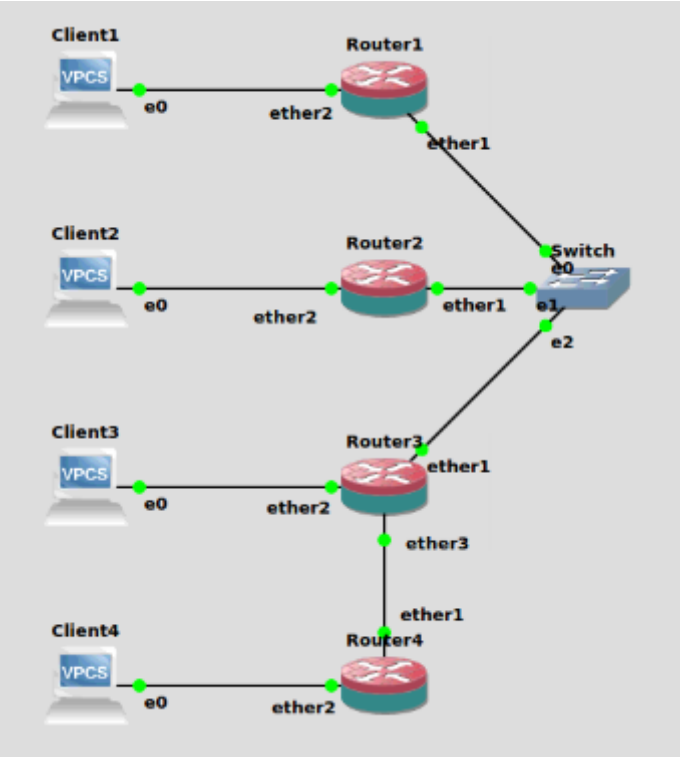
NE Lab 4 - OSPF

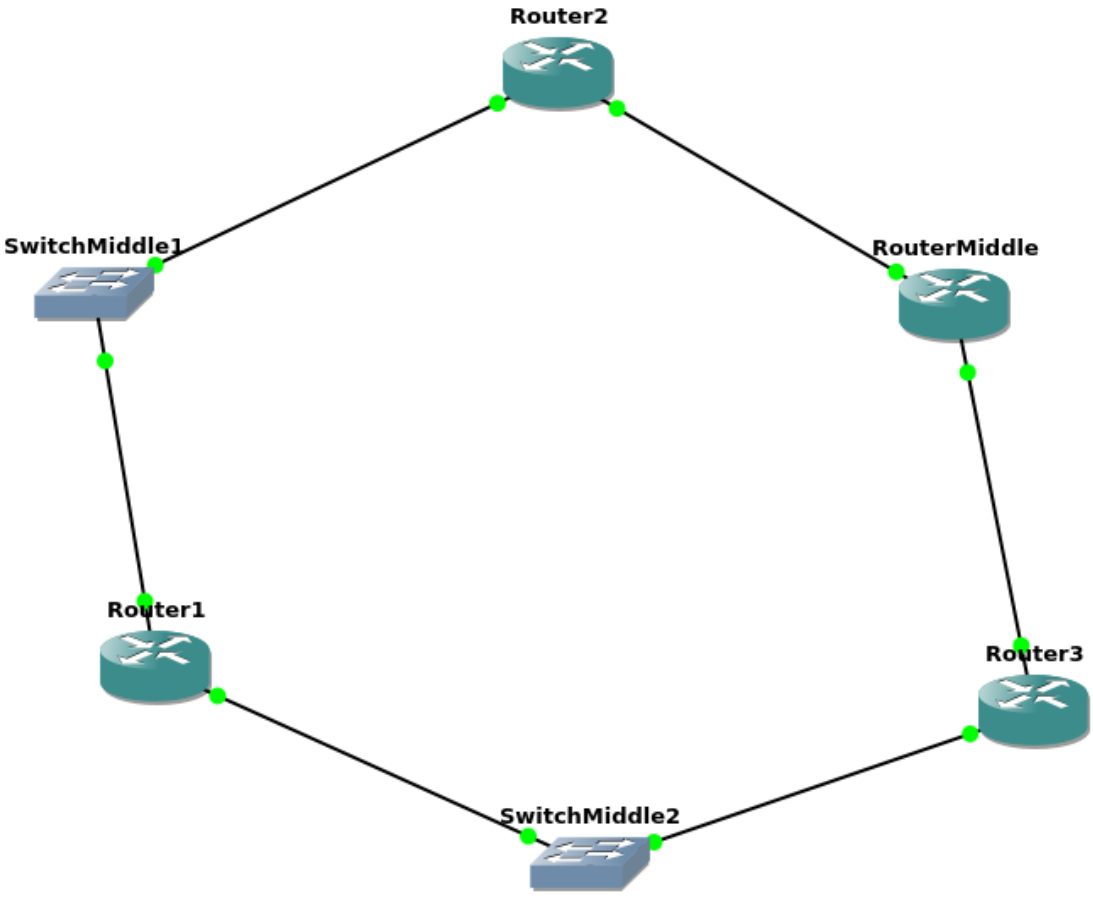
Task 1 - Prepare your network topology

1. In the GNS3 project, select and install a virtual routing solution that you would like to use: **Mikrotik** (recommended), Pfsense, vyos and so on.
2. Prepare a simple network consisting of at least 3 routers, each one of them has a different subnet, and they should be able to reach each other (for example by a switch/router in the middle or a bus topology).
   Do not write a static routes between different networks.
   A couple of variants are below:

a)



b)



> **Note:** Try to draw a network scheme before you start the lab. This will help you in the deployment phase.

Task 2 - OSPF Learning & Configuring

1. Deploy OSPF in your chosen network topology.
2. Which interface you will select as the `OSPF router ID` and why?
3. What is the difference between advertising all the networks VS manual advertising (per interface or per subnet)? Which one is better?
4. If you have a static route in a router, how can you let your OSPF neighbors know about it? Approve and show it on practice.
5. Enable OSPF with authentication between the neighbors and verify it.
6. *Bonus: if one of the routers has multiple subnets, try to use route summarization.*

Task 3 - OSPF Verification

1. How can you check if you have a full adjacency with your router neighbor?
2. How can you check in the routing table which networks did you receive from your neighbors?
3. Use `traceroute` to verify that you have a full OSPF network.
4. Which router is selected as `DR` and which one is `BDR`?
5. Check what is the `cost` for each network that has been received by OSPF in the routing table.

Bonus - Multi-Area network

1. In the case if until now every router was in `area 0`, try to create more networks and assign them to different OSPF areas.
2. Why every area has to be connected to `area 0`?

3. What can you do if you have an `area X` which is not connected to area 0, but to `area Y`?
4. Verify that `area X` can reach all the network.