CCNA ITN Lab 2 **Homework** **Deadline: 7.12.**

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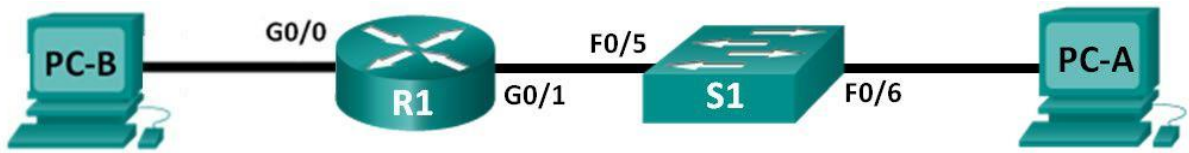
IPv4 Subnetting
Basic IPv4 and IPv6 LAN
Router and Switch Configuration
TFTP Server



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Homework / Preparation

Part 1: Cisco IOS Basic Configuration Commands

a. Read the Lab Instructions of this Lab

b. Check the IOS Command List, provided for the Labs.

c. Which IOS commands are necessary to configure the following tasks?

- Enter the privileged mode from startup mode. **Router>enable**
- Enter the configuration (EXEC) mode from terminal. **Router#configure terminal**
- Set the hostname to R1. **Router(config)# hostname R1**
- Disable DNS lookup. **R1(config)#no** ip domain- lookup
- Assign **class** the EXEC encrypted password **Enable secret class**
- Configure global password encryption.
- Return from configuration (EXEC) mode: **exit**
- Assign **cisco** the console password and enforce login and set **logging synchronous** to prevent console messages from interrupting command entry.

  R1(config)# line

  console 0

  R1(config-line)#

  password cisco

  R1(config-line)#

  login

  R1(config-line)#

  R1(config-line)#exit

- Use vty (Telnet) lines 0-4, assign **cisco** as the vty (Telnet) password and enforce login.

  R1(config)#

  Line vty 0 4

  R1(config-line)#

  Password cisco

  R1(config-line)#

  login

  R1(config-line)#exit

- Create a banner that will warn anyone accessing the device that unauthorized access is prohibited.

  R1(config)#banner motd #message#

- Save the running configuration to the startup configuration file.

R1(config)#copy running-config startup-config

- Display the **running configuration**. **R1(config)#show startup-config**
- Display the status of all **interfaces** in brief. **R1(config)#**

Show interfaces status

Part 2: Calculate IPv4 Subnets

Step 1: Network Topology A

Given is the following network topology.

PC-A is in subnet A with **208 hosts** in total.

PC-B is in subnet B with **98 hosts** in total.

Calculate the appropriate minimum sized subnets.

a. How many IP subnets are given in the topology in total? 2

b. Which subnet mask is used in network A?255.255.255.0

c. Which subnet mask is used in network B?255.255.255.128

Plan the subnets with private IP addresses in the **IP address range of 192.168.0.0 / 16**. Design your subnet addressing scheme (decimal) starting with network A. The network addresses shall be consecutive without any gap in the used address space.

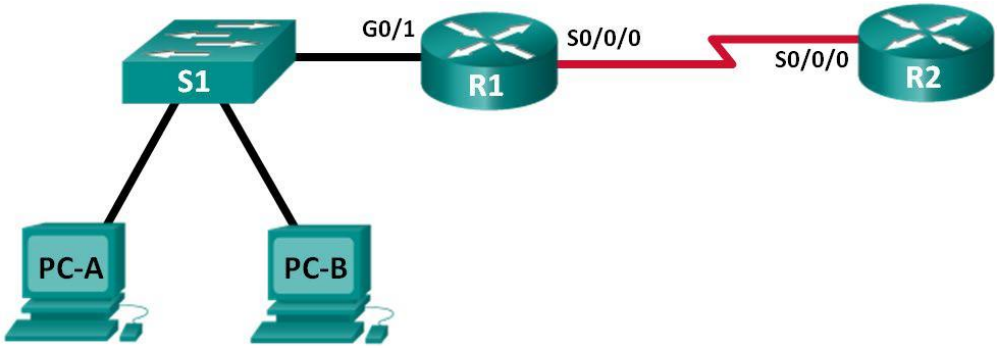
Subnet Number	Subnet IP Address	First Usable Host IP Address	Last Usable Host IP Address	Broadcast IPAddress
A	192.168.0.0/24	192.168.0.1/24	192.168.0.254/24	192.168.0.255/24
B	192.168.1.0/25	192.168.1.1/25	192.168.1.126/25	192.168.1.127/25

Step 2: Network Topology B

Given is the following network topology. You have been given the private IP address space **172.16.0.0/24**.

PC-A and PC-B are in a subnet with **48 hosts**.

The subnet between the router R1 and R2 has **no additional hosts**.



Plan your subnets with the following rules:

- Subnets shall have a minimum size needed to support all IP addresses in that subnet

- Subnets shall be planned form the largest to the smallest one
- Subnet addresses shall be consecutive without any address space gap

a. How many IP subnets are in the topology in total? 2

b. How many "0" bits in the subnet mask are needed for the largest subnet?6

c. Which subnet mask is used in the largest subnet (decimal)?255.255.255.192

d. How many "0" bits in the subnet mask are needed for the second largest subnet?2

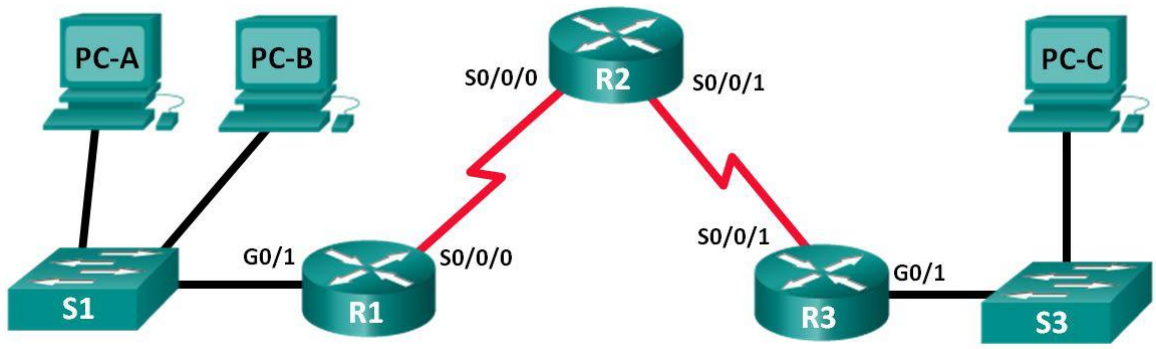
e. Which subnet mask is used in that subnet (decimal)?255.255.255.252

Design your subnet addressing scheme (decimal).

Subnet Number	Subnet IP Address	First Usable Host IP Address	Last Usable Host IP Address	Broadcast IP Address
A	172.16.0.0/26	172.16.0.1/26	172.16.0.62/26	172.16.0.63/26
B	172.16.0.64/30	172.16.0.65/30	172.16.0.66/30	172.16.0.67/30

Step 3: Network Topology C

The network topology C is illustrated in the following topology. Use the **192.168.10.0/24** network address range to provide addresses to the network devices, and then design a new addressing scheme to support the additional network requirement.



a. How many IP subnets are in the topology in total? 4

b. In the following table you find the number of host IP addresses per subnet.

Subnet	Number of hosts	Number of router IPs	Subnet mask	Maximum hosts IP addresses
Subnet PC-A, PC-B	101	1	255.255.255.128	126
Subnet PC-C	42	1	255.255.255.192	62
Subnet R1-R2	0	2	255.255.255.252	2
Subnet R2-R3	0	2	255.255.255.252	2

c. Plan your subnets according to the following rules:

- Subnets shall have a minimum size needed to support all IP addresses in that subnet
- Subnets shall be planned form the largest to the smallest one
- Subnet addresses shall be consecutive without any address space gap

Fill the following table with the subnet information:

Subnet Number	Subnet IP Address	First Usable Host IP Address	Last Usable Host IP Address	Broadcast IP Address
1	192.168.10.0/25	192.168.10.1/25	192.168.10.126/25	192.168.10.127/25
2	192.168.10.128/26	192.168.10.129/26	192.168.10.190/26	192.168.10.191/2
3	192.168.10.192/30	192.168.10.193/30	192.168.10.194/30	192.168.10.195/30
4	192.168.10.196/30	192.168.10.197/30	192.168.10.198/30	192.168.10.199/30

How many IP addresses from the given IP address range 192.168.10.0/24 have not been assigned to any subnet?

Part 3: IPv6 Addresses

a. Which 2 types of IPv6 addresses must be configured on an IPv6 interface?

Anycast and

multicast

b. Given is the IPv6 global prefix **2001:638:402:1303 / 64** and the IPv6 host address **::100 / 64** Create the global unicast IPv6 address and the link-local unicast IPv6 address for that interface:

Global unicast: 2001:638:402:1303:100 / 64

Link-local unicast: FE80:100 / 64