TÉCNICO LISBOA

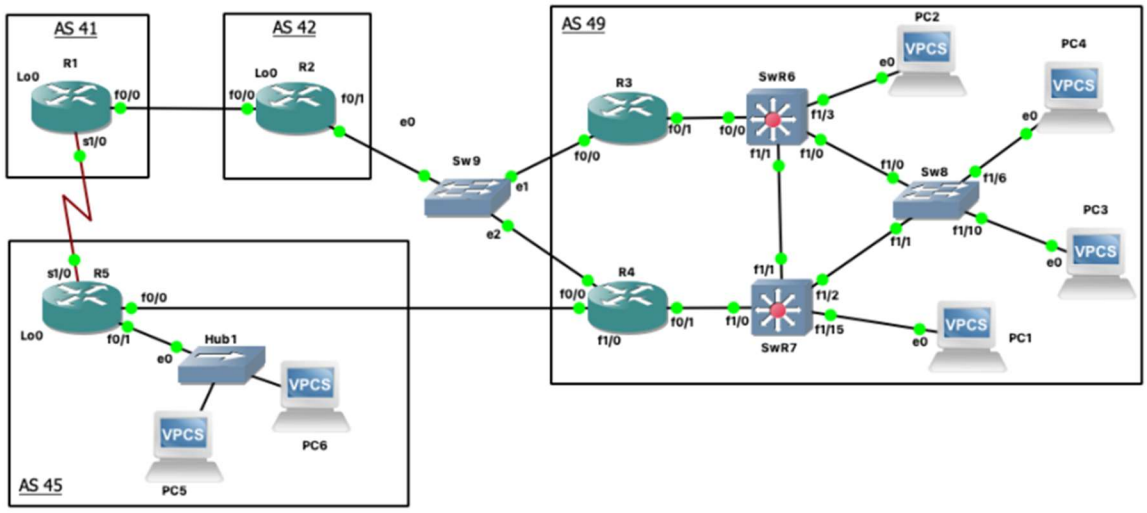
Network Architecture

LETI

2023/2024

Final Project Report

The objective of the final phase of the AR project is to implement, configure, and test a networking architecture.



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Group 2

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1 IPv4 Table

Device	*Interface*	*IPv4 Address*
PC1	*Ethernet 0*	*10.49.8.1/24*
PC2	*Ethernet 0*	*10.49.9.2/24*
PC3	*Ethernet 0*	*10.49.11.3/24*
PC4	*Ethernet 0*	*10.49.10.4/24*
PC5	*Ethernet 0*	*194.45.100.6/24*
PC6	*Ethernet 0*	*194.45.100.7/24*
R1	*FastEthernet0/0*	*172.16.2.1/29*
R1	*Serial1/0*	*172.16.3.1/29*
R2	*FastEthernet0/0*	*172.16.2.2/29*
R2	*FastEthernet0/1*	*172.16.4.2/29*
R3	*FastEthernet0/0*	*172.16.4.3/29*
R3	*FastEthernet0/1*	*194.49.2.3/25*
R4	*FastEthernet0/0*	*172.16.4.4/29*
R4	*FastEthernet1/0*	*172.16.5.4/29*
R4	*FastEthernet0/1*	
R5	*Serial1/0*	*172.16.3.5/29*
R5	*FastEthernet0/0*	*172.16.5.5/29*
R5	*FastEthernet0/1*	*194.45.100.5/24*
SwR6	*FastEthernet0/0*	*194.49.2.6/25*
SwR6	*FastEthernet1/1*	
SwR6	*FastEthernet1/0*	
SwR6	*FastEthernet1/3*	*10.49.9.6/24*
SwR7	*FastEthernet1/0*	
SwR7	*FastEthernet1/1*	
SwR7	*FastEthernet1/2*	
SwR7	*FastEthernet1/15*	
Sw8	*FastEthernet1/0*	
Sw8	*FastEthernet1/1*	
Sw8	*FastEthernet1/6*	
Sw8	*FastEthernet1/10*	

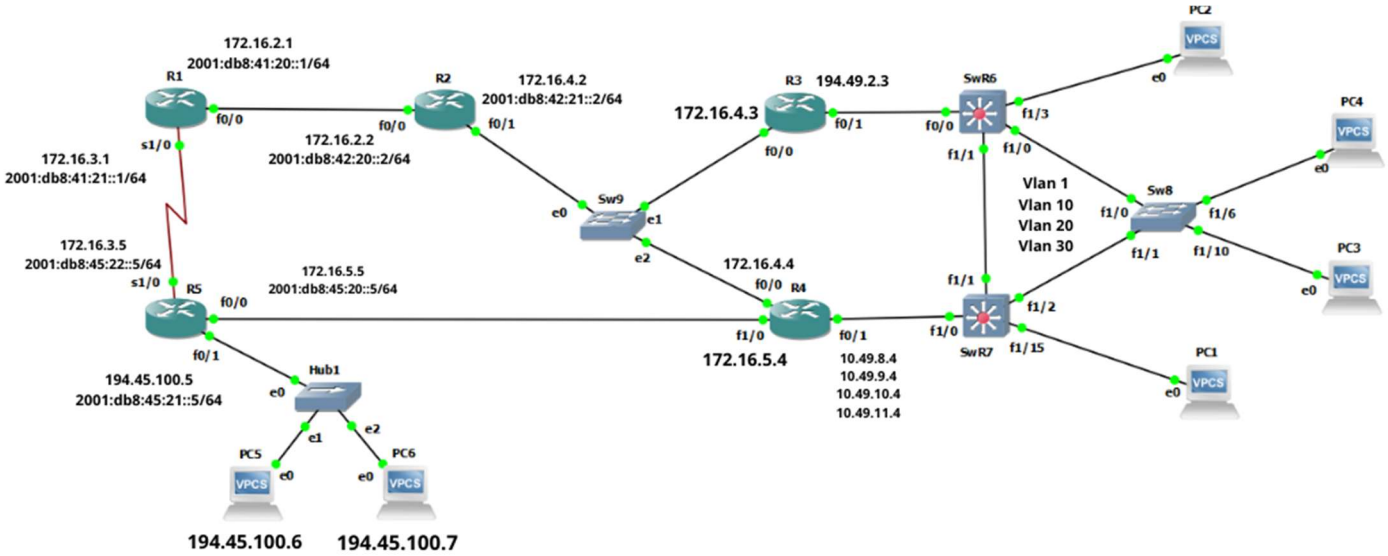
2 IPv6 Table

Device	*Interface*	*IPv6 Address*
PC1	*Ethernet 0*	
PC2	*Ethernet 0*	
PC3	*Ethernet 0*	
PC4	*Ethernet 0*	
PC5	*Ethernet 0*	
PC6	*Ethernet 0*	
R1	*FastEthernet0/0*	*2001:db8:41:20::1/64*
R1	*Serial1/0*	*2001:db8:41:21::1/64*
R2	*FastEthernet0/0*	*2001:db8:42:20::2/64*
R2	*FastEthernet0/1*	*2001:db8:42:21::2/64*
R3	*FastEthernet0/0*	
R3	*FastEthernet0/1*	
R4	*FastEthernet0/0*	
R4	*FastEthernet1/0*	
R4	*FastEthernet0/1*	
R5	*Serial1/0*	*2001:db8:45:22::5/64*
R5	*FastEthernet0/0*	*2001:db8:45:20::5/64*
R5	*FastEthernet0/1*	*2001:db8:45:21::5/64*
SwR6	*FastEthernet0/0*	
SwR6	*FastEthernet1/1*	
SwR6	*FastEthernet1/0*	
SwR6	*FastEthernet1/3*	
SwR7	*FastEthernet1/0*	
SwR7	*FastEthernet1/1*	
SwR7	*FastEthernet1/2*	
SwR7	*FastEthernet1/15*	
Sw8	*FastEthernet1/0*	
Sw8	*FastEthernet1/1*	
Sw8	*FastEthernet1/6*	
Sw8	*FastEthernet1/10*	

3 VLAN

VLAN	*IP Address*
VLAN1	*10.49.8.0/24*
VLAN10	*10.49.9.0/24*
VLAN20	*10.49.10.0/24*
VLAN30	*10.49.11.0/24*

4 Network Figure



5 BGP

For some reason, which we couldn't determine, when we attempted to ping the interfaces of R1 from PC2, we started to observe the error (ICMP type:3, code:1, Destination host unreachable). This occurred only on the s1/0 interface of the pinged router, as the f0/0 interface had successful pings. We noticed that when we executed the "show ip route" command, the IPs of the 172.16.0.0 subnets displayed only the IPs 172.16.4.0 and 172.16.2.0, missing the IPs from the 172.16.3.0 subnet, which we believe to be the root cause of the issue.

6 DNS/IPV6

In our attempt to set up the network for DNS and IPv6 connectivity, we faced challenges that hinder the full functionality of the system. Although fundamental configurations such as IPv6 addressing, OSPFv3, and multiprotocol BGP appear to be correct, DNS name resolution and IPv6 connectivity are not working as expected. This may be due to incomplete or incorrect DNS server configuration on R1, hidden routing issues affecting the propagation of IPv6 routes and packet forwarding, or network connectivity and interface configuration issues. These problems underscore the inherent complexity of configuring modern networks, requiring a detailed analysis to identify and rectify the existing flaws.