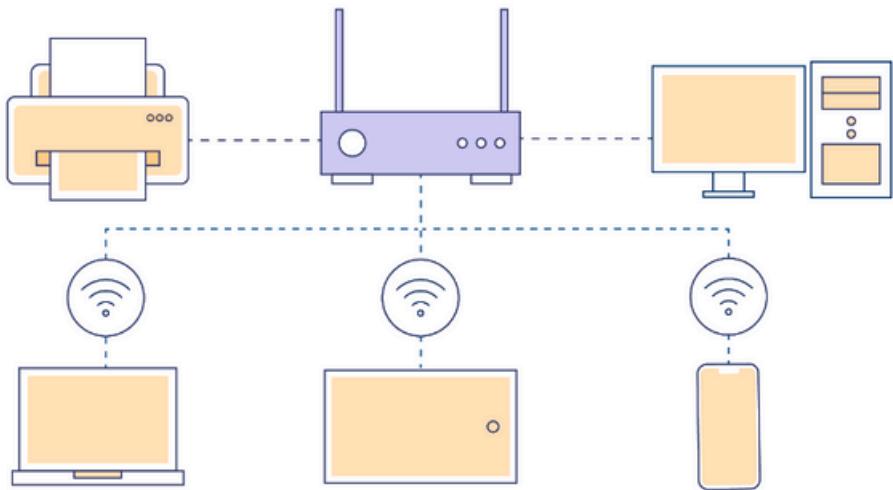




# Linux Network Configuration



- This session (L6 S10) focuses on Linux network configuration concepts and tools.
- Linux is widely used in servers, network devices, and some desktop environments.

Key topics covered include:

- a) Networking Basics
- b) Network Interfaces
- c) Configuration Files
- d) Local Address Book
- e) DNS Resolver Configuration
- f) Network Configuration Scripts
- g) Netplan
- h) Basic YAML Configuration



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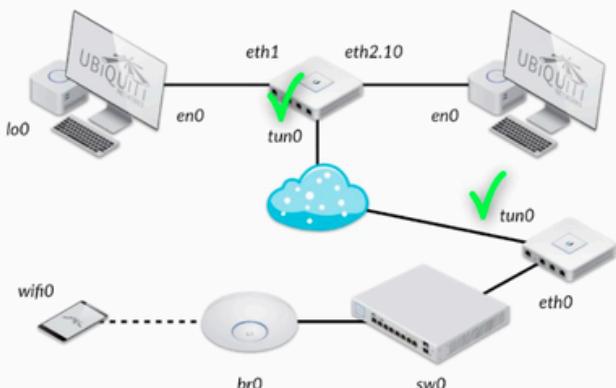
## a) Networking Basics

Linux is a powerful operating system widely used for:

- Servers
- Network devices
- Some desktops due to its robust networking capabilities

## Network Interfaces

- Interface is port on which host sends/receives
- Physical interfaces
  - Wired Ethernet (ex. eth0, en0)
  - Wireless (ex. wifi0, ath0)
  - Switch Ports (ex. sw0)
- Logical interfaces
  - Loopback (ex. lo0)
  - Bridge (ex. br0)
  - Virtual (ex. eth0.10)
  - Tunnel (ex. tun0, p2p0)



## b) Network Interfaces

- A network interface is the hardware component (like ethernet card or wifi adapter).
- It connects your device to a network.
- Linux assigns a name to each interface
- Generally the names start with "[eth](#)" for ethernet (e.g., [eth0](#)) or "[wlan](#)" for wifi (e.g., [wlan0](#)).



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## c) Configuration Files

Network configuration files define how your Linux device interacts with the network.

Common configuration files include:

- `/etc/hosts`
- `/etc/resolv.conf`
- `/etc/sysconfig/network-scripts/` (Linux specific)

These define settings like IP address, subnet mask, and gateway

```
127.0.0.1      localhost
192.168.1.100    myserver.localdomain    myserver
```

## d) Local Address Book

This file is like a local directory of IP addresses and hostnames.

### Path

`/etc/hosts`

### Format

Each line contains an IP address followed by one or more hostnames.

### Example

`vim /etc/host`



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## e) DNS Resolver Configuration

This file configures how the system resolves domain names to IP addresses.

### Path

/etc/resolv.conf

### Common Entries:

- **nameserver:** Specifies the IP address of a DNS server.
- **search:** Specifies the search domains to append to hostnames.
- **options:** Allows you to set various resolver options.

### Example:

Vim /etc/resolv.conf

```
sql

nameserver 8.8.8.8
nameserver 8.8.4.4
search example.com
```



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## f) Network Configuration Scripts

This directory holds scripts and configurations related to network interfaces.

### Path

`/etc/sysconfig/network-scripts/` (Linux specific)

### Common Parameters:

- **DEVICE:** The name of the device (e.g., `eth0`)
- **BOOTPROTO:** The method used to assign the IP address (`static` or `dhcp`)
- **ONBOOT:** Specifies whether the interface should be activated at boot (`yes` or `no`)
- **IPADDR:** The static IP address assigned to the interface
- **NETMASK:** The subnet mask
- **GATEWAY:** The default gateway

makefile

```
DEVICE=eth0
BOOTPROTO=static
ONBOOT=yes
IPADDR=192.168.1.100
NETMASK=255.255.255.0
GATEWAY=192.168.1.1
```



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## g) Netplan

- Netplan is a utility for easily configuring networking on a Linux system.
- It uses YAML descriptions of the network configuration to generate configurations for various network renderers.

Key Netplan Commands:

- `sudo netplan apply` (Apply Configuration)
- `sudo netplan generate` (Generate Configuration Files)
- `sudo netplan try` (Test Configuration)
- `sudo netplan status` (View Netplan Status)

## h) Basic YAML Configuration

Below is a simple YAML configuration file for Netplan, typically located in the `/etc/netplan/` directory:

```
yaml
network:
  version: 2
  ethernets:
    eth0:
      dhcp4: true
```