

Projet Inter-VLAN sur Cisco Packet Tracer

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Qu'est-ce qu'un VLAN?

Un réseau local virtuel, communément appelé VLAN (pour *Virtual LAN*), est un réseau informatique logique indépendant. De nombreux VLAN peuvent coexister sur un même commutateur réseau ou « Switch ».

Qu'est-ce qu'un inter-VLAN?

Le routage inter-VLAN est un processus qui permet de transférer du trafic réseau d'un VLAN à un autre à l'aide d'un périphérique de couche 3 comme un routeur.

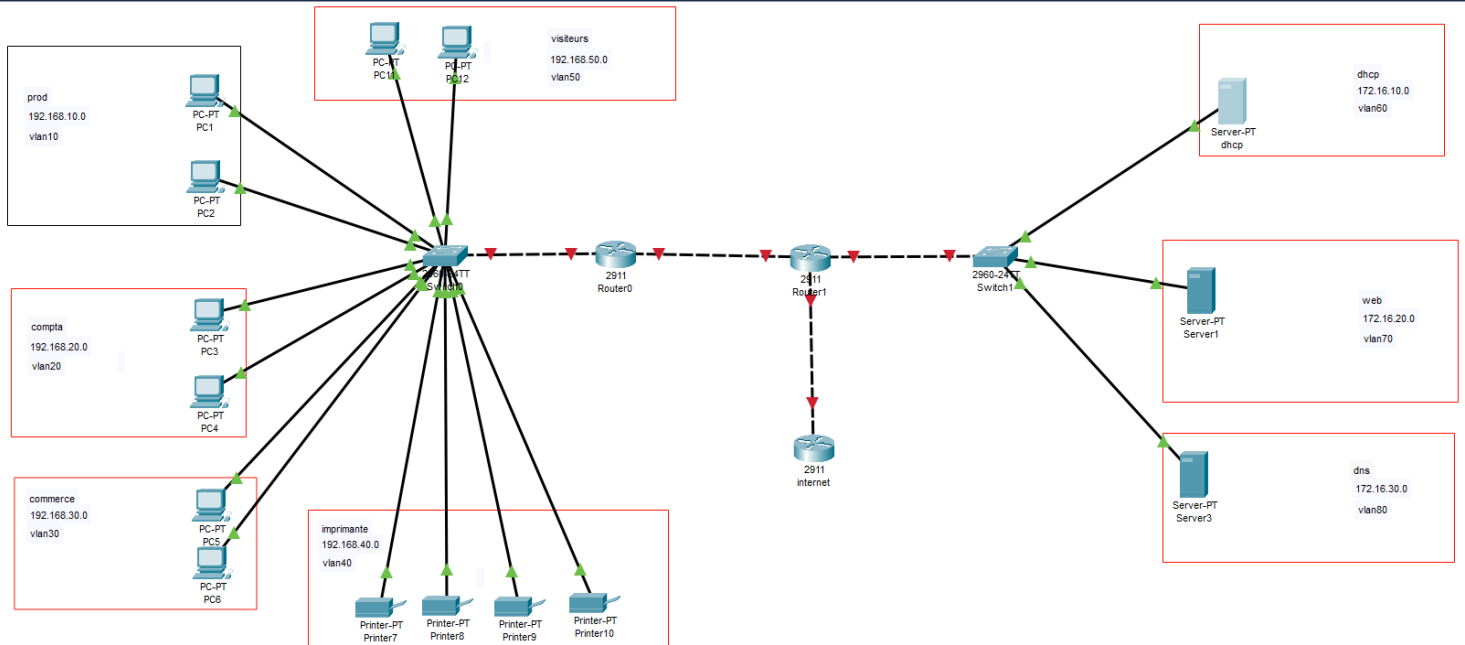
Objectif du projet

L'objectif de ce projet est de créer une connexion inter-VLAN sur le logiciel de simulation Cisco packet tracer en vue de le reproduire dans la réalité dans des futurs projets.

Installation

1/ Crée un réseau virtuel

Lancer Cisco packet tracer et recrée votre infrastructure réseau

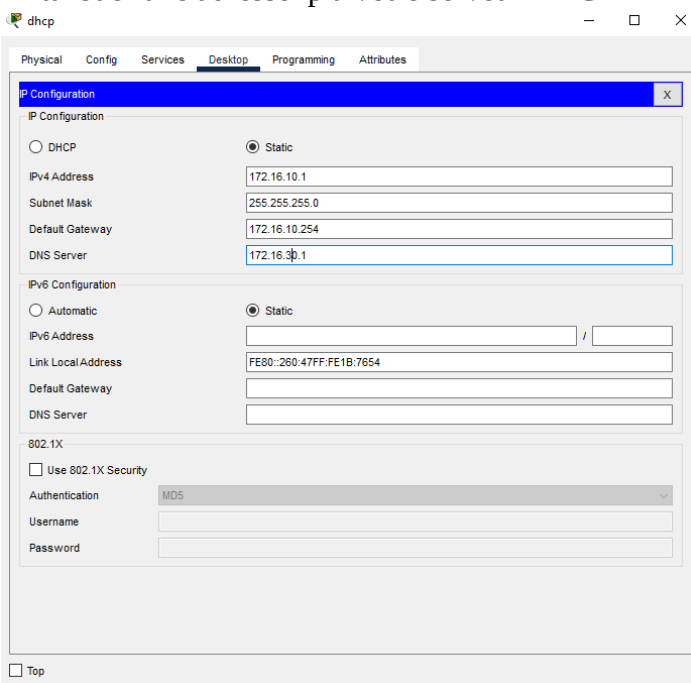


2/ Configurer toutes les machines

2.1/ Configurer vos serveurs

2.1.1/ Serveur DHCP

Attribuer une adresse ip à votre serveur DHCP



Faire la configuration de votre serveur DHCP en fonction des vlan utilisés

DHCP

Interface FastEthernet0 v

Pool Name vlan20

Default Gateway 192.168.20.254

DNS Server 172.16.30.1

Start IP Address : 192 168 20 0

Subnet Mask: 255 255 255 0

Maximum Number of Users : 200

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Service ☐ On ☒ Off

Add
Save
Remove

	Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
	vlan80	192.168.80.254	172.16.30.1	192.168.80.0	255.255.255.0	200	0.0.0.0	0.0.0.0
	vlan70	192.168.70.254	172.16.30.1	192.168.70.0	255.255.255.0	200	0.0.0.0	0.0.0.0
	vlan60	192.168.60.254	172.16.30.1	192.168.60.0	255.255.255.0	200	0.0.0.0	0.0.0.0
	vlan50	192.168.50.254	172.16.30.1	192.168.50.0	255.255.255.0	200	0.0.0.0	0.0.0.0
	vlan40	192.168.40.254	172.16.30.1	192.168.40.0	255.255.255.0	200	0.0.0.0	0.0.0.0
	vlan30	192.168.30.254	172.16.30.1	192.168.30.0	255.255.255.0	200	0.0.0.0	0.0.0.0
	vlan20	192.168.20.254	172.16.30.1	192.168.20.0	255.255.255.0	200	0.0.0.0	0.0.0.0
	vlan10	192.168.10.254	172.16.30.1	192.168.10.0	255.255.255.0	200	0.0.0.0	0.0.0.0

N'oubliez pas d'activer le service une fois la configuration effectué.

2.1.2/Serveur WEB

Attribué une adresse ip à votre serveur WEB

The screenshot shows the 'web' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for both IPv4 and IPv6. The IPv4 configuration is set to 'Static' with the following values: IPv4 Address: 172.16.20.1, Subnet Mask: 255.255.255.0, Default Gateway: 172.16.20.254, and DNS Server: 172.16.30.1. The IPv6 configuration is also set to 'Static' with the following values: IPv6 Address: (empty), Link Local Address: FE80::20B:BEFF:FE87:487B, Default Gateway: (empty), and DNS Server: (empty). The '802.1X' section is also visible, with 'Use 802.1X Security' unchecked, 'Authentication' set to 'MD5', and 'Username' and 'Password' fields empty.

web

Physical Config Services **Desktop** Programming Attributes

IP Configuration X

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 172.16.20.1

Subnet Mask: 255.255.255.0

Default Gateway: 172.16.20.254

DNS Server: 172.16.30.1

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::20B:BEFF:FE87:487B

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

☐ Top

Aller dans «Services» puis dans «HTTP» puis activer le service HTTP et HTTPS

The screenshot shows the 'web' configuration window with the 'Services' tab selected. The 'HTTP' section is expanded, showing settings for both HTTP and HTTPS. Both services are set to 'On'. Below the service settings is a 'File Manager' table with 5 rows of files. The 'New File' and 'Import' buttons are at the bottom right.

web

Physical Config **Services** Desktop Programming Attributes

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

HTTP

HTTP: ☒ On ☐ Off

HTTPS: ☒ On ☐ Off

File Manager

	File Name	Edit	Delete
1	copyrights.html	(edit)	(delete)
2	cscoptlogo177x111.jpg		(delete)
3	helloworld.html	(edit)	(delete)
4	image.html	(edit)	(delete)
5	index.html	(edit)	(delete)

New File Import

☐ Top

2.1.3/Serveur DNS

Attribuer une adresse ip à votre serveur DNS

The screenshot shows the 'dns' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is active, showing settings for IPv4 and IPv6. The IPv4 configuration is set to 'Static' with the following values:

Field	Value
IPv4 Address	172.16.30.1
Subnet Mask	255.255.255.0
Default Gateway	172.16.30.254
DNS Server	172.16.30.1

The IPv6 configuration is also set to 'Static' with the following values:

Field	Value
IPv6 Address	
Link Local Address	FE80::20B:BEFF:FEC4:E7C5
Default Gateway	
DNS Server	

Below the IP configuration, there is a section for '802.1X' with a checkbox for 'Use 802.1X Security' (unchecked), a dropdown for 'Authentication' (set to 'MD5'), and fields for 'Username' and 'Password'.

Mettez l'adresse IP de votre serveur web puis donnez-lui un nom

The screenshot shows the 'dns' configuration window with the 'Services' tab selected. The 'DNS' service is configured as follows:

DNS Service: ☒ On ☐ Off

Resource Records:

Name	Type	Address
www.site.com	A Record	172.16.20.1

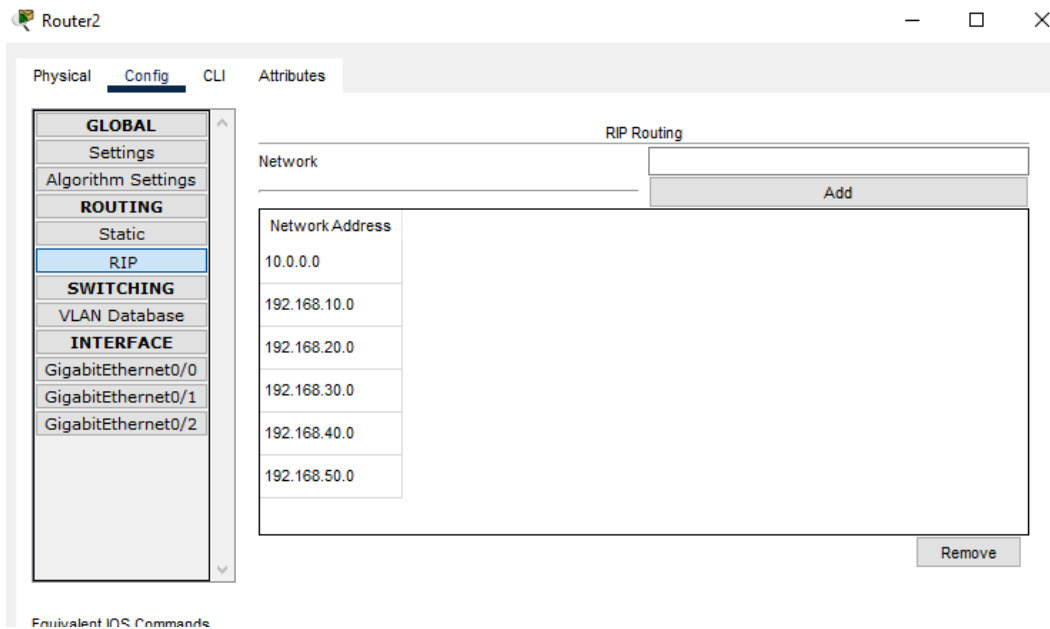
Buttons: Add, Save, Remove

No.	Name	Type	Detail
0	www.site.com	A Record	172.16.20.1

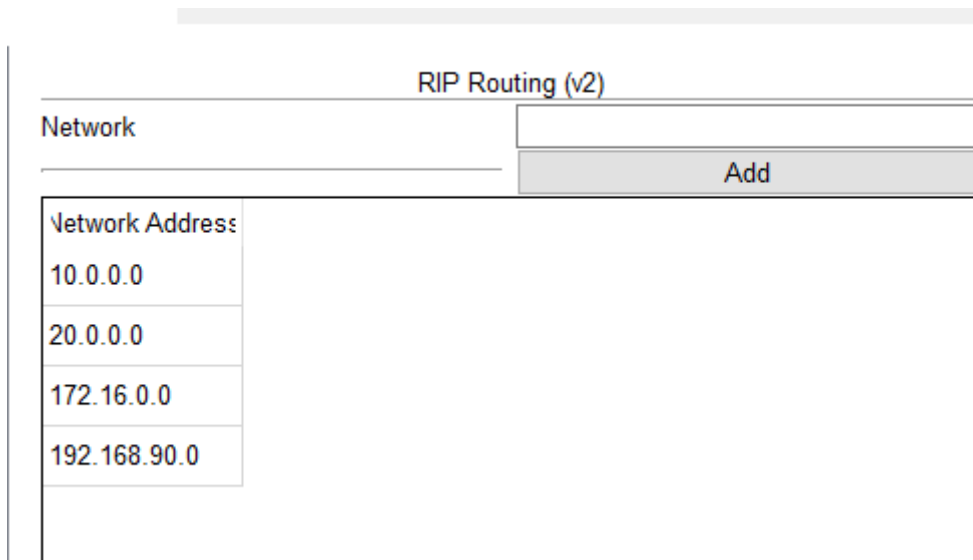
Buttons: DNS Cache

2.2/Configurer vos routeur

Aller dans «Config» puis dans «RIP» puis marqué les réseaux adjacent que vous souhaitez joindre



Faite de même pour le Routeur 1



Ensuite configurer les interfaces

Routeur 1:

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/2

GigabitEthernet0/2

Port Status ☒ On

Bandwidth ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00D0.FFC7.8B03

IP Configuration

IPv4 Address 20.0.0.1

Subnet Mask 255.255.255.252

Tx Ring Limit 10

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/1

Port Status ☒ On

Bandwidth ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00D0.FFC7.8B02

IP Configuration

IPv4 Address 10.0.0.2

Subnet Mask 255.255.255.252

Tx Ring Limit 10

Equivalent IOS Commands

Routeur2:

Router2

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/1

Port Status ☒ On

Bandwidth ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0002.163E.C102

IP Configuration

IPv4 Address 10.0.0.1

Subnet Mask 255.255.255.252

Tx Ring Limit 10

Router2

Physical **Config** CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/0

Port Status ☒ On

Bandwidth ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0002.163E.C101


IP Configuration

IPv4 Address 192.168.0.254

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Routeur Internet

 internet

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

GigabitEthernet0/2

GigabitEthernet0/2

Port Status

Bandwidth

Duplex

MAC Address

IP Configuration

IPv4 Address

Subnet Mask

Tx Ring Limit

☒ On

☒ 1000 Mbps

☐ 100 Mbps

☐ 10 Mbps

☒ Auto

☐ Half Duplex

☒ Full Duplex

☒ Auto

00E0.F90B.A003

20.0.0.2

255.255.255.252

10

2.3/Configurer vos PC

Pour les PC il suffit juste de les mettre en DHCP et les PC prendront la bonne IP automatiquement si le serveur DHCP est bien configurer

The screenshot shows the WinBox configuration window for the FastEthernet0 interface. The left sidebar has tabs for 'Physical', 'Config' (selected), 'Desktop', 'Programming', and 'Attributes'. Under 'Config', there are sub-tabs for 'GLOBAL', 'Settings', 'Algorithm Settings', 'INTERFACE', 'FastEthernet0' (selected), and 'Bluetooth'. The main area is titled 'FastEthernet0' and contains the following settings:

- Port Status:** ☒ On
- Bandwidth:** ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex:** ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address:** 00D0.BC84.C232
- IP Configuration:**
 - ☒ DHCP
 - ☐ Static
 - IPv4 Address:** 192.168.20.2
 - Subnet Mask:** 255.255.255.0
- IPv6 Configuration:**
 - ☐ Automatic
 - ☒ Static
 - IPv6 Address:** [Empty field]
 - Link Local Address:** FE80::2D0:BCFF:FE84:C232

2.3/Configurer vos switch

Créer vos vlans sur le Switch

3/Créer des vlans sur les routeurs

```
Switch(config)#vlan 10
```

```
Switch(config-vlan)#name vlan10
```

Création d'un vlan sur le routeur 2

```
Router(config)#in gi0/0.10
Router(config-subif)#enca
Router(config-subif)#encapsulation d
Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip add
Router(config-subif)#ip address 192.168.10.254 255.255.255.0
Router(config-subif)#ip help
Router(config-subif)#ip helper-address 172.16.10.1
Router(config-subif)#
```

Faire ceci pour les 8 vlans

Voici le résultat à la fin pour le routeur 2

Pour le routeur 1

```
GigabitEthernet0/0.10 is up, line protocol is up (connected)
  Hardware is PQUICC_FEC, address is 0002.163e.c101 (bia 0002.163e.c101)
  Internet address is 192.168.10.254/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 10
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last clearing of "show interface" counters never
GigabitEthernet0/0.20 is up, line protocol is up (connected)
  Hardware is PQUICC_FEC, address is 0002.163e.c101 (bia 0002.163e.c101)
  Internet address is 192.168.20.254/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 20
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last clearing of "show interface" counters never
GigabitEthernet0/0.30 is up, line protocol is up (connected)
  Hardware is PQUICC_FEC, address is 0002.163e.c101 (bia 0002.163e.c101)
  Internet address is 192.168.30.254/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 30
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last clearing of "show interface" counters never
GigabitEthernet0/0.40 is up, line protocol is up (connected)
  Hardware is PQUICC_FEC, address is 0002.163e.c101 (bia 0002.163e.c101)
  Internet address is 192.168.40.254/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 40
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last clearing of "show interface" counters never
GigabitEthernet0/0.50 is up, line protocol is up (connected)
  Hardware is PQUICC_FEC, address is 0002.163e.c101 (bia 0002.163e.c101)
  Internet address is 192.168.50.254/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 50
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last clearing of "show interface" counters never
```

```
0 output buffer failures, 0 output buffers swapped out
GigabitEthernet0/0.60 is up, line protocol is up (connected)
Hardware is PQUICC_FEC, address is 00d0.ffc7.8b01 (bia 00d0.ffc7.8b01)
Internet address is 172.16.10.254/24
MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation 802.1Q Virtual LAN, Vlan ID 60
ARP type: ARPA, ARP Timeout 04:00:00,
Last clearing of "show interface" counters never
GigabitEthernet0/0.70 is up, line protocol is up (connected)
Hardware is PQUICC_FEC, address is 00d0.ffc7.8b01 (bia 00d0.ffc7.8b01)
Internet address is 172.16.20.254/24
MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation 802.1Q Virtual LAN, Vlan ID 70
ARP type: ARPA, ARP Timeout 04:00:00,
Last clearing of "show interface" counters never
GigabitEthernet0/0.80 is up, line protocol is up (connected)
Hardware is PQUICC_FEC, address is 00d0.ffc7.8b01 (bia 00d0.ffc7.8b01)
Internet address is 172.16.30.254/24
MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation 802.1Q Virtual LAN, Vlan ID 80
ARP type: ARPA, ARP Timeout 04:00:00,
Last clearing of "show interface" counters never
GigabitEthernet0/0.90 is up, line protocol is up (connected)
Hardware is PQUICC_FEC, address is 00d0.ffc7.8b01 (bia 00d0.ffc7.8b01)
Internet address is 192.168.90.254/24
MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
```

Guide Admin

Pour supprimer une vlan il suffit juste de faire **no vlan [numéro vlan]**

```
Switch#conf t
Enter configuration commands, one per line
Switch(config)#no vlan 50
```

Pour supprimer une interface il suffit juste de faire **no interface [numéro de l'interface]**

```
Router(config)#no in
Router(config)#no interface 0/0.10
```

Conclusion

Ce tp nous a permis de comprendre comment monter une architecture réseau virtuelle sur le logiciel packet tracer pour pouvoir le réaliser dans la réalité.

Nous avons essayé de mettre en place des ACL sur les Vlan, mais nous avons rencontré des problèmes sur les vlans pour autoriser seulement l'accès au requête DHCP et DNS.