

LFCS - Network

1. Configure Networking, Start/Stop/Check Status of Network Services
2. Packet Filtering
3. Configure SSH Servers and Clients

1. Configure IPv4 and IPv6 networking and hostname resolution

IPv4 : ^{32bit} 192.168.1.101 / 16
[prefix]

IPv6 : ^{128bit} 2001:0da8:0000: ... : 0000:00A1 / 64
연속된 0 축약 가능
축약 ≠ 2001:da8::A1 / 64

```
ubuntu@ip-172-31-35-100:~$ ip link = ip l
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT group default qlen 1000
   link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 9001 qdisc fq_codel state UP mode DEFAULT group default qlen 1000
   link/ether 0a:81:71:5b:9e:bb brd ff:ff:ff:ff:ff:ff
ubuntu@ip-172-31-35-100:~$ ip -c (address)=(addr)=(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 9001 qdisc fq_codel state UP group default qlen 1000
   link/ether 0a:81:71:5b:9e:bb brd ff:ff:ff:ff:ff:ff
   inet 172.31.35.100/20 metric 100 brd 172.31.47.255 scope global dynamic eth0
       valid_lft 3310sec preferred_lft 3310sec
   inet6 fe80::881:71ff:fe5b:9ebb/64 scope link
       valid_lft forever preferred_lft forever
ubuntu@ip-172-31-35-100:~$ sudo ip link set dev eth0 down
```

↳ ec2에 하면 안됨...
재워킹으로 해결

```

ubuntu@ip-172-31-35-100:~$ 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 9001 qdisc fq_codel state UP group default qlen 1000
    link/ether 0a:81:71:5b:9e:bb brd ff:ff:ff:ff:ff:ff
    inet 172.31.35.100/20 metric 100 brd 172.31.47.255 scope global dynamic eth0
        valid_lft 3374sec preferred_lft 3374sec
    inet6 fe80::881:71ff:fe5b:9ebb/64 scope link
        valid_lft forever preferred_lft forever
ubuntu@ip-172-31-35-100:~$ sudo ip a add 172.31.5.31/20 dev eth0
ubuntu@ip-172-31-35-100:~$ ip -c 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 9001 qdisc fq_codel state UP group default qlen 1000
    link/ether 0a:81:71:5b:9e:bb brd ff:ff:ff:ff:ff:ff
    inet 172.31.35.100/20 metric 100 brd 172.31.47.255 scope global dynamic eth0
        valid_lft 3322sec preferred_lft 3322sec
    inet 172.31.5.31/20 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::881:71ff:fe5b:9ebb/64 scope link
        valid_lft forever preferred_lft forever
ubuntu@ip-172-31-35-100:~$ sudo ip a del 172.31.5.31/20 dev eth0
ubuntu@ip-172-31-35-100:~$ ip -c 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 9001 qdisc fq_codel state UP group default qlen 1000
    link/ether 0a:81:71:5b:9e:bb brd ff:ff:ff:ff:ff:ff
    inet 172.31.35.100/20 metric 100 brd 172.31.47.255 scope global dynamic eth0
        valid_lft 3252sec preferred_lft 3252sec
    inet6 fe80::881:71ff:fe5b:9ebb/64 scope link
        valid_lft forever preferred_lft forever

```

참고: IP로 설정하면 재부팅시 사라진다.

ip a

ip l

ip -c a

ip a add [ip] dev [nic name]
del

ip r = (route)

netplan

netplan? ubuntu's basic network setting manager → not like 'ip', netplan is permanent settings.

```
ubuntu@ip-172-31-35-100:~$ sudo netplan get
```

```
network:
  version: 2
  ethernet:
    eth0:
      match:
        macaddress: "0a:81:71:5b:9e:bb"
      dhcp4: true
      dhcp6: false
      set-name: "eth0"
```

EC2 기본 netplan

```
ubuntu@ip-172-31-35-100:~$ ls /etc/netplan/
50-cloud-init.yaml
```

```
ubuntu@ip-172-31-35-100:~$ sudo cat /etc/netplan/50-cloud-init.yaml
```

```
# This file is generated from information provided by the datasource. Changes
# to it will not persist across an instance reboot. To disable cloud-init's
# network configuration capabilities, write a file
# /etc/cloud/cloud.cfg.d/99-disable-network-config.cfg with the following:
# network: {config: disabled}
network:
  ethernet:
    eth0:
      dhcp4: true
      dhcp6: false
      match:
        macaddress: 0a:81:71:5b:9e:bb
      set-name: eth0
  version: 2
```

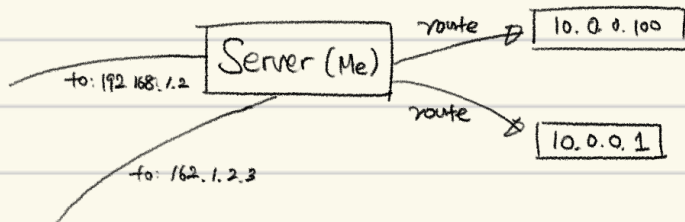
```
ubuntu@ip-172-31-35-100:~$ sudo vim /etc/netplan/99-my-settings.yaml
```

```
ubuntu@ip-172-31-35-100:~$ cat /etc/netplan/99-my-settings.yaml
```

```
network:
  version: 2
  ethernet:
    enp0s8:
      dhcp4: false
      dhcp6: false
      addresses:
        - 10.0.0.9/24
        - abcd::1234/64
      nameservers:
        addresses:
          - 8.8.8.8
          - 8.8.4.4
      routes:
        - to: 192.168.0.0/16
          via: 10.0.0.100
        - to: 0.0.0.0/0
          via: 10.0.0.1
```

```
ubuntu@ip-172-31-35-100:~$ sudo netplan try --time-out=30 (기본 120)
```

apply (바로 적용, 위험)



Global DNS

```
ubuntu@ip-172-31-35-100:~$ resolvectl status
```

Global

```
Protocols: -LLMNR -mDNS -DNSOverTLS DNSSEC=no/unsupported
resolv.conf mode: stub
```

Link 2 (eth0)

```
Current Scopes: DNS
Protocols: +DefaultRoute +LLMNR -mDNS -DNSOverTLS DNSSEC=no/unsupported
Current DNS Server: 172.31.0.2
DNS Servers: 172.31.0.2
DNS Domain: ap-northeast-2.compute.internal
```

```
ubuntu@ip-172-31-35-100:~$ sudo vim /etc/systemd/resolved.conf
```

```
ubuntu@ip-172-31-35-100:~$ sudo vim /etc/systemd/resolved.conf
```

```
ubuntu@ip-172-31-35-100:~$ resolvectl status
```

Global

```
Protocols: -LLMNR -mDNS -DNSOverTLS DNSSEC=no/unsupported
resolv.conf mode: stub
```

Link 2 (eth0)

```
Current Scopes: DNS
Protocols: +DefaultRoute +LLMNR -mDNS -DNSOverTLS DNSSEC=no/unsupported
Current DNS Server: 172.31.0.2
DNS Servers: 172.31.0.2
DNS Domain: ap-northeast-2.compute.internal
```

```
ubuntu@ip-172-31-35-100:~$ sudo systemctl restart systemd-resolved.service
```

```
ubuntu@ip-172-31-35-100:~$ resolvectl status
```

Global

```
Protocols: -LLMNR -mDNS -DNSOverTLS DNSSEC=no/unsupported
resolv.conf mode: stub
```

```
DNS Servers: 1.1.1.1 8.8.8.8
```

Link 2 (eth0)

```
Current Scopes: DNS
Protocols: +DefaultRoute +LLMNR -mDNS -DNSOverTLS DNSSEC=no/unsupported
DNS Servers: 172.31.0.2
DNS Domain: ap-northeast-2.compute.internal
```

[Resolve]

```
# Some examples of DNS servers which may be used for
# Cloudflare: 1.1.1.1#cloudflare-dns.com 1.0.0.1#cloud
dns.com
# Google:      8.8.8.8#dns.google 8.8.4.4#dns.google
# Quad9:       9.9.9.9#dns.quad9.net 149.112.112.112
DNS=1.1.1.1 8.8.8.8
#FallbackDNS=
```

DNS global setting

사용자 호기 파일 구성 예시!

```
ubuntu@ip-172-31-35-100:~$ sudo vim /etc/hosts
ubuntu@ip-172-31-35-100:~$ sudo cat /etc/hosts
127.0.0.1 localhost
127.0.123.123 dbserver
1.2.3.4 example.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
ff02::3 ip6-allhosts
ubuntu@ip-172-31-35-100:~$ ping dbserver
PING dbserver (127.0.123.123) 56(84) bytes of data.
64 bytes from dbserver (127.0.123.123): icmp_seq=1 ttl=64 time=0.012 ms
64 bytes from dbserver (127.0.123.123): icmp_seq=2 ttl=64 time=0.027 ms
64 bytes from dbserver (127.0.123.123): icmp_seq=3 ttl=64 time=0.026 ms
^C
--- dbserver ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2054ms
rtt min/avg/max/mdev = 0.012/0.021/0.027/0.006 ms
ubuntu@ip-172-31-35-100:~$ ping example.com
PING example.com (1.2.3.4) 56(84) bytes of data.
^C
--- example.com ping statistics ---
8 packets transmitted, 0 received, 100% packet loss, time 7189ms
```

```
ubuntu@ip-172-31-35-100:~$ ls /usr/share/doc/netplan/examples/
bonding.yaml          infiniband.yaml      source_routing.yaml  vxlan.yaml
bonding_router.yaml   ipv6_tunnel.yaml     sriov.yaml           windows_dhcp_server.yaml
bridge.yaml           loopback_interface.yaml  sriov_vlan.yaml     wireguard.yaml
bridge_vlan.yaml      modem.yaml           static_multiaddress.yaml  static.yaml
dhcp.yaml             network_manager.yaml  static_singlenic_multiip_multigateway.yaml  wireless.yaml
dhcp_wired8021x.yaml  offload.yaml         vrf.yaml             wpa_enterprise.yaml
direct_connect_gateway.yaml  openvswitch.yaml     vlan.yaml
direct_connect_gateway_ipv6.yaml  route_metric.yaml
ubuntu@ip-172-31-35-100:~$ cat /usr/share/doc/netplan/examples/dhcp.yaml
network:
  version: 2
  renderer: networkd
  ethernets:
    enp3s0:
      dhcp4: true
ubuntu@ip-172-31-35-100:~$ cat /usr/share/doc/netplan/examples/static.yaml
network:
  version: 2
  renderer: networkd
  ethernets:
    enp3s0:
      addresses:
        - 10.10.10.2/24
      nameservers:
        search: [mydomain, otherdomain]
        addresses: [10.10.10.1, 1.1.1.1]
      routes:
        - to: default
          via: 10.10.10.1
```

Sudo ss -ltnp
 ↳ number
 ↳ process (Sudo)
 ↳ listen
 ↳ tcp, udp

