**Networking 2**

**First Semester, A.Y. 2024 – 2025**

**Activity No. \_\_\_\_\_\_\_\_\_\_\_\_**

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| **Course, Year, and Section** | **BSIT 3F** | **Name of Professor:** | **Sir Jed Concepcion** |

1. **Define VLAN Segmentation**: VLAN segmentation divides a single physical network into multiple isolated virtual networks. This technique, using VLANs, enhances network security, performance, and manageability. By logically grouping devices based on their function or department, VLANs create separate broadcast domains. This reduces broadcast traffic and prevents unauthorized access between different virtual networks. Additionally, VLAN segmentation offers flexibility in network design, allowing for the creation of multiple virtual networks on a single physical infrastructure.  
     
   2. **VLAN Implementation:** VLAN implementation involves planning the number and purpose of VLANs, configuring switches to create and assign ports to VLANs, setting up a router to route traffic between VLANs, and finally, testing the network to ensure proper functionality and security.  
     
   3. Inter-VLAN routing using routers: Inter-VLAN routing, the process of enabling communication between different VLANs, necessitates a Layer 3 device like a router. This is because switches, operating at Layer 2, cannot route traffic based on IP addresses. Two common methods for inter-VLAN routing are:

* **Traditional Router-Based Inter-VLAN Routing** requires multiple physical interfaces on the router, each connected to a different VLAN. Separate VLAN interfaces are configured on the router, assigned IP addresses, and a routing protocol is configured to facilitate traffic routing between VLANs.
* **Router-on-a-Stick** utilizes a single physical interface on the router connected to a trunk port on the switch. Subinterfaces are created on the router's physical interface, each representing a different VLAN. Similar to the traditional method, IP addresses are assigned to the subinterfaces, and a routing protocol is configured for inter-VLAN routing.