

Figure 1: IP subnetworks of a company

The network manager of a company has to connect 11 subnetworks and an experimental network to a central router. Figure 1 presents the topology of the interconnection:

- Dept. A subnetwork: 121 hosts,
- Dept. B subnetwork: 126 hosts,
- Dept. C subnetwork: 450 hosts,
- 8 subnetworks of associations (14 hosts per association),
- $\bullet\,$  an experimental network 18.196.1.0/26.

At first, we focus on the company network (departments and associations) and exclude the experimental network. Do not forget to take into account one address per subnetwork that needs to be allocated to the router.

Answer the following questions:

**Q.1** What is the optimal number of addresses to allocate for all hosts of the company? Optimal means that it is the smallest number sufficient for addressing all hosts.

**Q.2** One host at Dept. C will have 18.195.128.1 address. What will be the CIDR prefix and the address range for the whole network of the company?

**Q.3** Give the CIDR prefix of all subnetworks and their address ranges (for associations, give only the first three subnetworks).

We now consider the overall network including the experimental one.

- Q.4 Give the routing table of the central router—fill in the table below using Unix syntax:
  - destination prefix composed of an address and a subnetwork mask
  - next hop (the address of the next router)
  - flag: U for active entry, G for gateway—it means that a packet needs to be forward to the next hop router
  - interface identifier (use the convention eth1 etc.)

Allocate to the router the highest usable address in the address range allocated to a given subnetwork. For associations, provide the first three entries.

destination prefix				
address	mask	next hop	flag	interface