



Mawlana Bhashani Science and Technology University

Lab-Report

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Ans to the question no:1

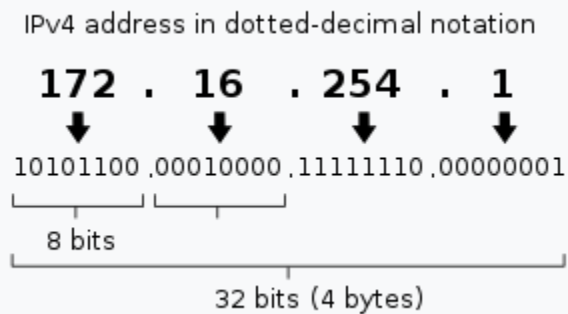
As you may already know, each device connected to a computer network that uses the Internet Protocol for communication is assigned a numerical label, an Internet Protocol address, or IP address for short. An IP address identifies the device and establishes a path to it.

But not all IP addresses can be reached through the public internet, and **192.168.1.1** is among them. This default IP address of most Linksys routers is one of 65,536 IP addresses in the 16-bit block of the private IPv4 address space, which includes addresses from **192.168.0.0** to **192.168.255.255**.

Private IP addresses are used for local area networks (LANs), and they were defined in an effort to delay IPv4 address exhaustion. Because private IP addresses can be used without approval from a regional Internet registry, they allow anyone from individual home users to organizations to readily deploy internet-connected devices using Network Address Translation (NAT), a method of assigning a public address to a computer inside a private network.

Manufacturers of home routers use private IP addresses, including **192.168.1.1**, as the default gateway, allowing users to type `http://192.168.1.1` into a web browser to access the router admin panel and change router settings.

IPv4 Addressing:



Decomposition of the quad-dotted IPv4 address representation to its binary value

IPv4 uses 32-bit addresses which limits the address space to 4294967296 (2^{32}) addresses.

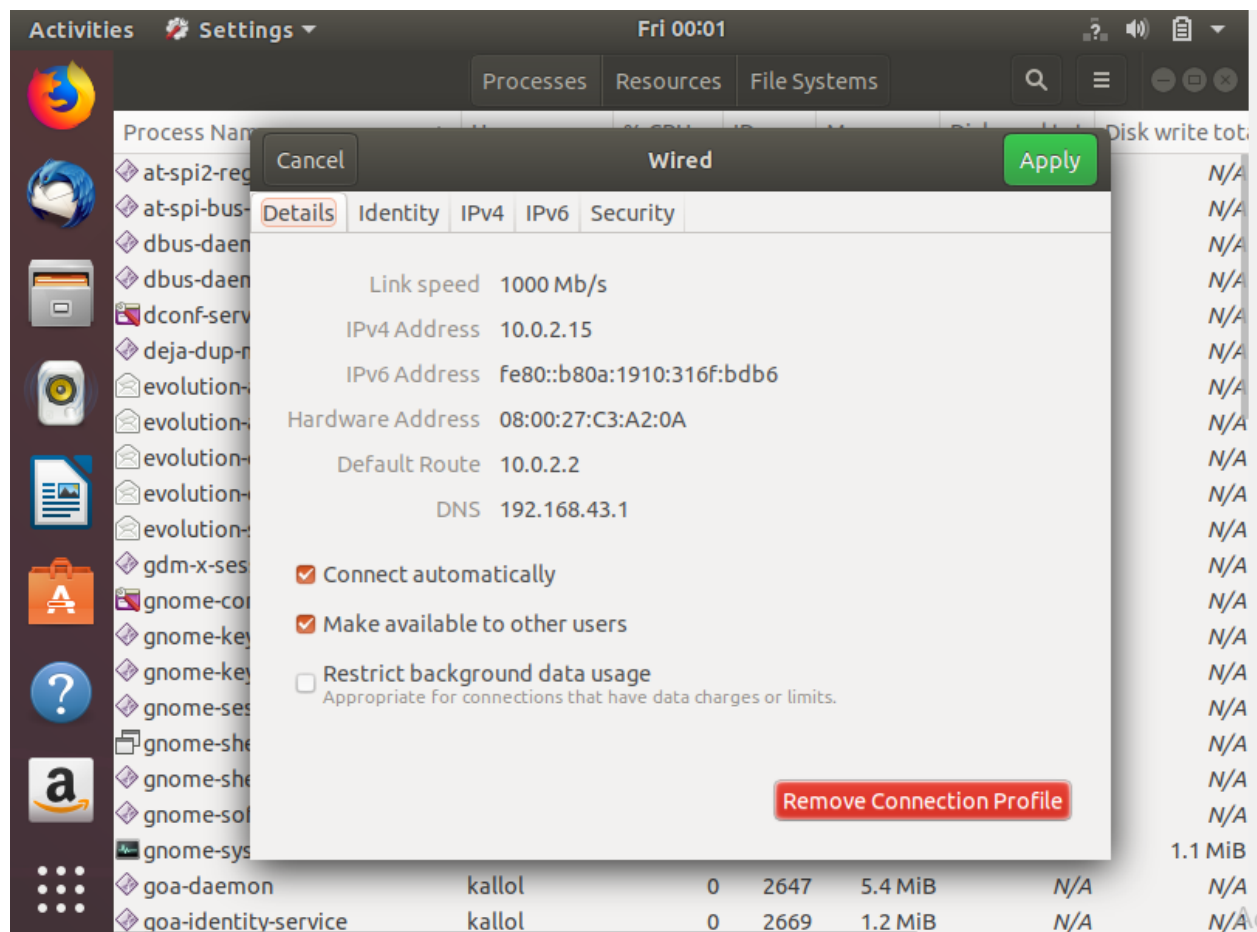
IPv4 reserves special address blocks for private networks (~18 million addresses) and multicast addresses (~270 million addresses).

Ans to the question no:2

IP Address:

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

```
kallol@kallol-VirtualBox:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defau
lt 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
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
    link/ether 08:00:27:c3:a2:0a brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 86003sec preferred_lft 86003sec
    inet6 fe80::b80a:1910:316f:bdb6/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
```



MAC Address:

```
kallol@kallol-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::5b40:9954:44b4:587d prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:b7:da:6e txqueuelen 1000 (Ethernet)
    RX packets 2042 bytes 2567602 (2.5 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 702 bytes 74412 (74.4 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 207 bytes 15061 (15.0 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 207 bytes 15061 (15.0 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Ans to the question no:3

```
kallol@kallol-VirtualBox:~$ 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                  20548                  /run/user/1000/systemd/notify
unix  17     [ ]                 DGRAM                  13631                  /run/systemd/journal/dev-log
unix  2      [ ]                 DGRAM                  13633                  /run/systemd/journal/syslog
unix  8      [ ]                 DGRAM                  13641                  /run/systemd/journal/socket
unix  3      [ ]                 DGRAM                  13617                  /run/systemd/notify
unix  3      [ ]                 STREAM                 CONNECTED               24269
unix  3      [ ]                 STREAM                 CONNECTED               23124
unix  3      [ ]                 STREAM                 CONNECTED               20298
unix  3      [ ]                 STREAM                 CONNECTED               17195                  /run/systemd/journal/stdout
unix  3      [ ]                 STREAM                 CONNECTED               16930
unix  3      [ ]                 STREAM                 CONNECTED               17617                  /var/run/dbus/system_bus_socket
unix  3      [ ]                 STREAM                 CONNECTED               18239                  /run/cups/cups.sock
unix  3      [ ]                 STREAM                 CONNECTED               24922                  @/tmp/dbus-QlT0BRhg
unix  3      [ ]                 STREAM                 CONNECTED               24267                  /run/user/1000/bus
unix  3      [ ]                 STREAM                 CONNECTED               23210
unix  3      [ ]                 STREAM                 CONNECTED               21626                  /run/user/1000/bus
unix  2      [ ]                 DGRAM                  20054
unix  3      [ ]                 STREAM                 CONNECTED               17848
```

| | | | | | |
|-------------|-----|--------|-----------|-------|----------------------|
| unix 3 | [] | STREAM | CONNECTED | 24270 | /var/run/dbus/system |
| _bus_socket | | | | | |
| unix 3 | [] | STREAM | CONNECTED | 23211 | |
| unix 3 | [] | STREAM | CONNECTED | 22110 | /var/run/dbus/system |
| _bus_socket | | | | | |
| unix 3 | [] | STREAM | CONNECTED | 21429 | |
| unix 3 | [] | STREAM | CONNECTED | 18515 | |
| unix 3 | [] | STREAM | CONNECTED | 24921 | |
| unix 3 | [] | STREAM | CONNECTED | 23097 | /run/user/1000/bus |
| unix 3 | [] | STREAM | CONNECTED | 20300 | /var/run/dbus/system |
| _bus_socket | | | | | |
| unix 2 | [] | DGRAM | | 16333 | |
| unix 3 | [] | STREAM | CONNECTED | 21667 | /run/user/1000/pulse |
| /native | | | | | |
| unix 3 | [] | STREAM | CONNECTED | 18242 | /var/run/dbus/system |
| _bus_socket | | | | | |
| unix 3 | [] | STREAM | CONNECTED | 25767 | /run/systemd/journal |
| /stdout | | | | | |
| unix 3 | [] | STREAM | CONNECTED | 24621 | |
| unix 3 | [] | STREAM | CONNECTED | 23943 | /run/user/1000/pulse |
| /native | | | | | |
| unix 2 | [] | DGRAM | | 21927 | |
| unix 3 | [] | STREAM | CONNECTED | 21619 | @/tmp/.X11-unix/X0 |
| unix 3 | [] | STREAM | CONNECTED | 18236 | |
| unix 3 | [] | STREAM | CONNECTED | 17922 | |
| unix 3 | [] | STREAM | CONNECTED | 21441 | |
| unix 3 | [] | STREAM | CONNECTED | 19464 | /var/run/dbus/system |
| _bus_socket | | | | | |
| unix 3 | [] | STREAM | CONNECTED | 18224 | /var/run/dbus/system |

```

unix 3      [ ]          DGRAM          13619
unix 3      [ ]          STREAM    CONNECTED    17616      /var/run/dbus/system
_bus_socket
unix 2      [ ]          DGRAM          20540
unix 2      [ ]          DGRAM          14610
unix 3      [ ]          STREAM    CONNECTED    23253
unix 3      [ ]          STREAM    CONNECTED    23531      @/tmp/dbus-QLT0BRhg
unix 3      [ ]          STREAM    CONNECTED    20261      /run/systemd/journal
/stdout
unix 2      [ ]          DGRAM          22767
unix 3      [ ]          STREAM    CONNECTED    21551      @/tmp/dbus-04cGhGw04
v
unix 3      [ ]          STREAM    CONNECTED    21136
unix 3      [ ]          STREAM    CONNECTED    27421
unix 3      [ ]          STREAM    CONNECTED    16318      /run/systemd/journal
/stdout
unix 3      [ ]          STREAM    CONNECTED    21539
unix 3      [ ]          STREAM    CONNECTED    22537      /run/systemd/journal
/stdout
unix 3      [ ]          STREAM    CONNECTED    21579
unix 3      [ ]          STREAM    CONNECTED    19129      /run/systemd/journal
/stdout
unix 3      [ ]          STREAM    CONNECTED    23283      /run/user/1000/bus
unix 3      [ ]          STREAM    CONNECTED    15325
unix 3      [ ]          STREAM    CONNECTED    21018      /run/user/1000/bus
unix 3      [ ]          STREAM    CONNECTED    14575      /run/systemd/journal
/stdout
unix 3      [ ]          STREAM    CONNECTED    22543      /run/user/1000/bus
unix 3      [ ]          STREAM    CONNECTED    21967      /var/run/dbus/svstem

```

```

kallol@kallol-VirtualBox:~$ netstat -r
Kernel IP routing table
Destination      Gateway          Genmask         Flags       MSS  Window  irtt  Iface
default          _gateway        0.0.0.0         UG          0  0        0     enp0s3
10.0.2.0         0.0.0.0         255.255.255.0   U           0  0        0     enp0s3
link-local       0.0.0.0         255.255.0.0     U           0  0        0     enp0s3
kallol@kallol-VirtualBox:~$

```