# Cis 326 project report

## Group members :

| | Name | ID | Role Participated in | Sign |
|---|---|---|---|---|
| 1 | Haidar AL-Shabib | 2220005020 | ospf | |
| 2 | Abdullah Alsaeed | 2220000092 | rip | |
| 3 | Ali Al-hussain | 2220006383 | vlans | |
| 4 | Ali alnemer | 2220001346 | Server and wireless Lan controller | |
| 5 | Feras Alameer | 222004198 | Leader and supervisor | |

## Abstract:

In this project we will be going step by step to configuring a network with Vlans by using the OSPF and RIP protocols. This report will be cut into two parts, Part 1 will be about the configurations and installment of the network using packet tracer. Part two will be a case study about Alibaba cloud and answering the 5 required questions: 1-Concept of cloud computing, 2- its modals and usage areas, 3- How does cloud computing work?, 4- What cloud-computing services are available?, and the 5$^{th}$ question is “How is the chosen cloud Is different from other cloud providers?”.

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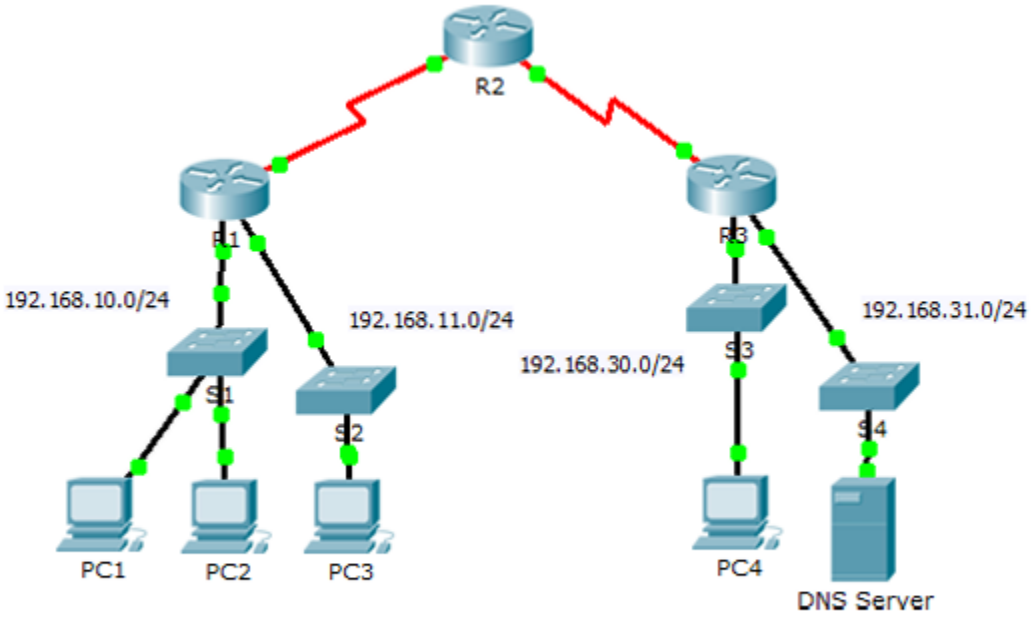
# Part 1:

In this file we will start explaining every step in our project. We started by choosing the topology that we will use, we chose this topology.




14.

After choosing the topology we started by gathering the requirements for the projects, the requirements are:

1. More than 4 PCs
2. More than 2 Laptop and tab
3. More than 1 IP Printer
4. More than 2 Cisco Switch
5. More than 2 Cisco Router
6. More than 1 Wireless LAN Controller and Lightweight Access points
7. 1 or more Servers
8. Cables: UTP, serial, console…

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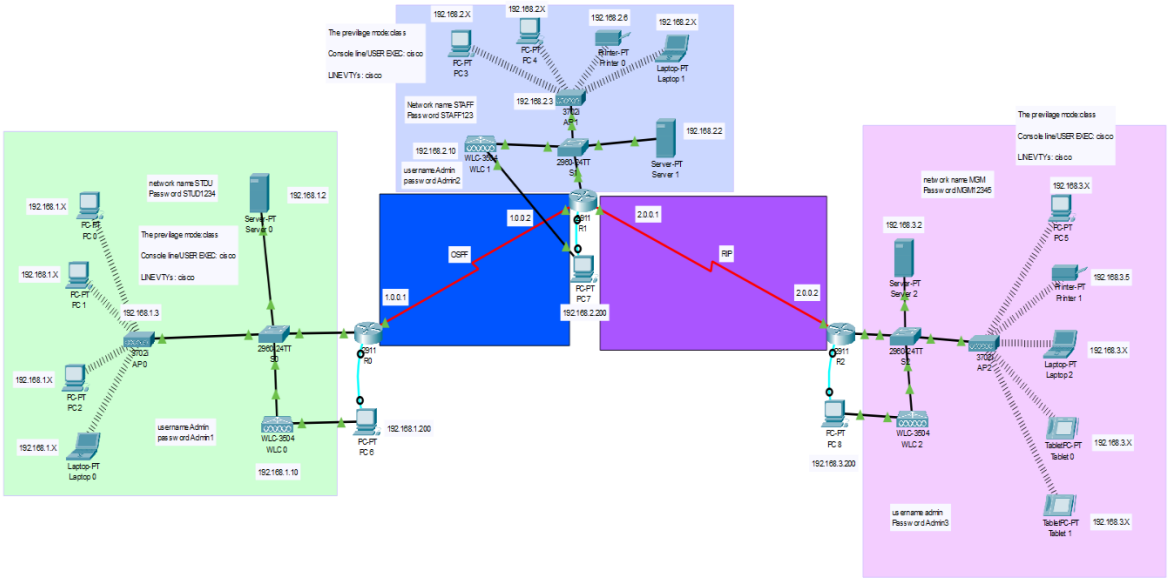

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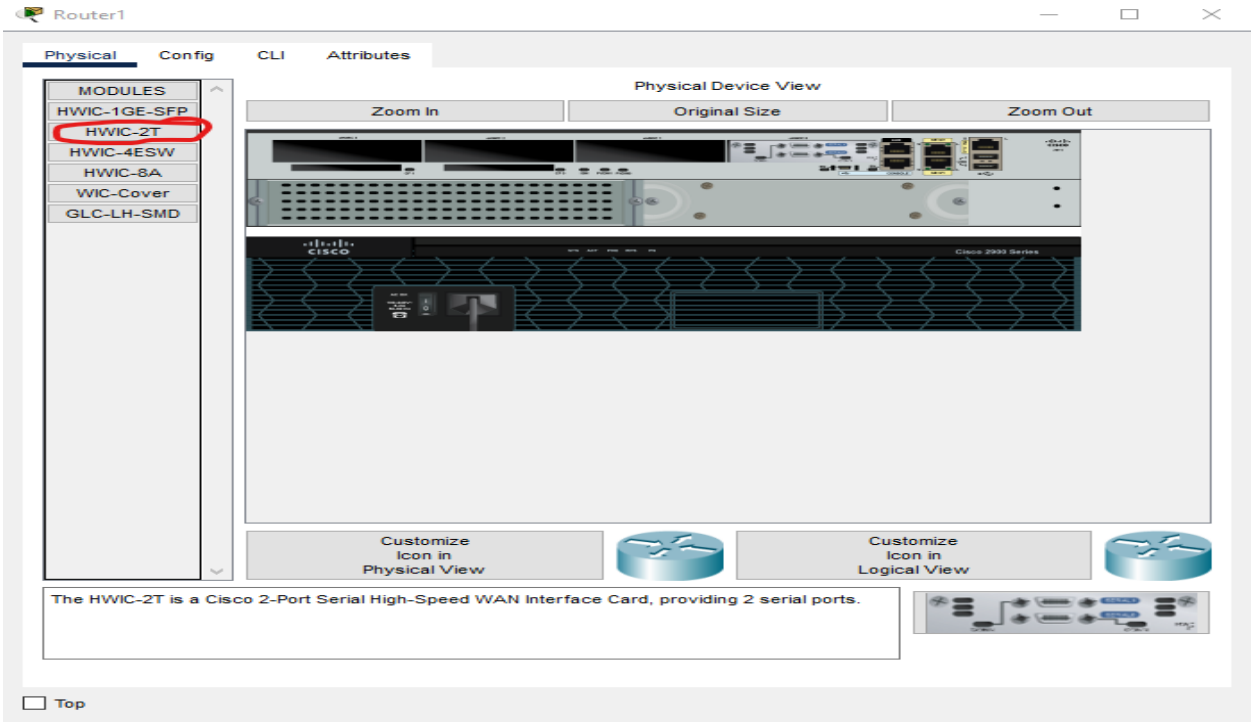
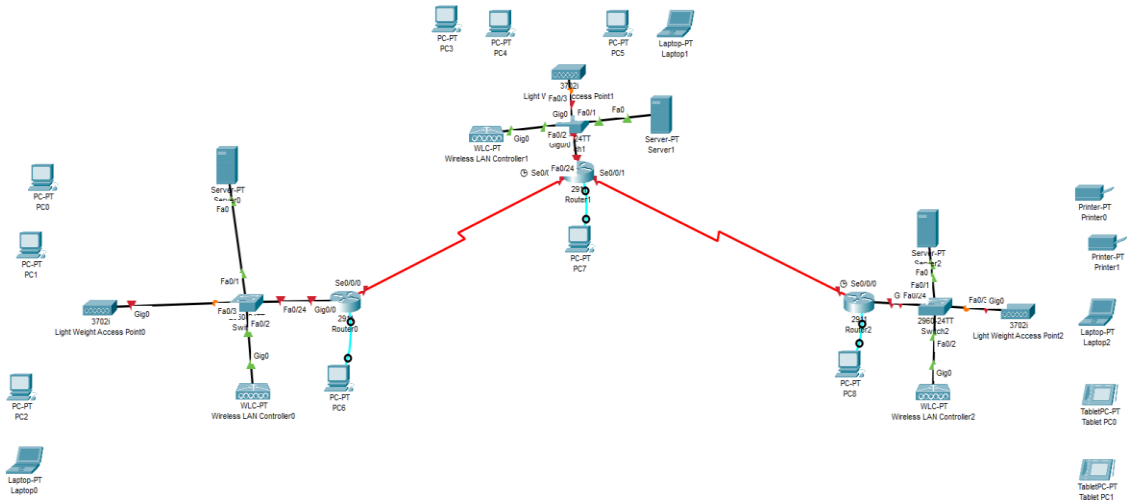
## Step 1: conect the cabels:

First we set up the routers and add the HWIC-2T part so we can use the serial cabels between the routers.




After that we connect all the cables between all the devices.



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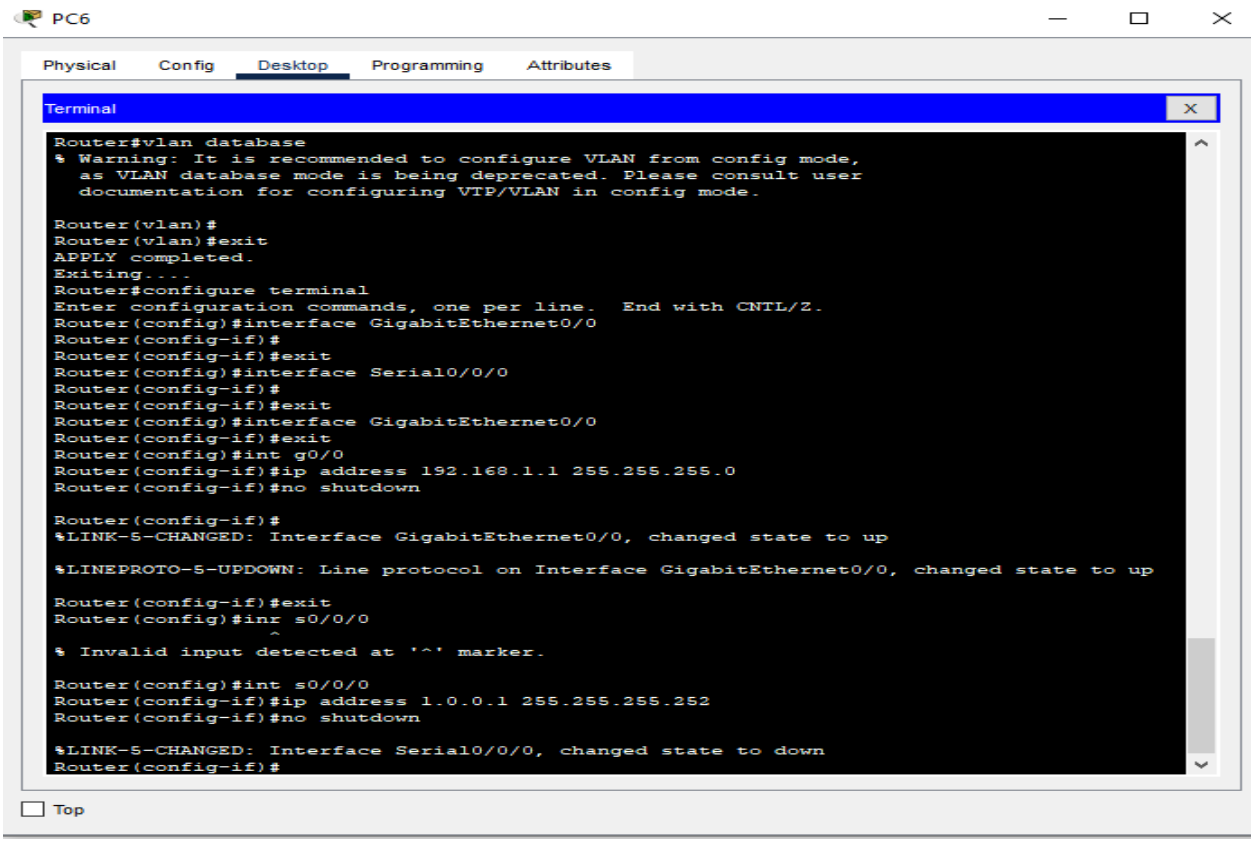
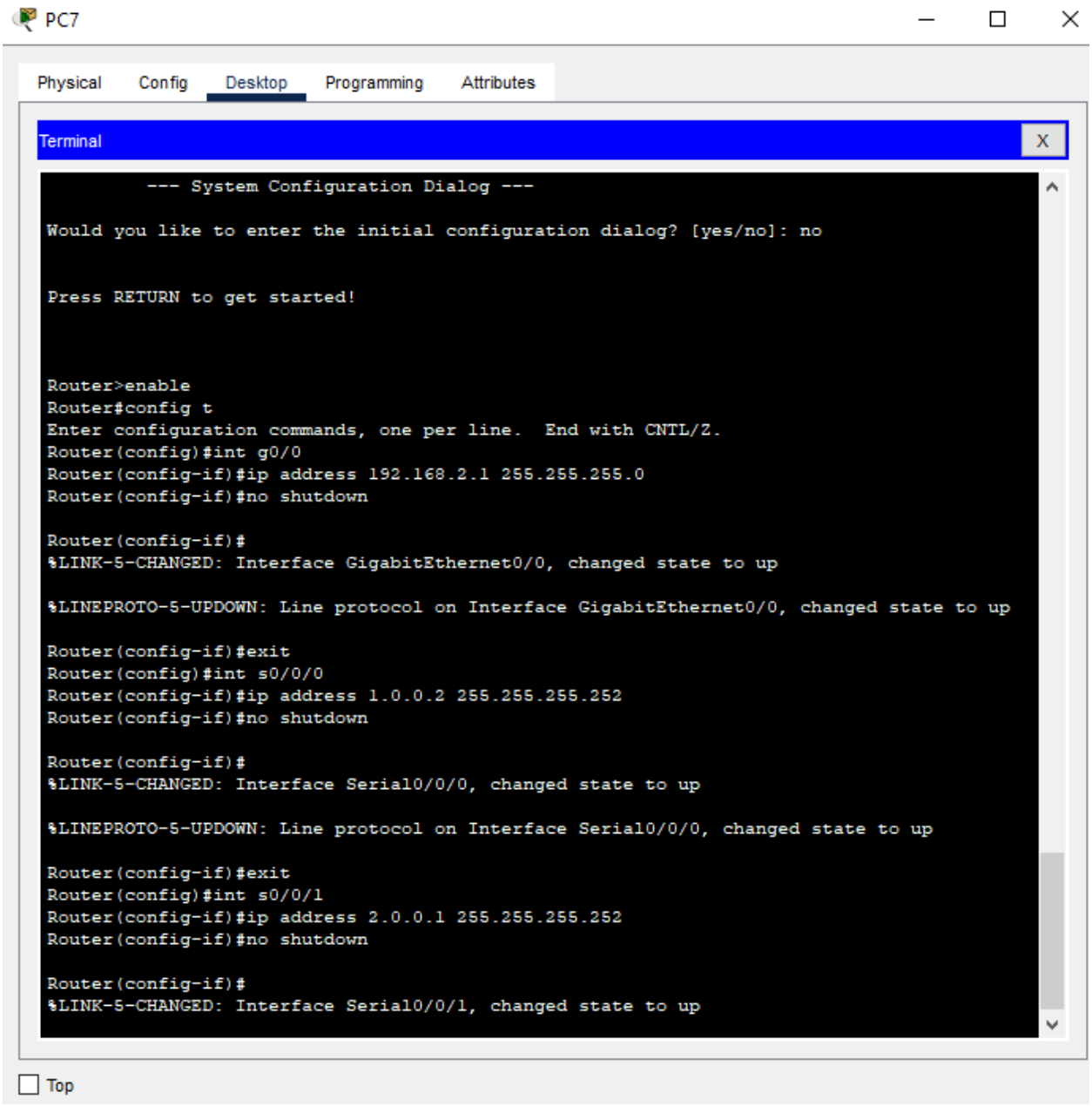
## Step 2: assign IP addresses to the routers:

Router 0:

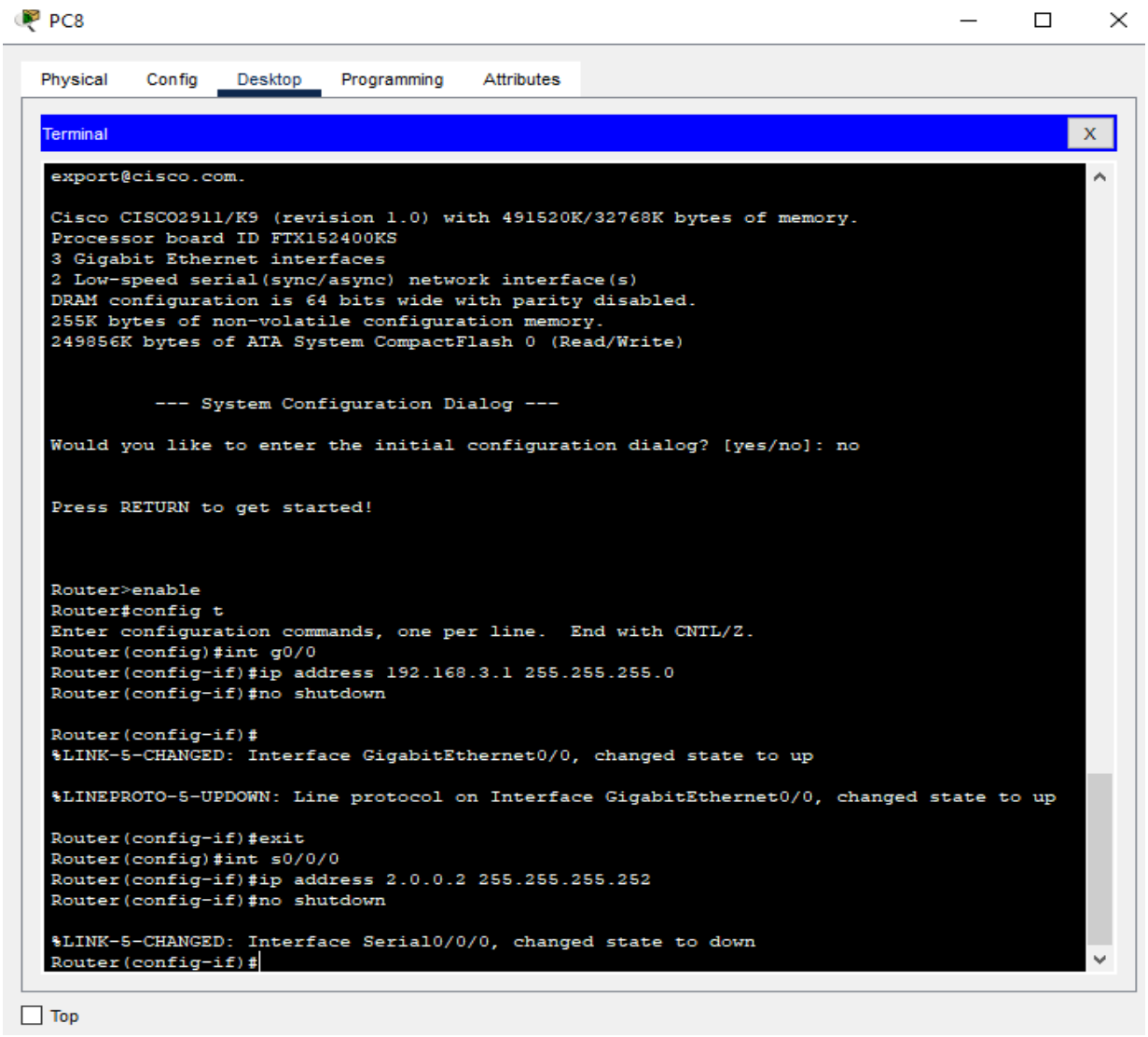



Router 1:

# Cis 326 project report



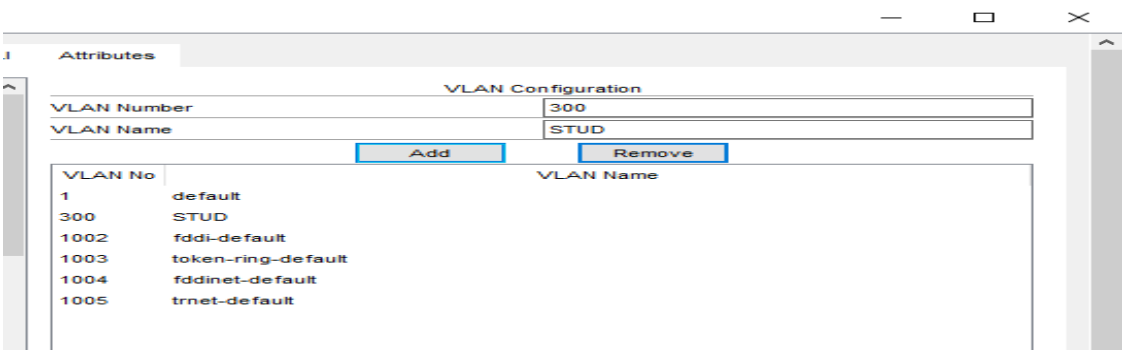

Router 2:




## Step 3: set up the vlans:

Now that we're done from the router setup we can start setting up the vlans.

Switch 0:



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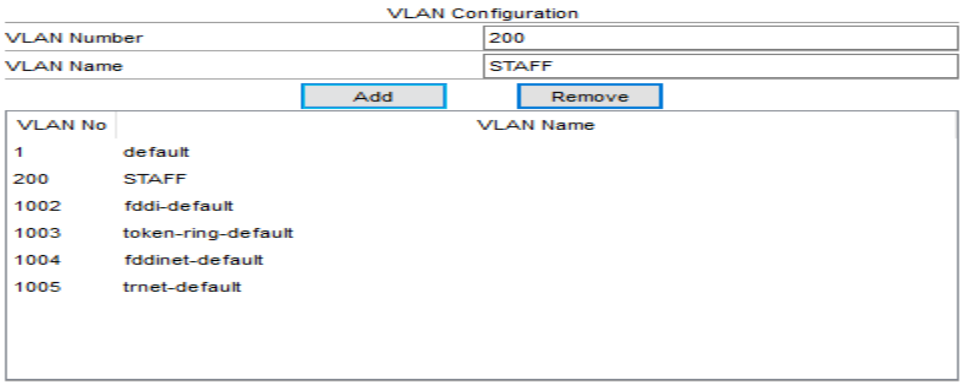
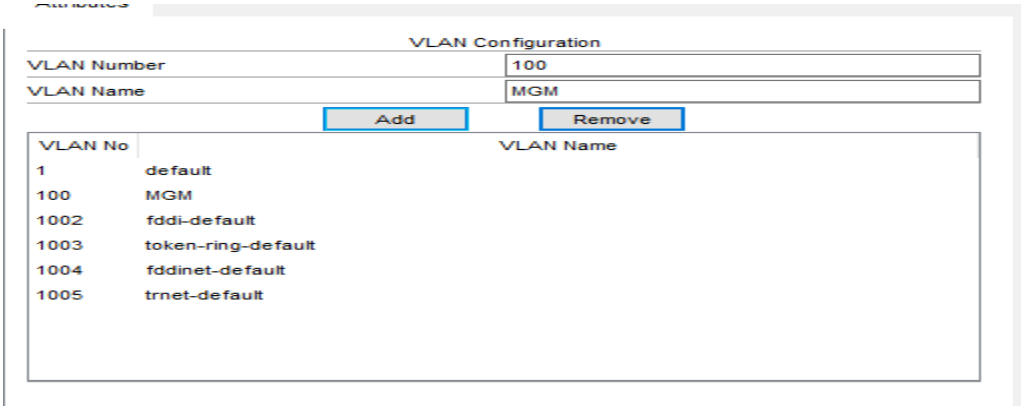
Switch 1:




Switch 2:




## Step 4: configure the OSPF between router 0 and 1:

Now we need to set the configuration between router 0 and 1 by using the OSPF protocol.

Router 0:

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 1.0.0.0 0.255.255.255 area 0
Router(config-router)#network 192.168.1.0 0.0.0.255 area 0
```

Router 1:

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.168.2.0 0.0.0.255 area 0
Router(config-router)#network 1.0.0.0 0.255.255.255 area 0
```

## Step 5: allow routers to enter the vlan:

now that we finished the OSPF configuration, we need to allow the routers to retrieve packets from the Vlan.

Router 0:

```
Router(config-router)#exit
Router(config)#int g0/0
Router(config-if)#no ip address
Router(config-if)#exit
Router(config)#int g0/0.300
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.300, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.300, changed state to
up

Router(config-subif)#enc
Router(config-subif)#encapsulation dot1q 300
Router(config-subif)#ip address 192.168.1.1 255.255.255.0
Router(config-subif)#no shutdown
```

Router 1:

```
Router(config-router)#exit
Router(config)#int g0/0
Router(config-if)#no ip address
Router(config-if)#exit
Router(config)#int g0/0.200
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.200, changed state to
up

Router(config-subif)#enca
Router(config-subif)#encapsulation dot1q 200
Router(config-subif)#ip address 192.168.2.1 255.255.255.0
Router(config-subif)#no shutdown
```

Router 2:

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int g0/0
Router(config-if)#no ip address
Router(config-if)#exit
Router(config)#int g0/0.100
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.100, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.100, changed state to
up

Router(config-subif)#ec
Router(config-subif)#enc
Router(config-subif)#encapsulation dot1q 100
Router(config-subif)#ip address 192.168.3.1 255.255.255.0
Router(config-subif)#no shutdown
```

## Step 6: configure the RIP between router 1 and 2:

Now we need to set the configuration between router 1 and 2 by using the RIP protocol.

Router 1:

```
Router(config)#router rip
Router(config-router)#versiom 2
                      ^
% Invalid input detected at '^' marker.

Router(config-router)#versio
Router(config-router)#version 2
Router(config-router)#netwrok 192.168.2.0
                     ^
% Invalid input detected at '^' marker.

Router(config-router)#network 192.168.2.0
Router(config-router)#network 2.0.0.0
```

Router 2:

```
Router(config)#router rip
Router(config-router)#ver
Router(config-router)#version 2
Router(config-router)#network 192.168.3.0
Router(config-router)#network 2.0.0.0
```

## Step 7: allowing RIP and OSPF to work together:

Now that we have finished configuring the OSPF and RIP we need to make them work together, as follows.

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Router 0:

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#redi
Router(config-router)#redistribute rip subnets
Router(config-router)#exit
Router(config)#router rip
Router(config-router)#redi
Router(config-router)#redistribute ospf 1 metric 1
```

Router 1:

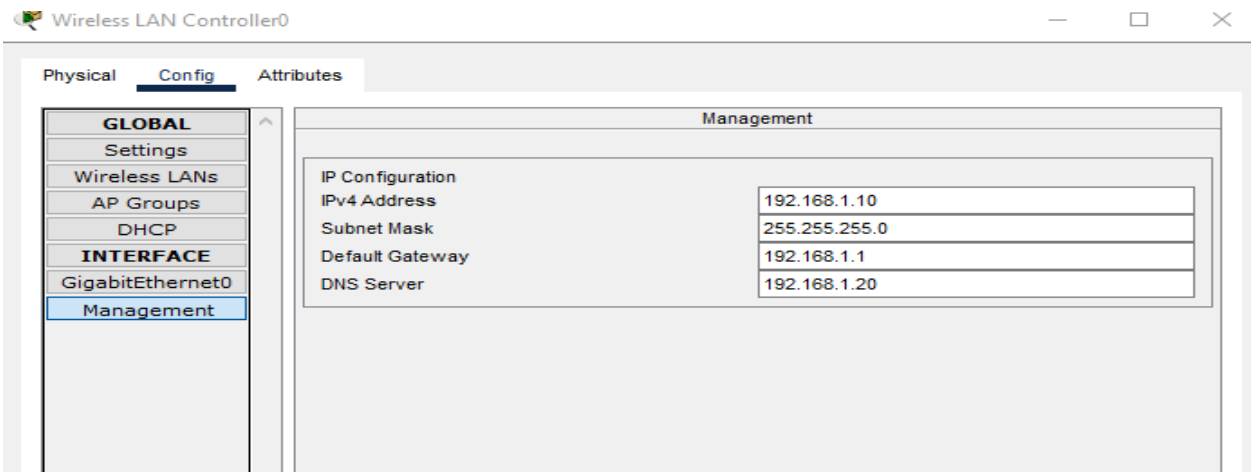
```
Router(config)#router rip
Router(config-router)#redi
Router(config-router)#redistribute ospf 1
Router(config-router)#redistribute ospf 1 met
Router(config-router)#redistribute ospf 1 metric 1
Router(config-router)#exit
Router(config)#router ospf 1
Router(config-router)#red
Router(config-router)#redistribute rip subnets
```

Router 2:

```
Router(config-router)#exit
Router(config)#router ospf 1
Router(config-router)#redi
Router(config-router)#redistribute rip subnets
Router(config-router)#exit
Router(config)#router rip
Router(config-router)#redi
Router(config-router)#redistribute ospf 1 metric 1
```

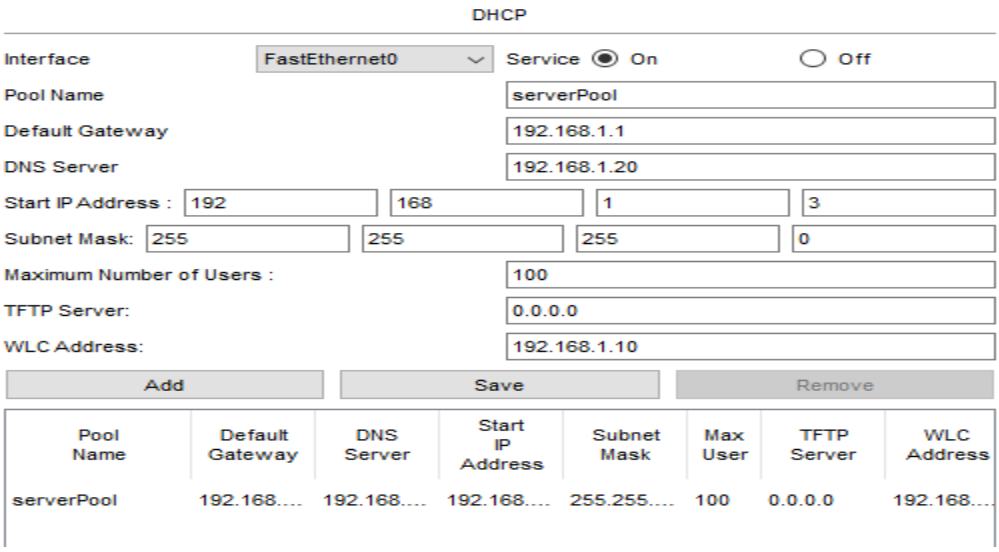
## Step 8: configuring the wireless controllers and the servers:

WLC 0:

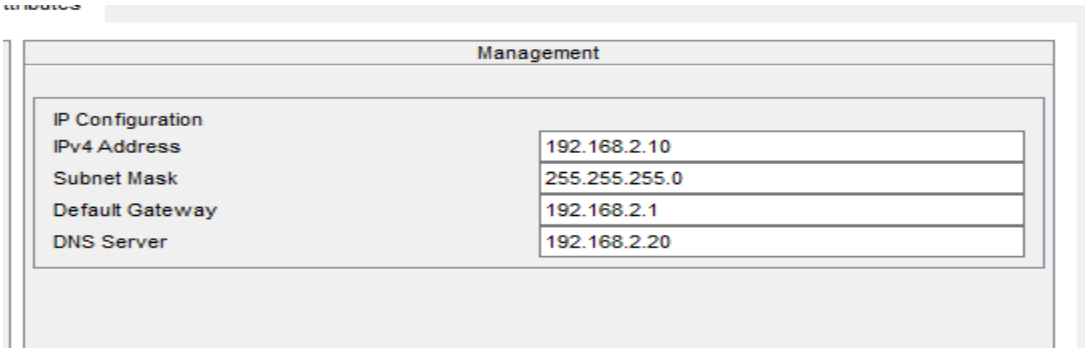


# Cis 326 project report

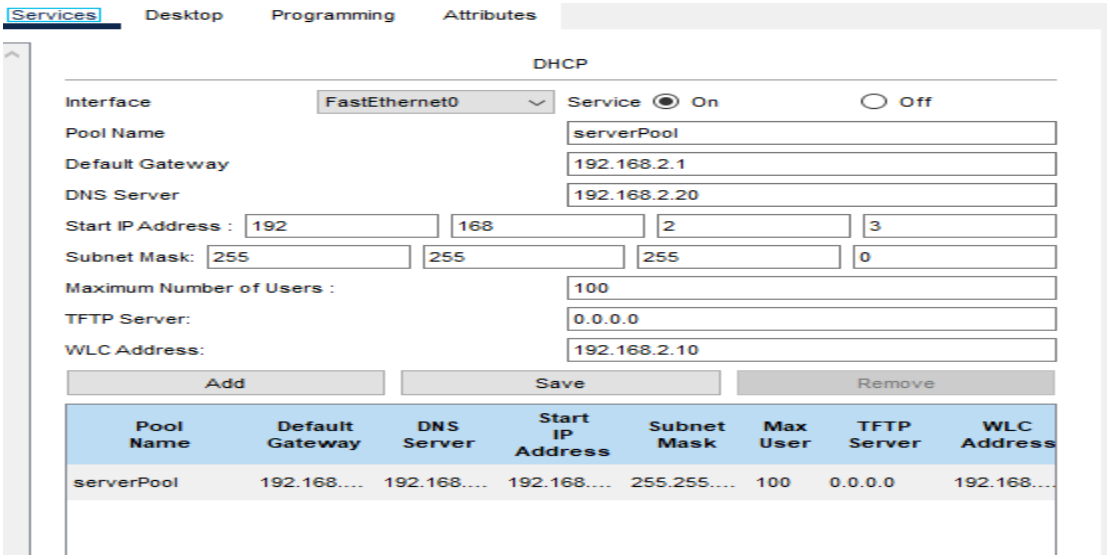
## Server 0:




## WLC 1:

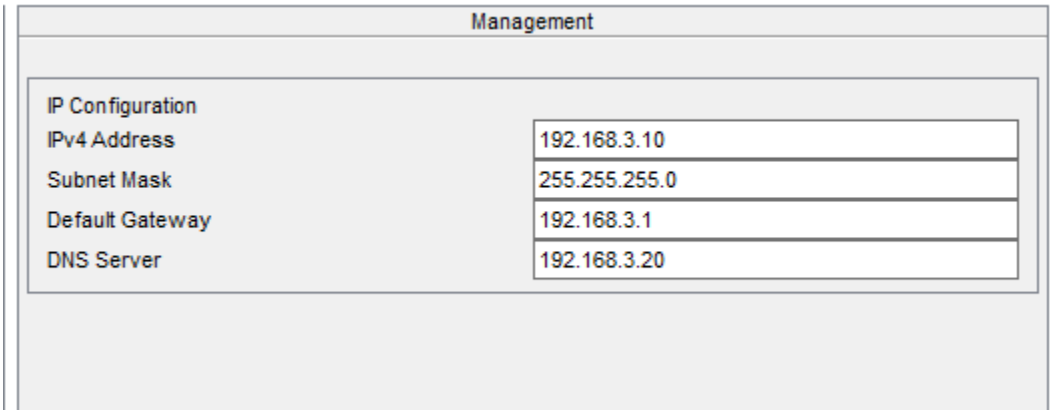



## Server 1:

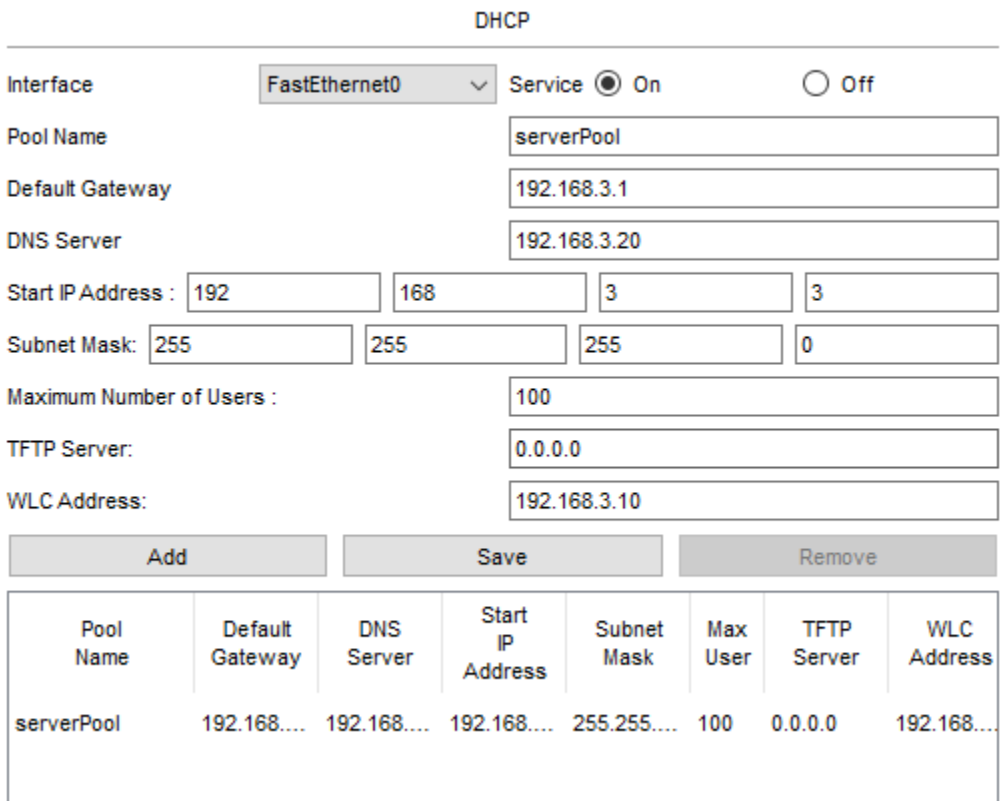


# Cis 326 project report

WLC 2:




Router 2:




## Step 9: creating and configuring the wireless LAN:

Now we need to configure the networks:

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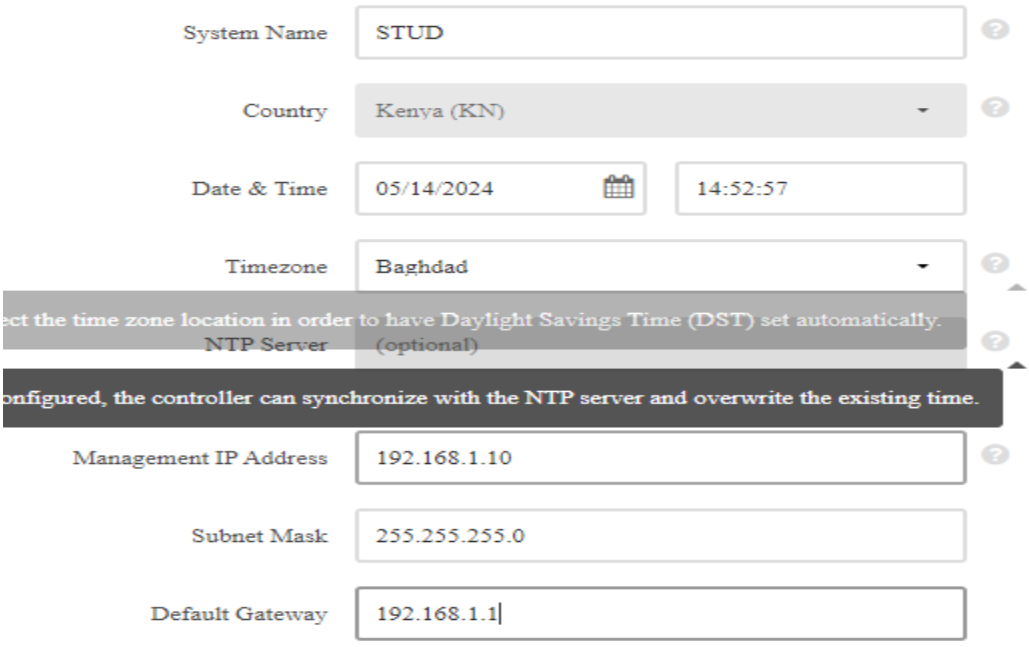
WLC 0:

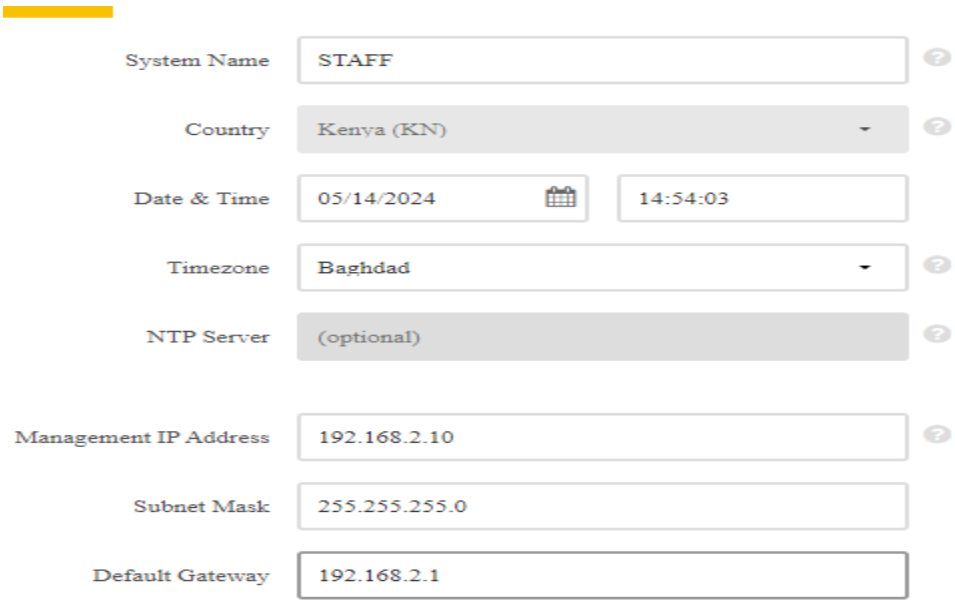
We set and created the network STUD.




| WLAN ID | Type | Profile Name | WLAN SSID | Admin Status | Security Policies | |
|---|---|---|---|---|---|---|
| 1 | WLAN | STDU | STDU | Enabled | [WPA2][Auth(PSK)] | Remove |

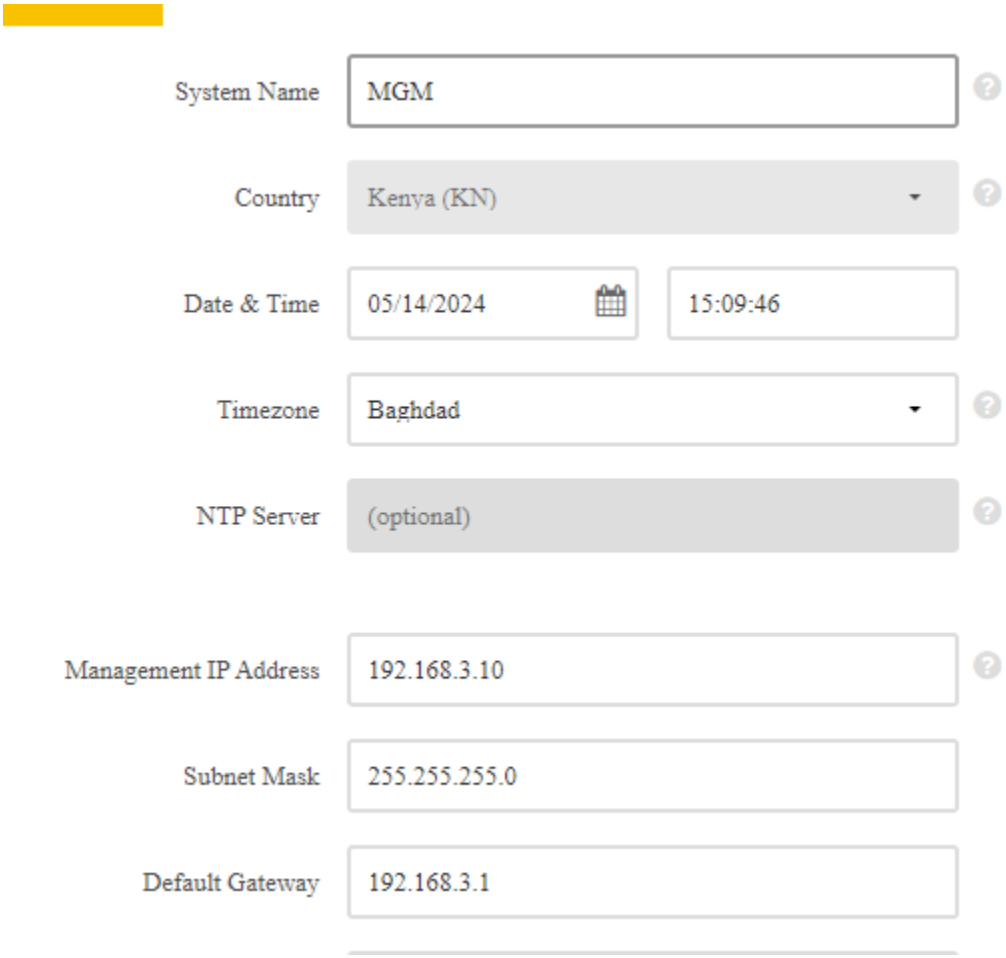
WLC 1:

We set and created the network STAFF.




WLC 2:

We set and created the network MGM.





## Step 10: changing the end device's connection.

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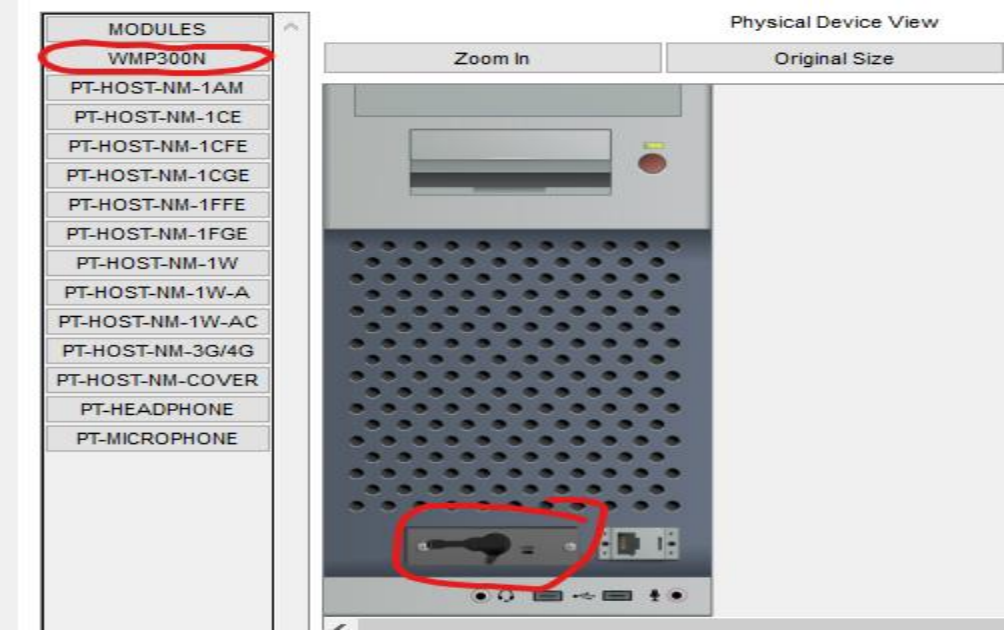
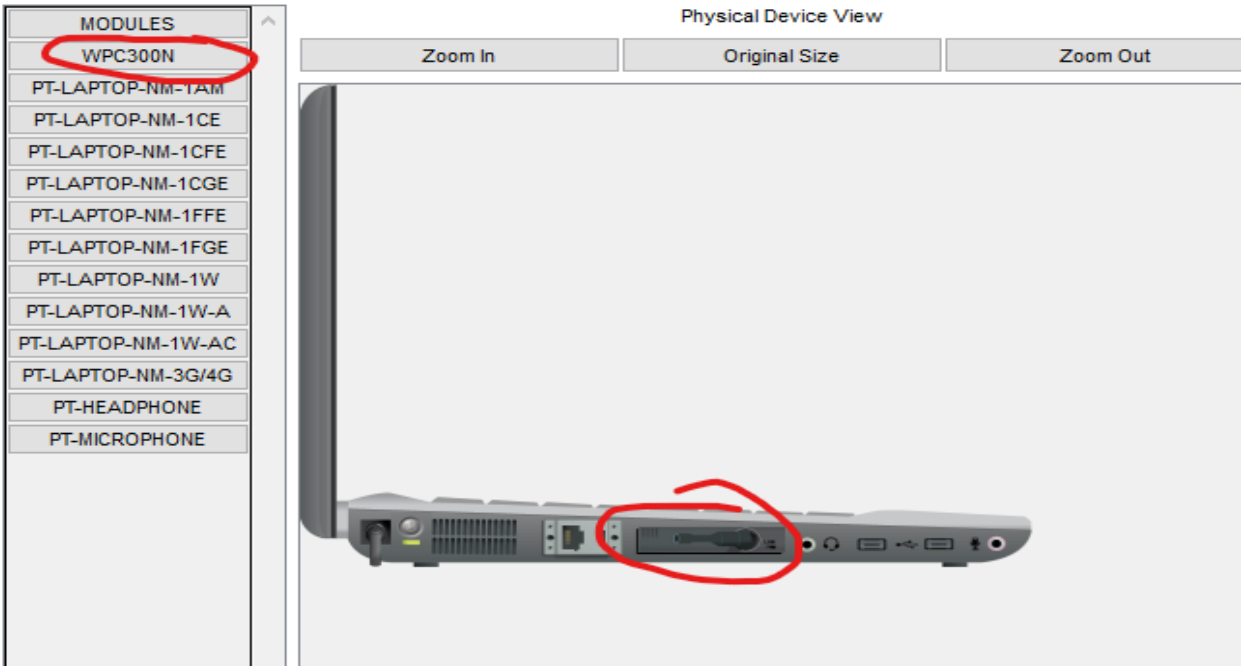
After configuring the the Wlans and configure all the connections, now we need to the install the WMP300N part into the end devices so we can use the wireless connection.

PC




Laptop

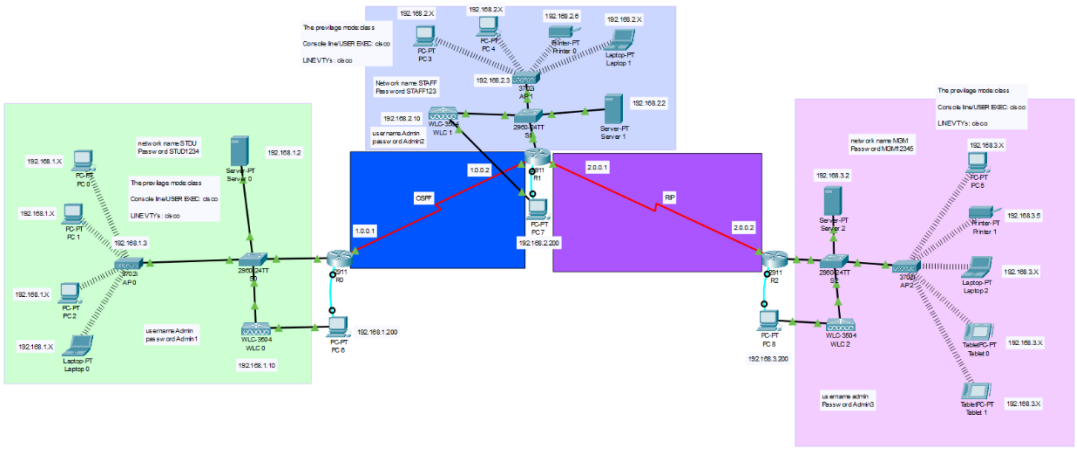


Printer


And tablets come with built-in wireless access.

## Step 11: connecting the devices to the network:

At the end of this steps the network should be as follows:



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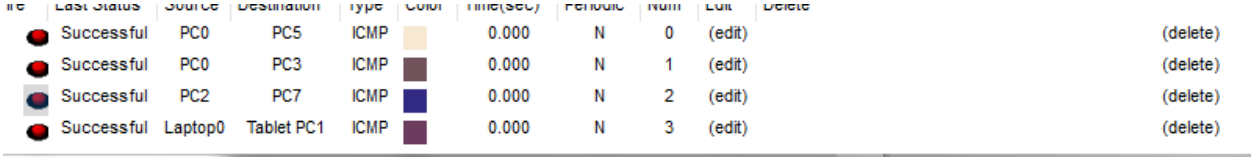
And with the server being configured and the routers are all configured and ready, the switches configured with the wanted vlans and the end devices being configured and connected to the wanted vlans. Any device that want to ping another device should be successful regardless of the location of the end devices and the vlan that's the devices connected to.



| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | Edit | Delete |
|---|---|---|---|---|---|---|---|---|---|---|
| | Successful | PC0 | PC5 | ICMP | | 0.000 | N | 0 | (edit) | (delete) |
| | Successful | PC0 | PC3 | ICMP | | 0.000 | N | 1 | (edit) | (delete) |
| | Successful | PC2 | PC7 | ICMP | | 0.000 | N | 2 | (edit) | (delete) |
| | Successful | Laptop0 | Tablet PC1 | ICMP | | 0.000 | N | 3 | (edit) | (delete) |

# Addressing Table:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 4 | R1 | g0/0.200 | 192.168.2.1 | 255.255.255.0 | N/A |
| 5 | | s0/0/0 | 1.0.0.2 | 255.255.255.252 | N/A |
| 6 | | s0/0/1 | 2.0.0.1 | 255.255.255.252 | N/A |
| 7 | R2 | g0/0.100 | 192.168.3.1 | 255.255.255.0 | N/A |
| 8 | | s0/0/0 | 2.0.0.2 | 255.255.255.252 | N/A |
| 9 | server 0 | fa0 | 192.168.1.2 | 255.255.255.0 | 192.168.1.1 |
| 10 | AP 0 | g0 | 192.168.1.3 | 255.255.255.0 | 192.168.1.1 |
| 11 | PC 0 | wireless | 192.168.1.X[DHCP] | 255.255.255.0 | 192.168.1.1 |
| 12 | PC 1 | wireless | 192.168.1.X[DHCP] | 255.255.255.0 | 192.168.1.1 |
| 13 | PC 2 | wireless | 192.168.1.X[DHCP] | 255.255.255.0 | 192.168.1.1 |
| 14 | Labtop 0 | wireless | 192.168.1.X[DHCP] | 255.255.255.0 | 192.168.1.1 |
| 15 | WLC 0 | g1 | 192.168.1.10 | 255.255.255.0 | 192.168.1.1 |
| 16 | PC 6 | fa0 | 192.168.1.200 | 255.255.255.0 | 192.168.1.1 |
| 17 | server 1 | fa0 | 192.168.2.2 | 255.255.255.0 | 192.168.2.1 |
| 18 | AP 1 | g0 | 192.168.2.3 | 255.255.255.0 | 192.168.2.1 |
| 19 | PC 3 | wireless | 192.168.2.X[DHCP] | 255.255.255.0 | 192.168.2.1 |
| 20 | PC 4 | wireless | 192.168.2.X[DHCP] | 255.255.255.0 | 192.168.2.1 |
| 21 | Printer 0 | wireless | 192.168.2.6 | 255.255.255.0 | 192.168.2.1 |
| 22 | Laptop 1 | wireless | 192.168.2.X[DHCP] | 255.255.255.0 | 192.168.2.1 |
| 23 | WLC 1 | g1 | 192.168.2.10 | 255.255.255.0 | 192.168.2.1 |
| 24 | PC 7 | fa0 | 192.168.2.200 | 255.255.255.0 | 192.168.2.1 |
| 25 | server 2 | fa0 | 192.168.3.2 | 255.255.255.0 | 192.168.3.1 |
| 26 | AP 2 | g0 | 192.168.3.3 | 255.255.255.0 | 192.168.3.1 |
| 27 | PC 5 | wireless | 192.168.3.X[DHCP] | 255.255.255.0 | 192.168.3.1 |
| 28 | printer 1 | wireless | 192.168.3.5 | 255.255.255.0 | 192.168.3.1 |
| 29 | Laptop 2 | wireless | 192.168.3.X[DHCP] | 255.255.255.0 | 192.168.3.1 |
| 30 | Tablet 0 | wireless | 192.168.3.X[DHCP] | 255.255.255.0 | 192.168.3.1 |
| 31 | Tablet 1 | wireless | 192.168.3.X[DHCP] | 255.255.255.0 | 192.168.3.1 |
| 32 | WLC 2 | g1 | 192.168.3.10 | 255.255.255.0 | 192.168.3.1 |
| 33 | PC 8 | fa0 | 192.168.3.200 | 255.255.255.0 | 192.168.3.1 |

# Part 2: case study (Alibaba cloud service)

## 1- Concept of cloud computing:

In principle, cloud computing involves the provision of various computing services over the Internet, eliminating the need for on-premises infrastructure. This concept is embodied in Alibaba Cloud, which offers a broad range of services such as computing power, storage, networking, databases, analysis, and artificial intelligence that can be accessed over the Internet. In comparison with traditional IT infrastructure, users can access these resources on demand, scale them to their needs and pay only for what they use, thereby increasing flexibility, scalability as well as cost effectiveness.

## 2- its modals and usage areas:

Alibaba cloud offers three main models of cloud computing:

- **Infrastructure as a Service (IaaS):** provides virtualized resources over the internet, including virtual machines, storage, and networking.
- **Platform as a Service (PaaS):** offers a platform developers to build, deploy, and manage application without worrying about underlying infrastructure.
- **Software as a Service (SaaS):** delivers software applications over the internet on a subscription basis, eliminating the need for users to install, maintain, and manage software locally.

Alibaba Cloud's services find applications across various industries and use cases, including e-commerce, finance, healthcare, gaming, media, IoT, and more. For instance, businesses can use Alibaba Cloud's ECS (Elastic Compute Service) for hosting websites, OSS (Object Storage Service) for storing and managing large datasets, and ApsaraDB (Alibaba Cloud's database services) for reliable and scalable database solutions.

## 3- How does cloud computing work?:

Alibaba Cloud uses a global network of data centers to provide cloud computing services. Using Alibaba's powerful infrastructure and advanced technologies, users are able to connect to cloud services through the Internet. Alibaba Cloud allocates computing resources from its pool of servers, storage and network components as soon as a user applies for any service or resource. This means that users can increase or decrease their use of these resources on demand, without having to configure and manage them manually. Alibaba Cloud provides users with reliable and resilient cloud computing solutions through a distributed architecture that guarantees high availability, continuity of data as well as fault tolerance.

## 4- What cloud-computing services are available?:

In order to meet the diverse needs of businesses and developers, Alibaba Cloud offers an extensive range of cloud services. The following key services shall be included:

- Elastic compute Services (ECS)
- Object storage Services (OSS)
- Relational Database Services (RDS)
- ApsaraDB for PolarDB
- Data lake Analytics (DLA)
- Content Delivery Network (CDN)
- Machine learning Platform for AI (PAI)
- Internet of Things Platform (IoT)
- Blockchain as a Service (BaaS)
- Security services like Anti-DDoS, web application firewall (WAF), and Cloud Firewall

These services enable businesses to invent and grow in the cloud through a range of computing, storage, networking, security, and artificial intelligence functionalities.

## 5- How is the chosen cloud Is different from other cloud providers?:

With a few key factors, Alibaba Cloud distinguishes itself from other cloud service providers:

- **Global reach with a Focus on Asia:** In particular in China, where Alibaba Cloud is the leading provider of cloud services, it has an extensive presence in Asia Pacific. With low latency and high reliability, its extensive network of data centers spans the globe, making it possible for global businesses to access cloud services.

- **Advanced Technologies and innovations:** Alibaba Cloud's investment in Research and Development is leading innovation in fields like Big Data, Artificial Intelligence, Machine Learning, and the Internet of Things. The power of digital transformation is being harnessed by businesses through its cutting-edge technology and industry expertise.

- **Vertical Integration and Ecosystem Support:** The cloud is part of the Alibaba Group, which operates a large ecosystem that includes e commerce, digital finance, logistics and much more. This vertical integration enables Alibaba Cloud to integrate easily with all the services of the Alibaba Group and provide end point solutions that are specifically suited to a particular industry or business need.

- **Security and Compliance:** In order to ensure the protection of personal data, privacy and regulatory compliance, Alibaba Cloud is focused on safety and security with a wide range of services and certifications. It has distinguished itself as a trusted cloud partner for businesses around the world through its strong security infrastructure and an active approach to cybersecurity.

# References:

1- https://www.alibabacloud.com/en/about?_p_lc=1&spm=a3c0i.14327653.9135018350.9.1731188fbE1sDn
2- https://www.alibabacloud.com/en/solutions/why-alibaba-cloud?_p_lc=1&spm=a3c0i.14327653.2121941010.1.e069188fPxFI3H
3- https://www.alibabacloud.com/en?_p_lc=1
4- https://www.citrix.com/glossary/what-is-cloud-computing.html