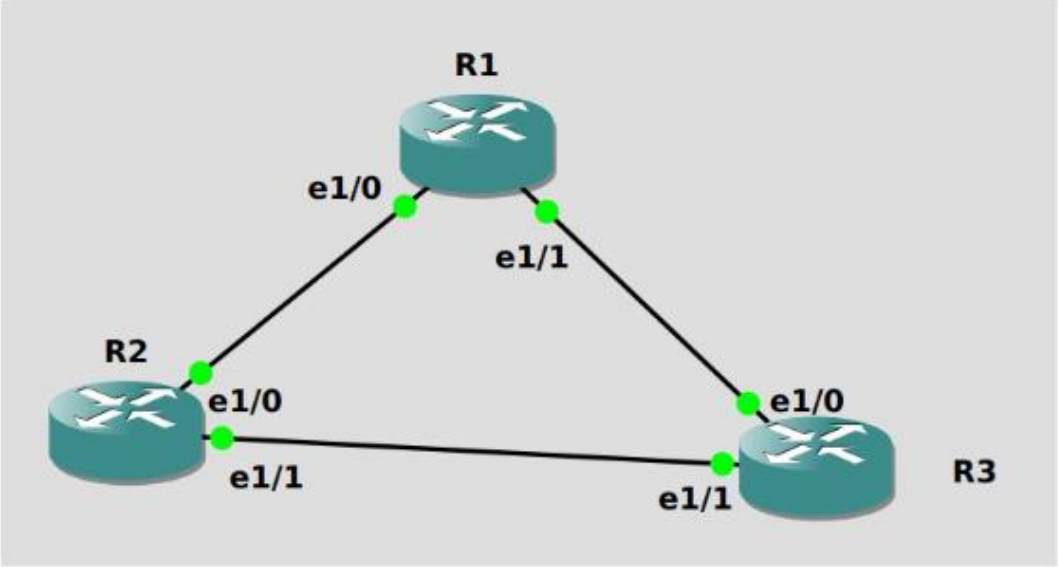
1 Implementation of Network topology

Follow all the instructions here: https://docs.gns3.com/docs/getting-started/your-first-cisco-topology

to implement the following topology. Implement the topology using images of

c7200 router (find the image in the eclass files - any other image you find on the web

will perform the basic commands required and will be functional).



To insert it select edit->Preferences->Dynamips->New. Insert the image and follow the instructions. At the end the c7200 router will be available in the devices toolbox. See what interfaces it has and make sure there are 3 on each router (e.g. C7200-IO-FE and PA-4E). Information on the type of each interface is available from CISCO on their product site,

Questions:

1. For each router, assign IP addresses to the required interfaces. Check the

result with sh ip int br each time and the status of each interface with the command: sh int int

<interface name>

2. Run the ping command from all to all routers to verify that

they are communicating.

3. Enable the opsf routing protocol so that all routers

all routers are informed of all paths.

4. Re-execute the ping no commands on the conflicting connections to ensure that the

routers see all interfaces of the other routers.

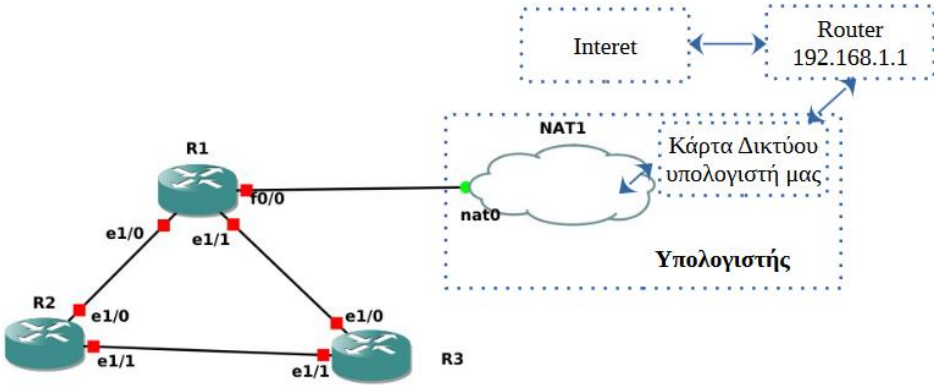
5. Display the routing paths for each router with the commands: sh ip ospf neigh and sh ip route

➢ Save the configuration you made: copy running-config startup-config (or with the wr command when you did the configuration) to each router.

➢ With all the routers' commnad lines open, see the messages that appear on the the moment you finish configuring a link on both sides, which each router "discovers" its neighbor.

2 Connection to external network

Then add the cloud icon (see the figure below, what it implements) to implement access to the external network. Follow all the instructions from here: https://docs.gns3.com/docs/using-gns3/advanced/connect-gns3-internet/



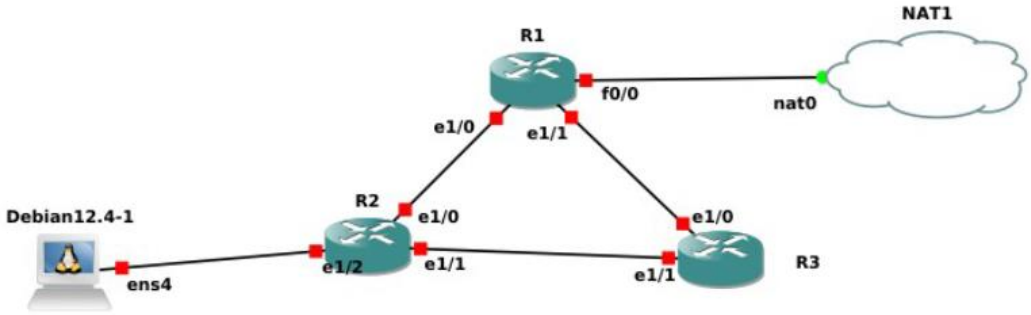
Questions:

6. Run from all routers R1,R2 and R3, ping 8.8.8.8 and verify that a connection exists.

7. From router R2, run traceroute 8.8.8.8 and show the output.

3 Add a debian terminal.

Add debian terminal as in Task 1. The commands to be executed on R2 are given below



For the e1/2 interface an IP address based on your IP address will be used. Assuming the SI (Student's ID) 1074545, the subnet on the e1/2 interface will be 107.45.45.0/24. The 1st IP address is assigned to the e1/2 contact itself (gateway), i.e. 107.45.45.1 All terminals connected to e1/2 get an IP address from :

107.45.45.2 to 107.45.45.254.

(the instructions are below).

Students whose SI has consecutive zeros in the 2nd or 3rd position MUST add +10 accordingly

e.g. 1070044-> 1071044). Students whose AM ends in "0" or "1" modify accordingly

Παραμετροποίηση R2

We define IP based on the SI: 107.45.45.1 and networking /24 for interface e1/2	enable config t interface Ethernet 1/2 no shut ip add 107.45.45.1 255.255.255.0 exit exit wr
We define the 1) DHCP pool by IP addresses, 2) the subnet they will belong to, 3) the DNS server and 4) the gateway. All these settings will are given to the clients that connected to e1/2	enable config t interface Ethernet 1/2 ip dhcp pool DHCPpool network 107.45.45.1 255.255.255.0 dns-server 8.8.8.8 default-router 107.45.45.1 service dhcp exit wr
Set NAT on the output	configure terminal interface Ethernet 1/0 ip nat outside exit exit wr
We set NAT at the entrance	enable configure terminal interface Ethernet 1/2 ip nat inside ip nat inside source list 1 interface Ethernet 1/0 overload access-list 1 permit 107.45.45.0 0.0.0.255 exit wr

Configure R1 - add passwd to telnet connections

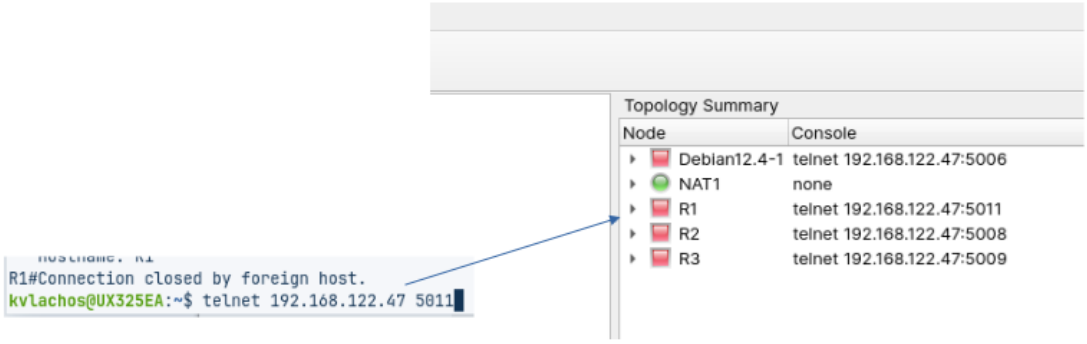
In addition to what is mentioned in the 1st part of the network topology implementation you should

add passwd to R1 to allow remote connections to it.

Configure telnet access to be done with passwd number registry (or your modified AM as mentioned above) VTY: Virtual TYpe or Virtual Terminal (these are virtual terminals as defined by	enable config t line vty 0 15 password 1074545 exit exit wri

Cisco Virtual Teletype as defined by Cisco Virtual Teletype and involves telnet or ssh. Virtual terminals are numbered from 0 to 15)	

Try connecting from your host PC directly to R1. (find the IP address and port.



Questions:

8. From the debian terminal run the following commands and show the output:

    1. ping 8.8.8.8.
    2. traceroute -n 8.8.8.8
    3. ping google.com

9. From the R2 router, run the commands and show the output:

    1. sh ip int br
    2. show ip route
    3. sh ip ospf neigh

Search the literature for what the above commands perform.

IMPORTANT

You must first update the debian operating system and install telnet and

the gcc compiler:

- sudo apt-get update
- sudo apt-get install telnet gcc

(or in a command sudo apt-get update && sudo apt-get install telnet gcc)