

4.7 EXERCISE

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Exercise:

Your company has been allocated the IP address block 192.168.50.0/24. You are tasked with creating a subnetting scheme to accommodate the following departments:

1. Sales Department: Requires 50 IP addresses.
2. HR Department: Requires 25 IP addresses.
3. IT Department: Requires 30 IP addresses.
4. Marketing Department: Requires 10 IP addresses.
5. Research Department: Requires 5 IP addresses.
6. Guest Network: Requires 20 IP addresses.

You need to subnet the allocated block to satisfy the requirements of each department with the least amount of IP address waste. After determining the subnet sizes, you must provide the following for each department:

- The subnet address.
- The broadcast address.
- The range of usable IP addresses.
- The subnet mask.

Instructions

1. Calculate Subnet Size: Calculate the required subnet size for each department. Remember that each subnet will need to accommodate the network address and the broadcast address, so you will need to provide at least 2 more IP addresses than the department requires.
2. Determine Subnet Masks: For each subnet size, determine the appropriate subnet mask that will provide the required number of usable IP addresses.
3. Allocate IP Addresses: Starting with the largest subnet, allocate IP address blocks sequentially from the allocated IP address range.
4. Document Subnets: For each subnet, document the subnet address, broadcast address, range of usable IP addresses, and subnet mask.
5. Verify No Overlap: Ensure that the subnets do not overlap and that they fit within the allocated 192.168.50.0/24 block.
6. Optimize IP Usage: Make sure that there is as little waste as possible in the allocation of IP addresses to each subnet.