SECURE NETWORK DOCUMENTATION

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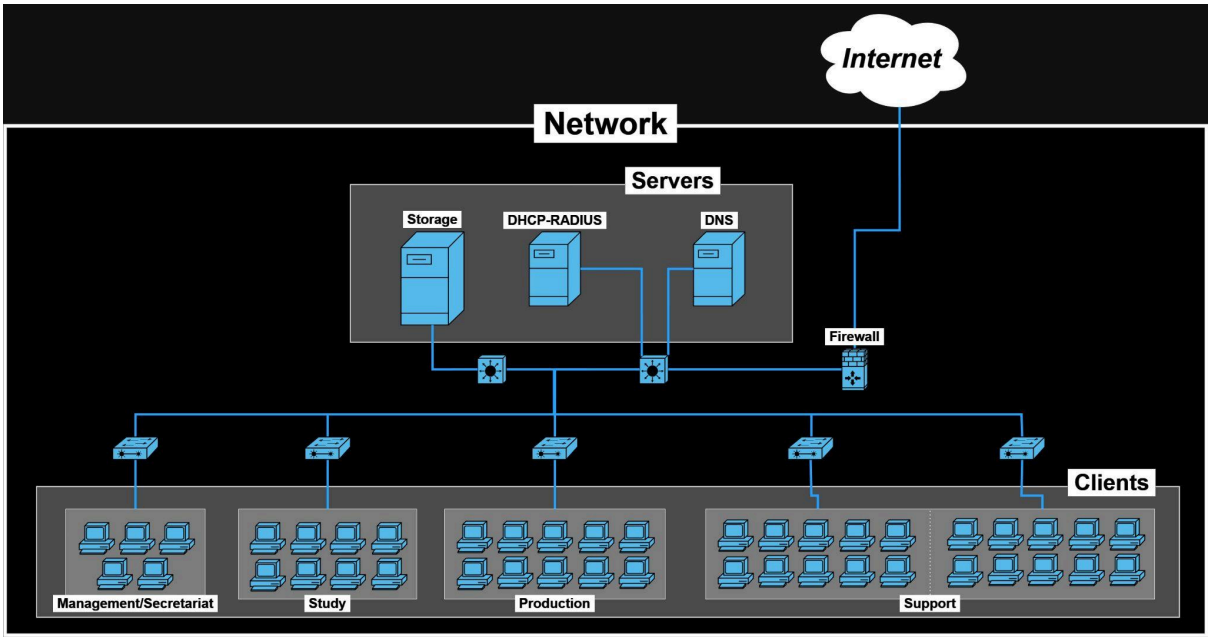
Network Diagram



As you can see in the diagram above, our network design is composed of 43 computers, 5 layer 2 switches, 2 layer 3 switches, 1 IOS firewall and 3 servers.

The computers are divided into 5 LANs:

- Management/Secretariat
- Study
- Production
- Support #1
- Support #2

All those LANs are connected to 2 layer 3 switches, one that connects to the FTP storage server and another that connects to the DHCP-RADIUS and DNS servers.

IP Addressing Table

(Per sector and VLAN)

Configuration Details

DNS server
[steps to follow to configure]

DHCP server
Enter Desktop > IP Configuration

1. Setup an IP address for the DHCP server(192.168.1.1), it will automatically setup a subnet mask based on the format of the IP address

Enter Services menu > DHCP

2. Set the default gateway as the IP address of the DHCP server
3. Indicate the IP address of the DNS server
4. Save and turn on

On each computer that enters the network

5. Enter IP Configuration menu
6. Select DHCP instead of Static

FTP server
Enter Services menu > FTP

1. Turn on
2. Add users with passwords and setup rights for each user

On each computer, to access the FTP server

1. Open Command prompt
2. Type following command: `ftp [IP address of FTP server]`
3. Enter credentials
4. Browse files (use the command `help` to see what commands are available on the FTP server)

IOS **Firewall**
In the CLI, configure a password to access privileged mode, then configure each interface with the following commands:

```
int [id of the interface]
no shut
ip add [IP address of a device on the LAN] [subnet mask of that LAN]
nameif [name you want to give to the LAN]
security level [0-100, 0 for least trusted and 100 for most trusted]
```

To save the configuration

```
wr me
```

VLANs

In each switch (master in example) > CLI.
We create each VLAN number and name

```
master>enable
master#conf t
master(config)#vlan 10 master
(config-vlan)#name Management
master(config-vlan)#exit
```

Repeat for each VLAN.
Then we affect each ports to the correct VLAN

```
master(config)#interface fa0/1
master(config-if)#switchport mode trunk
master(config-if)#switchport trunk allowed vlan 10,20,30,40,50,60,70
master(config-if)#exit
```

That port is configured in trunk mode because it's the link between the 2 master switches.

We can now configure each interface to its corresponding vlan, using access mode since they are meant to connect to only one VLAN:

```
master(config)#interface fa0/4
master(config-if)#switchport mode access
master(config-if)#switchport access vlan 10
master(config-if)#exit
```

ACLs
[steps to follow to configure]

…
[steps to follow to configure]

Security Measures

Dedicated DNS server
Although it added cost to have a dedicated DNS server, we decided to still settle on that design as DNS deals with internet requests and is vulnerable to external attacks such as DNS spoofing. Having a dedicated DNS server adds a layer of protection for the network as if it is compromised it can be more easily isolated from the rest of the network.

Dedicated Storage server
Another service we decided to have a dedicated server for is the FTP storage server. As companies may want to store sensitive data on their servers, we decided to have a dedicated server on a separate LAN to increase the security of the data stored on the server. Having a dedicated LAN for the storage server also presents the benefit of ensuring good bandwidth for fast and efficient access to the data stored on the server.

VLANs and ACLs
[explanation and justification]

RADIUS authentication
[explanation and justification]

Firewall
We implemented a firewall to control network traffic and block unauthorized access. It protects the company's data, prevents cyber attacks, and ensures only legitimate communications enter the network, maintaining security and business continuity.

Subnetting
We implemented a dedicated subnet for each VLAN, effectively segmenting the network. This approach enhances both network traffic optimization and security.

Cost Breakdown

Item	Number	Unit price	Total price
Computers	43	500€	21 500€
Layer 2 switches	5	21€	105€
Layer 3 switches	2	150€	300€
Servers	3	1 500€	4 500€
IOS Firewall	1	90€	90€
Total			26 495€