

# RAPPORT DE PROJET

*Sous le thème de*

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## Réseaux Locaux et Protocoles Simulation Et Configuration D'un Réseau Soho

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## *Phase 1 : Introduction*

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# 1 Entreprise : NovaTech Solutions

*Entreprise de développement de logiciels et de solutions technologiques*

### **Réseau de NovaTech Solutions**

En tant qu'étudiante en génie informatique, j'ai travaillé sur la conception d'un réseau pour NovaTech Solutions, une entreprise spécialisée dans le développement de logiciels et de solutions technologiques. L'entreprise est située dans un bâtiment de trois étages, avec différents départements répartis sur chaque étage, chacun ayant des besoins spécifiques en réseau.

Mon objectif est de concevoir une infrastructure réseau performante, sécurisée et adaptée à la structure de l'entreprise. Le projet inclut une organisation claire des départements et des choix techniques pour répondre aux besoins en communication, en connectivité et en sécurité.

Chaque département dispose d'ordinateurs et d'imprimantes pour les activités quotidiennes. Mon travail consiste à configurer les VLAN pour chaque département, intégrer un DNS, des routeurs, et des switches (niveau 2 et niveau 3) pour assurer une communication fluide et sécurisée entre les étages et les équipements.

Ce projet m'a permis de renforcer mes compétences en conception et gestion de réseaux tout en répondant aux exigences d'une entreprise moderne.

## **1. Organisation des Départements et Ressources**

### **Premier étage**

1. **ICT (Technologies de l'Information)**
  - Ordinateurs :30
  - Imprimantes :12
2. **Recherche et Développement (R&D)**
  - Ordinateurs :30
  - Imprimantes :12
3. **Électrique (Maintenance)**
  - Ordinateurs :10
  - Imprimantes :4

### **Troisième étage**

1. **Logistique et Entrepôt**
  - Ordinateurs : 30
  - Imprimantes :10
2. **Service Client**
  - Ordinateurs :40
  - Imprimantes :10

### **Deuxième étage**

1. **Marketing**
  - Ordinateurs : 30
  - Imprimantes :10
2. **Comptabilité**
  - Ordinateurs :25
  - Imprimantes :10
3. **Finances**
  - Ordinateurs : 20
  - Imprimantes :10

### **Premier étage**

<b>N° d</b>	<b>Nom de département</b>	<b>Nombre d'ordinateurs</b>	<b>Nombre d'imprimantes</b>
<b>1</b>	IT (Technologies de l'Information)	30	12
<b>2</b>	Recherche et Développement (R&D)	30	12
<b>3</b>	Électrique	10	4

### **Deuxième étage**

<b>N° de département</b>	<b>Nom de département</b>	<b>Nombre d'ordinateurs</b>	<b>Nombre d'imprimantes</b>
<b>1</b>	Marketing	30	10
<b>2</b>	Comptabilité	25	10
<b>3</b>	Finances	20	10

### **Troisième étage**

<b>N° d</b>	<b>Nom de département</b>	<b>Nombre d'ordinateurs</b>	<b>Nombre d'imprimantes</b>
<b>1</b>	Logistique et Entrepôt	30	10
<b>2</b>	Service Client	40	10

## 2 Equipements de la topologie

### Conception du réseau :

#### VLANs et Sous-Réseaux

Chaque département est isolé dans un VLAN distinct pour améliorer la sécurité et la gestion du trafic. Voici la configuration adoptée :

- VLAN 10 : IT
- VLAN 20 : R&D
- VLAN 30 : Électrique
- VLAN 40 : Marketing
- VLAN 50 : Comptabilité
- VLAN 60 : Finances
- VLAN 70 : Logistique et Entrepôt
- VLAN 80 : Service Client

#### Equipements de la topologie et leur modèle :

<b>Routeur</b>	<b>2911</b>
<b>Switch de distribution N° 1</b>	<b>3560-24PS</b>
<b>Switch de distribution N° 2</b>	<b>3950-24PS</b>
<b>Switches d'accès</b>	<b>2960-24TT</b>
<b>Printers</b>	<b>Printer-PT</b>
<b>PCs</b>	<b>PC-PT</b>
<b>DNS</b>	<b>Server-PT</b>

#### Câblage :

- Cable croisé : entre les deux switches de distribution ,entre les switches d'accès et les switches de distribution, entre le routeur et le serveur DNS .
- Cable direct : entre les deux switches de distribution et le routeur , entre les switches d'accès et les( PCs & imprimantes ).

# 3 Bilan Global et Plan d'Adressage de la Topologie

## 1. Rôle de chaque équipement de la topologie :

### Routeur

- **Rôle :**
  - Effectuer le routage inter-VLAN pour permettre la communication entre les différents VLANs.
  - Chaque VLAN dispose d'une interface IP sur le routeur, qui agit comme passerelle par défaut pour les hôtes de ce VLAN.
  - Assure la connexion entre les hôtes finaux et le serveur (DNS , HTTP , HTTPS ) .
- **Interfaces VLAN configurées :**
  - VLAN 10 : 192.168.10.1
  - VLAN 20 : 192.168.20.1
  - VLAN 30 : 192.168.30.1
  - ...
  - VLAN 80 : 192.168.80.1

### Switchs de distribution (Switch1 et Switch2)

- **Rôle :**
  - Connecter les switches d'accès et fournir une liaison redondante pour les hôtes via des ports trunk.
  - Servir de point de convergence entre le routeur et les switches d'accès.
  - Propager les VLANs configurés à tous les switches d'accès.
- **Mode d'opération :**
  - Ports connectés au routeur : Trunk.
  - Ports connectés aux switches d'accès : Trunk.
  - Connectés entre eux via deux ports en trunk pour la redondance.

### **Switchs d'accès (A1 à A8)**

- **Rôle :**
  - Connecter les hôtes finaux dans leurs VLANs respectifs.
  - Chaque switch d'accès appartient à un seul VLAN (Switch A1 pour VLAN 10, Switch A2 pour VLAN 20, etc.).
- **Mode d'opération :**
  - Ports connectés aux hôtes finaux : Access (attribués au VLAN correspondant).
  - Ports connectés à Switch1 et Switch2 : Trunk (pour propager le VLAN vers les switches de distribution).

### **3. configuration des ports :**

#### **Switch1 et Switch2 (Distribution):**

- Ports en trunk :
  - Ports connectés au routeur.
  - Ports connectés aux switches d'accès (A1 à A8).
  - Ports connectés entre Switch1 et Switch2.
- Trunk VLANs autorisés : 10, 20, 30, ..., 80.

#### **Switchs d'accès (A1 à A8):**

- **Ports en trunk :**
  - Ports connectés à Switch1 et Switch2.
- **Ports en access :**
  - Tous les ports connectés aux hôtes finaux.
  - Chaque port en mode access appartient au VLAN correspondant :
    - Switch A1 : VLAN 10
    - Switch A2 : VLAN 20
    - ...

## 4 Configuration des équipements de la topologie : le plan d'adressage

### Passerelle par défaut :

- Pour les hôtes dans VLAN 10 (connectés à Switch A1) :
  - Passerelle par défaut : 192.168.10.1 (interface VLAN 10 du routeur)
- Pour les hôtes dans VLAN 20 (connectés à Switch A2) :
  - Passerelle par défaut : 192.168.20.1 (interface VLAN 20 du routeur)
- Pour les hôtes dans VLAN 30 (connectés à Switch A3) :
  - Passerelle par défaut : 192.168.30.1 (interface VLAN 30 du routeur)

Switch d'accès	VLAN	Plage d'adresses IP	Default Gateway	Plage d'adresses IP pour les hôtes
Switch A1	VLAN 10	192.168.10.0/24	192.168.10.1	192.168.10.4 à 192.168.10.254
Switch A2	VLAN 20	192.168.20.0/24	192.168.20.1	192.168.20.4 à 192.168.20.254
Switch A3	VLAN 30	192.168.30.0/24	192.168.30.1	192.168.30.4 à 192.168.30.254
Switch A4	VLAN 40	192.168.40.0/24	192.168.40.1	192.168.40.4 à 192.168.40.254
Switch A5	VLAN 50	192.168.50.0/24	192.168.50.1	192.168.50.4 à 192.168.50.254
Switch A6	VLAN 60	192.168.60.0/24	192.168.60.1	192.168.60.4 à 192.168.60.254
Switch A7	VLAN 70	192.168.70.0/24	192.168.70.1	192.168.70.4 à 192.168.70.254
Switch A8	VLAN 80	192.168.80.0/24	192.168.80.1	192.168.80.4 à 192.168.80.254

### Les deux switches de distribution et le serveur :

Equipement	Interface connecté au routeur	Adresse IP	Masque de sous-réseau	Passerelle par défaut
Switch 1	Fa 0/3	192.168.1.2	/24	192.168.1.1
Switch 2	Gig 1/0/3	192.168.2.2	/24	192.168.2.1
Serveur	Fa 0	192.168.3.2	/24	192.168.3.1





## 5 Points primordiaux dans la topologie :

### Router :

1. **Interface GigabitEthernet0/0** : Connectée à Switch1 (trunk).
2. **Interface GigabitEthernet0/1** : Connectée à Switch2 (trunk).

### Switch1 et Switch2 :

- **Trunk :**
  - Interfaces vers le routeur.
  - Interfaces vers l'autre switch de distribution.
  - Interfaces vers les switches d'accès.
- **VLANs** : Tous les VLANs (10 à 80) sont autorisés sur les trunks.

### Switchs d'accès (A1 à A8) :

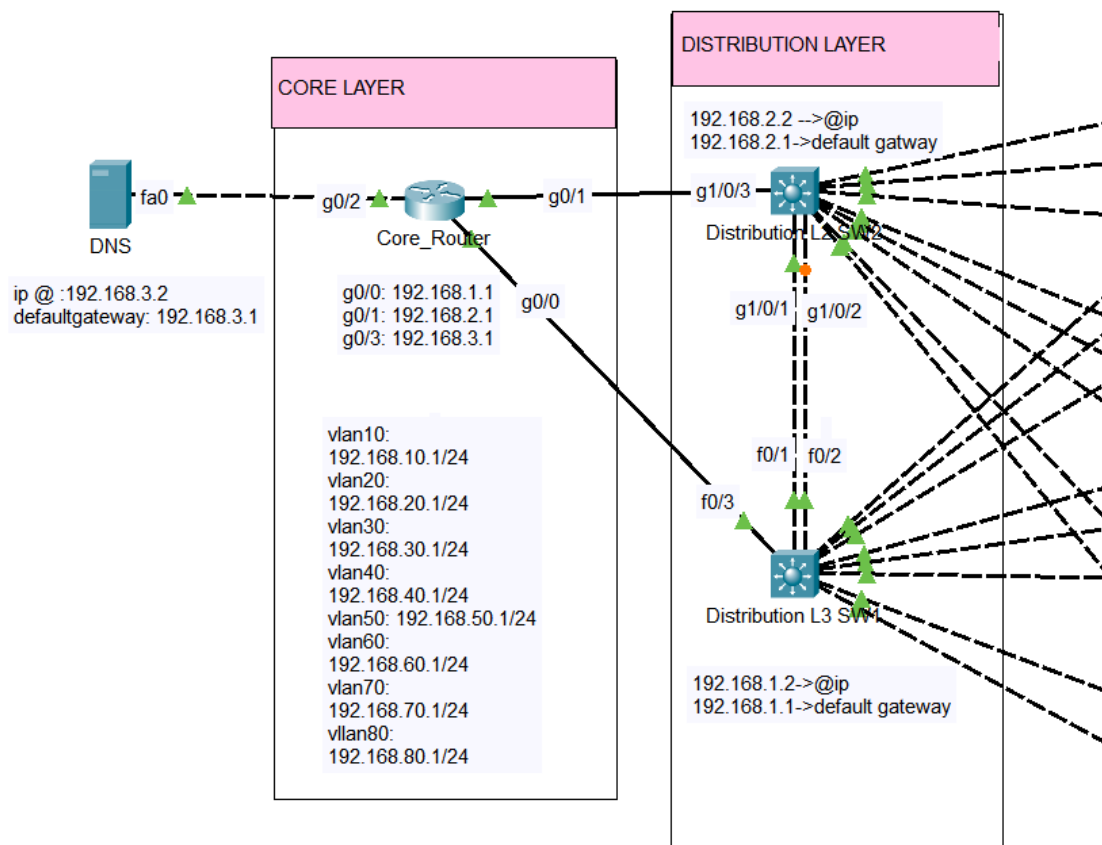
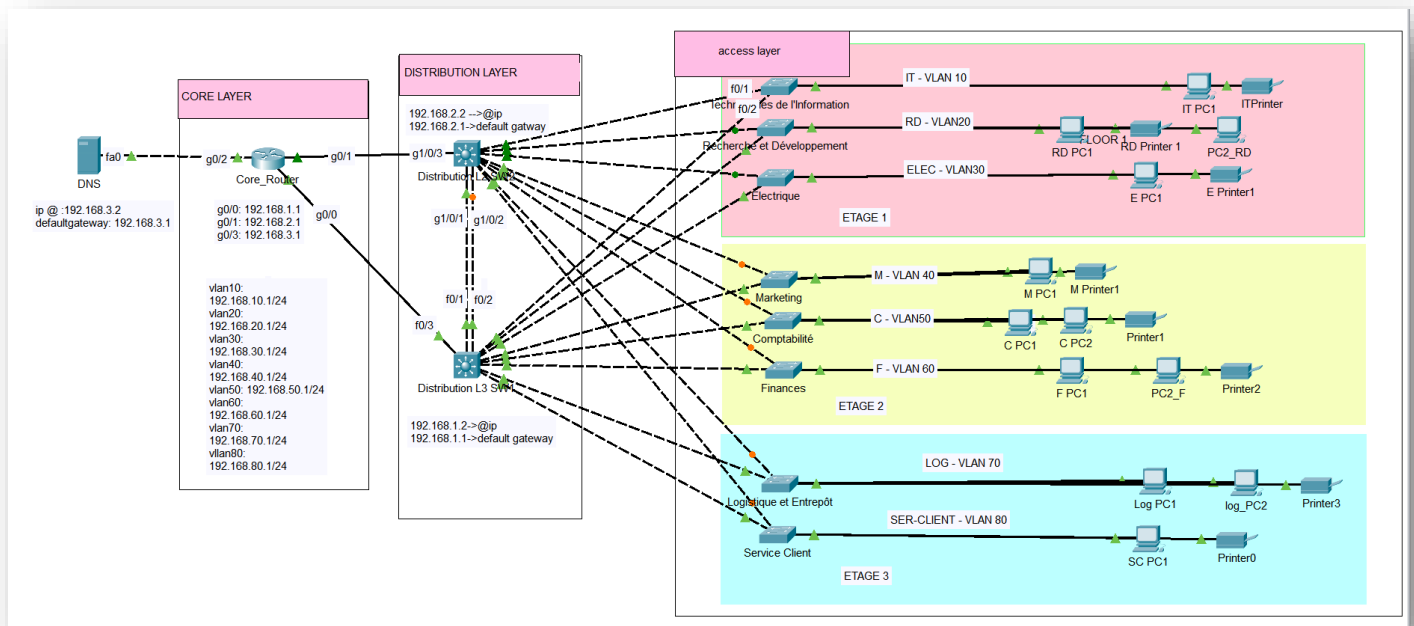
- **Trunk** : Ports connectés à Switch1 et Switch2.
- **Access** : Ports connectés aux hôtes finaux, assignés au VLAN correspondant.

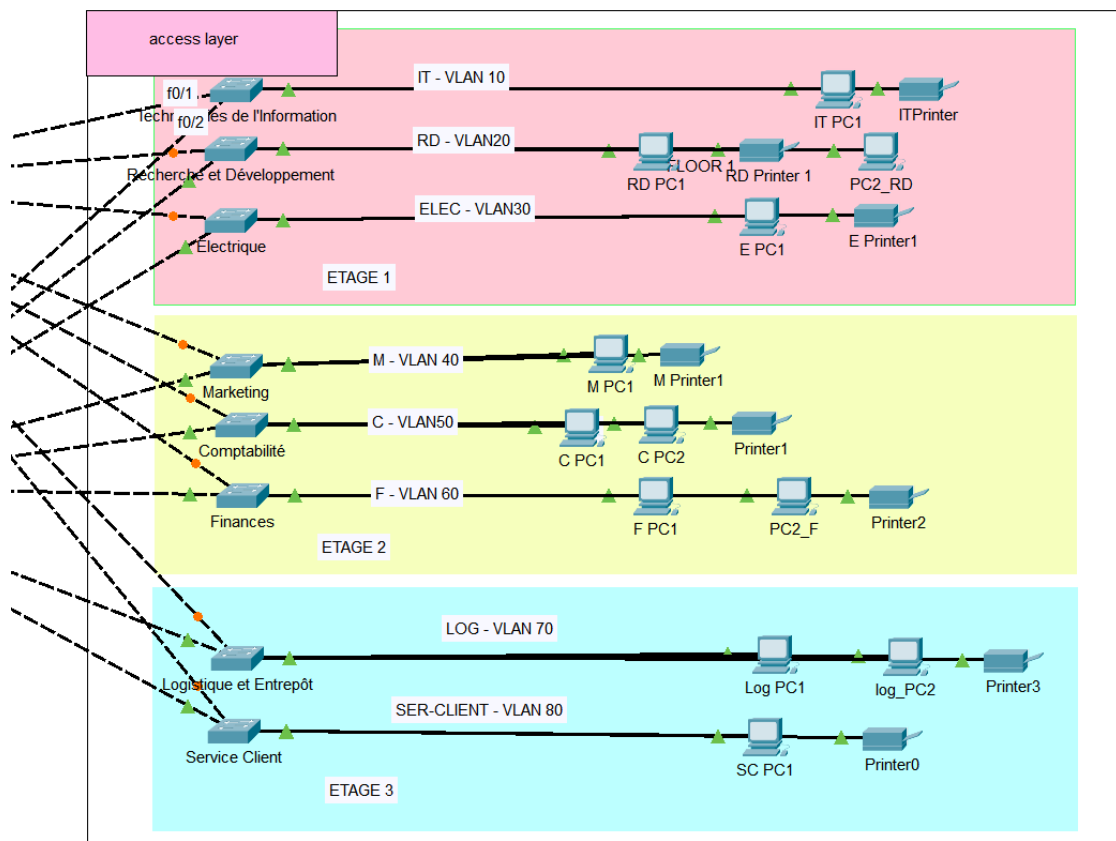
### Bilan

1. Redondance : Switch1 et Switch2 sont interconnectés avec deux ports trunk pour assurer une liaison redondante.
2. VLAN propagation : Tous les VLANs (10 à 80) sont propagés entre le routeur, Switch1, Switch2 et les switches d'accès via des ports trunk.
3. Passerelle par défaut des hôtes : L'interface VLAN configurée sur le routeur (192.168.X.1 pour chaque VLAN).
4. Ports en mode access : Les ports connectés aux hôtes sont configurés en mode access et assignés au VLAN correspondant.



## 6 Topologie finale



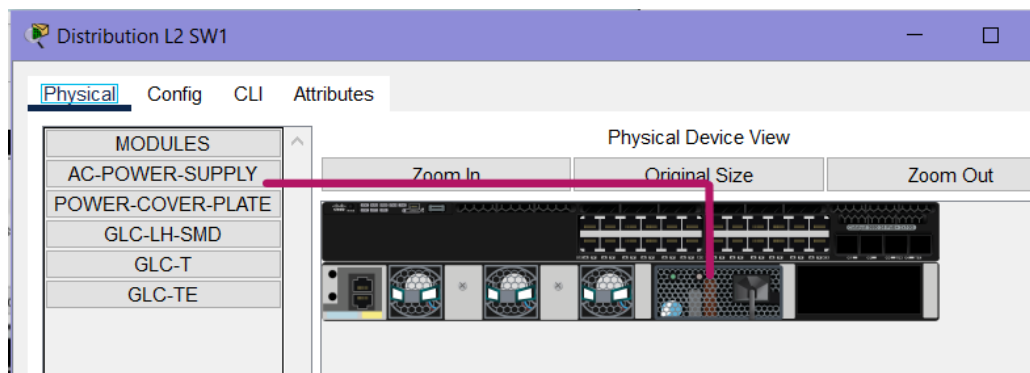


## *Phase 2 : Configuration des appareils*

### 1 Partie 1 : ajout des modules nécessaires

#### AC-PAWER-SUPPLY

- Les équipements réseau, comme les routeurs Cisco, nécessitent une alimentation fiable. La **AC Power Supply** est essentielle pour fournir une énergie stable à ces dispositifs.
- Après l'ajout de ce module , on accède à CLI du switch , on répond par no .



#### Activer les interfaces qui sont en mode down :

- C'est via la commande : no shutdown

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int range gig0/0-1
Router(config-if-range)#no shutdown
```

## 2 Partie 2 : Configuration de base des appareils du réseau

### 2.1 Les points traités dans la configuration de base du réseau

#### Nom d'hôte (Hostname) :

- Définit un nom unique pour l'appareil pour faciliter son identification.

#### Mot de passe secret (Enable Secret) :

- Configure un mot de passe sécurisé et chiffré pour accéder au mode privilégié (enable).

#### Mots de passe pour la console et les lignes VTY :

- Protège l'accès à l'appareil via la console locale ou les connexions à distance (Telnet/SSH).

#### Message de bannière (Banner) :

- Affiche un message informatif ou d'avertissement aux utilisateurs qui se connectent à l'appareil.

#### Désactivation de la recherche DNS (No IP Domain Lookup) :

- Empêche les délais causés par la tentative de résolution DNS des commandes incorrectes.

#### Délai d'inactivité (Exec Timeout) :

- Configure une déconnexion automatique après un temps donné d'inactivité (5 minutes).

#### Journalisation synchrone (Logging Synchronous) :

- Préserve une saisie fluide des commandes en évitant les interruptions dues aux messages système.

#### Cryptage des mots de passe (Service Password Encryption) :

- Chiffre tous les mots de passe en clair pour renforcer la sécurité.

### 2.2 L'objectif de ces commandes :

**Sécurité :** Empêche les accès non autorisés grâce aux mots de passe et au cryptage.

**Gestion efficace :** Facilite la maintenance avec des noms d'hôte clairs et une interface administrateur organisée.

**Préparation aux pannes :** Enregistre les configurations pour éviter leur perte en cas de redémarrage.

## 2.3 Liste de commandes :

```
enable
configure terminal
hostname <nom>

enable secret zineb

service password-encryption

line console 0
password zineb123
login
exec-timeout 5 0
logging synchronous
exit

line vty 0 4
password zineb@123
login
exec-timeout 5 0
logging synchronous
exit

banner motd # -----Binevenue Zineb !!----- #

no ip domain-lookup

end
write memory
```

## 2.4 Captures d'écran de la configuration de chaque appareil



## IOS Command Line Interface

```

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname IT
IT(config)#
IT(config)#enable secret zineb
IT(config)#
IT(config)#service password-encryption
IT(config)#
IT(config)#line console 0
IT(config-line)#password zineb123
IT(config-line)#login
IT(config-line)#exec-timeout 5 0
IT(config-line)#logging synchronous
IT(config-line)#exit
IT(config)#
IT(config)#line vty 0 4
IT(config-line)#password zineb@123
IT(config-line)#login
IT(config-line)#exec-timeout 5 0
IT(config-line)#logging synchronous
IT(config-line)#exit
IT(config)#
IT(config)#banner motd # -----Binevenue Zineb !!----- #
IT(config)#
IT(config)#no ip domain-lookup
IT(config)#
IT(config)#end
IT#write memory
Building configuration...
[OK]
IT#
%SYS-5-CONFIG_I: Configured from console by console

```

## IOS Command Line Interface

```

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Rech_Dev
Rech_Dev(config)#
Rech_Dev(config)#enable secret zineb
Rech_Dev(config)#
Rech_Dev(config)#service password-encryption
Rech_Dev(config)#
Rech_Dev(config)#line console 0
Rech_Dev(config-line)#password zineb123
Rech_Dev(config-line)#login
Rech_Dev(config-line)#exec-timeout 5 0
Rech_Dev(config-line)#logging synchronous
Rech_Dev(config-line)#exit
Rech_Dev(config)#
Rech_Dev(config)#line vty 0 4
Rech_Dev(config-line)#password zineb@123
Rech_Dev(config-line)#login
Rech_Dev(config-line)#exec-timeout 5 0
Rech_Dev(config-line)#logging synchronous
Rech_Dev(config-line)#exit
Rech_Dev(config)#
Rech_Dev(config)#banner motd # -----Binevenue Zineb !!----- #
Rech_Dev(config)#
Rech_Dev(config)#no ip domain-lookup
Rech_Dev(config)#
Rech_Dev(config)#end
Rech_Dev#write memory
Building configuration...
[OK]
Rech_Dev#
%SYS-5-CONFIG_I: Configured from console by console

```

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Elec
Elec(config)#
Elec(config)#enable secret zineb
Elec(config)#
Elec(config)#service password-encryption
Elec(config)#
Elec(config)#line console 0
Elec(config-line)#password zineb123
Elec(config-line)#login
Elec(config-line)#exec-timeout 5 0
Elec(config-line)#logging synchronous
Elec(config-line)#exit
Elec(config)#
Elec(config)#line vty 0 4
Elec(config-line)#password zineb@123
Elec(config-line)#login
Elec(config-line)#exec-timeout 5 0
Elec(config-line)#logging synchronous
Elec(config-line)#exit
Elec(config)#
Elec(config)#banner motd # -----Binevenue Zineb !!----- #
Elec(config)#
Elec(config)#no ip domain-lookup
Elec(config)#
Elec(config)#end
Elec#write memory
Building configuration...
[OK]
Elec#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Marketing
Marketing(config)#
Marketing(config)#enable secret zineb
Marketing(config)#
Marketing(config)#service password-encryption
Marketing(config)#
Marketing(config)#line console 0
Marketing(config-line)#password zineb123
Marketing(config-line)#login
Marketing(config-line)#exec-timeout 5 0
Marketing(config-line)#logging synchronous
Marketing(config-line)#exit
Marketing(config)#
Marketing(config)#line vty 0 4
Marketing(config-line)#password zineb@123
Marketing(config-line)#login
Marketing(config-line)#exec-timeout 5 0
Marketing(config-line)#logging synchronous
Marketing(config-line)#exit
Marketing(config)#
Marketing(config)#banner motd # -----Binevenue Zineb !!----- #
Marketing(config)#
Marketing(config)#no ip domain-lookup
Marketing(config)#
Marketing(config)#end
Marketing#write memory
Building configuration...
[OK]
Marketing#
%SYS-5-CONFIG_I: Configured from console by console
```

```

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Comptabilite
Comptabilite(config)#
Comptabilite(config)#enable secret zineb
Comptabilite(config)#
Comptabilite(config)#service password-encryption
Comptabilite(config)#
Comptabilite(config)#line console 0
Comptabilite(config-line)#password zineb123
Comptabilite(config-line)#login
Comptabilite(config-line)#exec-timeout 5 0
Comptabilite(config-line)#logging synchronous
Comptabilite(config-line)#exit
Comptabilite(config)#
Comptabilite(config)#line vty 0 4
Comptabilite(config-line)#password zineb@123
Comptabilite(config-line)#login
Comptabilite(config-line)#exec-timeout 5 0
Comptabilite(config-line)#logging synchronous
Comptabilite(config-line)#exit
Comptabilite(config)#
Comptabilite(config)#banner motd # -----Binevenue Zineb !!----- #
Comptabilite(config)#
Comptabilite(config)#no ip domain-lookup
Comptabilite(config)#
Comptabilite(config)#end
Comptabilite#write memory
Building configuration...
[OK]
Comptabilite#
%SYS-5-CONFIG_I: Configured from console by console

```

```

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Finance
Finance(config)#
Finance(config)#enable secret zineb
Finance(config)#
Finance(config)#service password-encryption
Finance(config)#
Finance(config)#line console 0
Finance(config-line)#password zineb123
Finance(config-line)#login
Finance(config-line)#exec-timeout 5 0
Finance(config-line)#logging synchronous
Finance(config-line)#exit
Finance(config)#
Finance(config)#line vty 0 4
Finance(config-line)#password zineb@123
Finance(config-line)#login
Finance(config-line)#exec-timeout 5 0
Finance(config-line)#logging synchronous
Finance(config-line)#exit
Finance(config)#
Finance(config)#banner motd # -----Binevenue Zineb !!----- #
Finance(config)#
Finance(config)#no ip domain-lookup
Finance(config)#
Finance(config)#end
Finance#write memory
Building configuration...
[OK]
Finance#
%SYS-5-CONFIG_I: Configured from console by console

```

IOS Command Line Interface

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Log_Entrepot
Log_Entrepot(config)#
Log_Entrepot(config)#enable secret zineb
Log_Entrepot(config)#
Log_Entrepot(config)#service password-encryption
Log_Entrepot(config)#
Log_Entrepot(config)#line console 0
Log_Entrepot(config-line)#password zineb123
Log_Entrepot(config-line)#login
Log_Entrepot(config-line)#exec-timeout 5 0
Log_Entrepot(config-line)#logging synchronous
Log_Entrepot(config-line)#exit
Log_Entrepot(config)#
Log_Entrepot(config)#line vty 0 4
Log_Entrepot(config-line)#password zineb@123
Log_Entrepot(config-line)#login
Log_Entrepot(config-line)#exec-timeout 5 0
Log_Entrepot(config-line)#logging synchronous
Log_Entrepot(config-line)#exit
Log_Entrepot(config)#
Log_Entrepot(config)#banner motd # -----Binevenue Zineb !!----- #
Log_Entrepot(config)#
Log_Entrepot(config)#no ip domain-lookup
Log_Entrepot(config)#
Log_Entrepot(config)#end
Log_Entrepot#write memory
Building configuration...
[OK]
Log_Entrepot#
%SYS-5-CONFIG_I: Configured from console by console
```

IOS Command Line Interface

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Serv_Client
Serv_Client(config)#
Serv_Client(config)#enable secret zineb
Serv_Client(config)#
Serv_Client(config)#service password-encryption
Serv_Client(config)#
Serv_Client(config)#line console 0
Serv_Client(config-line)#password zineb123
Serv_Client(config-line)#login
Serv_Client(config-line)#exec-timeout 5 0
Serv_Client(config-line)#logging synchronous
Serv_Client(config-line)#exit
Serv_Client(config)#
Serv_Client(config)#line vty 0 4
Serv_Client(config-line)#password zineb@123
Serv_Client(config-line)#login
Serv_Client(config-line)#exec-timeout 5 0
Serv_Client(config-line)#logging synchronous
Serv_Client(config-line)#exit
Serv_Client(config)#
Serv_Client(config)#banner motd # -----Binevenue Zineb !!----- #
Serv_Client(config)#
Serv_Client(config)#no ip domain-lookup
Serv_Client(config)#
Serv_Client(config)#end
Serv_Client#write memory
Building configuration...
[OK]
Serv_Client#
%SYS-5-CONFIG_I: Configured from console by console
```

## IOS Command Line Interface

```

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Switch2
Switch2(config)#
Switch2(config)#enable secret zineb
Switch2(config)#
Switch2(config)#service password-encryption
Switch2(config)#
Switch2(config)#line console 0
Switch2(config-line)#password zineb123
Switch2(config-line)#login
Switch2(config-line)#exec-timeout 5 0
Switch2(config-line)#logging synchronous
Switch2(config-line)#exit
Switch2(config)#
Switch2(config)#line vty 0 4
Switch2(config-line)#password zineb@123
Switch2(config-line)#login
Switch2(config-line)#exec-timeout 5 0
Switch2(config-line)#logging synchronous
Switch2(config-line)#exit
Switch2(config)#
Switch2(config)#banner motd # -----Binevenue Zineb !!----- #
Switch2(config)#
Switch2(config)#no ip domain-lookup
Switch2(config)#
Switch2(config)#end
Switch2#write memory
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
Switch2#
%SYS-5-CONFIG_I: Configured from console by console

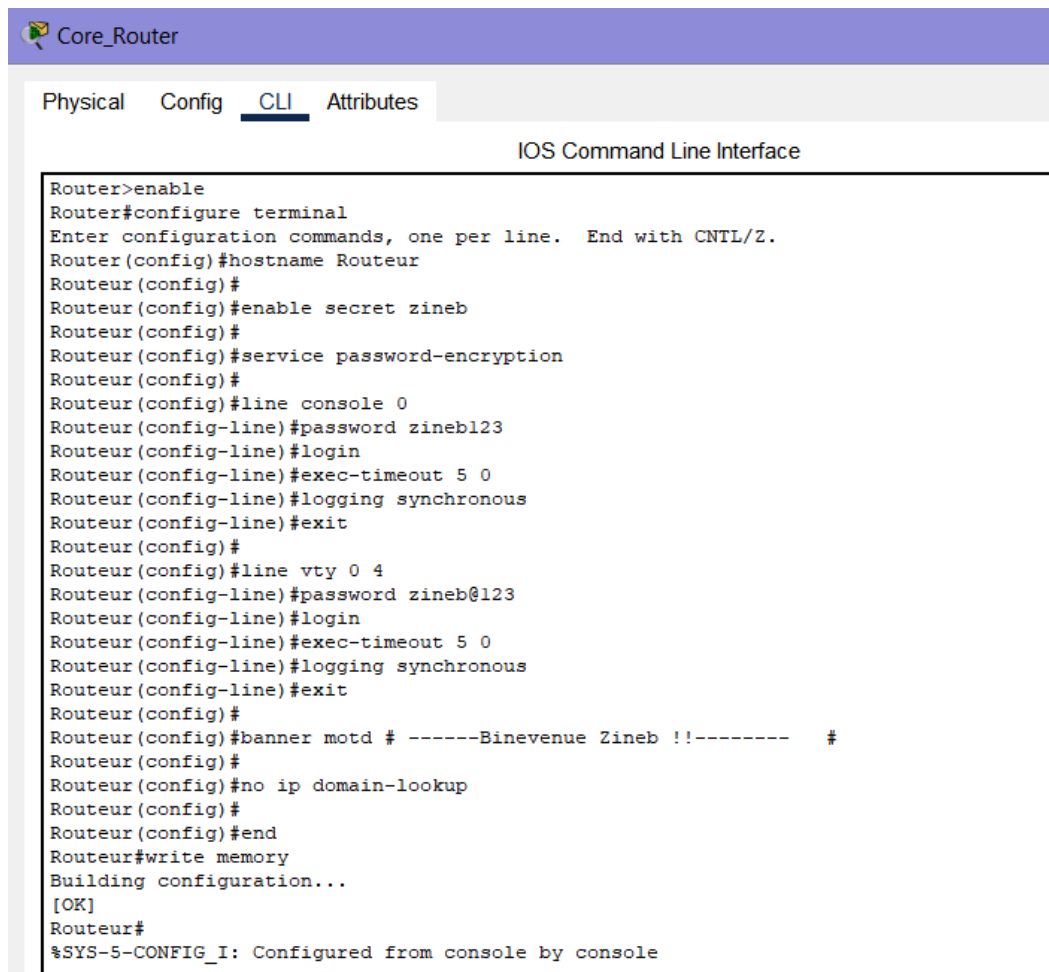
```

## IOS Command Line Interface

```

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname Switch1
Switch1(config)#
Switch1(config)#enable secret zineb
Switch1(config)#
Switch1(config)#service password-encryption
Switch1(config)#
Switch1(config)#line console 0
Switch1(config-line)#password zineb123
Switch1(config-line)#login
Switch1(config-line)#exec-timeout 5 0
Switch1(config-line)#logging synchronous
Switch1(config-line)#exit
Switch1(config)#
Switch1(config)#line vty 0 4
Switch1(config-line)#password zineb@123
Switch1(config-line)#login
Switch1(config-line)#exec-timeout 5 0
Switch1(config-line)#logging synchronous
Switch1(config-line)#exit
Switch1(config)#
Switch1(config)#banner motd # -----Binevenue Zineb !!----- #
Switch1(config)#
Switch1(config)#no ip domain-lookup
Switch1(config)#
Switch1(config)#end
Switch1#write memory
Building configuration...
[OK]
Switch1#
%SYS-5-CONFIG_I: Configured from console by console

```



The screenshot shows a web-based interface for a Core\_Router. At the top, there is a purple header bar with the text 'Core\_Router'. Below this, there is a navigation bar with four tabs: 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is currently selected and highlighted. The main content area is titled 'IOS Command Line Interface' and displays a terminal window with the following text:

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname Routeur
Routeur(config)#
Routeur(config)#enable secret zineb
Routeur(config)#
Routeur(config)#service password-encryption
Routeur(config)#
Routeur(config)#line console 0
Routeur(config-line)#password zinebl23
Routeur(config-line)#login
Routeur(config-line)#exec-timeout 5 0
Routeur(config-line)#logging synchronous
Routeur(config-line)#exit
Routeur(config)#
Routeur(config)#line vty 0 4
Routeur(config-line)#password zineb@123
Routeur(config-line)#login
Routeur(config-line)#exec-timeout 5 0
Routeur(config-line)#logging synchronous
Routeur(config-line)#exit
Routeur(config)#
Routeur(config)#banner motd # -----Binevenue Zineb !!----- #
Routeur(config)#
Routeur(config)#no ip domain-lookup
Routeur(config)#
Routeur(config)#end
Routeur#write memory
Building configuration...
[OK]
Routeur#
%SYS-5-CONFIG_I: Configured from console by console
```

## Remarque importante :

Je laisse cette partie de la configuration pour la fin afin de simplifier l'accès aux switches et au routeur lors de la configuration, sans demander de mot de passe à chaque fois. C'est pourquoi, dans le reste des captures d'écran, vous verrez des équipements sans nom.

## 3 Partie 3 : Le VTP , et la Configuration des ports en mode trunk et en mode accès

### Routeur connecté à Switch1 et Switch2 via deux interfaces distinctes

- Le routeur a deux interfaces trunk, chacune connectée à un switch de distribution (Switch1 et Switch2).
- Chaque interface gère les VLANs des hôtes connectés directement au switch correspondant.

**Interface GigabitEthernet0/0** : Connectée à Switch1 (trunk).

**Interface GigabitEthernet0/1** : Connectée à Switch2 (trunk).

### 3.1 Configuration du routeur (Router)

Configuration des interfaces pour le routage inter-VLAN

Configuration pour chaque interface :

```
enable
configure terminal

! Configuration de l'interface vers Switch1
interface GigabitEthernet0/0
  no shutdown
  description Connexion à Switch1 (Trunk)
  no ip address
!
! Sous-interfaces pour le routage inter-VLAN
interface GigabitEthernet0/0.10
  encapsulation dot1Q 10
  ip address 192.168.10.1 255.255.255.0
!
interface GigabitEthernet0/0.20
  encapsulation dot1Q 20
  ip address 192.168.20.1 255.255.255.0
! Répétez pour les autres VLANs...

! Configuration de l'interface vers Switch2
interface GigabitEthernet0/1
  no shutdown
  description Connexion à Switch2 (Trunk)
  no ip address
!
```

```

! Sous-interfaces pour le routage inter-VLAN
interface GigabitEthernet0/1.10
 encapsulation dot1Q 10
 ip address 192.168.10.1 255.255.255.0
!
interface GigabitEthernet0/1.20
 encapsulation dot1Q 20
 ip address 192.168.20.1 255.255.255.0
! Répétez pour les autres VLANs...
end
write memory

```

## Configuration de VTP :

### Commande dans switch switch de distribution 1 :

- Création du domaine vtp : zineb
- Mode : server
- Création des Vlans nécessaires

```

conf t
vtp domain zineb
vtp mode server
vlan 10
name IT
vlan 20
name Recherche_developpement
vlan 30
name Electrique
vlan 40
name Marketing
vlan 50
name Comptabilite
vlan 60
name Finance
vlan 70
name LOfistique_entrepot
vlan 80
name service_client
end
wr

```

### Dans le switch de distribution 1 :



```
Distribution L3 SW1

Physical Config CLI Attributes

IOS Command Line Interface

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp domain zineb
Domain name already set to zineb.
Switch(config)#vtp mode server
Device mode already VTP SERVER.
Switch(config)#vlan 10
Switch(config-vlan)#name IT
Switch(config-vlan)#vlan 20
Switch(config-vlan)#name Recherche_developpement
Switch(config-vlan)#vlan 30
Switch(config-vlan)#name Electrique
Switch(config-vlan)#vlan 40
Switch(config-vlan)#name Marketing
Switch(config-vlan)#vlan 50
Switch(config-vlan)#name Comptabilite
Switch(config-vlan)#vlan 60
Switch(config-vlan)#name Finance
Switch(config-vlan)#vlan 70
Switch(config-vlan)#name LOGistique_entrepot
Switch(config-vlan)#vlan 80
Switch(config-vlan)#name service_client
Switch(config-vlan)#end
Switch#wr
%SYS-5-CONFIG_I: Configured from console by console

Building configuration...
[OK]
```

les autres switches en mode client :

```
Distribution L2 SW2

Physical Config CLI Attributes

IOS Command Line Interface

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp domain zineb
Domain name already set to zineb.
Switch(config)#vtp mode client
Setting device to VTP CLIENT mode.
Switch(config)#do wr
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
```

On répète la même liste de commandes pour tous les autres switches d'accès

```
conf t
vtp domain zineb
vtp mode client
end
wr
```

Vérification des Vlan créés par la commande : show vlan brief

## IOS Command Line Interface

Switch#show vlan brief

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	IT	active	
20	Rcherche_developpement	active	
30	Electrique	active	
40	Marketing	active	
50	Comptabilite	active	
60	Finance	active	
70	LOgistique_entrepot	active	
80	service_client	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

Switch#

## IOS Command Line Interface

Switch#show vlan brief

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	IT	active	
20	RECHERCHE_DEVELOPEMENT	active	
30	Electrique	active	
40	Marketing	active	
50	Comptabilite	active	
60	Finance	active	
70	Logistique_Entrepot	active	
80	service_Client	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

Switch#

Physical Config CLI Attributes

## IOS Command Line Interface

Switch#show vlan brief

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	IT	active	
20	RECHERCHE_DEVELOPEMENT	active	
30	Electrique	active	
40	Marketing	active	
50	Comptabilite	active	
60	Finance	active	
70	Logistique_Entrepot	active	
80	service_Client	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

Switch#

Physical Config CLI Attributes

## IOS Command Line Interface

Switch#show vlan brief

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	IT	active	
20	RECHERCHE_DEVELOPEMENT	active	
30	Electrique	active	
40	Marketing	active	
50	Comptabilite	active	
60	Finance	active	
70	Logistique_Entrepot	active	
80	service_Client	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

Switch#

## IOS Command Line Interface

Switch#show vlan brief

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	IT	active	
20	RECHERCHE_DEVELOPEMENT	active	
30	Electrique	active	
40	Marketing	active	
50	Comptabilite	active	
60	Finance	active	
70	Logistique_Entrepot	active	
80	service_Client	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

## IOS Command Line Interface

Switch#show vlan brief

%SYS-5-CONFIG\_I: Configured from console by console

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	IT	active	
20	RECHERCHE_DEVELOPEMENT	active	
30	Electrique	active	
40	Marketing	active	
50	Comptabilite	active	
60	Finance	active	
70	Logistique_Entrepot	active	
80	service_Client	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

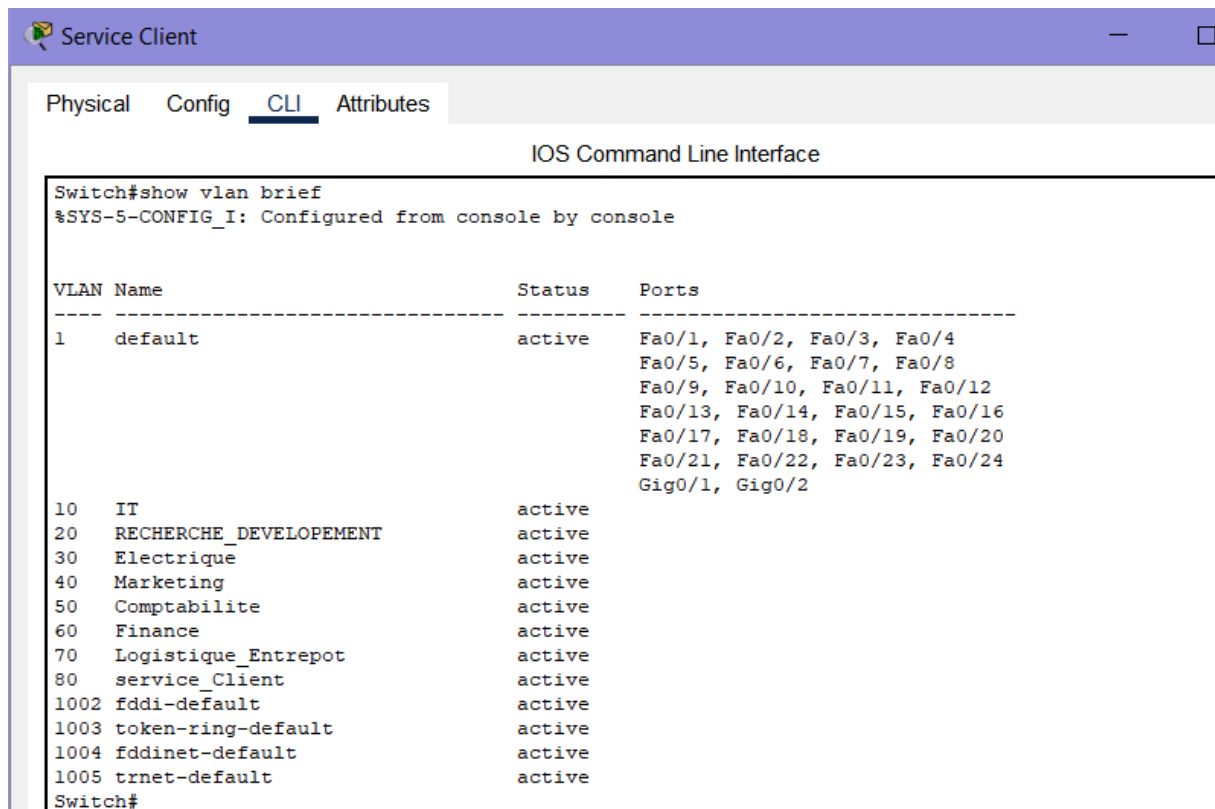
## IOS Command Line Interface

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	IT	active	
20	RECHERCHE_DEVELOPEMENT	active	
30	Electrique	active	
40	Marketing	active	
50	Comptabilite	active	
60	Finance	active	
70	Logistique_Entrepot	active	
80	service_Client	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

## IOS Command Line Interface

```
Switch#show vlan brief
%SYS-5-CONFIG_I: Configured from console by console
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	IT	active	
20	RECHERCHE_DEVELOPEMENT	active	
30	Electrique	active	
40	Marketing	active	
50	Comptabilite	active	
60	Finance	active	
70	Logistique_Entrepot	active	
80	service_Client	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	



## 3.2 Configuration des ports : mode access et mode trunk :

### 3.2.1 2. Configuration des Switchs de Distribution (Switch1 et Switch2)

Configuration des ports en mode trunk sur Switch1 et Switch2 :

```
! Configurer les interfaces Trunk vers le routeur et Switch2
interface GigabitEthernet0/1
  switchport mode trunk
  switchport trunk allowed vlan 10,20,30,40,50,60,70,80

interface GigabitEthernet0/2
  switchport mode trunk
  switchport trunk allowed vlan 10,20,30,40,50,60,70,80

! Configurer les interfaces Trunk vers les switches d'accès
interface range GigabitEthernet0/3-0/10
  description Connexion aux switches d'accès
  switchport mode trunk
  switchport trunk allowed vlan 10,20,30,40,50,60,70,80

! Activer les interfaces
interface range GigabitEthernet0/1-0/10
```

```
no shutdown
end
write memory
```

### 3.2.2 Configuration similaire sur Switch2 :

- la même configuration pour Switch2 avec les mêmes VLANs et interfaces trunk.

#### switches d'accès :

liste de commande :

```
conf t
int range f0/1-2
switchport mode trunk
switchport trunk allowed vlan « liste des vlans »

int range f0/3-5
switchport mode access
switchport access vlan 10
end
wr
```

#### les Ports en mode trunk :

The image displays four screenshots of network switch CLI configurations, each for a different department. Each screenshot shows the configuration of interfaces f0/1-2 as trunks and f0/3-5 as access ports.

- Electrique:**

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/1-2
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 30
Switch(config-if-range)#end
Switch#wr
```
- Technologies de l'Information:**

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/1-2
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 10
Switch(config-if-range)#end
Switch#
```
- Recherche et Développement:**

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/1-2
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 20
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
Switch#disable
```
- Comptabilité:**

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/1-2
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 50
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
```

Marketing

Physical Config CLI Attributes

IOS Command Line Interface

```

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/1-2
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 40
Switch(config-if-range)#end
Switch#wr
Building configuration...

```

Logistique et Entrepôt

Physical Config CLI Attributes

IOS Command Line Interface

```

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/1-2
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 70
Switch(config-if-range)#end
Switch#wr

```

Finances

Physical Config CLI Attributes

IOS Command Line Interface

```

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/1-2
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 60
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]

```

Service Client

Physical Config CLI Attributes

IOS Command Line Interface

```

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/1-2
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 80
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
Switch#
%SYS-5-CONFIG_I: Configured from console by console

```



## 4 Partie 4 : Configuration du groupe Etherchannel "LACP"

### L'Etherchannel

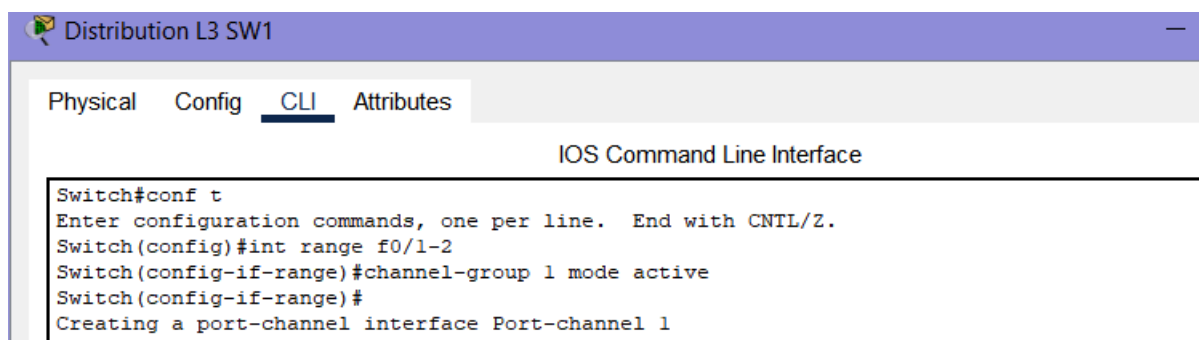
**EtherChannel** : Les interfaces FastEthernet0/1 et FastEthernet0/2 sont regroupées en un seul canal de port (Port-channel1) en utilisant LACP (mode actif).

Commande de verification des groupes etherchannel :


Il y'a plusieurs commandes pour vérifier une configuration EtherChannel :

1. **show interface port-channel** : Affiche l'état général de l'interface de port-channel. Par exemple, l'interface Port Channel 1 est active.
2. **show etherchannel summary** : Affiche une ligne d'informations unique par canal de port. Par exemple, le groupe 1 utilise LACP.
3. **show etherchannel port-channel** : Affiche des informations spécifiques sur une interface port-channel. Par exemple, l'interface Port Channel 1 est constituée de FastEthernet0/1 et FastEthernet0/2, utilisant LACP en mode actif.
4. **show interfaces etherchannel** : Fournit des informations sur le rôle de l'interface dans l'EtherChannel. Par exemple, FastEthernet 0/1 fait partie du groupe EtherChannel 1 avec LACP comme protocole.

- **Création de etherchannel entre les deux switches de distribution :**



```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/1-2
Switch(config-if-range)#channel-group 1 mode active
Switch(config-if-range)#
Creating a port-channel interface Port-channel 1
```

 Distribution L3 SW1

Physical Config CLI Attributes

IOS Command Line Interface


```
Switch(config-if-range)#channel-group 1 mode active
Switch(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%EC-5-CANNOT_BUNDLE2: Fa0/1 is not compatible with Pol and will be suspended (vlan mask is
different)

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to down

%EC-5-CANNOT_BUNDLE2: Fa0/2 is not compatible with Pol and will be suspended (vlan mask is
different)

Switch(config-if-range)#no shutdown
```

 Distribution L2 SW2

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch(config-if-range)#switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
Switch(config-if-range)#channel-group 1 mode active
Switch(config-if-range)#
Creating a port-channel interface Port-channel 1

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/0/1, changed state to down

%EC-5-CANNOT_BUNDLE2: Gig1/0/1 is not compatible with Pol and will be suspended (vlan mask is
different)

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet1/0/2, changed state to down

%EC-5-CANNOT_BUNDLE2: Gig1/0/2 is not compatible with Pol and will be suspended (vlan mask is
different)

Switch(config-if-range)#no shutdown
```

- **Verification dans switch1 :**

```

interface Port-channel1
!
interface FastEthernet0/1
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
switchport mode trunk
channel-group 1 mode active
!
interface FastEthernet0/2
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
switchport mode trunk
channel-group 1 mode active
!
interface FastEthernet0/3
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/4
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/5
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/6
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/7
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/8
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/9
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
--More--

```

## Verification switch 2 :

```

interface Port-channel1
!
interface GigabitEthernet1/0/1
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
channel-group 1 mode active
!
interface GigabitEthernet1/0/2
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
channel-group 1 mode active
.

```

## IOS Command Line Interface

```

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range g1/0/4-11
Switch(config-if-range)#switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
Switch(config-if-range)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
WT
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]

```

- **Verification dans les deux switches :**

## IOS Command Line Interface

```

interface Port-channell
!
interface GigabitEthernet1/0/1
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
channel-group 1 mode active
!
interface GigabitEthernet1/0/2
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
channel-group 1 mode active
!
interface GigabitEthernet1/0/3
!
interface GigabitEthernet1/0/4
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
!
interface GigabitEthernet1/0/5
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
!
interface GigabitEthernet1/0/6
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
!
interface GigabitEthernet1/0/7
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
!
interface GigabitEthernet1/0/8
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
!
interface GigabitEthernet1/0/9
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
!
interface GigabitEthernet1/0/10
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport mode trunk
--More--

```

## IOS Command Line Interface

```

!
interface Port-channell
!
interface FastEthernet0/1
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
switchport mode trunk
channel-group 1 mode active
!
interface FastEthernet0/2
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
switchport mode trunk
channel-group 1 mode active
!
interface FastEthernet0/3
!
interface FastEthernet0/4
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/5
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/6
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/7
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/8
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
interface FastEthernet0/9
switchport trunk allowed vlan 1,10,20,30,40,50,60,70,80
switchport trunk encapsulation dot1q
!
--More--

```

## Distribution L3 SW1

Physical Config CLI Attributes

### IOS Command Line Interface

```
Switch#show etherchannel summary
Flags:  D - down          P - in port-channel
        I - stand-alone  s - suspended
        H - Hot-standby (LACP only)
        R - Layer3       S - Layer2
        U - in use       f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port

Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
-----+-----+-----+-----
1      Pol(SD)          LACP       Fa0/1(I) Fa0/2(I)
Switch#
Switch#
```

## Distribution L2 SW2

Physical Config CLI Attributes

### IOS Command Line Interface

```
Switch#show etherchannel summary
Flags:  D - down          P - in port-channel
        I - stand-alone  s - suspended
        H - Hot-standby (LACP only)
        R - Layer3       S - Layer2
        U - in use       f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port

Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
-----+-----+-----+-----
1      Pol(SD)          LACP       Gig1/0/1(I) Gig1/0/2(I)
Switch#
Switch#
```

## 5 Partie 5 : Configuration du Spanning Tree Protocol (STP) :

- **Switch 1** est configuré comme root primaire pour les VLANs 1, 10, 20, 30, 40, 50, 60, 70 et 80.
- **Switch 2** est configuré comme root secondaire pour les mêmes VLANs.

```
Distribution L3 SW1

Physical Config CLI Attributes

IOS Command Line Interface

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#spanning-tree vlan 1 root primary
Switch(config)#spanning-tree vlan 10 root primary
Switch(config)#spanning-tree vlan 20 root primary
Switch(config)#spanning-tree vlan 30 root primary
Switch(config)#spanning-tree vlan 40 root primary
Switch(config)#spanning-tree vlan 50 root primary
Switch(config)#spanning-tree vlan 60 root primary
Switch(config)#spanning-tree vlan 70 root primary
Switch(config)#spanning-tree vlan 80 root primary
Switch(config)#end
Switch#wr
Building configuration...
[OK]
```

```
Distribution L2 SW2

Physical Config CLI Attributes

IOS Command Line Interface

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#spanning-tree vlan 1 root secondary
Switch(config)#spanning-tree vlan 10 root secondary
Switch(config)#spanning-tree vlan 20 root secondary
Switch(config)#spanning-tree vlan 30 root secondary
Switch(config)#spanning-tree vlan 40 root secondary
Switch(config)#spanning-tree vlan 50 root secondary
Switch(config)#spanning-tree vlan 60 root secondary
Switch(config)#spanning-tree vlan 70 root secondary
Switch(config)#spanning-tree vlan 80 root secondary
Switch(config)#end
Switch#wr
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
```

Configuration de la priorité :

--pour le switch 1

```
conf t
spanning-tree vlan 1 priority 4096
spanning-tree vlan 10 priority 4096
spanning-tree vlan 20 priority 4096
```

```

spanning-tree vlan 30 priority 4096
spanning-tree vlan 40 priority 4096
spanning-tree vlan 50 priority 4096
spanning-tree vlan 60 priority 4096
spanning-tree vlan 70 priority 4096
spanning-tree vlan 80 priority 4096
end
wr
--pour le switch 2
conf t
spanning-tree vlan 1 priority 8192
spanning-tree vlan 10 priority 8192
spanning-tree vlan 20 priority 8192
spanning-tree vlan 30 priority 8192
spanning-tree vlan 40 priority 8192
spanning-tree vlan 50 priority 8192
spanning-tree vlan 60 priority 8192
spanning-tree vlan 70 priority 8192
spanning-tree vlan 80 priority 8192
end
wr

```

Ces configurations assurent que le Switch 1 sera le root bridge principal pour les VLANs spécifiés, et si le Switch 1 échoue, le Switch 2 prendra le relais en tant que root bridge secondaire. Lorsque le Switch 1 revient en ligne, il redeviendra automatiquement le root bridge grâce à la priorité plus basse.

#### **Spanning Tree Protocol (STP) :**

- **Switch 1** est configuré comme root primaire pour les VLANs spécifiés avec une priorité de 4096.
- **Switch 2** est configuré comme root secondaire pour les VLANs spécifiés avec une priorité de 8192.

**Préemption :** La configuration ci-dessus assure que le Switch 1 reprendra son rôle de root bridge dès qu'il sera de nouveau opérationnel, grâce à la priorité plus basse (4096) par rapport au Switch 2 (8192).

## Distribution L3 SW1

Physical Config CLI Attributes

### IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#spanning-tree vlan 1 priority 4096
Switch(config)#spanning-tree vlan 10 priority 4096
Switch(config)#spanning-tree vlan 20 priority 4096
Switch(config)#spanning-tree vlan 30 priority 4096
Switch(config)#spanning-tree vlan 40 priority 4096
Switch(config)#spanning-tree vlan 50 priority 4096
Switch(config)#spanning-tree vlan 60 priority 4096
Switch(config)#spanning-tree vlan 70 priority 4096
Switch(config)#spanning-tree vlan 80 priority 4096
Switch(config)#end
Switch#wr
%SYS-5-CONFIG_I: Configured from console by console

Building configuration...
[OK]
```

## Distribution L2 SW2

Physical Config CLI Attributes

### IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#spanning-tree vlan 1 priority 8192
Switch(config)#spanning-tree vlan 10 priority 8192
Switch(config)#spanning-tree vlan 20 priority 8192
Switch(config)#spanning-tree vlan 30 priority 8192
Switch(config)#spanning-tree vlan 40 priority 8192
Switch(config)#spanning-tree vlan 50 priority 8192
Switch(config)#spanning-tree vlan 60 priority 8192
Switch(config)#spanning-tree vlan 70 priority 8192
Switch(config)#spanning-tree vlan 80 priority 8192
Switch(config)#end
Switch#wr
%SYS-5-CONFIG_I: Configured from console by console

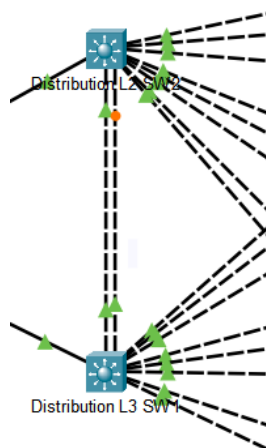
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
```

- **Commande de vérification : show sanning-tree**



Distribution L2 SW2		Distribution L3 SW1	
Physical	Config	CLI	Attributes
IOS Command Line Interface		IOS Command Line Interface	
VLAN0080 Spanning tree enabled protocol ieee Root ID Priority 4176 Address 0002.165C.698B Cost 19 Port 1(GigabitEthernet1/0/1) Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec  Bridge ID Priority 8272 (priority 8192 sys-id-ext 80) Address 00E0.8F1B.2A20 Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec Aging Time 20		VLAN0080 Spanning tree enabled protocol ieee Root ID Priority 4176 Address 0002.165C.698B This bridge is the root. Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec  Bridge ID Priority 4176 (priority 4096 sys-id-ext 80) Address 0002.165C.698B Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec Aging Time 20	
Interface	Role Sts Cost Prio.Nbr Type	Interface	Role Sts Cost Prio.Nbr Type
Gil/0/2	Altn BLK 19 128.2 P2p	Fa0/2	Desg FWD 19 128.2 P2p
Gil/0/4	Desg FWD 19 128.4 P2p	Fa0/4	Desg FWD 19 128.4 P2p
Gil/0/5	Desg FWD 19 128.5 P2p	Fa0/7	Desg FWD 19 128.7 P2p
Gil/0/1	Root FWD 19 128.1 P2p	Fa0/9	Desg FWD 19 128.9 P2p
Gil/0/6	Desg FWD 19 128.6 P2p	Fa0/5	Desg FWD 19 128.5 P2p
Gil/0/7	Desg FWD 19 128.7 P2p	Fa0/1	Desg FWD 19 128.1 P2p
Gil/0/8	Desg FWD 19 128.8 P2p	Fa0/6	Desg FWD 19 128.6 P2p
Gil/0/9	Desg FWD 19 128.9 P2p	Fa0/8	Desg FWD 19 128.8 P2p
Gil/0/10	Desg FWD 19 128.10 P2p	Fa0/10	Desg FWD 19 128.10 P2p
Gil/0/11	Desg FWD 19 128.11 P2p	Fa0/11	Desg FWD 19 128.11 P2p

Etat des ports des deux switches :



#### Autres commandes de vérification :

**show spanning-tree bridge** : Affiche les informations sur le bridge, y compris la priorité et l'adresse MAC.

**show spanning-tree root** : Affiche les informations sur le root bridge pour chaque VLAN.

## 6 Partie 6 : Configuration des Adresses

- **Sub-Interfaces du Routeur pour chaque VLAN :** Le routeur a une interface par VLAN, appelée sub-interface. Pour chaque VLAN (par exemple, VLAN 10, 20, 30, etc.), une sub-interface est créée sur le routeur avec une adresse IP correspondant à l'adresse du VLAN et à son sous-réseau. Ces adresses sont également celles que tu utilises pour la configuration HSRP (adresse virtuelle pour chaque VLAN).
- **Adresse IP virtuelle HSRP :** Comme mentionné précédemment, c'est l'adresse IP partagée par le groupe HSRP. Chaque VLAN aura son propre groupe HSRP, et l'adresse 192.168.x.1 est l'adresse virtuelle pour chaque VLAN.

### Configuration :

1. Configurer les sub-interfaces sur le routeur pour chaque VLAN. Par exemple, pour le VLAN 10, crée une sub-interface GigabitEthernet0/0.10 avec l'adresse IP 192.168.10.1. Répète cela pour chaque VLAN.

### 1. LAN (Local Area Network)

Un LAN est généralement constitué de tous les équipements connectés dans un même réseau local (comme des switches, des routeurs et des hôtes dans un même sous-réseau).

- **LANs par VLAN :** Dans cette topologie, on a un VLAN pour chaque réseau, ce qui signifie qu'il y a 8 LANs distincts (un pour chaque VLAN).
  - VLAN 10 : 192.168.10.0/24
  - VLAN 20 : 192.168.20.0/24
  - VLAN 30 : 192.168.30.0/24
  - VLAN 40 : 192.168.40.0/24
  - VLAN 50 : 192.168.50.0/24
  - VLAN 60 : 192.168.60.0/24
  - VLAN 70 : 192.168.70.0/24
  - VLAN 80 : 192.168.80.0/24

Ainsi, on a 8 LANs différents (un par VLAN) dans ton réseau.

### 2. Sous-réseaux

Chaque VLAN représente un sous-réseau distinct. En tenant compte de cela, voici l'analyse des sous-réseaux dans cette topologie :

- VLAN 10 : 192.168.10.0/24 (Sous-réseau pour VLAN 10)

- VLAN 20 : 192.168.20.0/24 (Sous-réseau pour VLAN 20)
- VLAN 30 : 192.168.30.0/24 (Sous-réseau pour VLAN 30)
- VLAN 40 : 192.168.40.0/24 (Sous-réseau pour VLAN 40)
- VLAN 50 : 192.168.50.0/24 (Sous-réseau pour VLAN 50)
- VLAN 60 : 192.168.60.0/24 (Sous-réseau pour VLAN 60)
- VLAN 70 : 192.168.70.0/24 (Sous-réseau pour VLAN 70)
- VLAN 80 : 192.168.80.0/24 (Sous-réseau pour VLAN 80)

#### **Résumé :**


- LANs : 8 LANs (un pour chaque VLAN)
- Sous-réseaux : 9 sous-réseaux (8 pour les VLANs et 1 pour la connexion au serveur)

Chaque VLAN est isolé dans son propre sous-réseau et géré par le routeur via des sub-interfaces pour permettre la communication inter-VLAN.

### **3. Configuration des Sub-interfaces sur Gig0/0 (connecté au Switch 1) :**

- Avec HSRP qu'on va activer sur les switches, c'est le switch actif qui prend en charge la communication avec le routeur.
- Si le switch actif tombe, le switch standby deviendra actif via HSRP, et le routeur continuera à fonctionner sans avoir à configurer les deux interfaces.

VLAN	Plage d'adresse	Sous-réseau	Routeur (SVI)
VLAN 10	192.168.10.0/24	192.168.10.0	192.168.10.1
VLAN 20	192.168.20.0/24	192.168.20.0	192.168.20.1
VLAN 30	192.168.30.0/24	192.168.30.0	192.168.30.1
VLAN 40	192.168.40.0/24	192.168.40.0	192.168.40.1
VLAN 50	192.168.50.0/24	192.168.50.0	192.168.50.1
VLAN 60	192.168.60.0/24	192.168.60.0	192.168.60.1
VLAN 70	192.168.70.0/24	192.168.70.0	192.168.70.1
VLAN 80	192.168.80.0/24	192.168.80.0	192.168.80.1

 Core\_Router

Physical
Config
**CLI**
Attributes

IOS Command Line Interface

```

Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface gig0/0.10
Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip address 192.168.10.1 255.255.255.0
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#
Router(config)#interface gig0/0.20
Router(config-subif)#encapsulation dot1Q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#
Router(config)#interface gig0/0.30
Router(config-subif)#encapsulation dot1Q 30
Router(config-subif)#ip address 192.168.30.1 255.255.255.0
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#
Router(config)#interface gig0/0.40
Router(config-subif)#encapsulation dot1Q 40
Router(config-subif)#ip address 192.168.40.1 255.255.255.0
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#
Router(config)#interface gig0/0.50
Router(config-subif)#encapsulation dot1Q 50
Router(config-subif)#ip address 192.168.50.1 255.255.255.0
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#
Router(config)#interface gig0/0.60
Router(config-subif)#encapsulation dot1Q 60
Router(config-subif)#ip address 192.168.60.1 255.255.255.0
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#
Router(config)#interface gig0/0.70
Router(config-subif)#encapsulation dot1Q 70
Router(config-subif)#ip address 192.168.70.1 255.255.255.0
Router(config-subif)#no shutdown

```

#### 4. Tableau des plages des hôtes finaux et passerelles par défaut :

- **Passerelle par défaut** : c'est l'adresse de la sous-interface du routeur pour chaque vlan .

VLAN	Plage des Hôtes (IP)	Passerelle par défaut (IP)
<b>VLAN 10</b>	192.168.10.4 - 192.168.10.254	192.168.10.1
<b>VLAN 20</b>	192.168.20.4- 192.168.20.254	192.168.20.1
<b>VLAN 30</b>	192.168.30.4- 192.168.30.254	192.168.30.1

<b>VLAN 40</b>	192.168.40.4 - 192.168.40.254	192.168.40.1
<b>VLAN 50</b>	192.168.50.4 - 192.168.50.254	192.168.50.1
<b>VLAN 60</b>	192.168.60.4 - 192.168.60.254	192.168.60.1
<b>VLAN 70</b>	192.168.70.4 - 192.168.70.254	192.168.70.1
<b>VLAN 80</b>	192.168.80.4 - 192.168.80.254	192.168.80.1

**Exemple de configuration pour pc , et printer dans le département IT :**

The screenshot shows the 'IT PC1' configuration window with the 'Config' tab selected. The left sidebar has a tree view with 'GLOBAL' expanded, showing 'Settings' and 'Algorithm Settings'. Under 'INTERFACE', 'FastEthernet0' is selected. The main area displays 'Global Settings' for 'IT PC1' on 'FastEthernet0'. The 'Gateway/DNS IPv4' section has 'Static' selected, with 'Default Gateway' set to '192.168.10.1' and 'DNS Server' set to '192.168.3.2'.

The screenshot shows the 'IT PC1' configuration window with the 'Config' tab selected. The left sidebar has a tree view with 'INTERFACE' expanded, and 'FastEthernet0' is selected. The main area displays 'FastEthernet0' settings. 'Port Status' is checked 'On'. 'Bandwidth' is set to '100 Mbps' and 'Duplex' is set to 'Full Duplex', both with 'Auto' selected. The 'MAC Address' is '00E0.F99E.796E'. The 'IP Configuration' section has 'Static' selected, with 'IPv4 Address' set to '192.168.10.10' and 'Subnet Mask' set to '255.255.255.0'.

ITPrinter

Physical **Config** Attributes

**GLOBAL**

Settings

**INTERFACE**

FastEthernet0

Global Settings

Display Name

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway

DNS Server

ITPrinter

Physical **Config** Attributes

**GLOBAL**

Settings

**INTERFACE**

FastEthernet0

FastEthernet0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

Subnet Mask

De même pour le reste des hôtes finaux .

Avec : 192.168.3.2 = adresse du serveur (http , https , DNS ) .

Configuration du serveur :

DNS

Physical **Config** **Services** Desktop Programming Attributes

**SERVICES**

HTTP

DHCP

DHCPv6

TFTP

**DNS**

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name  Type **A Record**

Address

Add Save Remove

No.	Name	Type	Detail
0	cisco.com	A Record	0.0.0.0
1	www.bonjourzineb.com	A Record	192.168.3.2

DNS

Physical
 Config
 Services
 Desktop
 Programming
 Attributes

**GLOBAL**
Settings
Algorithm Settings
**INTERFACE**
FastEthernet0

### Global Settings

Display Name 

Gateway/DNS IPv4
☐ DHCP
☒ Static

Default Gateway 
DNS Server

DNS

Physical
 Config
 Services
 Desktop
 Programming
 Attributes

**GLOBAL**
Settings
Algorithm Settings
**INTERFACE**
FastEthernet0

### FastEthernet0

Port Status ☒ On

Bandwidth
☒ 100 Mbps
☐ 10 Mbps
☒ Auto

Duplex
☐ Half Duplex
☒ Full Duplex
☒ Auto

MAC Address 

IP Configuration
☐ DHCP
☒ Static

IPv4 Address 
Subnet Mask

## 7 Partie 7 : HSRP (Hot Standby Router Protocol)

Dans **HSRP**, la **préemption** n'est pas activée par défaut. Cela signifie qu'un **routeur avec une priorité plus faible** ne deviendra **actif** que s'il est configuré pour **prendre le relais** en cas de défaillance du routeur actuel, et si la préemption est activée.

Si tu veux que ton routeur **préempte** (devienne actif dès qu'il a une priorité plus faible), tu dois l'activer explicitement avec la commande **standby preempt**.

### Note :

Dans le Spanning Tree Protocol (STP), le switch avec la priorité la plus basse (valeur numérique la plus élevée) devient le root bridge. En revanche, dans HSRP (Hot Standby Router Protocol), le routeur ou switch avec la priorité la plus élevée (valeur numérique la plus élevée) devient l'actif.

### on veut que :

- **Switch 1 a une priorité de 110, ce qui le rend actif.**
- **Switch 2 a une priorité de 100, ce qui le rend standby.**

### Démarche :

- On va configurer **HSRP** sur les VLANs sur vos switches pour assurer une redondance des passerelles par défaut.
- **Switch1** devient le **routeur principal** (Active) pour chaque VLAN, et **Switch2** est le **routeur de secours** (Standby).
- Si **Switch1** tombe en panne, **Switch2** prendra automatiquement le relais.

### 1. Configuration sur Switch1 (Active Router)

Sur **Switch1**, vous allez définir l'interface VLAN pour chaque VLAN et configurer HSRP pour assurer la redondance.

#### 1. Adresses physiques pour VLANs

Chaque switch doit avoir une **adresse IP physique unique** pour chaque VLAN. Cela sert à la communication interne entre les switches et permet de définir les priorités HSRP.

#### 2. Adresse virtuelle HSRP (VIP)



Chaque VLAN doit avoir une **adresse virtuelle partagée** entre les deux switches. Cette adresse virtuelle sera configurée dans HSRP et servira de **passerelle par défaut** pour les hôtes du VLAN.

```
conf t
interface vlan 10
ip address 192.168.10.2 255.255.255.0 ! Adresse physique
standby 10 ip 192.168.10.1           ! Adresse virtuelle HSRP
standby 10 priority 110              ! Priorité pour être actif
standby 10 preempt                   ! Activer la préemption
exit

interface vlan 20
ip address 192.168.20.2 255.255.255.0
standby 20 ip 192.168.20.1
standby 20 priority 110
standby 20 preempt
exit

interface vlan 30
ip address 192.168.30.2 255.255.255.0
standby 30 ip 192.168.30.1
standby 30 priority 110
standby 30 preempt
exit
```

## 2. Configuration sur Switch2 (Backup Router)

Sur **Switch2**, la configuration sera similaire, mais avec une priorité plus basse pour que **Switch2** soit le routeur de secours (standby).

```
conf t
interface vlan 10
ip address 192.168.10.3 255.255.255.0 ! Adresse physique
standby 10 ip 192.168.10.1           ! Même adresse virtuelle
standby 10 priority 100              ! Priorité inférieure
exit

interface vlan 20
ip address 192.168.20.3 255.255.255.0
standby 20 ip 192.168.20.1
standby 20 priority 100
exit

interface vlan 30
ip address 192.168.30.3 255.255.255.0
standby 30 ip 192.168.30.1
```

```
standby 30 priority 100  
exit
```

```
#la meme chose pour le reste des vlans
```

## Explication des commandes

1. **standby <VLAN\_ID> ip <IP>** : Cette commande définit l'adresse IP virtuelle utilisée par HSRP, qui sera la passerelle par défaut pour les hôtes du VLAN. Les hôtes du VLAN 10, par exemple, utiliseront 192.168.10.254 comme passerelle par défaut.
2. **standby <VLAN\_ID> priority <value>** : La priorité détermine quel switch deviendra le routeur principal. Un switch avec une priorité plus élevée sera élu **Active Router**. Dans cet exemple, Switch1 a une priorité de 110 (plus élevée que celle de Switch2, qui est de 100).
3. **standby <VLAN\_ID> preempt** : Cela permet à un switch avec une priorité plus élevée de reprendre le rôle de routeur principal si le switch secondaire prend momentanément la relève.
4. **standby <VLAN\_ID> timers <hello\_time> <hold\_time> <dead\_time>** : Ce réglage ajuste les minuteries HSRP. Les valeurs par défaut sont souvent suffisantes, mais juste pour une personnalisation.

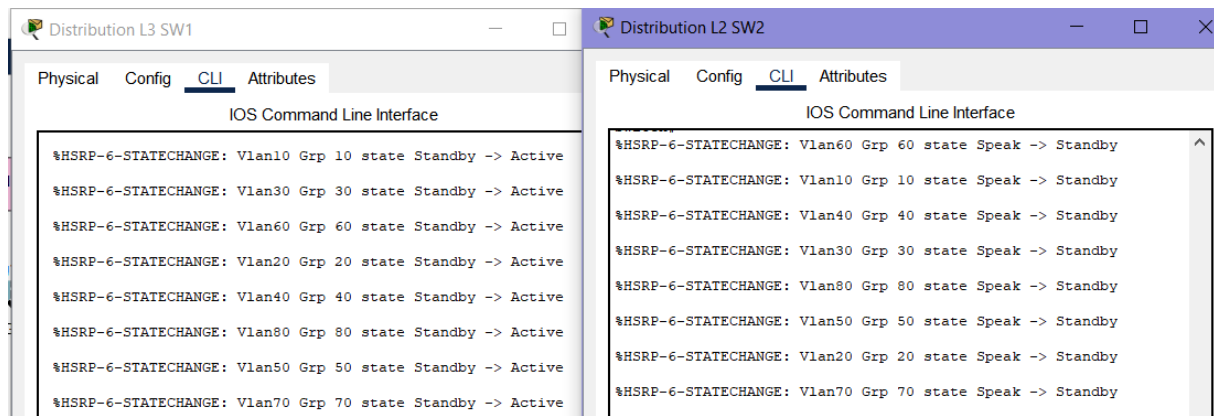
## IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface vlan 10
Switch(config-if)#ip address 192.168.10.3 255.255.255.0
Switch(config-if)#standby 10 ip 192.168.10.1
Switch(config-if)#standby 10 priority 100
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 20
Switch(config-if)#ip address 192.168.20.3 255.255.255.0
Switch(config-if)#standby 20 ip 192.168.20.1
Switch(config-if)#standby 20 priority 100
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 30
Switch(config-if)#ip address 192.168.30.3 255.255.255.0
Switch(config-if)#standby 30 ip 192.168.30.1
Switch(config-if)#standby 30 priority 100
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 40
Switch(config-if)#ip address 192.168.40.3 255.255.255.0
Switch(config-if)#standby 40 ip 192.168.40.1
Switch(config-if)#standby 40 priority 100
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 50
Switch(config-if)#ip address 192.168.50.3 255.255.255.0
Switch(config-if)#standby 50 ip 192.168.50.1
Switch(config-if)#standby 50 priority 100
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 60
Switch(config-if)#ip address 192.168.60.3 255.255.255.0
Switch(config-if)#standby 60 ip 192.168.60.1
Switch(config-if)#standby 60 priority 100
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 70
Switch(config-if)#ip address 192.168.70.3 255.255.255.0
Switch(config-if)#standby 70 ip 192.168.70.1
Switch(config-if)#standby 70 priority 100
```

```
Switch(config)#
Switch(config)#interface vlan 80
Switch(config-if)#ip address 192.168.80.3 255.255.255.0
Switch(config-if)#standby 80 ip 192.168.80.1
Switch(config-if)#standby 80 priority 100
```

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface vlan 10
Switch(config-if)#ip address 192.168.10.2 255.255.255.0
Switch(config-if)#standby 10 ip 192.168.10.1
Switch(config-if)#standby 10 priority 110
Switch(config-if)#standby 10 preempt
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 20
Switch(config-if)#ip address 192.168.20.2 255.255.255.0
Switch(config-if)#standby 20 ip 192.168.20.1
Switch(config-if)#standby 20 priority 110
Switch(config-if)#standby 20 preempt
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 30
Switch(config-if)#ip address 192.168.30.2 255.255.255.0
Switch(config-if)#standby 30 ip 192.168.30.1
Switch(config-if)#standby 30 priority 110
Switch(config-if)#standby 30 preempt
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 40
Switch(config-if)#ip address 192.168.40.2 255.255.255.0
Switch(config-if)#standby 40 ip 192.168.40.1
Switch(config-if)#standby 40 priority 110
Switch(config-if)#standby 40 preempt
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 50
Switch(config-if)#ip address 192.168.50.2 255.255.255.0
Switch(config-if)#standby 50 ip 192.168.50.1
Switch(config-if)#standby 50 priority 110
Switch(config-if)#standby 50 preempt
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 60
Switch(config-if)#ip address 192.168.60.2 255.255.255.0
Switch(config-if)#standby 60 ip 192.168.60.1
Switch(config-if)#standby 60 priority 110
Switch(config-if)#standby 60 preempt
```

```
Switch(config)#interface vlan 70
Switch(config-if)#ip address 192.168.70.2 255.255.255.0
Switch(config-if)#standby 70 ip 192.168.70.1
Switch(config-if)#standby 70 priority 110
Switch(config-if)#standby 70 preempt
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface vlan 80
Switch(config-if)#ip address 192.168.80.2 255.255.255.0
Switch(config-if)#standby 80 ip 192.168.80.1
Switch(config-if)#standby 80 priority 110
Switch(config-if)#standby 80 preempt
```

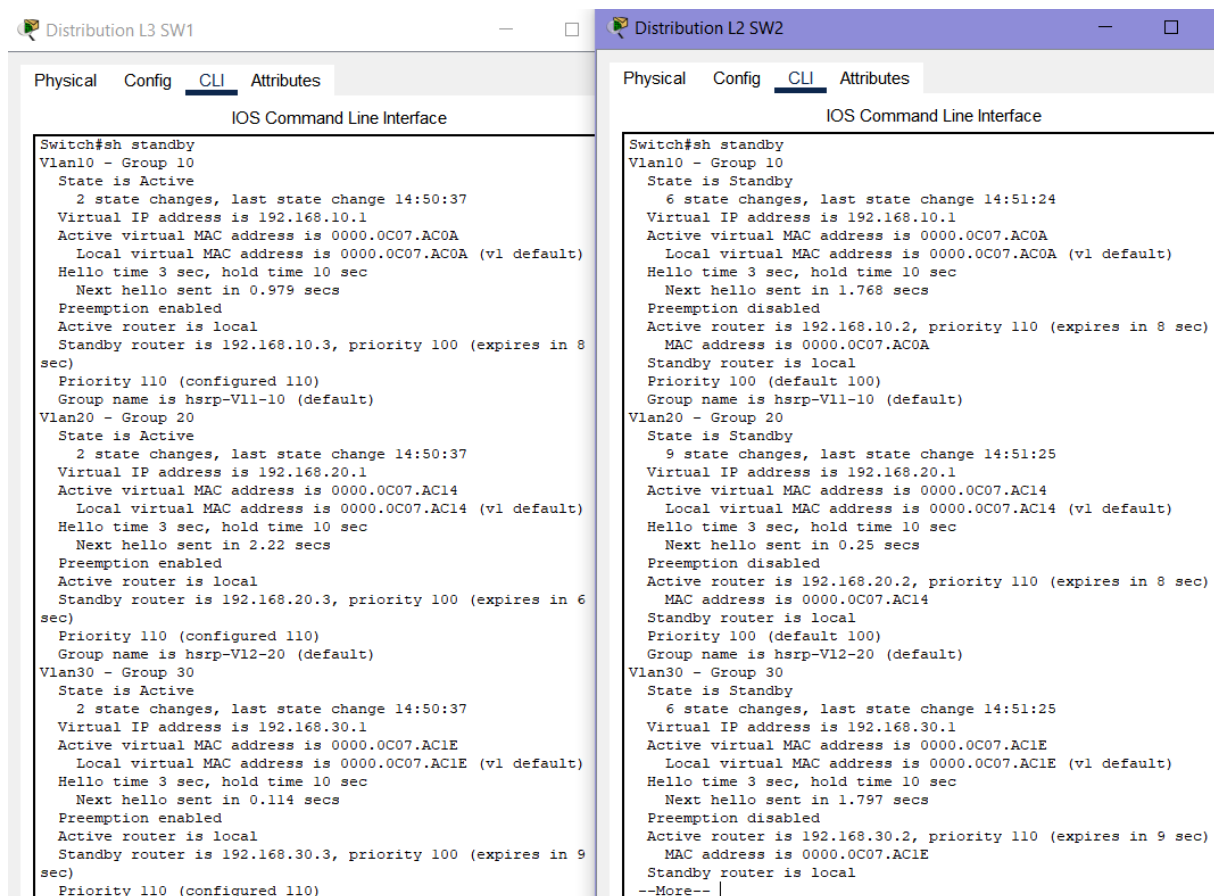


- **Vérification de la configuration :**

Commande :

```
Switch1# show standby
Switch2# show standby
```

Cela affichera l'état de HSRP, y compris qui est actuellement le routeur actif (Active) et qui est le routeur en veille (Standby), ainsi que l'adresse IP virtuelle utilisée par les hôtes.



- Activer le routage dans les deux switches de distribution :

Distribution L3 SW1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip routing
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#wr
Building configuration...
[OK]
Switch#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    192.168.10.0/24 is directly connected, Vlan10
C    192.168.20.0/24 is directly connected, Vlan20
C    192.168.30.0/24 is directly connected, Vlan30
C    192.168.40.0/24 is directly connected, Vlan40
C    192.168.50.0/24 is directly connected, Vlan50
C    192.168.60.0/24 is directly connected, Vlan60
C    192.168.70.0/24 is directly connected, Vlan70
C    192.168.80.0/24 is directly connected, Vlan80
```

Distribution L2 SW2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip routing
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#wr
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
Switch#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    192.168.10.0/24 is directly connected, Vlan10
C    192.168.20.0/24 is directly connected, Vlan20
C    192.168.30.0/24 is directly connected, Vlan30
C    192.168.40.0/24 is directly connected, Vlan40
C    192.168.50.0/24 is directly connected, Vlan50
C    192.168.60.0/24 is directly connected, Vlan60
C    192.168.70.0/24 is directly connected, Vlan70
C    192.168.80.0/24 is directly connected, Vlan80
```

## 8 Partie 8 : Port Security (sticky )

La **Port Security** est une fonctionnalité utilisée sur les ports d'un switch pour contrôler et sécuriser l'accès au réseau. Elle limite le nombre d'adresses MAC autorisées à s'associer à un port et peut agir sur des violations en fonction de la configuration.

### Configuration de la sécurité des ports :

Les commandes configurent la **sécurité des ports** sur un switch afin de protéger le réseau contre des connexions non autorisées. Voici les principaux objectifs :

#### 1. Restreindre le nombre d'appareils connectés :

- **switchport port-security maximum 1** : Limite le port à une seule adresse MAC autorisée.

#### 2. Apprendre dynamiquement les adresses MAC :

- **switchport port-security mac-address sticky** : Enregistre automatiquement l'adresse MAC du premier appareil connecté et la fixe au port.

#### 3. Réagir aux violations :

- **switchport port-security violation shutdown** : Met le port en mode **err-disabled** (désactivé) si une adresse MAC non autorisée est détectée.

#### 4. Vérifier l'état de la sécurité des ports :

- **show port-security** : Fournit un résumé de la configuration et de l'état des ports sécurisés.

```
--configuration dans les ports en mode access
conf t
int range f0/3-5
switchport port-security
switchport port-security maximum 1
switchport port-security mac-address sticky
switchport port-security violation shutdown
end
wr
--verifier la configuration
show port-security
```

## IOS Command Line Interface

```

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/3-5
Switch(config-if-range)#switchport port-security
Switch(config-if-range)#switchport port-security maximum 1
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]

```

**Verification : commande #show port-security**

## IOS Command Line Interface

```

Switch#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
          (Count)          (Count)          (Count)
-----
Fa0/3      1              0              0      Shutdown
Fa0/4      1              0              0      Shutdown
Fa0/5      1              0              0      Shutdown

```

## IOS Command Line Interface

```

Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/3-5
Switch(config-if-range)#switchport port-security
Switch(config-if-range)#switchport port-security maximum 1
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
Switch#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
          (Count)          (Count)          (Count)
-----
Fa0/3      1              0              0      Shutdown
Fa0/4      1              0              0      Shutdown
Fa0/5      1              0              0      Shutdown

```



IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/3-5
Switch(config-if-range)#switchport port-security
Switch(config-if-range)#switchport port-security maximum 1
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
Switch#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
      (Count)      (Count)      (Count)
-----
      Fa0/3      1      0      0      Shutdown
      Fa0/4      1      0      0      Shutdown
      Fa0/5      1      0      0      Shutdown
```

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/3-5
Switch(config-if-range)#switchport port-security
Switch(config-if-range)#switchport port-security maximum 1
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
Switch#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
      (Count)      (Count)      (Count)
-----
      Fa0/3      1      0      0      Shutdown
      Fa0/4      1      0      0      Shutdown
      Fa0/5      1      0      0      Shutdown
```

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/3-5
Switch(config-if-range)#switchport port-security
Switch(config-if-range)#switchport port-security maximum 1
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
Switch#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
      (Count)      (Count)      (Count)
-----
      Fa0/3      1      0      0      Shutdown
      Fa0/4      1      0      0      Shutdown
      Fa0/5      1      0      0      Shutdown
```

Finances

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/3-5
Switch(config-if-range)#switchport port-security
Switch(config-if-range)#switchport port-security maximum 1
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
Switch#show port-security
```

Secure	Port	MaxSecureAddr (Count)	CurrentAddr (Count)	SecurityViolation (Count)	Security Action
	Fa0/3	1	0	0	Shutdown
	Fa0/4	1	0	0	Shutdown
	Fa0/5	1	0	0	Shutdown

Logistique et Entrepôt

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/3-5
Switch(config-if-range)#switchport port-security
Switch(config-if-range)#switchport port-security maximum 1
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
Switch#show port-security
```

Secure	Port	MaxSecureAddr (Count)	CurrentAddr (Count)	SecurityViolation (Count)	Security Action
	Fa0/3	1	0	0	Shutdown
	Fa0/4	1	0	0	Shutdown
	Fa0/5	1	0	0	Shutdown

Service Client

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range f0/3-5
Switch(config-if-range)#switchport port-security
Switch(config-if-range)#switchport port-security maximum 1
Switch(config-if-range)#switchport port-security mac-address sticky
Switch(config-if-range)#switchport port-security violation shutdown
Switch(config-if-range)#end
Switch#wr
Building configuration...
[OK]
Switch#show port-security
```

Secure	Port	MaxSecureAddr (Count)	CurrentAddr (Count)	SecurityViolation (Count)	Security Action
	Fa0/3	1	0	0	Shutdown
	Fa0/4	1	0	0	Shutdown
	Fa0/5	1	0	0	Shutdown

Commande show run :

## IOS Command Line Interface

```
!  
interface FastEthernet0/3  
  switchport access vlan 10  
  switchport mode access  
  switchport port-security  
  switchport port-security mac-address sticky  
  switchport port-security mac-address sticky 00E0.F99E.796E  
!  
interface FastEthernet0/4  
  switchport access vlan 10  
  switchport mode access  
  switchport port-security  
  switchport port-security mac-address sticky  
  switchport port-security mac-address sticky 0002.1625.D103  
!  
interface FastEthernet0/5  
  switchport access vlan 10  
  switchport mode access  
  switchport port-security  
  switchport port-security mac-address sticky  
  switchport port-security mac-address sticky 000B.BE8B.A09E  
!
```

## 9 Partie 9 : Rapid PVST+ , BPDU Guard

### Qu'est-ce que Rapid PVST+ ?

**Rapid PVST+** (Rapid Per VLAN Spanning Tree Plus) est une version améliorée de **PVST+** qui permet une meilleure gestion des boucles réseau dans des environnements où il y a plusieurs VLANs. Ce mode aide à accélérer la convergence du réseau après une panne ou un changement de topologie.

#### 1. **spanning-tree mode rapid-pvst**

Cette commande configure le mode Rapid PVST+ (Rapid Per VLAN Spanning Tree Plus) pour le protocole STP. Elle permet une convergence plus rapide du réseau en réduisant le temps nécessaire pour réagir aux changements de topologie (par exemple, lorsqu'un port passe de l'état "blocking" à "forwarding").

#### 2. **spanning-tree portfast**

Active le mode PortFast sur les interfaces sélectionnées. Cela signifie que les interfaces seront immédiatement mises en état "forwarding" (transmission de données) sans passer par les étapes habituelles de STP comme "listening" et "learning", car elles sont supposées être connectées à des appareils finaux (par exemple, des PC ou des imprimantes).


#### 3. **spanning-tree bpduguard enable**

Active BPDU Guard sur les interfaces sélectionnées. Si une interface configurée avec PortFast reçoit un BPDU (Bridge Protocol Data Unit), elle sera immédiatement mise en état Errdisable pour éviter des perturbations dans le réseau causées par des appareils non configurés pour STP.

Cette configuration est appliquée aux interfaces d'accès pour améliorer la convergence du STP et sécuriser les interfaces contre les attaques liées aux BPDUs.

```
conf t
spanning-tree mode rapid-pvst
interface range fa0/3 - 5
spanning-tree portfast
spanning-tree bpduguard enable
end
wr
```


- **Vérification : via la commande show run :**

 Technologies de l'Information

Physical Config CLI Attributes

IOS Command Line Interface

```
interface FastEthernet0/3
switchport access vlan 10
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 00E0.F99E.796E
spanning-tree portfast
spanning-tree bpduguard enable
!
interface FastEthernet0/4
switchport access vlan 10
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 0002.1625.D103
spanning-tree portfast
spanning-tree bpduguard enable
!
interface FastEthernet0/5
switchport access vlan 10
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 000B.BE8B.A09E
spanning-tree portfast
spanning-tree bpduguard enable
.
```

 Recherche et Développement

Physical Config CLI Attributes

IOS Command Line Interface

```
interface FastEthernet0/3
switchport access vlan 20
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 00D0.BC44.6345
spanning-tree portfast
spanning-tree bpduguard enable
!
interface FastEthernet0/4
switchport access vlan 20
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 00D0.588E.BCD4
spanning-tree portfast
spanning-tree bpduguard enable
!
interface FastEthernet0/5
switchport access vlan 20
switchport mode access
switchport port-security
switchport port-security mac-address sticky
switchport port-security mac-address sticky 0090.2BEE.B309
spanning-tree portfast
spanning-tree bpduguard enable
.
```

```
interface FastEthernet0/3
  switchport access vlan 30
  switchport mode access
  switchport port-security
  switchport port-security mac-address sticky
  switchport port-security mac-address sticky 0090.2143.5243
  spanning-tree portfast
  spanning-tree bpduguard enable
!
interface FastEthernet0/4
  switchport access vlan 30
  switchport mode access
  switchport port-security
  switchport port-security mac-address sticky
  switchport port-security mac-address sticky 0060.2FD9.3837
  spanning-tree portfast
  spanning-tree bpduguard enable
!
interface FastEthernet0/5
  switchport access vlan 30
  switchport mode access
  switchport port-security
  switchport port-security mac-address sticky
  spanning-tree portfast
  spanning-tree bpduguard enable
!
```

```
interface FastEthernet0/3
  switchport access vlan 40
  switchport mode access
  switchport port-security
  switchport port-security mac-address sticky
  switchport port-security mac-address sticky 0007.EC99.CB36
  spanning-tree portfast
  spanning-tree bpduguard enable
!
interface FastEthernet0/4
  switchport access vlan 40
  switchport mode access
  switchport port-security
  switchport port-security mac-address sticky
  switchport port-security mac-address sticky 00D0.BA37.09BE
  spanning-tree portfast
  spanning-tree bpduguard enable
!
interface FastEthernet0/5
  switchport access vlan 40
  switchport mode access
  switchport port-security
  switchport port-security mac-address sticky
  spanning-tree portfast
  spanning-tree bpduguard enable
```

## IOS Command Line Interface

```

interface FastEthernet0/3
 switchport access vlan 50
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0005.5EEE.90DA
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/4
 switchport access vlan 50
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 000A.41AC.6C82
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/5
 switchport access vlan 50
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0006.2AA0.DDA3
 spanning-tree portfast
 spanning-tree bpduguard enable

```

## IOS Command Line Interface

```

interface FastEthernet0/3
 switchport access vlan 60
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 00D0.BCD0.4446
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/4
 switchport access vlan 60
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0090.0C85.882C
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/5
 switchport access vlan 60
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0030.A366.D2E1
 spanning-tree portfast
 spanning-tree bpduguard enable

```

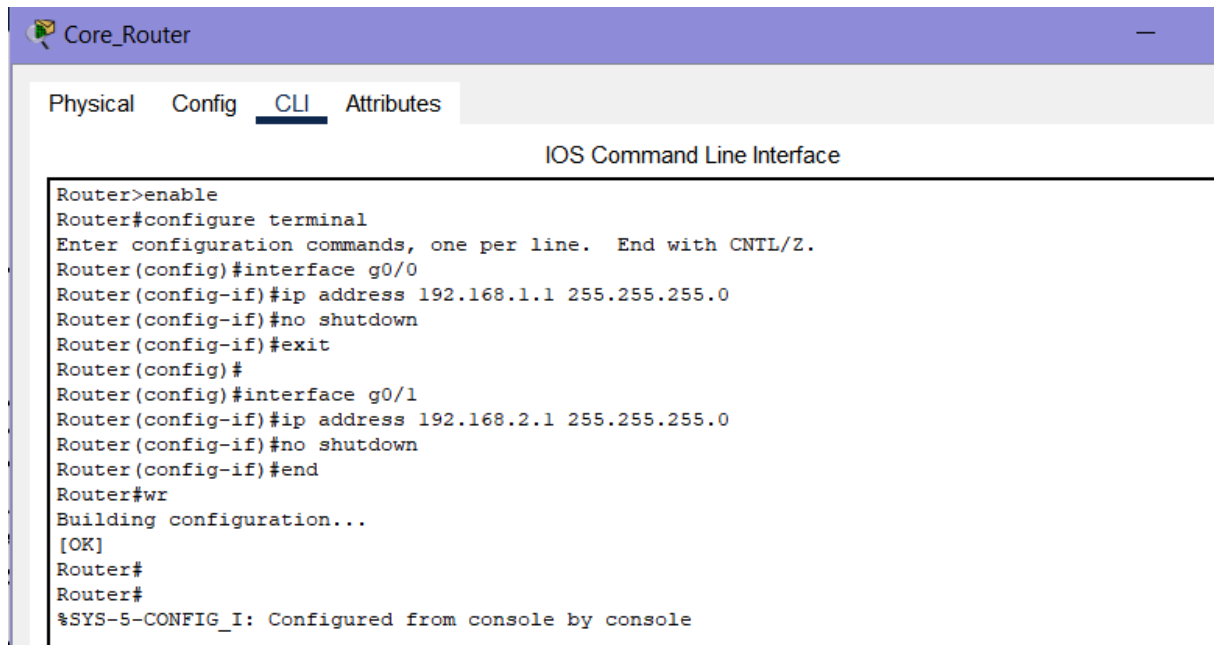
```
interface FastEthernet0/3
 switchport access vlan 70
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0001.6491.3B8D
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/4
 switchport access vlan 70
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 00D0.D322.2B42
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/5
 switchport access vlan 70
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0000.0C14.8EC0
 spanning-tree portfast
 spanning-tree bpduguard enable
```

```
interface FastEthernet0/3
 switchport access vlan 80
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0005.5EDD.3D22
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/4
 switchport access vlan 80
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0001.640C.58D7
 spanning-tree portfast
 spanning-tree bpduguard enable
!
interface FastEthernet0/5
 switchport access vlan 80
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 spanning-tree portfast
 spanning-tree bpduguard enable
,
```



# 10 Partie 10 : configuration des switches de distribution , et le routage static

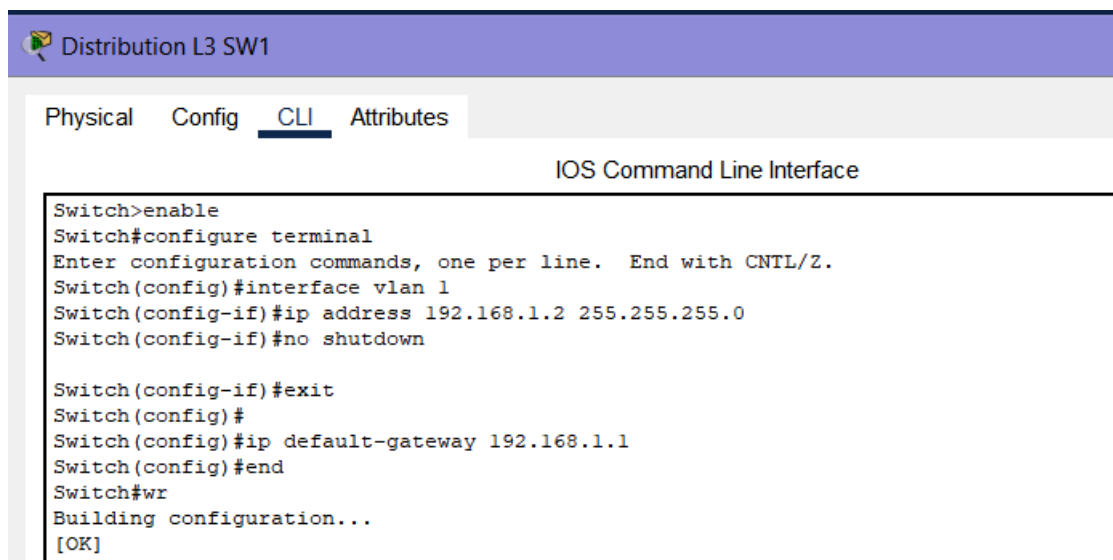
## Routeur :



The screenshot shows the CLI interface of a device named 'Core\_Router'. The 'CLI' tab is selected. The user has entered the following commands: 'enable', 'configure terminal', 'interface g0/0', 'ip address 192.168.1.1 255.255.255.0', 'no shutdown', 'exit', 'interface g0/1', 'ip address 192.168.2.1 255.255.255.0', 'no shutdown', 'end', 'wr'. The system responds with 'Building configuration...', '[OK]', and a confirmation message: '%SYS-5-CONFIG\_I: Configured from console by console'.

```
Core_Router
Physical Config CLI Attributes
IOS Command Line Interface
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface g0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
Router(config)#interface g0/1
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#end
Router#wr
Building configuration...
[OK]
Router#
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

## Switch 1 :




The screenshot shows the CLI interface of a device named 'Distribution L3 SW1'. The 'CLI' tab is selected. The user has entered the following commands: 'enable', 'configure terminal', 'interface vlan 1', 'ip address 192.168.1.2 255.255.255.0', 'no shutdown', 'exit', 'ip default-gateway 192.168.1.1', 'end', 'wr'. The system responds with 'Building configuration...', '[OK]', and a confirmation message: '%SYS-5-CONFIG\_I: Configured from console by console'.

```
Distribution L3 SW1
Physical Config CLI Attributes
IOS Command Line Interface
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface vlan 1
Switch(config-if)#ip address 192.168.1.2 255.255.255.0
Switch(config-if)#no shutdown

Switch(config-if)#exit
Switch(config)#
Switch(config)#ip default-gateway 192.168.1.1
Switch(config)#end
Switch#wr
Building configuration...
[OK]
Switch#
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```

## Switch 2 :

 Distribution L2 SW2

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface vlan 1
Switch(config-if)#ip address 192.168.2.2 255.255.255.0
Switch(config-if)#no shutdown


Switch(config-if)#exit
Switch(config)#
Switch(config)#ip default-gateway 192.168.2.1
Switch(config)#end
Switch#wr
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
```

### Résumé des connexions

- Routeur g0/0 → Switch 1 VLAN 1 : 192.168.1.1 / 192.168.1.2
- Routeur g0/1 → Switch 2 VLAN 1 : 192.168.2.1 / 192.168.2.2

## ROUTAGE statique :

### Routeur :


 Core\_Router

Physical Config CLI Attributes

IOS Command Line Interface

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.1.2
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.2.2
Router(config)#ip route 192.168.1.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.10.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.20.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.30.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.40.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.50.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.60.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.70.0 255.255.255.0 192.168.1.2
Router(config)#ip route 192.168.80.0 255.255.255.0 192.168.1.2
Router(config)#
Router(config)#ip route 192.168.10.0 255.255.255.0 192.168.2.2
Router(config)#ip route 192.168.20.0 255.255.255.0 192.168.2.2
Router(config)#ip route 192.168.30.0 255.255.255.0 192.168.2.2
Router(config)#ip route 192.168.40.0 255.255.255.0 192.168.2.2
Router(config)#ip route 192.168.50.0 255.255.255.0 192.168.2.2
Router(config)#ip route 192.168.60.0 255.255.255.0 192.168.2.2
Router(config)#ip route 192.168.70.0 255.255.255.0 192.168.2.2
Router(config)#ip route 192.168.80.0 255.255.255.0 192.168.2.2
Router(config)#
```

### Switch 1 :


 Distribution L3 SW1

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip route 192.168.2.0 255.255.255.0 192.168.1.1
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console


Switch#wr
Building configuration...
[OK]
```

 Distribution L3 SW1

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.1.1
Switch(config)#end
Switch#wr
Building configuration...
[OK]
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```

 Distribution L3 SW1

Physical Config CLI Attributes

IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip route 0.0.0.0 0.0.0.0 192.168.1.1
Switch(config)#
Switch(config)#ip route 192.168.1.0 255.255.255.0 192.168.1.1
Switch(config)#ip route 192.168.10.0 255.255.255.0 192.168.1.1
Switch(config)#ip route 192.168.20.0 255.255.255.0 192.168.1.1
Switch(config)#ip route 192.168.30.0 255.255.255.0 192.168.1.1
Switch(config)#ip route 192.168.40.0 255.255.255.0 192.168.1.1
Switch(config)#ip route 192.168.50.0 255.255.255.0 192.168.1.1
Switch(config)#ip route 192.168.60.0 255.255.255.0 192.168.1.1
Switch(config)#ip route 192.168.70.0 255.255.255.0 192.168.1.1
Switch(config)#ip route 192.168.80.0 255.255.255.0 192.168.1.1
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```

**Switch 2 :**

## Distribution L2 SW2

Physical Config CLI Attributes

### IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip route 192.168.1.0 255.255.255.0 192.168.2.1
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#wr
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
```

## Distribution L2 SW2

Physical Config CLI Attributes

### IOS Command Line Interface

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.2.1
Switch(config)#end
Switch#wr
Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```

## Distribution L2 SW2

Physical Config CLI Attributes

### IOS Command Line Interface

```
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.10.1
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.20.1
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.30.1
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.40.1
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.50.1
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.60.1
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.70.1
Switch(config)#ip route 192.168.3.0 255.255.255.0 192.168.80.1
Switch(config)#end
Switch#wr
%SYS-5-CONFIG_I: Configured from console by console

Building configuration...
Compressed configuration from 7383 bytes to 3601 bytes[OK]
[OK]
```

Distribution L2 SW2

Physical Config CLI Attributes

IOS Command Line Interface

Switch#conf t  
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)#ip route 0.0.0.0 0.0.0.0 192.168.2.1  
Switch(config)#ip route 192.168.10.0 255.255.255.0 192.168.2.1  
Switch(config)#ip route 192.168.20.0 255.255.255.0 192.168.2.1  
Switch(config)#ip route 192.168.30.0 255.255.255.0 192.168.2.1  
Switch(config)#ip route 192.168.40.0 255.255.255.0 192.168.2.1  
Switch(config)#ip route 192.168.50.0 255.255.255.0 192.168.2.1  
Switch(config)#ip route 192.168.60.0 255.255.255.0 192.168.2.1  
Switch(config)#ip route 192.168.70.0 255.255.255.0 192.168.2.1  
Switch(config)#ip route 192.168.80.0 255.255.255.0 192.168.2.1  
Switch(config)#  
Switch(config)#end  
Switch#  
%SYS-5-CONFIG\_I: Configured from console by console  
wr  
Building configuration...  
Compressed configuration from 7383 bytes to 3601 bytes[OK]  
[OK]

Les deux layer3 switches peuvent communiquer :

Distribution L3 SW1

Physical Config CLI Attributes

IOS Command Line Interface

Switch>ping 192.168.2.1  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:  
!!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/3 ms  
  
Switch>ping 192.168.2.2  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 192.168.2.2, timeout is 2 seconds:  
!!!!!  
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

Distribution L2 SW2

Physical Config CLI Attributes

IOS Command Line Interface

Switch>ping 192.168.1.1  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:  
!!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms  
  
Switch>ping 192.168.1.2  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 192.168.1.2, timeout is 2 seconds:  
!!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Verification du routage static :

Commande : show ip route :

Physical Config CLI Attributes

## IOS Command Line Interface

```
Switch#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 192.168.2.1 to network 0.0.0.0

S    192.168.1.0/24 [1/0] via 192.168.2.1
C    192.168.2.0/24 is directly connected, Vlan1
S    192.168.3.0/24 [1/0] via 192.168.2.1
C    192.168.10.0/24 is directly connected, Vlan10
C    192.168.20.0/24 is directly connected, Vlan20
C    192.168.30.0/24 is directly connected, Vlan30
C    192.168.40.0/24 is directly connected, Vlan40
C    192.168.50.0/24 is directly connected, Vlan50
C    192.168.60.0/24 is directly connected, Vlan60
C    192.168.70.0/24 is directly connected, Vlan70
C    192.168.80.0/24 is directly connected, Vlan80
S*   0.0.0.0/0 [1/0] via 192.168.2.1
```

Physical Config CLI Attributes

## IOS Command Line Interface

```
Switch>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 192.168.1.1 to network 0.0.0.0

C    192.168.1.0/24 is directly connected, Vlan1
S    192.168.2.0/24 [1/0] via 192.168.1.1
S    192.168.3.0/24 [1/0] via 192.168.1.1
C    192.168.10.0/24 is directly connected, Vlan10
C    192.168.20.0/24 is directly connected, Vlan20
C    192.168.30.0/24 is directly connected, Vlan30
C    192.168.40.0/24 is directly connected, Vlan40
C    192.168.50.0/24 is directly connected, Vlan50
C    192.168.60.0/24 is directly connected, Vlan60
C    192.168.70.0/24 is directly connected, Vlan70
C    192.168.80.0/24 is directly connected, Vlan80
S*   0.0.0.0/0 [1/0] via 192.168.1.1
```

## IOS Command Line Interface

```

192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.1.0/24 is directly connected, GigabitEthernet0/0
L    192.168.1.1/32 is directly connected, GigabitEthernet0/0
192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.2.0/24 is directly connected, GigabitEthernet0/1
L    192.168.2.1/32 is directly connected, GigabitEthernet0/1
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.3.0/24 is directly connected, GigabitEthernet0/2
L    192.168.3.1/32 is directly connected, GigabitEthernet0/2
192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.10.0/24 is directly connected, GigabitEthernet0/0.10
L    192.168.10.1/32 is directly connected, GigabitEthernet0/0.10
192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.20.0/24 is directly connected, GigabitEthernet0/0.20
L    192.168.20.1/32 is directly connected, GigabitEthernet0/0.20
192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.30.0/24 is directly connected, GigabitEthernet0/0.30
L    192.168.30.1/32 is directly connected, GigabitEthernet0/0.30
192.168.40.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.40.0/24 is directly connected, GigabitEthernet0/0.40
L    192.168.40.1/32 is directly connected, GigabitEthernet0/0.40
192.168.50.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.50.0/24 is directly connected, GigabitEthernet0/0.50
L    192.168.50.1/32 is directly connected, GigabitEthernet0/0.50
192.168.60.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.60.0/24 is directly connected, GigabitEthernet0/0.60
L    192.168.60.1/32 is directly connected, GigabitEthernet0/0.60
192.168.70.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.70.0/24 is directly connected, GigabitEthernet0/0.70
L    192.168.70.1/32 is directly connected, GigabitEthernet0/0.70
192.168.80.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.80.0/24 is directly connected, GigabitEthernet0/0.80
L    192.168.80.1/32 is directly connected, GigabitEthernet0/0.80
S*  0.0.0.0/0 [1/0] via 192.168.1.2
    [1/0] via 192.168.2.2

```

## Vérification des adressages :

Core\_Router

Physical Config CLI Attributes

IOS Command Line Interface

```
Router#show ip int brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0	192.168.1.1	YES	manual	up	up
GigabitEthernet0/0.10	192.168.10.1	YES	manual	up	up
GigabitEthernet0/0.20	192.168.20.1	YES	manual	up	up
GigabitEthernet0/0.30	192.168.30.1	YES	manual	up	up
GigabitEthernet0/0.40	192.168.40.1	YES	manual	up	up
GigabitEthernet0/0.50	192.168.50.1	YES	manual	up	up
GigabitEthernet0/0.60	192.168.60.1	YES	manual	up	up
GigabitEthernet0/0.70	192.168.70.1	YES	manual	up	up
GigabitEthernet0/0.80	192.168.80.1	YES	manual	up	up
GigabitEthernet0/1	192.168.2.1	YES	manual	up	up
GigabitEthernet0/2	192.168.3.1	YES	manual	up	up
Serial0/3/0	unassigned	YES	NVRAM	down	down
Serial0/3/1	unassigned	YES	NVRAM	administratively down	down
Vlan1	unassigned	YES	unset	administratively down	down

Distribution L3 SW1

Physical Config CLI Attributes

IOS Command Line Interface

GigabitEthernet0/1	unassigned	YES	NVRAM	down	down
GigabitEthernet0/2	unassigned	YES	NVRAM	down	down
Vlan1	192.168.1.2	YES	manual	up	up
Vlan10	192.168.10.2	YES	manual	up	up
Vlan20	192.168.20.2	YES	manual	up	up
Vlan30	192.168.30.2	YES	manual	up	up
Vlan40	192.168.40.2	YES	manual	up	up
Vlan50	192.168.50.2	YES	manual	up	up
Vlan60	192.168.60.2	YES	manual	up	up
Vlan70	192.168.70.2	YES	manual	up	up
Vlan80	192.168.80.2	YES	manual	up	up

Distribution L2 SW2

Physical Config CLI Attributes

IOS Command Line Interface

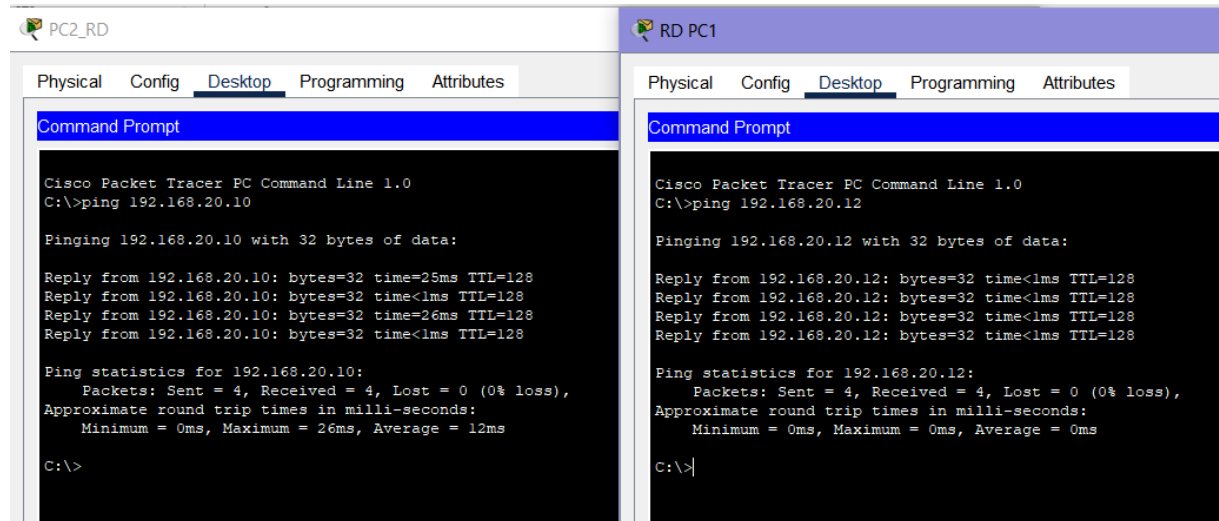
Vlan1	192.168.2.2	YES	manual	up	up
Vlan10	192.168.10.3	YES	manual	up	up
Vlan20	192.168.20.3	YES	manual	up	up
Vlan30	192.168.30.3	YES	manual	up	up
Vlan40	192.168.40.3	YES	manual	up	up
Vlan50	192.168.50.3	YES	manual	up	up
Vlan60	192.168.60.3	YES	manual	up	up
Vlan70	192.168.70.3	YES	manual	up	up
Vlan80	192.168.80.3	YES	manual	up	up



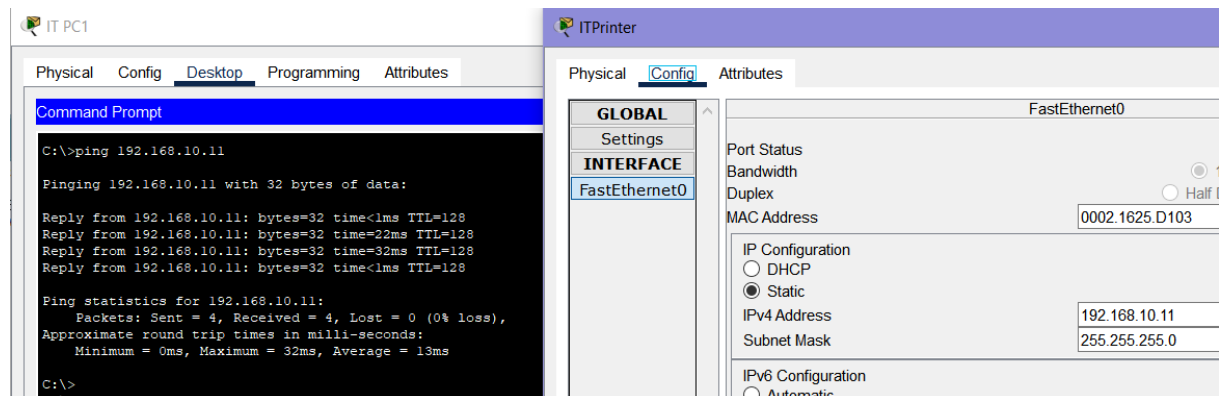
# 11 Partie 11 : Vérification de la connectivité

## 1. Dans le même VLAN :

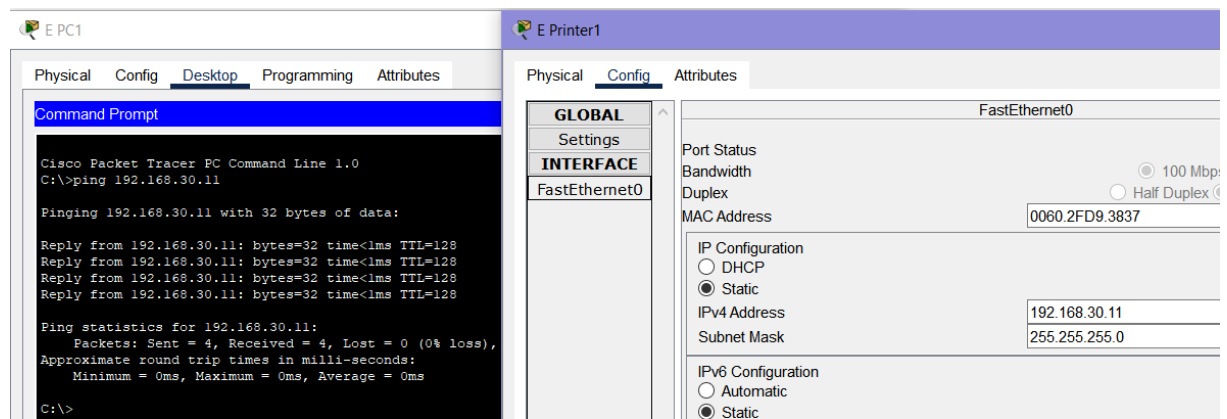
### Vlan 20 :



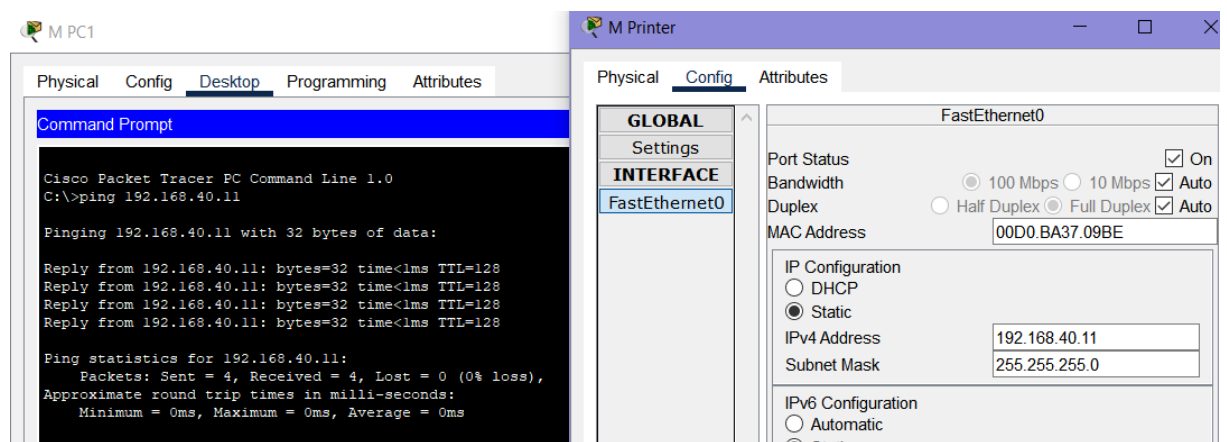
### Vlan 10 :



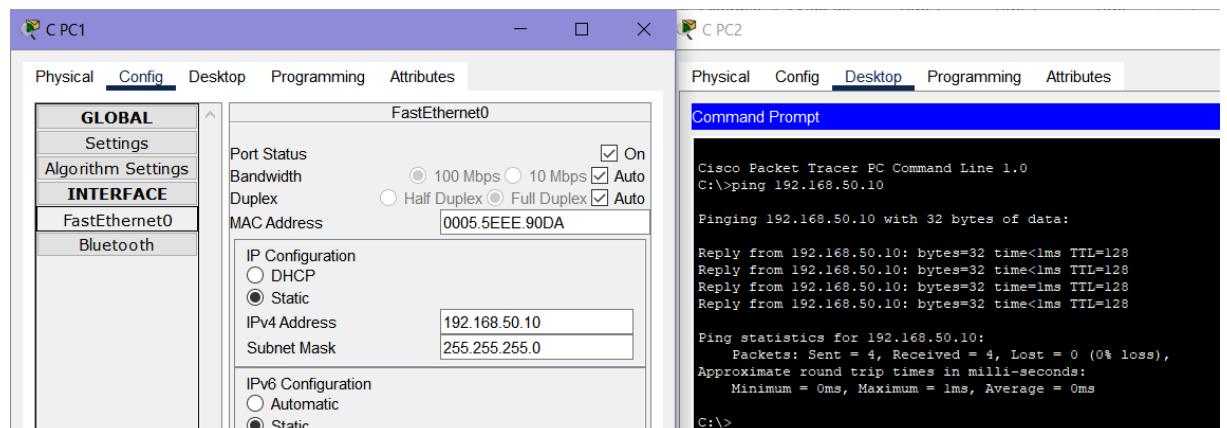
### Vlan 30 :

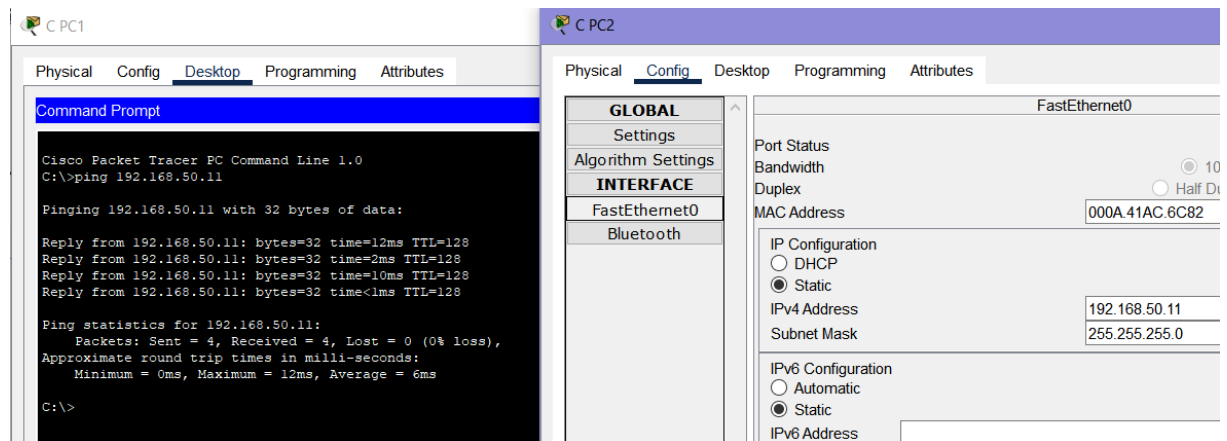


## Vlan 40 :

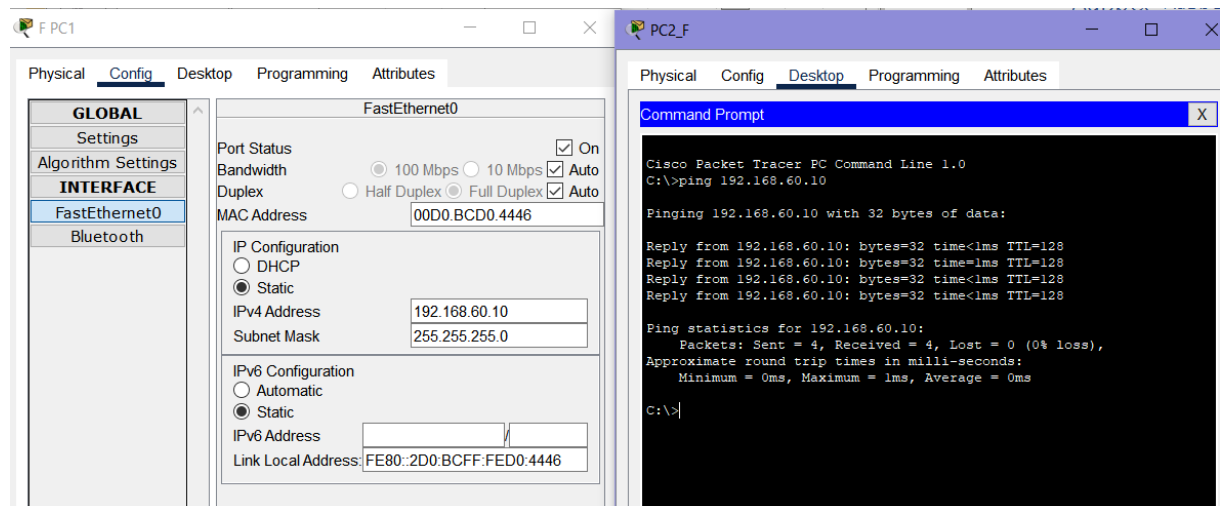
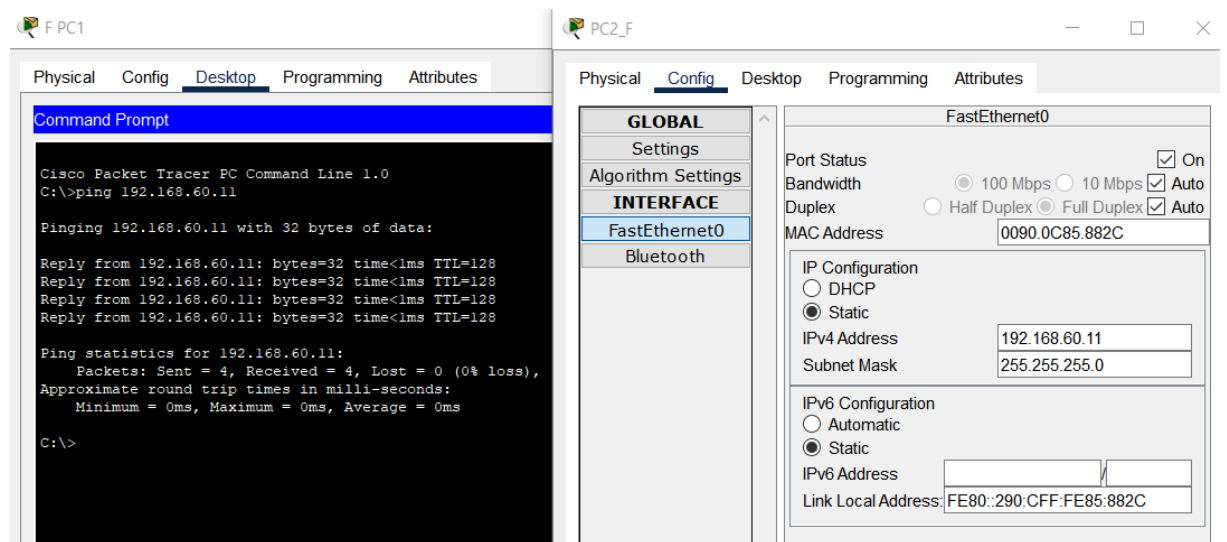


## Vlan 50 :





## Vlan 60 :



## Vlan 70 :

Log PC1

Physical Config Desktop Programming Attributes

Command Prompt

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.70.12

Pinging 192.168.70.12 with 32 bytes of data:

Reply from 192.168.70.12: bytes=32 time<1ms TTL=128
Reply from 192.168.70.12: bytes=32 time<1ms TTL=128
Reply from 192.168.70.12: bytes=32 time<1ms TTL=128
Reply from 192.168.70.12: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.70.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

LOG Printer

Physical Config Attributes

GLOBAL

Settings

INTERFACE

FastEthernet0

FastEthernet0

Port Status
Bandwidth
Duplex
MAC Address
IP Configuration
IPv4 Address
Subnet Mask
IPv6 Configuration
Link Local Address

100 Mbps

10

Half Duplex

Full Duplex

0000.0C14.8EC0

Static

192.168.70.12

255.255.255.0

Static

FE80::200:CFF:FE14:8EC0

## Vlan 80 :

SC PC1

Physical Config Desktop Programming Attributes

Command Prompt

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.80.11

Pinging 192.168.80.11 with 32 bytes of data:

Reply from 192.168.80.11: bytes=32 time<1ms TTL=128
Reply from 192.168.80.11: bytes=32 time<1ms TTL=128
Reply from 192.168.80.11: bytes=32 time<1ms TTL=128
Reply from 192.168.80.11: bytes=32 time=18ms TTL=128

Ping statistics for 192.168.80.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 18ms, Average = 4ms

C:\>

```

SC Printer

Physical Config Attributes

GLOBAL

Settings

INTERFACE

FastEthernet0

FastEthernet0

Port Status
Bandwidth
Duplex
MAC Address
IP Configuration
IPv4 Address
Subnet Mask
IPv6 Configuration
Link Local Address

On

100 Mbps

10 Mbps

Auto

Half Duplex

Full Duplex

Auto

0005.5EDD.3D22

Static

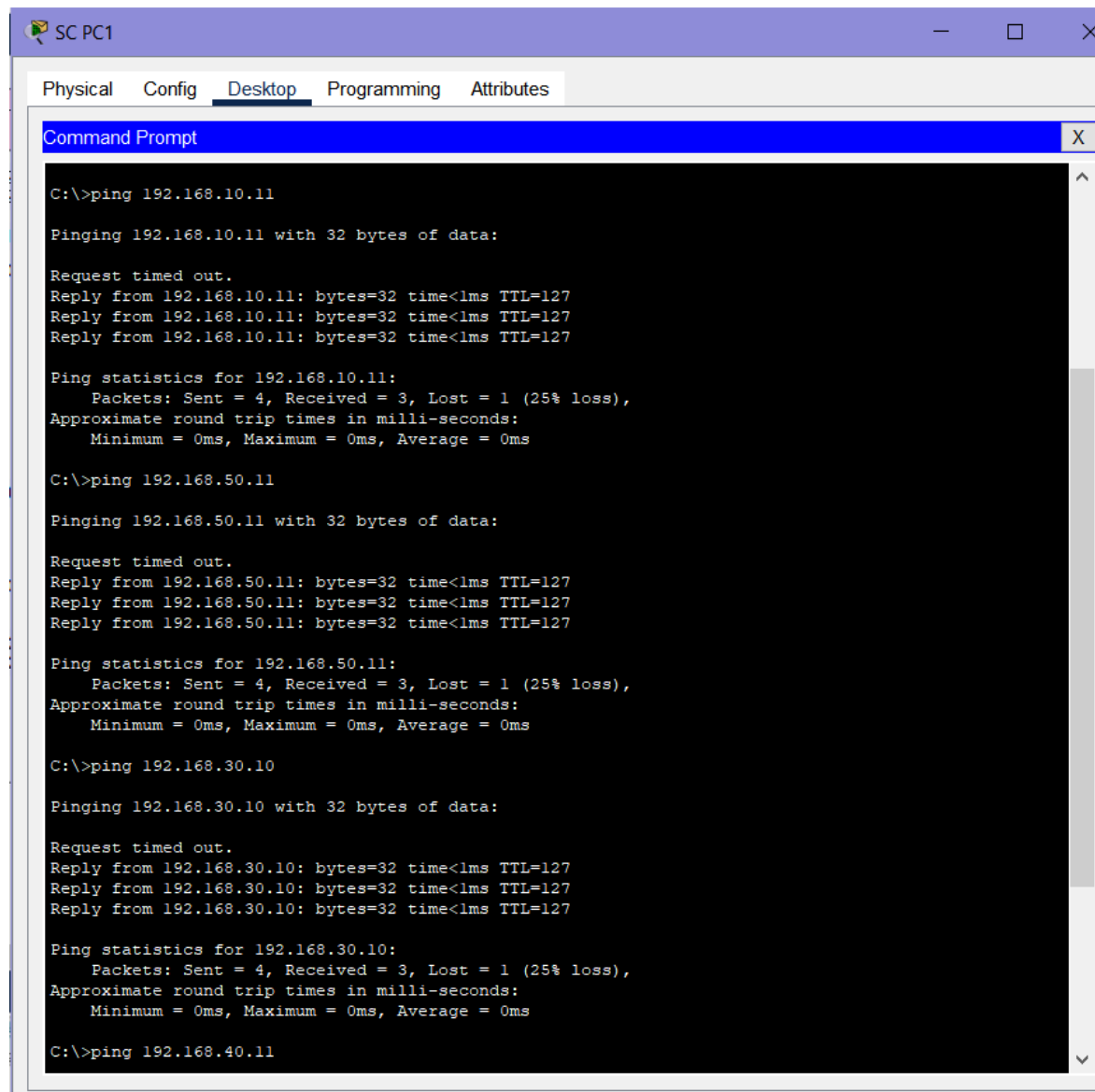
192.168.80.11

255.255.255.0

Static

FE80::205:5EFF:FEDD:3D22

## 2. Dans des VLANs différentes :



The screenshot shows a network configuration window for a device named 'SC PC1'. The window has tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes', with 'Desktop' currently selected. Inside the 'Desktop' tab, there is a 'Command Prompt' window. The Command Prompt displays the results of four ping commands executed from the C:\ prompt. Each command targets a different IP address: 192.168.10.11, 192.168.50.11, 192.168.30.10, and 192.168.40.11. For each IP, the output shows a 'Request timed out.' message, followed by three successful replies from the target IP, each with 32 bytes of data, a time less than 1ms, and a TTL of 127. The ping statistics for each IP indicate that 4 packets were sent, 3 were received, and 1 was lost (25% loss). The approximate round trip times in milliseconds are shown as Minimum = 0ms, Maximum = 0ms, and Average = 0ms.

```
C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Request timed out.
Reply from 192.168.10.11: bytes=32 time<1ms TTL=127
Reply from 192.168.10.11: bytes=32 time<1ms TTL=127
Reply from 192.168.10.11: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.50.11

Pinging 192.168.50.11 with 32 bytes of data:

Request timed out.
Reply from 192.168.50.11: bytes=32 time<1ms TTL=127
Reply from 192.168.50.11: bytes=32 time<1ms TTL=127
Reply from 192.168.50.11: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.50.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.30.10

Pinging 192.168.30.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.30.10: bytes=32 time<1ms TTL=127
Reply from 192.168.30.10: bytes=32 time<1ms TTL=127
Reply from 192.168.30.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.30.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.40.11
```

## Command Prompt

```
C:\>ping 192.168.30.10

Pinging 192.168.30.10 with 32 bytes of data:

Reply from 192.168.30.10: bytes=32 time<1ms TTL=127
Reply from 192.168.30.10: bytes=32 time=12ms TTL=127
Reply from 192.168.30.10: bytes=32 time<1ms TTL=127
Reply from 192.168.30.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.30.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 12ms, Average = 3ms

C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.10.11: bytes=32 time=1ms TTL=127
Reply from 192.168.10.11: bytes=32 time<1ms TTL=127
Reply from 192.168.10.11: bytes=32 time<1ms TTL=127
Reply from 192.168.10.11: bytes=32 time=5ms TTL=127

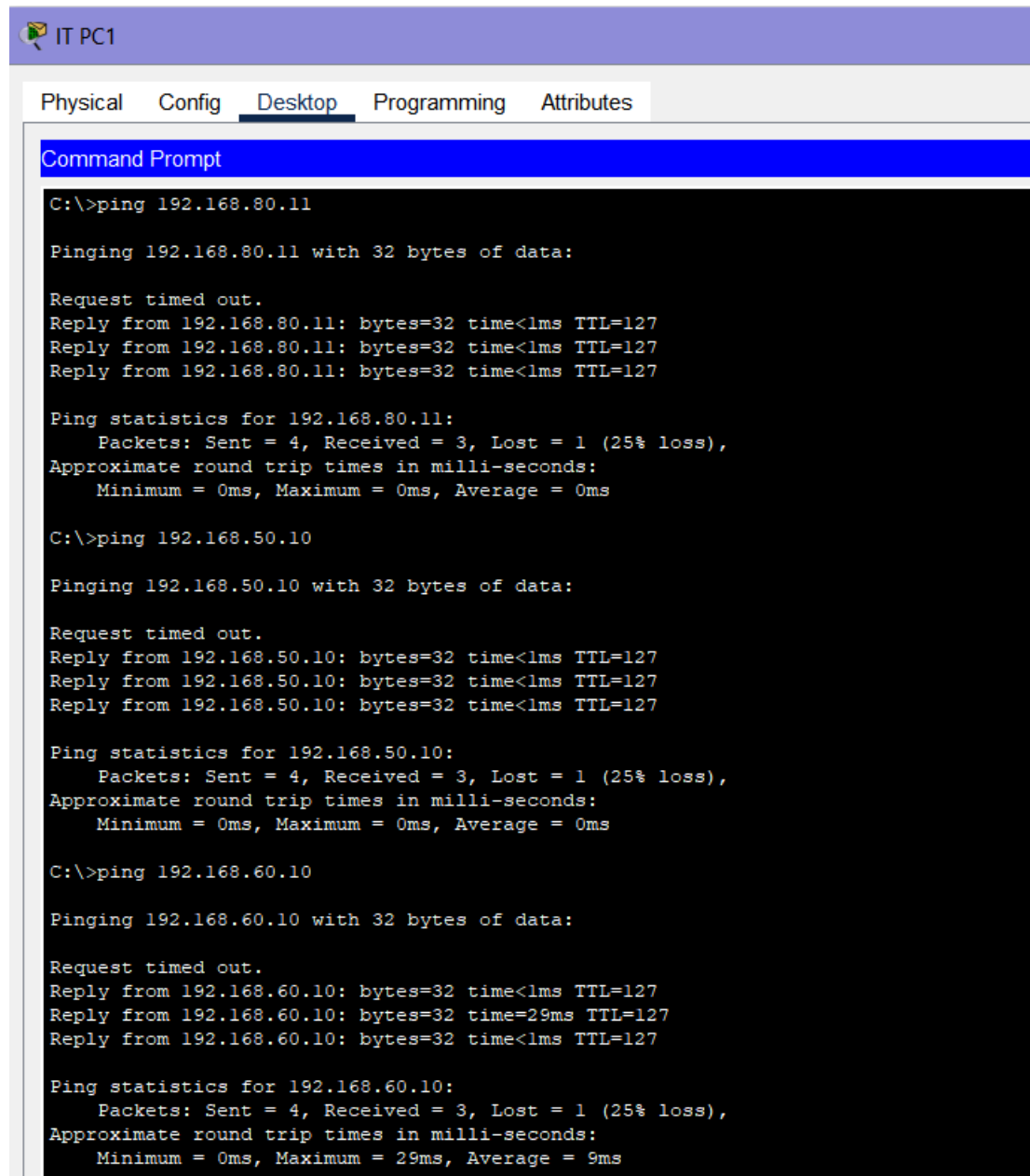
Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 1ms

C:\>ping 192.168.70.10

Pinging 192.168.70.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.70.10: bytes=32 time=10ms TTL=127
Reply from 192.168.70.10: bytes=32 time<1ms TTL=127
Reply from 192.168.70.10: bytes=32 time=29ms TTL=127

Ping statistics for 192.168.70.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 29ms, Average = 13ms
```



The screenshot shows a network switch configuration interface with a purple header bar labeled "IT PC1". Below the header is a navigation bar with tabs: "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is selected, and a "Command Prompt" window is open. The command prompt shows the execution of three ping commands from the switch to three different IP addresses: 192.168.80.11, 192.168.50.10, and 192.168.60.10. Each ping command is followed by a detailed output showing the number of bytes, time, TTL, and statistics for the ping.

```
C:\>ping 192.168.80.11

Pinging 192.168.80.11 with 32 bytes of data:

Request timed out.
Reply from 192.168.80.11: bytes=32 time<lms TTL=127
Reply from 192.168.80.11: bytes=32 time<lms TTL=127
Reply from 192.168.80.11: bytes=32 time<lms TTL=127

Ping statistics for 192.168.80.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.50.10

Pinging 192.168.50.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.50.10: bytes=32 time<lms TTL=127
Reply from 192.168.50.10: bytes=32 time<lms TTL=127
Reply from 192.168.50.10: bytes=32 time<lms TTL=127

Ping statistics for 192.168.50.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.60.10

Pinging 192.168.60.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.60.10: bytes=32 time<lms TTL=127
Reply from 192.168.60.10: bytes=32 time=29ms TTL=127
Reply from 192.168.60.10: bytes=32 time<lms TTL=127

Ping statistics for 192.168.60.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 29ms, Average = 9ms
```

### 3. Ping entre les hôtes finaux et les switches de distribution :

## Command Prompt

```
C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time<1ms TTL=255
Reply from 192.168.2.2: bytes=32 time<1ms TTL=255
Reply from 192.168.2.2: bytes=32 time<1ms TTL=255
Reply from 192.168.2.2: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

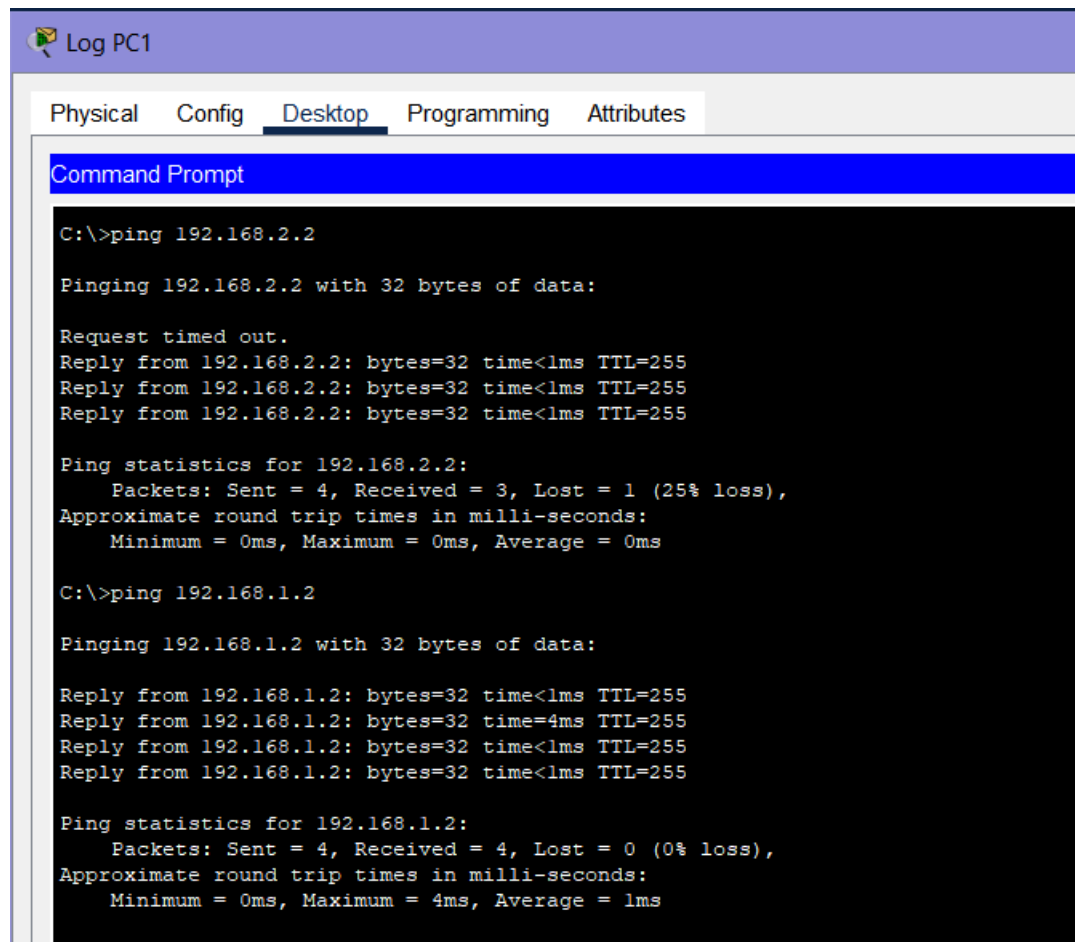
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time<1ms TTL=255
Reply from 192.168.1.2: bytes=32 time<1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```





The screenshot shows a window titled "Log PC1" with a tabbed interface. The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the execution of two ping commands. The first command is "C:\>ping 192.168.2.2", which results in a "Request timed out." and three successful replies from 192.168.2.2 with 32 bytes of data, time <1ms, and TTL=255. The ping statistics for 192.168.2.2 show 4 packets sent, 3 received, 1 lost (25% loss), and approximate round trip times of 0ms. The second command is "C:\>ping 192.168.1.2", which results in four successful replies from 192.168.1.2 with 32 bytes of data, time <1ms, and TTL=255. The ping statistics for 192.168.1.2 show 4 packets sent, 4 received, 0 lost (0% loss), and approximate round trip times of 0ms, 4ms, and 1ms.

```
C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.2: bytes=32 time<1ms TTL=255
Reply from 192.168.2.2: bytes=32 time<1ms TTL=255
Reply from 192.168.2.2: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time<1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=4ms TTL=255
Reply from 192.168.1.2: bytes=32 time<1ms TTL=255
Reply from 192.168.1.2: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 4ms, Average = 1ms
```

#### 4. Ping entre les appareils et le routeur :

## Command Prompt

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=23ms TTL=255
Reply from 192.168.2.1: bytes=32 time<1ms TTL=255
Reply from 192.168.2.1: bytes=32 time<1ms TTL=255
Reply from 192.168.2.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 23ms, Average = 5ms

C:\>ping 192.168.3.1

Pinging 192.168.3.1 with 32 bytes of data:

Reply from 192.168.3.1: bytes=32 time<1ms TTL=255
Reply from 192.168.3.1: bytes=32 time=18ms TTL=255
Reply from 192.168.3.1: bytes=32 time=1ms TTL=255
Reply from 192.168.3.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 18ms, Average = 4ms
```

E PC1

Physical Config Desktop Programming Attributes

Command Prompt

```
Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time<1ms TTL=255
Reply from 192.168.2.1: bytes=32 time<1ms TTL=255
Reply from 192.168.2.1: bytes=32 time=1ms TTL=255
Reply from 192.168.2.1: bytes=32 time=23ms TTL=255

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 23ms, Average = 6ms

C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.3.1
Ping request could not find host 192.168.3.1. Please check the name and try again.
C:\>ping 192.168.3.1

Pinging 192.168.3.1 with 32 bytes of data:

Reply from 192.168.3.1: bytes=32 time<1ms TTL=255
Reply from 192.168.3.1: bytes=32 time=4ms TTL=255
Reply from 192.168.3.1: bytes=32 time<1ms TTL=255
Reply from 192.168.3.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 4ms, Average = 1ms
```

## 5. Ping entre le routeur et les deux switches de distribution et les hôtes finaux :

```
Core_Router
Physical Config CLI Attributes
IOS Command Line Interface

Router>ping 192.168.2.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.2, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router>ping 192.168.1.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.2, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router>ping 192.168.3.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.3.2, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router>ping 192.168.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.10, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

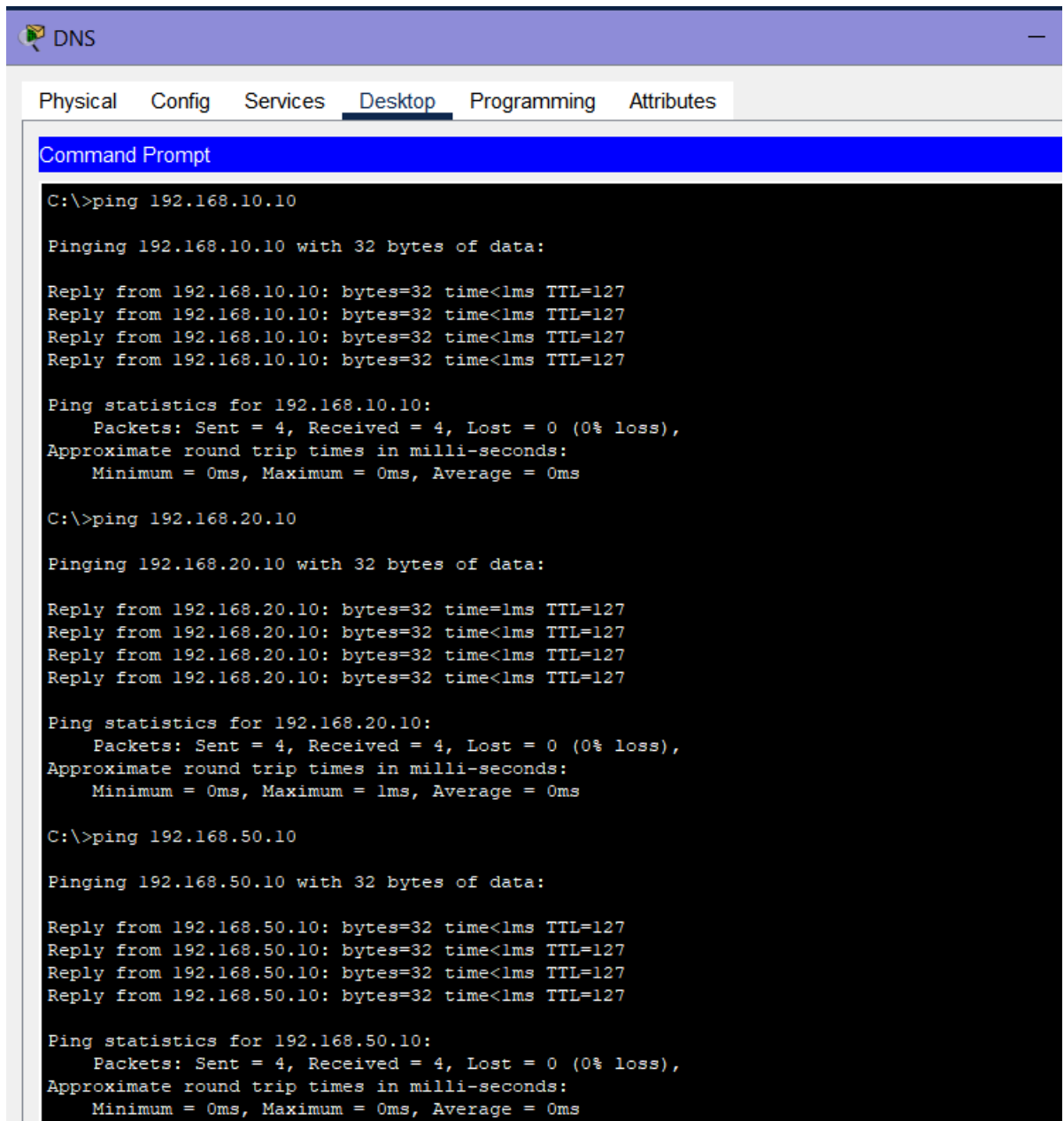
Router>ping 192.168.20.11

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.20.11, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/12/28 ms

Router>ping 192.168.80.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.80.10, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

## 6. Ping entre le serveur et les hôtes finaux :



DNS

Physical Config Services Desktop Programming Attributes

Command Prompt

```
C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: bytes=32 time<1ms TTL=127
Reply from 192.168.10.10: bytes=32 time<1ms TTL=127
Reply from 192.168.10.10: bytes=32 time<1ms TTL=127
Reply from 192.168.10.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.10

Pinging 192.168.20.10 with 32 bytes of data:

Reply from 192.168.20.10: bytes=32 time=1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127

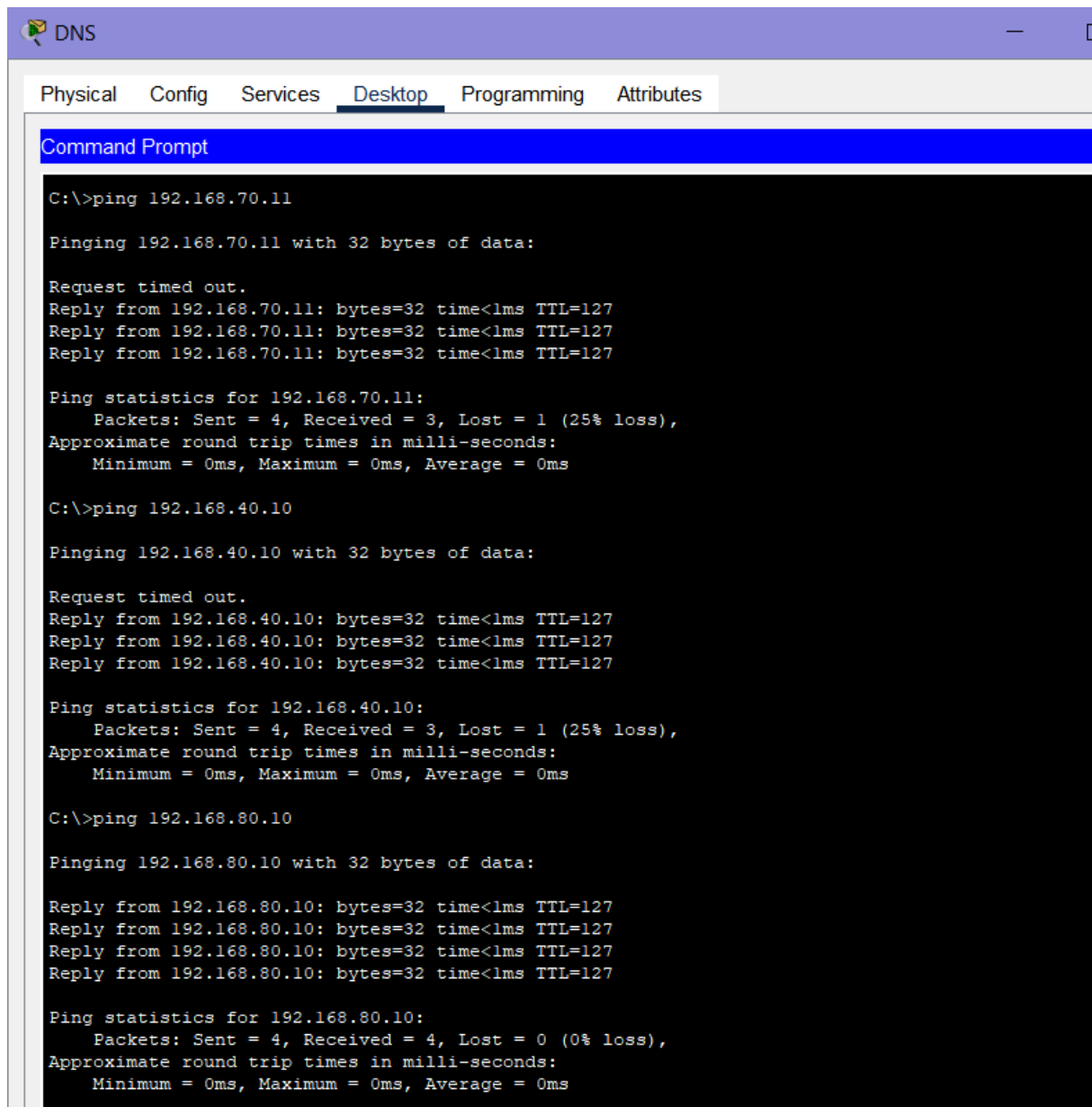
Ping statistics for 192.168.20.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.50.10

Pinging 192.168.50.10 with 32 bytes of data:

Reply from 192.168.50.10: bytes=32 time<1ms TTL=127
Reply from 192.168.50.10: bytes=32 time<1ms TTL=127
Reply from 192.168.50.10: bytes=32 time<1ms TTL=127
Reply from 192.168.50.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.50.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```



DNS

Physical Config Services Desktop Programming Attributes

Command Prompt

```
C:\>ping 192.168.70.11

Pinging 192.168.70.11 with 32 bytes of data:

Request timed out.
Reply from 192.168.70.11: bytes=32 time<1ms TTL=127
Reply from 192.168.70.11: bytes=32 time<1ms TTL=127
Reply from 192.168.70.11: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.70.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.40.10

Pinging 192.168.40.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.40.10: bytes=32 time<1ms TTL=127
Reply from 192.168.40.10: bytes=32 time<1ms TTL=127
Reply from 192.168.40.10: bytes=32 time<1ms TTL=127

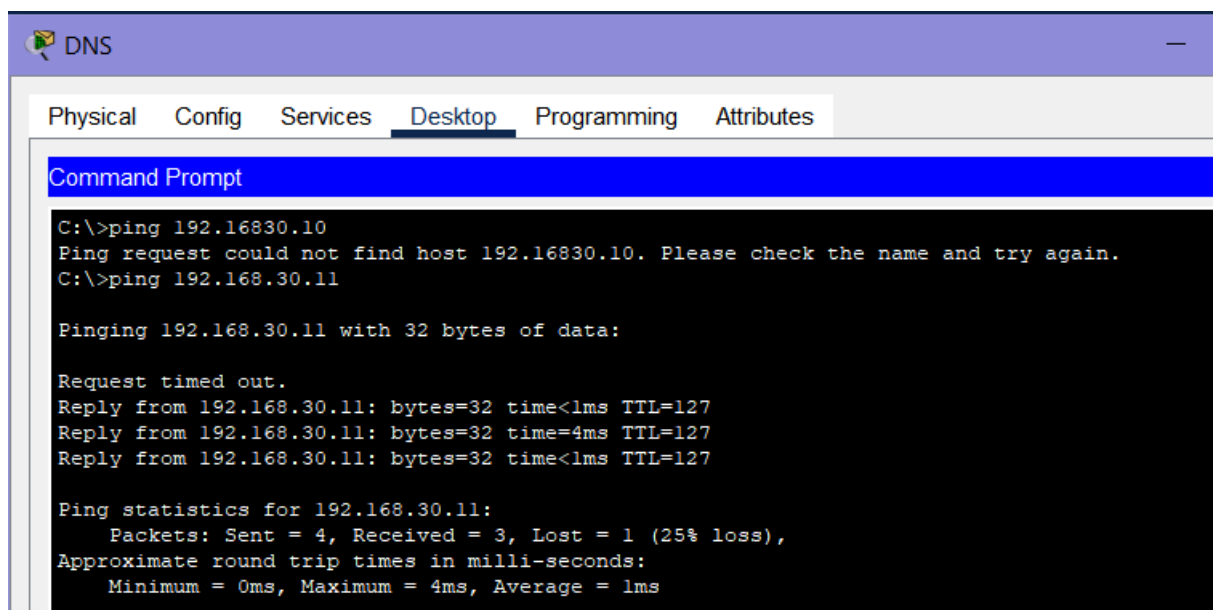
Ping statistics for 192.168.40.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.80.10

Pinging 192.168.80.10 with 32 bytes of data:

Reply from 192.168.80.10: bytes=32 time<1ms TTL=127
Reply from 192.168.80.10: bytes=32 time<1ms TTL=127
Reply from 192.168.80.10: bytes=32 time<1ms TTL=127
Reply from 192.168.80.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.80.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```



DNS

Physical Config Services Desktop Programming Attributes

Command Prompt

```
C:\>ping 192.16830.10
Ping request could not find host 192.16830.10. Please check the name and try again.
C:\>ping 192.168.30.11

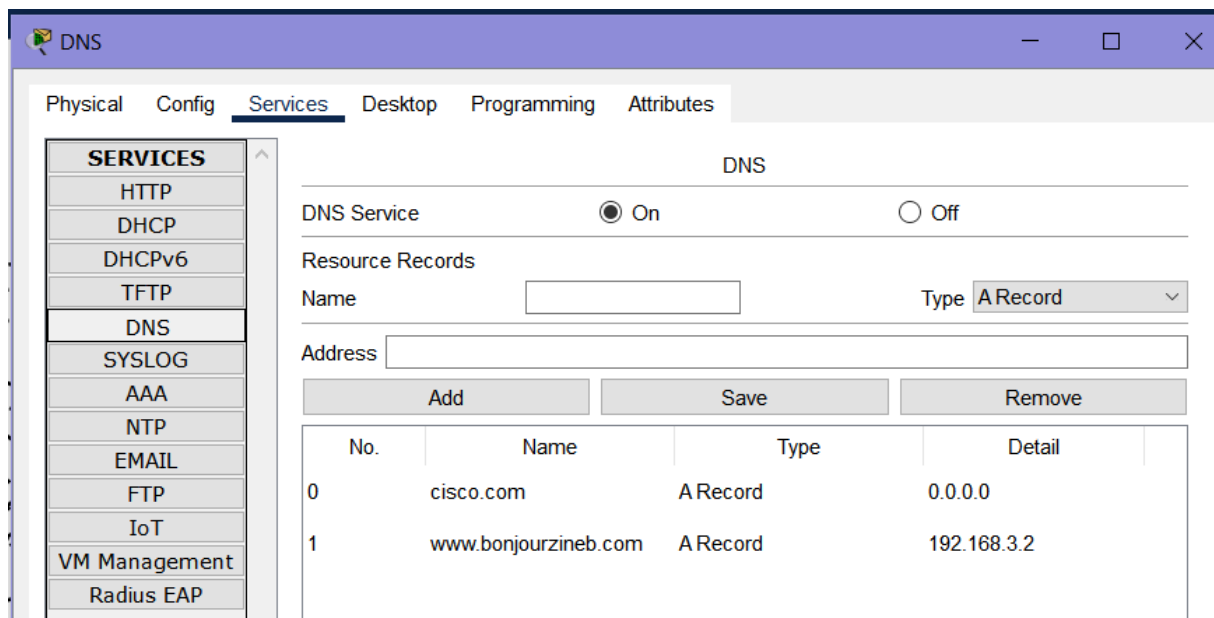
Pinging 192.168.30.11 with 32 bytes of data:

Request timed out.
Reply from 192.168.30.11: bytes=32 time<1ms TTL=127
Reply from 192.168.30.11: bytes=32 time=4ms TTL=127
Reply from 192.168.30.11: bytes=32 time<1ms TTL=127

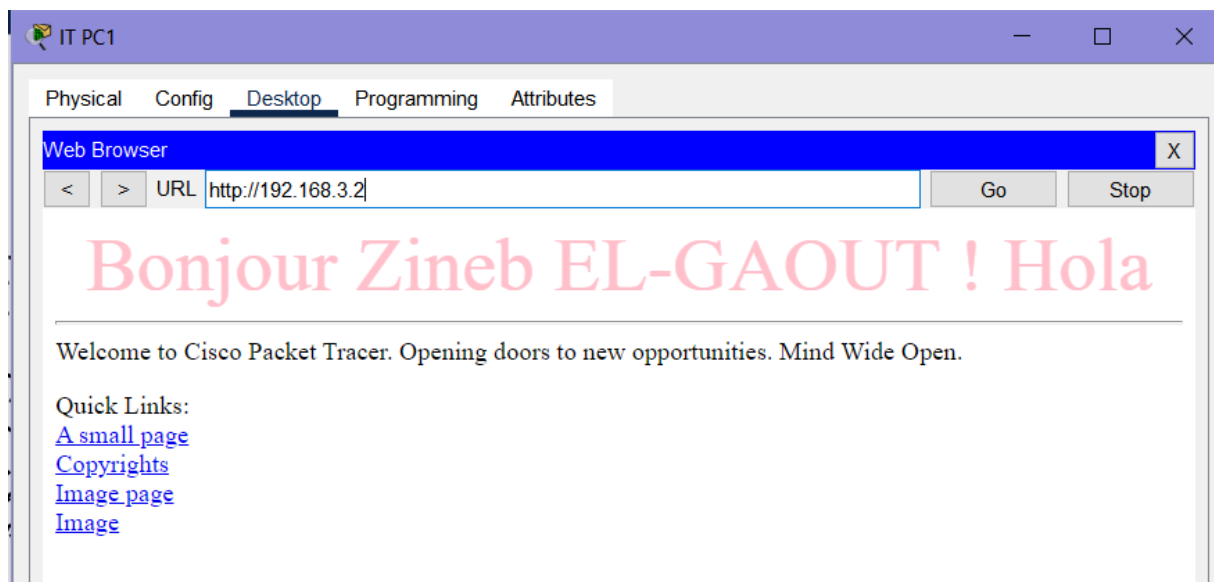
Ping statistics for 192.168.30.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 4ms, Average = 1ms
```

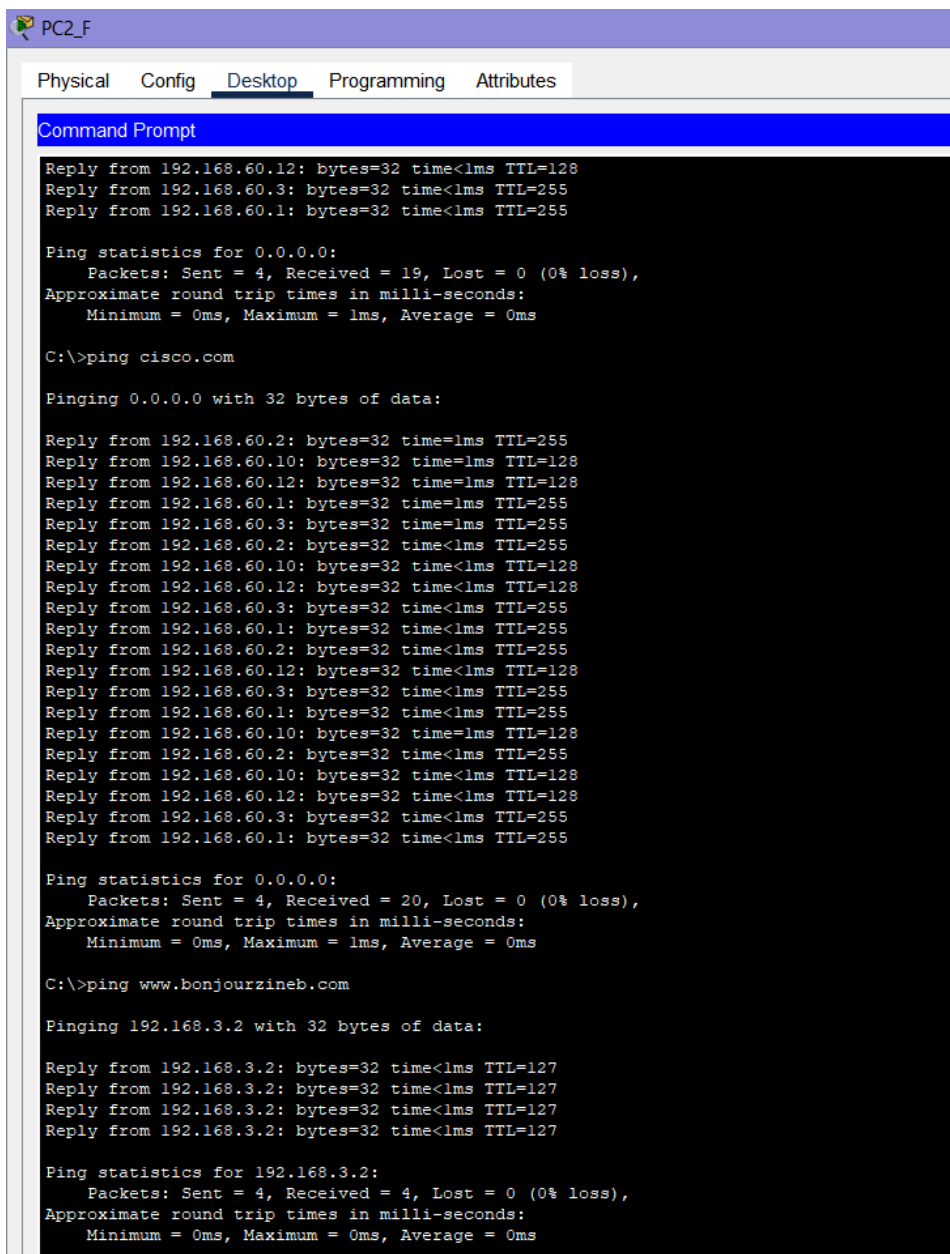
## 7. Ping entre les hôtes finaux et le serveur DNS , http , https :

### Rappel :



### Test :







## Command Prompt

```
Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
C:\>ping 0.0.0.0
```

```
Pinging 0.0.0.0 with 32 bytes of data:
```

```
Reply from 192.168.40.11: bytes=32 time<1ms TTL=128
Reply from 192.168.40.1: bytes=32 time<1ms TTL=255
Reply from 192.168.40.2: bytes=32 time<1ms TTL=255
Reply from 192.168.40.11: bytes=32 time<1ms TTL=128
Reply from 192.168.40.3: bytes=32 time<1ms TTL=255
Reply from 192.168.40.1: bytes=32 time<1ms TTL=255
Reply from 192.168.40.2: bytes=32 time<1ms TTL=255
Reply from 192.168.40.3: bytes=32 time<1ms TTL=255
Reply from 192.168.40.1: bytes=32 time<1ms TTL=255
Reply from 192.168.40.11: bytes=32 time<1ms TTL=128
Reply from 192.168.40.2: bytes=32 time<1ms TTL=255
Reply from 192.168.40.11: bytes=32 time<1ms TTL=128
Reply from 192.168.40.3: bytes=32 time<1ms TTL=255
Reply from 192.168.40.1: bytes=32 time<1ms TTL=255
```

```
Ping statistics for 0.0.0.0:
    Packets: Sent = 4, Received = 14, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
C:\>ping www.bonjourzineb.com
```

```
Pinging 192.168.3.2 with 32 bytes of data:
```

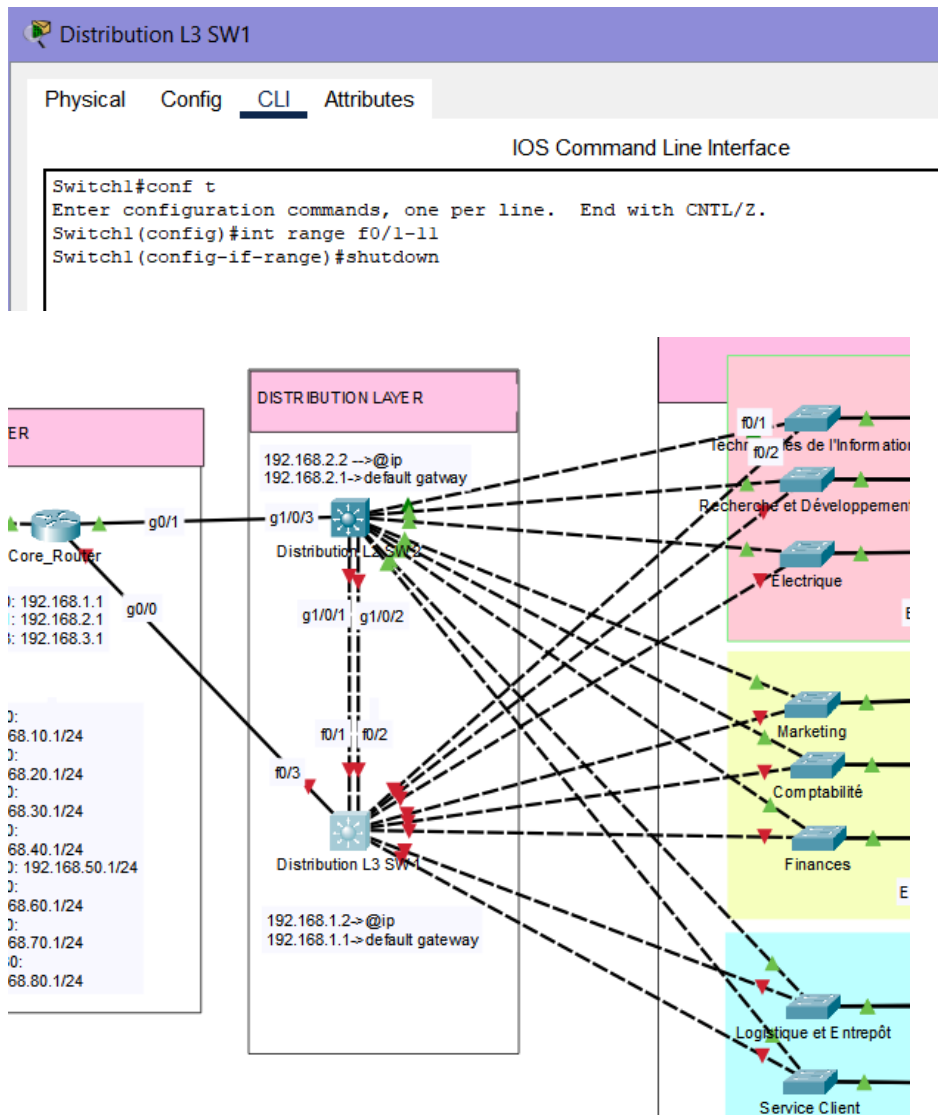
```
Reply from 192.168.3.2: bytes=32 time<1ms TTL=127
Reply from 192.168.3.2: bytes=32 time=25ms TTL=127
Reply from 192.168.3.2: bytes=32 time=5ms TTL=127
Reply from 192.168.3.2: bytes=32 time<1ms TTL=127
```

```
Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 25ms, Average = 7ms
```

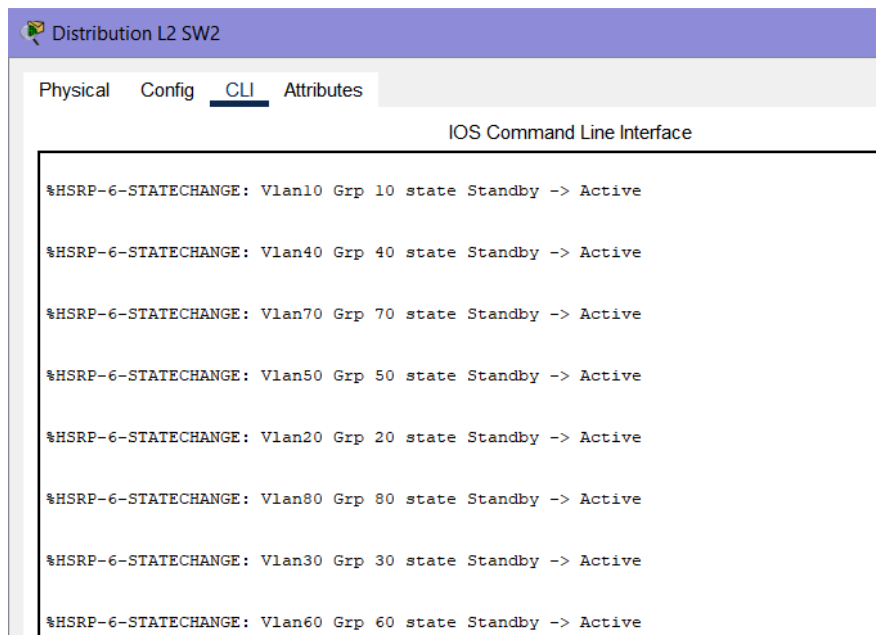
```
C:\>
```

## 12 Partie 12 : Vérification du protocole HSRP spanning tree

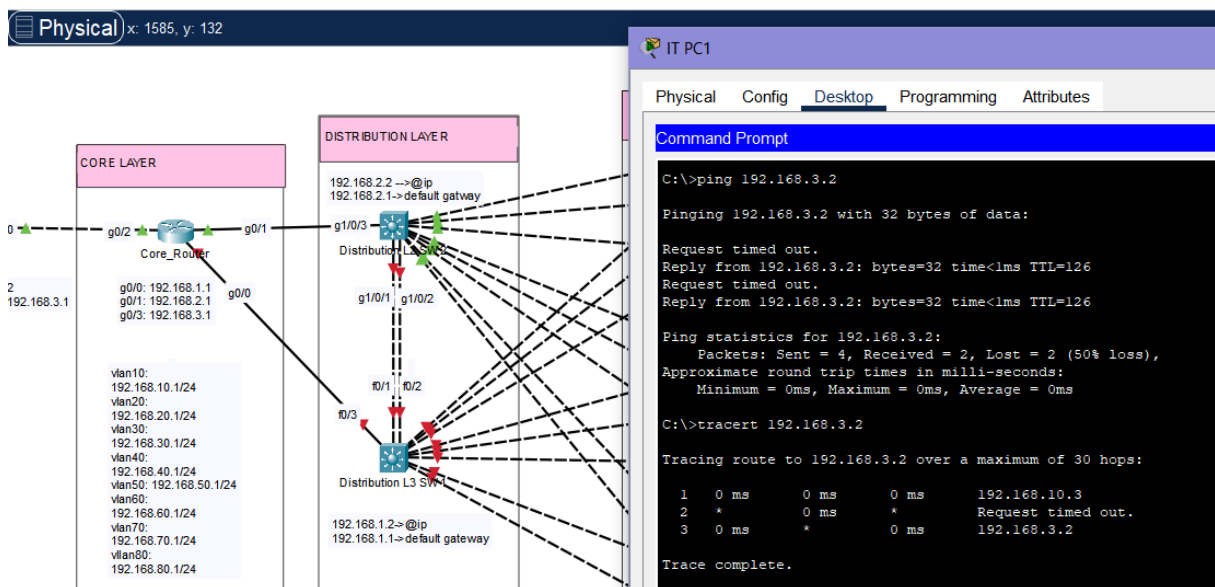
**On mettre toutes les interfaces de switch1 (root +active ) en shutdown , on va vérifier le fonctionnement des protocoles utilisés .**



**On remarque : au niveau du switch 2 , il devient root et active :**



**On va tester si les appareils ont connectés :**

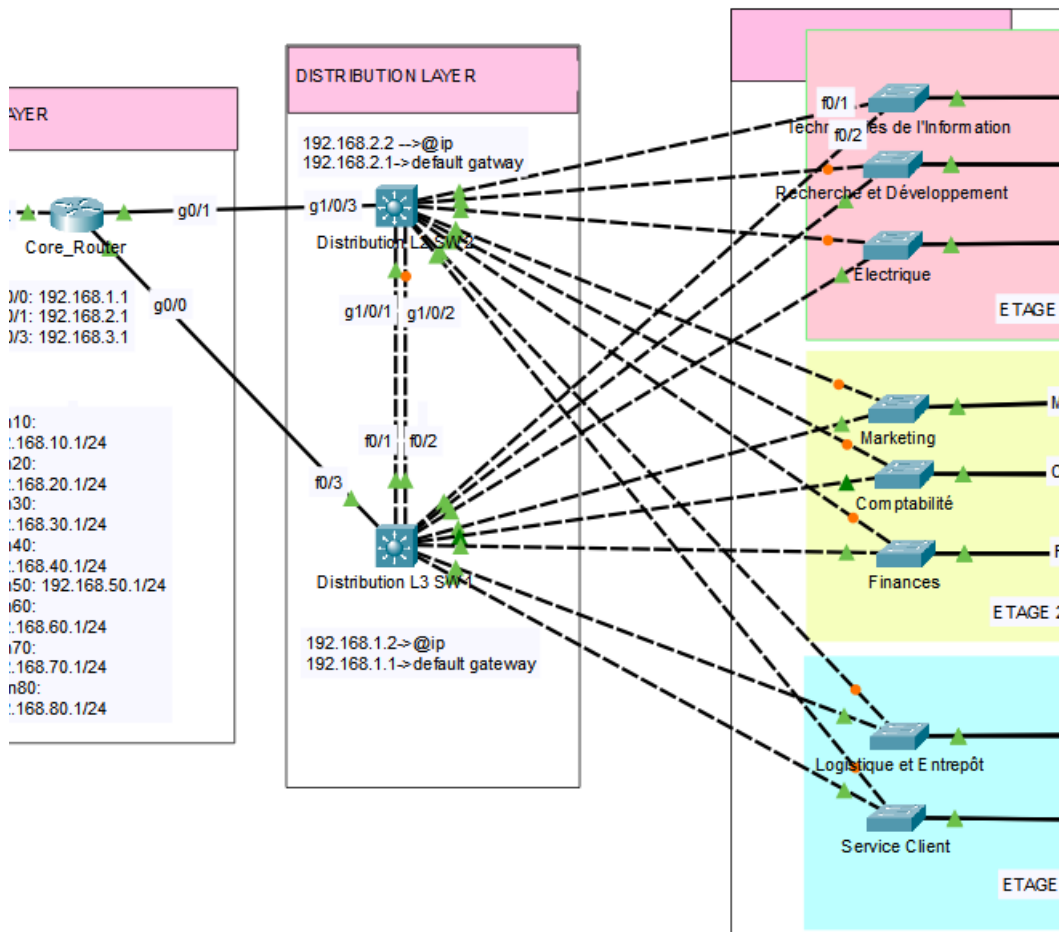


## On va réactiver le switch 1 pour tester la préemption :

```

Distribution L3 SW1
Physical  Config  CLI  Attributes
IOS Command Line Interface

Switch1>en
Password:
Switch1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch1(config)#int range f0/1-11
Switch1(config-if-range)#no shutdown
  
```



## Vérification :

**commande : show spanning-tree**

Distribution L3 SW1

Physical Config CLI Attributes

IOS Command Line Interface

```

VLAN0010
Spanning tree enabled protocol ieee
Root ID    Priority    4106
           Address    0002.165C.698B
           This bridge is the root
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    4106 (priority 4096 sys-id-ext 10)
           Address    0002.165C.698B
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
           Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Fa0/7     Desg FWD 19   128.7 P2p
Fa0/1     Desg FWD 19   128.1 P2p
Fa0/5     Desg FWD 19   128.5 P2p
Fa0/2     Desg FWD 19   128.2 P2p
Fa0/3     Desg FWD 19   128.3 P2p
Fa0/6     Desg FWD 19   128.6 P2p
Fa0/4     Desg FWD 19   128.4 P2p
Fa0/8     Desg FWD 19   128.8 P2p
Fa0/10    Desg FWD 19   128.10 P2p
Fa0/9     Desg FWD 19   128.9 P2p
Fa0/11    Desg FWD 19   128.11 P2p

VLAN0020
Spanning tree enabled protocol ieee
Root ID    Priority    4116
           Address    0002.165C.698B
           This bridge is the root
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    4116 (priority 4096 sys-id-ext 20)
           Address    0002.165C.698B
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
           Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Fa0/7     Desg FWD 19   128.7 P2p
Fa0/1     Desg FWD 19   128.1 P2p

```

IT PC1

Physical Config Desktop Programming Attributes

Command Prompt

```

C:\>ping 192.168.3.2

Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time<1ms TTL=127
Reply from 192.168.3.2: bytes=32 time<1ms TTL=127
Reply from 192.168.3.2: bytes=32 time<1ms TTL=127
Reply from 192.168.3.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>tracert 192.168.3.2

Tracing route to 192.168.3.2 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    192.168.10.1
  2  0 ms    0 ms    0 ms    192.168.3.2

```

## 13 Partie 13 : Vérification de la sécurité des ports

**On va connecter un nouveau ordinateur au switch du vlan 10 , on va tester si lorsqu'on essaie de ping un appareils , les interfaces se met automatiquement en mode shutdown .**

The screenshot shows the configuration window for a device named 'PC\_étranger'. The 'Config' tab is selected. On the left, under 'INTERFACE', 'FastEthernet0' is chosen. The main area displays 'Global Settings' for 'FastEthernet0'. The 'Display Name' is 'PC\_étranger'. Under 'Gateway/DNS IPv4', 'Static' is selected. The 'Default Gateway' is '192.168.10.1' and the 'DNS Server' is '192.168.3.2'.

Global Settings	
Display Name	PC_étranger
Interfaces	FastEthernet0
Gateway/DNS IPv4	
<input type="radio"/> DHCP	
<input checked="" type="radio"/> Static	
Default Gateway	192.168.10.1
DNS Server	192.168.3.2

The screenshot shows the configuration window for 'PC\_étranger' with the 'FastEthernet0' interface selected. The 'Config' tab is active. On the left, 'FastEthernet0' is selected under 'INTERFACE'. The main area shows 'FastEthernet0' settings. 'Port Status' is 'Up'. 'Bandwidth' is '100 Mbps'. 'Duplex' is 'Full Duplex'. 'MAC Address' is '0006.2A74.BED5'. Under 'IP Configuration', 'Static' is selected. The 'IPv4 Address' is '192.168.10.15' and the 'Subnet Mask' is '255.255.255.0'.

FastEthernet0	
Port Status	Up
Bandwidth	100 Mbps
Duplex	Full Duplex
MAC Address	0006.2A74.BED5
IP Configuration	
<input type="radio"/> DHCP	
<input checked="" type="radio"/> Static	
IPv4 Address	192.168.10.15
Subnet Mask	255.255.255.0

# Vérification :

**Technologies de l'Information**

**GLOBAL**

Settings

Algorithm Settings

**SWITCHING**

VLAN Database

**INTERFACE**

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

**FastEthernet0/5**

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/11

**FastEthernet0/5**

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

Access  VLAN

Tx Ring Limit

**Equivalent IOS Commands**

Enter configuration commands, one per line. End with CNTL/Z.

```
IT(config)#interface FastEthernet0/5
IT(config-if)#no shutdown
IT(config-if)#
```

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to down