

VLAN = Virtual Local Area Network

(虛擬)

(區域網路)

Daniel Lee

HUB與Switch差別

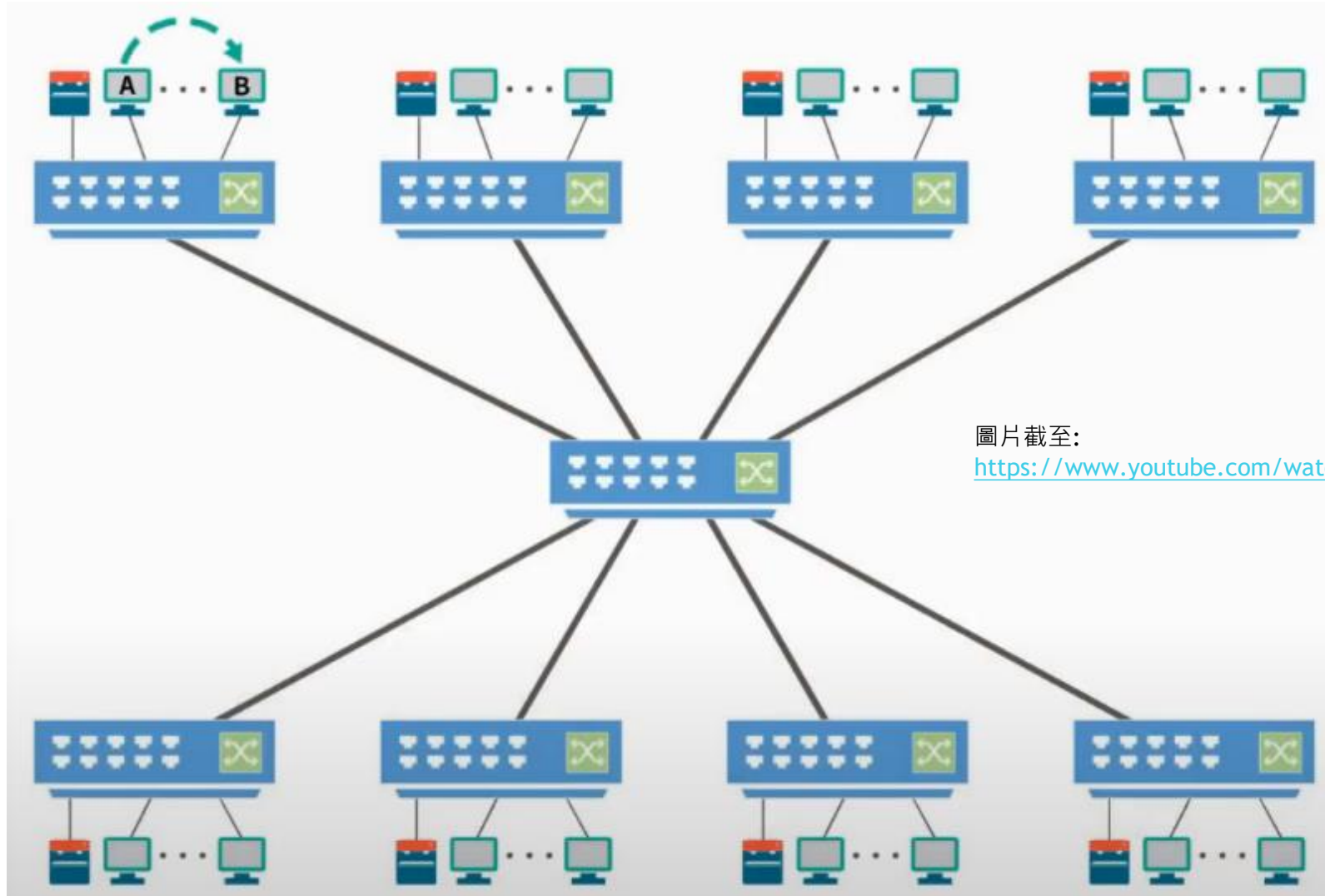
Hub



Switch



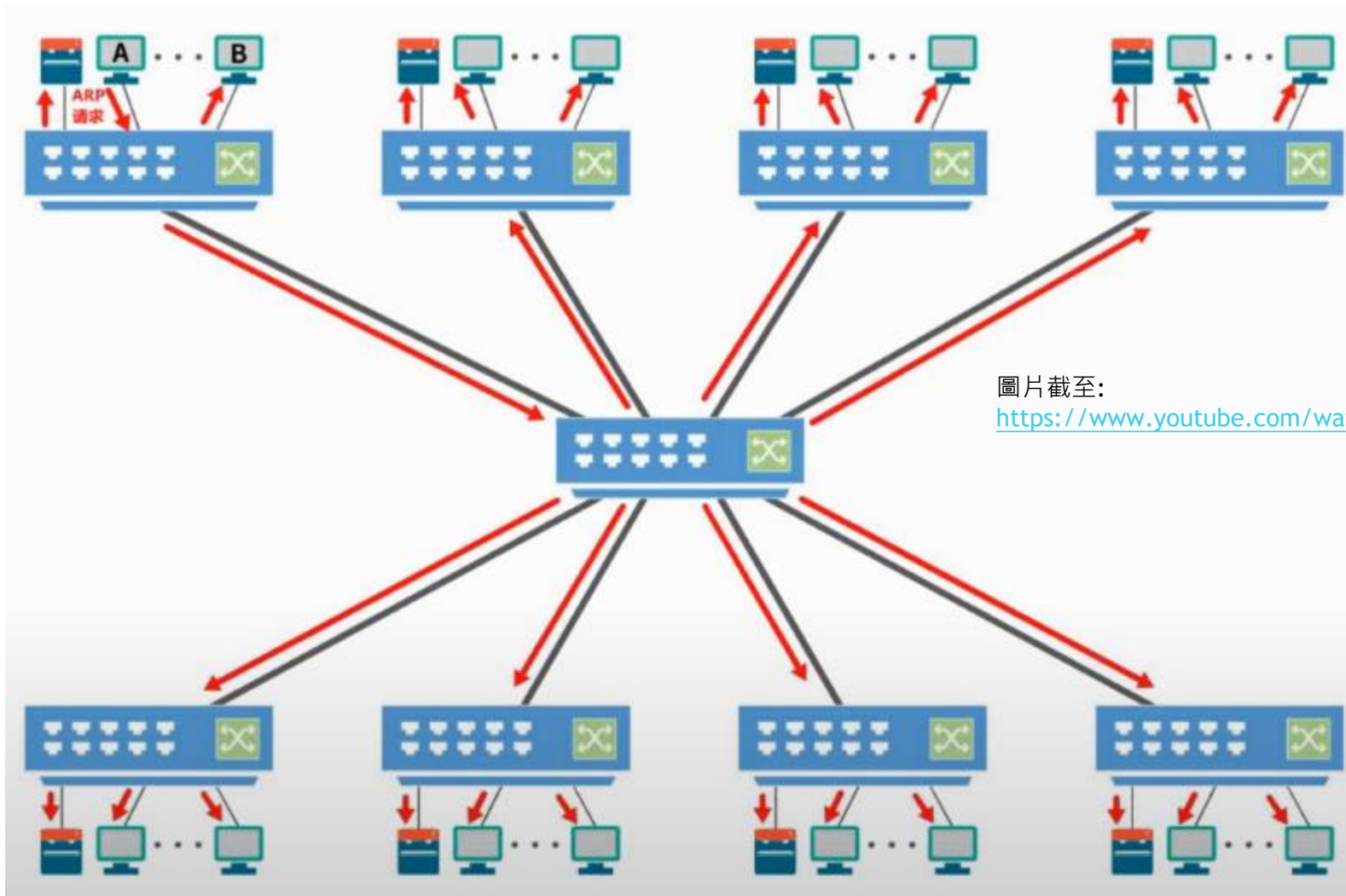
Switch交換器原理



圖片截至:

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

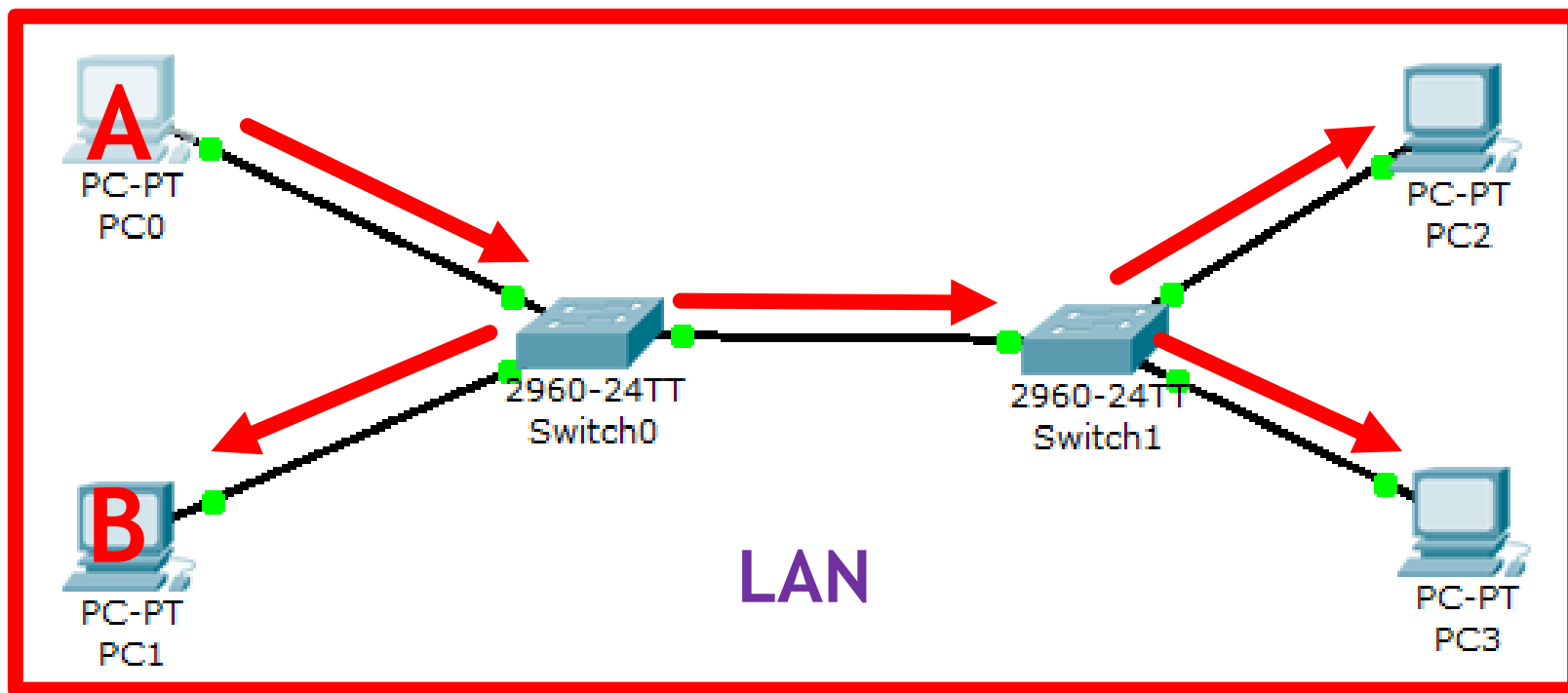
Switch 交換器原理



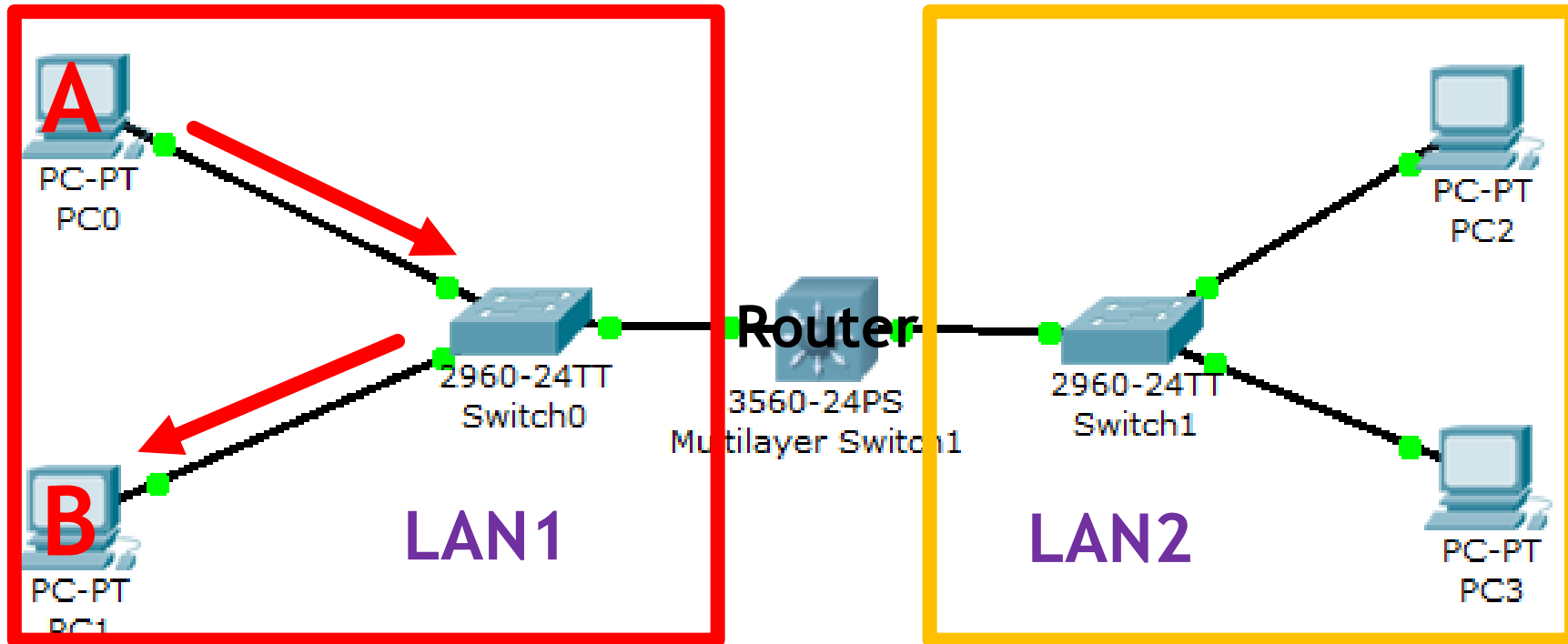
圖片截至:

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

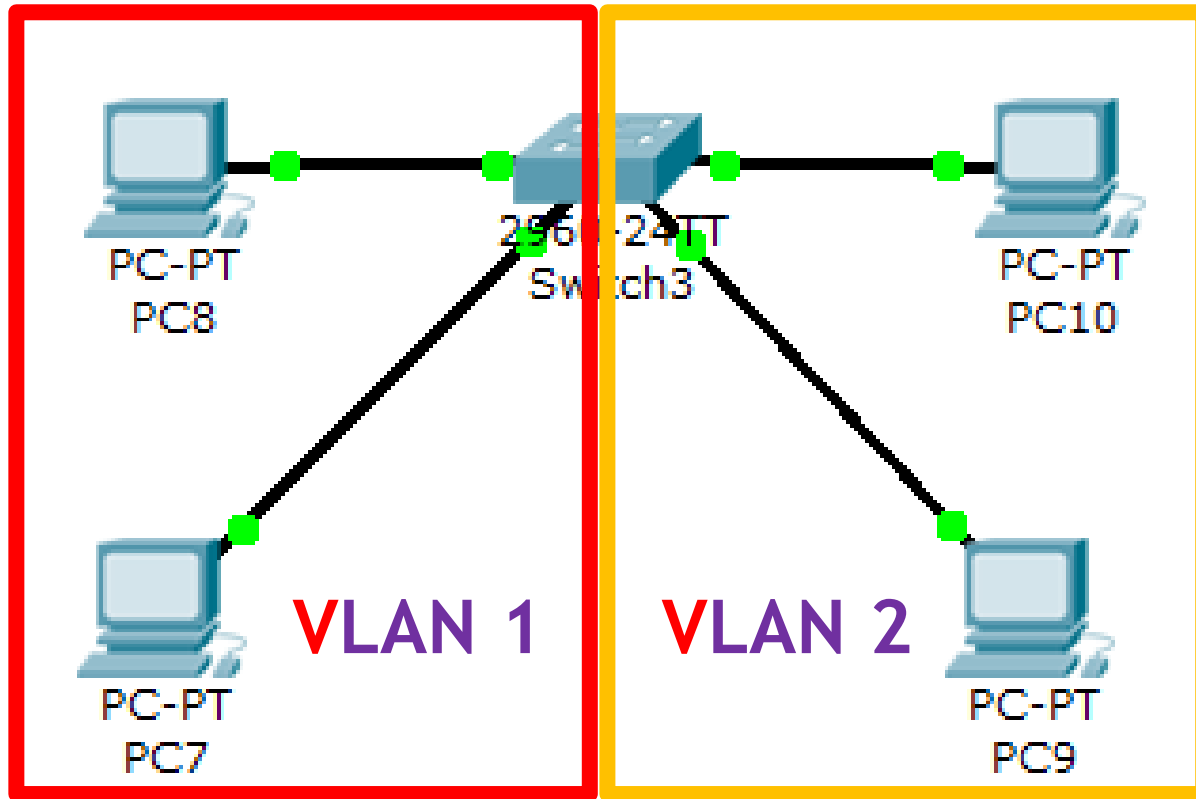
VLAN的切割



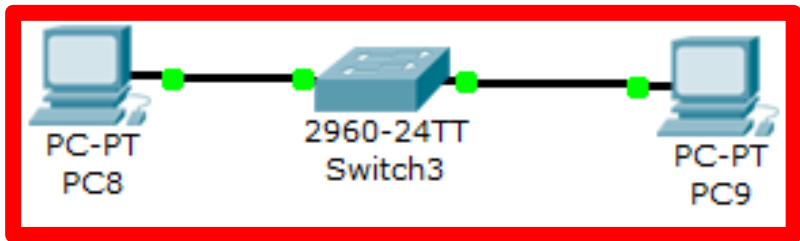
VLAN的切割



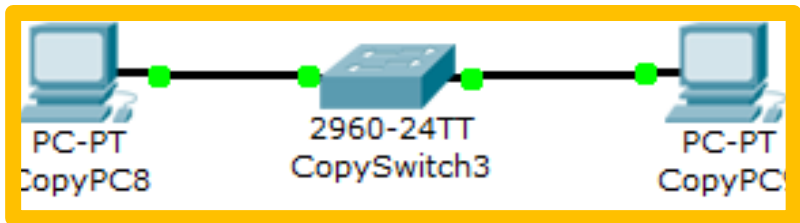
VLAN的切割



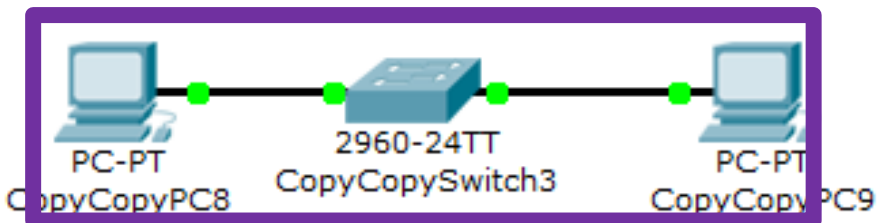
VLAN的實例



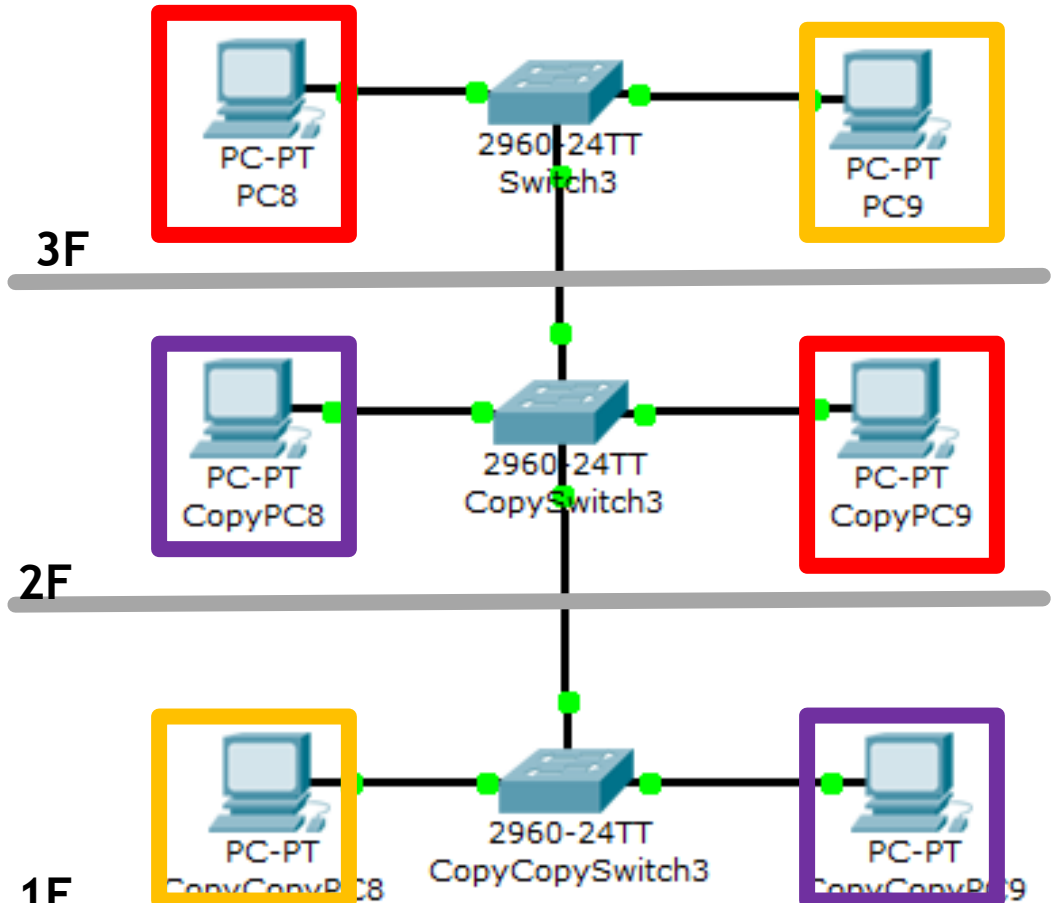
3F



2F

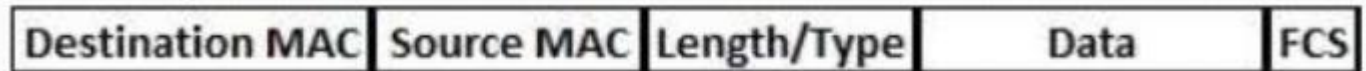


1F

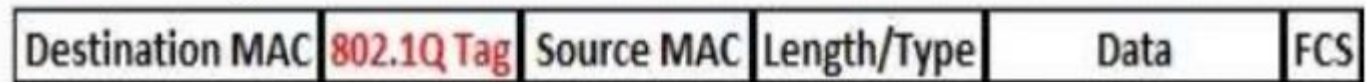


VLAN tag

- **Original frame:**



- **802.1Q frame:**

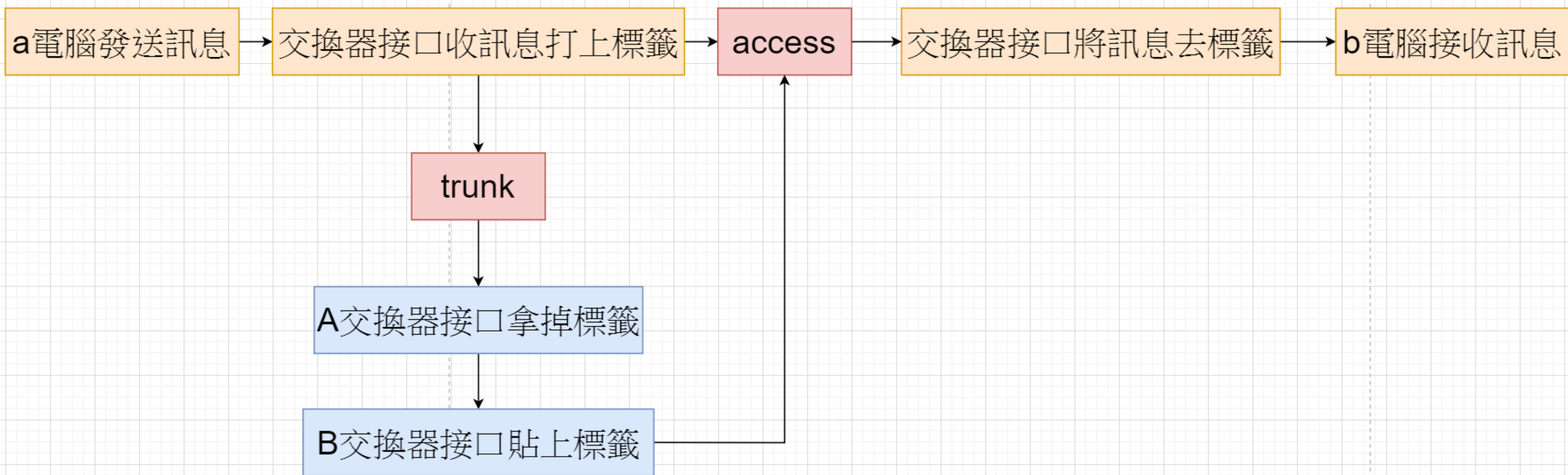
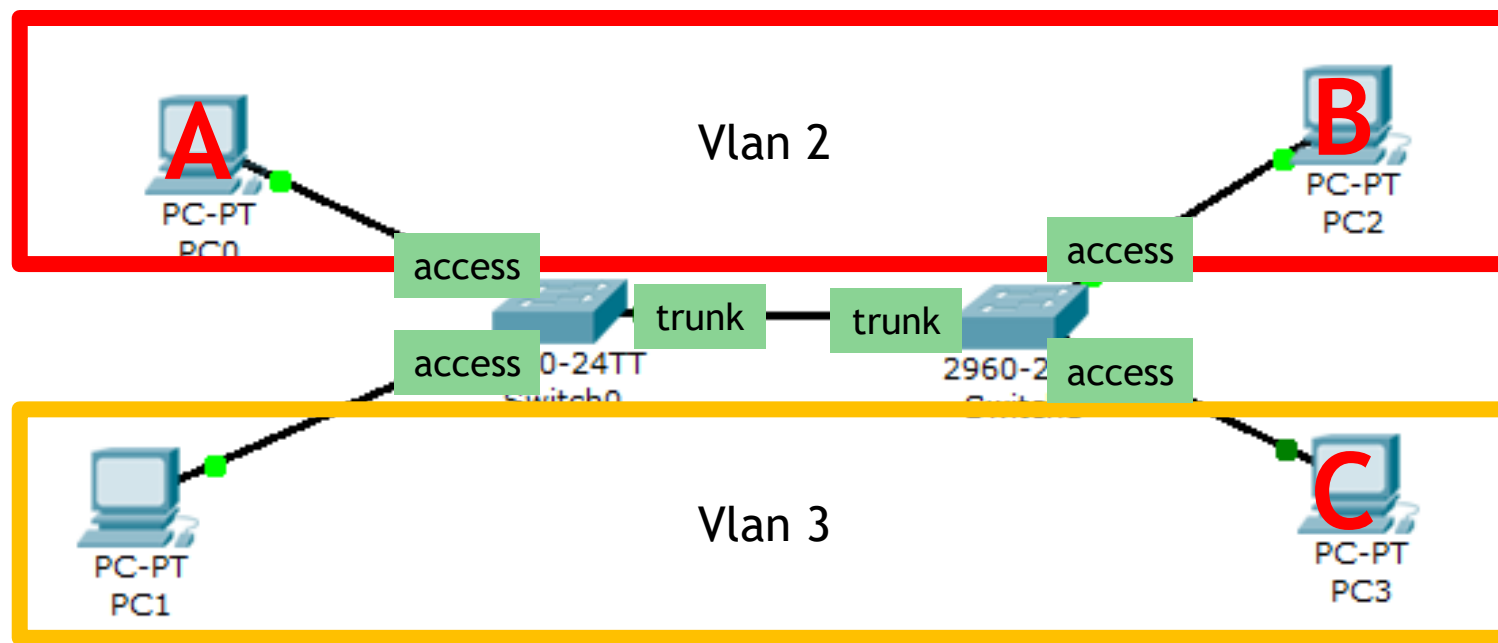
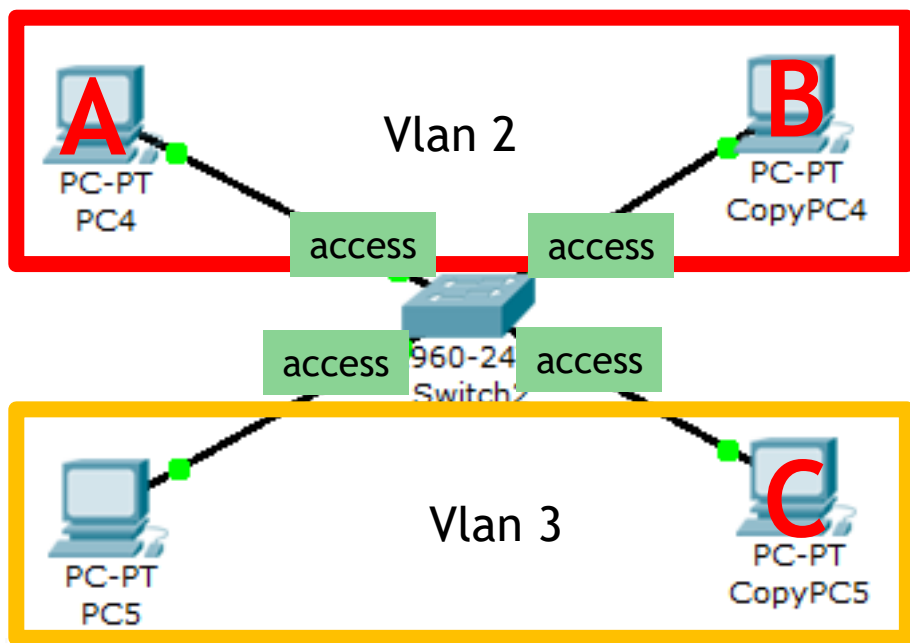


Access/Trunk 差別

Access/Trunk mode差別

Access端口	Trunk端口
只允許一個VLAN	可允許多個VLAN
一般用於交換器連接電腦間使用	用於交換器之間或交換器與路由器間使用
接口: 只接受未打標籤的封包進入時打上標籤 出口: 若標籤與出口的VLAN ID相同則取下標籤	接口: 相同VLAN ID時通過該接口 相異VLAN ID時則不通過該接口 出口: 將未打標籤的封包貼上Native VLAN mID標籤

VLAN的行為



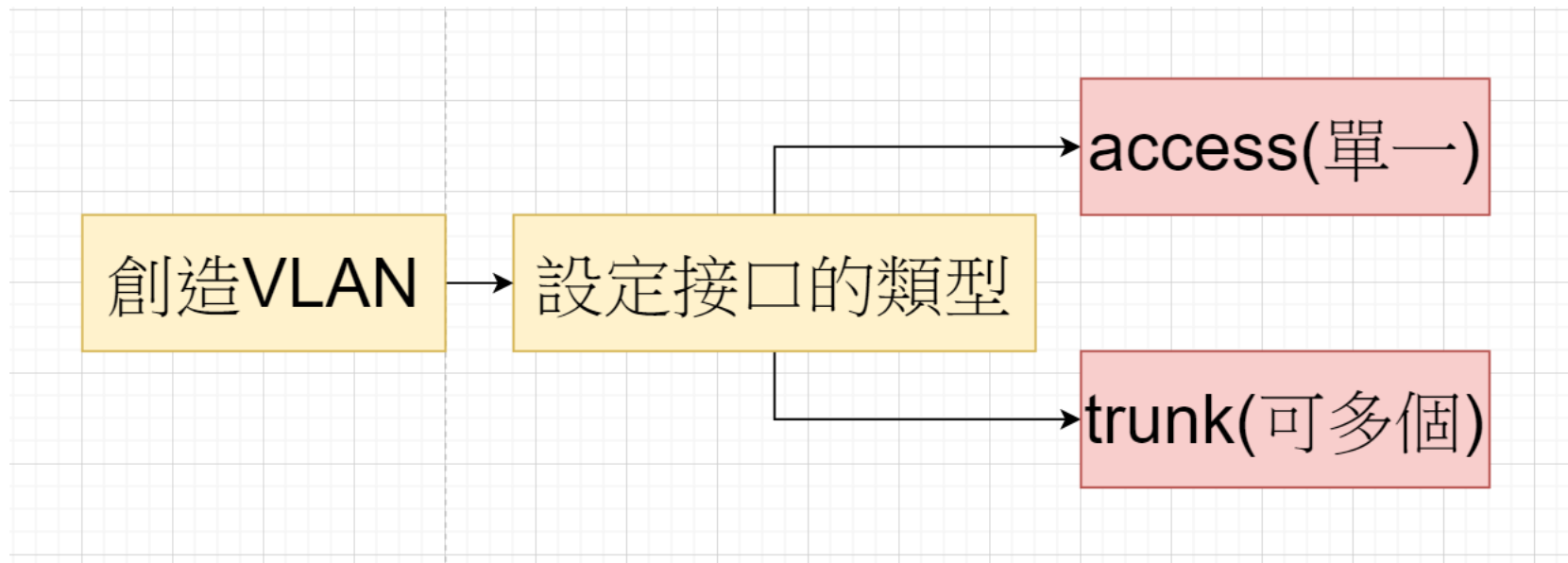
VLAN設定流程及步驟

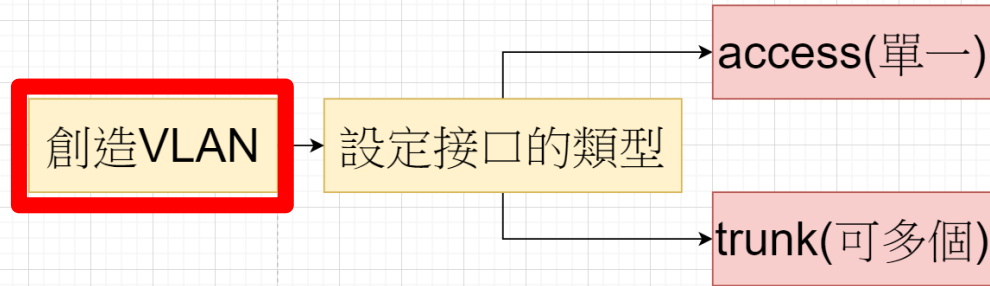
創造VLAN

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

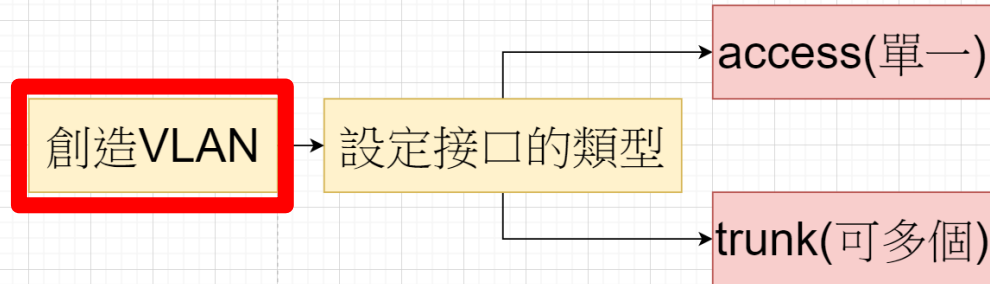
VLAN Name

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) #
```

Switch0(1) Config

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: 2
VLAN Name: LAN

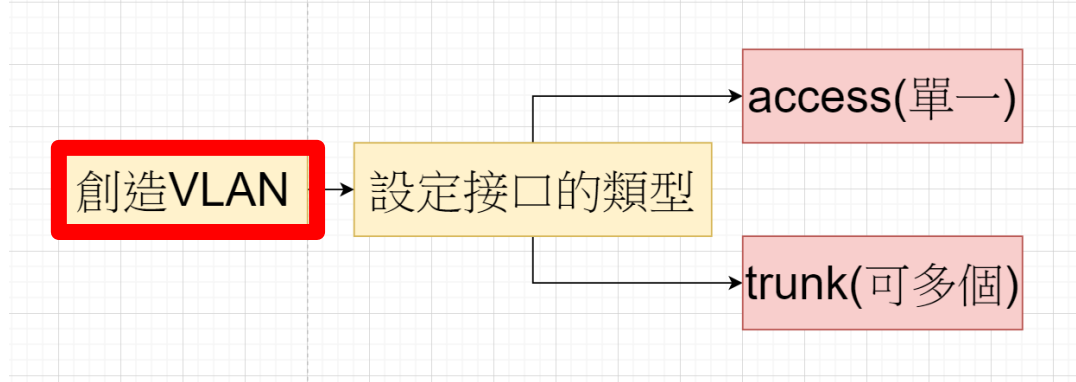
Add Remove

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) #
```



Switch0

Physical Config CLI

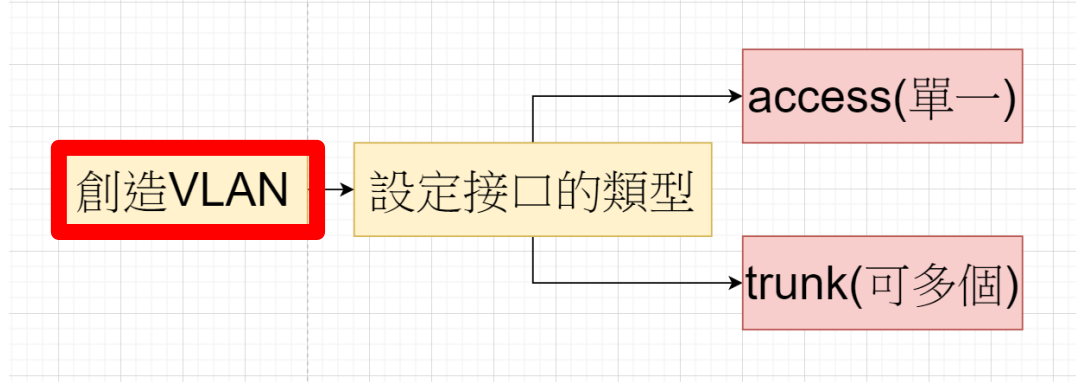
VLAN Configuration

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)#
```



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".

Left Sidebar:

- 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

Main Configuration Area:

FastEthernet0/1

- Port Status: On
- Bandwidth: Auto
 - 10 Mbps
 - 100 Mbps
- Duplex: Auto
 - Full Duplex
 - Half Duplex
- Access Mode: VLAN:
- Tx Ring Limit:

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)

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

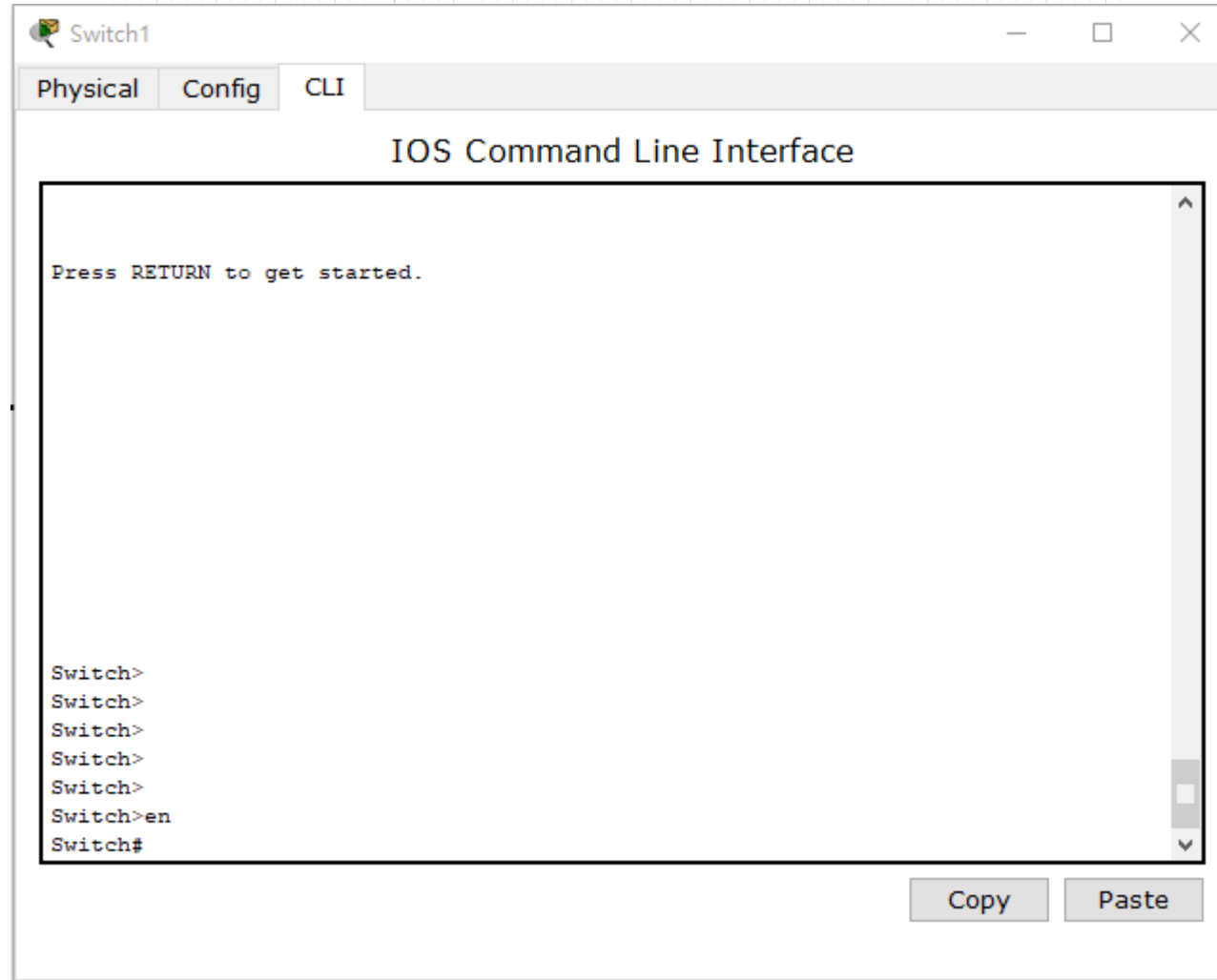
```
Switch(config-if)#  
Switch(config-if)#  
Switch(config-if)#switchport access vlan 1  
Switch(config-if)#
```

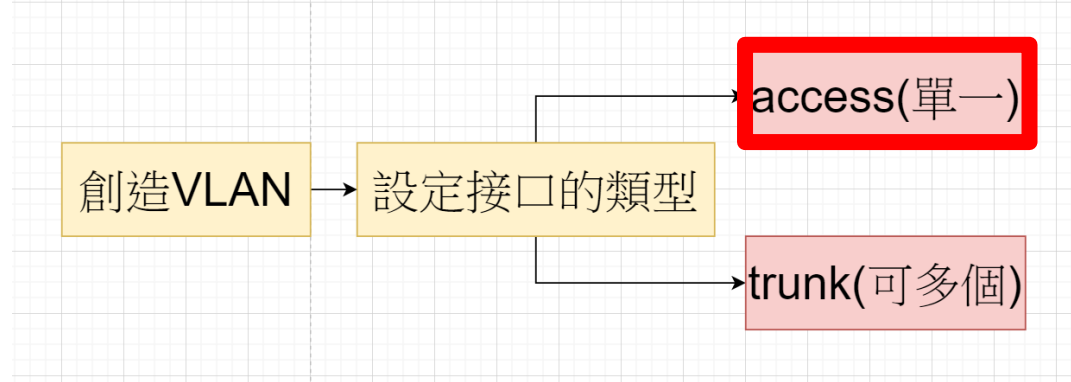
創造VLAN

設定接口的類型

access(單一)

trunk(可多個)

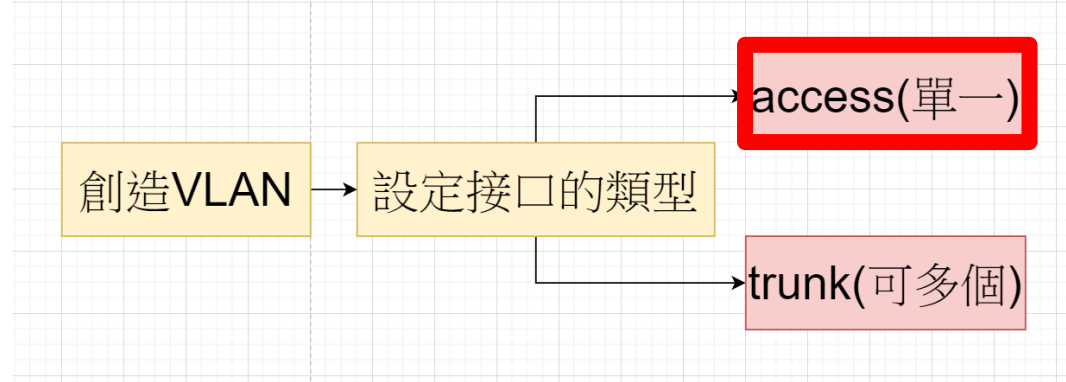




```
Switch>
Switch>
Switch>
Switch>
Switch>en      >輸入en進入#
Switch#conf    #輸入config進入編輯模式
Switch#configure
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interf
Switch(config)#interface fa
Switch(config)#interface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

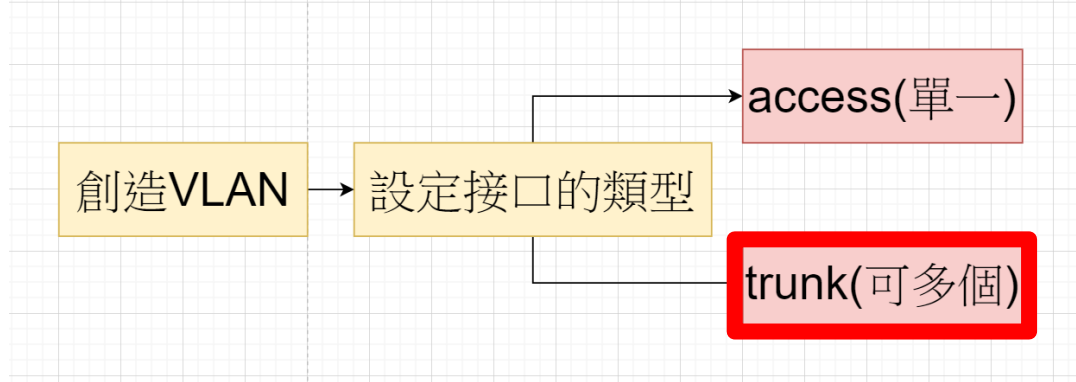
Copy

Paste



```
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)#
```

Copy Paste



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

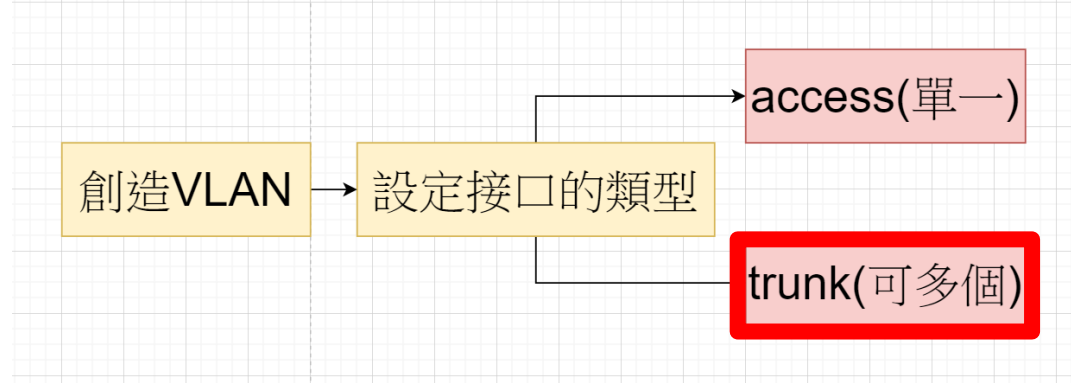
Full Duplex Half Duplex

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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