Linux and Shell Scripting

4: Configuring Linux

Introduction

In this chapter, we will explore the various aspects of configuring a Linux system. This includes network configuration, package management, system services, and basic system security. By the end of this chapter, you will have a thorough understanding of how to set up and manage a Linux system to meet your specific requirements.

4.1 Network Configuration

4.1.1 Configuring Network Interfaces

Network interfaces can be configured using various tools and configuration files depending on the Linux distribution.

Ubuntu

On Ubuntu, network configuration is typically handled by netplan.

1. Edit Netplan Configuration File:

bash

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sudo nano /etc/netplan/01-netcfg.yaml

2. Sample Configuration:

yaml

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network: version: 2 renderer: networkd ethernets: enp0s3: dhcp4: yes # Static IP configuration # addresses: # - 192.168.1.10/24 # gateway4: 192.168.1.1 # nameservers: # addresses: # - 8.8.8.8 # - 8.8.4.4

3. Apply Configuration:

bash

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sudo netplan apply

CentOS

On CentOS, network interfaces are configured using NetworkManager or by editing network-scripts directly.

1. Edit Network Configuration File:

bash

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sudo nano /etc/sysconfig/network-scripts/ifcfg-eth0

2. Sample Configuration:

ini

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DEVICE=eth0 BOOTPROTO=dhcp ONBOOT=yes # Static IP configuration # IPADDR=192.168.1.10 # NETMASK=255.255.255.0 # GATEWAY=192.168.1.1 # DNS1=8.8.8.8 # DNS2=8.8.4.4

3. Restart Network Service:

bash

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sudo systemctl restart network

4.1.2 Configuring Hostnames and DNS

Changing the Hostname

- Ubuntu:

bash

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sudo hostnamectl set-hostname new-hostname

- CentOS:

bash

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sudo hostnamectl set-hostname new-hostname

Configuring DNS

1. Edit Resolv.conf:

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sudo nano /etc/resolv.conf

2. Add DNS Servers:

bash

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nameserver 8.8.8.8 nameserver 8.8.4.4

4.1.3 Network Troubleshooting

- Check IP Address:

bash

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ip a

- Ping a Host:

bash

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ping 8.8.8.8

- Traceroute:

bash

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traceroute google.com

- Check Network Services:

bash

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sudo systemctl status network

4.2 Package Management

4.2.1 Package Managers

Ubuntu: APT (Advanced Package Tool)

- Update Package List:

bash

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sudo apt update

- Upgrade Packages:

bash

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sudo apt upgrade

- Install a Package:

bash

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sudo apt install package_name

- Remove a Package:

bash

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sudo apt remove package_name

- Search for a Package:

bash

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apt search package_name

CentOS: YUM/DNF (Yellowdog Updater, Modified)

- Update Package List:

bash

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sudo yum update

- Install a Package:

bash

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sudo yum install package_name

- Remove a Package:

bash

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sudo yum remove package_name

- Search for a Package:

bash

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yum search package_name

4.2.2 Repositories

- Add a Repository on Ubuntu:

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sudo add-apt-repository ppa:repository_name sudo apt update

- Add a Repository on CentOS:

bash

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```
sudo yum-config-manager --add-repo http://repository_url/repo_name.repo
```

4.3 System Services

4.3.1 Managing Services with Systemd

- Start a Service:

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sudo systemctl start service_name
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- Stop a Service:

bash

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sudo systemctl stop service_name
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- Restart a Service:

bash

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sudo systemctl restart service_name
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- Enable a Service to Start on Boot:

bash

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sudo systemctl enable service_name
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- Disable a Service from Starting on Boot:

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sudo systemctl disable service_name
```

- Check Service Status:

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sudo systemctl status service_name
```

4.3.2 Common Services

- SSH (Secure Shell):

- Install SSH Server:

bash

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sudo apt install openssh-server # Ubuntu sudo yum install openssh-server # CentOS

- Start and Enable SSH:

bash

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sudo systemctl start ssh sudo systemctl enable ssh

- Web Server (Apache):
  - Install Apache:

bash

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sudo apt install apache2 # Ubuntu sudo yum install httpd # CentOS

- Start and Enable Apache:

bash

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sudo systemctl start apache2 # Ubuntu sudo systemctl enable apache2 # Ubuntu sudo systemctl start httpd # CentOS sudo systemctl enable httpd # CentOS

4.4 Basic System Security

4.4.1 User Management

- Add a User:

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sudo adduser username

- Delete a User:

bash

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sudo deluser username

- Modify a User:

bash

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sudo usermod -aG group_name username

4.4.2 Firewall Configuration

UFW (Uncomplicated Firewall) on Ubuntu

- Enable UFW:

bash

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sudo ufw enable

- Allow a Service:

bash

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sudo ufw allow ssh sudo ufw allow http

- Check Status:

bash

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sudo ufw status

Firewalld on CentOS

- Start Firewalld:

bash

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sudo systemctl start firewalld

- Enable Firewalld:

bash

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sudo systemctl enable firewalld

- Allow a Service:

bash

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sudo firewall-cmd --permanent --add-service=http sudo firewall-cmd --permanent --add-service=https sudo firewall-cmd --reload

- Check Status:

bash

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```
sudo firewall-cmd --state
```

4.5 Summary

In this chapter, we explored the configuration aspects of Linux systems, covering network configuration, package management, system services, and basic system security. You now have the knowledge to set up and manage a Linux system effectively, ensuring it is configured to meet your specific needs.