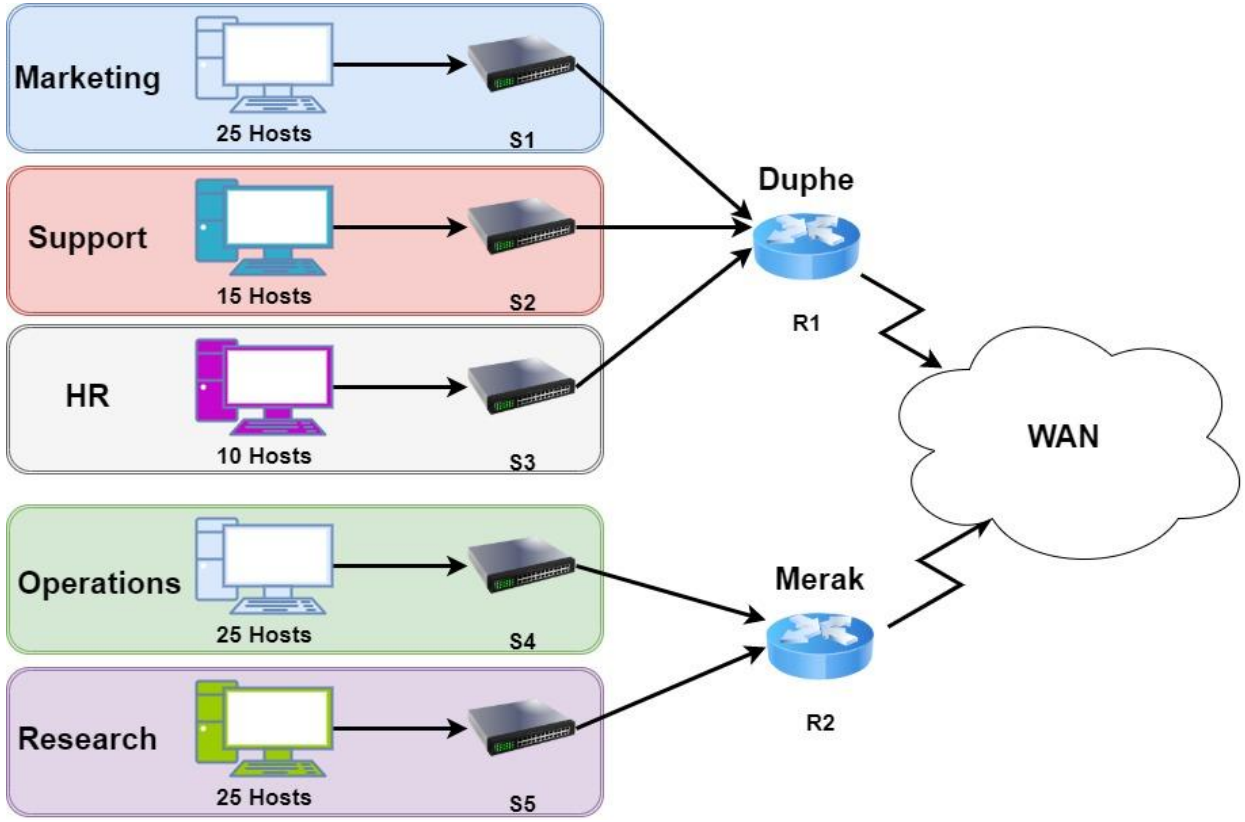
Subnetting Scenario

You work for the Ursa Major company. The company's headquarters is located in Dubhe city. Your company plans to launch a new office in Merak city. With the new office, your company decided to renew its network infrastructure. They establish new departments in the headquarters.

To install the new network, your company applied to IANA for an IP address. IANA registered the IP address **195.168.10.0/24** to your company.

According to the below network diagram, prepare the IP addressing plan for each network segment taking into account the number of hosts in each segment, including the interfaces for routers.

Note: Try to calculate the subnets manually to better understand the topic. Don't use subnetting calculators.



Answer the following questions:

1. Based on the topology, how many subnets are needed?
* Gerçek hayatta routerların WAN'a bakan portlarına da IP adresi atanması gerektiğinden bu sorunun cevabının 7 olması gerekiyor (Router'ın her bir portu ayrı bir LAN'dır malum). Ancak AWS'de kuracağımız VPC'lerde WAN'a bakan portlarla işimiz olmayacak. O yüzden bu sorunun 5 olarak cevaplanması uygun.

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2. How many bits must be borrowed to support the number of subnets in the topology?

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3. With the borrowed bits, how many subnets can be created?

2^3 = 8

4. How many usable hosts per subnet can be assigned an IP address with the remaining bits?

2^5 - 2 = 30

5. Calculate the binary values for the subnets.

195.168.10.00000000 .0
195.168.10.00100000 .32
195.168.10.01000000 .64
195.168.10.01100000 .96
195.168.10.10000000 .128
195.168.10.10100000 .160
195.168.10.11000000 .192
195.168.10.11100000 .224

6. Calculate the binary and decimal values of the new subnet mask.

Binary	**11111111.11111111.11111111.11100000**
Decimal	**255.255.255.224 CIDR: /27**

7. Fill in the below table, listing the decimal value of all available subnets, the first and last usable host address, and the broadcast address.

Subnet	Subnet ID	First Usable Host Address	Last Usable Host Address	Broadcast Address
Marketing	**195.168.10.00100000** **195.168.10.32**	**195.168.10.00100001** **195.168.10.33**	**195.168.10.00111110** **195.168.10.62**	**195.168.10.00111111** **195.168.10.63**
Support	**195.168.10.01000000** **195.168.10.64**	**195.168.10.01000001** **195.168.10.65**	**195.168.10.01011110** **195.168.10.94**	**195.168.10.01011111** **195.168.10.95**
HR	**195.168.10.01100000** **195.168.10.96**	**195.168.10.01100001** **195.168.10.97**	**195.168.10.01111110** **195.168.10.126**	**195.168.10.01111111** **195.168.10.127**
Operations	**195.168.10.10000000** **195.168.10.128**	**195.168.10.10000001** **195.168.10.129**	**195.168.10.10011110** **195.168.10.158**	**195.168.10.10011111** **195.168.10.159**
Research	**195.168.10.10100000** **195.168.10.160**	**195.168.10.10100001** **195.168.10.161**	**195.168.10.10111110** **195.168.10.190**	**195.168.10.10111111** **195.168.10.191**