

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:

- it contains the IPv4 public class C addresses $200.1x_3x_4.1x_8x_9.128/25$;
- it contains the IPv6 global address $2001:x_2x_7::/64$;
- it internally uses the range of IPv4 private class C address $10.1x_4x_9.0.0/16$ (several class C networks);
- every local network has a private IPv4 and an IPv6 global network;
- The connection between R0 and R1 is a private network using the already available private addressing;
- 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;
- The Internet is simulated with the IPv4 network $203.0.0.0/24$ and the IPv6 network $2300:A:A:A::/64$.

- Configure the IPv4 and IPv6 addressing in the different equipments.
- Include and configure (at least) 1 terminal in each network with the corresponding IP addresses and gateway(s).
- 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.
- DHCP server must be configured in R0 to assign private addresses to the network equipments.
- Configure the IPv4 and IPv6 static/default routing.
- Place a terminal in the "Internet" to test IPv4 and IPv6 connectivity.
- Configure and test a HTTP/HTTPS server accessed from the terminals.
- Configure a DNS server to enable the access through names to the previous server.
- Develop a 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.

