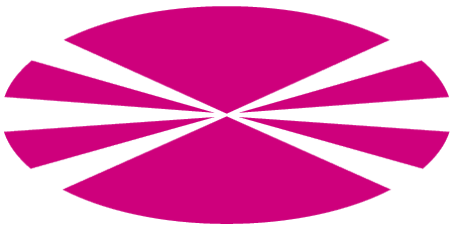

UNIVERSIDADE DA CORUÑA
Computer Science Department

COMPUTER NETWORKS LAB

Practice 2: Subnetting using Packet Tracer

This practice consists of three scenarios. The main purpose is to apply in the network simulator those concepts acquired during the master classes about subnetting.

Scenario 1a

This scenario represents an organization consisting in a building with 4 departments. The employees are distributed in these departments.

Students are asked to configure the addressing using subnetting and to obtain full connectivity between devices, taking into account these considerations:

- The organization has contracted a class C address: 200.0.0.1/30.
- Since there are many devices in this organization, that class C address (assigned to Se2/0 interface in the router called “Interno”) is not enough. So, a new private network address is used (10.X.0.0/16) and subnets are created without modifying the IP for Se2/0 interface in the router already mentioned.
- Every student will start with an address where the second octet is formed by the last two numbers in her/his document identifier (DNI in case of being a Spanish student). For example: if my DNI is 69.111.3**33**-T, the IP for the organization will be 10.**33**.0.0/16.
- The number of employees in every department will not increase. So new departments can be added but new employees will not be hired for the already existing departments. Therefore, **the number of host bits must be minimized**.
- The number of IP addresses needed for the devices in the different departments are already fixed. These numbers take into account the IP for the router interfaces: :
  - *Ventas*: 260 addresses
  - *Leyes*: 50 addresses
  - *I+D*: 100 address
  - *Contabilidad*: 25 addresses
- **All subnets must have the same size**.
- The web server must be reachable from all the devices in the organization.

Scenario 1b

Using the same scenario as in the previous section, students are asked to configure the addressing again considering that **the subnets can have different sizes and that the number of host bits must be minimized**.

Checklist for scenario 1a and 1b

This is the checklist for scenarios 1a and 1b:

1. Ping from *Ventas* to *Servidor Web*
2. Ping from *Leyes* to *Servidor Web*
3. Ping from *I+D* to *Servidor Web*
4. Ping from *Contabilidad* to *Servidor Web*
5. Netmask for *Ventas*
6. Netmask for *Leyes*
7. Netmask for *I+D*
8. Netmask for *Contabilidad*
9. Gateways must belong to the corresponding subnet
10. Addresses must belong to the corresponding subnet

The network must be according to the document identifier. Otherwise, the grade will be 0. The grade will also be 0 when the student commits 3 or more errors considering the checklist. In any other case, the maximum grade will be 0.25 for each scenario.

Scenario 2

This second scenario consists in an organization formed by 5 offices where a set of employees work.

Students are asked to configure the addressing considering **variable length subnet masks** and to obtain **full connectivity between devices**, taking into account these considerations:

- The address for **all the organization** is private and class C. In particular it is 192.168.X.0/24. Every student will start with a class C address where the third octet is formed by the last two numbers in her/his document identifier (DNI in case of being a Spanish student). For example: if my DNI is 69.111.3**33**-T, the IP for the organization will be 192.168.**33**.0.

- The addressing must be adapted to the fact that the **host addresses should not be wasted**, so the mask for a particular office should be chosen according to the number of addresses needed for that office.
- The number of IP **addresses needed** in the offices are the following:
  - *Oficina 1*: 100 addresses
  - *Oficina 2*: 25 addresses
  - *Oficina 3*: 20 addresses
  - *Oficina 4*: 15 addresses
  - *Oficina 5*: 10 direcciones
- **The (dynamic) routing is already configured and it should not be modified.** It should be taken into account that the protocol employed (OSPF) needs a period of time to converge, so it is convenient to click on Fast Forward Time every time the scenario is open.

Checklist for scenario 2

This is the checklist for scenario 2:

1. Ping from *Oficina 1* to the remaining offices
2. Subnet mask for *Oficina 1*
3. Subnet mask for *Oficina 2*
4. Subnet mask for *Oficina 3*
5. Subnet mask for *Oficina 4*
6. *Subnet mask for Oficina 5*
7. Interface configuration in the routers
8. Gateways must belong to the corresponding subnet
9. Addresses must belong to the corresponding subnet
10. Absence of overlapping between addresses and use of addresses belonging to the appropriate range.

The network must be according to the document identifier. Otherwise, the grade will be 0. The grade will also be 0 when the student commits 3 or more errors considering the checklist. In any other case, the maximum grade will be 0.25.

Delivery instructions and defense

In the evaluation we will employ those files uploaded by the student to Moodle using the task called “Packet Tracer – p2. Entrega/submission”. Three files will be uploaded: p2-1a.pkt, p2-1b.pkt y p2-2.pkt.

Students should be able to explain any component of the scenario.

The deadline for the submission is on April 26, at 20:00. Students will defend her/his practice on 9th, 10th, 13th, 14th and 15th May in her/his usual practice class. Defense in other groups is not permitted without an appropriate justification.