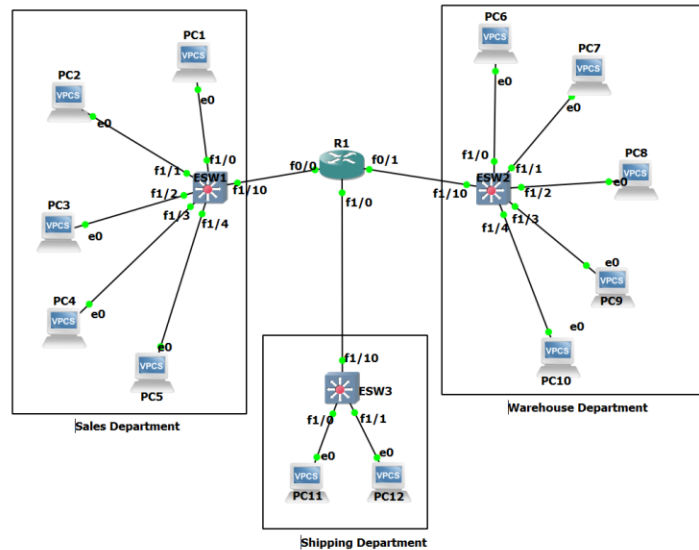


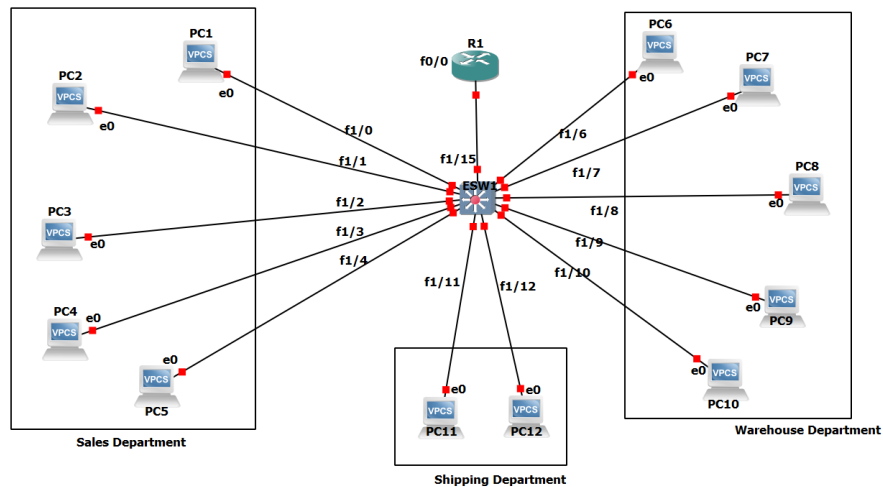
## Netlab 2: GNS3 – Integrating VLANs in Topology

**Purpose:** In this Lab exercise, we will expand the basic LAN topology from Lab1 to introduce VLANs.

### Procedure



Topology Lab1



Topology Lab2

In this pseudo-Company, the main purpose is to continue improving the network with the least hardware possible introducing VLANs.

## **Part 1**

First, you will modify topology 1 to build topology 2 as shown. You will create 3 VLANs (See Table 1 for Vlan IDs). Assign the switch ports to the VLANs as needed.

Department	SubNet ID or Bdcst Doamin	Mask	Gateway	VLAN ID
Sales	10.20.30.0/26	255.255.255.192	10.20.30.1/26	575
Shipping	10.20.30.80/29	255.255.255.248	10.20.30.81/29	406
Warehouse	10.20.30.64/28	255.255.255.240	10.20.30.65/28	306

**Table 1**

You will use the numbers in your student ID to replace the XX and YY. Replace XX with the last two numbers in your student ID and YY with the third and fourth numbers from the last.

Example: Student ID – 000012345, therefore, XX = 45 and YY = 23

To do an initial check of your new topology, you should be able to ping only the PCs within each department, NOT between departments. For example, PC1 should be able to ping PCs 2 ,3 ,4, and 5 but not the PCs in Shipping nor Warehouse.

## **Part 2**

Now, you have to introduce communication between all the departments in the company. To accomplish that, you need to configure the router as a “Router-on-a-Stick”. This configuration will to take full advantage of the 802.1q protocol discussed in class. (See the IOS Commands Reference Sheet). To check your final topology, you should be able to ping between all PCs regardless the department they are in.

## **Wireshark Questions**

Start a capture in the link between the Router R1 and switch ESW1. Apply the “ICMP” filter.

Ping any PC in the Sales department from the Shipping department and answer the following questions:

In regards to VLANs, what is the protocol encapsulation at layer 2 displayed in Wireshark?

Destination: c2: 04:0f:70:00:00, Source: Private\_66:68:09, Type: 802.1Q Virtual LAN(0x8100)

802.1Q Virtual Lan, PRI: 0, DEI: 0, ID: 406

What is the size (in bytes) of the frame header? \_\_102 Bytes\_\_\_\_\_

What is the size (in bytes) of the VLAN tagging? \_\_\_\_ 4 Bytes \_\_\_\_\_

What are the VLAN IDs you were able to dissect from the packet capture? \_\_\_\_ ID: 575 and 406. \_\_\_\_

Ping any PC in the Warehouse department from the Shipping department and answer the same previous questions:

PC 11 to PC 7:

Destination: Private\_66:68:05

Source: c2:04:0f:70:00:00

Type:802.1Q Virtual Lan (0x8100)

Byte: 102 Bytes of frame header

Size of VLAN tagging: Unable to determine. Data shows 56 Bytes

VLAN ID: 406 and 306

After answering the same previous questions. What changes can you identify?

The source and destination were switched when pinged from shipping department to warehouse. I was unable to find the VLAN size but I am guessing it would be the same. The VLAN ID also changed because now we are pinging the Warehouse.