

DevOps Career Path

Networking Assignment

- how to find ip of a domain?
nslookup gmail.com
- how to find router ip assigned by the ISP?
Open a web browser & Search for "What is my IP address" in our preferred search engine. The search results will often display our public IP address.
- How to find private ip of host machine?
For linux system: # ip a or # ifconfig & windows system: # ipconfig
- how to change private ip of a ubuntu machine?

```
root@DevOps:~# ip a
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
    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:14:ec:2e brd ff:ff:ff:ff:ff:ff
    inet 172.22.23.188/20 brd 172.22.31.255 scope global dynamic noprefixroute eth0
        valid_lft 86363sec preferred_lft 86363sec
```

sudo vi /etc/netplan/01-network-manager-all.yaml

```
# Let NetworkManager manage all devices on this system
network:
  version: 2
  renderer: NetworkManager
```

Replace info

```
# Let NetworkManager manage all devices on this system
network:
  version: 2
  renderer: networkd
  ethernets:
    eth0:
      dhcp4: no
      dhcp6: no
      addresses: [192.168.0.2/24]
      gateway4: 192.168.0.1
      nameservers:
        addresses: [8.8.8.8]
```

netplan apply

ip a

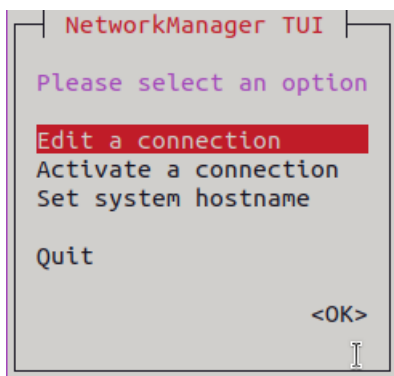
```

root@DevOps:~# ip a
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
    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:14:ec:2e brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.2/24 brd 192.168.0.255 scope global eth0
        valid_lft forever preferred_lft forever

```

Another command for change IP address

sudo nmtui



- check ports open in the current system:

sudo netstat -tulpn

```
devops@DevOps:~/Desktop$ sudo netstat -tulpn
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 127.0.0.53:53          0.0.0.0:*               LISTEN      308/systemd-resolve
tcp        0      0 127.0.0.1:631          0.0.0.0:*               LISTEN      451/cupsd
tcp6       0      0 :::631                 :::*                    LISTEN      451/cupsd
udp        0      0 0.0.0.0:38952          0.0.0.0:*               360/avahi-daemon: r
udp        0      0 127.0.0.53:53          0.0.0.0:*               308/systemd-resolve
udp        0      0 0.0.0.0:5353           0.0.0.0:*               360/avahi-daemon: r
udp        0      0 0.0.0.0:631            0.0.0.0:*               518/cups-browsed
udp6       0      0 :::5353                :::*                    360/avahi-daemon: r
udp6       0      0 :::51798               :::*                    360/avahi-daemon: r
devops@DevOps:~/Desktop$
```

sudo ss -ltn

```
devops@DevOps:~/Desktop$ sudo ss -ltn
State      Recv-Q Send-Q Local Address:Port      Peer Address:Port      Process
LISTEN     0      4096 127.0.0.53%lo:53        0.0.0.0:*
LISTEN     0      128 127.0.0.1:631           0.0.0.0:*
LISTEN     0      128 [::]:631                [::]:*
devops@DevOps:~/Desktop$
```

sudo nmap localhost

```
devops@DevOps:~/Desktop$ sudo nmap localhost
Starting Nmap 7.80 ( https://nmap.org ) at 2023-10-18 15:15 +06
Nmap scan report for localhost (127.0.0.1)
Host is up (0.0000010s latency).
Not shown: 999 closed ports
PORT      STATE SERVICE
631/tcp   open  ipp
Nmap done: 1 IP address (1 host up) scanned in 0.06 seconds
```

- enable port 80 and 3306 in vm.

sudo ufw allow 80/tcp

sudo ufw allow 3306/tcp

sudo ufw reload

sudo ufw status

```
devops@DevOps:~$ sudo ufw allow 80/tcp
[sudo] password for devops:
Rules updated
Rules updated (v6)
devops@DevOps:~$ sudo ufw allow 3306/tcp
Rules updated
Rules updated (v6)
devops@DevOps:~$ sudo ufw reload
Firewall not enabled (skipping reload)
devops@DevOps:~$ sudo ufw status
Status: inactive
devops@DevOps:~$ sudo ufw enable
Command may disrupt existing ssh connections. Proceed with operation (y|n)? y
Firewall is active and enabled on system startup
devops@DevOps:~$ sudo ufw reload
Firewall reloaded
devops@DevOps:~$ sudo ufw status
Status: active

To Action From
--
80/tcp ALLOW Anywhere
3306/tcp ALLOW Anywhere
80/tcp (v6) ALLOW Anywhere (v6)
3306/tcp (v6) ALLOW Anywhere (v6)
devops@DevOps:~$
```

- Download any file or software using terminal:

wget <http://nginx.org/download/nginx-1.20.2.tar.gz>

```
devops@DevOps:~/Desktop/networking-assignment$ wget http://nginx.org/download/nginx-1.20.2.tar.gz
--2023-10-18 16:34:52-- http://nginx.org/download/nginx-1.20.2.tar.gz
Resolving nginx.org (nginx.org)... 52.58.199.22, 3.125.197.172, 2a05:d014:edb:5702::6, ...
Connecting to nginx.org (nginx.org)|52.58.199.22|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1062124 (1.0M) [application/octet-stream]
Saving to: 'nginx-1.20.2.tar.gz'

nginx-1.20.2.tar.gz      100%[=====>]  1.01M  278KB/s   in 3.7s

2023-10-18 16:34:56 (278 KB/s) - 'nginx-1.20.2.tar.gz' saved [1062124/1062124]

devops@DevOps:~/Desktop/networking-assignment$ ls /home/devops/Desktop/networking-assignment/
check_ports.sh  enable_port.sh  nginx-1.20.2.tar.gz
devops@DevOps:~/Desktop/networking-assignment$ ls /home/devops/Desktop/networking-assignment/
check_ports.sh  enable_port.sh  nginx-1.20.2.tar.gz
devops@DevOps:~/Desktop/networking-assignment$ ls -la /home/devops/Desktop/networking-assignment/
ls: invalid option -- '/'
Try 'ls --help' for more information.
devops@DevOps:~/Desktop/networking-assignment$ ls -la /home/devops/Desktop/networking-assignment/
total 1056
drwxrwxr-x  2 devops devops   4096 00000000  18 16:34 .
drwxr-xr-x  3 devops devops   4096 00000000  18 15:52 ..
-rw-rw-r--  1 devops devops    55 00000000  18 16:00 check_ports.sh
-rw-rw-r--  1 devops devops   112 00000000  18 15:57 enable_port.sh
-rw-rw-r--  1 devops devops 1062124 00000000  16 2021 nginx-1.20.2.tar.gz
```

- Get web data response from terminal:

curl google.com

```
devops@DevOps:~/Desktop/networking-assignment$ curl 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>
devops@DevOps:~/Desktop/networking-assignment$
```

- install nginx webserver in the vm and access the welcome nginx page from web browser:

sudo apt update

sudo apt install nginx

```

devops@DevOps:~$ sudo apt update
[sudo] password for devops:
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Hit:2 http://bd.archive.ubuntu.com/ubuntu jammy InRelease
Get:3 http://bd.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Hit:4 http://bd.archive.ubuntu.com/ubuntu jammy-backports InRelease
Fetched 229 kB in 2s (94.7 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
24 packages can be upgraded. Run 'apt list --upgradable' to see them.
devops@DevOps:~$ sudo apt install nginx
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libnginx-mod-http-geoip2 libnginx-mod-http-image-filter libnginx-mod-http-xslt-filter libnginx-mod-mail
  libnginx-mod-stream libnginx-mod-stream-geoip2 nginx-common nginx-core
Suggested packages:
  fcgiwrap nginx-doc
The following NEW packages will be installed:
  libnginx-mod-http-geoip2 libnginx-mod-http-image-filter libnginx-mod-http-xslt-filter libnginx-mod-mail
  libnginx-mod-stream libnginx-mod-stream-geoip2 nginx-common nginx-core
0 upgraded, 9 newly installed, 0 to remove and 24 not upgraded.
Need to get 697 kB of archives.
After this operation, 2,395 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 nginx-common all 1.18.0-6ubuntu14.4 [40.0 kB]
Get:2 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-http-geoip2 amd64 1.18.0-6ubuntu14.4 [11
.9 kB]
Get:3 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-http-image-filter amd64 1.18.0-6ubuntu14
.4 [15.4 kB]
Get:4 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-http-xslt-filter amd64 1.18.0-6ubuntu14.
4 [13.7 kB]
Get:5 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-mail amd64 1.18.0-6ubuntu14.4 [45.7 kB]
Get:6 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-stream amd64 1.18.0-6ubuntu14.4 [72.9 kB]
Get:7 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-stream-geoip2 amd64 1.18.0-6ubuntu14.4 [
10.1 kB]
Get:8 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 nginx-core amd64 1.18.0-6ubuntu14.4 [484 kB]
Get:9 http://bd.archive.ubuntu.com/ubuntu jammy-updates/main amd64 nginx amd64 1.18.0-6ubuntu14.4 [3,872 B]
Fetched 697 kB in 3s (277 kB/s)
Preconfiguring packages ...
Selecting previously unselected package nginx-common.
(Reading database ... 203127 files and directories currently installed.)
Preparing to unpack .../0-nginx-common_1.18.0-6ubuntu14.4_all.deb ...
Unpacking nginx-common (1.18.0-6ubuntu14.4) ...
Selecting previously unselected package libnginx-mod-http-geoip2.
Preparing to unpack .../1-libnginx-mod-http-geoip2_1.18.0-6ubuntu14.4_amd64.deb ...
Unpacking libnginx-mod-http-geoip2 (1.18.0-6ubuntu14.4) ...
Selecting previously unselected package libnginx-mod-http-image-filter.
Preparing to unpack .../2-libnginx-mod-http-image-filter_1.18.0-6ubuntu14.4_amd64.deb ...
Unpacking libnginx-mod-http-image-filter (1.18.0-6ubuntu14.4) ...
Selecting previously unselected package libnginx-mod-http-xslt-filter.
Preparing to unpack .../3-libnginx-mod-http-xslt-filter_1.18.0-6ubuntu14.4_amd64.deb ...
Unpacking libnginx-mod-http-xslt-filter (1.18.0-6ubuntu14.4) ...
Selecting previously unselected package libnginx-mod-mail.
Preparing to unpack .../4-libnginx-mod-mail_1.18.0-6ubuntu14.4_amd64.deb ...
Unpacking libnginx-mod-mail (1.18.0-6ubuntu14.4) ...
Selecting previously unselected package libnginx-mod-stream.
Preparing to unpack .../5-libnginx-mod-stream_1.18.0-6ubuntu14.4_amd64.deb ...
Unpacking libnginx-mod-stream (1.18.0-6ubuntu14.4) ...
Selecting previously unselected package libnginx-mod-stream-geoip2.
Preparing to unpack .../6-libnginx-mod-stream-geoip2_1.18.0-6ubuntu14.4_amd64.deb ...
Unpacking libnginx-mod-stream-geoip2 (1.18.0-6ubuntu14.4) ...
Selecting previously unselected package nginx-core.
Preparing to unpack .../7-nginx-core_1.18.0-6ubuntu14.4_amd64.deb ...
Unpacking nginx-core (1.18.0-6ubuntu14.4) ...
Selecting previously unselected package nginx.
Preparing to unpack .../8-nginx_1.18.0-6ubuntu14.4_amd64.deb ...
Unpacking nginx (1.18.0-6ubuntu14.4) ...
Setting up nginx-common (1.18.0-6ubuntu14.4) ...
Created symlink /etc/systemd/system/multi-user.target.wants/nginx.service → /lib/systemd/system/nginx.service.
Setting up libnginx-mod-http-xslt-filter (1.18.0-6ubuntu14.4) ...
Setting up libnginx-mod-http-geoip2 (1.18.0-6ubuntu14.4) ...
Setting up libnginx-mod-mail (1.18.0-6ubuntu14.4) ...
Setting up libnginx-mod-http-image-filter (1.18.0-6ubuntu14.4) ...
Setting up libnginx-mod-stream (1.18.0-6ubuntu14.4) ...
Setting up libnginx-mod-stream-geoip2 (1.18.0-6ubuntu14.4) ...
Setting up nginx-core (1.18.0-6ubuntu14.4) ...
* Upgrading binary nginx
Setting up nginx (1.18.0-6ubuntu14.4) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...
devops@DevOps:~$

```

[OK]

```
# sudo systemctl start nginx
# sudo systemctl enable nginx
# sudo systemctl status nginx
```

[illegible]

- Access the welcome nginx page from web browser:

From VM machine



Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

From Host machine



Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

- Create a mysql database server in vm and access it from host machine:

```
# sudo apt install mysql-server
# sudo systemctl start mysql
# sudo systemctl enable mysql
# sudo mysql -u root -p
```

```
selim@selim-Virtual-Machine:~$ sudo systemctl enable mysql
Synchronizing state of mysql.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable mysql
selim@selim-Virtual-Machine:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.34-0ubuntu0.22.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> exit
Bye
selim@selim-Virtual-Machine:~$
```

```
# sudo ufw allow 3306/tcp
# sudo ufw status
# sudo systemctl restart mysql
```

```
selim@selim-Virtual-Machine:~$ sudo ufw allow 3306/tcp
[sudo] password for selim:
Rule added
Rule added (v6)
selim@selim-Virtual-Machine:~$ sudo ufw status
Status: active

To Action From
--
80/tcp ALLOW Anywhere
22/tcp ALLOW Anywhere
3306/tcp ALLOW Anywhere
80/tcp (v6) ALLOW Anywhere (v6)
22/tcp (v6) ALLOW Anywhere (v6)
3306/tcp (v6) ALLOW Anywhere (v6)

selim@selim-Virtual-Machine:~$
```

```
# sudo nano /etc/mysql/mysql.conf.d/mysqld.cnf
```

```
selim@sql-server:~$ sudo nano /etc/mysql/mysql.conf.d/mysqld.cnf
[sudo] password for selim:
selim@sql-server:~$ selim@sql-server:~$
```

Change bind-address =0.0.0.0


```

GNU nano 6.2 /etc/mysql/mysql.conf.d/mysql.cnf

[mysqld]
#
# * Basic Settings
#
user                = mysql
# pid-file           = /var/run/mysqld/mysqld.pid
# socket             = /var/run/mysqld/mysqld.sock
# port               = 3306
# datadir            = /var/lib/mysql

# If MySQL is running as a replication slave, this should be
# changed. Ref https://dev.mysql.com/doc/refman/8.0/en/server-system-variables.html#sysvar_tmpdir
# tmpdir             = /tmp
#
# Instead of skip-networking the default is now to listen only on
# localhost which is more compatible and is not less secure.
bind-address        = 0.0.0.0
mysqlx-bind-address = 127.0.0.1
#
# * Fine Tuning
#
key_buffer_size     = 16M
# max_allowed_packet = 64M
# thread_stack      = 256K

```

- MySQL new user create for remote login from host machine :

```
# CREATE USER 'selim'@'%' IDENTIFIED BY '123456' ;
```

```

selim@sql-server:~$ sudo mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 15
Server version: 8.0.34-0ubuntu0.22.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE USER 'selim'@'%' IDENTIFIED BY '123456';
Query OK, 0 rows affected (0.02 sec)

mysql>

```

- Remote login from host machine :

```
# install mysql client in host machine
```

```
# mysql -u selim -h 172.22.20.245 -p
```

```

Microsoft Windows [Version 10.0.19045.3570]
(c) Microsoft Corporation. All rights reserved.

C:\Users\USER>mysql -u selim -h 172.22.20.245 -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 16
Server version: 8.0.34-0ubuntu0.22.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>

```


- replace default nginx page with an index.html page containing your name and access it from web browser:

```
# cd /var/www/html
```

```
# ll
```

```
# cp index.nginx-debian.html index.html
```

```
# ll
```

```
devops@DevOps:~$
devops@DevOps:~$ cd /var/www/html/
devops@DevOps:/var/www/html$ ll
total 24
drwxr-xr-x 2 root root 4096 19 11:59 ./
drwxr-xr-x 3 root root 4096 19 09:51 ../
-rw-r--r-- 1 root root 12288 19 11:26 .index.html.swp
-rw-r--r-- 1 root root 612 19 09:51 index.nginx-debian.html
devops@DevOps:/var/www/html$ sudo cp index.nginx-debian.html index.html
devops@DevOps:/var/www/html$ ll
total 28
drwxr-xr-x 2 root root 4096 19 12:14 ./
drwxr-xr-x 3 root root 4096 19 09:51 ../
-rw-r--r-- 1 root root 612 19 12:14 index.html
-rw-r--r-- 1 root root 12288 19 11:26 .index.html.swp
-rw-r--r-- 1 root root 612 19 09:51 index.nginx-debian.html
```

```
# nano index.html
```

```
<!DOCTYPE html>
<html>
<head>
<title>Welcome to DevOps Career Paths!</title>
<style>
  body {
    width: 35em;
    margin: 0 auto;
    font-family: Tahoma, Verdana, Arial, sans-serif;
  }
</style>
</head>
<body>
<h1>Welcome to DevOps Career Paths!</h1>
<p>My Name is Md. Selim Azad</p>
<p>This is our Networking Assignment</p>

<p>For build your career on DevOps, join Interactive Cares
<a href="https://interactivecares-courses.com/"> interactivecares-courses.com</a>.<br/>
.</p>

<p><em>Thank you for being with us!</em></p>
</body>
</html>
```

```
# sudo systemctl restart nginx
```



Welcome to DevOps Career Paths!

My Name is Md. Selim Azad

This is our Networking Assignment

For build your career on DevOps,
join Interactive Cares interactivecares-courses.com

Thank you for being with us!

- display the same index.html file in "your_name.com" by utilizing hostname of vm and host machine:

cat /etc/hosts

```
devops@DevOps:/var/www/html$ cat /etc/hosts
127.0.0.1      localhost
127.0.1.1      DevOps
# The following lines are desirable for IPv6 capable hosts
::1          ip6-localhost ip6-loopback
fe00::0      ip6-localnet
ff00::0      ip6-mcastprefix
ff02::1      ip6-allnodes
ff02::2      ip6-allrouters
devops@DevOps:/var/www/html$
```

sudo nano /etc/hosts

Input VM IP & selim.com in hosts file

```
127.0.0.1      localhost
127.0.1.1      DevOps
172.22.21.126  selim.com

# The following lines are desirable for IPv6 capable hosts
::1          ip6-localhost ip6-loopback
fe00::0      ip6-localnet
ff00::0      ip6-mcastprefix
ff02::1      ip6-allnodes
ff02::2      ip6-allrouters
```

From VM machine



Welcome to DevOps Career Paths!

My Name is Md. Selim Azad

This is our Networking Assignment

For build your career on DevOps,
join Interactive Cares [interactivecares-courses.com](https://www.interactivecares.com)

Thank you for being with us!

For Host machine:

Input VM IP & selim.com in hosts file

C:\Windows\System32\drivers\etc\hosts

```
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com           # source server
#       38.25.63.10       x.acme.com               # x client host

# localhost name resolution is handled within DNS itself.
#       127.0.0.1         localhost
#       ::1               localhost
172.17.99.3       vcenter.deshipay.com
172.22.21.126    selim.com
```



Welcome to DevOps Career Paths!

My Name is Md. Selim Azad

This is our Networking Assignment

For build your career on DevOps,
join Interactive Cares [interactivecares.com](https://www.interactivecares.com)

Thank you for being with us!