

Redes de Computadores - RECOMP – 2025/2026

● Project Guidelines

.1. Project teams

In order to create teams, the laboratory class will be separated into groups of three or four students, with the condition that all team members must be from the same laboratory class.

.2. RECOMP sprints

The RECOMP Project is organized in 3 sprints, each with a duration of four or five weeks:

Table 1 – RECOMP sprints

RECOMP PROJECT	SPRINT START	SUBMISSION DEADLINE
Sprint 1	15-09-2025	19-10-2025
Sprint 2	20-10-2025	12-11-2025
Sprint 3	10-11-2025	14-12-2015

.3. Sprint presentation

After the sprint deadline, each team will give a 15-minute presentation during the next laboratory class to the teacher. The presentation must include a live demo.

.4. Deliverables

- Packet trace file
- Configurations files
- Sprint Report.

• Project Description – Sprint 1

Consider the following design of the RECOMP Corporation WAN. The design is comprised of four location sites interconnected over a large geographic area (Oporto, Warsaw, Munich and an unknown location).

All the branches are connected through the Internet. With this project's guidelines, packet trace file (Proj1 - start.pkt) with the initial Internet configurations is provided.

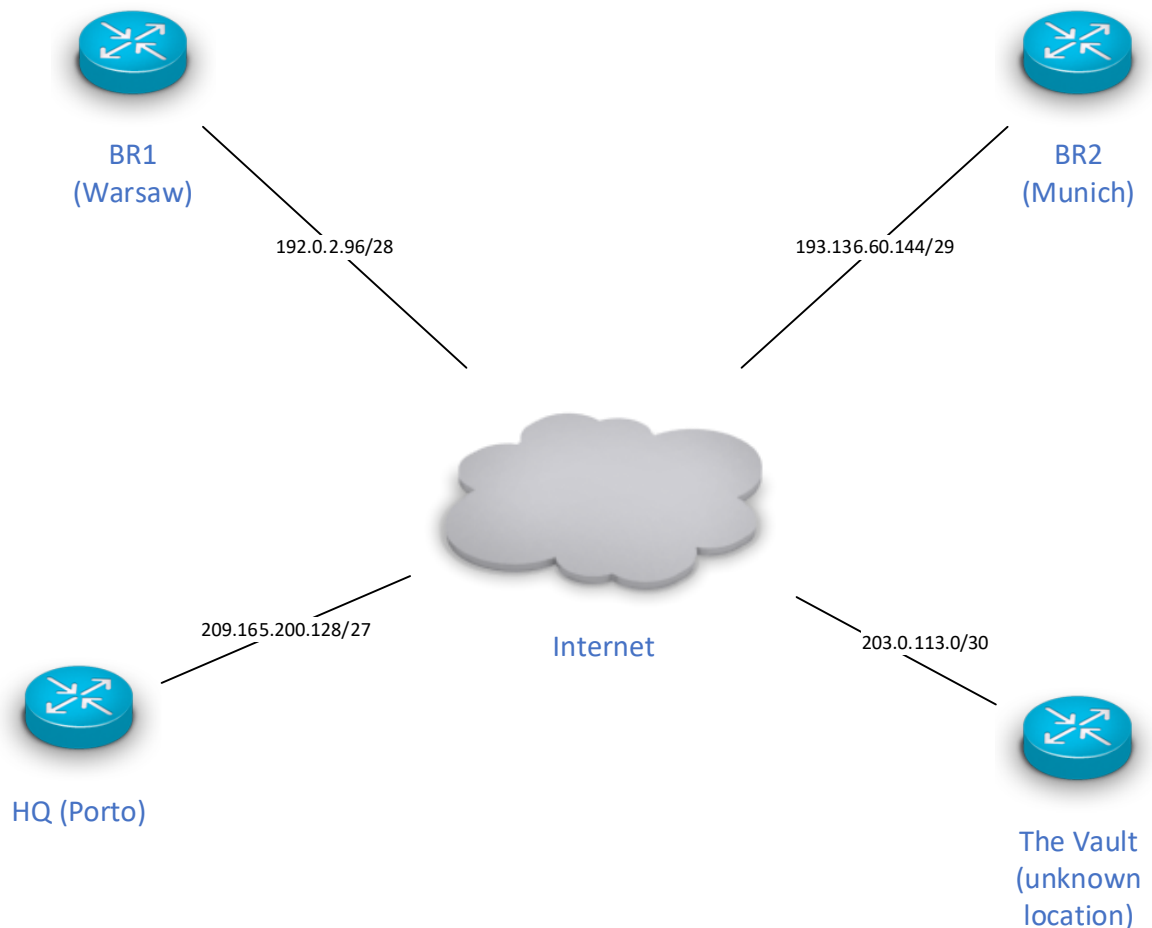


Figure 1. Project start

Oporto

- Oporto is the location where the headquarters of the RECOMP Corporation is based. This site is the most complex part of the WAN. The site is composed of:
 - One Router HQ (2911 model).
 - Two Multilayer Switch MLS1 and MLS2 (3560-24PS model).
 - Two Layer 2 switches (2960-24TT model).
 - Four PCs representing each of the networks of the HQ (STAFF, ACCOUNTING, HR and USERS).

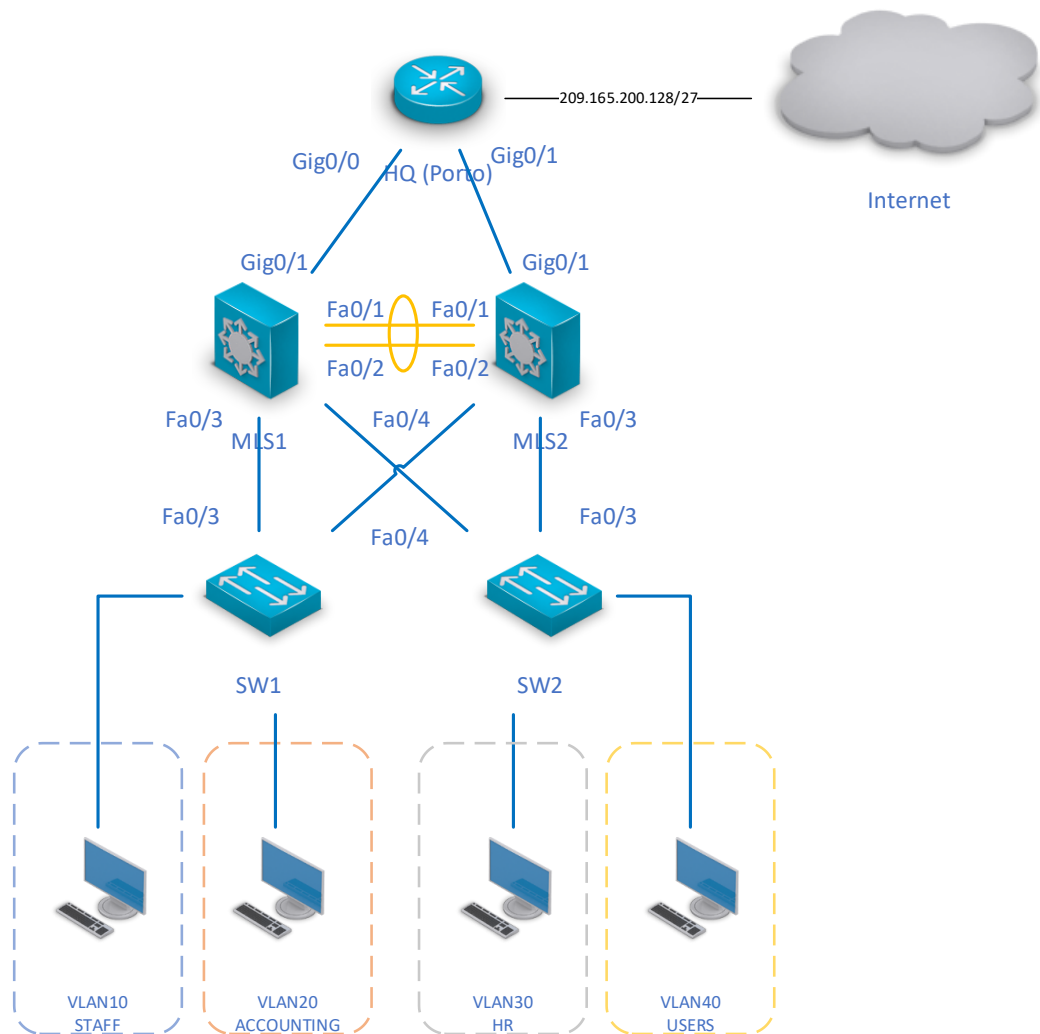


Figure 2. Oporto

Warsaw

- Warsaw is one of the new branches of the RECOMP Corporation. The network has:
 - One Router (2901 model).
 - Tree Multilayer Switch MLS3, MLS4 and MPL5 (3560-24PS model).
 - Four switch Layer 2 switches (2960-24TT model).
 - Four PCs representing each of the networks present in each branch.

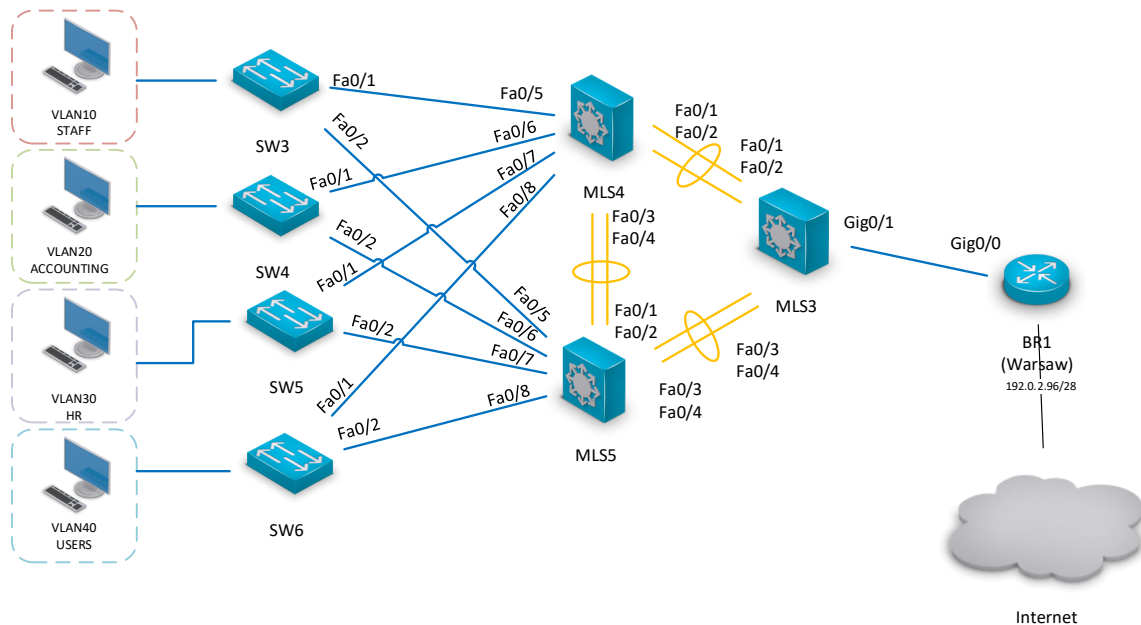


Figure 3. Warsaw

Munich

- Munich is the other new branch of the RECOMP Corporation. The network has:
 - Two Routers (2911 model).
 - Four switch Layer 2 switches (2960-24TT model).
 - Four PCs representing each of the networks present in each branch.

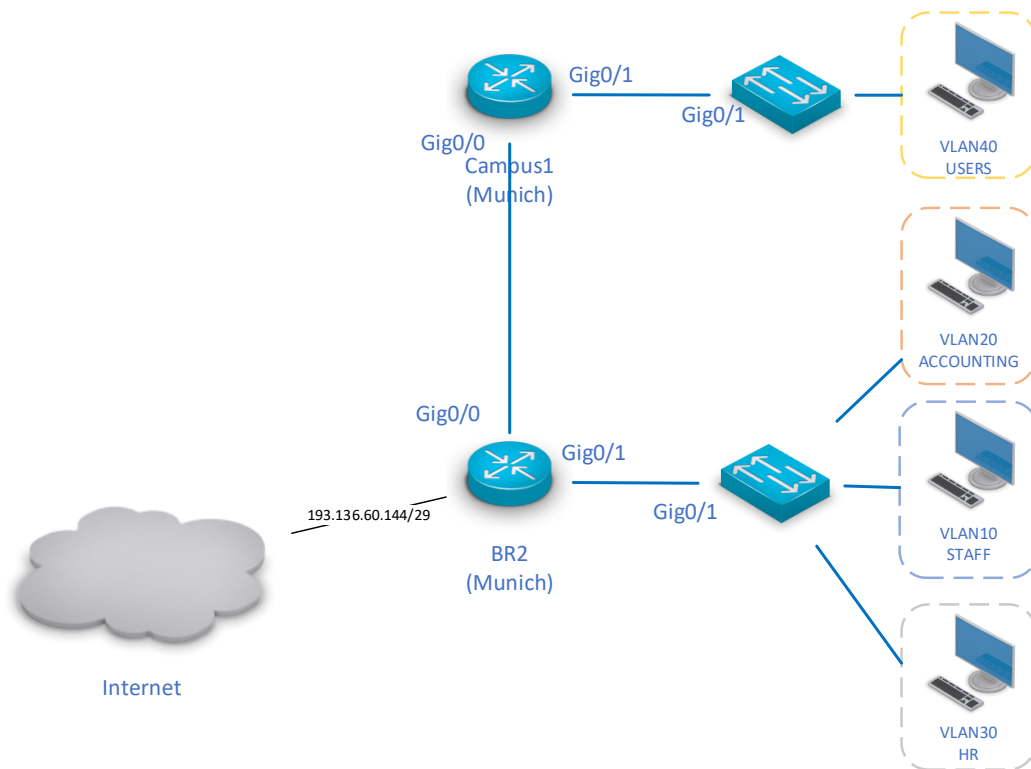


Figure 4. Munich

The Vault

- The Vault is a top-secret installation will be disclosed as you need to know. For now, the network has:
 - One Router HQ (2911 model).
 - One Layer 2 switch (2960-24TT model).

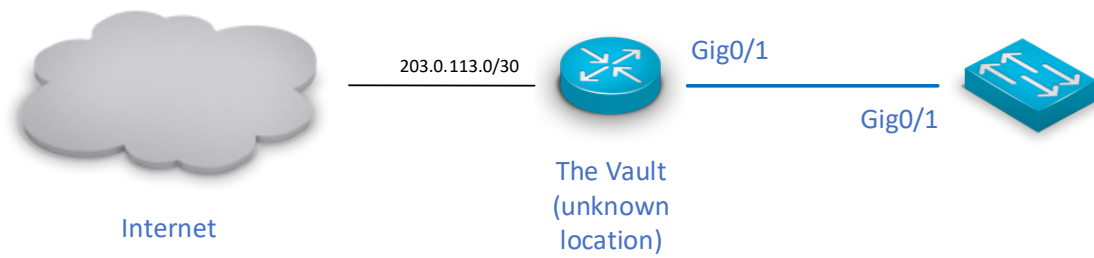


Figure 4. The Vault

.1. Startup configurations and verifications

Start by adding all missing devices to the packet trace file according to this project description.

The Service Provider (SP) connection to Oporto and Warsaw will receive an IP address through DHCP.

The SP connection to Munich should be configured manually using the address 193.136.60.147/29 and the default gateway of 193.136.60.150.

The SP connection to the Vault should be configured manually using the address 203.0.113.0/30 and the default gateway of 203.0.113.1.

Verify connectivity of all routers through the service provider. Also, test the connection from all routers to www.google.com.

.2. Address Scheme

Create the addressing scheme for HQ and all branches.

.2.1.HQ networks

Create the addressing scheme for HQ networks using the address attributed to your group (check Table 2 to find it). The following requisites must be abided:

- Addresses for the two point-to-point connections between the HQ router and HQ-MLS1 and HQ-MLS2.
- Four networks: STAFF (50 users), ACCOUNTING (200 users), HR (100 users) and USERS (500 users).

.2.2. BR Warsaw

Create the address scheme for BR1 networks using the address attributed to your group (check Table 2 to find it). The following requisites must be abided:

- Four networks: STAFF (30), ACCOUNTING (20 users), HR (10 users) and USERS (200 users)

.2.3.BR Munich

Create the address scheme for BR2 networks using the address attributed to your group (check Table 2 to find it). The following requisites must be abided:

- Four networks: STAFF (10 users), ACCOUNTING (20 users), HR (10 users) and USERS (200 users).

-

For each of the locations create two tables that should be included in the sprint 1 report:

- Table with the networks of each location site. For each network specify the network address, the broadcast address, the mask address and the first and last valid address.
- Table that identifies the interface and the assigned addresses.

.3. Configure HQ networks.

.3.1. VLAN'S configuration and connections

- Start by configuring the link aggregation between HQ-MLS1 and HQ-MLS2 as a trunk allowing all VLANs.
- Configure all layer 2 links as trunks, also allowing all VLANs to pass except for the VLAN 99.
- Configure all trunks to use VLAN 50 as its native VLAN.
- Configure the MLS switches as VTP Servers using the VTP domain of RECOMP2526TTTGG (TTT=class, GG=group number), the password 6252pmocer and all the L2 switches as VTP Clients.
- Configure the following VLANs in one of the VTP server switches: VLAN 10 (STAFF), VLAN 20 (ACCOUNTING), VLAN 30 (HR), VLAN 40 (USERS), VLAN 50 (NATIVE), VLAN 99 (BLACKHOLE).

.3.2. Rapid Spanning Tree Protocol (STP)

- Force MLS1 to become the ROOT bridge for VLAN 10 and 20 and the secondary root bridge for VLAN 30 and 40 and to use rapid-STP.
- MLS2 should have the opposite configuration of MLS1 regarding the STP position.

.3.3. Configure HSRP

- Configure the necessary switched virtual interface (SVI) for each VLAN in each MLS. Assigning the correct address and configure HSRP.
- Match the active HSRP MLS for each VLAN with the MLS that is acting as the root bridge for the same VLAN.
- Configure routed ports on both MLSSs.

.3.4. Configure Layer 2 Switch

- Configure both Layer 2 Switch ports as follows:
 - F0/5-8 VLAN 10
 - F0/9-12 VLAN 20
 - F0/13-16 VLAN 30
 - F0/17-20 VLAN 40
 - All other ports to VLAN 99 and shutdown

.3.5. Configure DHCP

- Configure duplicated DHCP pools in both MLS for each VLAN using the address scheme created.
 - Domain: (Check Table 2 to find the domain for your group)
 - DNS: 8.8.8.8
- Excluded the already used addresses on the configuration.

.3.6. Connectivity Tests

- Test connectivity between PCs on HQ networks, as there is no routing information for the other locations.

.4. Configure BR Warsaw

.4.1. VLAN'S configuration and connections

- Start by configuring the link aggregation between MLS3, MLS4 and MLS5 as a trunk allowing all VLANs.
- Configure all layer 2 links as trunks, also allowing all VLANs to pass, except for VLAN 99.
- Configure all trunks to use VLAN 50 as its native VLAN.
- Configure the MLS switches as VTP Servers using the VTP domain of RECOMP2526TTTGG (TTT=class, GG=group number), the password 6252pmocer and all the L2 switches as VTP Clients.
- Configure the following VLANs in one of the VTP server switches: VLAN 10 (STAFF), VLAN 20 (ACCOUNTING), VLAN 30 (HR), VLAN 40 (USERS), VLAN 50 (NATIVE), VLAN 99 (BLACKHOLE).

.4.2. Rapid Spanning Tree Protocol (STP)

- Force MLS4
 - to become the ROOT bridge for VLAN 10 and 20 and the secondary root bridge for VLAN 30 and 40 and to use rapid-STP.
- MLS5 should have the opposite configuration of MLS4 regarding the STP position.

.4.3. Configure HSRP

- Configure the necessary switched virtual interface (SVI) for each VLAN in MLS4 and MLS5. Assign the correct address and configure HSRP.
- Match the active HSRP MLS for each VLAN with the MLS that is acting as the root bridge for the same VLAN.
- Configure routed ports on MLS3. The connection between MLS3 - MLS4 and MLS3 - MLS5, operate in Layer 3, configure IP addresses.

.4.4. Configure Layer 2 Switches

Configure the following access ports on the switch:

- f0/3-5 VLAN 10
- f0/6-10 VLAN 20
- f0/11-15 VLAN 30
- f0/16-20 VLAN 40
- All other ports in VLAN 99 and shutdown

.4.5. Configure DHCP

- Configure duplicated DHCP pools in both MLS4 and MLS5 for each VLAN using the address scheme created.
 - Domain: (Check Table 2 to find the domain for your group)
 - DNS: 8.8.8.8
- Exclude the already used addresses on the configuration.

.1.1. Connectivity Tests

- Test connectivity between PCs on Warsaw networks, as there is no routing information for the other locations.

.2. Configure BR Munich

.2.1. Configure Layer 2 Switches

Configure g0/1 on SW7 from BR2 as a trunk link and use VLAN 50 as native allowing VLAN 10, 20 and 30.

Configure g0/1 on SW8 from Campus as access link and use VLAN 40.

Configure the following VLANs:

- SW7: VLAN 10 (STAFF), VLAN 20 (ACCOUNTING), VLAN 30 (HR), VLAN 50 (NATIVE), VLAN 99 (BLACKHOLE).

- SW8: VLAN 40 (USERS), VLAN 50 (NATIVE), VLAN 99 (BLACKHOLE).

Configure the following access ports on the switches SW7:

- f0/1-5 VLAN 10
- f0/6-10 VLAN 20
- f0/11-15 VLAN 30
- All other ports in VLAN 99 and shutdown

Configure the following access ports on the switches SW8:

- f0/1-24 VLAN 40
- All other ports in VLAN 99 and shutdown

Configure on BR2 router the Sub-interfaces as necessary using the last available address in each network.

Configure the DHCP server in each router for each of its networks, remember to exclude the use addresses.

Table 2 – Address, VTP domain and DHCP domain

Class	Team number (Within class)	IPv4 address space to be used for Oporto	IPv4 address space to be used for Warsaw	IPv4 address space to be used for Munich	IPv4 address space to be used for the vault	VTP domain	DHCP domain
M1A	1	10.16.24.0/22	192.168.172.0/23	172.30.54.0/23	10.31.76.0/24	RECOMP2526M1A01	RECOMP2526M1A01.recomp.com
	2	10.17.28.0/22	192.168.170.0/23	172.29.56.0/23	10.31.77.0/24	RECOMP2526M1A02	RECOMP2526M1A02.recomp.com
	3	10.18.32.0/22	192.168.168.0/23	172.28.58.0/23	10.31.78.0/24	RECOMP2526M1A03	RECOMP2526M1A03.recomp.com
	4	10.19.36.0/22	192.168.166.0/23	172.27.60.0/23	10.31.79.0/24	RECOMP2526M1A04	RECOMP2526M1A04.recomp.com
	5	10.20.40.0/22	192.168.164.0/23	172.26.62.0/23	10.31.80.0/24	RECOMP2526M1A05	RECOMP2526M1A05.recomp.com
	6	10.21.44.0/22	192.168.162.0/23	172.18.78.0/23	10.31.81.0/24	RECOMP2526M1A06	RECOMP2526M1A06.recomp.com
	7	10.22.48.0/22	192.168.160.0/23	172.17.80.0/23	10.31.82.0/24	RECOMP2526M1A07	RECOMP2526M1A07.recomp.com
M1B	1	10.23.52.0/22	192.168.176.0/23	172.25.64.0/23	10.31.83.0/24	RECOMP2526M1B01	RECOMP2526M1B01.recomp.com
	2	10.24.56.0/22	192.168.174.0/23	172.24.66.0/23	10.31.84.0/24	RECOMP2526M1B02	RECOMP2526M1B02.recomp.com
	3	10.25.60.0/22	192.168.158.0/23	172.23.68.0/23	10.31.85.0/24	RECOMP2526M1B03	RECOMP2526M1B03.recomp.com
	4	10.26.64.0/22	192.168.156.0/23	172.22.70.0/23	10.31.86.0/24	RECOMP2526M1B04	RECOMP2526M1B04.recomp.com
	5	10.27.68.0/22	192.168.154.0/23	172.21.72.0/23	10.31.87.0/24	RECOMP2526M1B05	RECOMP2526M1B05.recomp.com
	6	10.28.72.0/22	192.168.152.0/23	172.20.74.0/23	10.31.88.0/24	RECOMP2526M1B06	RECOMP2526M1B06.recomp.com
	7	10.29.74.0/22	192.168.150.0/23	172.19.76.0/23	10.31.89.0/24	RECOMP2526M1B07	RECOMP2526M1B07.recomp.com