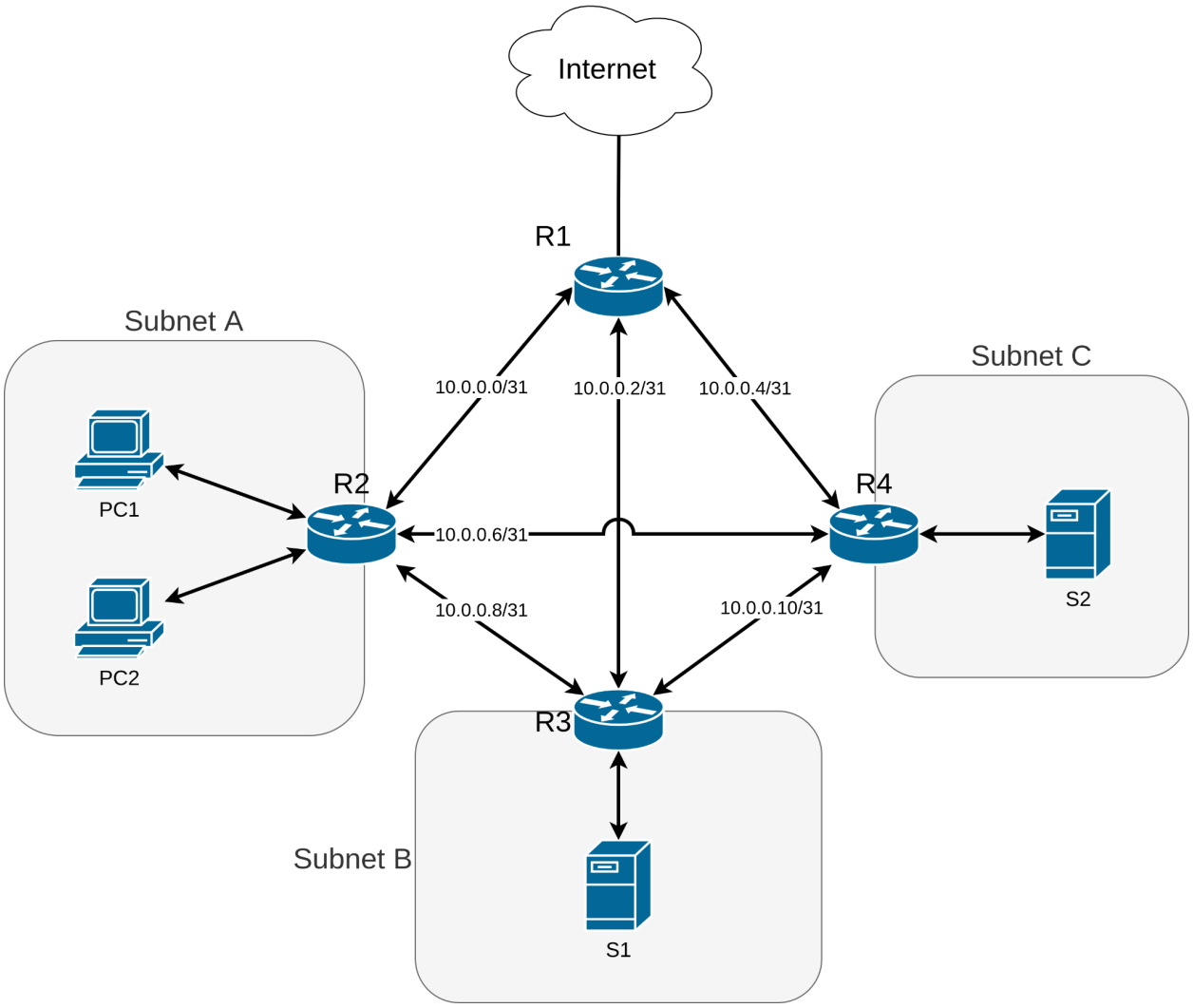
Network Infrastructures – First Midterm – C



Given the topology in figure, reproduce it in Kathara. You must use container names and addresses specified in the figure above. Container names should be all in lowercase.

For /31 subnets, the addresses are assigned with the following rule: the lower router number takes the even address.

The “Internet” cloud portrayed in the figure is not a Kathara node.

Sapienza University owns the IPv4 address space 151.100.0.0/16. You are at the head of the Department of Information, Electronics and Telecommunications and you are given the range of addresses 151.100.160.0/20 to manage.

Your job is to assign the subnets A, B, C, within your given range, knowing that:

- Subnet A contains 200 hosts
- Subnet B contains 200 hosts
- Subnet C contains 1000 hosts

Moreover, you are requested to assign subnets A, B, C such that the quantity of addresses not used by such hosts is minimized.

The maximum points are **8** and are assigned as follows:

- +0.5 points: create Kathara laboratory with correct lab.conf.
- +2 points: assign subnets as requested.
    - Which IP ranges are not used by any host? (write your answer as a comment inside the lab.conf file)
- +1 point: configure IP addresses of R1, R2, R3 and R4 via static /etc/network/interfaces
    - The address of R{1, 2, 3} inside the subnet {A, B, C} should be the lowest assignable address of the subnet.
- +1 point: configure S1 and S2 ip and routes with iproute2 using startup scripts.
    - Give to S1 the highest address assignable of the subnet.
    - Give to S2 the lowest address assignable of the subnet.
- +1.5 points: configure PCs in subnet A with DHCP. Use R2 as DHCP server.
- +1 point: configure static routes of R1, R2, R3 and R4 with iproute2 using startup scripts, minimizing the number of hops required to reach the different subnets.
- +0.5 points: Using netcat and tcpdump, send ”hi_udp” string on UDP port 9000 from PC1 to S1 and capture the communication on a file. The file must be placed inside the “shared” folder and named as “udp.pcap”
- +0.5 points: Using netcat and tcpdump, send ”hi_tcp” string on TCP port 8080 from PC2 to S2 and capture the communication on a file. The file must be placed inside the “shared” folder and named as “tcp.pcap”

Every node should be able to ping all the other nodes in the network