Our task :

Design a network where there are 2 departments, accounts and delivery where  
each department has atleast 2 pc

Network address is 192.168.40.0

Devices in department and accounts can communicate

Solution :

1. First we need to determine subnet mask. As we know we have 2 departments, so we can find subnet as   
   2^n = nr netwroks

where n is nr of bits borrowd from host (i.e our subnett)

2^n= 2

n = 1

hence our subnet is 11111111.11111111.11111111.10000000

which essentially is 255.255.255.128

1. Now we need to calculate ip ranges for each network, as we have 2 networks,
2. For network 1
   1. Network id is 192.168.40.0
   2. Range of ip for host is 192.168.40.1-192.168.40.126
   3. Broadcast is 192.168.40.127

This gives total of 126 ip ranges for host

1. For network 2
   1. Network id is 192.168.40.128
   2. Range of ip for host is 192.168.40.129-192.168.40.254
   3. Broadcast is 192.168.40.255

This gives total of 126 ip ranges for host

Now we are done with theoretical part, we need to configure router as follows so both devices can communicatte

Open cli on router

Enter en to enable router

Enter config t to start configuration, here t means via terminal

Int range gig0/0-1 means we will change 0 and 1 port, these are 2 switches connected to router

Enter no shutdown to stop from disconnecting ports

Do do wr to save and apply changes to router

Do exit to get out of range we selected in step 3 lines above( the one like int range gig0/0-1)  
  
now we will set up ip of both switches

Do int gig0/0 to select this port for changes we are going to make

Do ip address 192.168.40.1 255.255.255.128  
here we are giving ip and subnet mask

Do do wr  
to apply changes

Do exit

Now we configure switch 2

Do int gig0/1 to select this port for changes we are going to make

Do ip address 192.168.40.129 255.255.255.128  
here we are giving ip and subnet mask

Do do wr  
to apply changes

Do exit

Enter do show start

To start router

Now configure devices,   
give them ip of router on getway which is 192.168.40.1

Add static ip and subnet  
and your connection is done, Hurrah !!

Markup

# Network Design Documentation

## Project Overview

The objective of this project is to design a network infrastructure for a company with two departments, Accounts and Delivery, enabling communication between devices within each department. This documentation outlines the steps taken to configure the network using Cisco Packet Tracer.

## Network Requirements

1. Two departments: Accounts and Delivery.

2. Each department must have at least two PCs.

3. Network address: 192.168.40.0

4. Devices in both departments should be able to communicate.

## Solution

### Subnet Calculation

To accommodate the two departments, we need to determine the subnet mask:

\[2^n = \text{number of networks}\]

Given \(n\) as the number of bits borrowed from the host for subnetting:

\[2^n = 2\]

\[n = 1\]

Hence, the subnet mask is 255.255.255.128.

### IP Range Calculation

1. \*\*For Network 1\*\*

- Network ID: 192.168.40.0

- Host IP Range: 192.168.40.1 - 192.168.40.126

- Broadcast: 192.168.40.127

2. \*\*For Network 2\*\*

- Network ID: 192.168.40.128

- Host IP Range: 192.168.40.129 - 192.168.40.254

- Broadcast: 192.168.40.255

## Configuration Steps

### Router Configuration

1. Access the router's command-line interface (CLI).

2. Enable privileged EXEC mode.

3. Enter global configuration mode.

4. Select the interfaces to be configured (`gig0/0-1`).

5. Ensure interfaces are not shutdown.

6. Save and apply changes.

7. Exit interface configuration.

### Router Interface Configuration

1. Configure the IP address for the first switch (`gig0/0`): `192.168.40.1 255.255.255.128`.

2. Save changes and exit.

### Switch Configuration

1. Configure the IP address for the second switch (`gig0/1`): `192.168.40.129 255.255.255.128`.

2. Save changes and exit.

### Verify Configuration

1. View the router's startup configuration: `show start`.

## Device Configuration

1. Assign static IP addresses to devices.

2. Set the router's IP address (192.168.40.1) as the gateway.

3. Configure subnet masks.

## Conclusion

Upon completion of the above steps, the network infrastructure is established, enabling communication between devices within the Accounts and Delivery departments.

## Additional Notes

- Ensure proper documentation and labeling of devices for future reference.

- Regularly test network connectivity and perform maintenance as needed.

Feel free to modify and adapt this documentation as necessary for your project requirements.