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.

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 (220.0.0.0/24) and subnets are created.

- 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 routers (first IP in the subnet) 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 (192.168.0.0/24) and subnets are created.

- 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 : 192.168.0.128

  - A1 network: 192.168.0.160

  - B network: 192.168.0.192

  - AC network: 192.168.0.0

  - BC network: 192.168.0.4

  - CD network: 192.168.0.12

  - D network: 192.168.0.64

- Assign static IP addresses to the servers, hosts and router interfaces inside the organization. Routers wil have the first IP address in the subnet, starting with the closest router to Internet in the subnet.

- Assign 192.168.0.67 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 192.168.0.194 to the DHCP server in B 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.

Evaluation

This assignment does not require any delivery, but it should be completed before **May 3**. Students will be evaluated by means of a **written examination (up to 1 point in the final grade),** which will take place at the **theory lecture room on May 4** at the theory lecture hour. If a student does not take the exam at the hour for his or her group (10:30 a.m. for group 6), the final grade will be 0.