629 edge-mqtt-shv-02.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61609 edge-mqtt-shv-02.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61593 edge-mqtt-shv-02.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61576 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61562 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61550 edge-mqtt-shv-01.https ESTABLISHED  
tcp4 0 0 192.168.1.69.61478 edge-mqtt-shv-01.https ESTABLISHED
```

```
kctl 0 0 3 6 com.apple.netsrc
kctl 0 0 4 6 com.apple.netsrc
kctl 0 0 5 6 com.apple.netsrc
kctl 0 0 6 6 com.apple.netsrc
kctl 0 0 7 6 com.apple.netsrc
kctl 0 0 8 6 com.apple.netsrc
kctl 0 0 9 6 com.apple.netsrc
kctl 0 0 10 6 com.apple.netsrc
kctl 0 0 11 6 com.apple.netsrc
kctl 0 0 12 6 com.apple.netsrc
kctl 0 0 13 6 com.apple.netsrc
kctl 0 0 14 6 com.apple.netsrc
kctl 0 0 15 6 com.apple.netsrc
kctl 0 0 16 6 com.apple.netsrc
kctl 0 0 17 6 com.apple.netsrc
kctl 0 0 18 6 com.apple.netsrc
kctl 0 0 19 6 com.apple.netsrc
kctl 0 0 20 6 com.apple.netsrc
kctl 0 0 21 6 com.apple.netsrc
kctl 0 0 22 6 com.apple.netsrc
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kctl 0 0 24 6 com.apple.netsrc
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kctl 0 0 35 6 com.apple.netsrc
kctl 0 0 36 6 com.apple.netsrc
kctl 0 0 37 6 com.apple.netsrc
kctl 0 0 38 6 com.apple.netsrc
kctl 0 0 39 6 com.apple.netsrc
kctl 0 0 40 6 com.apple.netsrc
kctl 0 0 41 6 com.apple.netsrc
kctl 0 0 42 6 com.apple.netsrc
kctl 0 0 43 6 com.apple.netsrc
kctl 0 0 44 6 com.apple.netsrc
kctl 0 0 45 6 com.apple.netsrc
kctl 0 0 46 6 com.apple.netsrc
kctl 0 0 47 6 com.apple.netsrc
kctl 0 0 48 6 com.apple.netsrc
kctl 0 0 49 6 com.apple.netsrc
kctl 0 0 50 6 com.apple.netsrc
kctl 0 0 51 6 com.apple.netsrc
kctl 0 0 52 6 com.apple.netsrc
kctl 0 0 53 6 com.apple.netsrc
kctl 0 0 54 6 com.apple.netsrc
kctl 0 0 55 6 com.apple.netsrc
kctl 0 0 57 6 com.apple.netsrc
kctl 0 0 58 6 com.apple.netsrc
kctl 0 0 59 6 com.apple.netsrc
kctl 0 0 60 6 com.apple.netsrc
kctl 0 0 61 6 com.apple.netsrc
kctl 0 0 67 6 com.apple.netsrc
kctl 0 0 1 7 com.apple.network.statistics
kctl 0 0 2 7 com.apple.network.statistics
kctl 0 0 3 7 com.apple.network.statistics
```

9. **arp(Address Resolution Protocol):** used to store IP addresses and their resolved physical addresses.

```
➔ ~ arp -a
? (192.168.1.68) at bc:4c:c4:94:63:fd on en0 ifscope [ethernet]
? (192.168.1.71) at 26:ad:ef:8c:bd:e7 on en0 ifscope [ethernet]
? (192.168.1.75) at 32:92:e0:72:99:18 on en0 ifscope [ethernet]
? (192.168.1.88) at 36:b9:4:98:bf:ae on en0 ifscope [ethernet]
? (192.168.1.254) at e4:da:df:f5:cc:70 on en0 ifscope [ethernet]
? (192.168.1.255) at ff:ff:ff:ff:ff:ff on en0 ifscope [ethernet]
? (224.0.0.251) at 1:0:5e:0:0:fb on en0 ifscope permanent [ethernet]
```

10. **system_profiler:** Displays detailed configuration information about a computer and its operating system, including operating system configuration, security information, product ID, and hardware properties (such as RAM, disk space, and network cards).

```
➔ ~ system_profiler
Accessibility:

  Accessibility Information:

    Cursor Magnification: Off
    Display: Black on White
    Flash Screen: Off
    Mouse Keys: Off
    Slow Keys: Off
    Sticky Keys: Off
    VoiceOver: Off
    Zoom Mode: Full Screen
    Contrast: 0
    Keyboard Zoom: On
    Scroll Zoom: On

Apple Pay:

  Apple Pay Information:
    Platform ID: N5B2M003D3C70000
    SEID: 04403C5BCC6480021029052842308811B6FEA402717858BC
    Device: 0xd2
    Production Signed: Yes
    Restricted Mode: No
    Hardware: 0x00000007
    Firmware: 0x0700
    JCOP OS: 18.03

  Controller Information:
    Hardware: b2.2 ( )
    Firmware: 1.86 rev 127266
    Middleware: 5.1.1.34

Applications:

  Firefox:

    Version: 113.0.1
    Obtained from: Identified Developer
```