Final Project Adressing Report

Communication Networks I

University of Aveiro

Bernardo Falé 93331

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Chapter 1

Introduction

The goal of this *project* report is to present and justify the methods and range of addresses used in this work. The aim of this project was to design and configure a small network of a small company. It consisted of several local area networks, each one with a private IPv4 and a global IPv6 network. DHCP, NAT/PAT mechanisms were also used.

Chapter 2

Addressing

2.1 Available Adresses

These are the made available addresses that were used in this project:

Type	Adresses
IPv4 Private	10.139.0.0/16
IPv4 Public	200.139.139.128/25
IPv6 Global	2100:39::/60

2.2 Communication Networks Configuration

In this section it will be presented the IPv4 public and private sub-networks, but also the IPv6 global networks with their respective mask.

Name	Equipments	IPv4 Private	IPv4 Public	IPv6 Global
Design	55	10.139.1.0/24	200.139.139.128/26	2100:39:1::/64
Marketing	29	10.139.2.0/24	200.139.139.192/27	2100:39:2::/64
NAT/PAT	11		200.139.139.224/27	
PTP*		10.139.3.0/30		2100:39:3::/64

*Point to Point Router 0 -> Router 1

In this project the private IPv4 addressing was made in a simple and logical way. For instance, 10.139.1.0/24 is the first sub-net with the mask 255.255.255.0 of the 10.139.0.0/16 network. This sub-net has the range of addresses 10.139.1.1 - 10.139.1.254; As the 10.139.1.255 is the broadcast address. The public IPv4 sub-nets were arranged according to the necessary devices, i.e 200.139.139.128/26 allows the connection of 62 terminals, and only 55 are needed; The public network was divided in 2 sub-nets of /26, one for the Design department, and the other to consequently divide into 2 sub-nets of /27, one for NAT/PAT mechanisms and one for the Marketing department. Since there's no need to save IP's in IPv6 networks, the addressing was assigned according to the IPv4 private networks (.1/.2/.3).

2.3 Point to Point connections

Device 1	Device 2	Interface device 1	Interface device 2	IPv4 sub-net	IPv6 sub-net	Device 1 IPv4	Device 2 IPv4
Router 0	Router 1	f1/0	f0/0	10.139.3.0/30	2100:39:3::/64	10.139.3.1	10.139.3.2
Router 1	ISP	f0/1	f0/0	220.3.3.4/30	220:3:4:4::4/126	220.3.4.5	220.3.4.6

Device 1	Device 2	Device 1 IPv6	Device 2 IPv6
Router 0	Router 1	2100:39:3::1	2100:39:3::2
Router 1	ISP	2200:3:4:4::5	2200:3:4:4::6

The private IPv4 network only needs 2 terminals, router 0 and router 1, thus the assignment of a /30 mask on this private sub-net.

2.4 Routing

This section will present the IPv4 and IPv6 routing that was implemented in this work.

2.4.1 Router 0

R0
ip route 0.0.0.0 0.0.0.0 10.139.3.2
ipv6 route ::/0 2100:34:3::2

2.4.2 Router 1

R1
ip route 0.0.0.0 0.0.0.0 220.3.4.6
ip route 10.139.0.0 255.255.0.0 10.139.3.1
ip route 200.139.139.128 255.255.255.192 10.139.3.1
ip route 200.139.139.192 255.255.255.224 10.139.3.1
ipv6 route 2100:34::/32 2100:34:3::1
ipv6 route ::/0 2200:3:4:4::6

2.4.3 ISP

ISP
ip route 200.139.139.128 255.255.255.192 220.3.4.5
ip route 200.139.139.192 255.255.255.224 220.3.4.5
ip route 200.139.139.224 255.255.255.224 220.3.4.5
ipv6 route 2100:34::/32 2200:3:4:4::5