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.

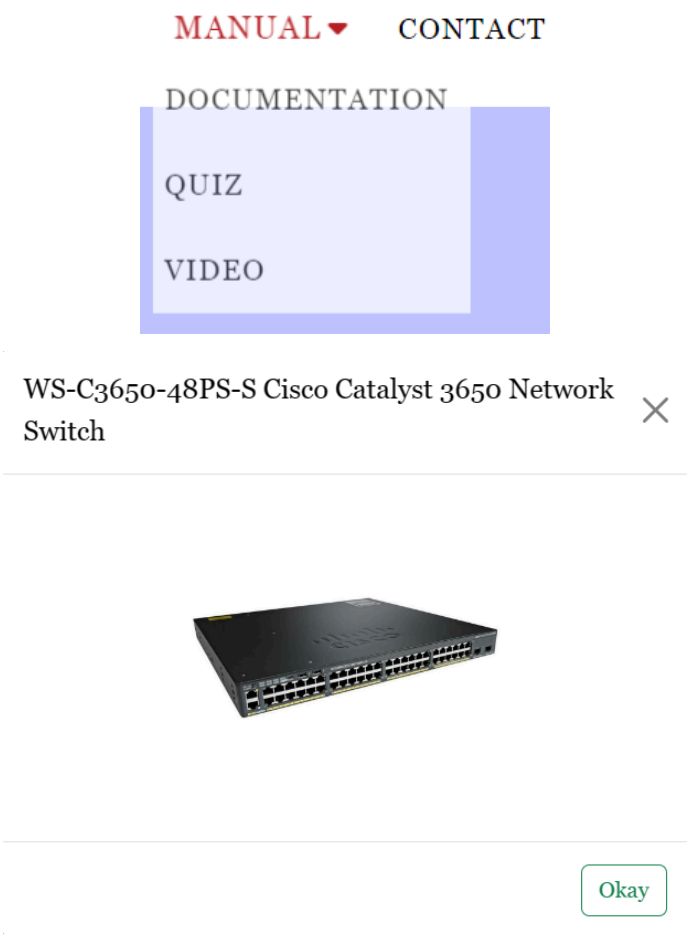


Fig. Rotable Network switch

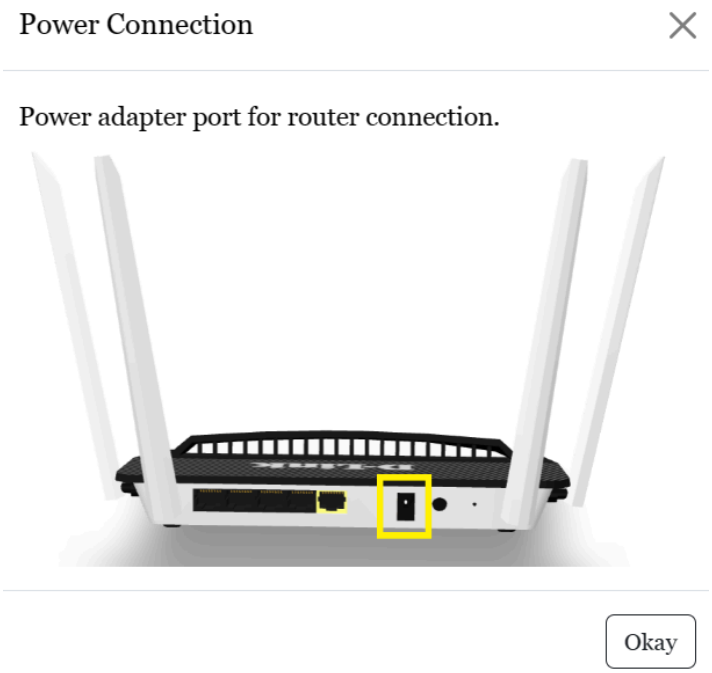


Fig. Power Connection

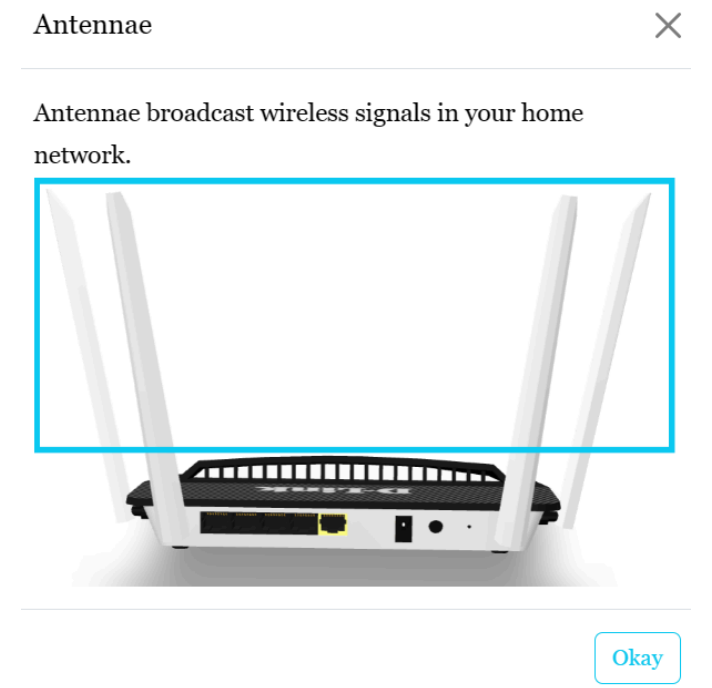


Fig. Antennae

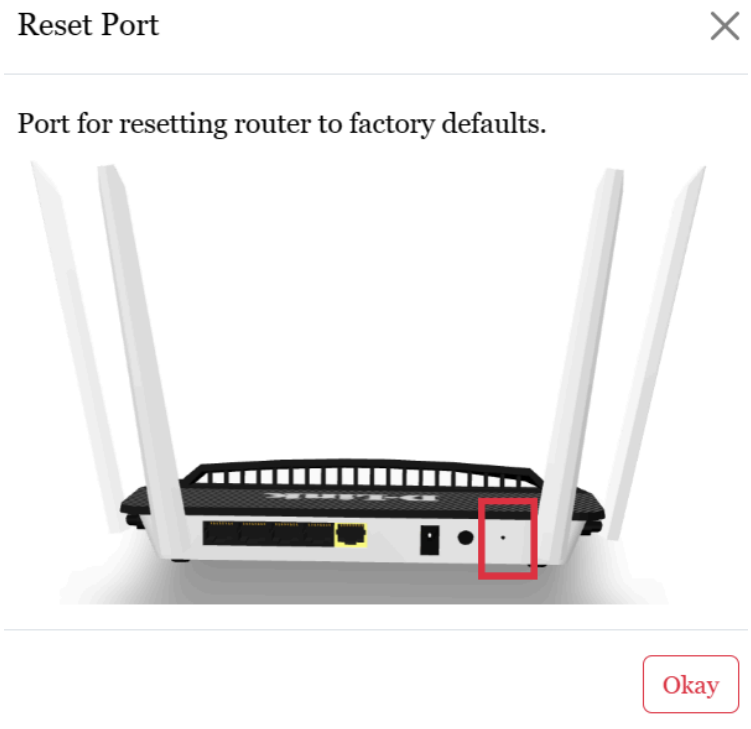


Fig. Reset Port

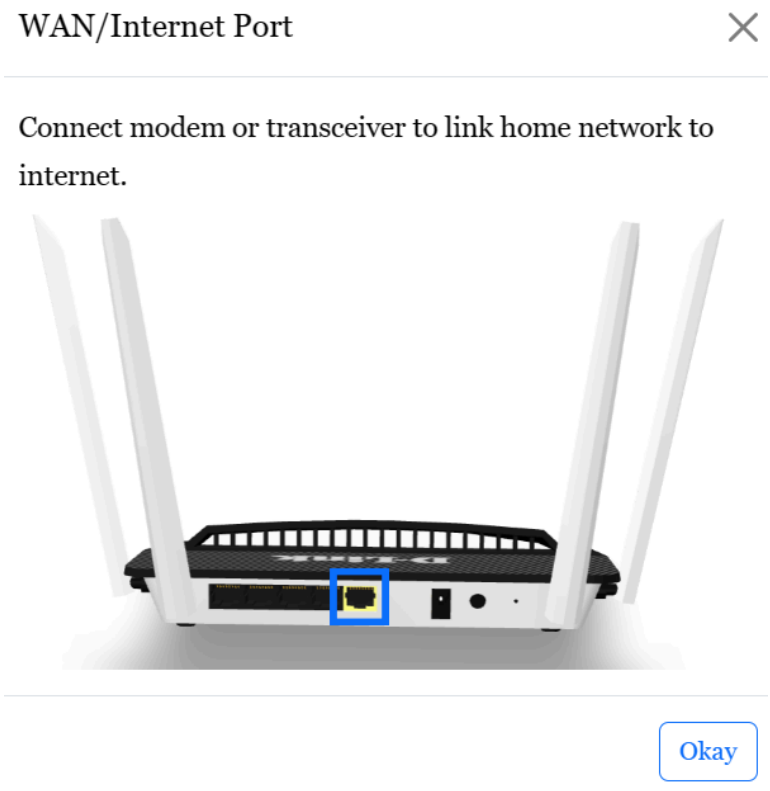


Fig. WAN/Internet Port

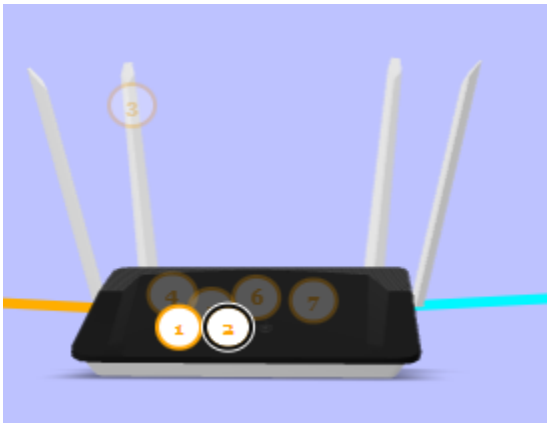
LAN Ports

Ports for wired devices on home network without wireless capability.

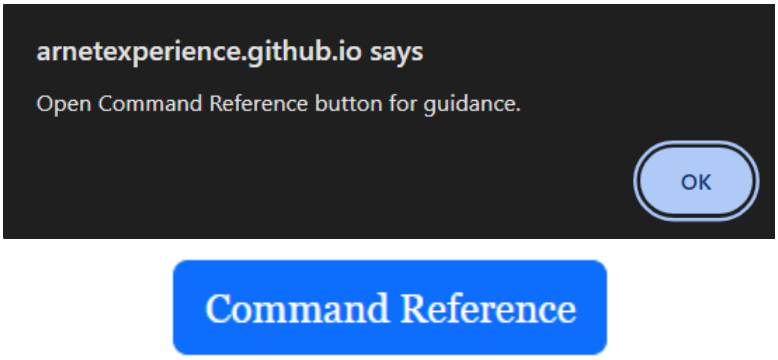
Okay

Fig. LAN Port

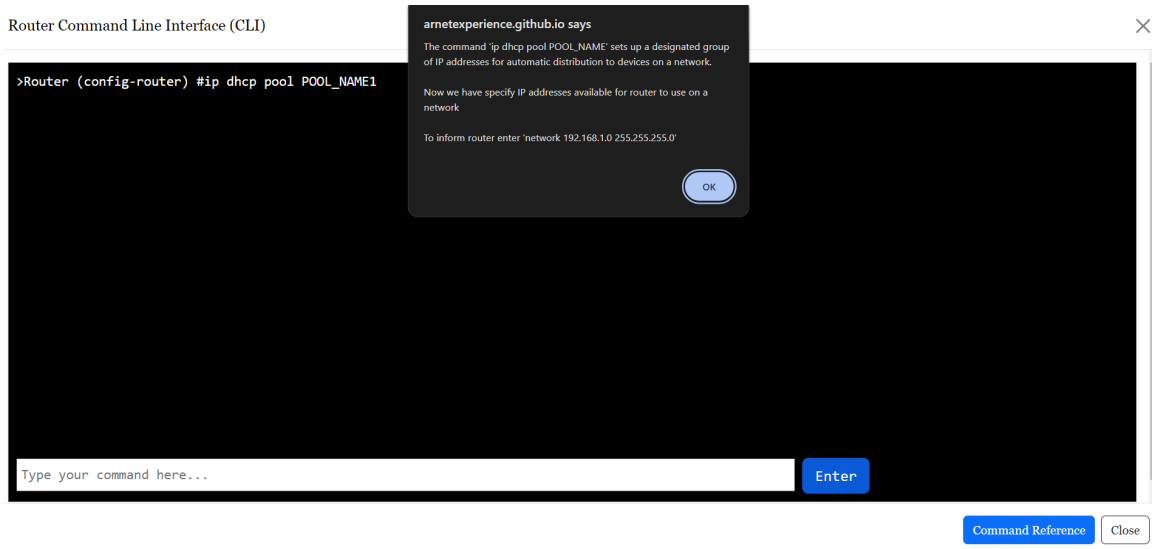
Click on Button number 2 of Router and Open CLI (Command Line Interface)

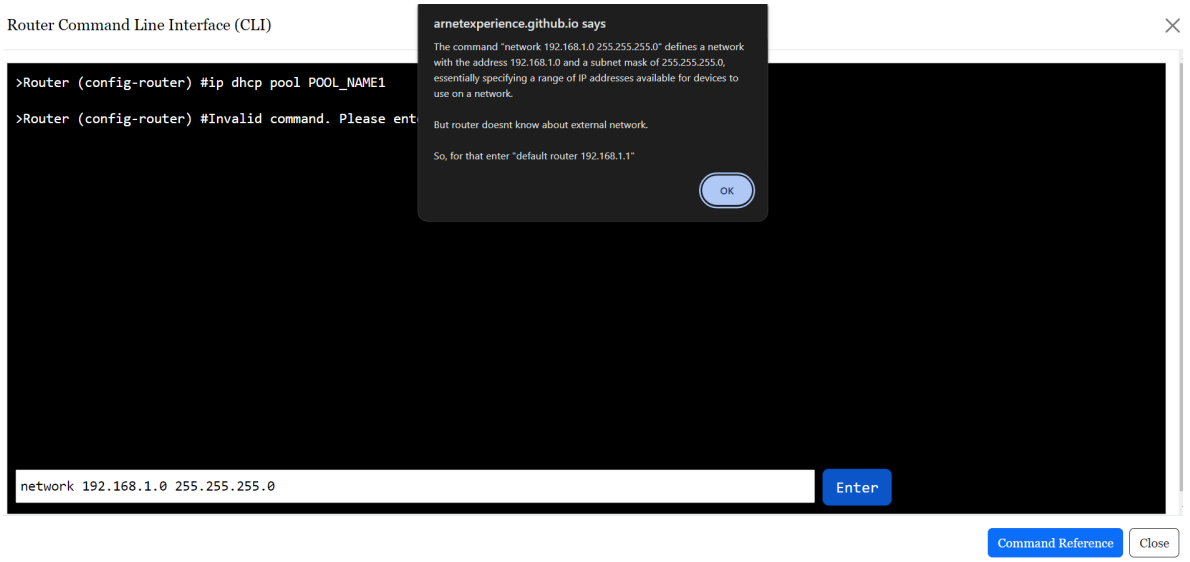


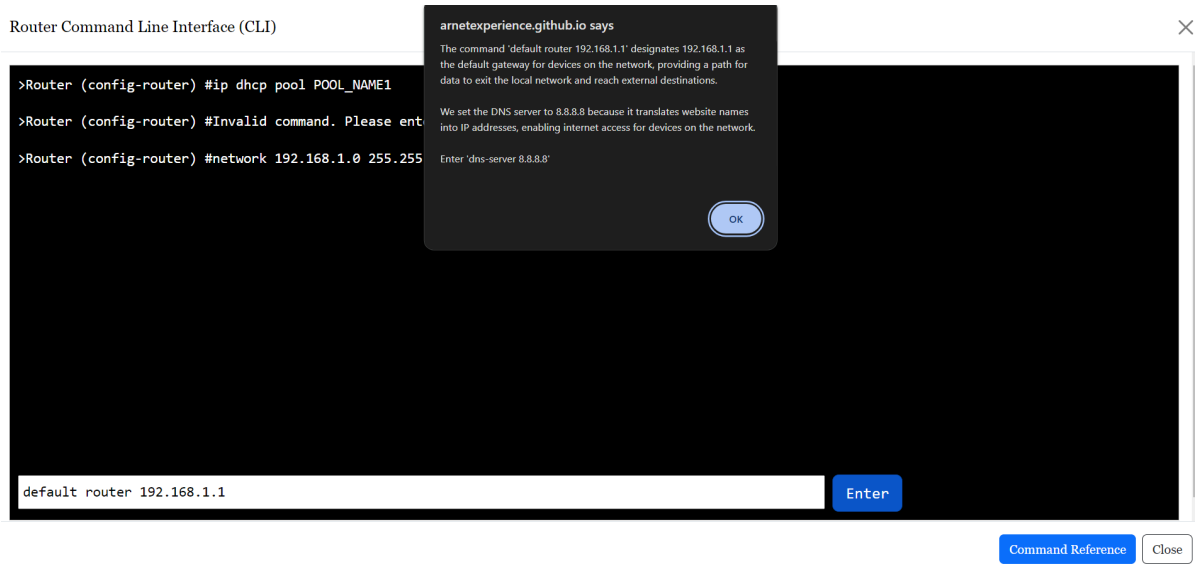
Click Ok

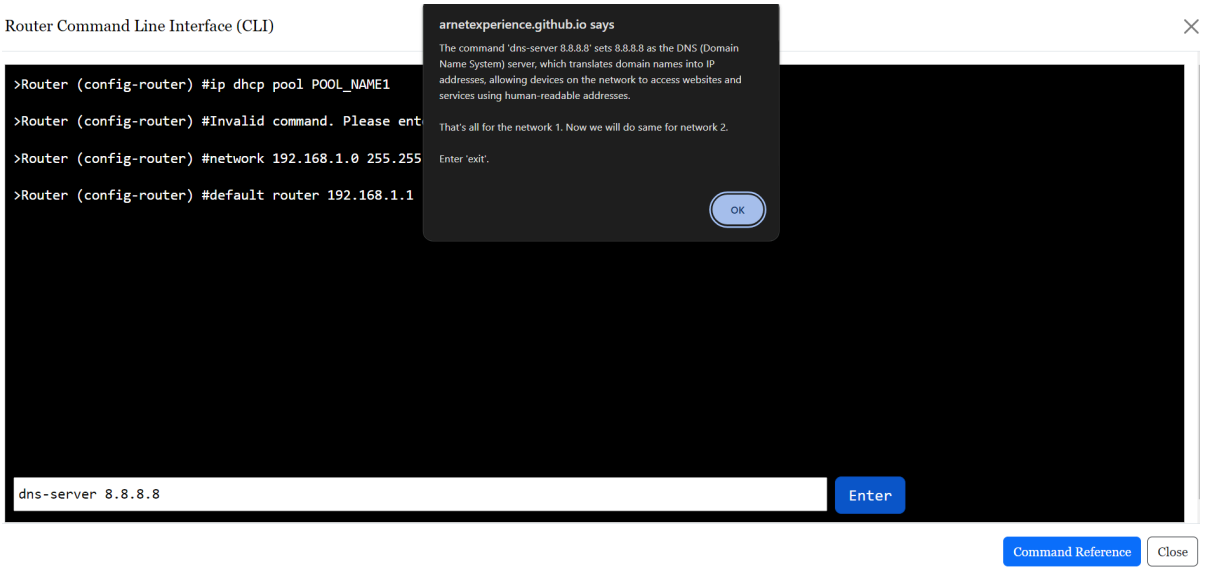


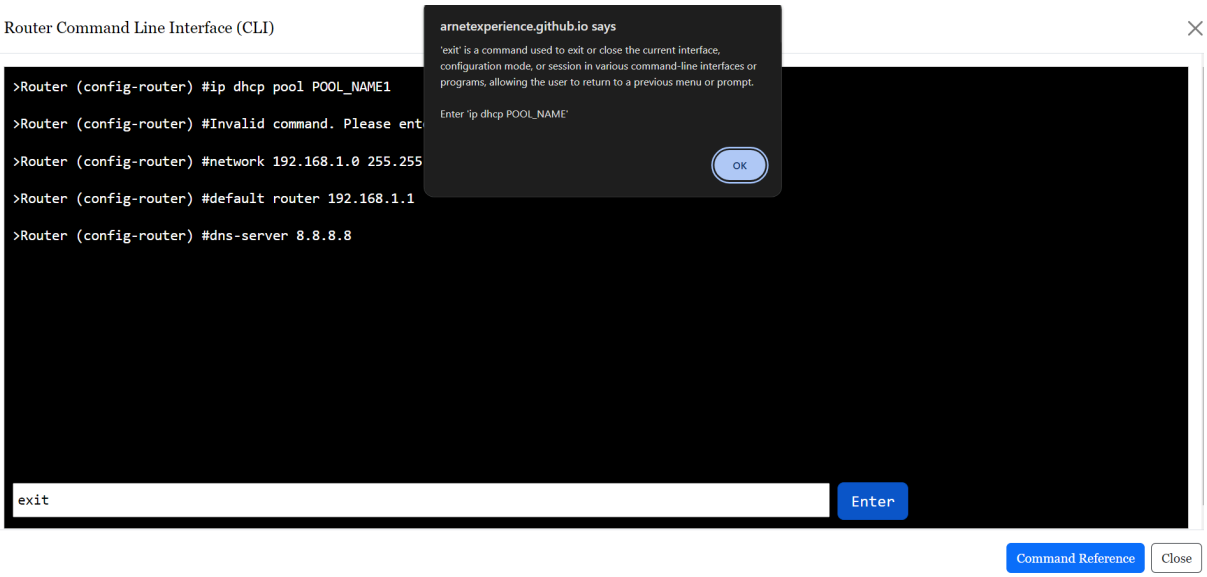
Enter one by one Configuring Pool for network 1




Router Command Line Interface (CLI)
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 doesnt know about external network.
So, for that enter "default router 192.168.1.1"
OK
>Router (config-router) #ip dhcp pool POOL_NAME1
>Router (config-router) #Invalid command. Please ent
network 192.168.1.0 255.255.255.0
Enter
Command Reference
Close


Router Command Line Interface (CLI)
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
>Router (config-router) #ip dhcp pool POOL_NAME1
>Router (config-router) #Invalid command. Please ent
>Router (config-router) #network 192.168.1.0 255.255
default router 192.168.1.1
Enter
Command Reference
Close

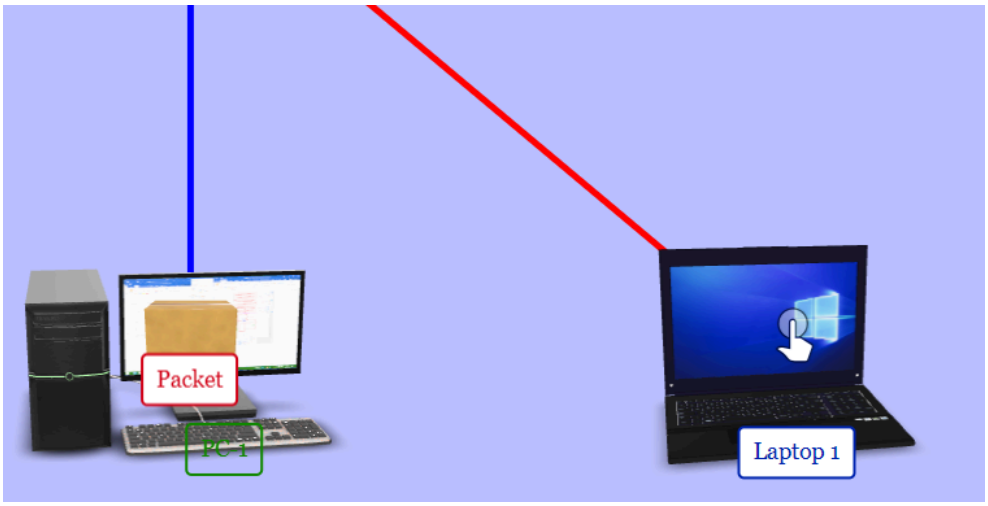




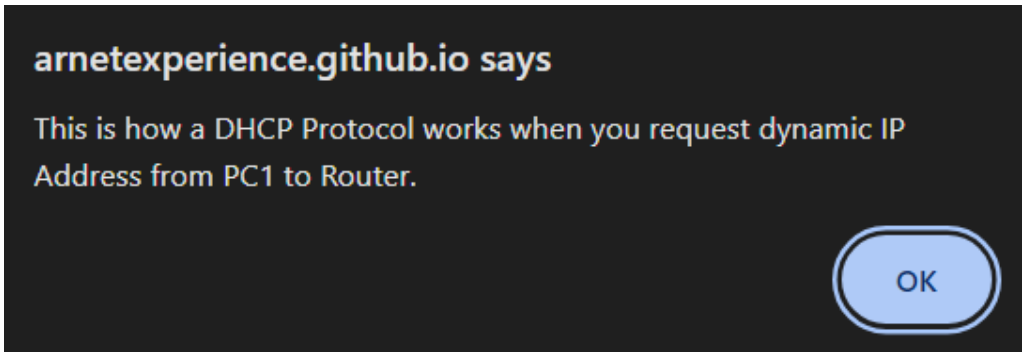
Similarly, enter the Configuring Pool for network 2 then close.

Click on PC1 then DHCP to know the IP Address,

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.