**Configuration of Network Devices for a Company**

*Section AA9*

*Proposed to*

Dr. Eiman Al-Zahrani

*Prepared by:*

*Jomana Sameer 2005725*

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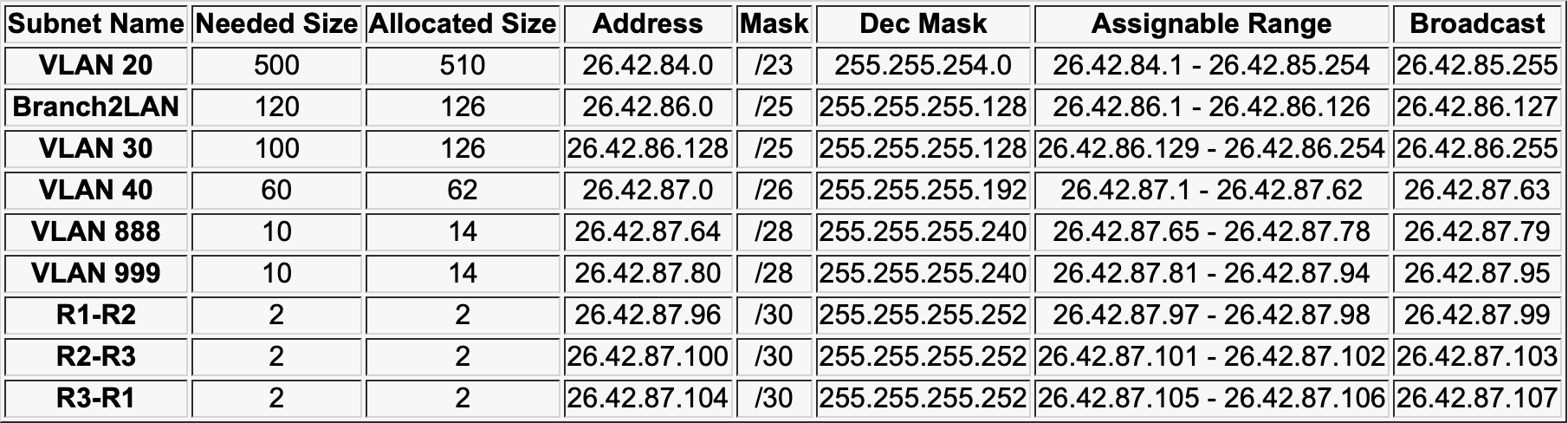
|  |
| --- |
| Phase 1 |

**Total Marks 42 – Weight 4.2%**

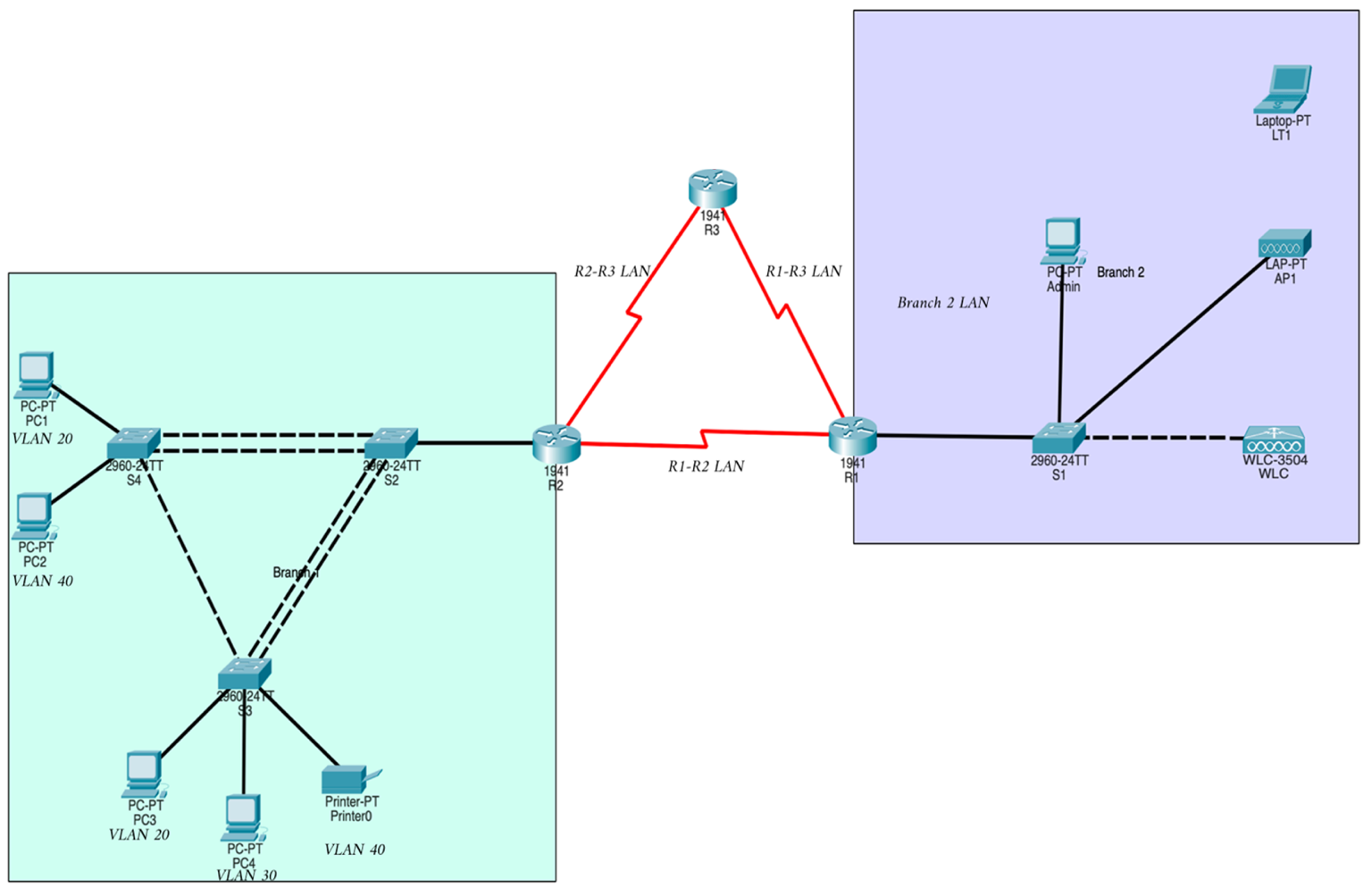
**Task 1: IP Addressing**

The subnetwork addresses for each student is based on her own KAU ID. Here is an example to generate your network address based on your KAU ID.

* Example KAU ID: [1948246](https://lms.kau.edu.sa/webapps/gradebook/do/instructor/enterGradeCenter?course_id=_430162_1&cvid=fullGC) 2005725
* Reverse your KAU ID: 6428491 5275002
* Add number 2 in front of the reversed KAU ID: 26428491 25275002
* Now, split this number into an IP address with every two digits forming a part: 26.42.84.91 25.27.50.02
* Consider the network address as: 26.42.84.91/22 25.27.48.00/22
* The following table illustrates the needed host for each subnet associated with a different example of IP address.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Subnet Name** | **Needed Size** | **Allocated Size** | **Address** | **Mask** | **Dec Mask** | **Assignable Range** | **Broadcast** |
| **VLAN 20** | 500 | 510 | 25.27.48.0 | /23 | **255.255.254.0** | 25.27.48.1-25.27.49.254 | 25.27.49.255 |
| **Branch2LAN** | 120 | 126 | 25.27.50.0 | **/25** | **255.255.255.128** | 25.27.50.1-25.27.50.126 | 25.27.50.127 |
| **VLAN 30** | 100 | 126 | 25.27.50.128 | **/25** | **255.255.255.128** | 25.27.50.129-25.27.50.224 | 25.27.50.255 |
| **VLAN 40** | 60 | 62 | 25.27.51.0 | **/26** | **255.255.255.192** | 25.27.51.1-25.27.51.62 | 25.27.51.63 |
| **VLAN 888** | 10 | 14 | 25.27.51.64 | **/28** | **255.255.255.240** | 25.27.51.65-25.27.51.78 | 25.27.51.79 |
| **VLAN 999** | 10 | 14 | 25.27.51.80 | **/28** | **255.255.255.240** | 25.27.51.81-25.27.51.94 | 25.27.51.95 |
| **R1-R2** | 2 | 2 | 25.27.51.96 | **/30** | **255.255.255.252** | 25.27.51.97-25.27.51.98 | 25.27.51.99 |
| **R2-R3** | 2 | 2 | 25.27.51.100 | **/30** | **255.255.255.252** | 25.27.51.101-25.27.51.102 | 25.27.51.103 |
| **R3-R1** | 2 | 2 | 25.27.51.104 | **/30** | **255.255.255.252** | 25.27.51.105-25.27.51.106 | 25.27.51.107 |



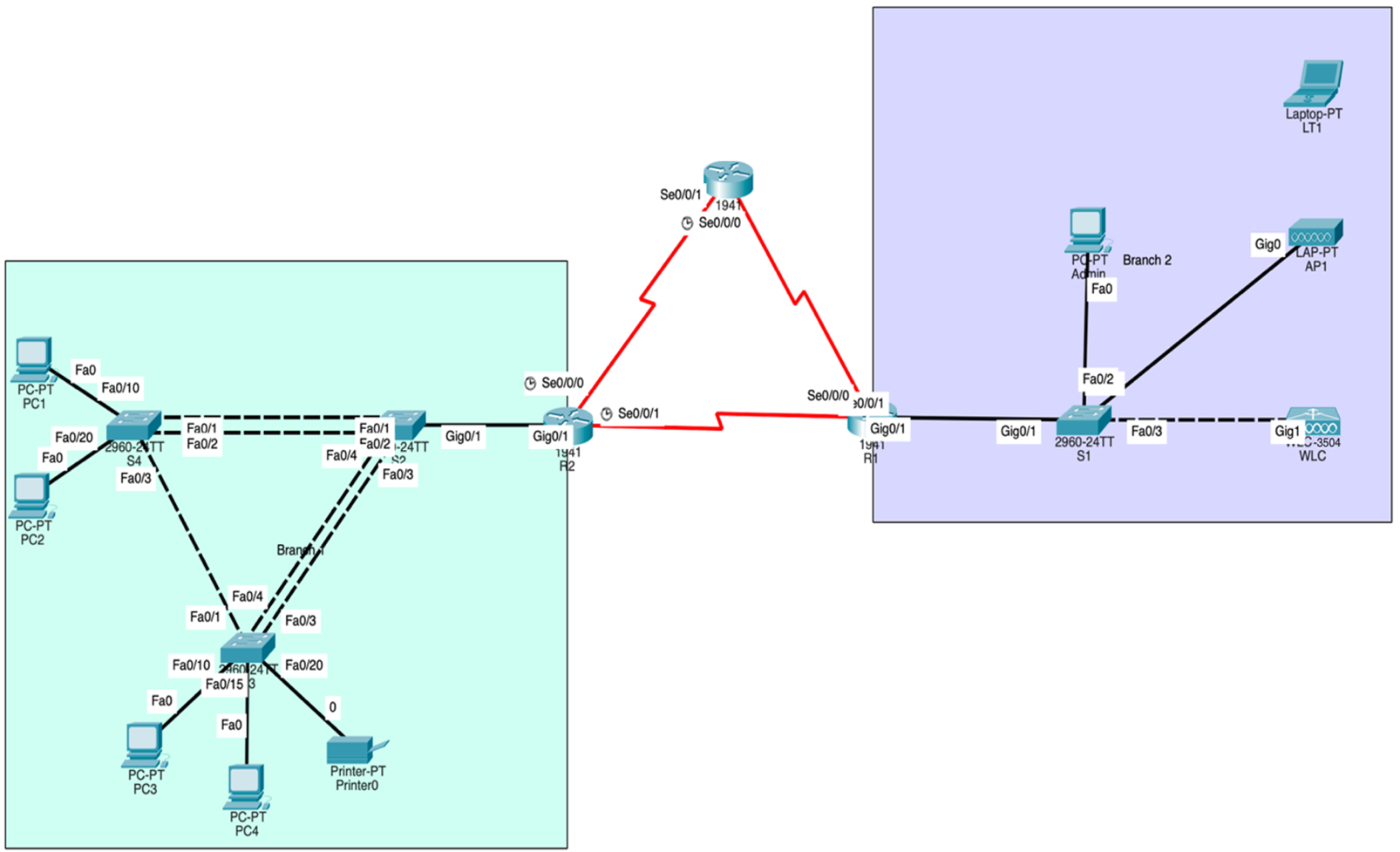
**Device Addressing Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **Interface** | **IP Address** | **Subnet Mask** | **Default Gateway** |
| **S1** | **VLAN 999** | 25.27.51.81 | **255.255.255.240** | 25.27.50.1 |
| **S2** | **VLAN 888** | 25.27.51.65 | **255.255.255.240** | 25.27.51.68 |
| **S3** | **VLAN 888** | 25.27.51.66 | **255.255.255.240** | 25.27.51.68 |
| **S4** | **VLAN 888** | 25.27.51.67 | **255.255.255.240** | 25.27.51.68 |
| **R1** | **G0/1** | 25.27.50.1 | **255.255.255.128** | **-** |
| **S0/0/0** | 25.27.51.98 | **255.255.255.252** | **-** |
| **S0/0/1** | 25.27.51.106 | **255.255.255.252** | **-** |
| **R2** | **S0/0/0** | 25.27.51.101 | **255.255.255.252** | **-** |
| **S0/0/1** | 25.27.51.97 | **255.255.255.252** | **-** |
| **G0/1.20** | 25.27.48.1 | **255.255.254.0** | **-** |
| **G0/1.30** | 25.27.50.129 | **255.255.255.128** | **-** |
| **G0/1.40** | 25.27.51.1 | **255.255.255.192** | **-** |
| **G0/1.888** | 25.27.51.68 | **255.255.255.240** | **-** |
| **R3** | **S0/0/0** | 25.27.51.105 | **255.255.255.252** | **-** |
| **S0/0/1** | 25.27.51.102 | **255.255.255.252** | **-** |
| **WLC** | **Management** | 25.27.50.2 | **255.255.255.128** | 25.27.50.1 |
| **Admin** | **NIC** | 25.27.50.3 | **255.255.255.128** | 25.27.50.1 |
| **PC1** | **NIC** | 25.27.48.2 | **255.255.254.0** | 25.27.48.1 |
| **PC2** | **NIC** | 25.27.51.2 | **255.255.255.192** | 25.27.51.1 |
| **PC3** | **NIC** | 25.27.48.3 | **255.255.254.0** | 25.27.48.1 |
| **PC4** | **NIC** | 25.27.50.130 | **255.255.255.128** | 25.27.50.129 |
| **Printer** | **NIC** | 25.27.51.3 | **255.255.255.192** | 25.27.51.1 |

**Port Assignments Table**

|  |  |
| --- | --- |
| **Ports** | **VLAN** |
| **All port** in S1 | Vlan1(default) |
| **F0/1- 0/9** for S2, S3 and S4 | Vlan888 |
| **F0/10- 0/14** for S2, S3 and S4 | Vlan20 |
| **F0/15- 0/19** for S2, S3 and S4 | Vlan30 |
| **F0/20- 0/24** for S2, S3 and S4 | Vlan40 |

**Task 2: Cable the network as shown in the topology**



**Task 3: Configure host PCs**

Configure all PCs with IP addresses and default gateways according to your addressing table.

**Task 4: Configure device basic settings (Switches, Routers)**

1. Configure device names as shown in the topology.
2. Configure the IP address and default gateway listed in your addressing table for SVIs on switches.
3. Configure routers' interfaces.

**Task 5: Configure VLANs on Switches**

1. Create the VLANs on switches.

**Branch 1**

* Vlan 20: HR
* Vlan 30: IT
* Vlan 40: Sales
* Vlan 888: Management&NativeBranch1

**Branch 2**

* Vlan 999: Management&NativeBranch2

**Task 6: Configure VLAN ports and trunk ports on the switches**

1. Configure the access ports on switches.
2. Configure the trunk ports on switches.
3. Shut down all interfaces that will not be used.

|  |
| --- |
| Phase 2 |

**Total Marks 58 – Weight 5.8%**

**Task 7: Configure Inter-VLAN Routing on R2**

1. Configure the sub-interfaces IP addresses listed in your addressing table.

**Task 8: Verify connectivity(screenshots)**

1. Verify connectivity between the same VLANs.

From PC1 to PC3:

A screenshot of a computer program

Description automatically generated

From PC2 to Printer:

A screenshot of a computer program

Description automatically generated

1. Verify connectivity between different VLANs.

From PC3 to PC4:

A computer screen with numbers and symbols

Description automatically generated

1. Can PC4 ping Admin? Why? No, i can’t without OSPF, the networks may be isolated, and there might be no routes known between PC4's network and the Admin PC's network. A screenshot of a computer screen

   Description automatically generated

**Task 9:** Configure WLC

1. Configure the IP address for WLC
2. Access the GUI of WLC and set credentials ( User Name: admin & Password: Admin123)
3. Create and enable the WLAN (Profile Name: **Branch2WLAN** & **SSID: SSID-1**)
4. Secure the WLAN (Use **SecureWLAN** as the passphrase)
5. Enable FlexConnect Local Switching and FlexConnect Local Auth
6. Configure a DHCP Scope
   * Scope Name: Branch2Scope
   * Pool Start Address: x.x.x.8
   * Pool End Address: x.x.x.30
   * Status: Enabled
   * Provide the values for **Network, Netmask, and Default Routers**
7. Add WPC300N wireless interface to LT1(from physical device view)
8. Configure LT1 to connect to the network.

**Task 10:** Configure Single-Area OSPFv2

1. Configure OSPFv2 for the networks directly connected.
2. Configure the passive interface.
3. **On R1**, automatically distribute the default route to all routers in the network.

**Task 11: Verify connectivity**

1. Can PC4 ping Admin?

A black screen with white text

Description automatically generatedWhy? Yes, OSPF enables dynamic routing, allowing routers to exchange information about networks. This facilitates the establishment of routes, and PC4 would likely have a path through routers and networks to reach the Admin PC.