Redes de Comunicações 1
Final Project

Professors:

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Num. Mec. Group member 1: $x_1x_2x_3x_4x_5$; **Num. Mec. Group member 2:** $x_6x_7x_8x_9x_{10}$;

Description:

Consider the communication network of a very small company depicted in the following figure:

(a) it contains the IPv4 public class C addresses $200.1x_3x_4.1x_8x_9.128/25$;

(b) it contains the IPv6 global address $2001:x_2x_7::/60$;

(c) it internally uses the range of IPv4 private class B address $10.1x_4x_9.0.0/16$ to build several class C networks;

(d) every local network has a private IPv4 and an IPv6 global network;

(e) The connection between R0 and R1 is a private network using the already available private addressing;

(f) considering the public IPv4 addressing, there are several equipments in the network that need public addressing: 55 servers at the Design network, 29 servers at the Marketing network, and Router1 needs 11 IPv4 public addresses to configure NAT/PAT mechanisms;

(g) The Internet is simulated with the IPv4 network $203.0.0.0/24$ and the IPv6 network $2300:A:A:A::/64$.

1. Configure the IPv4 and IPv6 addressing in the different equipments.

2. Include and configure (at least) 1 terminal in each network with the corresponding IP addresses and gateway(s).

3. In Router 1, configure the NAT/PAT mechanisms in an appropriate way. Use the range of public IPv4 addresses to configure the translation with the private network.

4. DHCP server must be configured in R0 to assign private addresses to the network equipments.

5. Configure the IPv4 and IPv6 static/default routing.

6. Place a terminal in the "Internet" to test IPv4 and IPv6 connectivity.

7. Configure and test a HTTP/HTTPS server accessed from the terminals.

8. Configure a DNS server to enable the access through names to the previous server.

9. Develop e client-server application (in python using sockets) that allows a client to periodically notify a central server of its CPU utilization and percentage of memory in use. [This task does not have to be integrated in GNS3, but a demonstration of the application in use must be possible.]

Deadline: 13/12/2021 to show points 1-6 (addressing report to be submitted in e-learning by the 13/12, and a 5 minutes demo in the practical classes of the week 20/12).
Deadline: 21/01/2022 for the final demonstration.

Design

Marketing

R0

R1

ISP

220.3.4.4/30
2200:3:4:4::4/126

Internet
203.0.0.0/24
2300:A:A:A::/64