



新北市政府

Education Department,  
New Taipei City Government

教育局



# 校園網路管理

網管輔導員 李煒

# 網路管理相關內容說明

網管大事

智慧網路管理系統

校園無線網路技術、網路基礎建設

新核心骨幹網路

# 112網管大事

## 校園2G線路

中華、亞太、台灣固網、凱擘、中嘉、全新北市第四台

Juniper MX480 Core Router正式上線。

Fortigate 3401E bridge mode NAT。

Juniper nat卡版達上限(ipv6議題討論)

SRX4200 骨幹NAT

Juniper 100G 骨幹建置。(彩光光纖卡版)

Apple MDM CDN

# 行動箱退休 1-3 代研發



# 自編教材內容說明

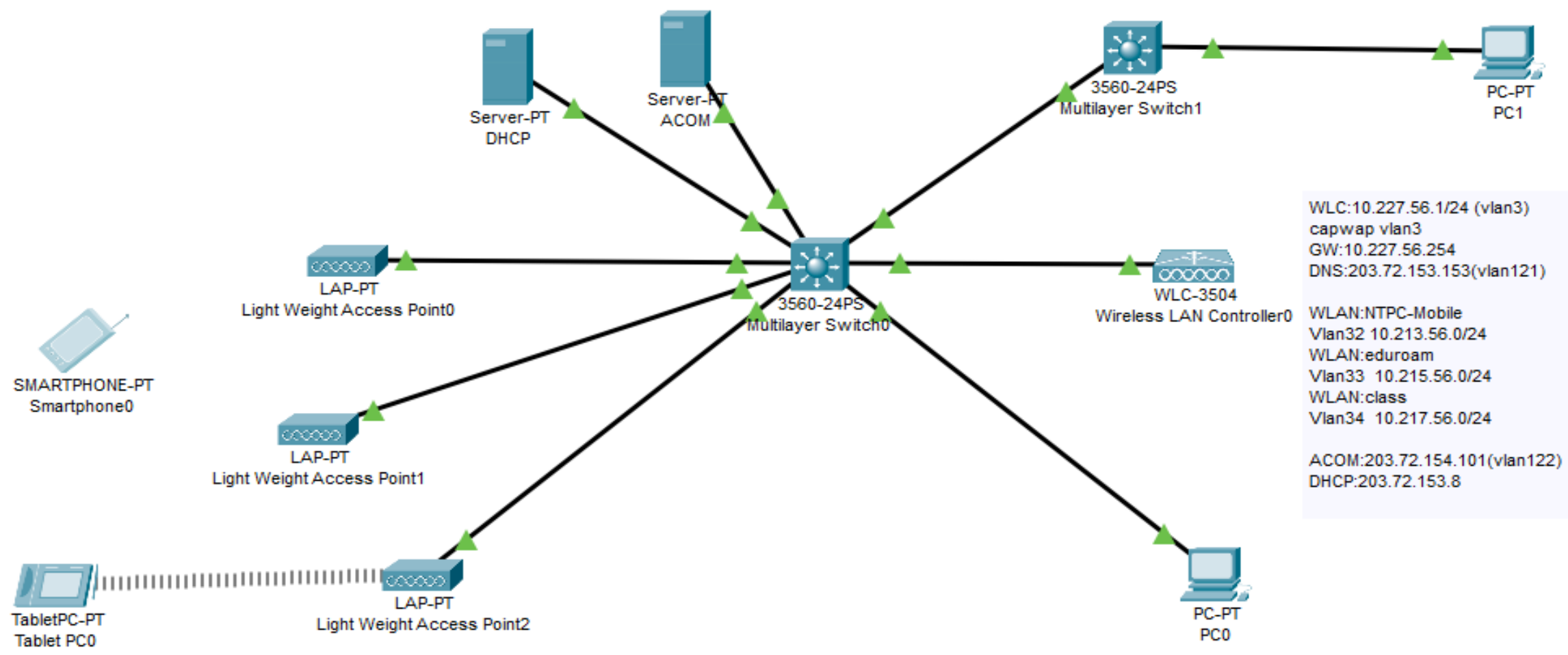
- 針對新北市校園網路編製教材
- 實驗完全依照校園網路建置。
- 教材內容擷取CCNA vlan、CCNP route、CCNP wireless。
- 智慧網管prtg建置實作，可以了解siraya相關建置的理論與實務。
- 課程涵蓋radius認證、DHCP等相關網路伺服器架設及實作。

在大水管中，大管內壁(小水管外and大水管壁之間空隙)能接觸到的資料流是untag



在所有小水管中的資料流都是帶tag的

# 核心知識 Vlan

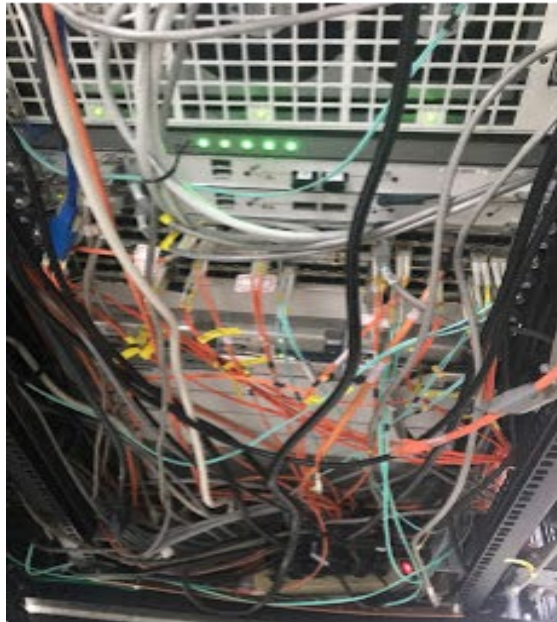
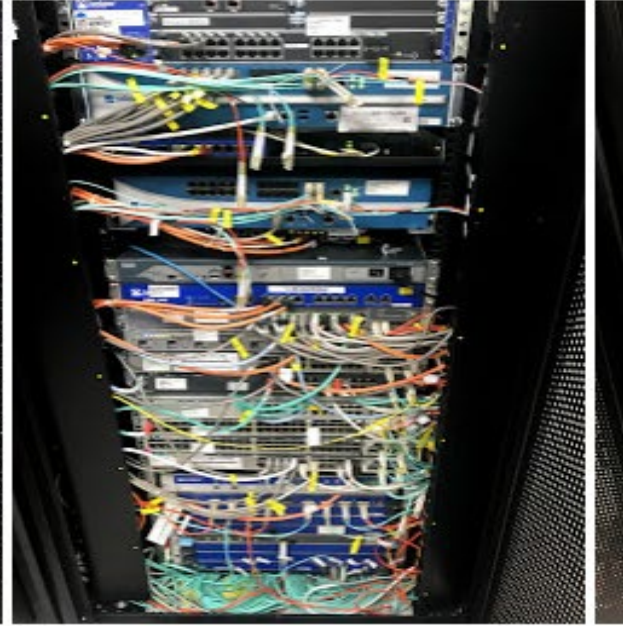
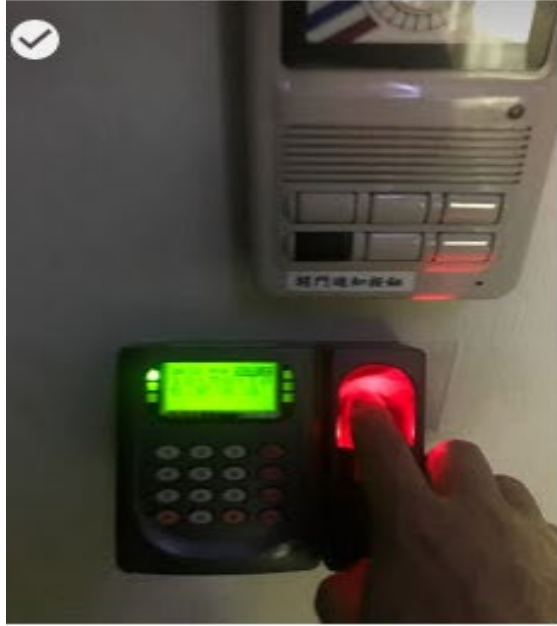


WLC:10.227.56.1/24 (vlan3)  
 capwap vlan3  
 GW:10.227.56.254  
 DNS:203.72.153.153(vlan121)

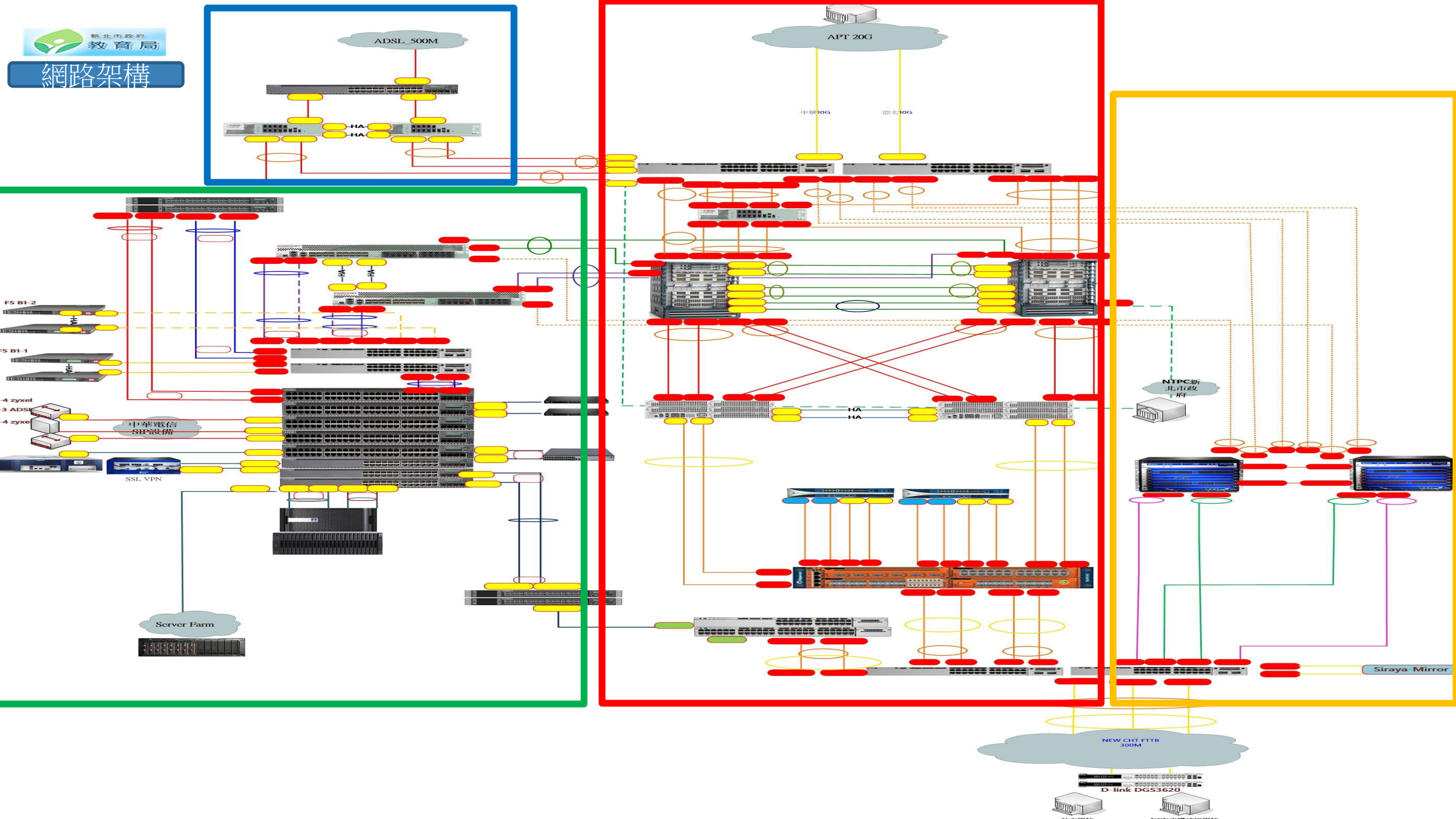
WLAN:NTPC-Mobile  
 Vlan32 10.213.56.0/24  
 WLAN:eduroam  
 Vlan33 10.215.56.0/24  
 WLAN:class  
 Vlan34 10.217.56.0/24

ACOM:203.72.154.101(vlan122)  
 DHCP:203.72.153.8

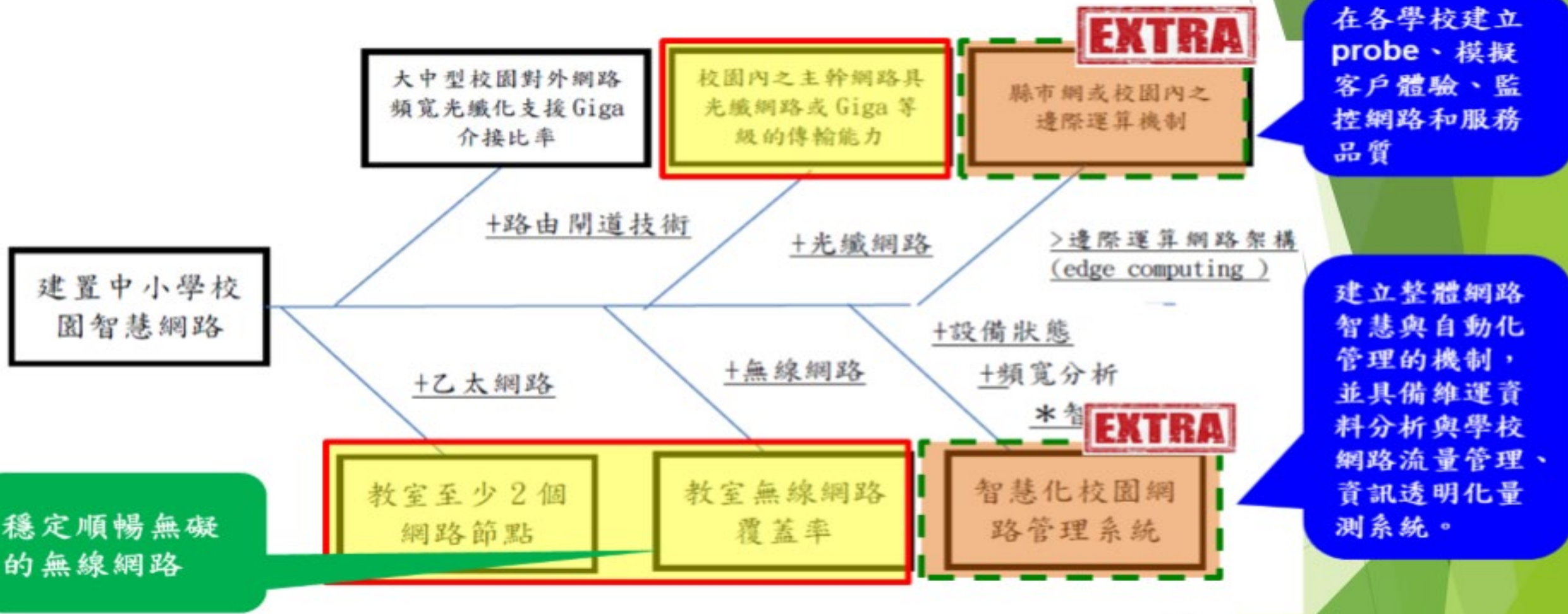
# 教網核心機房







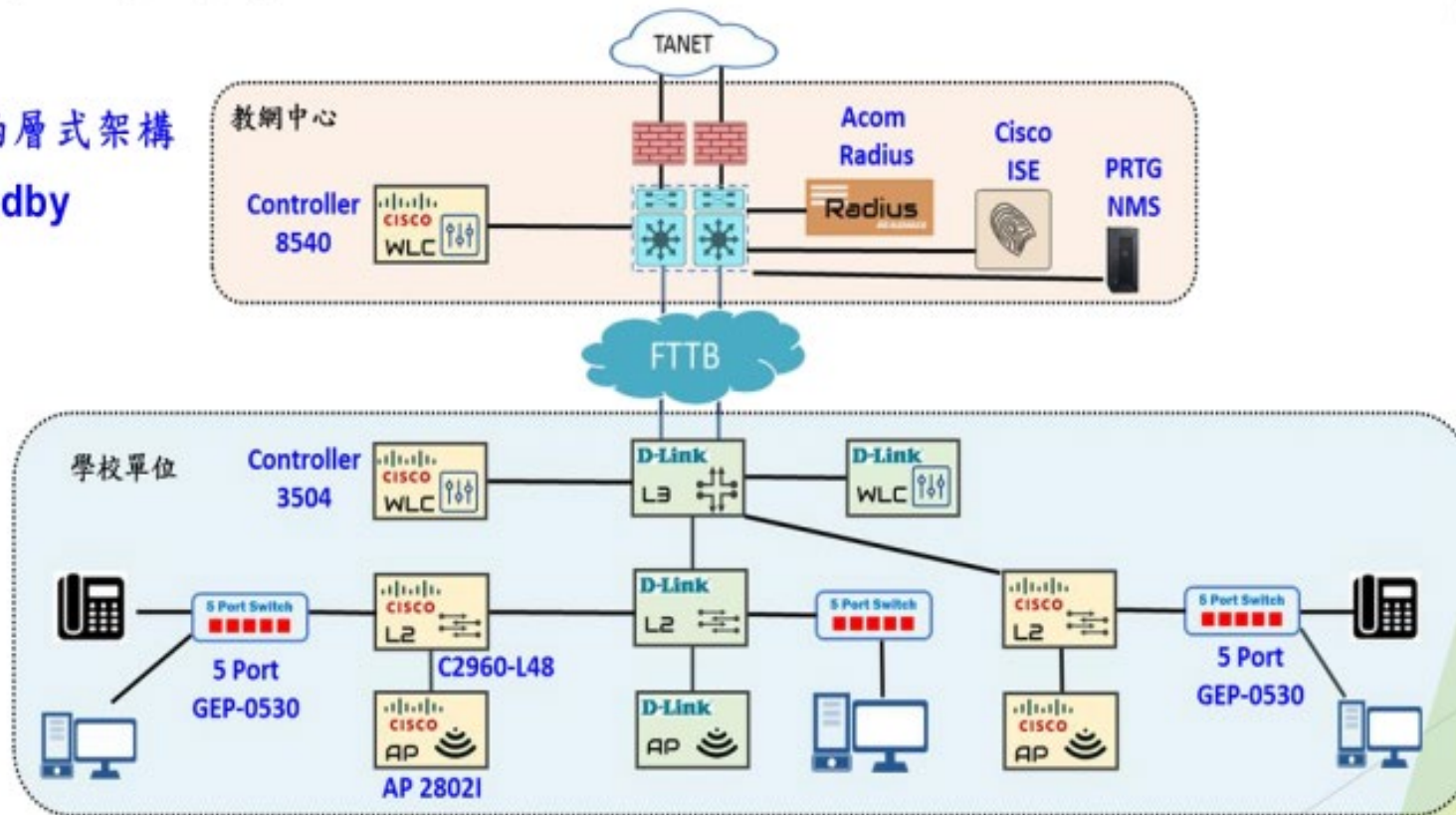
# 校園智慧網路重要技術關聯



# 智慧網路管理、骨幹網路架構及概況

## • 整體系統架構圖

- Controller兩層式架構
- Active-Standby



智慧網路工程重點：

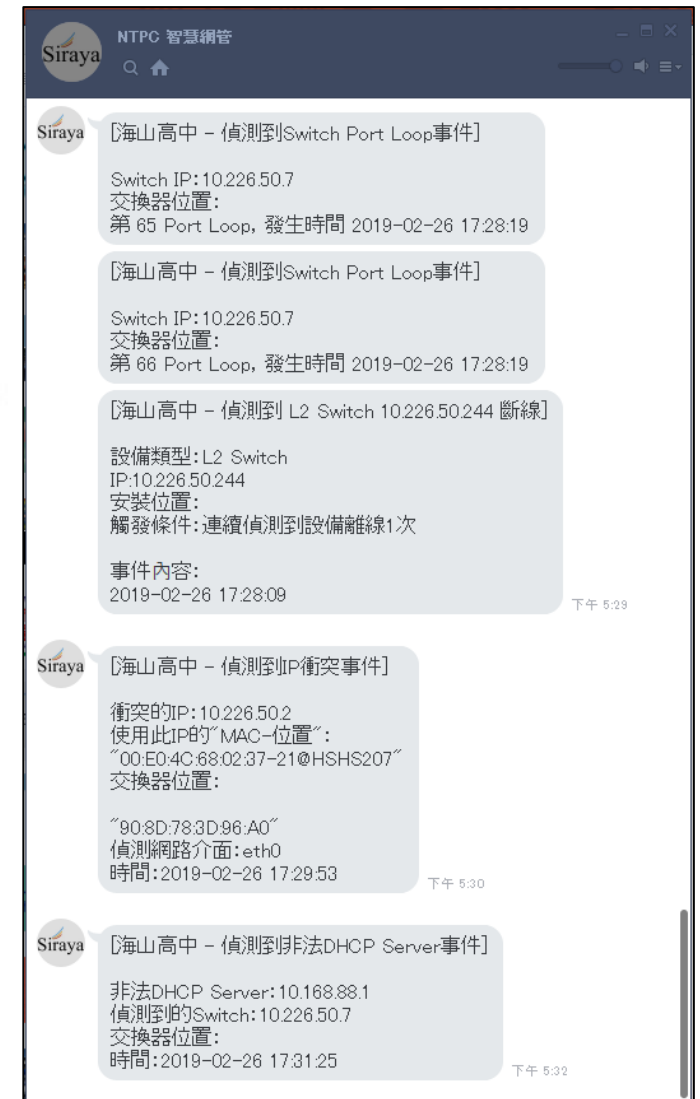
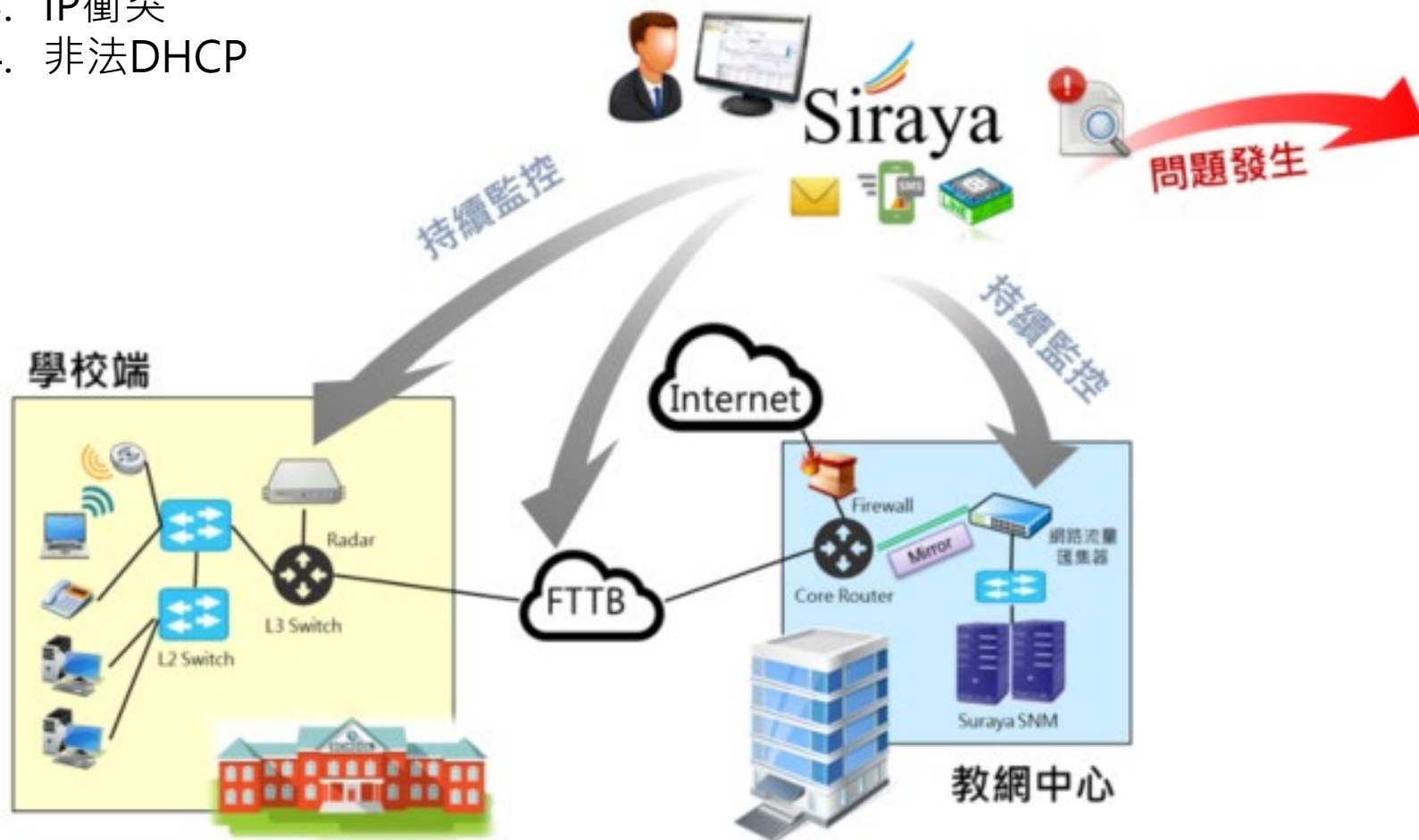
- 1、教室線路備援。
- 2、無線支援漫遊

TANetRoaming  
eduroam  
i-Taiwan  
NTPC-Mobile

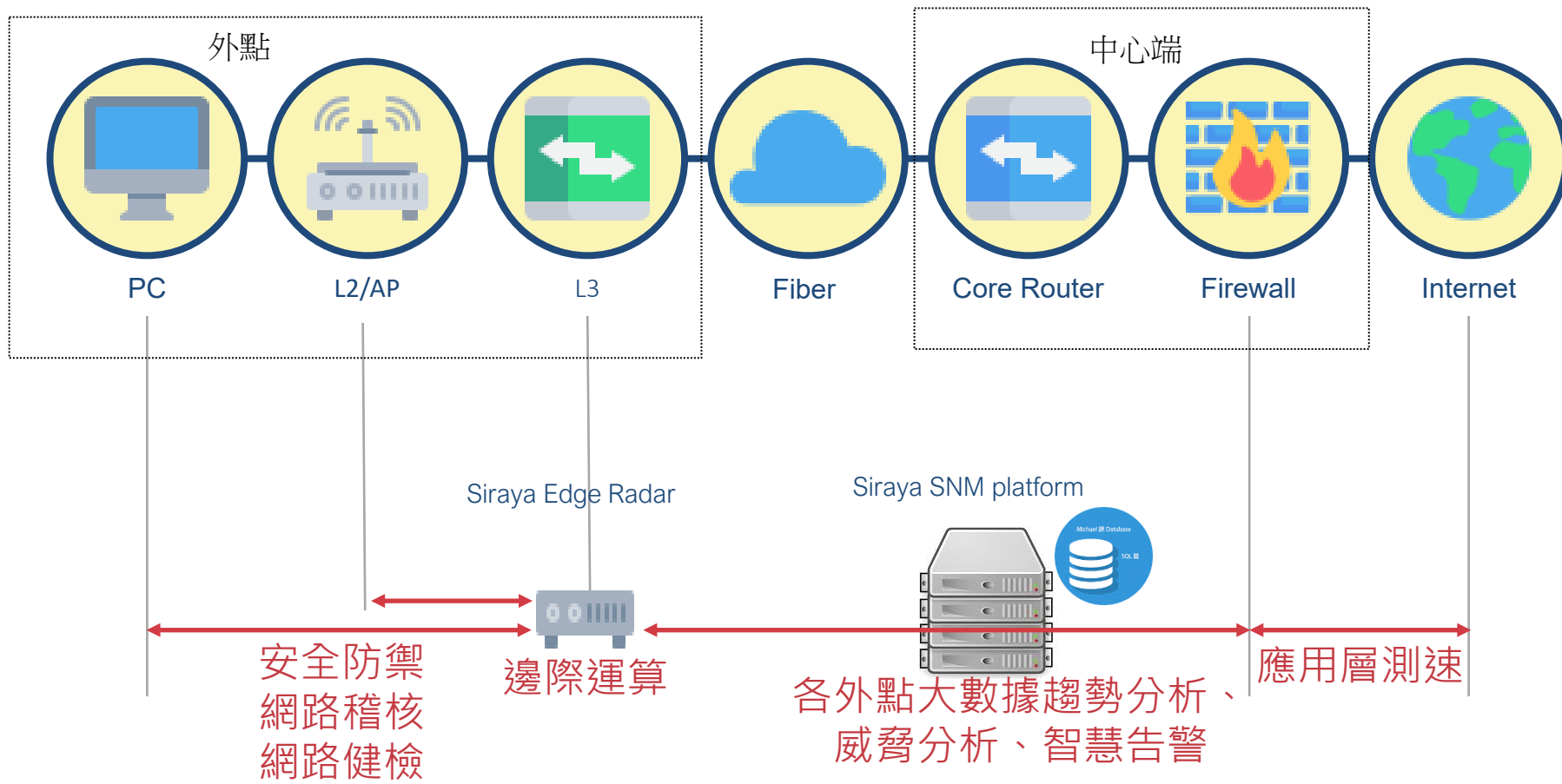
- 3、骨幹若為cat6 up to 2G  
單模up to 10G
- 4、教室實體線路x2  
教室可用 1G poe portx5
- 5、Acom radius server
- 6、PRTG and Siraya NMS
- 7、A-S Controller
- 8、PVC施作品質

# 智慧網管偵測問題產生告警

1. Port loop
2. 設備離線
3. IP衝突
4. 非法DHCP



# 智慧網管整體架構



# 交換器 Vlan 設定情形

10.226.184.5

Information Port Vlan

[ Dlink ][ DGS-1510-28XMP ][ 10.226.184.5 ]

Port	1	3
VLAN	Intra-2 wpa2 mac_auth wlan voip	Intra-2 wpa2 mac_auth wlan voip

VLAN 配置

預防設定造成錯誤發生,建議先進行Switch組態備份

vlan - Tag設定  vlan - unTag設定

[ Dlink ][ DGS-1510-28XMP ][ 10.226.184.5 ]

PORT:17

VLAN ID	VLAN	管理
請選擇...		新增
25	voip	刪除
33	eduroam	刪除
32	NTPC-Mobile	刪除
31	TANetRoaming	刪除
30	wlan	刪除
36	mac_auth	刪除
35	wpa2	刪除
34	class	刪除
3	MGMT	刪除

17 配置

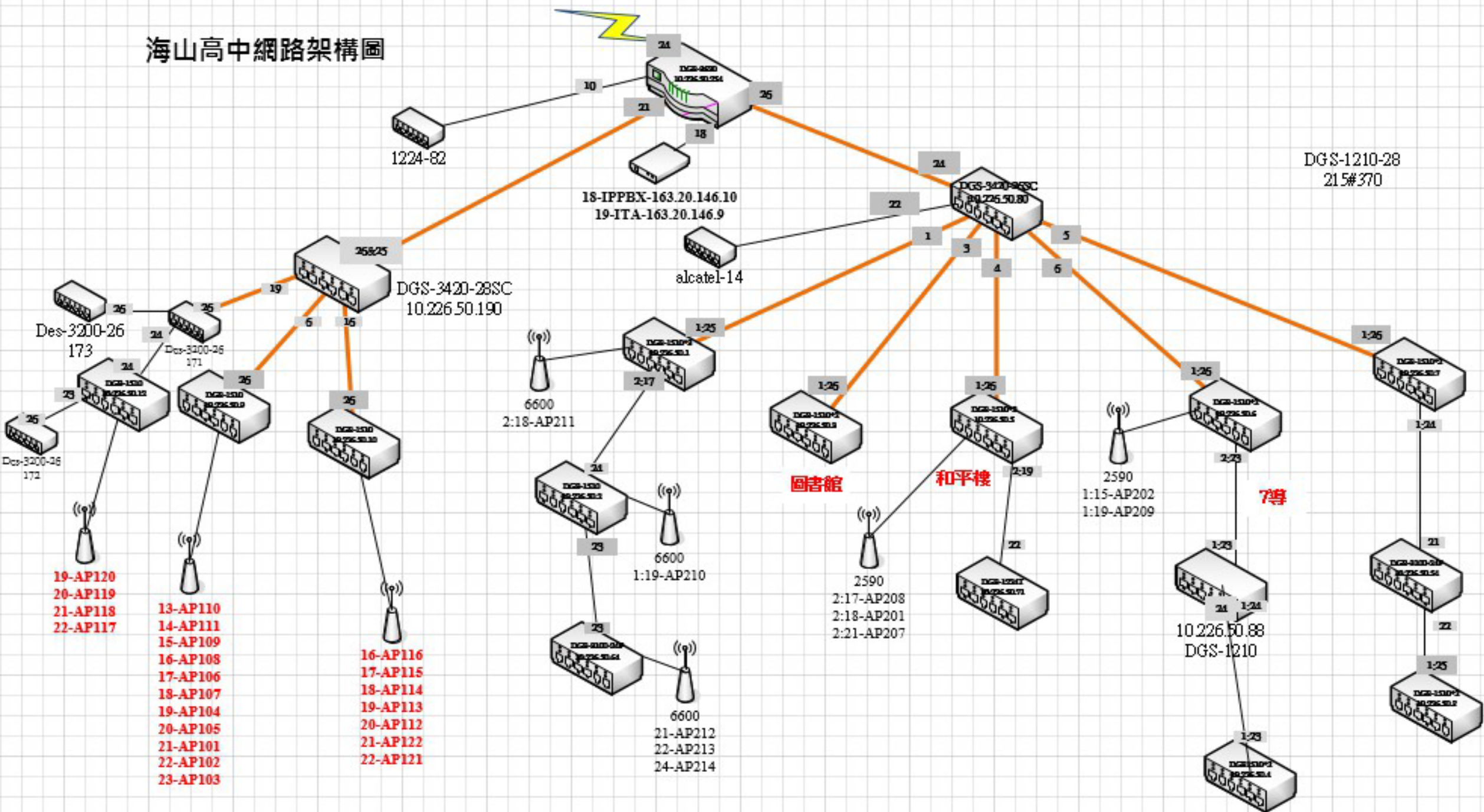
19 配置

Intra-2 MGMT class wpa2 mac_auth wlan TANetRoaming eduroam NTPC-Mobile voip	Intra-2 wpa2 mac_auth wlan voip
--	---

Intra-2  
wpa2  
mac\_auth  
wlan  
voip

Intra-2  
wpa2  
mac\_auth  
wlan  
voip

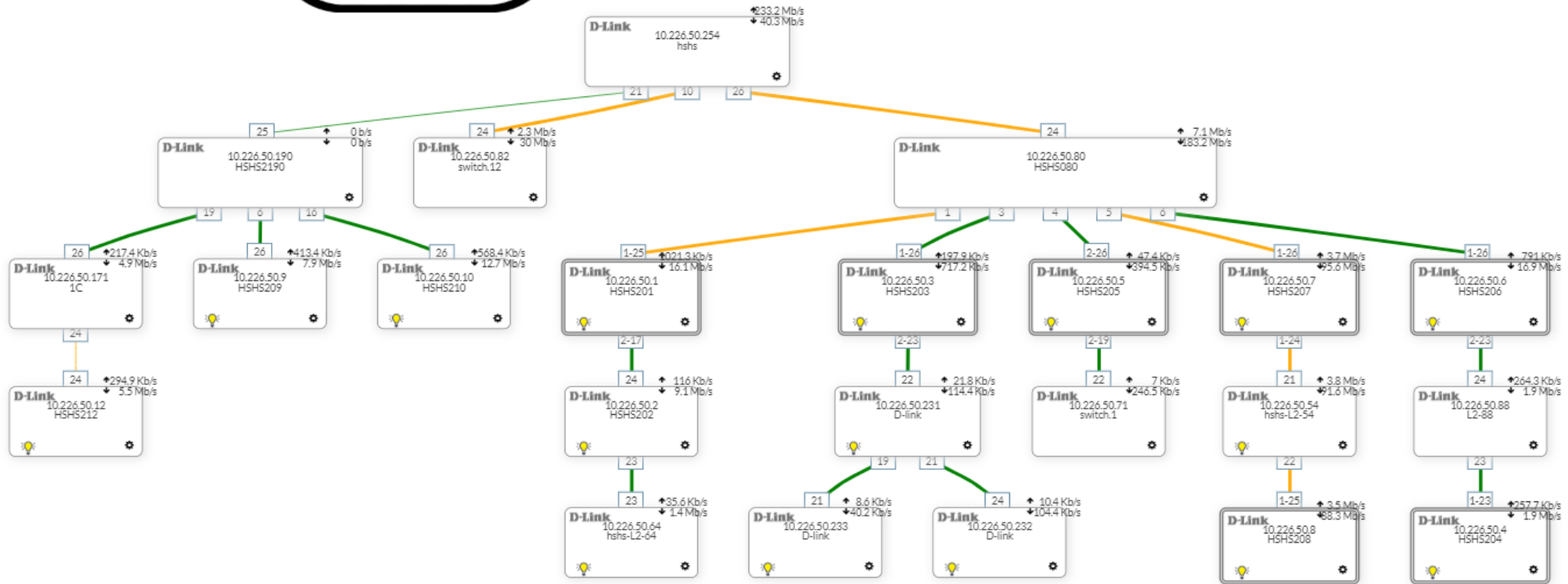
# 海山高中網路架構圖



# 智慧網管自動拓譜網路架構

拓模分析時間:  
2019-03-14 08:02:58 狀態switch 總數23

search ip mac name





# 交換器可以獲得ROUTE TABLE AND ARP TABLE相關資訊

10.226.184.254

Information	Port	Vlan	Traffic	Client
<input checked="" type="checkbox"/> Information				

Switch Name : Dlink 運作時間 : 38 days, 18:40:25.26

Model : DGS-3620-28TC









IP(s) :

- 10.226.184.254/24
- 10.217.184.254/24
- 10.247.184.254/24
- 163.20.85.126/25
- 192.168.1.254/24
- 10.90.90.254/24
- 10.211.184.254/24
- 10.228.184.254/24
- 10.231.184.254/24
- 10.239.184.254/24
- 10.245.184.254/24
- 10.233.184.254/24
- 10.241.184.254/24
- 10.243.184.254/24
- 10.253.184.254/24
- 163.20.206.185/29
- 10.213.184.254/24
- 10.215.184.254/24

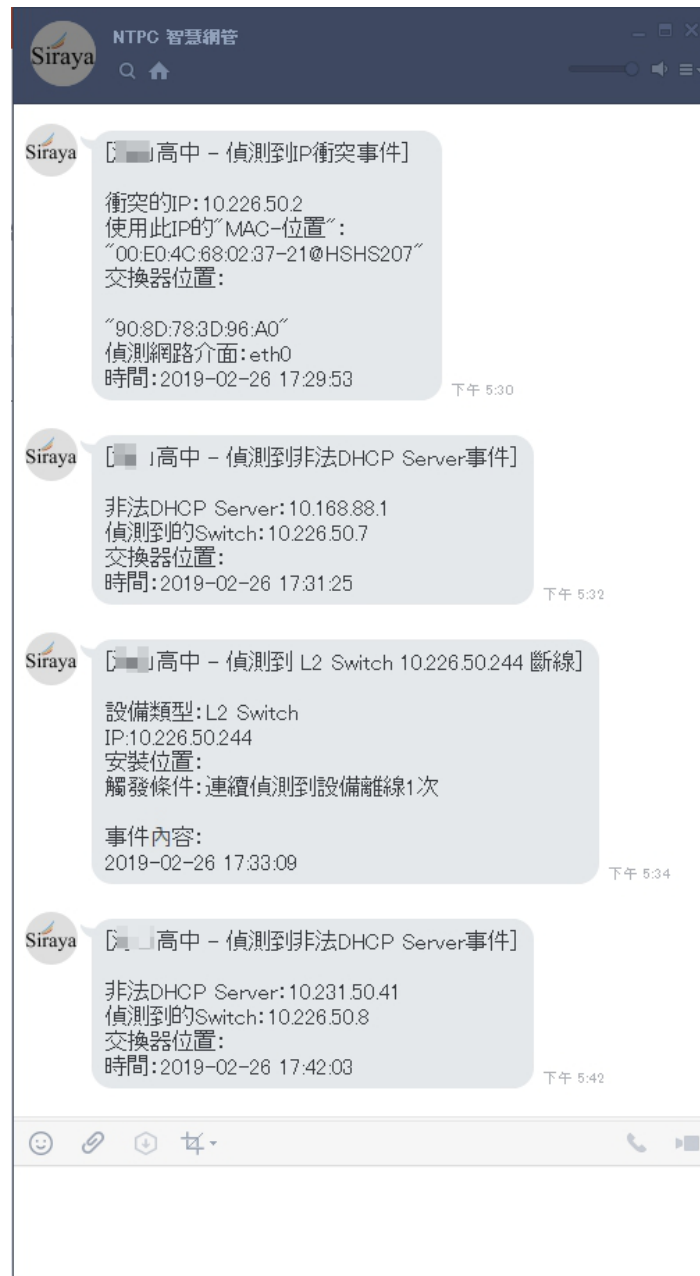
綁定的IP

# 交換器各埠資訊及功能

10.226.184.4

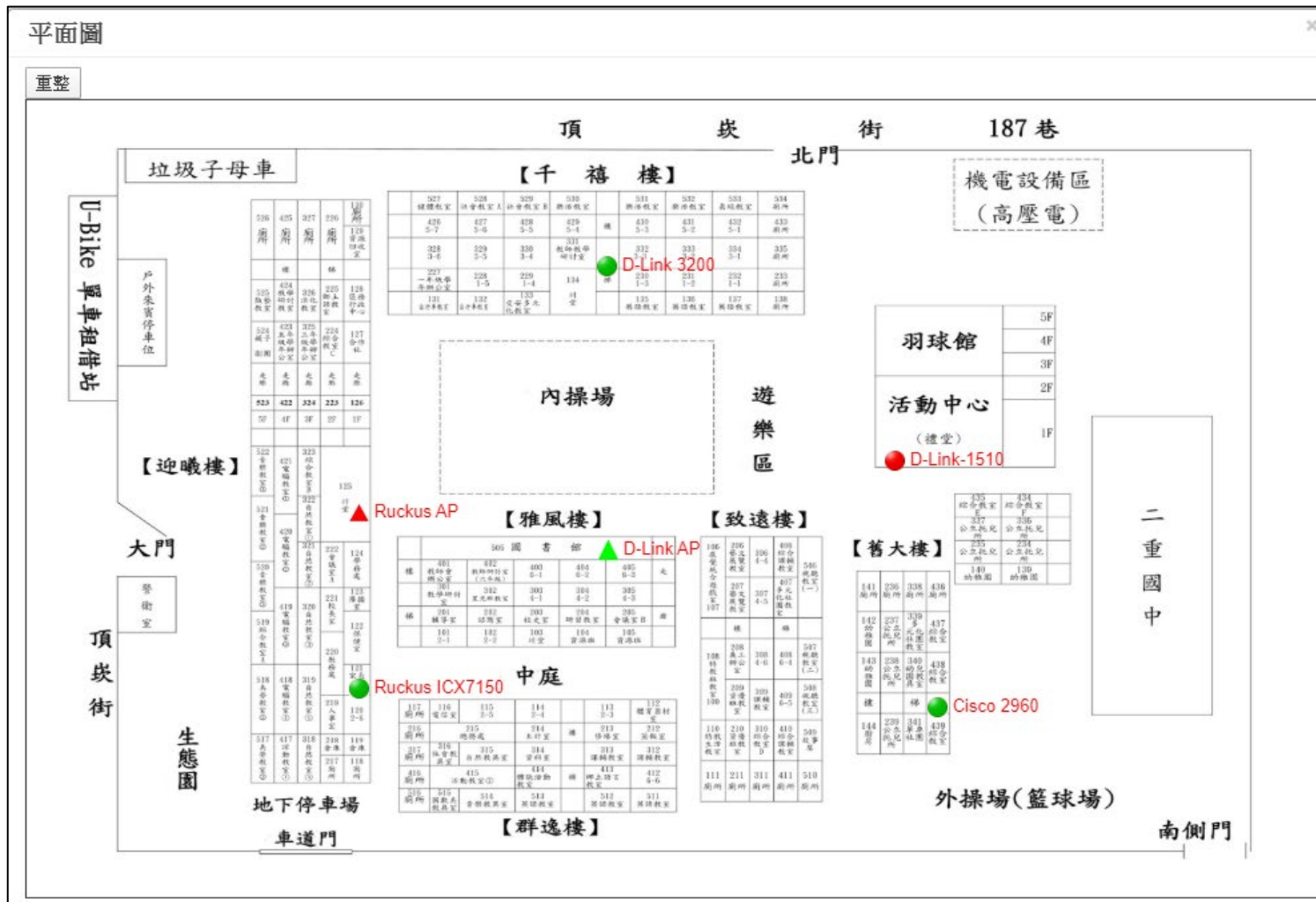
Information	Port	Vlan	Traffic	Client	PoE
[ Dlink ][ DGS-1510-28XMP ][ 10.226.184.4 ]					
PORT					
Port	啟用	PoE 供電	狀態	調速	Reset
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	 	1000 Auto	<input type="button" value="Reset"/>
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	 	10 Auto	<input type="button" value="Reset"/>
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	 	100 Auto	<input type="button" value="Reset"/>
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	 	1000 Auto	<input type="button" value="Reset"/>

# 告警通報



# Map

設備顯示於平面圖上，清楚得知實際位置。





- Monitoring
  - Network Summary
  - Access Points
  - Clients
- Rogues
  - Access Points
  - Clients
- Interferers
- Wireless Dashboard
  - AP Performance
  - Client Performance
- Best Practices

### GENERAL



User Name  
**Unknown**

Host Name  
**Unknown**

MAC Address: ac:15:f4:71:39:96 [Deauthenticate](#)

Uptime: Associated since 18 Days 34 Minutes

SSID: class

AP Name: 3F-MIS\_MeetingRoom (Ch 100)

Nearest APs

Device Type: Unclassified

Performance: Signal Strength: -64 dBm Signal Quality: 28 dB Connection Speed: 1300 Mbps Channel Width: 80 MHz

Capabilities: 802.11ac (5GHz) Spatial Stream: 3

Cisco Compatible: Not Supported

Connection Score: 100%

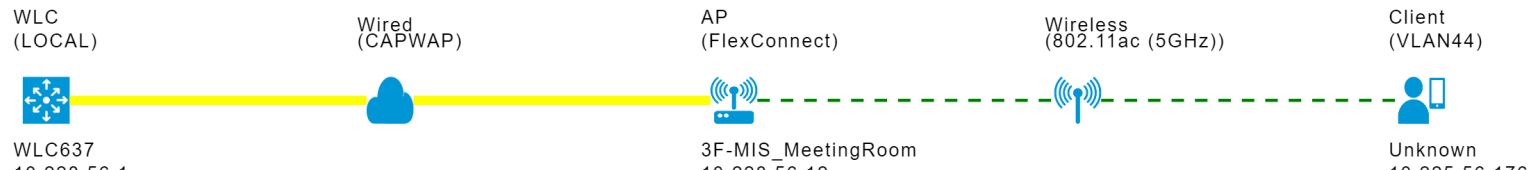
### CONNECTIVITY



### TOP APPLICATIONS

Name	Usage	% Usage
No Data Available!		

### MOBILITY STATE



# ACCESS POINT VIEW

- Monitoring
- Network Summary
  - Access Points
  - Clients
  - Rogues
  - Access Points
  - Clients
- Interferers
- Wireless Dashboard
  - AP Performance
  - Client Performance
  - Best Practices

## GENERAL



AP Name  
**3F-MIS\_MeetingRoom** [↗](#)

Location  
**default location**

MAC Address	a0:b4:39:88:72:68
IP Address	10.228.56.12
CDP / LLDP	3F-Blue_MeetingRoom, GigabitEthernet0
Ethernet Speed	1000 Mbps
Model / Domain	AIR-AP2802I-T-K9 / 802.11bg:-A 802.11a:-T
Power status	Power injector / Full Power
Serial Number	FJC2409M8W3
Groups	AP Group: default-group, Flex Group: default-flex-group
Mode / Sub-mode	FlexConnect / Not Configured
Max Capabilities	802.11n 2.4GHz, 802.11ac 5GHz Spatial Streams : 3 (2.4GHz), 3 (5.0GHz) Max. Data Rate : 217 Mbps(2.4GHz), 2340 Mbps(5.0GHz)
Fabric	Disabled

## PERFORMANCE SUMMARY

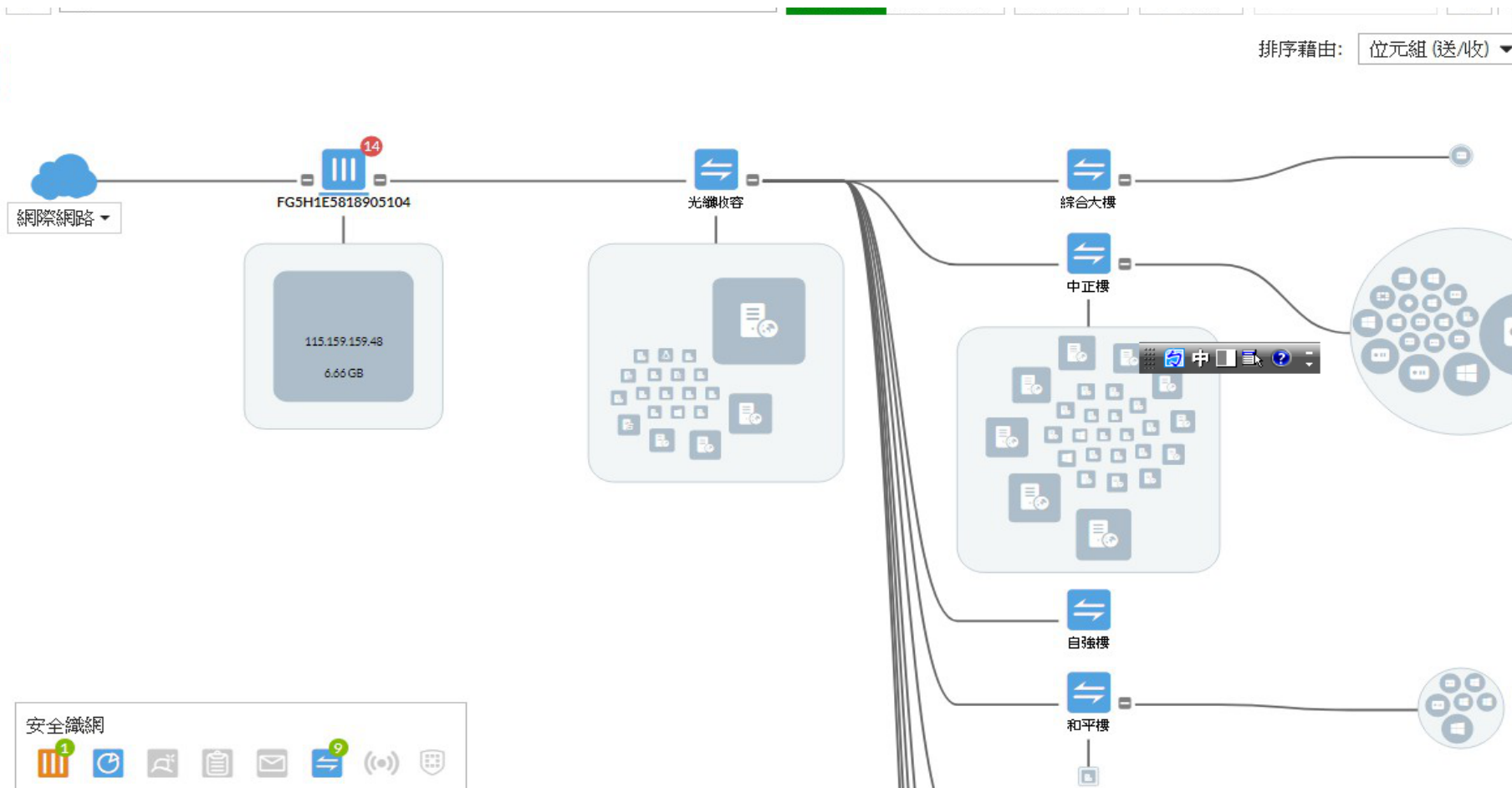
	2.4GHz	5GHz	Remote LAN
Number of clients	0	61	0
Channels	11	(100, 104, 108, 112)	0
Configured Rate	Min: 36 Mbps, Max: 217 Mbps	Min: 36 Mbps, Max: 1300 Mbps	Min: 0 Mbps, Max: 0 Mbps
Usage Traffic	0	96.1 GB	0
Throughput	0	17.2 KB	0
Transmit Power	20 dBm	17 dBm	0 dBm
Noise	Not Available	-96 -97 -97 -97	Not Available
Channel Utilization	0% <input type="text"/>	3% <input type="text"/>	0% <input type="text"/>
Interference	0% <input type="text"/>	0% <input type="text"/>	0% <input type="text"/>
Traffic	0% <input type="text"/>	3% <input type="text"/>	0% <input type="text"/>
Air Quality	-	-	-
Admin Status	Disabled	Enabled	Enabled
Clean Air Status	Down	Down	Not applicable

# FORTINET

- 安全鐵網
- 實體拓樸圖
- 邏輯拓樸圖
- 資安評級
- 自動化
- 設置
- Fabric Connectors

- FortiView
- 網路
- 系統管理
- 政策 & 物件
- 資安管理設定
- VPN
- 用戶與設備
- WiFi & Switch 控制器
- 日誌與報表
- 監測

排序藉由: 位元組 (送/收)

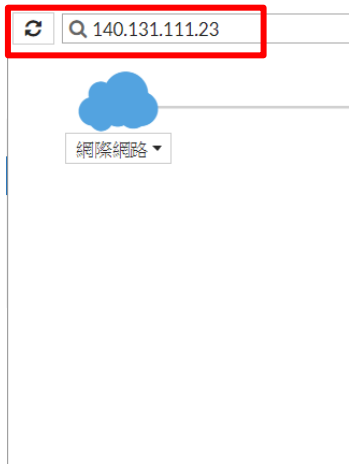


# 封鎖異常使用者在網路交換器上

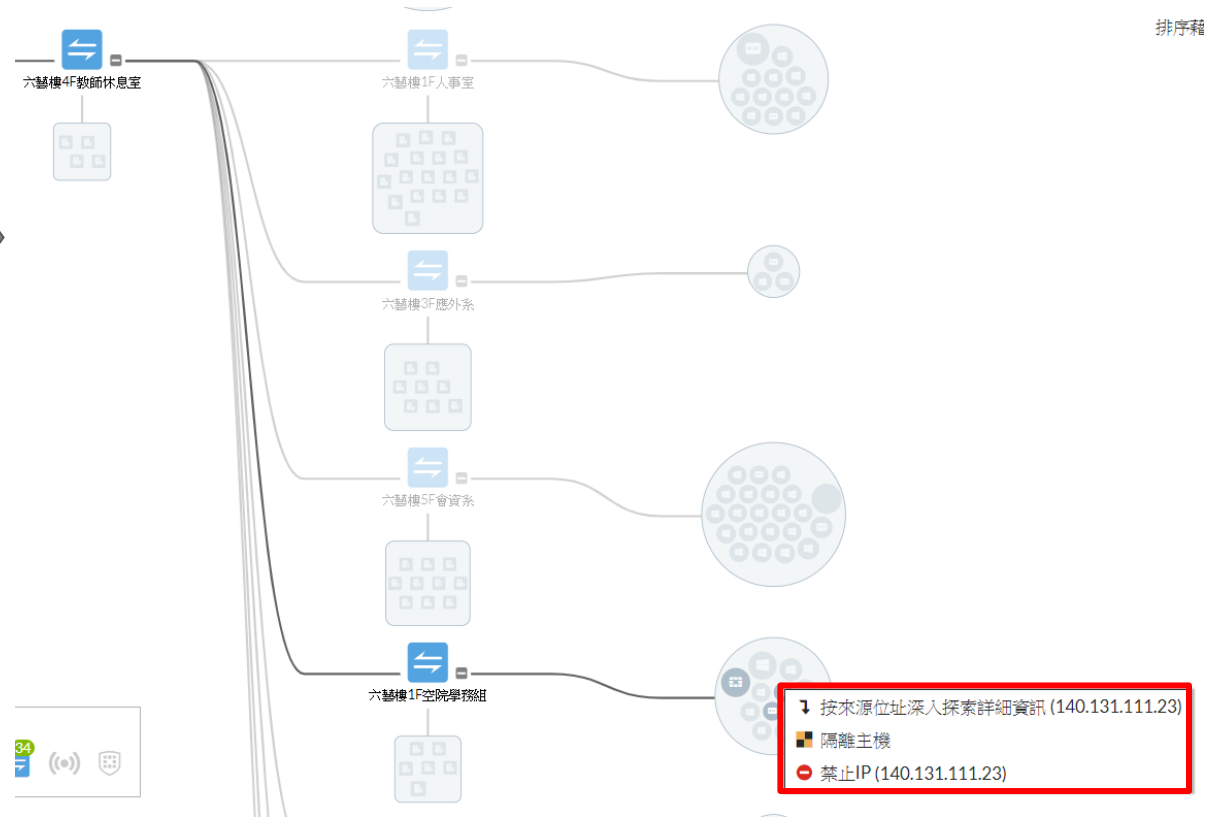
1. 點選實體拓樸圖



2. 輸入要查找IP位置



3. 找到使用者設備裝置後點選滑鼠右鍵進行封鎖





# 確認來源IP位置在哪個網路交換器埠上

## 1. 點選實體拓樸圖



## 2. 輸入要查找IP位置



## 3. 可呈現這個IP位置完整資訊

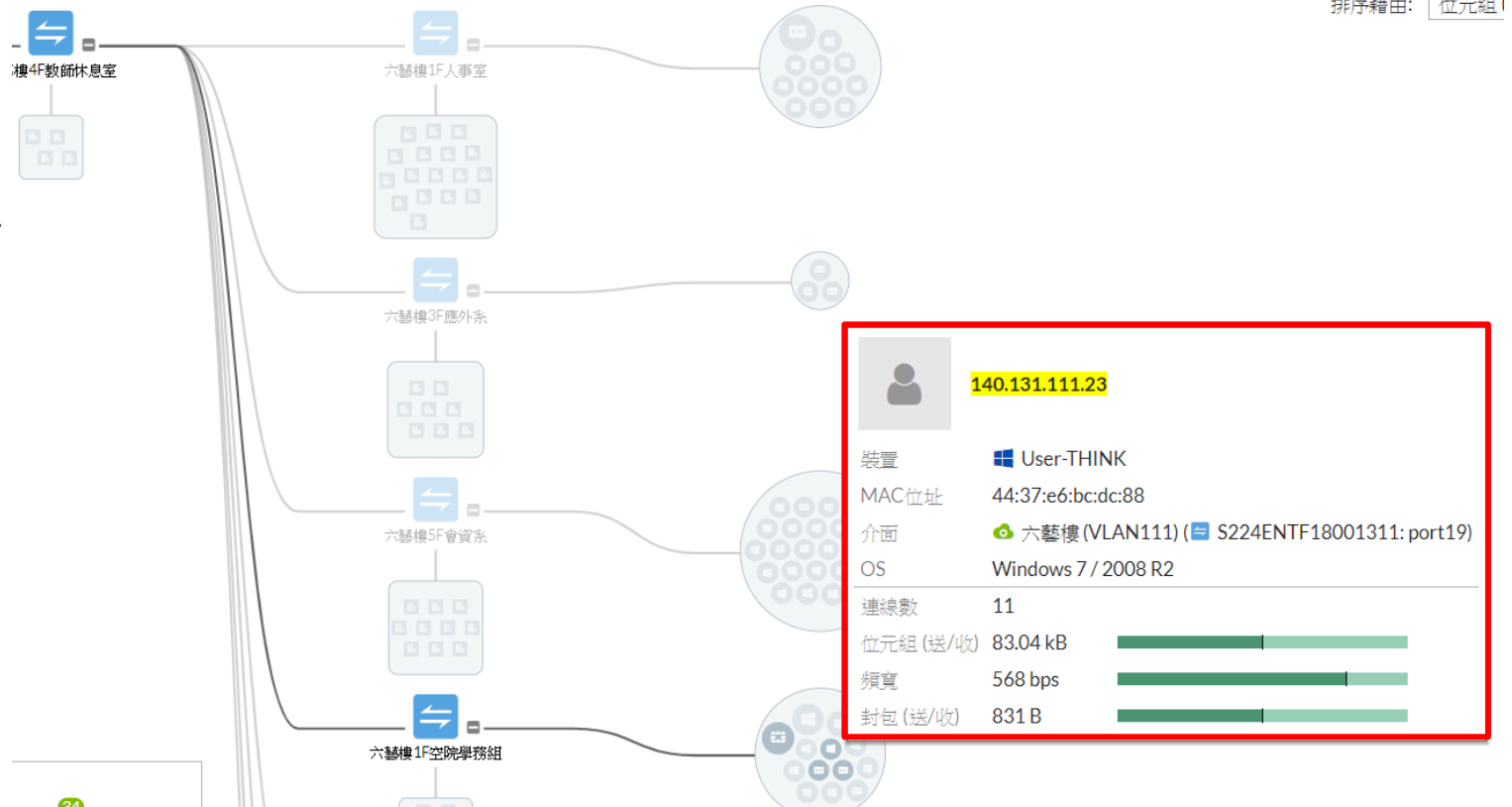
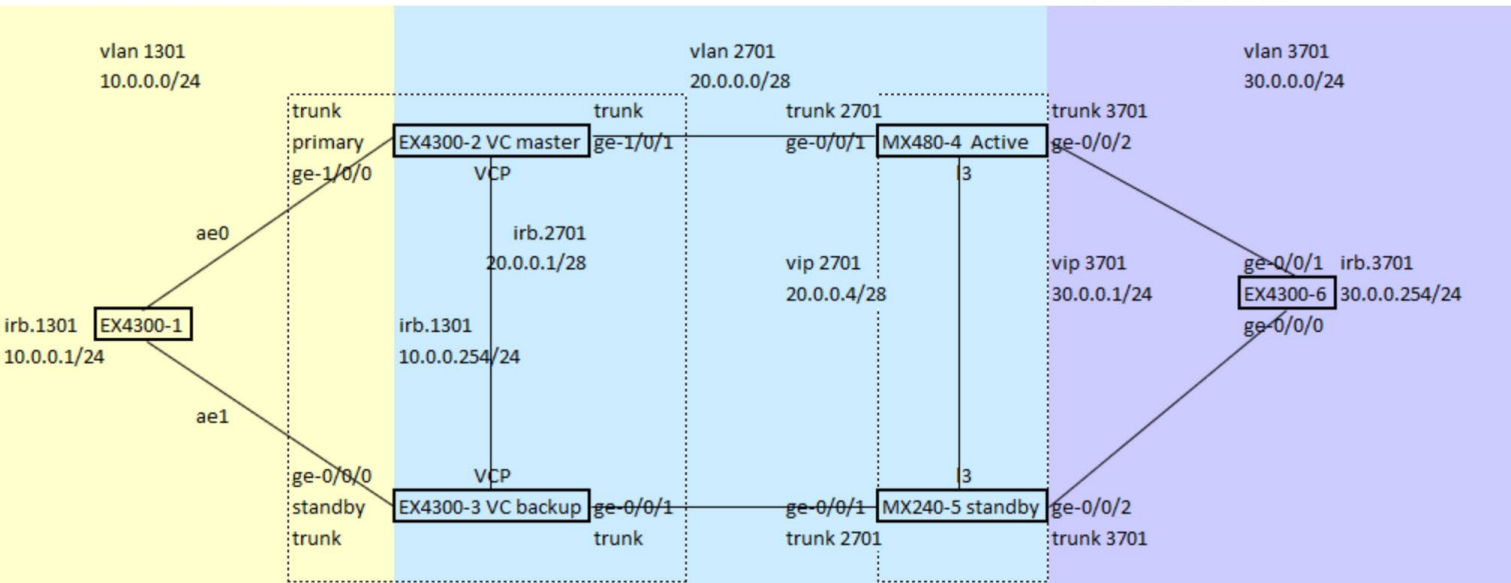
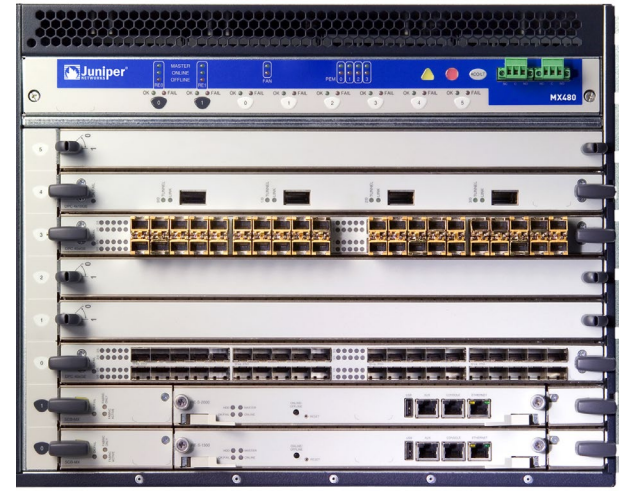
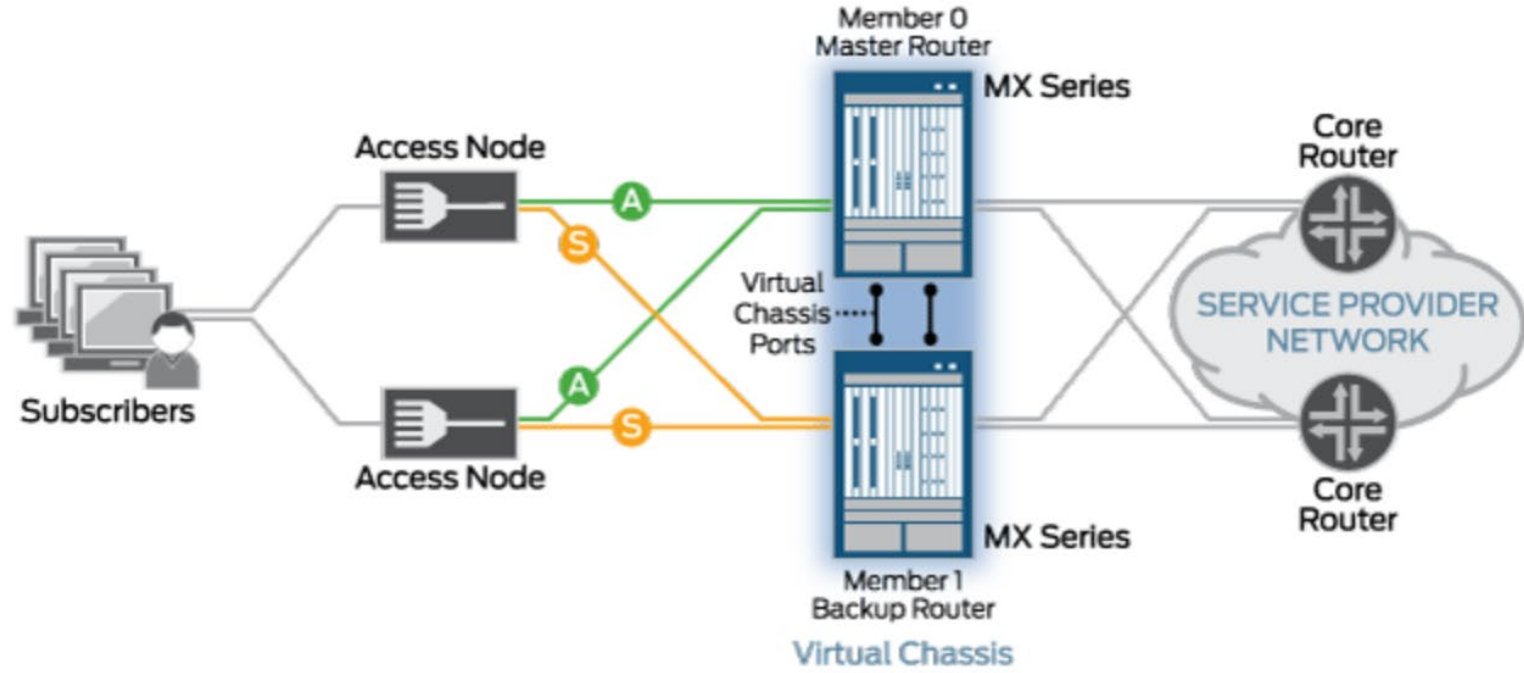


Figure 1: Sample Topology for MX Series Virtual Chassis



- A Active
- S Standby

g042815

# 無線問題討論

- 無線100M以上是正常的基本判斷。
- 無線訊號Cisco重開機。
- 無線測試的SOP
  - AP的Port直接接電腦，調整vlan為access(untag)32 or 34。OK
  - 測試2.4G OK
  - 校園內同一個vlan下multicasting封包，wireshark。
  - 第四台的ONT小烏龜問題，切到中華會改善。
  - 清port的trunk vlan。