Uma imagem com captura de ecrã, design, arte

Descrição gerada automaticamente



**CCNAv7 SRWE Final Exam Topology**

**Part 1: Develop an IP Addressing Scheme** (10 points) **Part 2: Clear Configs and Reload the Equipment** (1 point) **Part 3: Perform Equipment Initial Configuration** (2 points) **Part 4: Enable EtherChannel Between MLSs** (5 points) **Part 5: Configure VLANs, Trunks and Access Ports** (10 points) **Part 6: Configure IPv4 and IPv6 on the Interfaces, Sub-Interfaces and SWIs** (10 points) **Part 7: Adjust STP Default Configuration** (5 points) **Part 8: Implement DHCPv4 and DHCPv6** (12 points) **Part 9: Configure First Hop Redundancy Protocol (HSRP) (IPv4 only)** (10 points) **Part 10: Perform Security Configurations** (8 points) **Part 11: Configure Static Routes** (10 points)

**Part 12: Configure Multi-Location Wireless Deployment with WLC (IPv4 only)** (15 points) **Part 13: Test and Verify IPv4 and IPv6 End-to-End Connectivity** (1 point) **Part 14: Export All Configurations** (1 point)

# Scenario

The topology represents a growing Croatian Service company that develops tech gadgets with its headquarters in the capital Zagreb and two branches by the coast, in Pula and Split. Your task is to plan an IP address scheme to fulfill the company needs and to configure all equipment to guarantee full connectivity.

# Required Resources

* 3 Router (Cisco 4221/2911 with Cisco IOS XE)
* 4 Switch (Cisco 2960 with Cisco IOS)
* 2 Multi-Layer Switch (Cisco 3560/3650/3750 with Cisco IOS)
* 1 Wireless Lan Controller 2100/2500
* 3 LightWeight Access Points 1131
* 4 PCs (Windows with a terminal emulation program, such as Tera Term)
* 2 Laptops with a wireless NIC
* Console cables to configure the Cisco IOS devices via the console ports
* Ethernet cables as shown in the topology

# Instructions Part 1: Develop an IP Addressing Scheme

**Total points: 10**

## Step 1: Subnetting

1. The next table contains the IPV4 addresses used in this deployment.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Subnet** |  |  | **Prefix** |
| Zagreb | 172.20.0.0 | /21 |  |  |
| Pula | 172.20.8.0 | /22 |  |  |
| Split | 172.20.12.0 | /23 |  |  |
| Zagreb-Pula | 10.0.0.0 | /30 |  |  |
| Zagreb-Split | 10.0.0.4 | /30 |  |  |
| Pula-Split | 10.0.0.8 | /30 |  |  |

1. The next table contains the IPV6 addresses used in this deployment.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** |  | **Subnet** |  | **Prefix** |
| Zagreb | 2001:A:: |  | /61 |  |
| Pula | 2001:B:: |  | /61 |  |
| Split | 2001:C:: |  | /61 |  |

### IP Addressing Worksheet IPv4/IPv6 isepacademy.ccna.itn.com

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Network** |  | **Subnet** | **Prefix** |
| ZAGREB | Administration 20(250 users) | IPv4: 172.20.4.0 |  | /24 |
| IPv6: 2001:A:0:20:: |  | /64 |
| Staff 30 (250 users) | IPv4: 172.20.5.0 |  | /24 |
| IPv6: 2001:A:0:30:: |  | /64 |
| VoIP 40 (500 users) | IPv4: 172.20.0.0 |  | /23 |
| IPv6: 2001:A:0:40:: |  | /64 |
| Wireless-Zg 50 (500 users) | IPv4: 172.20.2.0 |  | /23 |
| IPv6: 2001:A:0:50:: |  | /64 |
| Guests-Zg 60 (250 users) | IPv4: 172.20.6.0 |  | /24 |
| IPv6: 2001:A:0:60:: |  | /64 |
| Management 6 (30 IPs) | IPv4: 172.20.7.64 |  | /27 |
| IPv6: 2001:A:0:6:: |  | /64 |
| Servers 10(30 IPs) | IPv4:172.20.7.32 |  | /27 |
| IPv6: 2001:A:0:10:: |  | /64 |
| Aps 5 (30 IPs) | IPv4: 172.20.7.0 |  | /27 |
| IPv6: 2001:A:0:5:: |  | /64 |
| To MLS1 | IPv4: 172.20.7.96 |  | /30 |
| IPv6: 2001:A:0:A:: |  | /64 |
| To MLS2 | IPv4: 172.20.7.100 |  | /30 |
| IPv6: 2001:A:0:B:: |  | /64 |
| **Free Space** | IPv4: 172.20.7.104-Split in 2 subnets /30 used to connect the MLS’s to the router RT1-Zg  172.20.7.112  172.20.7.128 |  | /29  /28  /25 |
| IPv6: ? |  |  |
| PULA | Engineering Lo0 (250 users) | IPv4: 172.20.8.0 |  | /24 |
| IPv6: 2001:B:: |  | /64 |
| Design Lo1 (25 users) | IPv4: 172.20.11.64 |  | /27 |
| IPv6: 2001:B:0:1:: |  | /64 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Network** |  | **Subnet** | **Prefix** |
|  | Communication Lo2 (100 users) | IPv4: 172.20.10.0 |  | /25 |
| IPv6: 2001:B:0:2:: |  | /64 |
| Staff 30 (100 users) | IPv4: 172.20.10.128 |  | /25 |
| IPv6: 2001:B:0:30:: |  | /64 |
| Wireless-Pl 50 (250 users) | IPv4: 172.20.9.0 |  | /24 |
| IPv6: 2001:B:0:50:: |  | /64 |
| Guests-Pl 60 (50 users) | IPv4: 172.20.11.0 |  | /26 |
| IPv6: 2001:B:0:60:: |  | /64 |
| APs 5 (6 IPs) | IPv4: 172.20.11.96 |  | /29 |
| IPv6: 2001:B:0:5:: |  | /64 |
| Management 6 (6 IPs) | IPv4:172.20.11.104 |  | /29 |
| IPv6: 2001:B:0:6:: |  | /64 |
| **Free Space** | IPv4:172.20.11.128  172.20.11.112 |  | /25  /28 |
| IPv6: ? |  |  |
| SPLIT | Multimedia Lo0(50 users) | IPv4: 172.20.12.0 |  | /26 |
| IPv6: | 2001:C:: | /64 |
| Design Lo1(50 users) | IPv4: 172.20.12.64 |  | /26 |
| IPv6: | 2001:C:0:1:: | /64 |
| Communication Lo2(50 users) | IPv4: 172.20.12.128 |  | /26 |
| IPv6: 2001:C:0:2:: |  | /64 |
| Staff 30 (100 users) | IPv4: 172.20.13.0 |  | /25 |
| IPv6: 2001:C:0:30:: |  | /64 |
| Wireless-St 50 (100 users) | IPv4:172.20.13.128 |  | /25 |
| IPv6: 2001:C:0:50:: |  | /64 |
| Guests-St 60 (30 users) | IPv4:172.20.12.192 |  | /27 |
| IPv6: 2001:C:0:60:: |  | /64 |
| APs 5 (6 IPs) | IPv4:172.20.12.224 |  | /29 |
| IPv6: 2001:C:0:5:: |  | /64 |
| Management (6 IPs) | IPv4: 172.20.12.232 |  | /29 |
| IPv6: 2001:C:0:6:: |  | /64 |
| **Free Space** | IPv4: 172.20.12.240 |  | /28 |
| IPv6: ? |  |  |

## 172.20.5.254Step 2: Interface addressing

1. Record your IPV4 assign addresses in the table below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Device** | **Interface** | **IP address** | **Prefix** | **Description** | **Gateway** |
| RT1  -  Zg | Gig0/0 | 172.20.7.105 | /30 | Connection to MLS1-Zg | N/A |
| Gig0/1 | 172.20.7.109 | /30 | Connection to MLS2-Zg | N/A |
| Gig0/2.102 | 10.0.0.1 | /30 | Connection to RT1-Pl | N/A |
| Gig0/2.103 | 10.0.0.5 | /30 | Connection to RT1-St | N/A |
| SW1-Zg | VLAN 6 | 172.20.7.65 | /27 | Management VLAN | 172.20.7.95 |
| SW2-Zg | VLAN 6 | 172.20.7.66 | /27 | Management VLAN | 172.20.7.95 |
| MLS1  -  Zg | Gig0/1 | 172.20.7.106 | /30 | Connection to RT1-Zg | N/A |
| VLAN5 | 172.20.7.1 | /27 | AP VLAN | N/A |
| VLAN6 | 172.20.7.67 | /27 | MANAGEMENT VLAN | N/A |
| VLAN10 | 172.20.7.33 | /27 | SERVERS VLAN | N/A |
| VLAN20 | 172.20.4.1 | /24 | ADMIN VLAN | N/A |
| VLAN30 | 172.20.5.1 | /24 | STAFF VLAN | N/A |
| VLAN40 | 172.20.0.1 | /23 | VOIP VLAN | N/A |
| VLAN50 | 172.20.2.1 | /23 | WIRELESS-Zg VLAN | N/A |
| VLAN60 | 172.20.6.1 | /24 | GUEST-Zg VLAN | N/A |
| MLS2  -  Zg | Gig0/1 | 172.20.7.110 | /30 | Connection to RT1-Zg | N/A |
| VLAN5 | 172.20.7.2 | /27 | AP VLAN | N/A |
| VLAN6 | 172.20.7.68 | /27 | MANAGEMENT VLAN | N/A |
| VLAN10 | 172.20.7.34 | /27 | SERVERS VLAN | N/A |
| VLAN20 | 172.20.4.2 | /24 | ADMIN VLAN | N/A |
| VLAN30 | 172.20.5.2 | /24 | STAFF VLAN | N/A |
| VLAN40 | 172.20.0.2 | /23 | VOIP VLAN | N/A |
| VLAN50 | 172.20.2.2 | /23 | WIRELESS VLAN | N/A |
| VLAN60 | 172.20.6.2 | /24 | GUEST VLAN | N/A |
| MLS1  -  Zg  / MLS2  -  Zg | VLAN5 vIP | 172.20.7.29 | /27 | N/A | N/A |
| VLAN6 vIP | 172.20.7.90 | /27 | N/A | N/A |
| VLAN10 vIP | 172.20.7.60 | /27 | N/A | N/A |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Device** | **Interface** | **IP address** | **Prefix** | **Description** | **Gateway** |
|  | VLAN 20 vIP | 172.20.4.250 | /24 | N/A | N/A |
| VLAN 30 vIP | 172.20.5.250 | /24 | N/A | N/A |
| VLAN 40 vIP | 172.20.1.250 | /23 | N/A | N/A |
| VLAN 50 vIP | 172.20.3.250 | /23 | N/A | N/A |
| VLAN 60 vIP | 172.20.6.250  \ | /24 | N/A | N/A |
| WLC1-Zg | Management | 172.20.7.94 | /27 | MANAGEMENT VLAN | 172.20.7.90 |
| AP | 172.20.7.30 | /27 | AP VLAN | 172.20.7.29 |
| wireless-zg | 172.20.3.253 | /23 | WIRELESS VLAN | 172.20.3.250 |
| guest-zg | 172.20.6.253 | /24 | GUEST VLAN | 172.20.6.250 |
| AP1-Zg | Fa1 | 172.20.7.5 | /27 | Connection to SW2-Zg | 172.20.7.29 |
| PCA | PC | 172.20.4.20 | /24 | N/A | 172.20.4.250 |
| PCB | PC | 172.20.5.30 | /24 | N/A | 172.20.5.250 |
| DHCP-SRV | Fa0/1 | 172.20.7.50 | /27 | N/A | 172.20.7.60 |
| RT1  -  Pl | Gig0/1.5 | 172.20.11.97 | /29 | VLAN AP | N/A |
| Gig0/1.6 | 172.20.11.105 | /29 | MANAGEMENT VLAN | N/A |
| Gig0/1.30 | 172.20.10.129 | /25 | STAFF VLAN | N/A |
| Gig0/1.50 | 172.20.9.1 | /24 | WIRELESS VLAN | N/A |
| Gig0/1.60 | 172.20.11.1 | /26 | Sh int GUEST VLAN | N/A |
| Gig0/2.102 | 10.0.0.2 | /30 | Connection to RT1-Zg | N/A |
| Gig0/2.203 | 10.0.0.9 | /30 | Connection to RT1-St | N/A |
| Lo0 | 172.20.8.1 | /24 | Engeniering Interface | N/A |
| Lo1 | 172.20.11.65 | /27 | Design Interface | N/A |
| Lo2 | 172.20.10.1 | /25 | Communication Interface | N/A |
| SW1-Pl | VLAN 6 | 172.20.11.  106 | /29 | Management Interface | 172.20.11.105 |
| AP1-Pl | Fa1 | 172.20.11.98 | /29 | Connection to SW1-Pl | 172.20.11.97 |
| PCC |  | 172.20.10.135 | /25 | Connection to SW1-Pl | 172.20.10.129 |
| RT1  -  St | Gig0/1.5 | 172.20.12.225 | /29 | AP’S VLAN | N/A |
| Gig0/1.6 | 172.20.12.233 | /29 | MANAGEMENT VLAN | N/A |
| Gig0/1.30 | 172.20.13.1 | /25 | STAFF VLAN | N/A |
| Gig0/1.50 | 172.20.13.129 | /25 | WIRELESS VLAN | N/A |
| Gig0/1.60 | 172.20.13.193 | /27 | GUEST VLAN | N/A |
| **Device** | **Interface** | **IP address** | **Prefix** | **Description** | **Gateway** |
|  | Gig0/2.103 | 10.0.0.6 | /30 | Connection to RT1-Zg | N/A |
| Gig0/2.203 | 10.0.0.10 | /30 | Connection to RT-Pl | N/A |
| Lo0 | 172.20.12.1 | /26 | Multimedia LAN | N/A |
| Lo1 | 172.20.12.65 | /26 | Design LAN | N/A |
| Lo2 | 172.20.12.129 | /26 | C | N/A |
| SW1-St | VLAN6 | 172.20.12.234 | /29 | Management Interface | 172.20.12.233 |
| AP1-St | Fa1 | 172.20.12.226 | /29 | Connection to SW1-St | 172.20.12.225 |
| PCD |  | 172.20.13.2 | /25 | Connection to SW1-St | 172.20.13.1 |

1. Record your IPV6 assign addresses in the table below using the link-local addresses for the inter-router connection

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Device** | **Interface** | **IP address** | **Prefix** | **Description** | **Gateway** |
| RT1  -  Zg | Gig0/0 | 2001:A:0:111::1 | /64 | Connection to MLS1-Zg | N/A |
| Gig0/1 | 2001:A:0:222::1 | /64 | Connection to MLS2-Zg | N/A |
| Gig0/2.102 | FE80::1 | /10 | Connection to RT1-Pl | N/A |
| Gig0/2.103 | FE80::1 | /10 | Connection to RT1-St | N/A |
| SW1-Zg | VLAN 6 | 2001:A:0:6::1 | /64 | MANAGEMENT VLAN | 2001:A:0:6::F |
| SW2-Zg | VLAN 6 | 2001:A:0:6::2 | /64 | MANAGEMENT VLAN | 2001:A:0:6::F |
| MLS1  -  Zg | Gig0/1 | 2001:A:0:111::2 | /64 | Connection to RT1-Zg | N/A |
| VLAN5 | 2001:A:0:5::1 | /64 | APs VLAN | N/A |
| VLAN6 | 2001:A:0:6::3 | /64 | MANAGEMENT VLAN | N/A |
| VLAN10 | 2001:A:0:10::1 | /64 | SERVERS VLAN | N/A |
| VLAN20 | 2001:A:0:20::1 | /64 | ADMIN VLAN | N/A |
| VLAN30 | 2001:A:0:30::1 | /64 | STAFF VLAN | N/A |
| VLAN40 | 2001:A:0:40::1 | /64 | VoIP VLAN | N/A |
| VLAN50 | 2001:A:0:50::1 | /64 | WIRELESS VLAN | N/A |
| VLAN60 | 2001:A:0:60::1 | /64 | GUEST VLAN | N/A |
| MLS2  -  Zg | Gig0/1 | 2001:A:0:222::2 | /64 | Connection to RT1-Zg | N/A |
| VLAN5 | 2001:A:0:5::2 | /64 | APs VLAN | N/A |
| VLAN6 | 2001:A:0:6::4 | /64 | MANAGEMENT VLAN | N/A |
| VLAN10 | 2001:A:0:10::2 | /64 | SERVERS VLAN | N/A |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Device** | **Interface** | **IP address** | **Prefix** | **Description** | **Gateway** |
|  | VLAN20 | 2001:A:0:20::2 | /64 | ADMIN VLAN | N/A |
| VLAN30 | 2001:A:0:30::2 | /64 | STAFF VLAN | N/A |
| VLAN40 | 2001:A:0:40::2 | /64 | VoIP VLAN | N/A |
| VLAN50 | 2001:A:0:50::2 | /64 | WIRELESS VLAN | N/A |
| VLAN60 | 2001:A:0:60::2 | /64 | GUEST VLAN | N/A |
| MLS1  -  Zg / MLS2  -  Zg | VLAN5 vIP | 2001:A:0:5::F | /64 | N/A | N/A |
| VLAN6 vIP | 2001:A:0:6::F | /64 | N/A | N/A |
| VLAN10 vIP | 2001:A:0:10::F | /64 | N/A | N/A |
| VLAN 20 vIP | 2001:A:0:20::F | /64 | N/A | N/A |
| VLAN 30 vIP | 2001:A:0:30::F | /64 | N/A | N/A |
| VLAN 40 vIP | 2001:A:0:40::F | /64 | N/A | N/A |
| VLAN 50 vIP | 2001:A:0:50::F | /64 | N/A | N/A |
| VLAN 60 vIP | 2001:A:0:60::F | /64 | N/A | N/A |
| WLC1-Zg | Management | 2001:A:0:6::10 | /64 | MANAGEMENT VLAN | 2001:A:0:6::F |
| AP-Manager | 2001:A:0:5::10 | /64 | APs VLAN | 2001:A:0:5::F |
| wireless-zg | 2001:A:0:50::10 | /64 | WIRELESS VLAN | 2001:A:0:50::F |
| guest-zg | 2001:A:0:60::10 | /64 | GUEST VLAN | 2001:A:0:60::F |
| AP1-Zg | Fa1 | 2001:A:0:5::50 | /64 | ACCESS POINT 1 Zg | 2001:A:0:5::F |
| PCA | PC | 2001:A:0:20::50 | /64 | N/A | 2001:A:0:20::F |
| PCB | PC | 2001:A:0:30::50 | /64 | N/A | 2001:A:0:30::F |
| DHCP-SRV | Fa0/1 | 2001:A:0:10::50 | /64 | N/A | 2001:A:0:10::F |
| RT1  -  Pl | Gig0/1.5 | 2001:B:5:: | /64 | VLAN AP | N/A |
| Gig0/1.6 | 2001:B:6:: | /64 | MANAGEMENT VLAN | N/A |
| Gig0/1.30 | 2001:B:30:: | /64 | STAFF VLAN | N/A |
| Gig0/1.50 | 2001:B:50:: | /64 | WIRELESS VLAN | N/A |
| Gig0/1.60 | 2001:B:60:: | /64 | GUEST VLAN | N/A |
| Gig0/2.102 | FE80::2:1 | /10 | Connection to RT1-Zg | N/A |
| Gig0/2.203 | FE80::2:1 | /10 | Connection to RT1-St | N/A |
| Lo0 | 2001:B:A:: | /64 | Engineering interface | N/A |
| Lo1 | 2001:B:1:: | /64 | Design interface | N/A |
| Lo2 | 2001:B:2:: | /64 | Communication interface | N/A |
| SW1-Pl | VLAN 6 | 2001:B:6::1 ?? | /64 | Management Interface | 2001:B:6:: ?? |
| **Device** | **Interface** | **IP address** | **Prefix** | **Description** | **Gateway** |
| AP1-Pl | Fa1 | 2001:B:5::1 ?? | /64 | Connection to SW1-Pl | 2001:B:5:: ?? |
| PCC | PC | 2001:B:30::1 ?? | /64 | Connection to SW1-Pl | 2001:B:30:: ?? |
| RT1  -  St | Gig0/1.5 | 2001:C:5:: | /64 | AP’S VLAN | N/A |
| Gig0/1.6 | 2001:C:6:: | /64 | MANAGEMENT VLAN | N/A |
| Gig0/1.30 | 2001:C:30:: | /64 | STAFF VLAN | N/A |
| Gig0/1.50 | 2001:C:50:: | /64 | WIRELESS VLAN | N/A |
| Gig0/1.60 | 2001:C:60:: | /64 | GUEST VLAN | N/A |
| Gig0/2.103 | FE80::3:1 | /10 | Connection to RT1-Zg | N/A |
| Gig0/2.203 | FE80::3:1 | /10 | Connection to RT-Pl | N/A |
| Lo0 | 2001:C:A:: | /64 | Multimedia LAN | N/A |
| Lo1 | 2001:C:1:: | /64 | Design LAN | N/A |
| Lo2 | 2001:C:2:: | /64 | Communication LAN | N/A |
| SW1-St | VLAN6 | 2001:C:6::1 ?? | /64 | Management Interface | 2001:C:6:: ?? |
| AP1-St | Fa1 | 2001:C:5::1 ?? | /64 | Connection to SW1-St | 2001:C:5:: ?? |
| PCD | PC | 2001:C:30::1 ?? | /64 | Connection to SW1-St | 2001:C:30:: ?? |

# Part 2: Clear Configs and Reload the Equipment

## Total points: 1

* Erase the startup configurations and VLANs from the router and switch and reload the devices.
* After the switch is reloaded, change the SDM template to one that supports IPv6 as necessary, and reload the switch again.

Register the commands used:

|  |  |
| --- | --- |
| **Task** | **IOS Command** |
| Erase the startup-config file on the Routers |  |
| Reload the Routers |  |
| Erase the startup-config file on the Switches |  |
| Delete the vlan.dat file on the Switches |  |
| Reload the Switches |  |

|  |  |
| --- | --- |
| **Task** | **IOS Command** |
| Verify the Switches SDM Template |  |
| Clear the WLC Config |  |
| Clear the APs Config |  |

# Part 3: Perform Equipment Initial Configuration

## Total points: 2

**Step 1: Configure on All Intermediary Devices:**

1. Disable DNS lookup
2. Change the hostname
3. Configure a domain name **isepacademy.ccna.itn.com**
4. Make sure that all configure passwords **must** be at least 10 characters long and encrypted in the running-config
5. Protect the console access the privileged EXEC with the password **classclass**
6. Create a user in the local user database named **cisco** and assign the password **classclass** to that user.
7. Make the necessary configuration to allow SSH connection to all the devices only for the previously configured user.
8. Configure the vty exec-timeout for 30 seconds
9. Protect the vty line against brute force for 3 attempts in 2 minutes then block it for 5 minutes
10. Configure a Message of the Day banner with a security warning of your choice.
11. Create a host table in each equipment (routers and switches) using the command **ip host.**

# Part 4: Enable EtherChannel Between MLSs

## Total points: 5

1. Configure the Gig0/2 e Gig0/3 from MLS1-Zg and MLS2-Zg to act as a single link providing redundancy and performance gain
2. The EtherChannel created must be Portchannel 1 and it shouldn’t use any dynamic protocol (PaGP or LaCP).

# Part 5: Configure VLANs, Trunks and Access Ports

## Total points: 10

1. Configure the following VLANs in all switches:
   * VLAN 5 name APs
   * VLAN 6 name MANAGEMENT
   * VLAN 7 name NATIVE
   * VLAN 10 name SERVERS
   * VLAN 20 name ADMINISTRATION
   * VLAN 30 name STAFF
   * VLAN 40 name VOIP
   * VLAN 50 name WIRELESS
   * VLAN 60 name GUESTS
   * VLAN 99 name BLACKHOLE
2. Configure trunks and access ports as described in the following table:

|  |  |  |
| --- | --- | --- |
| **Device** | **Ports** | **Configuration** |
| MLS1-Zg / MLS2-Zg | Po1 and Gig0/4 – Gig0/5 | Trunk allowing all VLANs with the exception of VLAN 99 |
| All unused ports should be shutdown | Access to VLAN 99 |
| SW1  -  Zg | Fa0/1 – F0/5 | Access to VLAN 10 |
| Fa0/6 – F0/13 | Access to VLAN 20, Voice VLAN 40 |
| Fa0/14 – F0/20 | Access to VLAN 30, Voice VLAN 40 |
| Gig0/1 – Gig0/2 | Trunk allowing all VLANs with the exception of VLAN 99 |
| All unused ports should be shutdown | Access to VLAN 99 |
| SW  2  -  Zg | Fa0/1 – F0/10 | Access to VLAN 20, Voice VLAN 40 |
| Fa0/11 – F0/20 | Access to VLAN 30, Voice VLAN 40 |
| Fa0/21 – Fa0/22 | Trunk allowing VLANs 5, 50 e 60, Native 5 |
| F0/23 | Trunk allowing all VLANs 5, 6, 50 e 60, Native 6 |
| Gig0/1 – Gig0/2 | Trunk allowing all VLANs with the exception of VLAN 99 |
| All unused ports should be shutdown | Access to VLAN 99 |
| SW1-Pl / SW1-St | F0/1 | Trunk allowing all VLANs |
| F0/2-15 | Access to VLAN 30 |
| Fa0/21 – Fa0/22 | Trunk allowing VLANs 5, 50 e 60, Native 5 |
| All unused ports should be shutdown | Access to VLAN 99 |

1. All trunk link should be configured with the NATIVE VLAN 7 unless specified otherwise.
2. Deactivate Dynamic Trunking Protocol (DTP) in all switching ports.
3. Remember to configure SW0 with the needed VLANs and Trunks

# Part 6: Configure IPv4 and IPv6 on the Interfaces

## Total points: 10

1. Configure all router interfaces and sub-interfaces with the IPv4 and IPv6 addresses previously defined.
2. Configure the Multi-Layer Switches routed-interfaces and switched virtual interfaces with the IPv4 and IPv6 addresses previously defined.
3. Configure the switches management VLAN with the IPv4 and IPv6 address and their gateways.
4. Configure all interfaces with and IPv6 link-local address.
5. Configure all interfaces with a description.

Use the ping command to test IPv4 and IPv6 connectivity between all network devices.

**Note**: If pings to host computers fail, temporarily disable the computer firewall and retest.

# Part 7: Adjust STP Configuration

## Total points: 5

1. Make MLS1-Zg the primary root bridge for VLANs 5, 6, 10, 20 and 30 and the secondary root bridge for VLANs 40, 50 and 60.
2. Make MLS2-Zg the primary root bridge for VLANs 40, 50, and 60 and the secondary root bridge for VLANs 5, 6, 10, 20 and 30
3. Enable Rapid Spanning Tree Protocol

# Part 8: Implement DHCPv4 and DHCPv6

## Total points: 12

1. The DHCP Server representation in Zagreb topology should be replaced by a router. In that router you must configure a DCHP Server for IPv4 and IPv6 for the Zagreb’s

ADMINISTRATION, STAFF, VOIP, WIRELESS-ZG and GUESTS-ZG networks.

**FAZER O LEASE EM EQUIPAMENTO**

1. RT1-Pl and RT1-St should act as the DCHP Server for IPv4 and IPv6 for the local STAFF, WIRELESS and GUESTS networks.

# Part 9: Configure First Hop Redundancy Protocol (HSRP)

## Total points: 10

1. MLS1-Zg must be configured as the active member of the Hot-Standby Routing Protocol for VLANs 5, 6, 10, 20 and 30 and standby member for VLANs 40, 50 and 60.
2. MLS2-Zg must be configured as the active member of the Hot-Standby Routing Protocol for VLANs 40, 50 and 60 and standby member for VLANs 5, 6, 10, 20, and 30.
3. Active members should be configured with preemption

# Part 10: Perform Security Configurations

## Total points: 8

1. Shutdown all unused ports.
2. Configure port-security in all switch ports configured as access to VLAN 10, 20 and 30 with the following requirements:
   * Maximum number of permitted mac-address: **5**
   * Action when a violation occurs: **shutdown**
   * Mac-address information should become invalid on a secured port after 5 minutes of inactivity **(O INACTIVITY NÃO DA PARA CONFIGURAR NNO PACKET TRACER)**
3. Configure DHCP snooping. Only the ports that need it should be configured as trusted, all other should be rate limited to 5 packets per second.  
   **(TA CONFIGURADO PARA TODAS AS INTERFACES DEPOIS REMOVER NAS TRSUTED)**
4. Configure dynamic arp inspection in all switch ports configured as access to VLAN 10, 20 and 30.
5. Configure all switch access ports to transfer immediately to the stp forwarding state.
6. Configure BPDU guards, as necessary, to protect the infrastructure against attackers trying to establish a trunk.

# Part 11: Configure Static Routes

## Total points: 10

1. Configure in each router in each location the necessary static routes to achieve full connectivity between them, using direct route as primary and the route through the other location as backup.

|  |  |  |
| --- | --- | --- |
| **Device** | **IPv4 Static Route** | **IPv6 Static Route** |
| RT1-Zg |  |  |
|  |  |
|  |  |
|  |  |
| RT1-Pl |  |  |
|  |  |
|  |  |
|  |  |
| RT1-St |  |  |
|  |  |
|  |  |  |
|  |  |

1. Configure floating static routes in Zagreb between RT1-Zg and MLS1-Zg and MLS2-Zg.
   * MLS1-Zg and MLS2-Zg should have a default route pointing to RT1-Zg
   * RT1-Zg should have active routes to APs, MANAGEMENT, SERVERS,

ADMINISTRATION and STAFF networks and backup routes to VOIP, WIRELESS and GUEST networks pointing to MLS1-Zg

* + RT1-Zg should have active routes to VOIP, WIRELESS and GUEST networks and backup routes to APs, MANAGEMENT, SERVERS, ADMINISTRATION and STAFF networks pointing to MLS2-Zg

# Part 12: Configure Multi-Location Wireless Deployment with WLC

## Total points: 15

a. Restart the WLC while connected through the console and press ESC key during boot to access the menu that will allow you to clear the configuration. (select option 5)

Booting Primary Image...

Press <ESC> now for additional boot options...

Boot Options

Please choose an option from below:

1. Run primary image (Version 7.0.98.0) (active)
2. Run backup image (Version 7.0.220.0)
3. Manually upgrade primary image
4. Change active boot image
5. Clear Configuration

Please enter your choice:

1. Create the initial configuration using the values presented in the next image.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Would you like to terminate autoinstall? [yes]: yes   |  | | --- | | **WLC1-Zg** |   System Name [Cisco\_31:c0:e0] (31 characters max):   |  | | --- | | **ciso** |   Enter Administrative User Name (24 characters max):   |  | | --- | | **Cisco1235** |  |  | | --- | | **Cisco1235** |   Enter Administrative Password (24 characters max): Re-enter Administrative Password : | | |
| Service interface IP Address Configuration [static][DHCP]:**<Enter>**   |  | | --- | | **<address previously defined from the MANAGEMENT vlan>** |   Management Interface IP Address:   |  | | --- | | **<network mask for the address>** |   Management Interface Netmask:   |  | | --- | | **<MANAGEMENT vlan default gateway>** |   Management Interface Default Router:  Management Interface VLAN Identifier (0 = untagged): **0**  Management Interface Port Num [1 to 8]: **1**   |  | | --- | | **<dhcp server address>** |   Management Interface DHCP Server IP Address:     |  | | --- | | **1.1.1.1** |   Virtual Gateway IP Address:     |  | | --- | | **cisco** |   Mobility/RF Group Name:     |  | | --- | | **WIRELESS-ZG** |   Network Name (SSID):     |  | | --- | | **NO** |   Configure DHCP Bridging Mode [yes][NO]:     |  | | --- | | **YES** |   Allow Static IP Addresses [YES][no]:     |  | | --- | | **NO** |   Configure a RADIUS Server now? [YES][no]:     |  | | --- | | **PT** |   Enter Country Code list (enter 'help' for a list of countries) [US]:     |  | | --- | | **YES** |   Enable 802.11b Network [YES][no]:   |  | | --- | | **YES** |   Enable 802.11a Network [YES][no]:   |  | | --- | | **YES** |   Enable 802.11g Network [YES][no]:   |  | | --- | | **YES** |   Enable Auto-RF [YES][no]:     |  | | --- | | **NO** |   Configure a NTP server now? [YES][no]:   |  | | --- | | **NO** |   Configure the system time now? [YES][no]:     |  | | --- | | **NO** |   Would you like to configure IPv6 parameters[YES][no]: | | |
| Configuration correct? If yes, system will save it and reset. [yes][NO]: | **YES** |  |

1. From PCA or PCB connect to the WLC1-Zg GUI, pointing the browser address bat to the management address configured. Use HTTP.
2. Connect to AP1-Zg using the console connection and turn on the device while pressing the mode button for 30 seconds to reset the configuration. Them enter the following commands:

Username: Cisco

Password: Cisco

> enable

Password: Cisco

# capwap ap ip address <ipaddress> <network mask>

# capwap ap ip default-gateway <default-gateway ip address>

# capwap ap controller ip address <management address configure on the wlc>

Note: The ip addresses used belong to the AP vlan from Zagred and have been define previously

1. Check the WLC GUI on the Wireless to verify if the AP was associated.
2. Repeat the following steps in both AP1-Pl and AP1-St.
3. Connect to the AP using the console connection and turn on the device while pressing the mode button for 30 seconds to reset the configuration. Them enter the following commands:

|  |
| --- |
| Username: Cisco  Password: Cisco > enable  Password: Cisco  # capwap ap ip address <ipaddress> <network mask>  # capwap ap ip default-gateway <default-gateway ip address>  # capwap ap controller ip address <management address configure on the wlc> |

Note: The IP addresses used belong to the AP vlan from Pula and Split and have been define previously

1. Once all three AP’s are associated with the WLC, start by configuring the AP Groups in the WLC GUI.
   * Zagreb-APs
   * Pula-APs
   * Split-APs
2. Configure interface for the local networks Wireless-Zg and Guests-Zg, under Controller > Interfaces.
   * Interface Name: wireless-Zg o VLAN Id: 50 o Port Number: 1 o IP Address: <previously defined> o Netmask: <previously defined> o Gateway: <previously defined> o Primary DHCP: <dhcp address>
   * Interface Name: guests-Zg o VLAN Id: 60 o Port Number: 1 o IP Address: <previously defined> o Netmask: <previously defined> o Gateway: <previously defined>
     + Primary DHCP: <dhcp address>
3. Next configure all SSIDs under the WLANs tab:
   * First edit the existing WIRELESS-ZG o General tab change the interface from management to wireless-zg o Security > Layer 2 tab change the Auth Key Mgmt from 802.1x to PSK and set

the password to **ciscocisco**

* + - Advanced tab select the FlexConnect Local Switching enable
  + Add a new wlan named GUESTS-ZG with a similar configuration
  + Add 4 more wlan named WIRELESS-Pl, GUESTS-Pl, WIRELESS-ST and GUESTS-St with the following configuration o General tab leave the interface in management and select the Status enable o Security > Layer 2 tab change the Auth Key Mgmt from 802.1x to PSK and set

the password to **ciscocisco** o Advanced tab select the FlexConnect Local Switching enable

1. Associate the newly created WLANs with the correspondent AP Groups under WLANs >

Advanced > AP Groups > WLANs

1. Configure the access points under Wireless tab.
   * Select all APs o Under the General tab change the name and the AP Mode to FlexConnect o Under the Advanced tab associate it to the correct AP Group Name o Under High Availability tab verify the name and address of the WLC o After the access points reboot select the AP again and under the FlexConnect tab select VLAN Support and change the Native VLAN to 5. Apply the configuration.
     + Return to the previous tab, then select VLAN Mapping to configure the correct VLAN for each SSID.

# Part 13: Test and Verify IPv4 and IPv6 End-to-End Connectivity

## Total points: 1

1. Use **ping** to verify connectivity:
2. Register the results

|  |  |  |  |
| --- | --- | --- | --- |
| **From** | **To** | **Ping Results IPv4** | **Ping Results IPv6** |
| PCA  *PC-A*  *PC-A*  *PC-A* | PCB |  |  |
| Local Wireless Host |  |  |
| Local Guest Host |  |  |
| PCC |  |  |
| **From** | **To** | **Ping Results IPv4** | **Ping Results IPv6** |
|  | PCD |  |  |
| Remote Wireless Host |  |  |
| Remote Guest Host |  |  |
| SW1-Zg Management |  |  |
| SW2-Zg Management |  |  |
| MLS1-Zg Management |  |  |
| MLS2-Zg Management |  |  |
| SW1-Pl Management |  |  |
| SW1-ST Management |  |  |

# Part 14: Export All Configurations

## Total points: 1

a. Export all intermediate devices configuration.