Fundamentos de Redes
Mini-Projeto

Professors:
Paulo Salvador salvador@ua.pt
Susana Sargento susana@ua.pt
António Nogueira nogueira@ua.pt

Objective 1: Definition of the Pv4 and IPv6 addressing scheme of a business network.

Description:

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

(a) it contains the IPv4 public class C addresses 200.0.0.0/24 and 201.0.0.0/24;

(b) it contains the IPv6 global address 3200::/56;

(c) it internally uses the range of IPv4 addresses 10.200.0.0/16;

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

(e) considering the public IPv4 addressing, there are several equipments in the network that need public addressing: 60 servers at the DMZ, 60 servers at the Internal Datacenter, 4 video-conference equipments, 60 PCs in the Engineering VLAN, Router1 needs 12 IPv4 public addresses to configure NAT/PAT mechanisms.

(f) An already existent network (Old Building) has the IPv4 network 192.168.0.0/20 and the terminals must maintain their IPv4 addresses. IPv6 connectivity is not required in the Old Building.

Define the private and public IPv4 sub-networks, and the global IPv6 networks with its network address and mask. Define also the range of IP addresses of the terminals and servers.

Objective 2: Configure the company communication network.

Description:

Consider the communication network of the company defined before. Internet is simulated with the IPv4 network 100.0.0.0/24 and the IPv6 network 3000:A:A:A::/64.

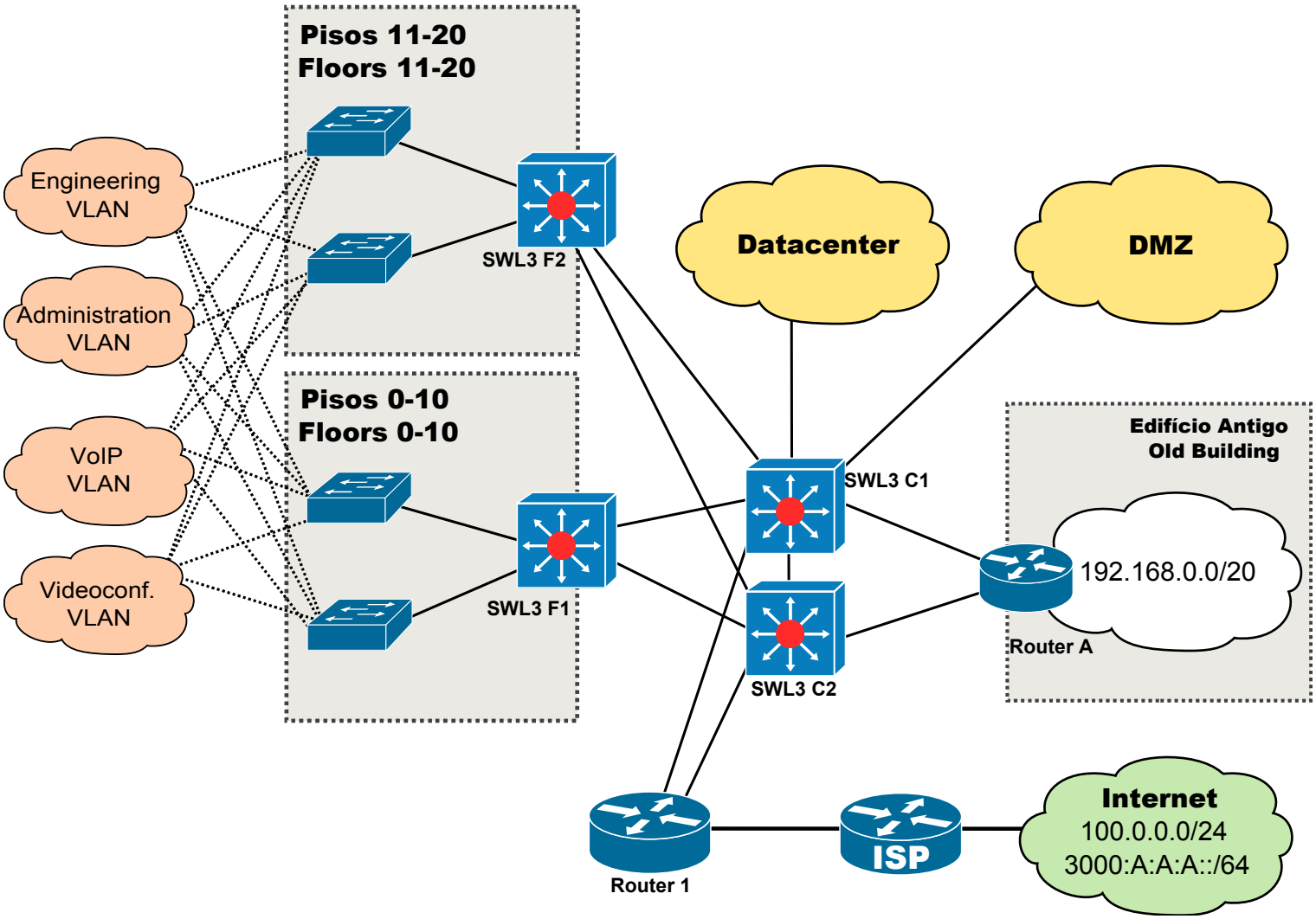
1. Configure, in Layer 2 and Layer 3 switches, the different VLANs and the access and inter-switch/trunk ports.
2. Configure the IPv4 and IPv6 addressing in the different equipments.
3. Include and configure (at least) 1 terminal in each VLAN with the corresponding IP addresses and gateway(s).
4. In 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.
5. Configure the IPv4 and IPv6 internal routing using the RIP and RIPng routing protocols.
6. Router 1 should announce a default route to the Internet, both in IPv4 and IPv6.
7. Place a terminal in the “Internet” to test IPv4 and IPv6 connectivity.

Extra Tasks

Configure a DHCP server for IPv4.

Configure a HTTP/HTTPS server.

Configure a DNS server.


Pisos 11-20
Floors 11-20
Engineering VLAN
Administration VLAN
VoIP VLAN
Videoconf. VLAN
SWL3 F2
Pisos 0-10
Floors 0-10
SWL3 F1
Datacenter
DMZ
SWL3 C1
SWL3 C2
Edifício Antigo
Old Building
192.168.0.0/20
Router A
Router 1
ISP
Internet
100.0.0.0/24
3000:A:A:A::/64