Redes de Telecomunicações, 2020/2021
Projeto

Professors:

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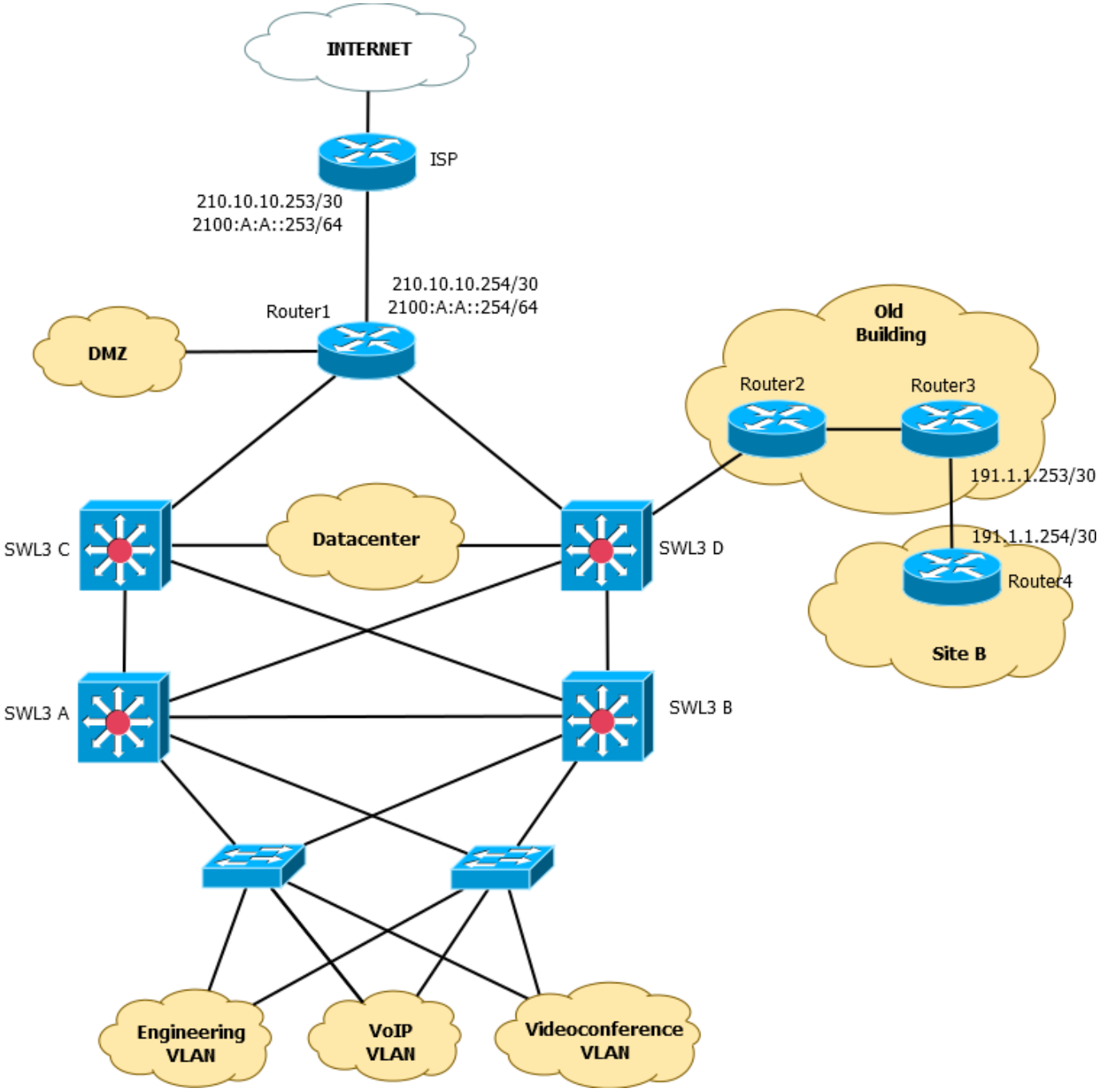
Objective 1: Definition of the Pv4 and IPv6 addressing scheme of a corporate network.
Note that $x_0x_1x_2x_3x_4$ are the digits of your UA numbers.
Deadline: May 7
Description: Consider the communication network of a company depicted in the following figure:
(a) it contains the IPv4 public class addresses 201.1x_1x_2.4.0/25;
(b) it contains the IPv6 global address 2100:$x_1x_2x_3x_4$::/60;
(c) it internally uses the range of IPv4 private addresses 10.1x_1x_2.0.0/16;
(d) every local network has a private IPv4 and an IPv6 global network;
(e) considering the public IPv4 addressing, there are several equipment in the network that need public addressing: 12 servers at the DMZ, 15 servers at the Datacenter, 8 terminals in the VoIP VLAN, 17 PCs in the Engineering VLAN, 8 Videoconference equipment, Router1 needs 10 IPv4 public addresses to configure NAT/PAT mechanisms.
(f) two already existent networks (Old Building and Site B) have the IPv4 networks 10.1.1.0/22 and 10.2.2.0/24 and the IPv6 networks 2100:1:1::/64 and 2100:1:2::/64, respectively.
Define the private and public IPv4 sub-networks, and the global IPv6 networks with their network address and subnet mask. Also define the range of IP addresses of the terminals, servers and interfaces that need IP address.

Objective 2: Build, test and run the network in GNS3.
Deadline: June 24
Description: Consider the communication network of the company defined before.

1. Internet should be simulated with the IPv4 network 203.0.0.0/24 and the IPv6 network 2300:A:A:A::/64.
2. Configure, in the Layer 2 and Layer 3 switches, the access and inter-switch/trunk ports and the appropriate VLANs.
3. Configure the IPv4 and IPv6 addressing in the different equipment.
4. Include and configure two terminals in each LAN/VLAN with the corresponding IP addresses and gateways.
5. Configure, in Router1, the NAT/PAT mechanisms in an appropriate way.
6. Configure the IPv4 and IPv6 internal routing in the core of the network with the OSPFv2 and OSPFv3 protocols. Routers 2 and 3, located in the Old Building, only support the RIP and RIPng protocols.
7. Connectivity between the Old Building and Site B should be assured by a static route.
8. A DHCP server must be configured in Router 1 in order to assign private addresses to the DMZ equipment.
9. Configure in Router1 default static IPv4 and IPv6 routes for the Internet through the ISP router.
10. Include and configure a terminal in the “Internet” and test the connectivity with the terminals in the company.


INTERNET
ISP
210.10.10.253/30
2100:A:A::253/64
210.10.10.254/30
2100:A:A::254/64
Router1
DMZ
Old
Building
Router2
Router3
191.1.1.253/30
191.1.1.254/30
Router4
Site B
SWL3 C
Datacenter
SWL3 D
SWL3 A
SWL3 B
Engineering
VLAN
VoIP
VLAN
Videoconference
VLAN