Redes de Comunicações 1
Network Project

x1:	0
x2:	7
x3:	9
x4:	6
x5:	1
x6:	0
x7:	7
x8:	7
x9:	0
x10:	8

Professors:

    Susana Sargento   susana@ua.pt
    Victor Marques   victor@ua.pt
    Pedro Rito   pedrorito@ua.pt

10 7 9 6 1   10 7 7 0 8

Num. Mec. Group member 1: 0/1$x_1x_2x_3x_4x_5$; Num. Mec. Group member 2: 0/1$x_6x_7x_8x_9x_{10}$;

Deadline: 11/11/2022 to submit the addressing report in e-learning.
Deadline: 28/11/2022 to show the functionalities 1 to 6, in the practical class.
Deadline: 02/01/2023 for the final demonstration in the practical class.

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

(a) it contains the IPv4 public class C addresses 198.1x_5x_3.1$x_{10}x_7$.0/24; 198.119.187.0/24

(b) it contains the IPv6 global address 2ABC:$x_9x_4x_8x_3$::/60; 2ABC:0679::/60

(c) it internally uses the range of IPv4 private class B address 172.2x_2.0.0/16 to build several class C networks; 172.27.0.0/16

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

(e) The connection between R2 and R1 is a private network using the already available private addressing;

(f) considering the public IPv4 addressing, there are several equipment in the network that need public addressing: 55 servers at the Design network, 29 servers at the Marketing network, 49 server at the Admin network, 18 servers at the DMZ network, 6 servers at the Datacenter network, and R2 needs 5 IPv4 public addresses to configure NAT/PAT mechanisms;

(g) The Internet is simulated with the IPv4 network 120.100.20.0/24 and the IPv6 network 2312:100:A199:AAEE::/64.

guardado em C:\Users\joaog\GNS3\projects

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

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

3. In R2, 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 R1 to assign private addresses to the network equipment.

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 server accessed from the terminals.

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

9. Develop a client-server application (using sockets) that allows a client to contact the server to get dynamically obtained information about the server (hostname, IP address). Additionally, the server also includes in the response the total number of payload bytes it has received so far, from each client and in total.

Note: the effort included into the fulfillment of each part is valued, e.g. support of a personalized web server, multiple DNS domains and visualization of the client and server information.

Design

Marketing

Admin

R1

DMZ

R2

DataCenter

110.44.55.4/30

2211:44:55:4::4/126

ISP

Internet
120.100.20.0/24
2312:100:A199:AAEE::/64