

## CMIT 351 Project 1 Description

### Intro:

ACME University IT wants to implement layer 2 segmentation to control broadcast domains and increase Local Area Network (LAN) performance.

### Scenario:

IT has tasked you with creating a prototype of the new LAN. You need to document the prototype and identify what works as well as what does not work. The requirements you have specify a maximum number of switch (2), the number of virtual LANs (VLANs) as three, and some computers for endpoint testing.

### Overview

Modern switches use VLANs to improve network performance by separating large Layer 2 broadcast domains into smaller ones. VLANs can also be used as a security measure by controlling which hosts can communicate. In general, VLANs make it easier to design a network to support the goals of an organization. VLAN trunks are used to span VLANs across multiple devices. Trunks allow the traffic from multiple VLANs to travel over a single link, while keeping the VLAN identification and segmentation intact.

### Objectives

- Design a Local Area Network using switches and hosts (computers)
- Create basic switch configurations necessary for switch maintenance and operation
- Define Virtual LANs (VLANs) to enforce segmentation
- Implement necessary VLAN trunking to extend a VLAN across the LAN

### Tools

- ~~You will need a diagramming application such as draw.io or Visio to complete Part 1.~~
- You can reference the following uCertify labs for help in building the switch configurations: Modules 5, 6, 7, 8, 9, and 10.
- Note: ~~access to physical or emulated Cisco devices is not required to complete this project. However, if you want to test, practice, or otherwise tinker you can get Cisco Packet Tracer (<https://skillsforall.com/course/getting-started-cisco-packet-tracer>) or GNS3 (<https://www.gns3.com/>)~~

### Part 1: Design the Local Area Network

The work milestones for this part of the project are as follows:

- The LAN must consist of 2 switches and 3 computers.
- The two switches must be named **S1** and **S2**.
- The three computers must be named **PC-A**, **PC-B**, and **PC-C**.

### Part 2: Create the basic switch configurations

Your network engineering lead has approved the LAN design. Now, the work to implement the design can begin. Your tasks are as follows:

#### 2.1 Cable the network

- Connect PC-A to S1 on Ethernet Interface 6
- Connect S1 to S2 on Ethernet Interfaces 1
- Connect PC-B to S2 on Ethernet Interface 11
- Connect PC-C to S2 on Ethernet Interface 18

## 2.2. Configure the basic switch functions

Configure the basic functions in both S1 and S2 as follows:

- Set the enable secret to “class”
- Set the line con 0 password to “cisco”
- Set the line vty 0 15 password to “cisco”
- Set the MOTD to “Unauthorized access is strictly prohibited.”
- Set logging to synchronous

## 2.3 Configure the computers

Configure the three computers as follows:

Name	IP Address	Subnet	Gateway
PC-A	192.168.10.3	255.255.255.0	192.168.10.1
PC-B	192.168.10.4	255.255.255.0	192.168.10.1
PC-C	192.168.20.3	255.255.255.0	192.168.20.1

## 2.4 Test and Validate Connectivity

Use *ping* to test connectivity between the computers. Detail your results in your project document, both what works and what doesn't work.

## Part 3: Define the VLANs

3.1 You need to define three VLANs in both S1 and S2 as follows:

- VLAN 10      Students
- VLAN 20      Faculty
- VLAN 99      Management

3.2 Then, define the following interfaces for the VLANs as:

Device	Interfaces	VLAN / IP Address
S1	6, 12 – 20, 22-23	VLAN 10
S1	11,21	VLAN 20
S1	VLAN 99	192.168.1.11 255.255.255.0
S2	11	VLAN 10
S2	18	VLAN 20
S2	VLAN 99	192.168.1.12 255.255.255.0

## **Part 4: Implement VLAN Trunking**

**4.1** Implement VLAN trunking on the switches as follows:

- Manually set interface 1 on S1 and S2 to trunk (do not use mode dynamic desirable)

**4.2** Use *ping* to test connectivity between the computers and switches. Detail your results in your project document, both what works and what doesn't work.