



UNIVERSIDADE DA CORUÑA

COMPUTER NETWORKS LAB

Practice 3: Routing



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

Scenario 3-0: Routing exercise

This scenario is based on the Routing Exercise (Lesson 8). Students are asked to configure computers and router interfaces, as well as routing tables, according to the exercise.

The scenario can be auto-validated and does not compute in the evaluation.

Scenario 3-1: Routing table optimization

- This scenario represents an organization.
- 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 is not enough. So, a new class C address is contracted (220.0.X.0/24) and subnets are created.
- 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 220.0.**33**.0.
- Considering the IP addresses already specified in the scenario, students are asked to configure the following points:
 - Subnet masks and identifiers must be computed.
 - IP addresses must be assigned to router and PC interfaces.
 - There should be full connectivity between all the devices in the scenario.
- The web server must be reachable from every device in the organization.
- The default entry for the routers should have a next hop that leads the packets towards the Internet router.
- The number of entries in the routing tables should be minimized and the subnet masks should be optimized.



Scenario 3-2: Routing and services

The main objective of this scenario is to reach total connectivity between the devices in the network. To achieve this, it is necessary to consider the following points:

- The organization has contracted a class C address: 200.200.200.2/30.
- Since there are many devices in this organization, that class C address is not enough. So, a new class C private network is used (192.168.X/24) and subnets are created.
- 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 69.111.333-T, the IP for the organization will be 192.168.33.0.
- The Externo router will do NAT automatically in order for internal devices to access Internet. NAT is already configured.
- The organization has also a DNS server and a DHCP server.

The tasks to accomplish are:

- Configure the IP addresses using VLSM, selecting the most appropriate masks. To do so, every student should maximize the number of host bits, there should not be overlapping between subnets and the subnet addresses must be:
 - A0 network : 192.168.X.64
 - A1 network: 192.168.X.96
 - B0 network: 192.168.X.128
 - AC network: 192.168.X.192
 - BC network: 192.168.X.196
 - CD network: 192.168.X.200
 - DMZ network: 192.168.X.0
- Assign static IP addresses to the servers, hosts and router interfaces inside the organization.
- Assign 192.168.X.3 to the DNS server. This server should resolve any request to www.google.com.
- Configure the hosts in the organization to use the DNS server.



- Assign 192.168.X.130 to the DHCP server in B0 network. This server should permit 10 simultaneous clients at most.
- Configure pc4 and pc5 to obtain their IP address using DHCP.
- Configure the static routing to communicate every device in the organization with any other and with the Google server.
- The number of entries in the routing tables should be minimized and the subnet masks should be optimized. The default entry for the routers should have a next hop that leads the packets towards the public network.

Delivery instructions

In the evaluation we will employ the file uploaded by the student to Moodle using the task called “Packet Tracer – p3”. A file called p3-1.pkt and a file called p3-2.pkt will be uploaded.

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

The deadline for the submission is on May 10, at 20:00.

If the third octet used does not correspond to the last two numbers in the student’ document identifier, the scenarios can be considered as not delivered.

In order to receive a grade, once the delivery is done, students will evaluate other students’ deliveries following the rubric provided in the Moodle task created. The deadline for this evaluation is May 17 at 20:00.

The network must be according to the document identifier. Otherwise, the final grade will be 0. The maximum grade will be 0.25 by each of the scenarios 3-1 and 3-2.