

VLAN = Virtual Local Area Network

(虛擬)

(區域網路)

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HUB與Switch差別

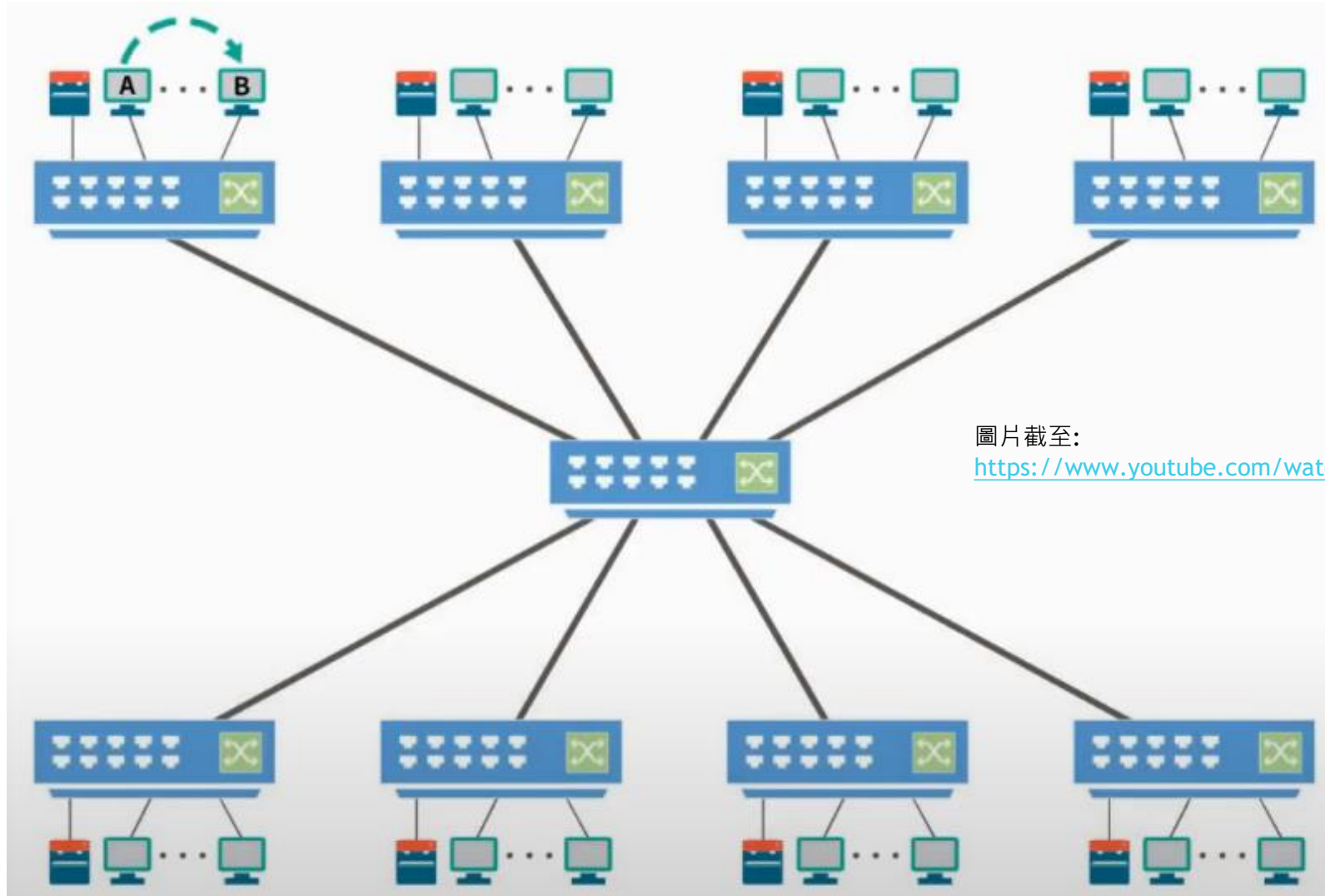
Hub



Switch



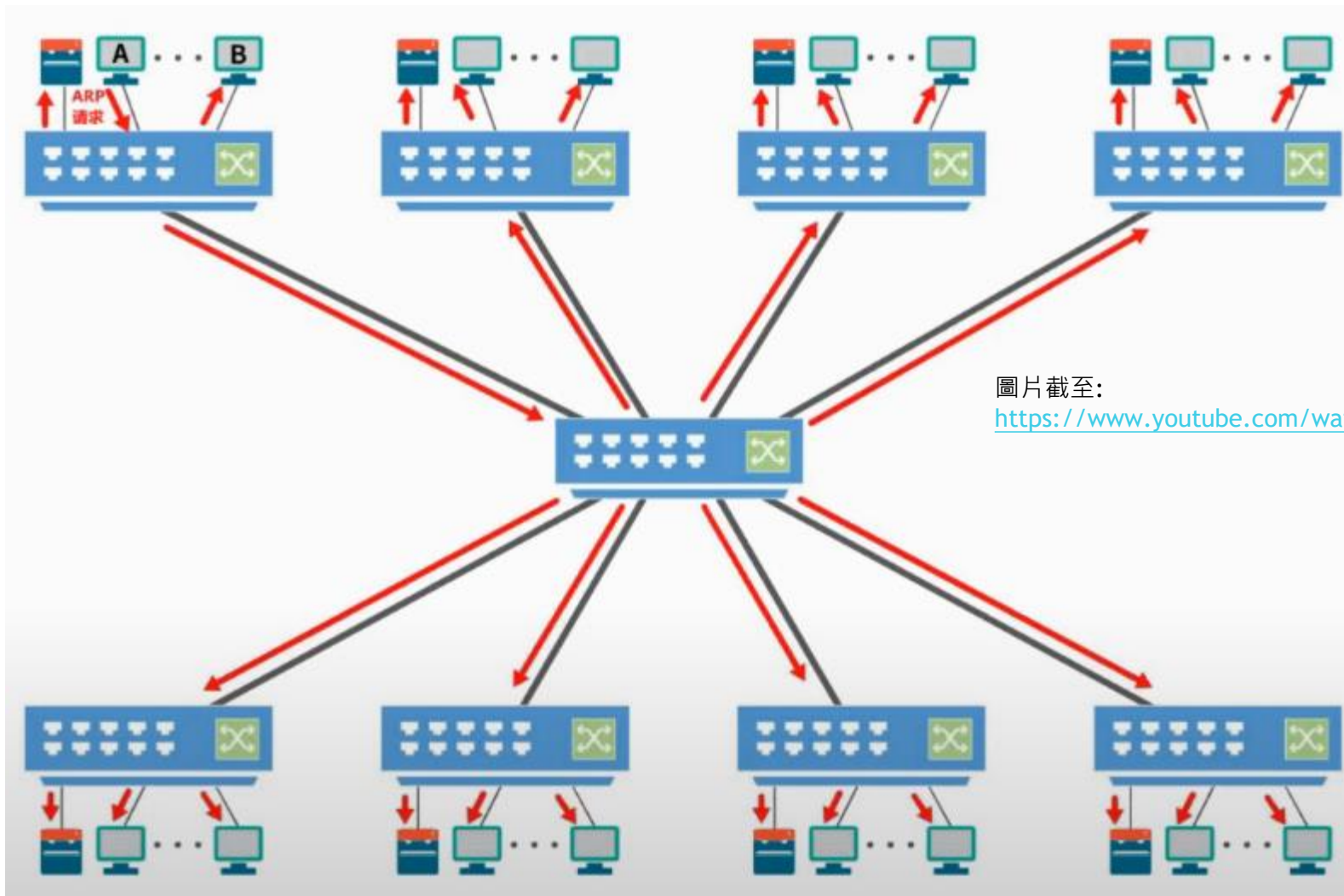
Switch交換器原理



圖片截至:

<https://www.youtube.com/watch?v=ErPumG9PthY>

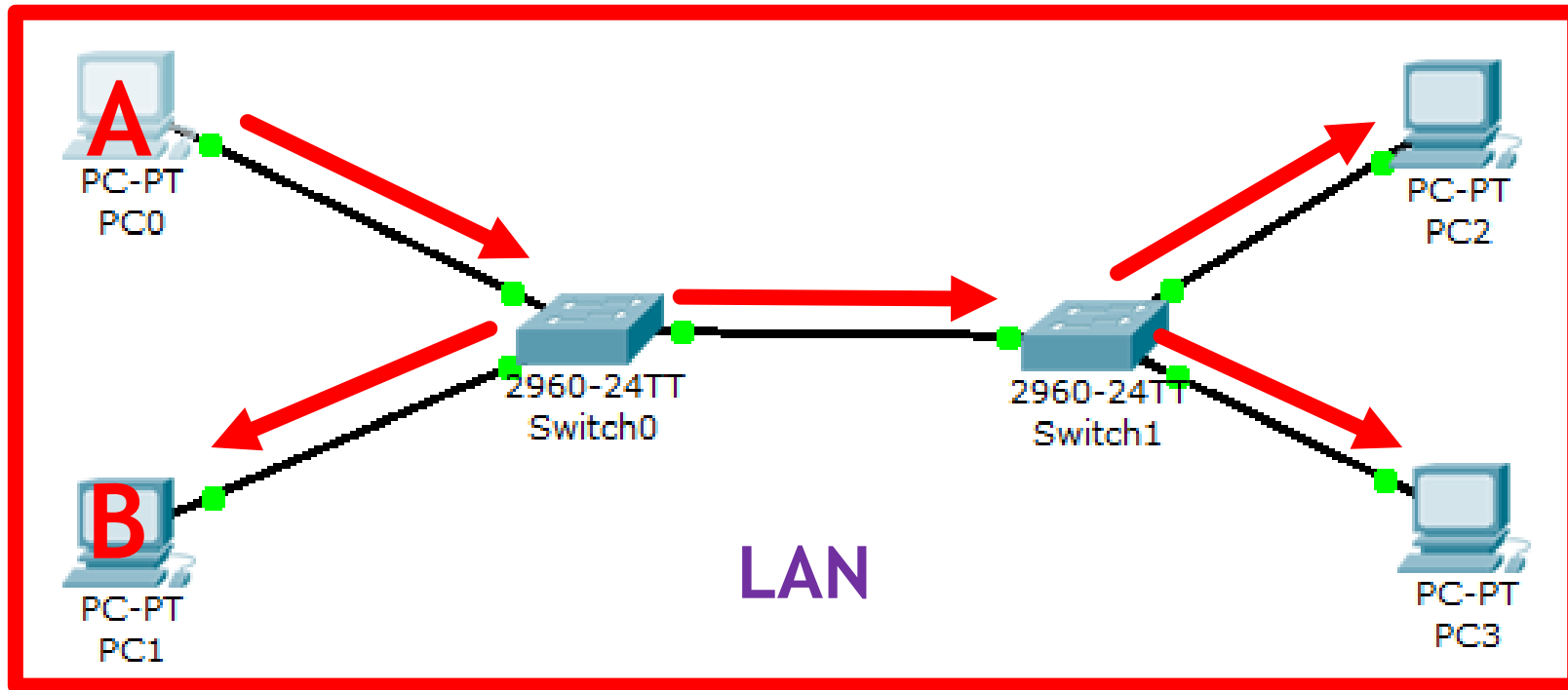
Switch交換器原理



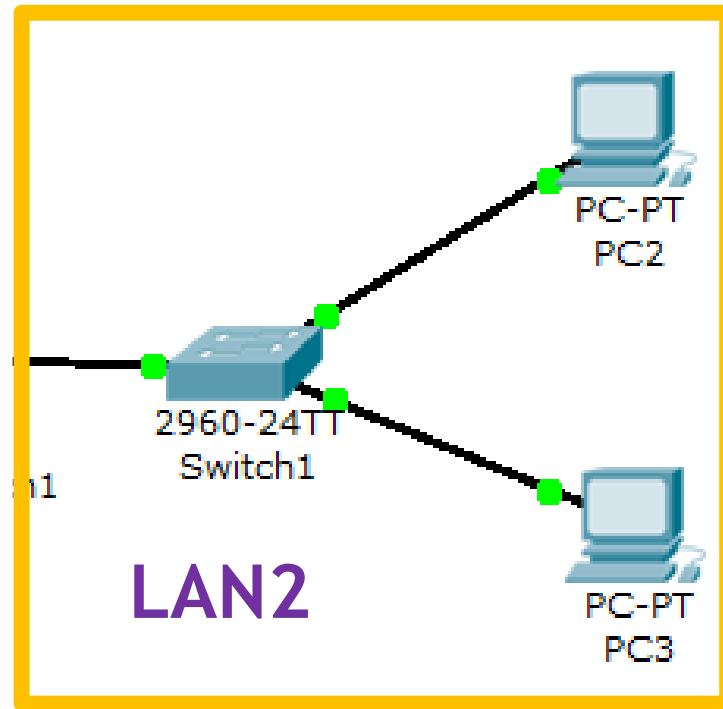
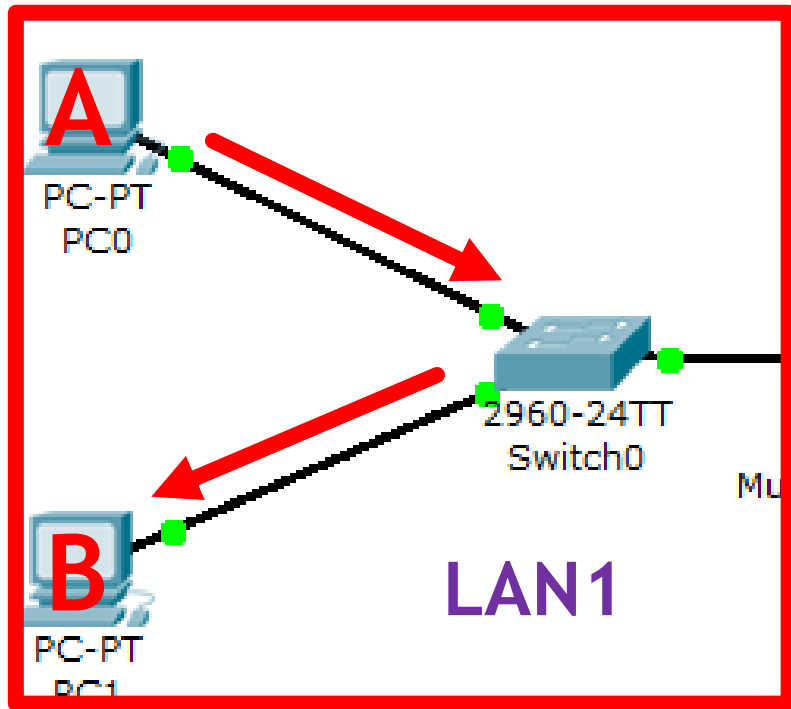
圖片截至:

<https://www.youtube.com/watch?v=ErPumG9PthY>

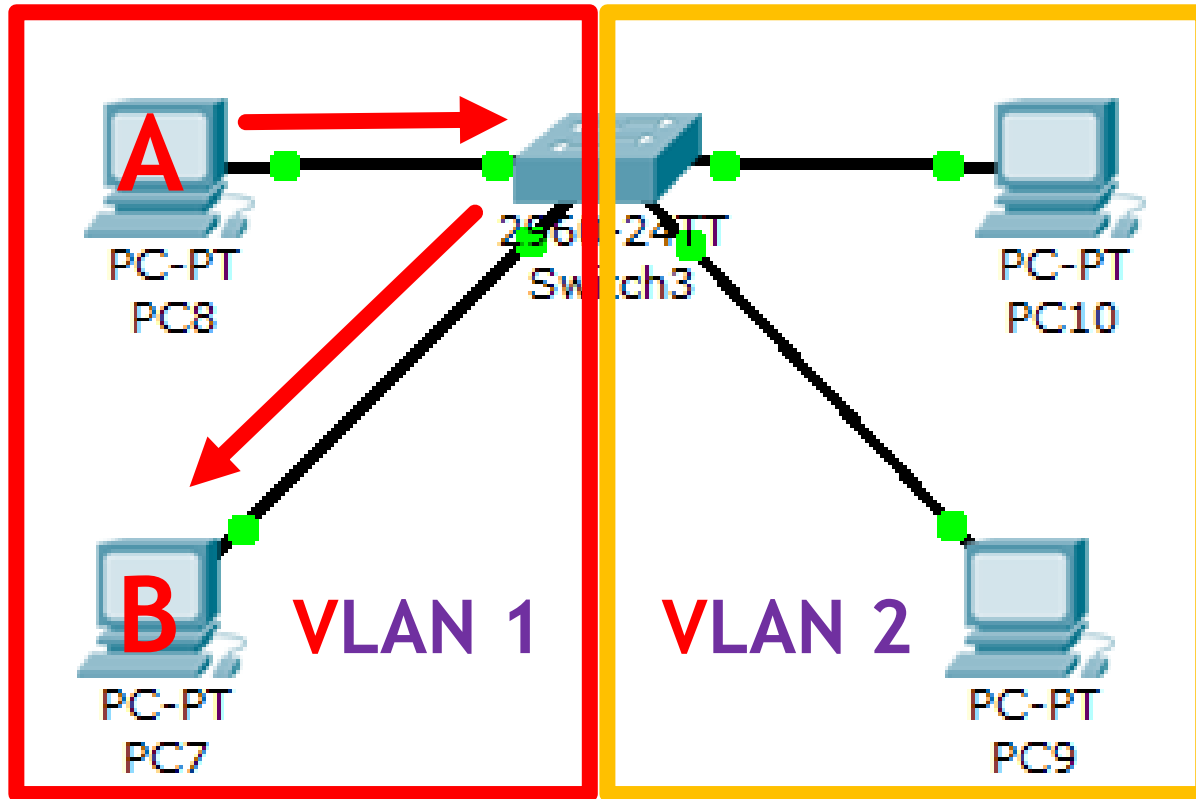
VLAN的切割



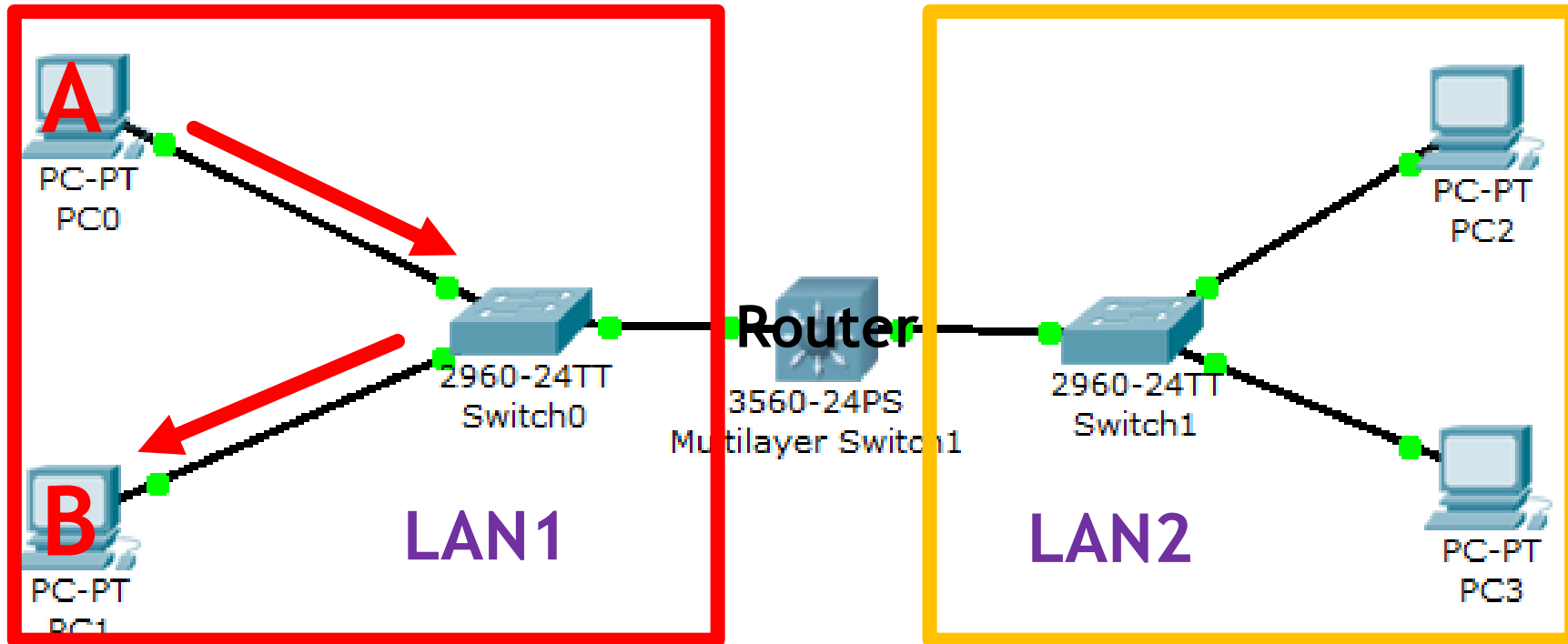
VLAN的切割



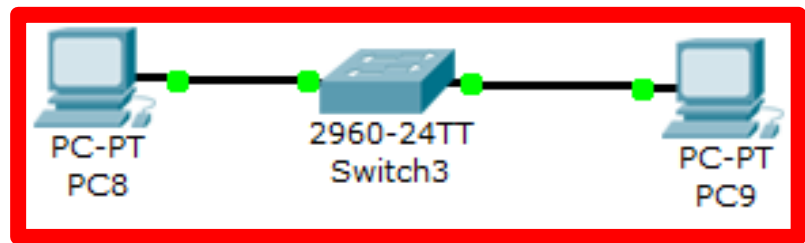
VLAN的切割



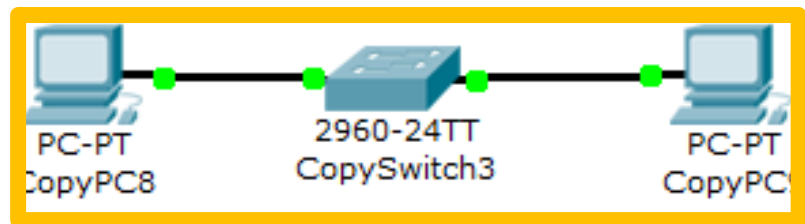
VLAN的切割



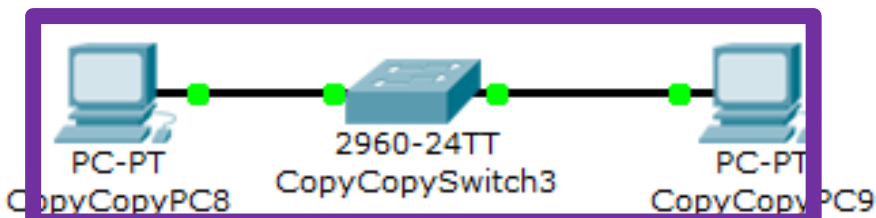
VLAN的實例



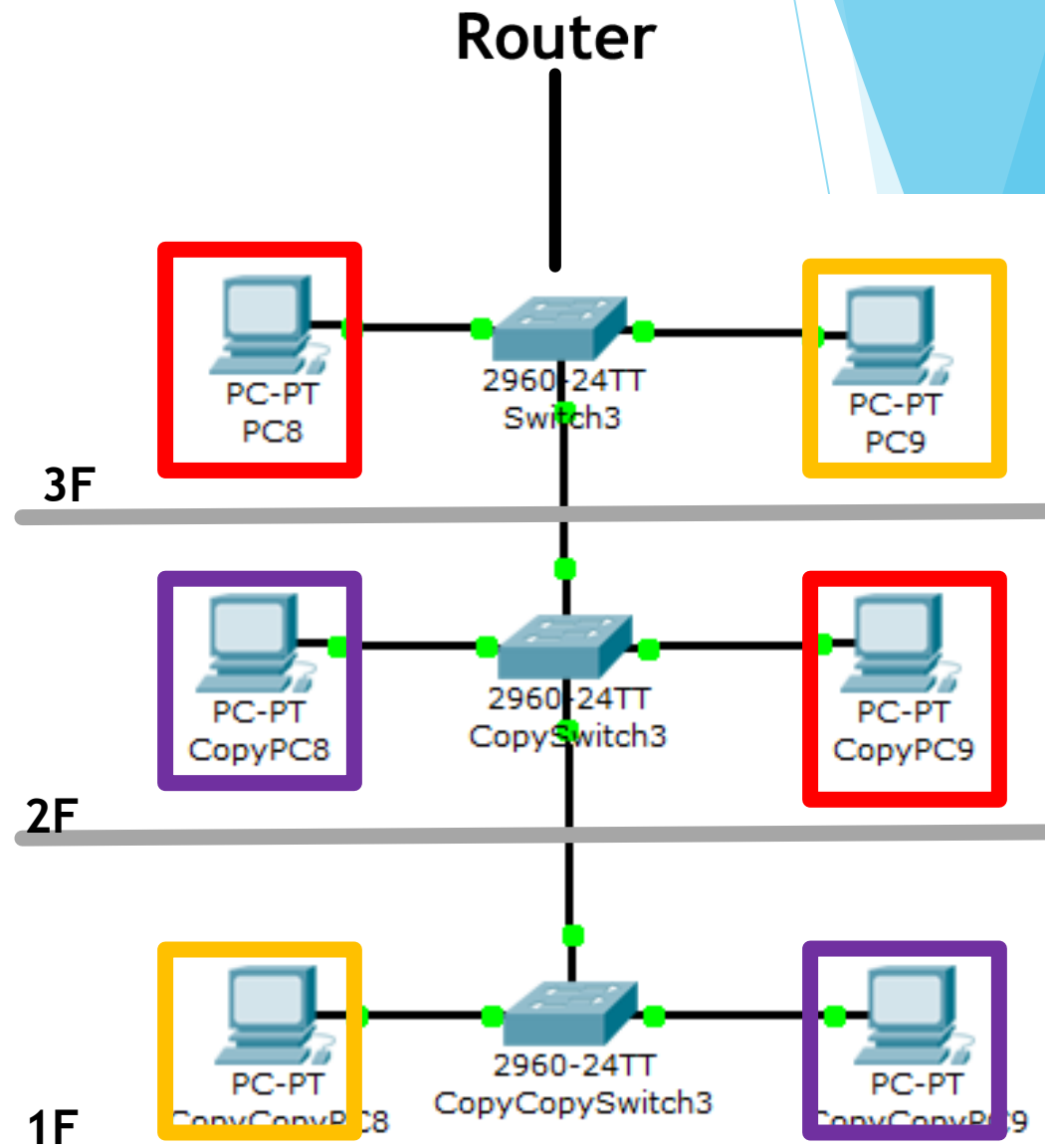
3F



2F

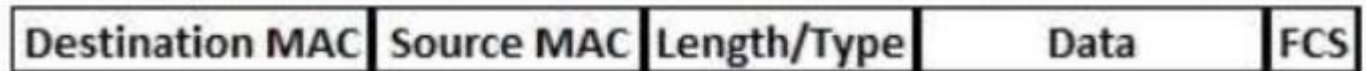


1F

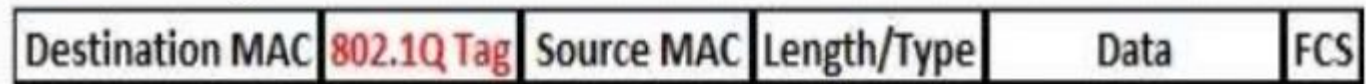


VLAN tag

- **Original frame:**



- **802.1Q frame:**



Access/Trunk 差別

Access/Trunk mode差別

Access端口

只允許一個VLAN

一般用於交換器連接電腦間使用

電腦進入交換器:

只接受未打標籤的封包進入時打上標籤

交換器離開到電腦:

若標籤與出口的VLAN ID相同則取下標籤

Trunk端口

可允許多個VLAN

用於交換器之間或交換器與路由器間使用

交換器進入另一個交換器:

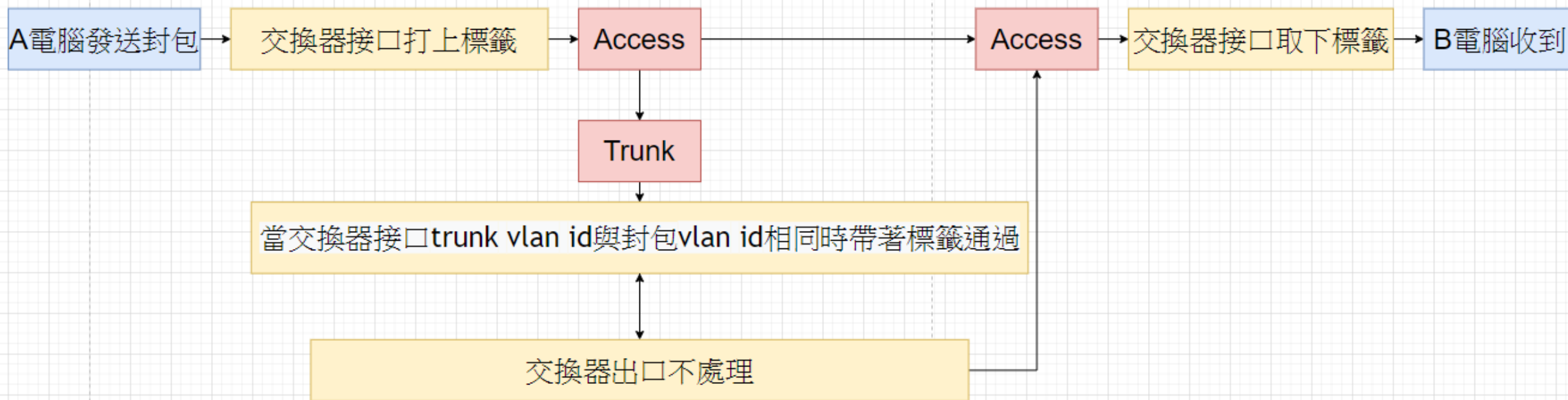
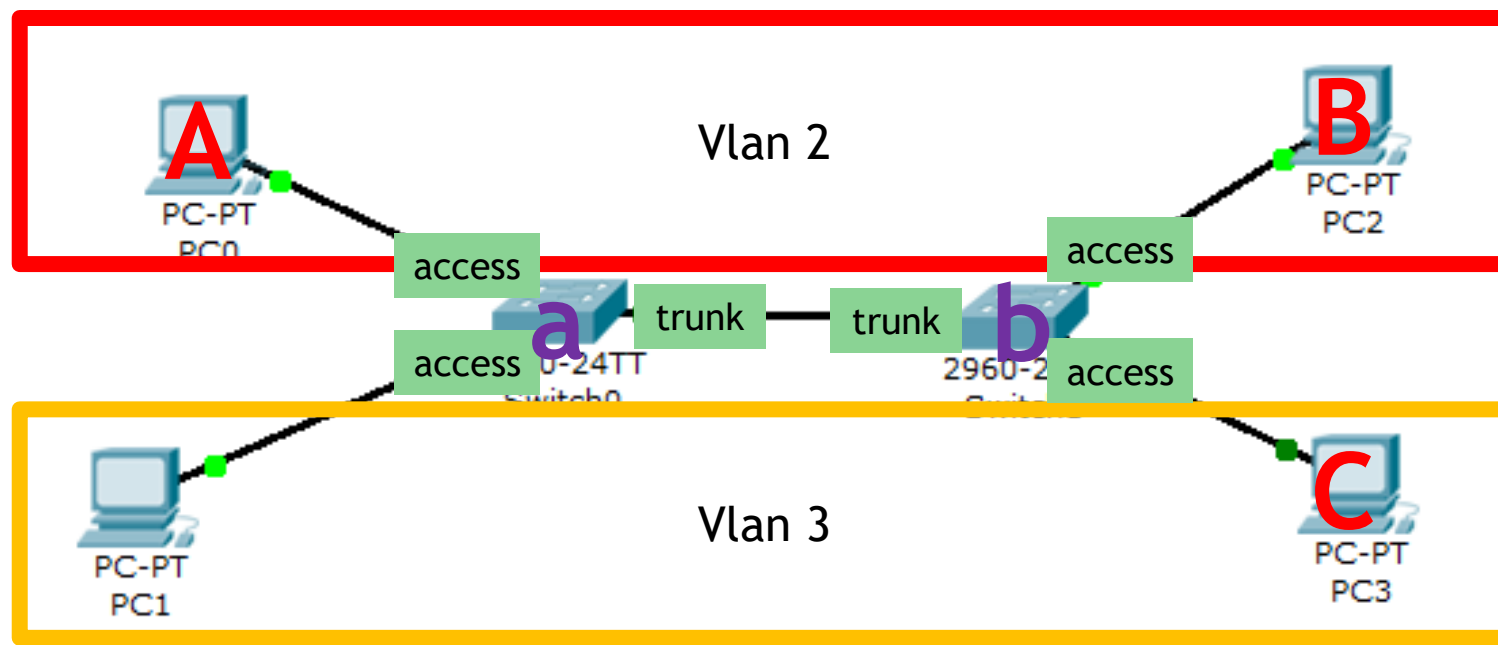
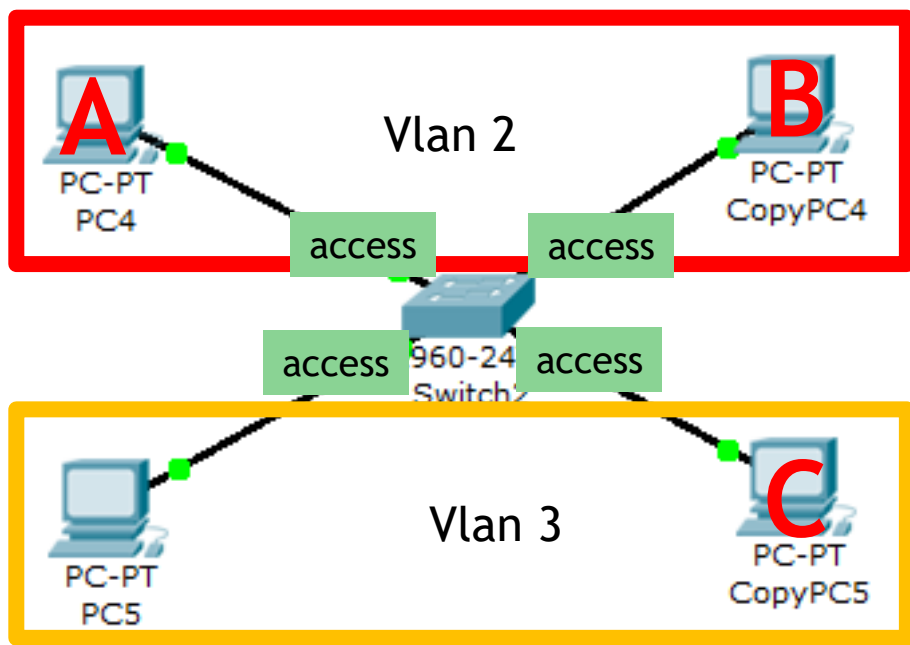
相同VLAN ID時通過該接口

相異VLAN ID時則不通過該接口

交換器離開到另一個交換器:

不處理標籤

VLAN的行為



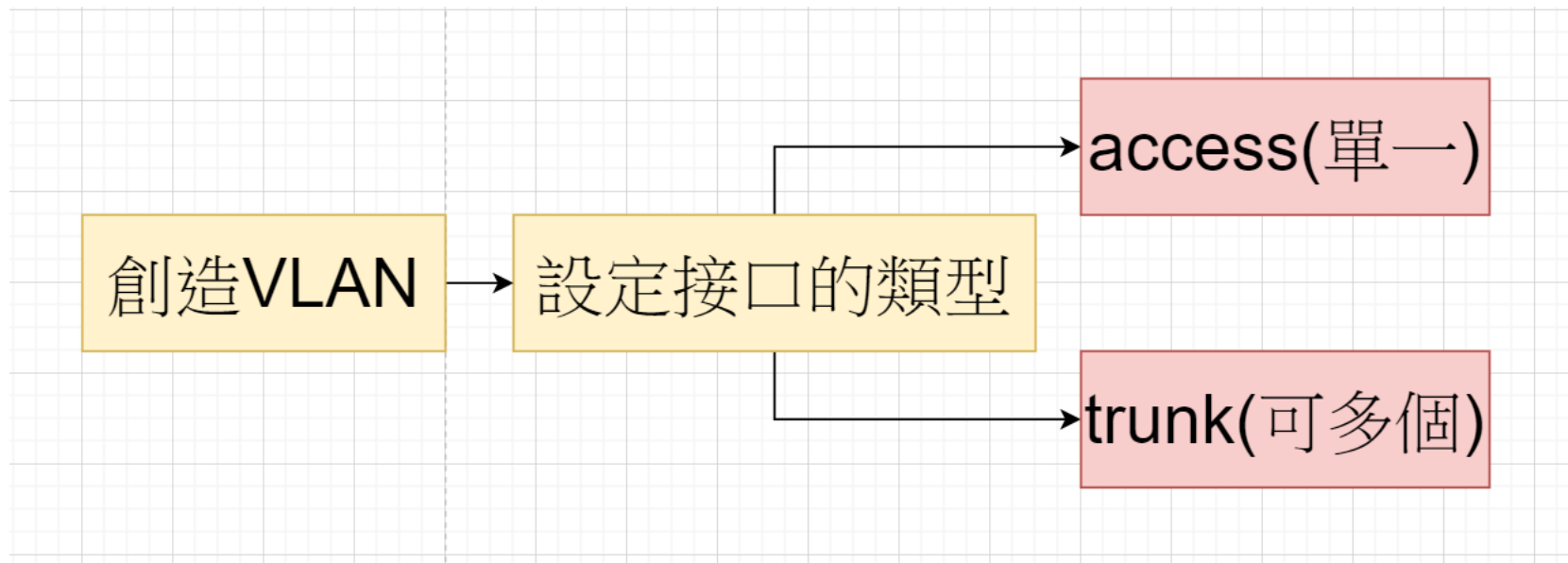
VLAN設定流程及步驟

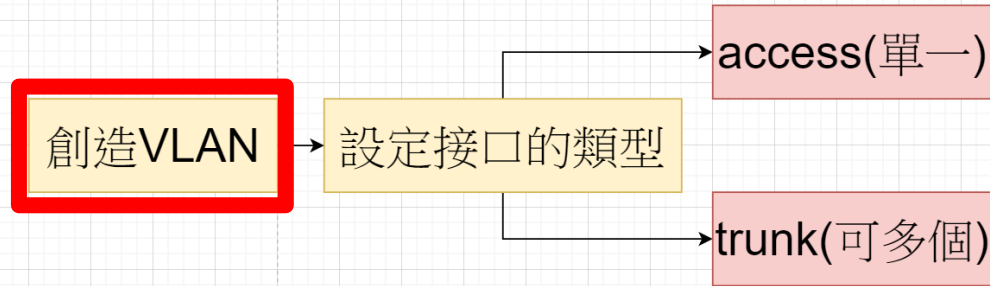
創造VLAN

設定接口的類型

access(單一)

trunk(可多個)





Switch0(1)

Physical **Config** CLI Attributes

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

VLAN Configuration

VLAN Number

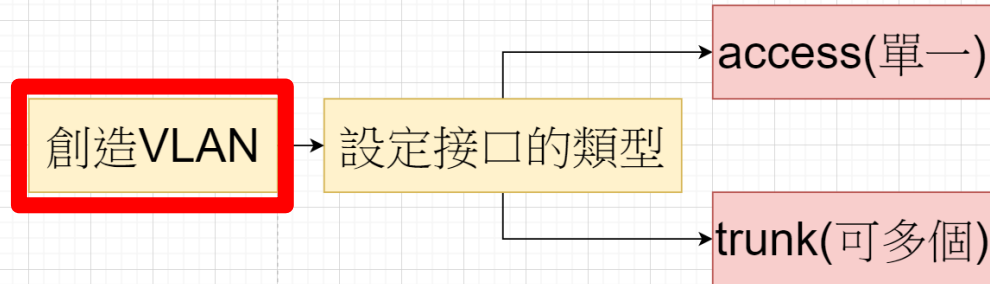
VLAN Name

VLAN No	VLAN Name
1	default
5	vlan5
20	vlan20
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1005	trnet-default

Equivalent IOS Commands

```
as VLAN database mode is being deprecated. Please
consult user
documentation for configuring VTP/VLAN in config
mode.

Switch(vlan) #
```



The screenshot shows the configuration interface for Switch0(1) in Packet Tracer. The "Config" tab is active, and the "VLAN Database" is selected in the left-hand menu. The "VLAN Configuration" section is highlighted with a red box, showing the following fields:

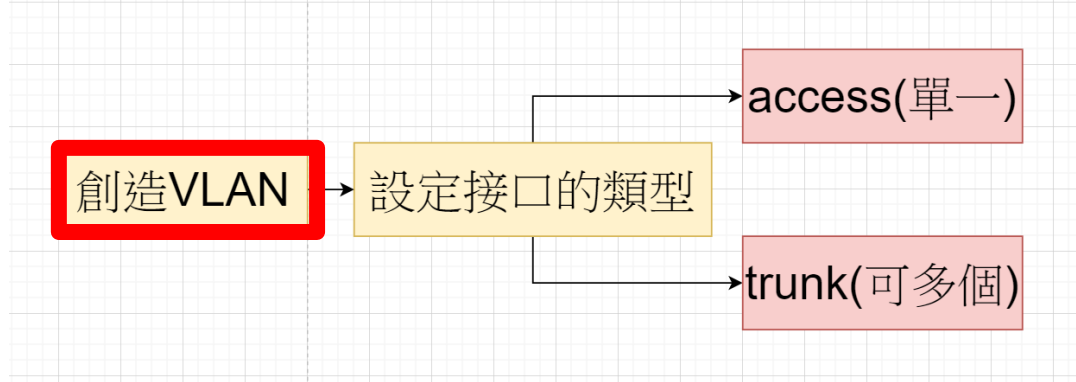
VLAN Number	VLAN Name
2	LAN

Below the configuration fields are "Add" and "Remove" buttons. A table below shows the current VLAN database:

VLAN No	VLAN Name
1	default
5	vlan5
20	vlan20
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1005	trnet-default

At the bottom, the "Equivalent IOS Commands" section shows a warning message:

```
as VLAN database mode is being deprecated. Please  
consult user  
documentation for configuring VTP/VLAN in config  
mode.  
Switch(vlan) #
```



Switch0

Physical Config CLI

VLAN Configuration

VLAN Number: 2
VLAN Name: LAN

VLAN No	VLAN Name
1	default
2	LAN
5	vlan5
20	vlan20
1002	fddi-default
1003	token-ring-default
1004	fddinet-default

Equivalent IOS Commands

```
Switch(config)#vlan 2
Switch(config-vlan)#name LAN
Switch(config-vlan)#exit
Switch(config)#
```

創造VLAN

設定接口的類型

access(單一)

trunk(可多個)

Switch0

Physical Config **CLI**

VLAN Configuration

VLAN Number: 2
VLAN Name: LAN

VLAN No	VLAN Name
1	default
2	LAN
5	vlan5
20	vlan20
1002	fddi- default
1003	token- ring- default
1004	fddinet- default

Equivalent IOS Commands

```
Switch(config)#vlan 2
Switch(config-vlan)#name LAN
Switch(config-vlan)#exit
Switch(config)#
```

創造VLAN

設定接口的類型

access(單一)

trunk(可多個)

The screenshot shows a network switch configuration window titled "Switch0". It has three tabs: "Physical", "Config", and "CLI". The "Config" tab is active, showing the configuration for "FastEthernet0/1".

On the left side, there is a navigation tree with the following sections:

- GLOBAL
 - Settings
 - Algorithm Settings
- SWITCH
 - VLAN Database
- INTERFACE
 - FastEthernet0/1** (highlighted with a red box)
 - FastEthernet0/2
 - FastEthernet0/3
 - FastEthernet0/4
 - FastEthernet0/5
 - FastEthernet0/6
 - FastEthernet0/7
 - FastEthernet0/8
 - FastEthernet0/9

The main configuration area for "FastEthernet0/1" includes the following settings:

- Port Status: On
- Bandwidth: Auto
 - 10 Mbps
 - 100 Mbps
- Duplex: Auto
 - Full Duplex
 - Half Duplex
- Access mode: (dropdown menu)
- VLAN: (dropdown menu)
- Tx Ring Limit:

At the bottom, there is a section titled "Equivalent IOS Commands" with a text area containing the following commands:

```
Switch(config-if)#  
Switch(config-if)#  
Switch(config-if)#switchport access vlan 1  
Switch(config-if)#
```

創造VLAN

設定接口的類型

access(單一)

trunk(可多個)

Switch0

Physical Config CLI

FastEthernet0/1

Port Status On

Bandwidth Auto

10 Mbps 100 Mbps

Duplex Auto

Full Duplex Half Duplex

Access VLAN 1

Tx Ring Limit 10

Equivalent IOS Commands

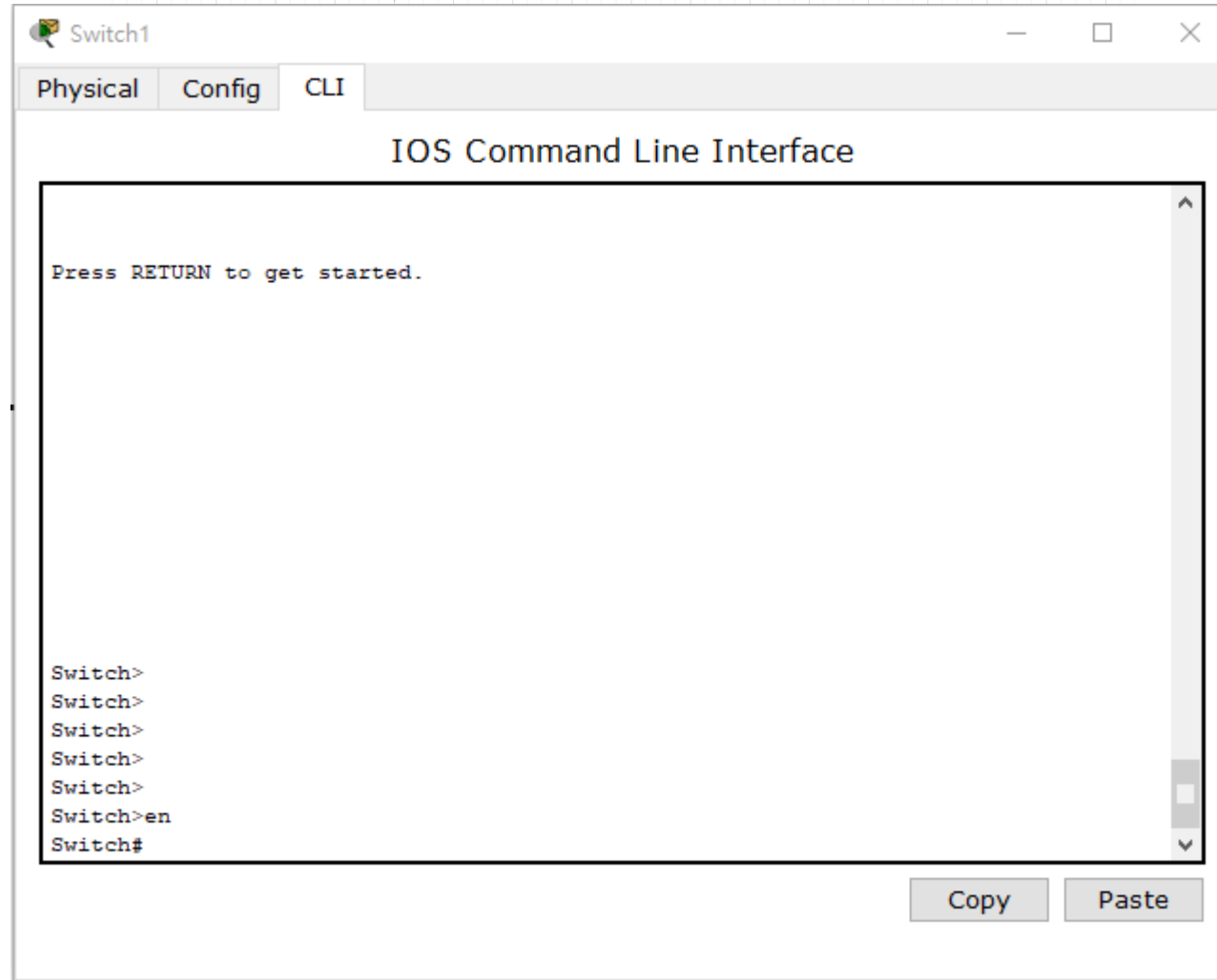
```
Switch(config-if)#  
Switch(config-if)#  
Switch(config-if)#switchport access vlan 1  
Switch(config-if)#
```

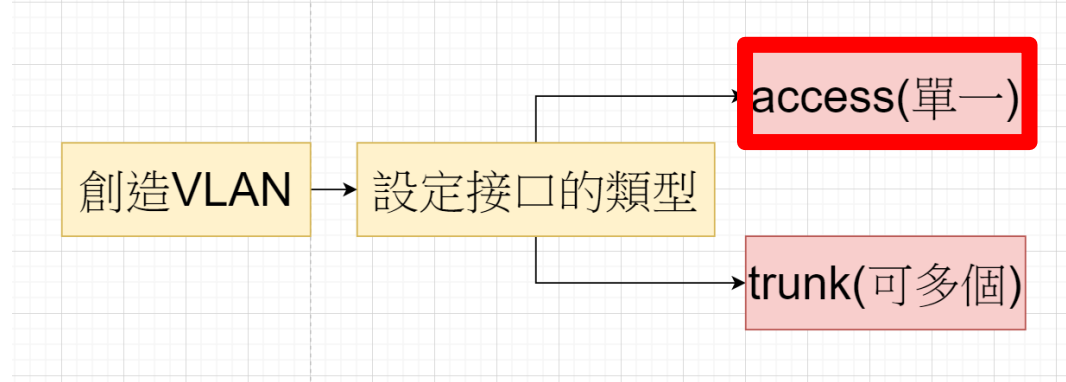
創造VLAN

設定接口的類型

access(單一)

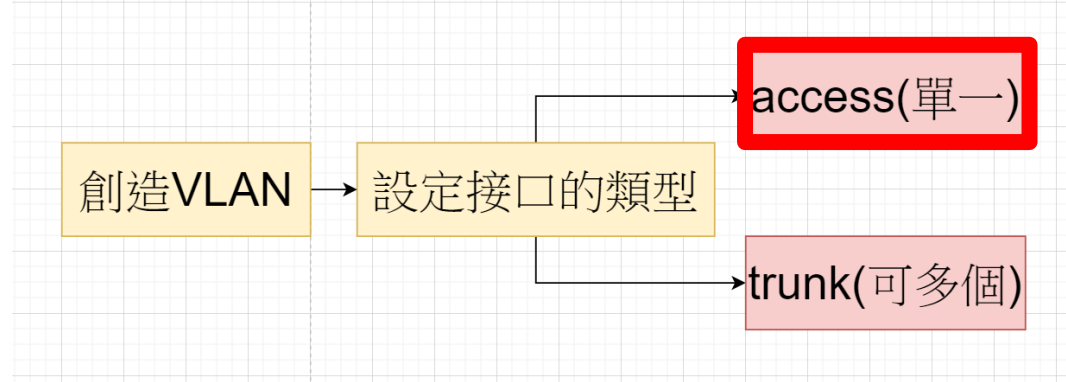
trunk(可多個)





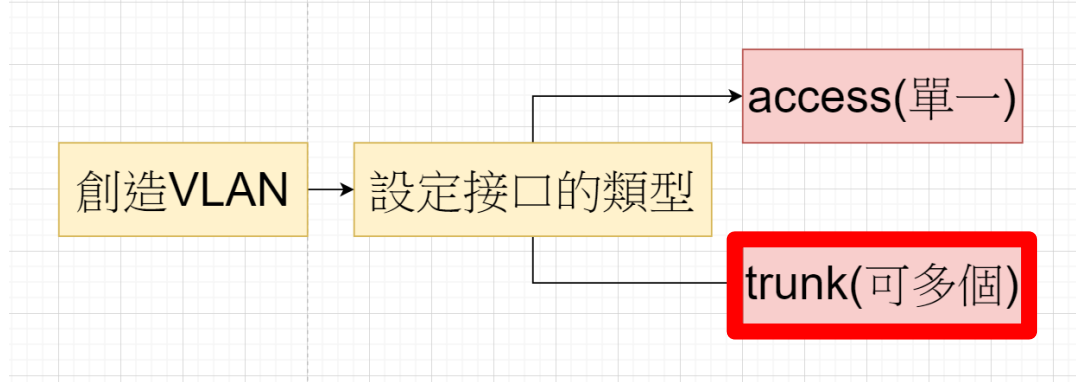
```
Switch>
Switch>
Switch>
Switch>
Switch>en      >輸入en進入#
Switch#conf    #輸入config進入編輯模式
Switch#configure
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interf
Switch(config)#interface fa
Switch(config)#interface fastEthernet 0/1  進入指定port
Switch(config-if)#
```

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```
Switch(config-if)#switchport mo
Switch(config-if)#switchport mode ac
Switch(config-if)#switchport mode access 選擇模式(access/trunk)
Switch(config-if)#sw
Switch(config-if)#switchport ac
Switch(config-if)#switchport access vl
Switch(config-if)#switchport access vlan 2 設定所屬vlan id
Switch(config-if)#exit 編輯完需退回上一層才可編輯其他port
Switch(config)#
```

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Switch1

Physical Config CLI

GLOBAL

- Settings
- Algorithm Settings

SWITCH

- VLAN Database

INTERFACE

- FastEthernet0/1
- FastEthernet0/2
- FastEthernet0/3
- FastEthernet0/4
- FastEthernet0/5
- FastEthernet0/6
- FastEthernet0/7
- FastEthernet0/8
- FastEthernet0/9

FastEthernet0/4

Port Status On

Bandwidth Auto

10 Mbps 100 Mbps

Duplex Auto

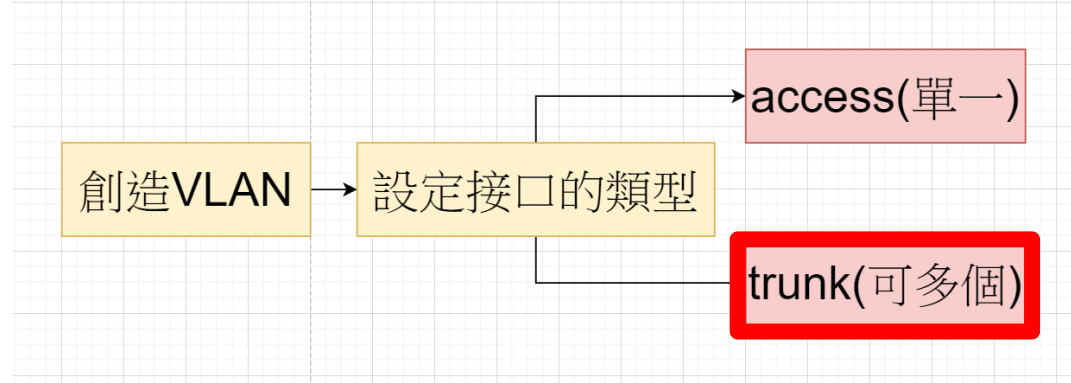
Full Duplex Half Duplex

Trunk /LAN 1-1005

Tx Ring Limit 10

Equivalent IOS Commands

```
Switch(config)#interface FastEthernet0/4
Switch(config-if)#
Switch(config-if)#switchport mode trunk
Switch(config-if)#
```



```
Switch(config-if)#switchport trunk al
Switch(config-if)#switchport trunk allowed vl
Switch(config-if)#switchport trunk allowed vlan 2,5,20 設定所屬vlan
Switch(config-if)#exit 編輯完需退回上一層才可編輯其他port
Switch(config)#
```

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