Computer Networks
Lab List 2

The network topology in room 109 is depicted in the figure on the next page. Computers are in three different networks; each of them is connected to different switch. At the end, we show how to connect these three networks.

Note: most of the commands below has to be run with root rights using `sudo`. At the beginning, type `netmode lab` to deconfigure network interfaces.

1. Assign an IP address to `eth0` interface executing `ifconfig eth0 10.0.0.`*`computer_no`* `up`. Activate `eth1` interface without assigning an IP address: `ifconfig eth1 up`.

   Check whether computers connected to one switch see each other, e.g., by pinging the broadcast address: `ping -b 10.255.255.255`. Only computers attached to the same switch (S_1, S_2 or S_3) should answer.

   Using `mii-tool` or `ethtool` check whether the interface `eth1` is connected to anything. Only in case of computers 4, 8 and 16 these cards are connected (to switch S_4).

2. Look at file `/etc/hosts` and read the manual (`man hosts`). Modify this file binding IP addresses with some names. Note that this binding works only locally. Check whether `ping` works also with these names.

3. Configure computers 4, 8 and 16 (i.e., ones connected to switch S_4) to work as bridges (between their `eth0` and `eth1` interfaces). You may do this in the following way.

   (a) `ifconfig eth0 0.0.0.0` — removing IP address from `eth0`. Execute `ifconfig` afterwards and make sure that both interfaces (i.e., `eth0` and `eth1`) are active, but neither of them has an IP address.

   (b) `brctl addbr br0` — create a bridge interface `br0`.

   (c) `brctl addif br0 eth0; brctl addif br0 eth1` — adding interfaces which will be connected by the bridge `br0`.

   (d) `brctl show` — display bridge configuration.

   (e) `ifconfig br0 up` — activate `br0` interface

   Find a `brctl` option, which displays MAC addresses the bridge has learned. Check whether remaining computers see each other. On the bridging computers, you should observe MAC addresses learned by the bridge. Is it possible to ping other computers from the bridge?
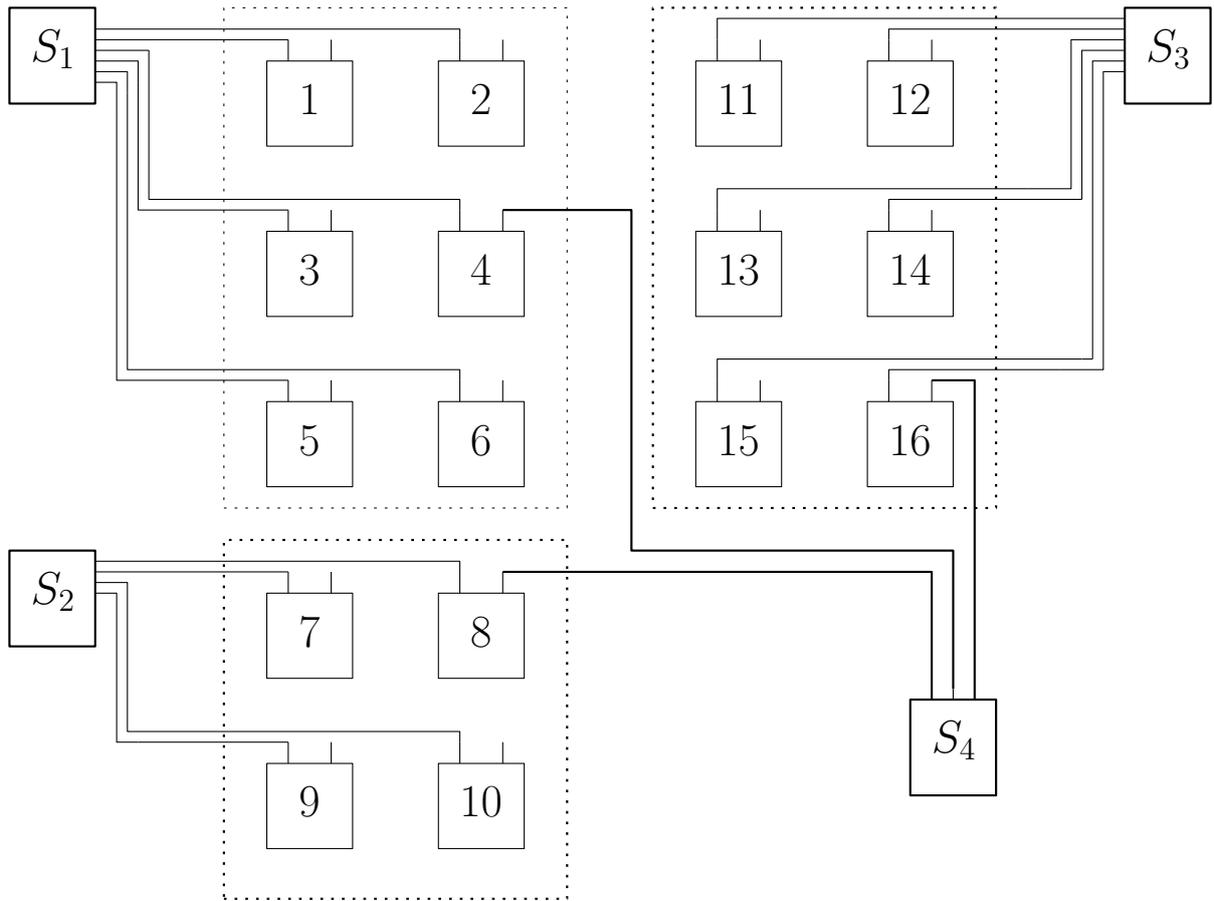
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Figure 1: The network topology in room 109