**Network Upgrade Plan**

Introduction:

After evaluating the current network. And after visiting the company site. I’m providing in this report information about upgrading and improving the current network.

Status que:

1. the company based in tree levels in a building. Due to building age and infrastructure, the network is poor because of the old used materials, cabling and connectivity.
2. The company has one server only was created when the company established. After the company has branched out, more servers should be implemented for network stability and speed.
3. Connectivity by cabling only. There is no wireless connection.
4. The HR department is hiring more employees. That led us to provide more IPs for each one (more security and protection between departments and employees).

Requirements:

1. The new network needs several servers like (DNS, DHCP, MAIL server and File server).
2. DHCP servers are required to provide all networked devices with a dynamic IP address.
3. Provided network with class B to cover the new requirements.
4. The company needs more secure and reliable connection.
5. Each department is required to have a wireless network for the users.
6. The network is also expected to connect to at least two ISPs to provide redundancy and each router to the connected to the two ISPs. Redundancy should be in each layer.
7. Each department should belong to a unique VLAN and separate subnetwork.
8. Set up the standard settings for the device, including hostnames, console password, enable password, banner messages, and disable IP domain lookup.
9. Each multilayer switch must be set for inter-VLAN routing for the devices in all departments to communicate with one another.
10. The multilayer switches are designed to perform switching and routing operations.

Network Design:

Diagram

Description automatically generated

Addressing and Subnetting: NETWORK ID: 172.16.1.0

Lower-level LAN:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | # of end devices | Network-address | Subnet-mask | Rang | Broadcast |
| Sales | 120 | 172.16.1.0/25 | 255.255.255.128/25 | 172.16.1.1 – 172.16.1.126 | 172.16.1.127 |
| HR | 120 | 172.16.1.128/25 | 255.255.255.128/25 | 172.16.1.129 – 172.16.1.254 | 172.16.1.255 |

Mid-level LAN:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | # of end devices | Network-address | Subnet-mask | Rang | Broadcast |
| Finance | 120 | 172.16.2.0/25 | 255.255.255.128/25 | 172.16.2.1 – 172.16.2.126 | 172.16.2.127 |
| Admin | 120 | 72.16.2.128/25 | 255.255.255.128/25 | 172.16.2.129– 172.16.2.254 | 172.16.2.255 |

Upper- level LAN:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Name | # of end devices | Network-address | Subnet-mask | | Rang | Broadcast |
| Management | 120 | 172.16.3.0/25 | | 255.255.255.128/25 | 172.16.3.1 – 172.16.3.126 | 172.16.3.127 |
| Servers | 12 | 72.16.3.128/28 | 255.255.255.240/28 | | 172.16.3.129- 172.16.3.142 | 172.16.3.143 |

Routers and L3 switches:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Network-address | Subnet-mask | Rang | Broadcast |
| R1-MLSW1 | 172.16.3.144 | 255.255.255.252 | 172.16.3.145-172.16.3.146 | 172.16.3.147 |
| R1-MLSW2 | 172.16.3.148 | 255.255.255.252 | 172.16.3.149-172.16.3.150 | 172.16.3.151 |
| R2-MLSW1 | 172.16.3.152 | 255.255.255.252 | 172.16.3.153-172.16.3.154 | 172.16.3.155 |
| R2-MLSW2 | 172.16.3.156 | 255.255.255.252 | 172.16.3.157-172.16.3.158 | 172.16.3.159 |

Router and ISPs:

Public IP addresses 195.136.17.0/30 -- 195.136.17.4/30 -- 195.136.17.8/30 -- 195.136.17.12/30.

Future upgrade:

This design is the current network design with the future recommended upgrade. We adhere to apply advanced component and technology to get the most use of the current network and adding the essential requirement.

Please note these settings apply for future upgrade which mean we allocate spare IPs.

Cost estimation:

|  |  |  |  |
| --- | --- | --- | --- |
| Component name | Number of devices required | Estimated cost in $ | Total cost in $ |
| Router | 2 | 220 | 440 |
| Multilayer Switch | 2 | 160 | 320 |
| Switches | 6 | 100 | 600 |
| Wireless access point | 5 | 90 | 450 |
| Serial cable | 2 | 5 | 10 |
| Ethernet cable | 200 | 10 | 2000 |
| Labour cost |  |  | 4500 |
| Total cost |  |  | 8320 |

Report and Documentation:

After our first visit to the site, we analyze the current network and what is the possibility to reuse the actual components. The current network has many problems in terms of security and reliability.

In this report we proposed the exact requirement to meet your future needs.

Finally, the provided cost was estimated depends on the actual market price.