Administration of system & network Group Project   
Network design for AAU CBE/FBE Campus

|  |  |
| --- | --- |
| Group Members | |
| Name | ID |
| Surafel Sisay | UGR/0475/13 |
| Tinsae Aschalew | **UGR/2286/13** |
| Rayemeriyam Meskele | **UGR/8108/13** |
| Jemila Yeshaw | **UGR/7292/13** |
| Shegaw Mulatu | UGR/3170/13 |
| Biruk | UGR/----/13 |
| Tariku Meselle | ---- |

Submitted to: Dr. Workshet Lamenew

I. Device Requirements

* 1. Switches
     1. We have total 26 switches
     2. Configurations made on the switches
        1. We created the vlans on the switches
           1. Switch# config t

Switch(config)# vlan vlan\_id  
switch(config-vlan)# name vlan\_name  
switch(config-vlan)# exit

* + - 1. Then we assigned the vlans created on the switch an ip address(IP for the vlans)
         1. Switch# config t  
            Switch(config)# interface vlan vlan\_id  
            Switch(config-if) ip address network\_address sunbent\_mask  
            Switch(config-if) no shutdown
      2. We assign which ports belongs to which vlan
         1. Switch# config t

Switch(config)# int fa0/int\_no

Switch(config-if) switchport mode access  
Switch(config-if) switchport access vlan vla\_id

Switch(config-if) end

* + - 1. We created trunk port
         1. Switch# config t

Switch(config)# int gb0/int\_no //the port we wanna make trunk

Switch(config-if) switchport mode trunk  
Switch(config-if) switchport trunk allowed vlan 1-range

Switch(config-if) end

* 1. Core switches
     1. We have 1 core switches for our campus
     2. The core switch is connected to the router, and each switches
     3. Configurations made on the core switches
        1. We created the vlans on the switches
           1. Switch# config t

Switch(config)# vlan vlan\_id  
switch(config-vlan)# name vlan\_name  
switch(config-vlan)# exit

* + - 1. We created trunk ports
         1. Switch#config t  
            switch(config)# int fa0/int\_no  
            Switch(config-if)#switchport trunk encapsulation dot1Q  
            Switch(config-if)#switchport mode trunk  
            Switch(config-if)#switchport trunk allowed vlan 1-range  
            Switch(config-if)#switchport trunk encapsulation dot1Q  
            Switch(config-if)#end
  1. Router
     1. We have 1 router
     2. Configurations made on the router
        1. We configured different sub-interfaces on a router (that single base interface enable us to carry traffic for different vlans)
           1. Router# config   
              Router(config)# interface gig0/0/0.1   
              Router(config-subif)# ip address default\_gateway\_of\_the\_vlan sunbent\_mask  
              Router(config-subif)#encapsulation dot1Q vlan\_id
        2. We also configured the DHCP on the router
           1. Router# config  
              Router(config)#ip dhcp pool pool\_name  
              Router(dhcp-config)# network network\_address subnet\_mask  
              Router(dhcp-config)# default-router default-address
        3. Then we gave an IP address for the interfaces
           1. Router# config   
              Router(config)# interface gig0/0/0.1   
              Router(config-subif)# ip address default\_gateway\_of\_the\_vlan sunbent\_mask
        4. We configured DNS on router (DHCP)
           1. Router# config t  
              Router(config-t)# ip name-server DNS\_server\_IP\_address
  2. Servers
     1. For service requirements we have 4 servers that provide web, DNS, mail, and FTP services. But beside these services we also provide services such as online teaching and learning, internet service in general including social media and so on.
     2. We have 4 servers
        1. Web server
           1. Configurations made on the web server

We assigned it an IP statically

We modified the index.html file on the HTTP services

When a user want to access the index.htm file he can go to the web browser on the desktop and insert the web server IP address

* + - 1. DNS server
         1. Configurations made on the web server

We assigned it an IP statically

On the DNS services we mapped an ip address of the web server with its domain name

When a user want to access the index.htm file he can go to the web browser on the desktop and insert the web server domain name

* + - 1. Mail server
         1. Configurations made on the web server

We assigned it an IP statically

On the EMAIL services we created a domain name(gmail.com) and users with password

* + - * 1. The we created user email account in users pc using desktop then Email

name, email address (@gmail.com)

Incoming and outgoing mail server = mail\_server’s IP address

User name and password

* + - 1. FTP server
         1. Configurations made on the web server

We assigned it an IP statically

On the FTP services we created a user with password and gave them an access a user privileges.

To access the files we go to the user PC then in the command prompt

dir

ftp ip\_address of FTP\_server

username:

password:

dir

get file\_name

* 1. Access points
     1. We have a total of 41 access points
        1. For 5 vlans
           1. Student 20 name: student pass: aau@student
           2. Staff 18 name: staff pass: aau@staff
           3. HR 1 name: HR pass: @hr12345
           4. IPSS 1 name: IPSS pass: IPSS@staff
           5. IT 1 name: IT pass: IPSS@staff
        2. Configurations made on the access points
           1. On port 1 we configured the SSID: student and WPA2-PSK pass phrase = password
           2. Then on the wireless devices/mobile/ we configured the wireless 0 interface and gave the SSID: student and WPA2-PSK pass phrase = password
           3. Then on PCs on the physical we turned off the pc then changed some physical device, then turned it on

We can configure the wireless 0 as the mobile or

On the desktop PC Wireless we can also connect

* 1. Different end devices are requires by users such as pcs, desktops, and mobile phones

Number of networks/VLANS

* + 1. We have 12 VLANS

|  |  |
| --- | --- |
| VLAN ID | VLAN Name |
| 3 | Accounting |
| 4 | PADM |
| 5 | Management |
| 6 | IS |
| 7 | Student |
| 8 | Staff |
| 10 | Economics |
| 12 | IPSS |
| 13 | IT |
| 14 | HR |
| 15 | Library |
| 16 | Server |

**The IP address We used**

Network 1 student : 510 hosts (closest subnet mask: /23)

Subnet: 172.16.0.0/23

sm: (255.255.254.0)

Usable host addresses: 172.16.0.1 to 172.16.1.254

Network 2 staff: 510 hosts (closest subnet mask: /23)

Subnet: 172.16.2.0/23

sm: (255.255.254.0)

Usable host addresses: 172.16.2.1 to 172.16.3.254

Network 3 IS: 255 hosts (closest subnet mask: /24)

Subnet: 172.16.4.0/24

sm: (255.255.255.0)

Usable host addresses: 172.16.4.1 to 172.16.4.254

Network 4 PADM: 64 hosts (closest subnet mask: /26)

Subnet: 172.16.5.0/26

sm: (255.255.255.192)

Usable host addresses: 172.16.5.1 to 172.16.5.62

Network 5 Mngt: 64 hosts (closest subnet mask: /26)

Subnet: 172.16.5.64/26

sm: (255.255.255.192)

Usable host addresses: 172.16.5.65 to 172.16.5.126

Network 6 Accounting: 64 hosts (closest subnet mask: /26)

Subnet: 172.16.5.128/26

sm: (255.255.255.192)

Usable host addresses: 172.16.5.129 to 172.16.5.190

Network 7 economics: 64 hosts (closest subnet mask: /26)

Subnet: 172.16.5.192/26

sm: (255.255.255.192)

Usable host addresses: 172.16.5.193 to 172.16.5.254

Network 8 IT: 64 hosts (closest subnet mask: /26)

Subnet: 172.16.6.0/26

sm: (255.255.255.192)

Usable host addresses: 172.16.6.1 to 172.16.6.62

Network 9 IPSS: 32 hosts (closest subnet mask: /27)

Subnet: 172.16.6.64/27

sm: (255.255.255.224)

Usable host addresses: 172.16.6.65 to 172.16.6.94

Network 10 HR: 32 hosts (closest subnet mask: /27)

Subnet: 172.16.6.96/27

sm: (255.255.255.224)

Usable host addresses: 172.16.6.97 to 172.16.6.126

Network 11 Library: 32 hosts (closest subnet mask: /27)

Subnet: 172.16.6.128/27

sm: (255.255.255.224)

Usable host addresses: 172.16.6.129 to 172.16.6.158

Network 12 server: 8 hosts (closest subnet mask: /27)

Subnet: 172.16.6.160/29

sm: (255.255.255.248)

Usable host addresses: 172.16.6.161 to 172.16.6.167

router

172.16.6.168-172.16.6.175