

新北市教網中心 無線網路THIN AP建置 輔導員

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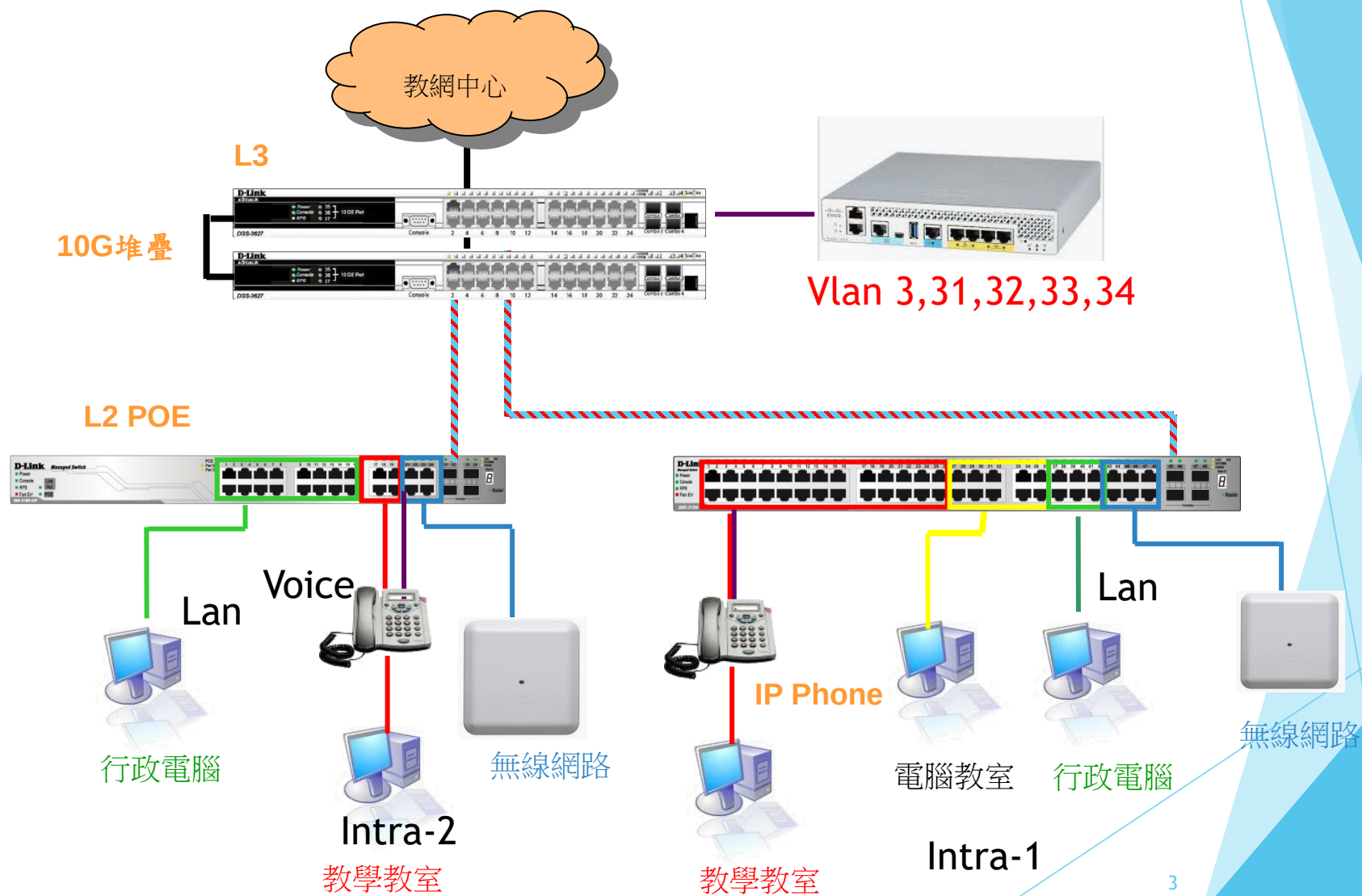
課程時間分配

時間	課程內容
09:00-10:00	網路vlan架構說明、L3無線路由 Radius Server、DHCP server實作
10:10-11:00	NTPC-Mobile 802.1X NTPC-WPA2
11:10-12:00	THIN AP設定 (CAWAP vs 固定AC ip) CISCO WLC 3504 WPA2認證 MAC認證 eduroam認證 VS SNGN架構
13:00-16:00 智慧網管	PRTG CISCO WLC 3504

CISCO Packet tracer

<https://www.computernetworkingnotes.com/ccna-study-guide/download-packet-tracer-for-windows-and-linux.html>

新北市高國中小學校園前瞻網路架構



前瞻計畫學校無線IP網段說明

段配置

Vlan	VID	網段	IPv6	用途
cisco	3	10.227.76.254	2001:288:22xx:3::/64	Cisco capwap用
Wan	2	163.20.203.89/29	2001:288:2201::/124	對外連結網段
Lan	5	163.20.172.254/24	2001:288:22xx:5::/64	行政用
Intra-1	10	10.231.76.254/24	2001:288:22xx:10::/64	電腦教室
class	34	10.217.76.0/24	2001:288:22xx:34::/64	無線投影用
TANetRoaming	31	10.211.76.254/24	2001:288:22xx:31::/64	Web認證
eduroam	32	10.213.76.0/24	2001:288:22xx:32::/64	無線WAP2用
NTPC-Mobile	33	10.215.76.0/24	2001:288:22xx:33::/64	無線Mobile用

無線網路架構設計

1. 無線與班級電腦同網段
2. 隔離各教室無線broadcast domain
3. 無線BYOD認證問題
4. 有時段限制功能及自訂SSID功能
5. 分權控管功能 (中心端與學校端)

Packet Tracer 7.3.0

<https://www.computernetworkingnotes.com/ccna-study-guide/download-packet-tracer-for-windows-and-linux.html>

設備命名、IP設定規則

設備	Hostname	IP Address	數量
Cisco WLC 3504	校碼後三碼+WLC	10.xxx.xxx.1	1
保留		10.xxx.xxx.2~10	9
Cisco AP 2802	校碼後三碼+AP+教室碼	10.xxx.xxx.11~125	115
LevelOne 5 Port Switch	校碼後三碼+5P+教室碼	10.xxx.xxx.126~240	115
Cisco Switch 2960 24/48 Port	校碼後三碼+L2+棟號+樓層編號	10.xxx.xxx.241~252	12
保留		10.xxx.xxx.253	1
Gateway		10.xxx.xxx.254	1
Cisco WLC 8540	NTPC_WLC	203.72.154.115	1
Cisco ISE 3515	NTPC_ISE	203.72.154.116	1
NTP Server		163.20.254.254	
DNS Server		203.72.153.153, 203.72.153.154	
DHCP Server ※ 若小校無教室碼，則依棟號+樓層編號+教室編號（由左至右數）。		203.72.153.8, 203.72.153.9， 203.72.153.38	

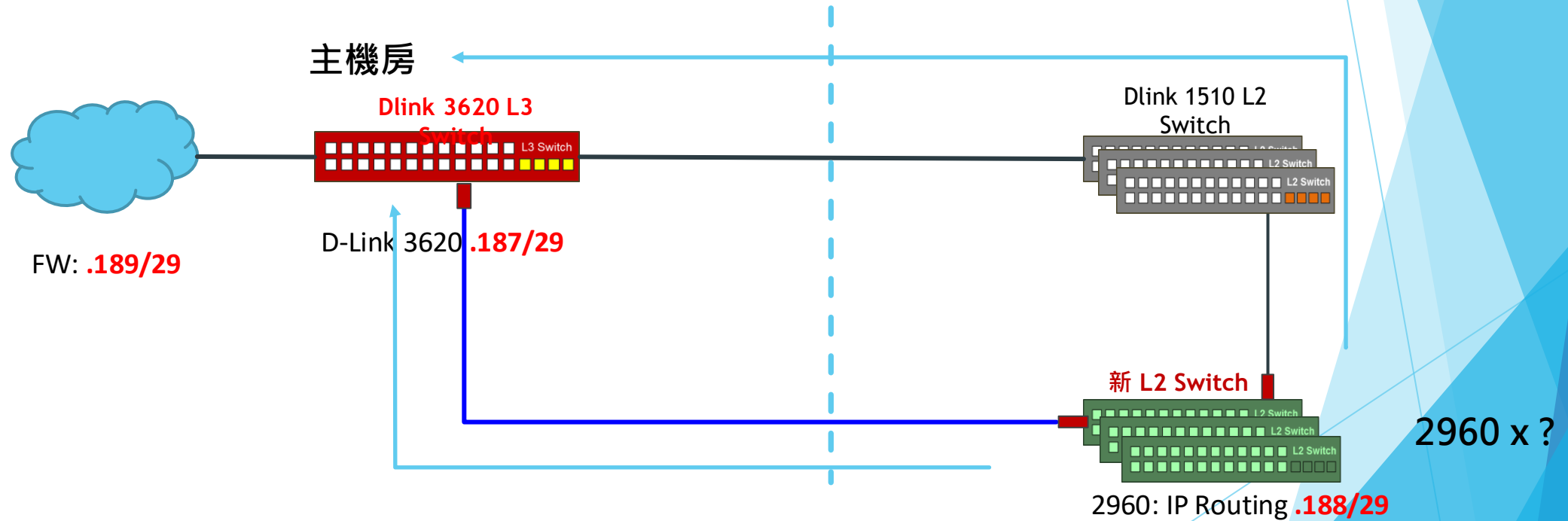
SSID 及加密認證方式

SSID	Vlan	認證
TANetRoaming	31	Web Portal
NTPC-Mobile5G	32	MAC
eduroam	33	802.1x
Class NTPC-Mobile2.4G	34	學校名稱+教室碼 (ex. SCPS-101) MAC

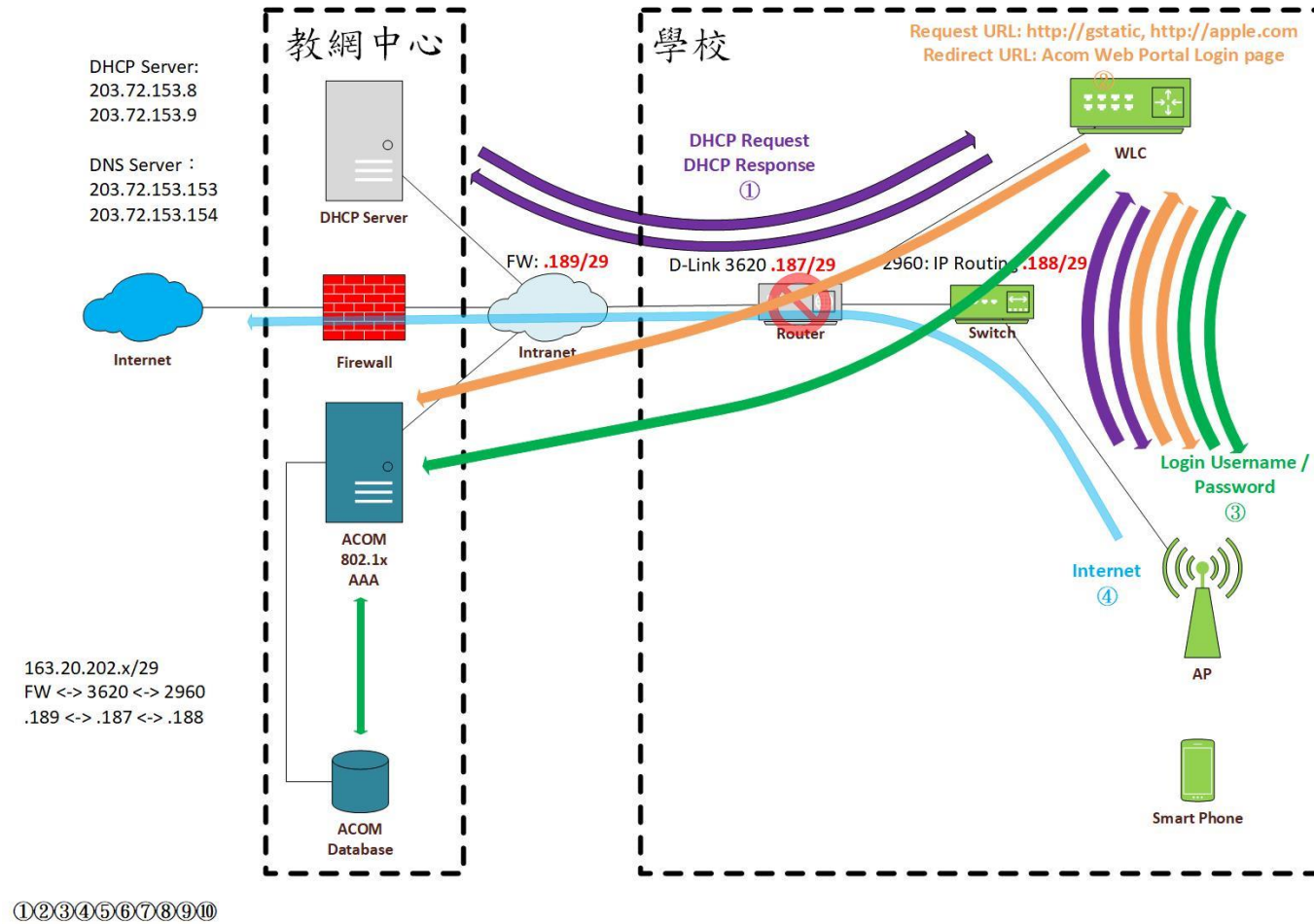
路由優化設計

▶ 路由問題：

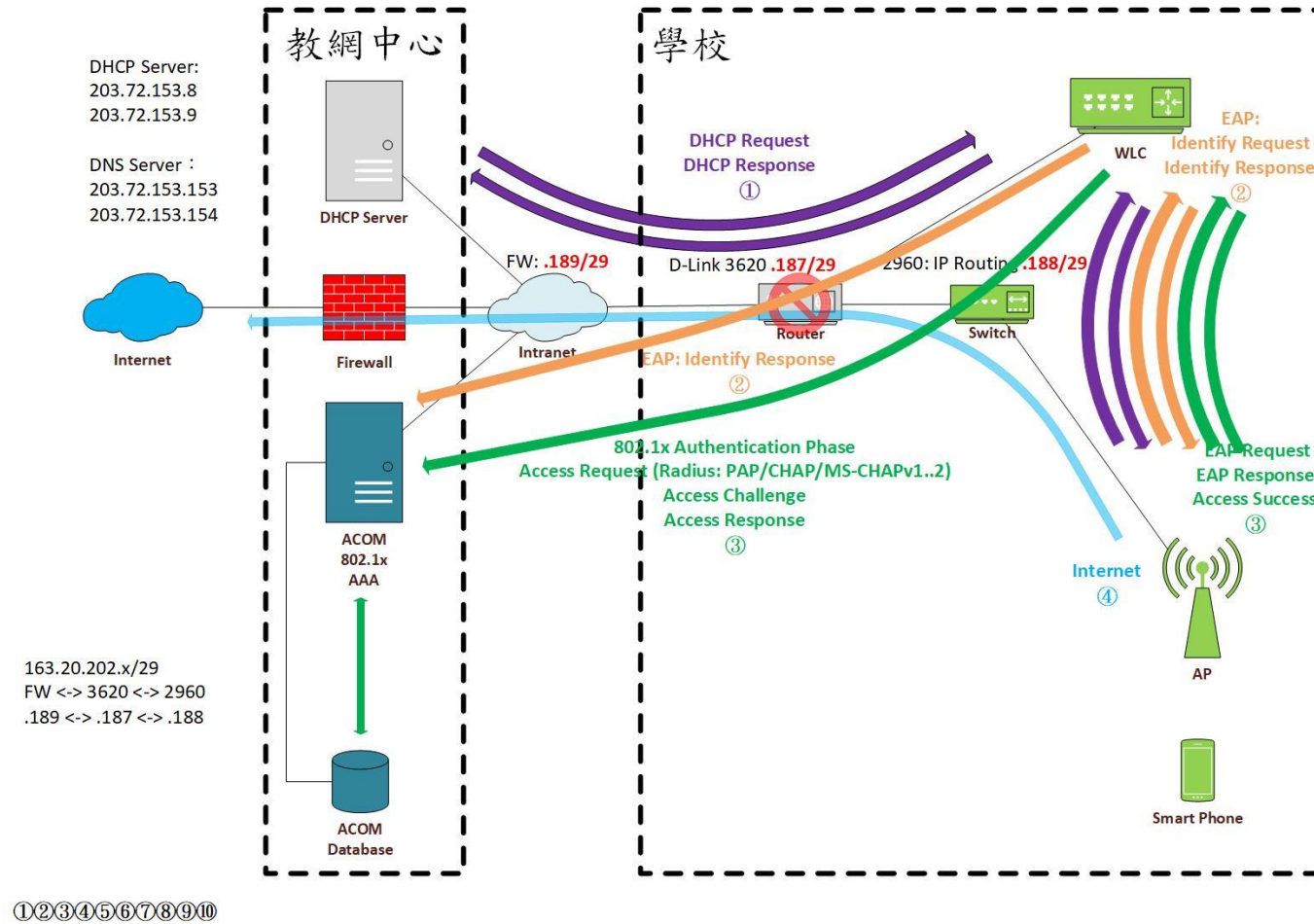
▶ D-Link 3620 L3 ip routing



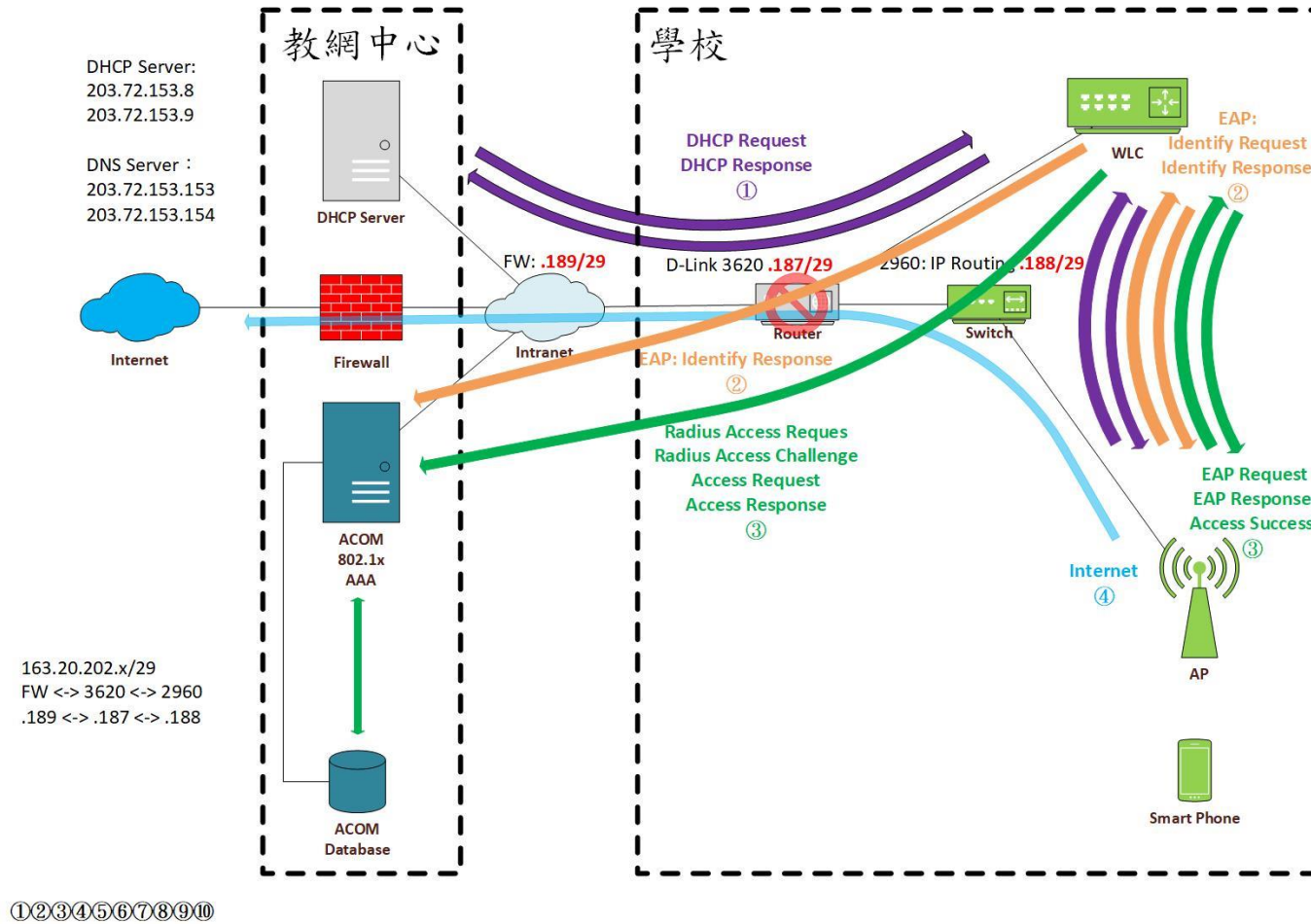
Web Portal Flow



802.1X Flow

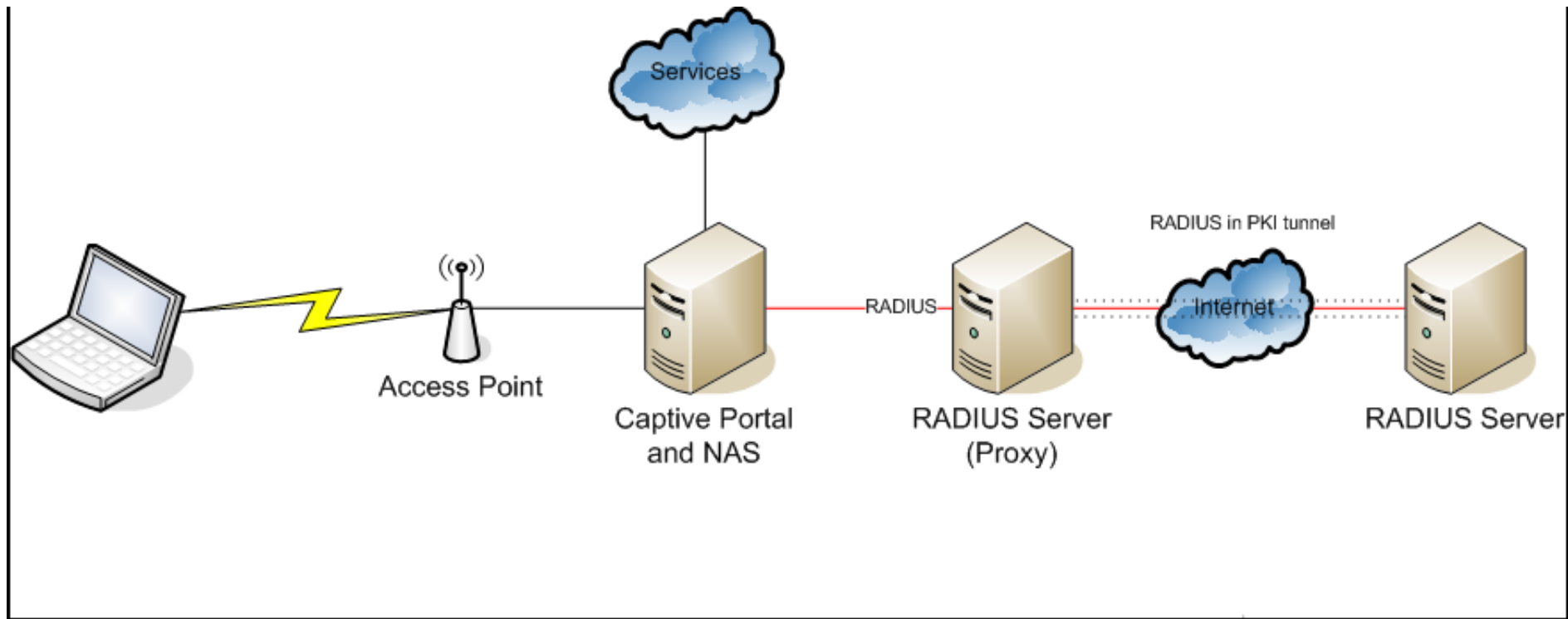


MAC Filtering

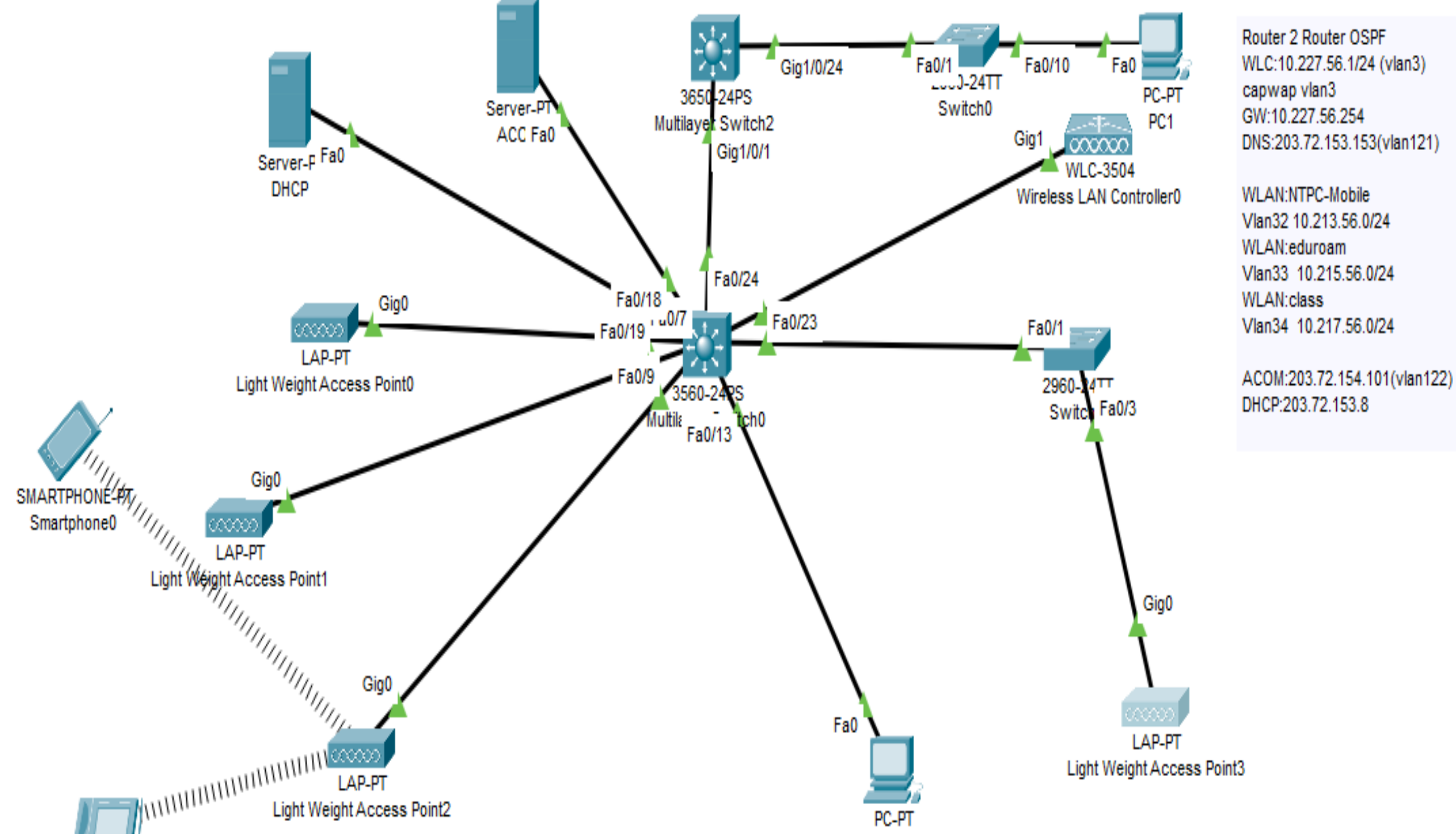


Radius Server

- ▶ Authenticator(Cisco WLC 3504)帶的HOST IP
- ▶ Radius Server(ACOM)是否已經加入Authenticator ip
- ▶ Key 「共享密碼」 (Shared secret) ntpcacom
- ▶ Firewall udp port 1812-1813 1645-1646



LAB



New AP Step by Step

- ▶ Check vlan
 - ▶ Add vlan31

Switch1

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: 31

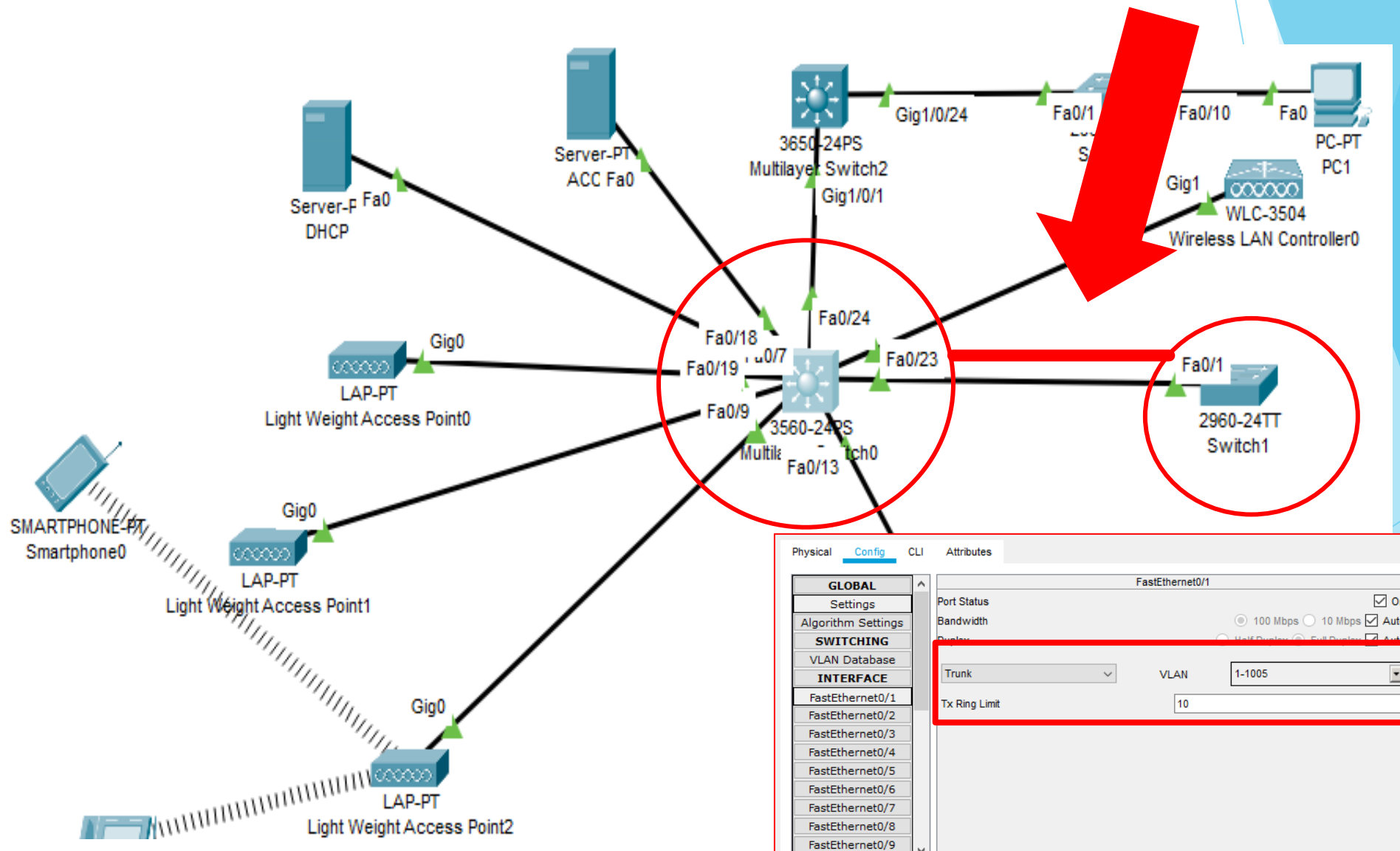
VLAN Name: TANETRoaming

Add Remove

VLAN No	VLAN Name
1	default
2	wan
3	cisco
5	lan
32	mobile
33	eduroam
34	class

Equivalent IOS Commands

骨幹間交換器線路Vlan都有帶



Cisco AP port 設定

```
Switch(config)#interface FastEthernet0/3
```

```
interface FastEthernet 0/3
```

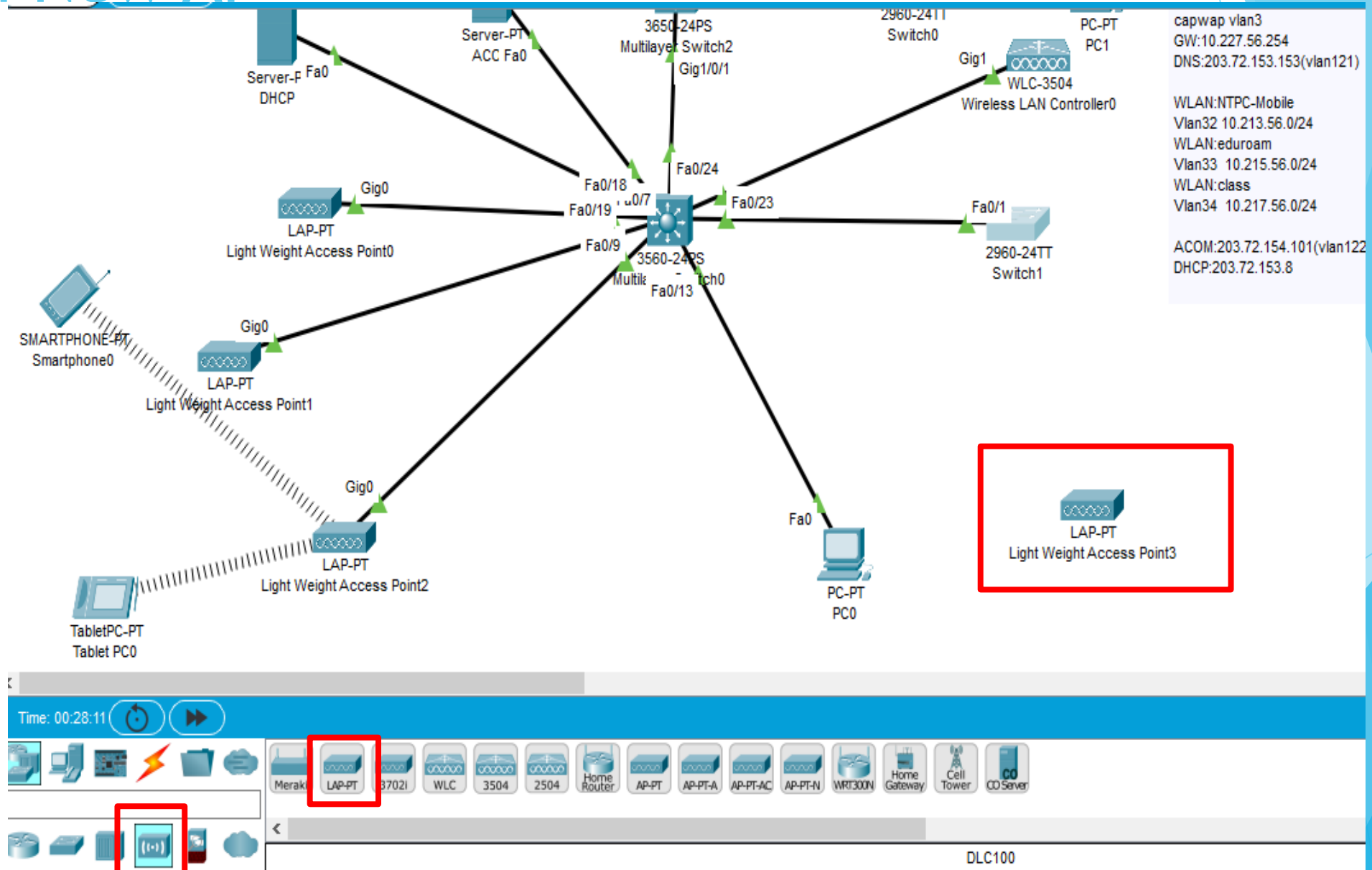
```
switchport trunk native vlan 3
```

```
switchport trunk allowed vlan 3,32-34
```

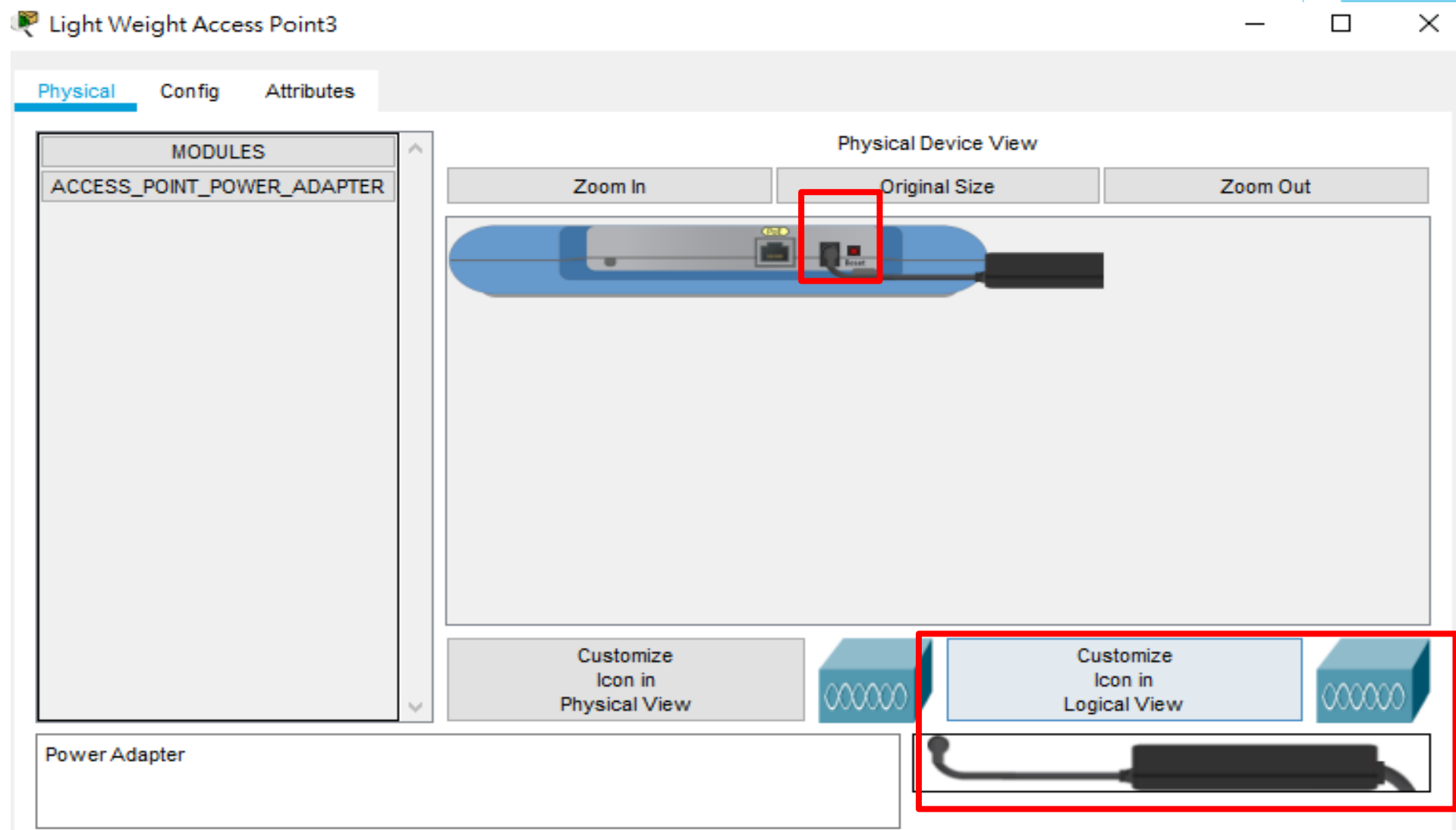
```
switchport trunk encapsulation dot1q
```

```
switchport mode trunk
```

Add New AP



插電



Radius Server 203.72.154.101 (vlan122)

ACOM

Physical Config **Services** Desktop Programming Attributes

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

AAA

Service ☒ On ☐ Off Radius Port

Network Configuration

Client Name Client IP
Secret ServerType Radius

	Client Name	Client IP	Server Type	Key	
1	enctc	10.227.56.1	Radius	ntpcacom	Add Save Remove

User Setup

Username Password

	Username	Password	
1	alfred	12345678	Add Save Remove
2	daniel	87654321	

☐ Top

DHCP Server 203.72.153.8 (Vlan121)

DHCP

Physical **Config** Services Desktop Programming Attributes

SERVICES

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

DHCP

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: eduroam

Default Gateway: 10.215.56.254

DNS Server: 203.72.153.153

Start IP Address : 10 215 56 100

Subnet Mask: 255 255 255 0

Maximum Number of Users : 156

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Add **Save** **Remove**

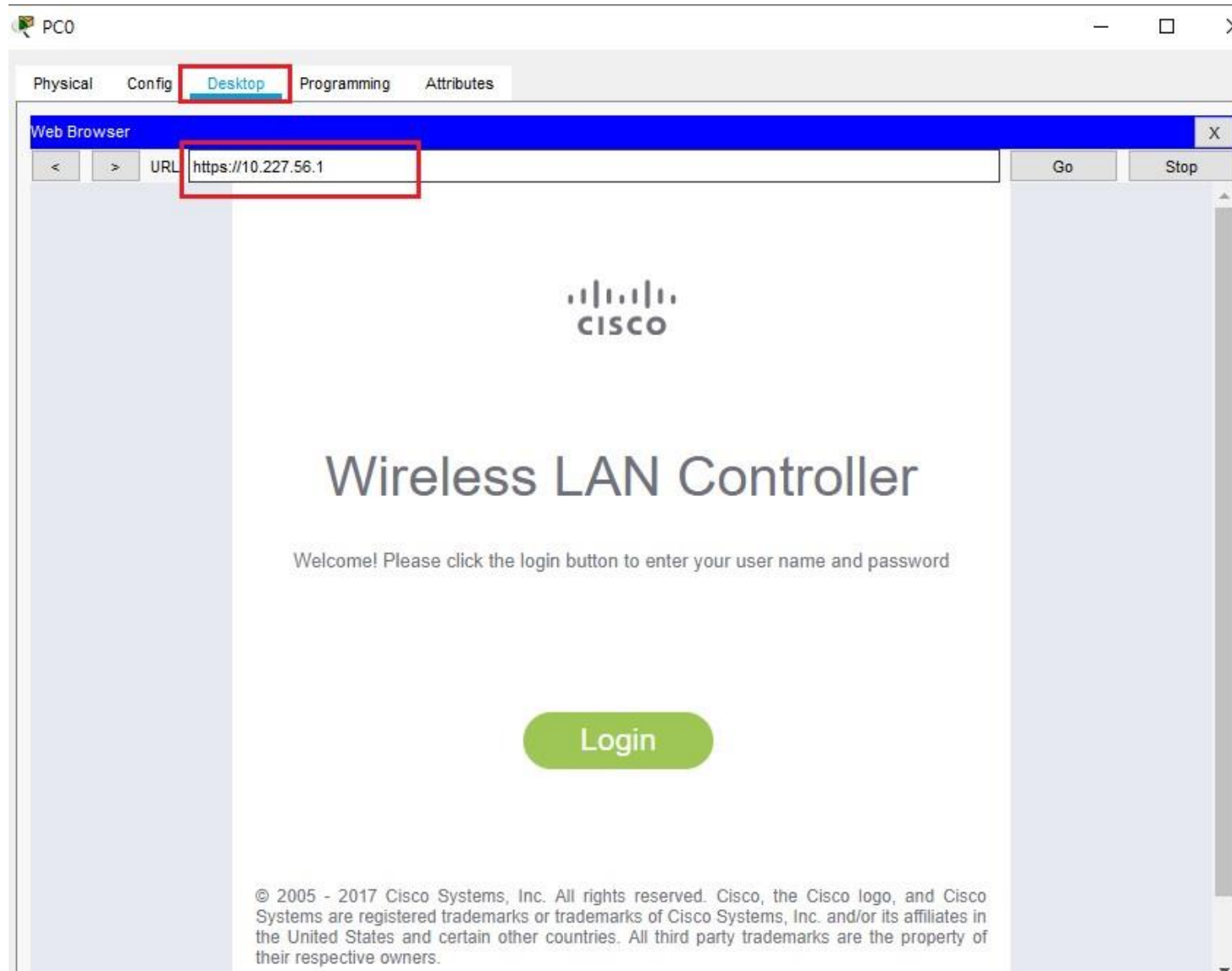
Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
class	10.217.56.254	203.72.153.153	10.217.56.100	255.255.255.0	100	0.0.0.0	0.0.0.0
eduroam	10.215.56.254	203.72.153.153	10.215.56.100	255.255.255.0	156	0.0.0.0	0.0.0.0
Mobile	10.213.56.254	203.72.153.153	10.213.56.100	255.255.255.0	156	0.0.0.0	0.0.0.0
capwap	10.227.56.254	203.72.153.153	10.227.56.100	255.255.255.0	156	0.0.0.0	10.227.56.1
serverPool	0.0.0.0	0.0.0.0	203.72.153.0	255.255.255.0	255	0.0.0.0	0.0.0.0

PC to CISCO WLC

- 1、放置一台PC，路由要能到WLC
- 2、使用browser連上wlc
- 3、密碼：admin admin
- 4、https://.....



WLC login : admin admin





Monitor

Summary

▶ Access Points

▶ Cisco CleanAir

▶ Statistics

▶ CDP

▶ Rogues

Clients

Sleeping Clients

Multicast

▶ Applications

Local Profiling

Controller Summary

Management IP Address	10.227.56.1 , ::/128
Software Version	8.3.111.0
Field Recovery Image Version	7.6.101.1
System Name	enc1c
Up Time	52 minutes, 49 seconds
System Time	週日 七月 5 23:35:41 2020
Redundancy Mode	N/A
Internal Temperature	+31 C
802.11a Network State	Enabled
802.11b/g Network State	Enabled
Local Mobility Group	
CPU(s) Usage	0%
Individual CPU Usage	0%/1%, 0%/0%
Memory Usage	46%
Fan Status	3800 rpm

Access Point Summary

	Total	Up	Down	
802.11a/n/ac Radios	3	3	0	Detail
802.11b/g/n Radios	3	3	0	Detail
Dual-Band Radios	0	0	0	Detail
All APs	3	3	0	Detail

Client Summary

Current Clients	2	Detail
Excluded Clients	0	Detail
Disabled Clients	0	Detail

Rogue Summary

Active Rogue APs	0	Detail
Active Rogue Clients	0	Detail
Adhoc Rogues	0	Detail
Rogues on Wired Network	0	

Top WLANs

Profile Name	# of Clients
--------------	--------------

Most Recent Traps

[View All](#)

Top Applications

Application Name	Packet Count	Byte Count
------------------	--------------	------------

[View All](#)

<

>

URL

https://10.227.56.1/frameRadiusList.html

Go

Stop

CISCO

MONITOR

WLANS

CONTROLLER

WIRELESS

SECURITY

MANAGEMENT

COMMANDS

HELP

FEEDBACK

Save Configuration

Ping

Logout

Refresh

Home

Security

AAA

General

RADIUS

Authentication

Accounting

Fallback

DNS

Downloaded AVP

TACACS+

LDAP

Local Net Users

MAC Filtering

Disabled Clients

User Login Policies

AP Policies

Password Policies

Local EAP

Advanced EAP

Priority Order

Certificate

Access Control Lists

Wireless Protection Policies

Web Auth

RADIUS Authentication Servers

Apply

New..

Auth Called Station ID Type

IP Address

Use AES Key Wrap

☐ (Designed for FIPS customers and requires a key wrap compliant RADIUS server)

MAC Delimiter

Hyphen

Framed MTU

1300

Network User	Management	Server Index	Server Address(Ipv4/Ipv6)	Port	IPSec	Admin Status		
☒	☒	1	*	203.72.154.101	1812	Disabled	Enabled	Remo
☒	☒	2		203.72.154.102	1812	Disabled	Enabled	Remo

Radius Authentication Server 認證設定

- 1、AAA ip
- 2、share secret
- 3、service port

Web Browser

URL: <https://10.227.56.1/frameRadiusEdit.html> Go Stop

Save Configuration | Ping | Logout | Refresh Home

CISCO MONITOR WLANs CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK

Security

AAA

General

RADIUS

Authentication

Accounting

Fallback

DNS

Downloaded AVP

TACACS+

LDAP

Local Net Users

MAC Filtering

Disabled Clients

User Login Policies

AP Policies

Password Policies

Local EAP

Advanced EAP

Priority Order

Certificate

Access Control Lists

Wireless Protection Policies

Web Auth

TrustSec SXP

Local Policies

Advanced

RADIUS Authentication Servers > Edit

< BACK Apply

Server Index 1

Server Address(Ipv4/Ipv6) 203.72.154.101

Shared Secret Format ASCII

Shared Secret

Confirm Shared Secret

Key Wrap ☐ (Designed for FIPS customers and requires a key wrap compliant RADIUS server)

Port Number 1812

Server Status Enabled

Support for CoA Disabled

Server Timeout 2 seconds

Network User ☒ Enable

Management ☒ Enable

Management Retransmit Timeout 2 seconds

Realm List

IPSec ☐ Enable

Radius Authentication Server

1、service port

2、client ip

3、secret key

4、user account and password

ACOM

Physical Config **Services** Desktop Programming Attributes

SERVICES

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

Service ☒ On ☐ Off Radius Port

Network Configuration

Client Name Client IP

Secret ServerType Radius

	Client Name	Client IP	Server Type	Key	
1	enctc	10.227.56.1	Radius	ntpcacom	Add Save Remove

User Setup

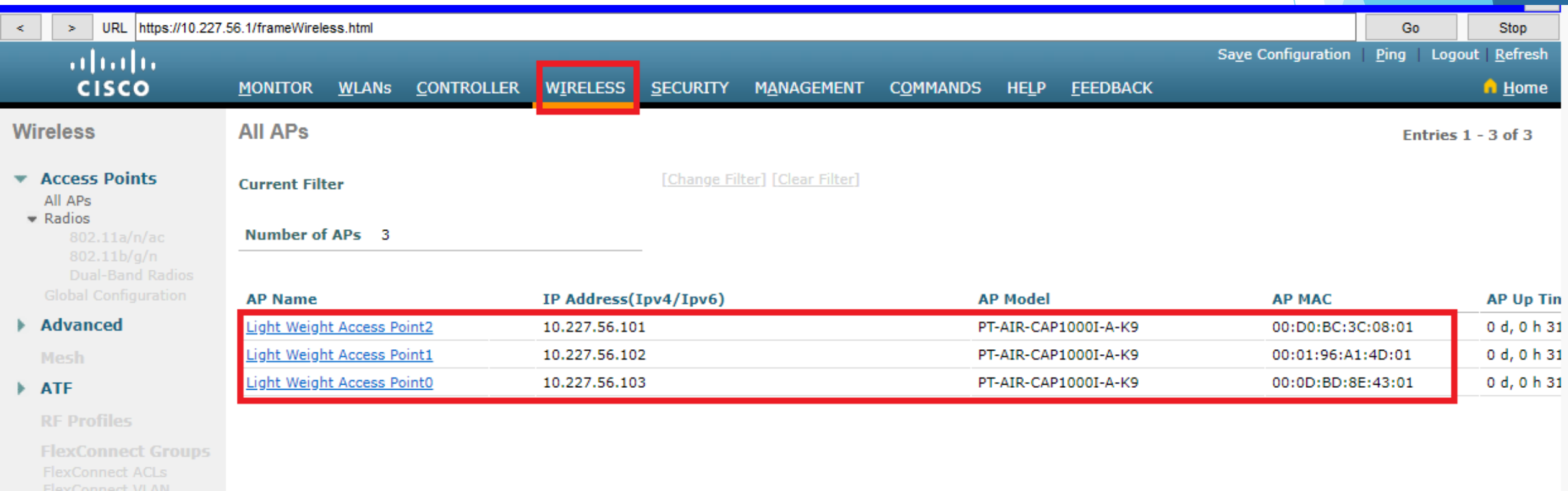
Username Password

	Username	Password	
1	alfred	12345678	Add Save Remove
2	daniel	87654321	

☐ Top

AP加入wlc

- 1、ap取得IP address
- 2、ap取得NETMASK
- 3、找到 WLC IP
- 4、取得CONFIG



The screenshot shows the Cisco WLC web interface. The top navigation bar includes the Cisco logo and tabs for MONITOR, WLANs, CONTROLLER, WIRELESS (highlighted with a red box), SECURITY, MANAGEMENT, COMMANDS, HELP, and FEEDBACK. The left sidebar shows the 'Wireless' section with sub-items like Access Points, Radios, and Advanced. The main content area is titled 'All APs' and shows a table of 3 APs. The table has columns for AP Name, IP Address(Ipv4/Ipv6), AP Model, AP MAC, and AP Up Tin. The first three rows of the table are highlighted with a red box.

URL: <https://10.227.56.1/frameWireless.html>

Go Stop

Save Configuration | Ping | Logout | Refresh

CISCO

MONITOR WLANs CONTROLLER **WIRELESS** SECURITY MANAGEMENT COMMANDS HELP FEEDBACK

Home

Wireless

All APs Entries 1 - 3 of 3

Current Filter [Change Filter] [Clear Filter]

Number of APs 3

AP Name	IP Address(Ipv4/Ipv6)	AP Model	AP MAC	AP Up Tin
Light Weight Access Point2	10.227.56.101	PT-AIR-CAP1000I-A-K9	00:D0:BC:3C:08:01	0 d, 0 h 31
Light Weight Access Point1	10.227.56.102	PT-AIR-CAP1000I-A-K9	00:01:96:A1:4D:01	0 d, 0 h 31
Light Weight Access Point0	10.227.56.103	PT-AIR-CAP1000I-A-K9	00:0D:BD:8E:43:01	0 d, 0 h 31

Access Points

All APs

Radios

802.11a/n/ac

802.11b/g/n

Dual-Band Radios

Global Configuration

Advanced

Mesh

ATF

RF Profiles

FlexConnect Groups

FlexConnect ACLs

FlexConnect VLAN

設定虛擬介面與實體介面的連結

Web Browser

URL: <https://10.227.56.1/frameInterfaceList.html> Go Stop

CISCO MONITOR WLANS **CONTROLLER** WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK Home

Controller

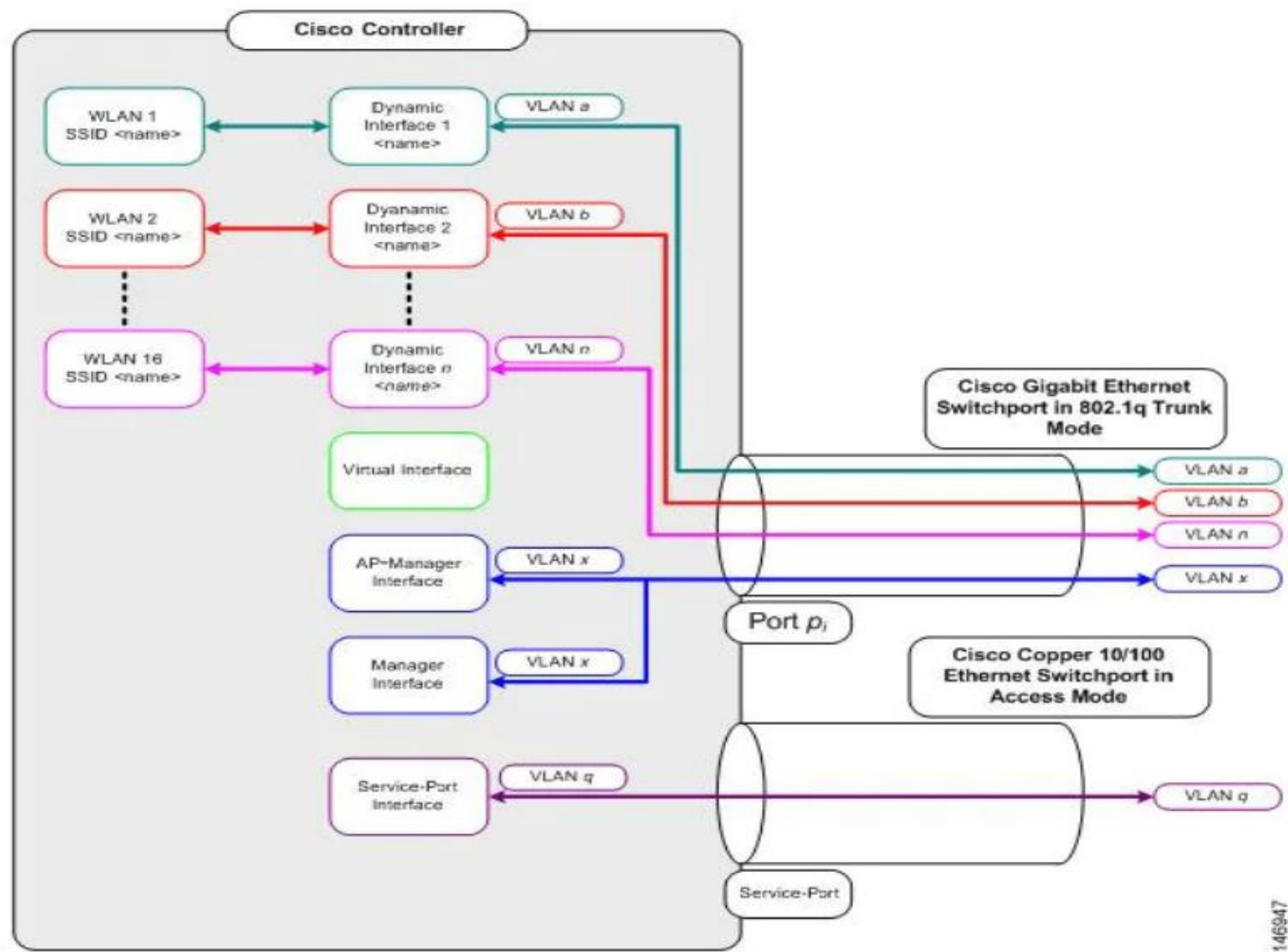
- General
- Inventory
- Interfaces**
- Interface Groups
- Multicast
- Internal DHCP Server
- Mobility Management
- Ports
- NTP
- CDP
- Tunneling
- IPv6
- mDNS
- Advanced

Interfaces

Entries 1 - 6

Interface Name	VLAN Identifier	IP Address	Interface Type	Dynamic AP Management	IPv6 Address
NTPC-Mobile	32	10.213.56.10	Dynamic	Disabled	
TANetRoaming	31	10.211.56.10	Dynamic	Disabled	
class	34	10.217.56.10	Dynamic	Disabled	
eduroam	33	10.215.56.10	Dynamic	Disabled	
management	untagged	10.227.56.1	Static	Enabled	::/128
virtual	N/A	192.0.2.1	Static	Not Supported	

VLANs with WLAN controllers use this model:



設定ssid

Web Browser

URL: <https://10.227.56.1/frameWlan.html> Go Stop

Save Configuration | Ping | Logout | Refresh

CISCO

MONITOR **WLANs** CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK Home

WLANs

Entries 1 - 4 of 4

Current Filter: [\[Change Filter\]](#) [\[Clear Filter\]](#) Create New ▼ Go

☐	WLAN ID	Type	Profile Name	WLAN SSID	Admin Status	Security Policies	
☐	1	WLAN	class	class	Enabled	[WPA2][Auth(PSK)]	Remove
☐	2	WLAN	class1	eduroam	Enabled	[WPA2][Auth(802.1X)]	Remove
☐	3	WLAN	class2	NTPC-Mobile	Enabled	[WPA2][Auth(802.1X)]	Remove
☐	4	WLAN	class3	TANetRoaming	Disabled	[WPA2][Auth(802.1X)]	Remove

設定ssid: eduroam

Physical Config **Desktop** Programming Attributes

Web Browser X

< > URL Go Stop

CISCO MONITOR WLANS CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK Save Configuration | Ping | Logout | Refresh Home

WLANs

- ▼ **WLANs**
 - WLANs
- ▼ **Advanced**
 - AP Groups

WLANs > New

< BACK Apply

Type	WLAN ▼
Profile Name	eduroam
SSID	eduroam
ID	5 ▼

設定ssid traffic 走的介面

Physical Config **Desktop** Programming Attributes

Web Browser
URL: https://10.227.56.1/frameWlanEdit.html
Go Stop

Save Configuration | Ping | Logout | Refresh

CISCO MONITOR **WLANs** CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK Home

WLANs

WLANs
Advanced
AP Groups

WLANs > **Edit 'class1'**

< BACK Apply

General Security QoS Policy-Mapping Advanced

Profile Name: class1

Type: WLAN

SSID: eduroam

Status: ☒ Enabled

Security Policies: [WPA2][Auth(802.1X)]
(Modifications done under security tab will appear after applying the changes.)

Radio Policy: All

Interface/Interface Group: eduroam

Multicast Vlan Feature: ☐ Enabled

Broadcast SSID: ☒ Enabled

NAS-ID:

設定ssid 認證加密方式

The screenshot displays the Cisco WLAN configuration page for a WLAN named 'class1'. The 'Security' tab is selected, and the 'Layer 2' sub-tab is active. The 'Layer 2 Security' is configured to 'WPA+WPA2'. The 'Protected Management Frame' (PMF) is set to 'Disabled'. Under the 'WPA+WPA2 Parameters' section, 'WPA2 Policy' is checked, and 'WPA2 Encryption' is set to 'AES'. In the 'Authentication Key Management' section, '802.1X' is checked and 'Enabled'. Other options like 'CCKM', 'PSK', and 'FT 802.1X' are unchecked. The interface includes a 'Foot Notes' section at the bottom.

WLANs > Edit 'class1'

General Security QoS Policy-Mapping Advanced

Layer 2 Layer 3 AAA Servers

Layer 2 Security 6 WPA+WPA2

MAC Filtering 2

Fast Transition

Fast Transition

Protected Management Frame

PMF Disabled

WPA+WPA2 Parameters

WPA Policy

WPA2 Policy

WPA2 Encryption AES TKIP

Authentication Key Management

802.1X Enable

CCKM Enable

PSK Enable

FT 802.1X Enable

Foot Notes

設定ssid 走的介面

Web Browser

URL: <https://10.227.56.1/frameWlanEdit.html> Go Stop

Save Configuration | Ping | Logout | Refr

CISCO

MONITOR **WLANS** CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK

Home

WLANS

WLANS > Edit 'class1'

< BACK Apply

General Security QoS Policy-Mapping **Advanced**

Clear HotSpot Configuration ☐ Enabled

Client user idle timeout(15-100000) ☐

Client user idle threshold (0-10000000) Bytes

Radius NAI-Realm ☐

Off Channel Scanning Defer

Scan Defer Priority ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

Scan Defer Time(msecs)

FlexConnect

FlexConnect Local Switching ☒ Enabled

FlexConnect Local Auth ☒ Enabled

FlexConnect Local Auth ☒ Enabled

FlexConnect Local Auth ☒ Enabled

Vlan based Central Switching ☐ Enabled

Central DHCP Processing ☐ Enabled

Override DNS ☐ Enabled

NAC State

Load Balancing and Band Select

Client Load Balancing ☐

Client Band Select ☐

Passive Client

Passive Client ☐

Voice

Media Session Snooping ☐ Enabled

Re-anchor Roamed Voice Clients ☐ Enabled

KTS based CAC Policy ☐ Enabled

Radius Client Profiling

DHCP Profiling ☐

HTTP Profiling ☐

Local Client Profiling

DHCP Profiling ☐

HTTP Profiling ☐

Universal AP Admin Support

設定ssid 認證server

Web Browser

URL: https://10.227.56.1/frameWlanEdit.html

Go Stop

Save Configuration | Ping | Logout | Refresh

CISCO

MONITOR **WLANs** CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK

WLANs

WLANs > Edit 'class1'

< BACK Apply

General **Security** QoS Policy-Mapping Advanced

Layer 2 Layer 3 **AAA Servers**

Select AAA servers below to override use of default servers on this WLAN

Radius Servers

Radius Server Overwrite interface ☐ Enabled

Authentication Servers

☒ Enabled

Server 1 IP:203.72.154.101, Port:1812 None

Server 2 None None

Server 3 None None

Server 4 None None

Server 5 None None

Server 6 None None

Accounting Servers

☐ Enabled

EAP Parameters

Enable ☐

Radius Server Accounting

Interim Update ☐

LDAP Servers

AP group profile

1、group包含哪些ssid

2、套用在那些AP

Physical Config Desktop Programming Attributes

Web Browser

URL: https://10.227.56.1/frameAPGroupEdit.html

Go Stop

Save Configuration Ping Logout Refresh Home

CISCO

MONITOR WLANs CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK

WLANs

WLANs

Advanced

AP Groups

Ap Groups > Edit 'class'

< Back

General WLANs RF Profile APs 802.11u Location Ports/Module

Add New

WLAN ID	WLAN SSID(2)(6)	Interface/Interface Group(G)	SNMP NAC State
2	eduroam	eduroam	Disabled Remove
3	NTPC-Mobile	NTPC-Mobile	Disabled Remove

Foot Notes

套用在那些AP

Web Browser

URL: <https://10.227.56.1/frameAPGroupEdit.html> Go Stop

Save Configuration | Ping | Logout | Refresh

CISCO MONITOR **WLANs** CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK Home

WLANs

- WLANs
- Advanced
 - AP Groups**

Ap Groups > Edit 'class' < Back

General WLANs RF Profile **APs** 802.11u Location Ports/Module

APs currently in the Group Remove APs

☐ AP Name	Ethernet MAC
☐ Light Weight Access Point1	0001.96A1.4D01
☐ Light Weight Access Point0	000D.BD8E.4301

Add APs to the Group Add APs

☐ AP Name	Group Name
☐ Light Weight Access Point2	default-group



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

GENERAL



MAC Address

User Name

Unknown



Uptime

Host Name

Unknown

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

WLC
(LOCAL)



WLC637
10.222.50.1

Wired
(CAPWAP)



AP
(FlexConnect)



3F-MIS_MeetingRoom
10.222.50.10

Wireless
(802.11ac (5GHz))



Client
(VLAN44)



Unknown
10.222.50.170

ACCESS POINT VIEW

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%	3%	0%
Interference	0%	0%	0%
Traffic	0%	3%	0%
Air Quality	-	-	-
Admin Status	Disabled	Enabled	Enabled
Clean Air Status	Down	Down	Not applicable

Cisco AP 2802i 指令

- ▶ capwap ap ip address 10.227.56.200 255.255.255.0
- ▶ capwap ap ip default-gateway 10.227.56.254
- ▶ config capwap ap controller ip address 10.227.56.1

CISCO 2960



- ▶ 基礎第 3 層具備靜態路由和路由資訊協定 (RIP)
- ▶ 全方位 802.1X 功能，可控制網路存取，包括彈性驗證、802.1X 監控模式與 RADIUS 授權變更。