EIDIA
Ecole d'Ingénierie Digitale et d'Intelligence Artificielle

UEMF

Filière WM 2024
Module : Administration linux avancée

Installation et Configuration d'un serveur DHCP

Réalisé par
ABDELLAH MJALI

Date : le 10/03/2024

Encadré par :AHMED AMAMOU

Année Universitaire : 2023/2024

Summary:

This report outlines the process of installing and configuring a DHCP (Dynamic Host Configuration Protocol) server on a Debian-based distribution. The DHCP server enables automatic management of IP addresses within a network, simplifying the administration of connected devices.

Keywords:

- **DHCP**
- **Installation**
- **Configuration**
- **Network**
- **Automation**

Table of Contents :

Introduction 1

I. Installation of DHCP Server :

1. Update available packages
2. Install the DHCP server (isc-dhcp-server)

II. Configuration of DHCP Server :

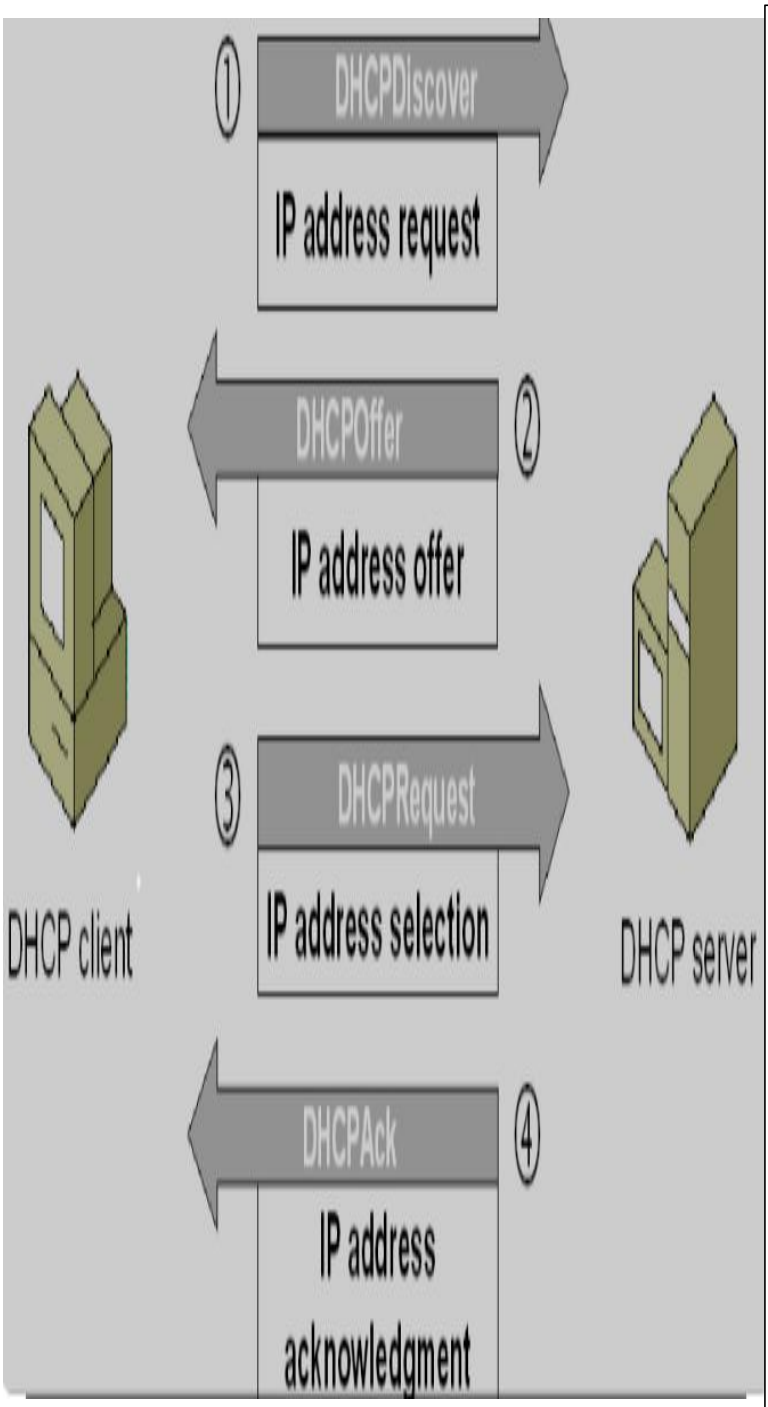
- Open the main configuration file (/etc/dhcp/dhcpd.conf)
- Modify the configuration file according to the network requirements

III. Starting and Managing DHCP Service :

- Start the DHCP service
- Enable the DHCP service to start on system boot
- Check the status of the DHCP service

IV. Troubleshooting Example: Resolving DHCP Service Startup Issue :

Introduction :

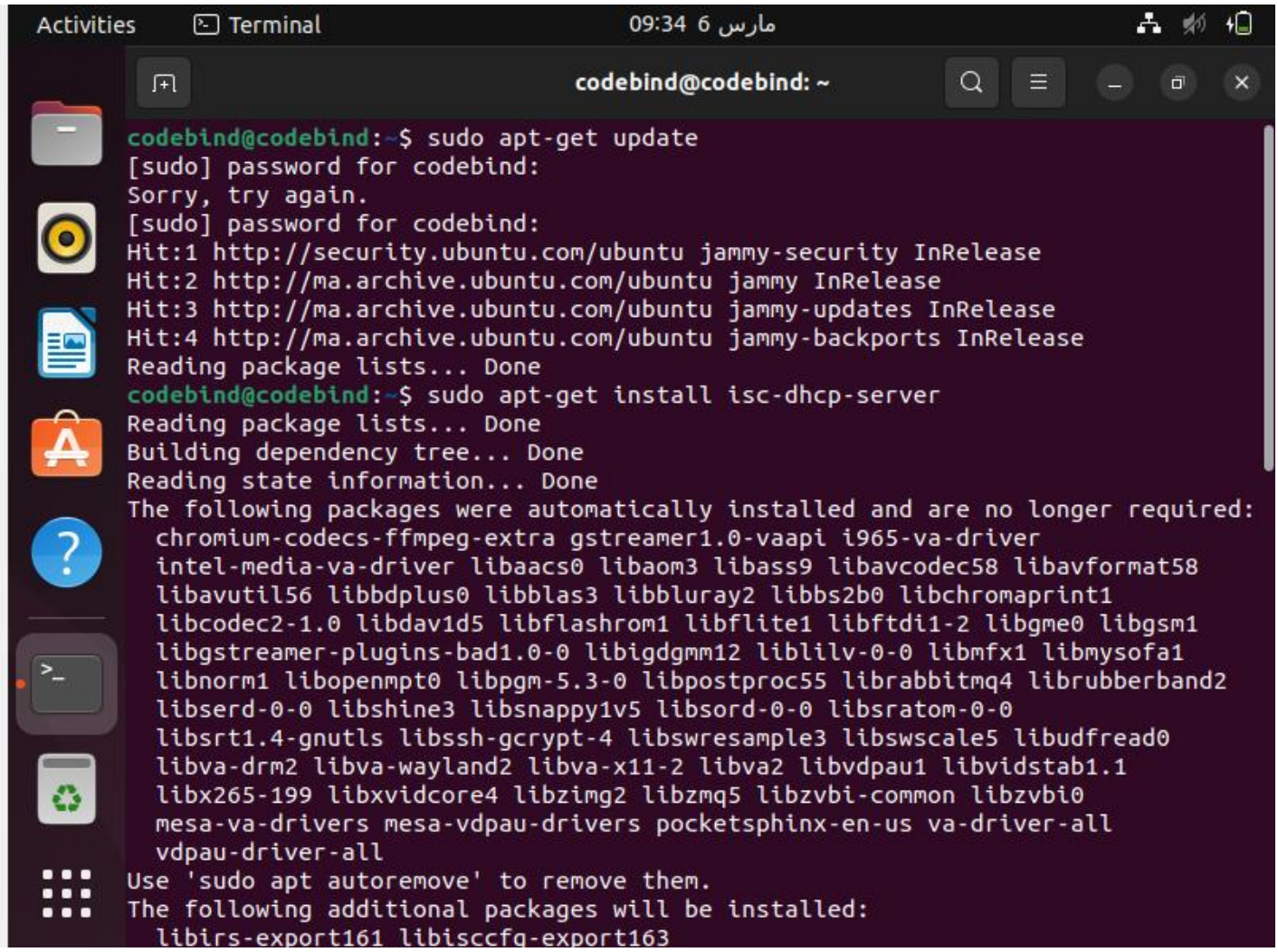


The DHCP Server's Role in Network Administration

The DHCP (Dynamic Host Configuration Protocol) server plays a vital role in the automatic management of IP addresses within a network. By dynamically allocating IP addresses and other network configuration parameters to connected devices, it streamlines the process of device administration, making it easier for network administrators to optimize and manage the network effectively.

With DHCP, the need for manual assignment of IP addresses to individual devices is eliminated, resulting in a more efficient and scalable network infrastructure. This automated approach not only saves time and effort but also reduces the likelihood of conflicts and errors that can arise from manual configuration.

I. Installation of DHCP Server :



Update available packages:

```
codebind@codebind:~$ sudo apt-get update
[sudo] password for codebind:
```

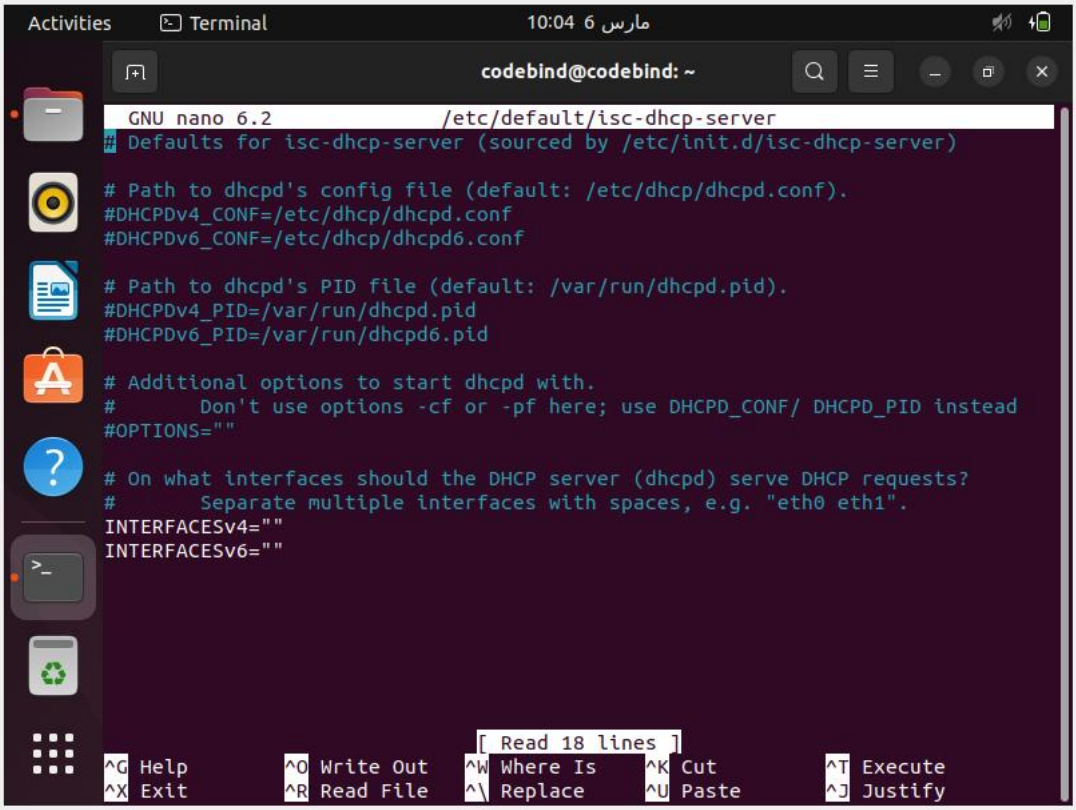
- **This command updates the list of available packages to ensure the system has the latest information about software packages.**

```
codebind@codebind:~$ sudo apt-get install isc-dhcp-server
Reading package lists... Done
```

- **This command installs the ISC DHCP server package which provides the necessary software to run a DHCP server on the system.**

II. Configuration of DHCP Server:

- **Modify the configuration file according to the network requirements.**

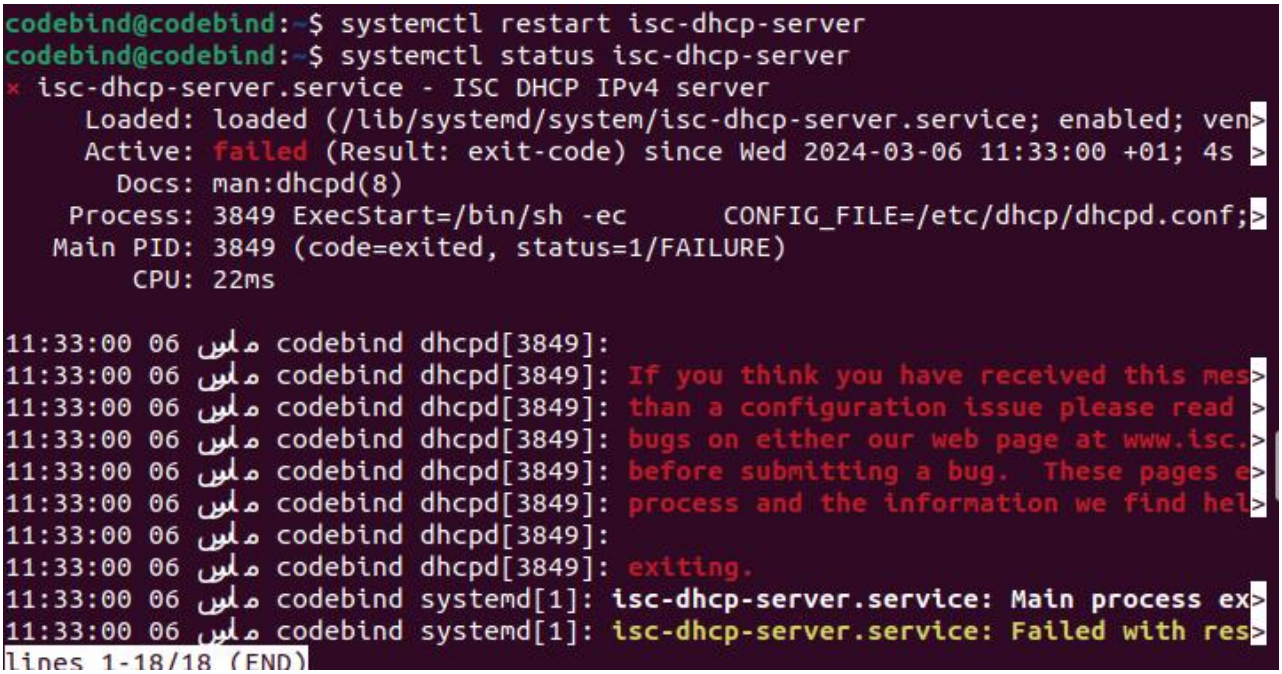


```
Try: sudo apt install <deb name>
codebind@codebind:~$ sudo nano /etc/default/isc-dhcp-server
[sudo] password for codebind:
codebind@codebind:~$ sudo nano /etc/default/isc-dhcp-server
```

This example configuration defines a subnet, IP address range, default gateway, subnet mask, domain name, and DNS servers for DHCP clients.

III. Starting and Managing DHCP Service

- **Start the DHCP service:**

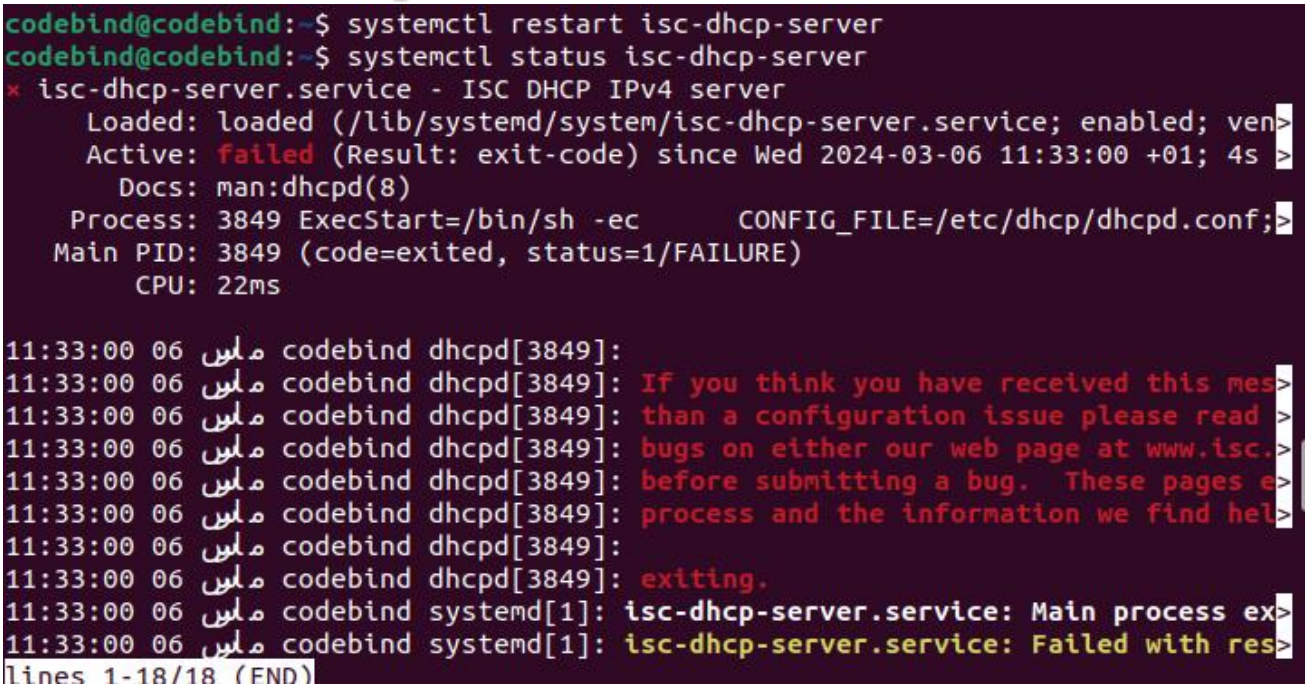



```
codebind@codebind:~$ systemctl restart isc-dhcp-server
codebind@codebind:~$ systemctl status isc-dhcp-server
```

- **1st command starts the DHCP server service, allowing it to begin offering IP addresses to clients on the network.**

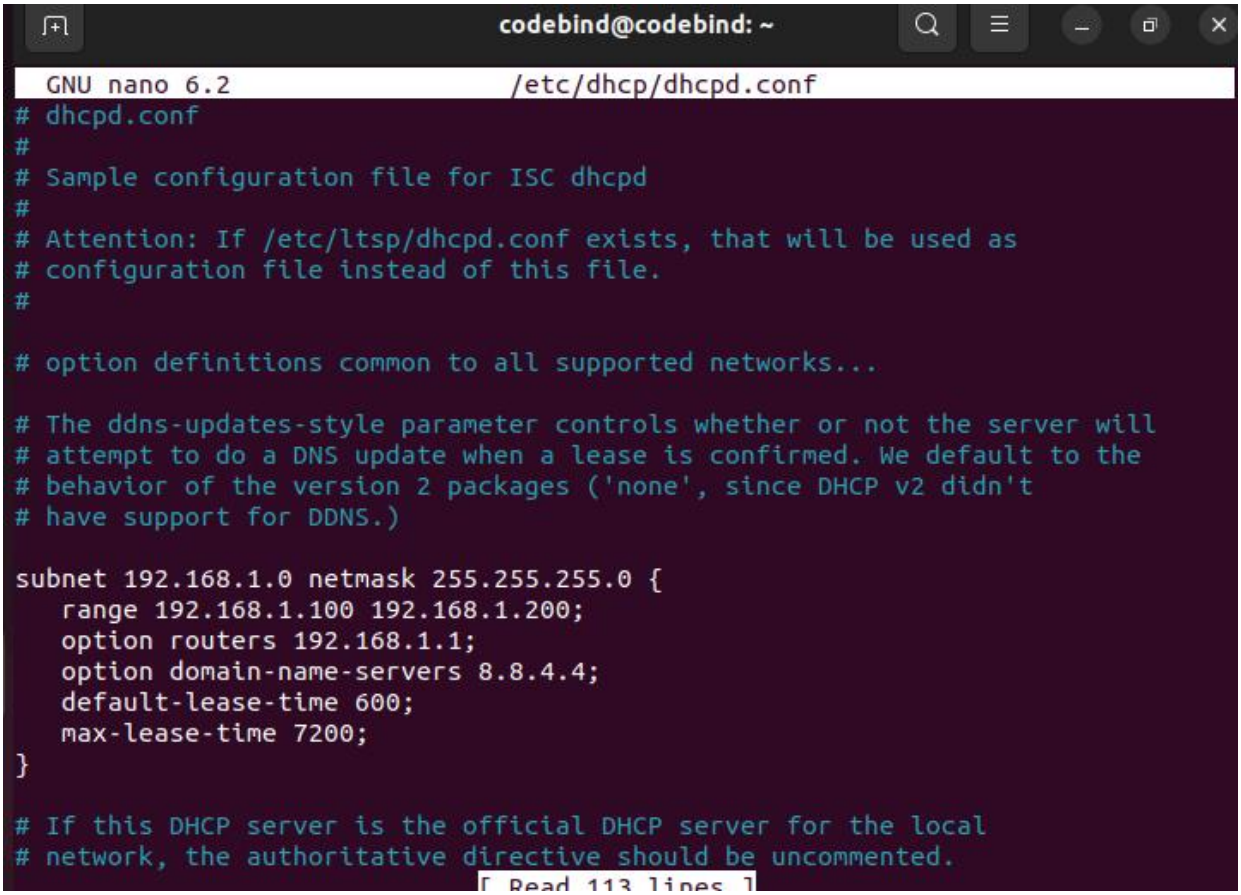
- **2nd command displays the current status of the DHCP server service, indicating whether it is running properly or encountering any issues.**

IV.Troubleshooting Example: Resolving DHCP Service Startup Issue :



- Upon configuring the DHCP server and attempting to start the service, an unexpected issue arose hindering the service's proper startup. Investigation revealed that an error occurred after deleting the primary DNS server (8.8.8.8) from the DHCP configuration, leaving only the secondary DNS server (8.8.4.4).

- To rectify this issue, the DHCP server's configuration was adjusted to include a valid primary DNS server. Following this, the DHCP service was restarted to implement the changes. Here are the steps taken to resolve the problem:




```
codebind@codebind:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.1  netmask 255.255.255.0  broadcast 192.168.1.255
        ether 08:00:27:32:be:d9  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 524  bytes 85722 (85.7 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 14875  bytes 1069683 (1.0 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 14875  bytes 1069683 (1.0 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

1. **<u>Configure the default gateway (router) IP address:</u>**

```
codebind@codebind:~$ sudo ifconfig enp0s3 192.168.1.1
codebind@codebind:~$
```

2. **Restart the DHCP service to apply the configuration changes:**

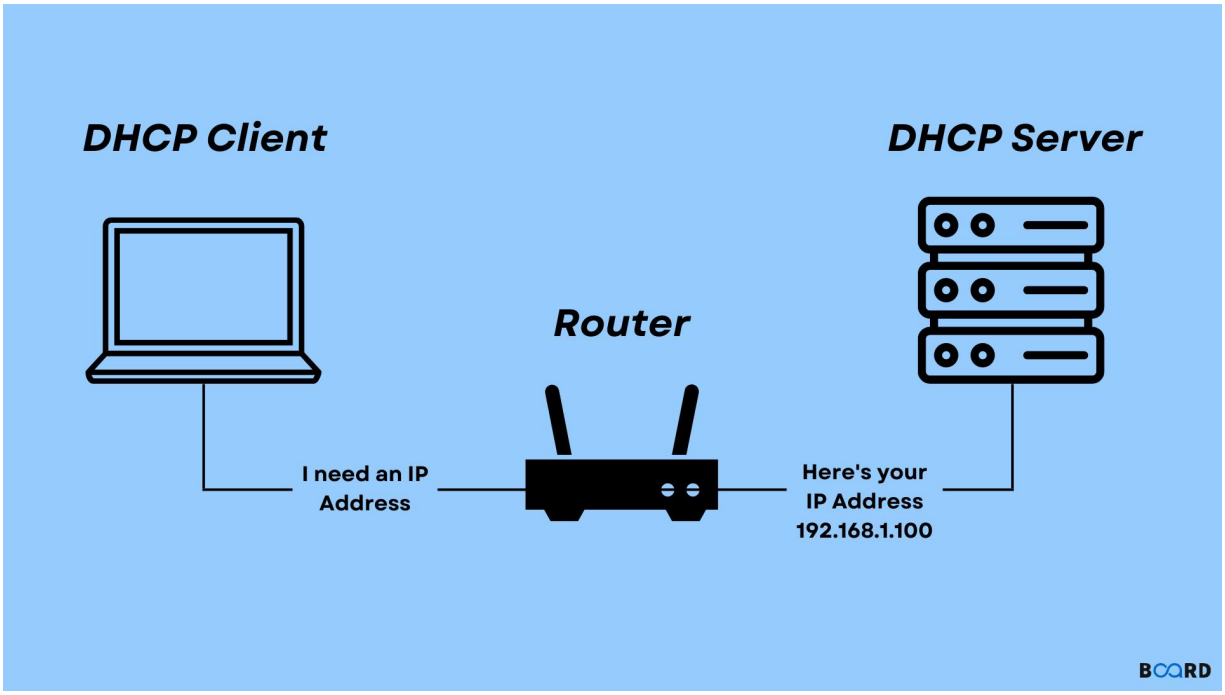
```
codebind@codebind:~$ systemctl restart isc-dhcp-server
codebind@codebind:~$
```

3. **Verify the status of the DHCP service to ensure it started successfully:**

```
codebind@codebind:~$ systemctl status isc-dhcp-server
● isc-dhcp-server.service - ISC DHCP IPv4 server
     Loaded: loaded (/lib/systemd/system/isc-dhcp-server.service; enabled; ven>
     Active: active (running) since Wed 2024-03-06 11:34:45 +01; 6min ago
       Docs: man:dhcpd(8)
   Main PID: 3920 (dhcpd)
      Tasks: 4 (limit: 5845)
     Memory: 4.5M
        CPU: 20ms
     CGroup: /system.slice/isc-dhcp-server.service
             └─3920 dhcpd -user dhcpd -group dhcpd -f -4 -pf /run/dhcp-server/>

11:34:45 06 ماس codebind dhcpd[3920]: Database file: /var/lib/dhcp/dhcpd.leas>
11:34:45 06 ماس codebind dhcpd[3920]: PID file: /run/dhcp-server/dhcpd.pid
11:34:45 06 ماس codebind dhcpd[3920]: Wrote 0 leases to leases file.
11:34:45 06 ماس codebind dhcpd[3920]: Listening on LPF/enp0s3/08:00:27:32:be:>
11:34:45 06 ماس codebind sh[3920]: Listening on LPF/enp0s3/08:00:27:32:be:d9/>
11:34:45 06 ماس codebind sh[3920]: Sending on   LPF/enp0s3/08:00:27:32:be:d9/>
11:34:45 06 ماس codebind sh[3920]: Sending on   Socket/fallback/fallback-net
11:34:45 06 ماس codebind dhcpd[3920]: Sending on   LPF/enp0s3/08:00:27:32:be:>
11:34:45 06 ماس codebind dhcpd[3920]: Sending on   Socket/fallback/fallback-n>
11:34:45 06 ماس codebind dhcpd[3920]: Server starting service.
...skipping...
● isc-dhcp-server.service - ISC DHCP IPv4 server
     Loaded: loaded (/lib/systemd/system/isc-dhcp-server.service; enabled; ven>
     Active: active (running) since Wed 2024-03-06 11:34:45 +01; 6min ago
       Docs: man:dhcpd(8)
```

V- CONCLUSION :



- In conclusion, the installation and configuration of a DHCP server on a Debian-based distribution is a crucial task for managing network resources efficiently. Throughout this report, we have outlined the step-by-step process of installing the DHCP server package, configuring the DHCP server to assign IP addresses and other network parameters to clients dynamically, and managing the DHCP service.

- Additionally, we encountered and successfully resolved a common issue related to DHCP service startup, demonstrating the importance of proper configuration and troubleshooting techniques.

- By following the instructions provided in this report, network administrators can effectively deploy and manage DHCP servers, ensuring smooth network operations and seamless connectivity for all devices within the network. DHCP simplifies network administration by automating the assignment of IP addresses, default gateways, and DNS servers, thereby reducing manual configuration efforts

and potential errors.

- Overall, the implementation of a DHCP server enhances network scalability, flexibility, and reliability, making it an essential component of modern network infrastructures.