

Dynamic Host Configuration Protocol

Introduction:

The Dynamic Host Configuration Protocol (DHCP) is a network management protocol used to dynamically assign IP addresses and other network configuration parameters to devices on a network. DHCP simplifies the administration of IP addressing by automating the process of IP allocation, thus reducing configuration errors and minimizing network downtime.

Aim of DHCP:

The primary aim of DHCP is to automate and streamline the assignment of IP addresses and network configuration parameters within a network infrastructure. By dynamically allocating IP addresses and other settings to devices as they connect to the network, DHCP ensures efficient utilization of IP address space and simplifies network administration.

Objectives of DHCP:

- **Efficient IP Address Management:** DHCP aims to efficiently manage IP address allocation within a network, ensuring that IP addresses are assigned dynamically and reused when devices are no longer connected.
- **Centralized Network Configuration:** DHCP centralizes the management of network configuration parameters such as IP addresses, subnet masks, default gateways, and DNS servers, reducing the need for manual configuration on individual devices.
- **Reduced Configuration Errors:** By automating the assignment of network configuration parameters, DHCP helps to minimize configuration errors and inconsistencies, improving network reliability and stability.
- **Scalability:** DHCP supports the dynamic allocation of IP addresses across large-scale networks, enabling efficient scaling to accommodate varying numbers of devices and network growth.

Steps in DHCP Operation:

- **DHCP Discovery:** When a device (client) connects to the network, it sends out a DHCP discovery broadcast message to locate a DHCP server.
- **DHCP Offer:** DHCP servers on the network receive the discovery message and respond with a DHCP offer message, which includes an available IP address and other configuration parameters.
- **DHCP Request:** The client selects one of the offered IP addresses and sends a DHCP request message to the chosen DHCP server, confirming its intention to use the offered configuration.
- **DHCP Acknowledgment:** The DHCP server that receives the request message sends a DHCP acknowledgment (ACK) message back to the client, confirming the lease of the IP address and providing the client with the assigned configuration parameters.
- **Configuration Renewal:** Periodically, the client initiates a DHCP lease renewal process to extend the lease duration or request a new IP address if necessary.

Conclusion:

In conclusion, DHCP plays a crucial role in simplifying and automating IP address management within network infrastructures.

By dynamically allocating IP addresses and network configuration parameters to devices, DHCP improves efficiency, reduces configuration errors, and enhances scalability in network environments.

Click on Documentation to read about DHCP, to know your knowledge about the topic click on Quiz and click on video to check how it works.

MANUAL ▼

CONTACT

DOCUMENTATION

QUIZ

VIDEO

WS-C3650-48PS-S Cisco Catalyst 3650 Network Switch



Okay

Fig. Rotable Network switch

Power Connection



Power adapter port for router connection.



Okay

Fig. Power Connection

Antennae



Antennae broadcast wireless signals in your home network.



Okay

Fig. Antennae

Reset Port



Port for resetting router to factory defaults.



Okay

Fig. Reset Port

WAN/Internet Port



Connect modem or transceiver to link home network to internet.



Okay

Fig. WAN/Internet Port

LAN Ports



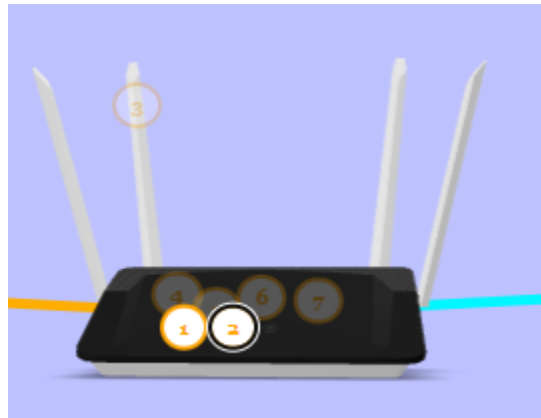
Ports for wired devices on home network without wireless capability.



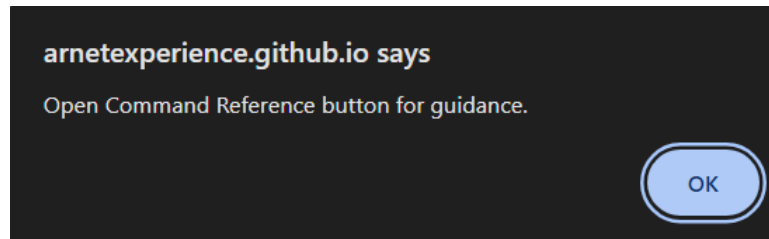
Okay

Fig. LAN Port

Click on Button number 2 of Router and Open CLI (Command Line Interface)

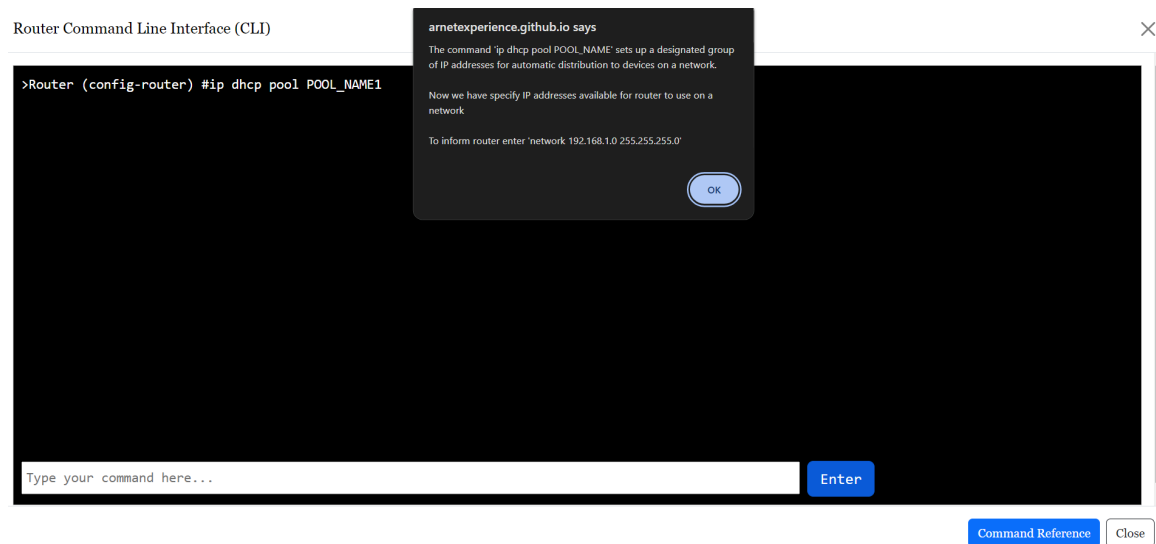


Click Ok



Command Reference

Enter one by one Configuring Pool for network 1



Router Command Line Interface (CLI)

```
>Router (config-router) #ip dhcp pool POOL_NAME1  
>Router (config-router) #Invalid command. Please enter
```

arnetexperience.github.io says

The command "network 192.168.1.0 255.255.255.0" defines a network with the address 192.168.1.0 and a subnet mask of 255.255.255.0, essentially specifying a range of IP addresses available for devices to use on a network.

But router doesn't know about external network.

So, for that enter "default router 192.168.1.1"

OK

```
network 192.168.1.0 255.255.255.0
```

Enter

Command Reference

Close

Router Command Line Interface (CLI)

```
>Router (config-router) #ip dhcp pool POOL_NAME1  
>Router (config-router) #Invalid command. Please enter  
>Router (config-router) #network 192.168.1.0 255.255.255.0
```

arnetexperience.github.io says

The command "default router 192.168.1.1" designates 192.168.1.1 as the default gateway for devices on the network, providing a path for data to exit the local network and reach external destinations.

We set the DNS server to 8.8.8.8 because it translates website names into IP addresses, enabling internet access for devices on the network.

Enter 'dns-server 8.8.8.8'

OK

```
default router 192.168.1.1
```

Enter

Command Reference

Close

Router Command Line Interface (CLI)

```
>Router (config-router) #ip dhcp pool POOL_NAME1
>Router (config-router) #Invalid command. Please enter a valid command.
>Router (config-router) #network 192.168.1.0 255.255.255.0
>Router (config-router) #default router 192.168.1.1
```

arnetexperience.github.io says

The command 'dns-server 8.8.8.8' sets 8.8.8.8 as the DNS (Domain Name System) server, which translates domain names into IP addresses, allowing devices on the network to access websites and services using human-readable addresses.

That's all for the network 1. Now we will do same for network 2.

Enter 'exit'.

OK

dns-server 8.8.8.8

Enter

Command Reference

Close

Router Command Line Interface (CLI)

```
>Router (config-router) #ip dhcp pool POOL_NAME1
>Router (config-router) #Invalid command. Please enter a valid command.
>Router (config-router) #network 192.168.1.0 255.255.255.0
>Router (config-router) #default router 192.168.1.1
>Router (config-router) #dns-server 8.8.8.8
```

arnetexperience.github.io says

'exit' is a command used to exit or close the current interface, configuration mode, or session in various command-line interfaces or programs, allowing the user to return to a previous menu or prompt.

Enter 'ip dhcp POOL_NAME'

OK

exit

Enter

Command Reference

Close

Similarly, enter the Configuring Pool for network 2 then close.

Click on PC1 then DHCP to know the IP Address,

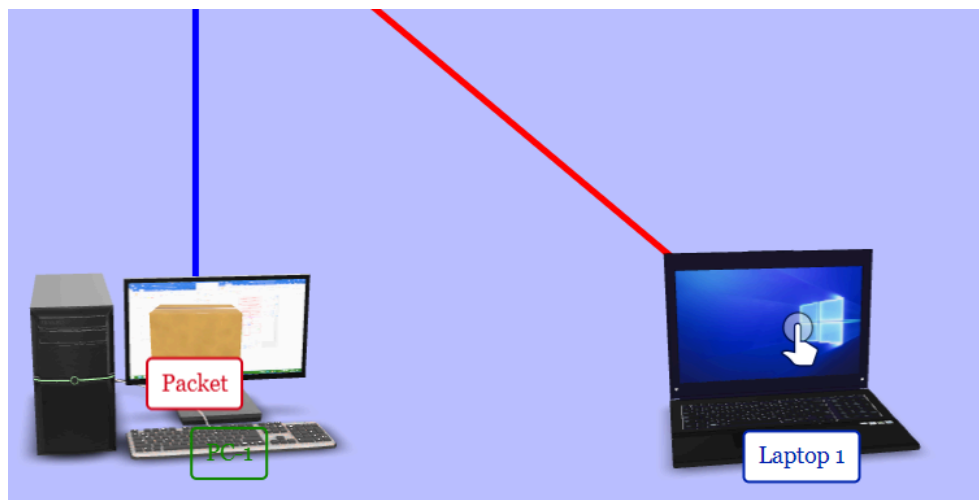
Enter Static IP Address OR Click **DHCP** to assign
Dynamic IP Address.

Enter IP Address

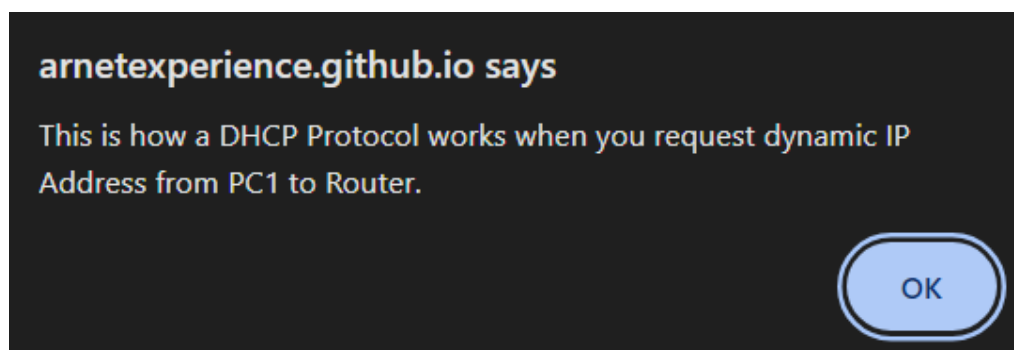
Save

Close

Packets will start moving from PC1 to router.



You will get a pop-up message after the operation is successful.



Similarly, We can perform for PC2 or Laptop1 to Router or Laptop2 to Router.

