**Super Lab 1: HermesCerf Network Design**

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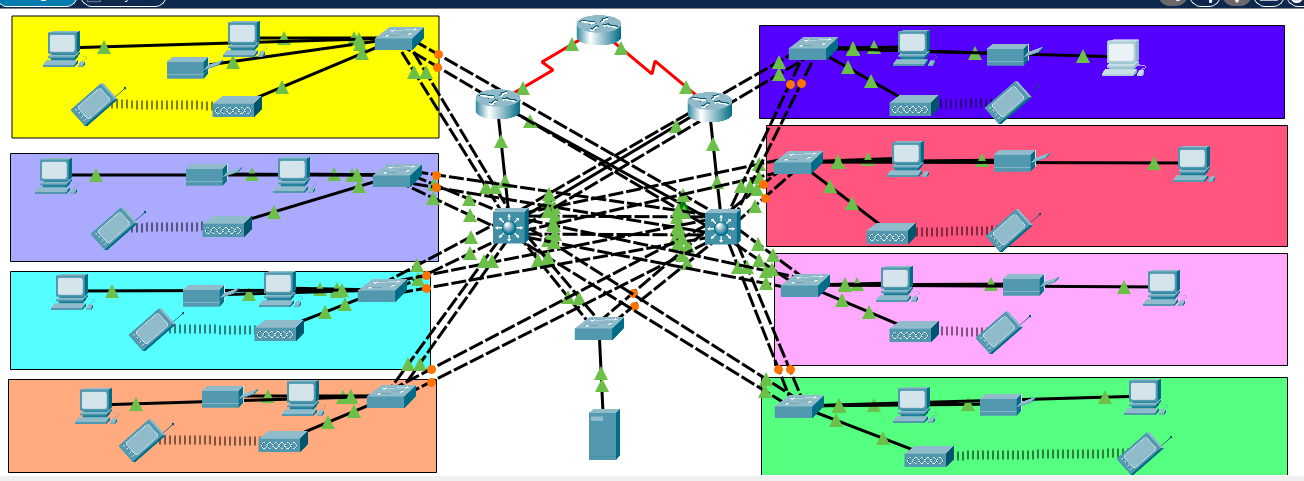
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# **Company Profile**



The HermesCerf IT Service & Consulting is a medium-sized IT services and consulting firm. It operates a network supports departmental VLANs, dynamic routing with OSPF, and VLSM-based efficient IP addressing. The topology showcases redundant edge routers and the utilization of a collapsed core model, with the edge routers feeding into two core multilayer switches, and distributed via location-based division access switches per floor.

# **IPv4 & IPv6 Addressing Scheme**

## **Software Engineering Department | VLAN 10**

**Address Block**: 10.10.10.0/24

**Network Address:** 10.10.10.0

**Subnet Mask**: 255.255.255.0

**Usable Host Range**: 10.10.10.1 – 10.10.10.254

**Broadcast Address**: 10.10.10.255

**Addressing Roles**:

* **HSRP VLAN 10**: 10.10.10.254
* **CoreSwitch1 VLAN 10 SVI**: 10.10.10.1
* **CoreSwitch2 VLAN 10 SVI:** 10.10.10.2

## **Infrastructure Department | VLAN 20**

**Address Block**: 10.10.20.0/24

**Network Address**: 10.10.20.0

**Subnet Mask**: 255.255.255.0

**Usable Host Range**: 10.10.20.1 – 10.10.20.254

**Broadcast Address:** 10.10.20.255

**Addressing Roles**:

* **HSRP VLAN 20**: 10.10.20.254
* **CoreSwitch1 VLAN 20 SVI**: 10.10.20.1
* **CoreSwitch2 VLAN 20 SVI:** 10.10.20.2

## **Technical Operations Department | VLAN 30**

**Address Block**: 10.10.30.0/27

**Network Address**: 10.10.30.0

**Subnet Mask:** 255.255.255.224

**Usable Host Range**: 10.10.30.1 – 10.10.30.30

**Broadcast Address**: 10.10.30.31

**Addressing Roles**:

* **HSRP VLAN 30**: 10.10.30.30
* **CoreSwitch1 VLAN 30 SVI**: 10.10.30.1
* **CoreSwitch2 VLAN 30 SVI:** 10.10.30.2

## **Sales & Marketing Department | VLAN 40**

**Address Block**: 10.10.40.0/26

**Network Address**: 10.10.40.0

**Subnet Mask**: 255.255.255.192

**Usable Host Range**: 10.10.40.1 – 10.10.40.62

**Broadcast Address**: 10.10.40.63

**Addressing Roles**:

* **HSRP VLAN 10**: 10.10.40.62
* **CoreSwitch1 VLAN 10 SVI**: 10.10.40.1
* **CoreSwitch2 VLAN 10 SVI:** 10.10.40.2

## **Customer Agents Department | VLAN 50**

**Address Block**: 10.10.50.0/24

**Network Address**: 10.10.50.0

**Subnet Mask**: 255.255.255.0

**Usable Host Range**: 10.10.50.1 – 10.10.50.254

**Broadcast Address**: 10.10.50.255

**Addressing Roles**:

* **HSRP VLAN 10**: 10.10.50.254
* **CoreSwitch1 VLAN 50 SVI**: 10.10.50.1
* **CoreSwitch2 VLAN 50 SVI:** 10.10.50.2

## **Accounting & Payroll Department | VLAN 60**

**Address Block**: 10.10.60.0/27

**Network Address**: 10.10.60.0

**Subnet Mask**: 255.255.255.224

**Usable Host Range**: 10.10.60.1 – 10.10.60.30

**Broadcast Address**: 10.10.60.31

**Addressing Roles**:

* **HSRP VLAN 60**: 10.10.60.30
* **CoreSwitch1 VLAN 60 SVI**: 10.10.60.1
* **CoreSwitch2 VLAN 60 SVI:** 10.10.60.2

## **Human Resources Department | VLAN 70**

**Address Block**: 10.10.70.0/26

**Network Address**: 10.10.70.0

**Subnet Mask**: 255.255.255.192

**Usable Host Range**: 10.10.70.1 – 10.10.70.62

**Broadcast Address**: 10.10.70.63

**Addressing Roles**:

* **HSRP VLAN 70**: 10.10.70.62
* **CoreSwitch1 VLAN 70 SVI**: 10.10.70.1
* **CoreSwitch2 VLAN 70 SVI:** 10.10.70.2

## **Procurement Department | VLAN 80**

**Address Block**: 10.10.80.0/27

**Network Address**: 10.10.80.0

**Subnet Mask**: 255.255.255.224

**Usable Host Range**: 10.10.80.1 – 10.10.80.30

**Broadcast Address**: 10.10.80.31

**Addressing Roles**:

* **HSRP VLAN 80**: 10.10.80.30
* **CoreSwitch1 VLAN 80 SVI**: 10.10.80.1
* **CoreSwitch2 VLAN 80 SVI:** 10.10.80.2

## **Network Management| VLAN 90**

**Address Block**: 10.10.90.0/24

**Network Address**: 10.10.90.0

**Subnet Mask**: 255.255.255.0

**Usable Host Range**: 10.10.90.1 - 10.10.90.254

**Broadcast Address**: 10.10.90.255

**Addressing Roles**:

* **HSRP VLAN 90**: 10.10.90.254
* **CoreSwitch1 VLAN 90 SVI**: 10.10.90.1
* **CoreSwitch2 VLAN 90 SVI:** 10.10.90.2

## **Servers | VLAN 100**

**Address Block**: 10.10.100.0/24

**Network Address**: 10.10.100.0

**Subnet Mask**: 255.255.255.0

**Usable Host Range**: 10.10.100.1 - 10.10.100.254

**Broadcast Address**: 10.10.100.255

**Addressing Roles**:

* **HSRP VLAN 10**: 10.10.100.254
* **CoreSwitch1 VLAN 10 SVI**: 10.10.100.1
* **CoreSwitch2 VLAN 10 SVI:** 10.10.100.2

## **Printers | VLAN 110**

**Address Block**: 10.10.110.0/24

**Network Address**: 10.10.110.0

**Subnet Mask**: 255.255.255.0

**Usable Host Range**: 10.10.110.1 - 10.10.110.254

**Broadcast Address**: 10.10.110.255

**Addressing Roles**:

* **HSRP VLAN 110**: 10.10.110.254
* **CoreSwitch1 VLAN 110 SVI**: 10.10.110.1
* **CoreSwitch2 VLAN 110 SVI:** 10.10.110.2

## **Wireless | VLAN 120**

**Address Block**: 10.10.120.0/24

**Network Address**: 10.10.120.0

**Subnet Mask**: 255.255.255.0

**Usable Host Range**: 10.10.120.1 - 10.10.120.254

**Broadcast address**: 10.10.120.255

**Addressing Roles**:

* **HSRP VLAN 10**: 10.10.120.254
* **CoreSwitch1 VLAN 120 SVI**: 10.10.120.1
* **CoreSwitch2 VLAN 120 SVI:** 10.10.120.2

## **Voice | VLAN 130**

**Address Block**: 10.10.130.0/24

**Network Address:** 10.10.130.0

**Subnet Mask**: 255.255.255.0

**Usable Host Range**: 10.10.130.1 – 10.10.130.254

**Broadcast Address**: 10.10.130.255

**Addressing Roles**:

* **HSRP VLAN 130**: 10.10.130.254
* **CoreSwitch1 VLAN 130 SVI**: 10.10.130.1
* **CoreSwitch2 VLAN 130 SVI:** 10.10.130.2

# **Device Connections in the Network Design**

Due to clutter try to practice the command “**show cdp neighbors**”to reveal the interfaces utilize in connecting the devices.

## **ISP Connections**

|  |  |  |
| --- | --- | --- |
| **ISP Interfaces** | **Connected Device & Its Interfaces** | **Network Address Block** |
| Se0/1/0 (201.0.113.1) | EdgeRouter1 Se0/1/0 (201.0.113.2) | 201.0.113.0/30 |
| Se0/1/1 (201.0.113.5) | EdgeRouter2 Se0/1/0 (201.0.113.6) | 201.0.113.4/30 |

## **EdgeRouter1 Connections**

|  |  |  |
| --- | --- | --- |
| **EdgeRouter1 Interfaces** | **Connected Device & Its Interfaces** | **Network Address Block** |
| Se0/1/0 (201.0.113.2) | ISP Se0/1/0 (201.0.113.1) | 201.0.113.0/30 |
| G0/0/0 (192.168.100.2) | CoreSwitch1 G1/0/1 (192.168.100.1) | 192.168.100.0/30 |
| G0/0/1 (192.168.200.2) | CoreSwitch2 G1/0/2 (192.168.200.1) | 192.168.200.0/30 |

## **EdgeRouter2 Connections**

|  |  |  |
| --- | --- | --- |
| **EdgeRouter2 Interfaces** | **Connected Devices & Their Interfaces** | **Network Address Block** |
| Se0/1/0 (201.0.113.6) | ISP Se0/1/1 (201.0.113.6) | 201.0.113.4/30 |
| G0/0/0 (192.168.100.6) | CoreSwitch2 G1/0/1 (192.168.100.5) | 192.168.100.4/30 |
| G0/0/1 (192.168.200.6) | CoreSwitch1 G1/0/2 (192.168.200.5) | 192.168.200.4/30 |

## **CoreSwitch1 Connections**

|  |  |  |
| --- | --- | --- |
| **CoreSwitch1 Interfaces** | **Connected Devices & Their Interfaces** | **Network Address Block** |
| G1/0/1 (192.168.100.1) | EdgeRouter1 G0/0/0 (192.168.100.2) | 192.168.100.0/30 |
| G1/0/2 (192.168.200.5) | EdgeRouter2 G0/0/1 (192.168.200.6) | 192.168.200.4/30 |
| G1/0/3-4 / Po1 (Trunk Port) | CoreSwitch2 G1/0/3-4 / Po1 (Trunk Port) | N/A |
| G1/0/5-6 / Po2 (Trunk Port) | AccessSwitch1 Fa0/1-2 / Po1 (Trunk Port) | N/A |
| G1/0/7-8 / Po3 (Trunk Port) | AccessSwitch2 Fa0/1-2 / Po1 (Trunk Port) | N/A |
| G1/0/9-10 / Po4 (Trunk Port) | AccessSwitch3 Fa0/1-2 / Po1 (Trunk Port) | N/A |
| G1/0/11-12 / Po5 (Trunk Port) | AccessSwitch4 Fa0/1-2 / Po1 (Trunk Port) | N/A |
| G1/0/13-14 / Po6 (Trunk Port) | AccessSwitch5 Fa0/1-2 / Po1 (Trunk Port) | N/A |
| G1/0/15-16 / Po7 (Trunk Port) | AccessSwitch6 Fa0/1-2 / Po1 (Trunk Port) | N/A |
| G1/0/17-18 / Po8 (Trunk Port) | AccessSwitch7 Fa0/1-2 / Po1 (Trunk Port) | N/A |
| G1/0/19-20 / Po9 (Trunk Port) | AccessSwitch8 Fa0/1-2 / Po1 (Trunk Port) | N/A |
| G1/0/21-22 / Po10 (Trunk Port) | AccessSwitch9 Fa0/1-2 / Po1 (Trunk Port) | N/A |

## **CoreSwitch2 Connections**

|  |  |  |
| --- | --- | --- |
| **CoreSwitch2 Interfaces** | **Connected Devices & Their Interfaces** | **Network Address Block** |
| G1/0/1 (192.168.100.5) | EdgeRouter2 G0/0/0 (192.168.100.6) | 192.168.100.4/30 |
| G1/0/2 (192.168.200.1) | EdgeRouter1 G0/0/1 (192.168.200.2) | 192.168.200.0/30 |
| G1/0/3-4 / Po1 (Trunk Port) | CoreSwitch1 G1/0/3-4 / Po1 (Trunk Port) | N/A |
| G1/0/5-6 / Po2 (Trunk Port) | AccessSwitch1 Fa0/3-4 / Po2 (Trunk Port) | N/A |
| G1/0/7-8 / Po3 (Trunk Port) | AccessSwitch2 Fa0/3-4 / Po2 (Trunk Port) | N/A |
| G1/0/9-10 / Po4 (Trunk Port) | AccessSwitch3 Fa0/3-4 / Po2 (Trunk Port) | N/A |
| G1/0/11-12 / Po5 (Trunk Port) | AccessSwitch4 Fa0/3-4 / Po2 (Trunk Port) | N/A |
| G1/0/13-14 / Po6 (Trunk Port) | AccessSwitch5 Fa0/3-4 / Po2 (Trunk Port) | N/A |
| G1/0/15-16 / Po7 (Trunk Port) | AccessSwitch6 Fa0/3-4 / Po2 (Trunk Port) | N/A |
| G1/0/17-18 / Po8 (Trunk Port) | AccessSwitch7 Fa0/3-4 / Po2 (Trunk Port) | N/A |
| G1/0/19-20 / Po9 (Trunk Port) | AccessSwitch8 Fa0/3-4 / Po2 (Trunk Port) | N/A |
| G1/0/21-22 / Po10 (Trunk Port) | AccessSwitch9 Fa0/3-4 / Po2 (Trunk Port) | N/A |

## **AccessSwitch1 Connections**

|  |  |  |
| --- | --- | --- |
| **AccessSwitch1 Interfaces** | **Connected Device & Their Interfaces** | **Network Address Block** |
| Fa0/1-2 / Po1 (Trunk Port) | CoreSwitch1 G1/0/5-6 / Po2 (Trunk Port) | N/A |
| Fa0/3-4 / Po2 (Trunk Port) | CoreSwitch2 G1/0/5-6 / Po2 (Trunk Port) | N/A |
| Fa0/5 (Access Port for VLAN 100) | DHCP Server Fa0 | N/A |
| Fa0/6 (Access Port for VLAN 100) | Unused | N/A |

## **AccessSwitch2 Connections**

|  |  |  |
| --- | --- | --- |
| **AccessSwitch2 Interfaces** | **Connected Device & Their Interfaces** | **Network Address Block** |
| Fa0/1-2 / Po1 (Trunk Port) | CoreSwitch1 G1/0/7-8 / Po3 (Trunk Port) | N/A |
| Fa0/3-4 / Po2 (Trunk Port) | CoreSwitch2 G1/0/7-8 / Po3 (Trunk Port) | N/A |
| Fa0/5-21 (Access Port for VLAN 10) | PCs | 10.10.10.0/24 |
| Fa0/22 (Access Port for VLAN 110 Printer) | Printer | 10.10.110.0/24 |
| Fa0/23 (Access Port for VLAN 130) | IP Phone | 10.10.130/24 |
| Fa0/24 (Access Port for VLAN 120) | Access Point | 10.10.120/24 |

## **AccessSwitch3 Connections**

|  |  |  |
| --- | --- | --- |
| **AccessSwitch3 Interfaces** | **Connected Device & Their Interfaces** | **Network Address Block** |
| Fa0/1-2 / Po1 (Trunk Port) | CoreSwitch1 G1/0/9-10 / Po4 (Trunk Port) | N/A |
| Fa0/3-4 / Po2 (Trunk Port) | CoreSwitch2 G1/0/9-10 / Po4 (Trunk Port) | N/A |
| Fa0/5-21 (Access Port for VLAN 20) | PCs | 10.10.20.0/24 |
| Fa0/22 (Access Port for VLAN 110 Printer) | Printer | 10.10.110.0/24 |
| Fa0/23 (Access Port for VLAN 130) | IP Phone | 10.10.130/24 |
| Fa0/24 (Access Port for VLAN 120) | Access Point | 10.10.120/24 |

## **AccessSwitch4 Connections**

|  |  |  |
| --- | --- | --- |
| **AccessSwitch4 Interfaces** | **Connected Device & Their Interfaces** | **Network Address Block** |
| Fa0/1-2 / Po1 (Trunk Port) | CoreSwitch1 G1/0/11-12 / Po5 (Trunk Port) | N/A |
| Fa0/3-4 / Po2 (Trunk Port) | CoreSwitch2 G1/0/11-12 / Po5 (Trunk Port) | N/A |
| Fa0/5-21 (Access Port for VLAN 30) | PCs | 10.10.30.0/27 |
| Fa0/22 (Access Port for VLAN 110 Printer) | Printer | 10.10.110.0/24 |
| Fa0/23 (Access Port for VLAN 130) | IP Phone | 10.10.130/24 |
| Fa0/24 (Access Port for VLAN 120) | Access Point | 10.10.120/24 |

## **AccessSwitch5 Connections**

|  |  |  |
| --- | --- | --- |
| **AccessSwitch5 Interfaces** | **Connected Device & Their Interfaces** | **Network Address Block** |
| Fa0/1-2 / Po1 (Trunk Port) | CoreSwitch1 G1/0/13-14 / Po6 (Trunk Port) | N/A |
| Fa0/3-4 / Po2 (Trunk Port) | CoreSwitch2 G1/0/13-14 / Po6 (Trunk Port) | N/A |
| Fa0/5-21 (Access Port for VLAN 40) | PCs | 10.10.40.0/26 |
| Fa0/22 (Access Port for VLAN 110 Printer) | Printer | 10.10.110.0/24 |
| Fa0/23 (Access Port for VLAN 130) | IP Phone | 10.10.130/24 |
| Fa0/24 (Access Port for VLAN 120) | Access Point | 10.10.120/24 |

## **AccessSwitch6 Connections**

|  |  |  |
| --- | --- | --- |
| **AccessSwitch6 Interfaces** | **Connected Device & Their Interfaces** | **Network Address Block** |
| Fa0/1-2 / Po1 (Trunk Port) | CoreSwitch1 G1/0/15-16 / Po7 (Trunk Port) | N/A |
| Fa0/3-4 / Po2 (Trunk Port) | CoreSwitch2 G1/0/15-16 / Po7 (Trunk Port) | N/A |
| Fa0/5-21 (Access Port for VLAN 50) | PCs | 10.10.50.0/24 |
| Fa0/22 (Access Port for VLAN 110 Printer) | Printer | 10.10.110.0/24 |
| Fa0/23 (Access Port for VLAN 130) | IP Phone | 10.10.130/24 |
| Fa0/24 (Access Port for VLAN 120) | Access Point | 10.10.120/24 |

## **AccessSwitch7 Connections**

|  |  |  |
| --- | --- | --- |
| **AccessSwitch7 Interfaces** | **Connected Device & Their Interfaces** | **Network Address Block** |
| Fa0/1-2 / Po1 (Trunk Port) | CoreSwitch1 G1/0/17-18 / Po8 (Trunk Port) | N/A |
| Fa0/3-4 / Po2 (Trunk Port) | CoreSwitch2 G1/0/17-18 / Po8 (Trunk Port) | N/A |
| Fa0/5-21 (Access Port for VLAN 60) | PCs | 10.10.60.0/27 |
| Fa0/22 (Access Port for VLAN 110 Printer) | Printer | 10.10.110.0/24 |
| Fa0/23 (Access Port for VLAN 130) | IP Phone | 10.10.130/24 |
| Fa0/24 (Access Port for VLAN 120) | Access Point | 10.10.120/24 |

## **AccessSwitch8 Connections**

|  |  |  |
| --- | --- | --- |
| **AccessSwitch8 Interfaces** | **Connected Device & Their Interfaces** | **Network Address Block** |
| Fa0/1-2 / Po1 (Trunk Port) | CoreSwitch1 G1/0/19-20 / Po9 (Trunk Port) | N/A |
| Fa0/3-4 / Po2 (Trunk Port) | CoreSwitch2 G1/0/19-20 / Po9 (Trunk Port) | N/A |
| Fa0/5-21 (Access Port for VLAN 70) | PCs | 10.10.70.0/26 |
| Fa0/22 (Access Port for VLAN 110 Printer) | Printer | 10.10.110.0/24 |
| Fa0/23 (Access Port for VLAN 130) | IP Phone | 10.10.130/24 |
| Fa0/24 (Access Port for VLAN 120) | Access Point | 10.10.120/24 |

## **AccessSwitch9 Connections**

|  |  |  |
| --- | --- | --- |
| **AccessSwitch9 Interfaces** | **Connected Device & Their Interfaces** | **Network Address Block** |
| Fa0/1-2 / Po1 (Trunk Port) | CoreSwitch1 G1/0/21-22 / Po10 (Trunk Port) | N/A |
| Fa0/3-4 / Po2 (Trunk Port) | CoreSwitch2 G1/0/21-22 / Po10 (Trunk Port) | N/A |
| Fa0/5-21 (Access Port for VLAN 80) | PCs | 10.10.80.0/27 |
| Fa0/22 (Access Port for VLAN 110 Printer) | Printer | 10.10.110.0/24 |
| Fa0/23 (Access Port for VLAN 130) | IP Phone | 10.10.130/24 |
| Fa0/24 (Access Port for VLAN 120) | Access Point | 10.10.120/24 |

# **ISP Configuration**

**hostname ISP**

**no ip domain lookup**

**ip routing**

**ipv6 unicast routing**

**int se0/1/0**

**description "Link to EdgeRouter1"**

**ip add 201.0.113.1 255.255.255.252**

**clock rate 1000000**

**no shutdown**

**exit**

**int se0/1/1**

**description "Link to EdgeRouter2"**

**ip add 201.0.113.5 255.255.255.252**

**clock rate 1000000**

**no shutdown**

**! simulate upstream internet for ipv4**

**ip route 0.0.0.0 0.0.0.0 null0**

# **Basic Configurations**

## **EdgeRouter1-2**

**No ip domain lookup**

**Hostname EdgeRouter<#> !1 or 2**

**Service password-encryption**

**Security passwords min-length 10**

**Enable secret ramcie12345**

**Login block-for 60 attempts 10 within 15**

**Ip routing**

**Spanning-tree mode rapid-pvst**

**Ip domain name ram-net.com**

**Username ramchi privilege 15 secret ramcie12345**

**Crypto key generate rsa general-keys modulus 1024**

**Line con 0**

**Logging synchronous**

**Password ramcie12345**

**Exec-timeout 1 30**

**Line vty 0 4**

**Logging synchronous**

**Transport input ssh**

**Password ramcie12345**

**Exec-timeout**

**Login local**

**! .4 for EdgeRouter2**

**Int loopback 0**

**Ip add 10.10.90.3 255.255.255.0**

### **Routed Ports to CoreSwitches & ISP in EdgeRouter1**

**int se0/1/0**

**description "Link to ISP for EdgeRouter1"**

**ip address 201.0.113.2 255.255.255.252**

**no shutdown**

### **int g0/0/0**

### **description "Link to CoreSwitch1"**

### **Ip address 192.168.100.2 255.255.255.252**

### **No shutdown**

### **int g0/0/1**

### **description "Link to CoreSwitch2"**

### **Ip address 192.168.200.2 255.255.255.252**

### **No shutdown**

### **Routed Ports to CoreSwitches & ISP in EdgeRouter2**

**int se0/1/0**

**description "Link to ISP for EdgeRouter2"**

**ip address 201.0.113.6 255.255.255.252**

**no shutdown**

**int g0/0/0**

**description "Link to CoreSwitch2"**

**Ip address 192.168.100.6 255.255.255.252**

**No shutdown**

**int g0/0/1**

**description "Link to CoreSwitch1"**

**Ip address 192.168.200.6 255.255.255.252**

**No shutdown**

## **CoreSwitch1-2**

**No ip domain lookup**

**Hostname CoreSwitch<#> !1 or 2**

**Service password-encryption**

**Enable secret ramcie12345**

**Login block-for 60 attempts 10 within 15**

**Ip routing**

**Spanning-tree mode rapid-pvst**

**Ip domain name ram-net.com**

**Username ramchi privilege 15 secret ramcie12345**

**Crypto key generate rsa general-keys modulus 1024**

**Line con 0**

**Logging synchronous**

**Password ramcie12345**

**Exec-timeout 1 30**

**Line vty 0 4**

**Logging synchronous**

**Transport input ssh**

**Password ramcie12345**

**Exec-timeout 1 30**

**Login local**

**! Use int vlan 90 for SSH**

### **Routed Ports to EdgeRouters in CoreSwitch1**

**int g1/0/1**

**Description “Link to EdgeRouter1”**

**No switchport**

**Ip address 192.168.100.1 255.255.255.252**

**no sh**

**int range g1/0/2**

**description "Link to EdgeRouter2"**

**No switchport**

**ip add 192.168.200.5 255.255.255.252**

**no sh**

### **Routed Ports to EdgeRouters in CoreSwitch2**

**int g1/0/1**

**Description “Link to EdgeRouter2”**

**no switchport**

**Ip address 192.168.100.5 255.255.255.252**

**no sh**

**int range g1/0/2**

**description "Link to EdgeRouter1"**

**no switchport**

**ip add 192.168.200.5 255.255.255.252**

**no sh**

## **AccessSwitch1-9**

**No ip domain lookup**

**Hostname AccessSwitch<#> !1-9**

**Service password-encryption**

**Enable secret ramcie12345**

**Login block-for 60 attempts 10 within 15**

**Ip routing**

**Spanning-tree mode rapid-pvst**

**Ip domain name ram-net.com**

**Username ramchi privilege 15 secret ramcie12345**

**Crypto key generate rsa general-keys modulus 1024**

**Line con 0**

**Logging synchronous**

**Password ramcie12345**

**Exec-timeout 1 30**

**Line vty 0 4**

**Logging synchronous**

**Transport input ssh**

**Password ramcie12345**

**Exec-timeout 1 30**

**Login local**

**! For remote network management**

**!increment by 1 as you go**

**Int vlan 90**

**Ip add 10.10.90.13 255.255.255.0**

**Exit**

**Ip default-gateway 10.10.90.254**

# **VLAN Configurations (SVI, Nomenclature, Trunk & Access Ports)**

## **CoreSwitch1-2**

**! on CoreSwitch use .2**

**int vlan 10**

**description "Software Engineering VLAN"**

**ip address 10.10.10.1 255.255.255.0**

**int vlan 20**

**description "Infrastructure VLAN"**

**ip address 10.10.20.1 255.255.255.0**

**int vlan 30**

**description "Technical Operations VLAN"**

**ip address 10.10.30.1 255.255.255.224**

**int vlan 40**

**description "Sales & Marketing VLAN"**

**ip address 10.10.40.1 255.255.255.192**

**int vlan 50**

**description "Customer Agents VLAN"**

**ip address 10.10.50.1 255.255.255.0**

**int vlan 60**

**description "Accounting & Payroll VLAN"**

**ip address 10.10.60.1 255.255.255.224**

**int vlan 70**

**description "Human Resources VLAN"**

**ip address 10.10.70.1 255.255.255.192**

**int vlan 80**

**description "Procurement VLAN"**

**ip address 10.10.80.1 255.255.255.240**

**int vlan 90**

**description "Network Management VLAN"**

**ip addess 10.10.90.1 255.255.255.0**

**int vlan 100**

**description "Servers VLAN"**

**ip add 10.10.100.1 255.255.255.0**

**int vlan 110**

**description "Printers VLAN"**

**ip add 10.10.110.1 255.255.255.0**

**int vlan 120**

**description "Wireless VLAN"**

**ip add 10.10.120.1 255.255.255.0**

**int vlan 130**

**description "Voice VLAN"**

**ip add 10.10.130.1 255.255.255.0**

**vlan 10**

**name "Software Engineering"**

**vlan 20**

**name "Infrastructure"**

**vlan 30**

**name "Technical Operations"**

**vlan 40**

**name "Sales & Marketing"**

**vlan 50**

**name "Customer Agents"**

**vlan 60**

**name "Accounting & Payroll"**

**vlan 70**

**name "Human Resources"**

**vlan 80**

**name "Procurement"**

**vlan 90**

**name "Network Management"**

**vlan 100**

**name "Servers"**

**vlan 110**

**name "Printers"**

**vlan 120**

**name "Wireless"**

**vlan 30**

**name "Voice"**

**int range g1/0/3-22**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

## **AccessSwitch1-9**

**vlan 10**

**name "Software Engineering"**

**vlan 20**

**name "Infrastructure"**

**vlan 30**

**name "Technical Operations"**

**vlan 40**

**name "Sales & Marketing"**

**vlan 50**

**name "Customer Agents"**

**vlan 60**

**name "Accounting & Payroll"**

**vlan 70**

**name "Human Resources"**

**vlan 80**

**name "Procurement"**

**vlan 90**

**name "Network Management"**

**vlan 100**

**name "Servers"**

**vlan 110**

**name "Printers"**

**vlan 120**

**name "Wireless"**

**vlan 130**

**name "Voice"**

**int range fa0/1-4**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

**int fa0/5-21**

**switchport mode access**

**switchport access vlan <10 – 80, 100>**

**spanning-tree portfast**

**spanning-tree bpduguard enable**

**int fa0/22**

**switchport mode access**

**switchport access vlan 110**

**spanning-tree portfast**

**spanning-tree bpduguard enable**

**int fa0/23**

**switchport mode access**

**switchport access vlan 110**

**switchport voice vlan 130**

**spanning-tree portfast**

**spanning-tree bpduguard enable**

**int fa0/24**

**switchport mode access**

**switchport access vlan 120**

**spanning-tree portfast**

**spanning-tree bpduguard enable**

# **DHCP Configurations**

## **Server**

**Statically configure**

**IP address:** 10.10.100.3

**Subnet mask**: 255.255.255.0

**Default-gateway**: 10.10.100.254

**DNS**: 8.8.8.8

**Pool name:** SoftwareEngineering\_Pool

**Default gateway**: 10.10.10.254

**DNS**: 8.8.8.8

**Start IP address**: 10.10.10.3

**Subnet mask**: 255.255.255.0

**Maximum no. of users**: 250

**Pool name:** Infrastructure\_Pool

**Default gateway**: 10.10.20.254

**DNS**: 8.8.8.8

**Start IP address**: 10.10.20.3

**Subnet mask**: 255.255.255.0

**Maximum no. of users**: 250

**Pool name:** TechnicalOps\_Pool

**Default gateway**: 10.10.30.30

**DNS**: 8.8.8.8

**Start IP address**: 10.10.10.3

**Subnet mask**: 255.255.255.224

**Maximum no. of users**: 27

**Pool name:** Sales&Marketing\_Pool

**Default gateway**: 10.10.40.62

**DNS**: 8.8.8.8

**Start IP address**: 10.10.40.3

**Subnet mask**: 255.255.255.192

**Maximum no. of users**: 59

**Pool name:** CustomerAgents\_Pool

**Default gateway**: 10.10.50.254

**DNS**: 8.8.8.8

**Start IP address**: 10.10.50.3

**Subnet mask**: 255.255.255.0

**Maximum no. of users**: 250

**Pool name:** Accounting&Payroll\_Pool

**Default gateway**: 10.10.60.30

**DNS**: 8.8.8.8

**Start IP address**: 10.10.60.3

**Subnet mask**: 255.255.255.224

**Maximum no. of users**: 27

**Pool name:** HR\_Pool

**Default gateway**: 10.10.70.62

**DNS**: 8.8.8.8

**Start IP address**: 10.10.70.3

**Subnet mask**: 255.255.255.192

**Maximum no. of users**: 59

**Pool name:** Procurement\_Pool

**Default gateway**: 10.10.80.30

**DNS**: 8.8.8.8

**Start IP address**: 10.10.80.3

**Subnet mask**: 255.255.255.224

**Maximum no. of users**: 27

**Pool name:** Printer\_Pool

**Default gateway**: 10.10.110.254

**DNS**: 8.8.8.8

**Start IP address**: 10.10.110.3

**Subnet mask**: 255.255.255.0

**Maximum no. of users**: 250

**Pool name:** Wireless\_Pool

**Default gateway**: 10.10.120.254

**DNS**: 8.8.8.8

**Start IP address**: 10.10.120.3

**Subnet mask**: 255.255.255.0

**Maximum no. of users**: 250

**Pool name:** Voice\_Pool

**Default gateway**: 10.10.130.254

**DNS**: 8.8.8.8

**Start IP address**: 10.10.130.3

**Subnet mask**: 255.255.255.0

**Maximum no. of users**: 250

## **CoreSwitch1-2**

**Int vlan 10**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 20**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 30**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 40**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 50**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 60**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 70**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 80**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 90**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 100**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 110**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 120**

**Ip dhcp helper-address 10.10.100.3**

**Int vlan 130**

**Ip dhcp helper-address 10.10.100.3**

# **EtherChannel**

## **CoreSwitch1-2**

**int range g1/0/3-4**

**channel-group 1 mode active**

**int po1**

**switchport trunk native vlan 90**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,100,110,120,130**

**int range g1/0/5-6**

**channel-group 2 mode active**

**int po2**

**description "Etherchannel link to CoreSwitch"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,100,110,120,130**

**int range g1/0/7-8**

**channel-group 3 mode active**

**int po3**

**description "Etherchannel link to AccessSwitch2"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

**int range g1/0/9-10**

**channel-group 4 mode active**

**int po4**

**description "Etherchannel link to AccessSwitch3"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

**int range g1/0/11-12**

**channel-group 5 mode active**

**int po5**

**description "Etherchannel link to AccessSwitch4"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

**int range g1/0/13-14**

**channel-group 6 mode active**

**int po6**

**description "Etherchannel link to AccessSwitch5"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

**int range g1/0/15-16**

**channel-group 7 mode active**

**int po7**

**description "Etherchannel link to AccessSwitch6"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

**int range g1/0/17-18**

**channel-group 8 mode active**

**int po8**

**description "Etherchannel link to AccessSwitch7"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

**int range g1/0/19-20**

**channel-group 9 mode active**

**int po9**

**description "Etherchannel link to AccessSwitch8"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

**int range g1/0/21-22**

**channel-group 10 mode active**

**int po10**

**description "Etherchannel link to AccessSwitch9"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

## **AccessSwitch1-9**

**int range fa0/1-2**

**channel-group 1 mode active**

**int po1**

**description "Etherchannel link2 to CoreSwitch1"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

**int range fa0/3-4**

**channel-group 2 mode active**

**int po2**

**description "Etherchannel link to CoreSwitch2"**

**switchport mode trunk**

**switchport trunk allowed vlan 10,20,30,40,50,60,70,80,90,100,110,120,130**

# **HSRP Configurations**

## **CoreSwitch1-2**

**! Use 100 on CoreSwitch2**

**interface vlan 10**

**standby 1 ip 10.10.10.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 20**

**standby 1 ip 10.10.20.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 30**

**standby 1 ip 10.10.30.30**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 40**

**standby 1 ip 10.10.40.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 50**

**standby 1 ip 10.10.50.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 60**

**standby 1 ip 10.10.60.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 70**

**standby 1 ip 10.10.70.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 80**

**standby 1 ip 10.10.80.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 90**

**standby 1 ip 10.10.90.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 100**

**standby 1 ip 10.10.100.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 110**

**standby 1 ip 10.10.110.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 120**

**standby 1 ip 10.10.120.254**

**standby 1 priority 110**

**standby 1 preempt**

**interface vlan 130**

**standby 1 ip 10.10.130.254**

**standby 1 priority 110**

**standby 1 preempt**

# **STP Configurations**

## **On CoreSwitch1**

**spanning-tree vlan 10 root primary**

**spanning-tree vlan 20 root primary**

**spanning-tree vlan 30 root primary**

**spanning-tree vlan 40 root primary**

**spanning-tree vlan 50 root primary**

**spanning-tree vlan 60 root primary**

**spanning-tree vlan 70 root primary**

**spanning-tree vlan 80 root primary**

**spanning-tree vlan 90 root primary**

**spanning-tree vlan 100 root primary**

**spanning-tree vlan 110 root primary**

**spanning-tree vlan 120 root primary**

**spanning-tree vlan 130 root primary**

## **On CoreSwitch2**

**spanning-tree vlan 10 root secondary**

**spanning-tree vlan 20 root secondary**

**spanning-tree vlan 30 root secondary**

**spanning-tree vlan 40 root secondary**

**spanning-tree vlan 50 root secondary**

**spanning-tree vlan 60 root secondary**

**spanning-tree vlan 70 root secondary**

**spanning-tree vlan 80 root secondary**

**spanning-tree vlan 90 root secondary**

**spanning-tree vlan 100 root secondary**

**spanning-tree vlan 110 root secondary**

**spanning-tree vlan 120 root secondary**

**spanning-tree vlan 130 root secondary**

# **Single-Area OSPF and Default Routes**

## **On EdgeRouter1**

**route ospf 10**

**router-id 100.100.100.100**

**network 192.168.100.0 0.0.0.3 area 0**

**network 192.168.200.0 0.0.0.3 area 0**

**network 10.10.90.0 0.0.0.255 area 0**

**ip route 0.0.0.0 0.0.0.0 201.0.113.1**

## **On EdgeRouter2**

**router ospf 10**

**router-id 200.200.200.200**

**network 192.168.100.4 0.0.0.3 area 0**

**network 192.168.200.4 0.0.0.3 area 0**

**network 10.10.90.0 0.0.0.255 area0**

**ip route 0.0.0.0 0.0.0.0 201.0.113.4**

## **On CoreSwitch1**

**router ospf 10**

**router-id 111.111.111.111**

**network 192.168.100.0 0.0.0.3 area 0**

**network 192.168.200.4 0.0.0.3 area 0**

**network 10.10.10.0 0.0.0.255 area 0**

**network 10.10.20.0 0.0.0.255 area 0**

**network 10.10.30.0 0.0.0.31 area 0**

**network 10.10.40.0 0.0.0.63 area 0**

**network 10.10.50.0 0.0.0.255 area 0**

**network 10.10.60.0 0.0.0.31 area 0**

**network 10.10.70.0 0.0.0.63 area 0**

**network 10.10.80.0 0.0.0.15 area 0**

**network 10.10.90.0 0.0.0.255 area 0**

**network 10.10.100.0 0.0.0.255 area 0**

**network 10.10.110.0 0.0.0.255 area 0**

**network 10.10.120.0 0.0.0.255 area 0**

**network 10.10.130.0 0.0.0.255 area 0**

## **On CoreSwitch2**

**router ospf 10**

**router-id 222.222.222.222**

**network 192.168.100.4 0.0.0.3 area 0**

**network 192.168.200.0 0.0.0.3 area 0**

**network 10.10.10.0 0.0.0.255 area 0**

**network 10.10.20.0 0.0.0.255 area 0**

**network 10.10.30.0 0.0.0.31 area 0**

**network 10.10.40.0 0.0.0.63 area 0**

**network 10.10.50.0 0.0.0.255 area 0**

**network 10.10.60.0 0.0.0.31 area 0**

**network 10.10.70.0 0.0.0.63 area 0**

**network 10.10.80.0 0.0.0.15 area 0**

**network 10.10.90.0 0.0.0.255 area 0**

**network 10.10.100.0 0.0.0.255 area 0**

**network 10.10.110.0 0.0.0.255 area 0**

**network 10.10.120.0 0.0.0.255 area 0**

**network 10.10.130.0 0.0.0.255 area 0**

# **ACLs, NAT and PAT**

## **On EdgeRouter1-2**

**access-list 10 permit 10.10.0.0 0.0.255.255**

**ip access-list extended EDGE\_INBOUND**

**remark Permit established replies and SSH from admin net**

**permit tcp any any established**

**permit icmp any any**

**deny ip any 10.10.0.0 0.0.255.255**

**permit ip any any**

**ip nat inside source list 10 interface se0/1/0 overload**

**int se0/1/0**

**ip nat outside**

**ip access-group EDGE\_INBOUND in**

**int g0/0/0**

**ip nat inside**

**int g0/0/1**

**ip nat inside**

# **Port Security Configurations**

# **AccessSwitch1**

**Int range fa0/5**

**Switchport port-security**

**Switchport port-security maximum 1**

**Switchport port-security mac-address sticky**

**Switchport port-security violation shutdown**

**End**

**Copy run start**

# **AccessSwitch2-9**

**Int range fa0/5-22**

**Switchport port-security**

**Switchport port-security maximum 1**

**Switchport port-security mac-address sticky**

**Switchport port-security violation shutdown**

**!If there is voice**

**Int fa0/23**

**Switchport port-security**

**Switchport port-security maximum 2**

**Switchport port-security mac-address sticky**

**Switchport port-security violation protect**

**! IF there is for wireless**

**Int fa0/24**

**Switchport port-security**

**Switchport port-security maximum 30**

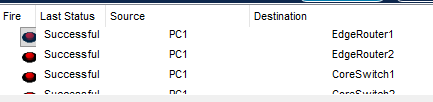
**Switchport port-security mac-address sticky**

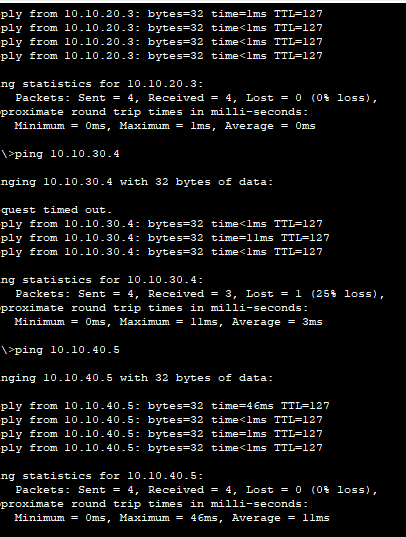
**Switchport port-security violation shutdown**

**Switchport port-security aging time 60**

**Switchport port-security aging type inactivity (if available)**

# **Check-ups**



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