

ZYXEL

Your Networking Ally

# CCTV訓練課程

## 監控專用交換器

# Agenda (1/2)

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01  
監控要素

02  
選擇PoE  
交換器要點

03  
監控專用硬體

04  
監控模式  
及ONVIF

05  
遠距離佈建

06  
IP-CAM自動救援

# Agenda (2/2)

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07

IP-CAM供電  
不中斷

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08

LLDP Power-  
via-MDI

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09

Power-up  
Mode: 802.3bt

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10

大功率PoE供電

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11

PoE供電排程

## 1. PoE 網路

PoE 網路就是整監控網路的電源, 供電出問題, 監控就出問題

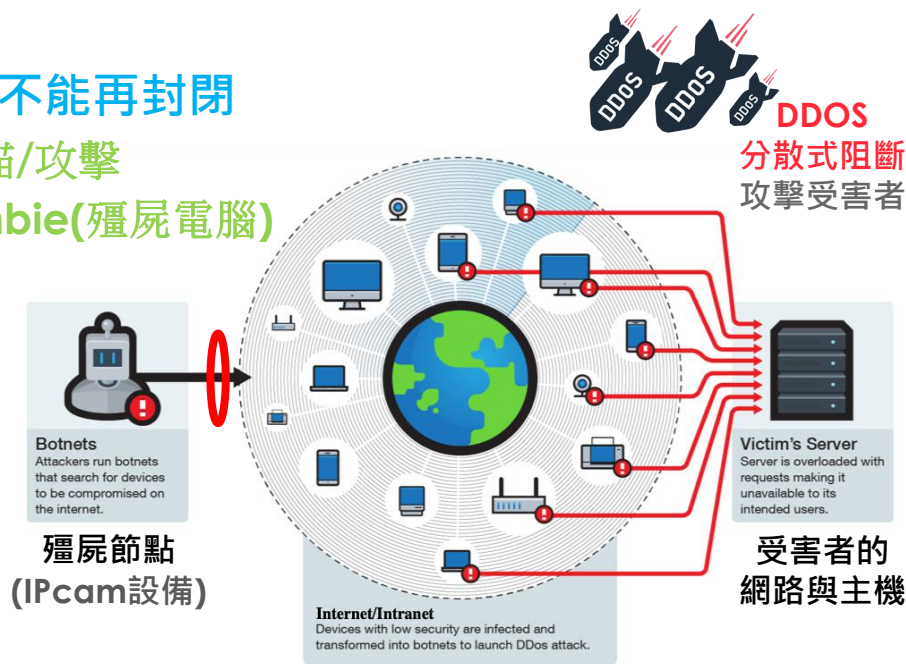
◆ PoE switch 品質參差不齊, 安裝/使用問題多

## 2. 連網(Internet) 後的資安問題

遠端/雲端監控的需求迫使CCTV 網路不能再封閉

◆ 讓camera 暴露在來自外網/內網的掃描/攻擊

◆ 輕則camera 當機, 重則被駭, 成為Zombie(殭屍電腦)



# 監控要素

01





指紋辨識器



門鈴



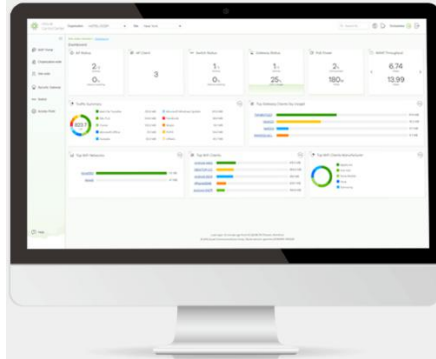
監視器



讀卡機









# 到底是誰在使用監控系統呢



# 您的監視系統被截持了嗎



# 萬物皆可駭

- ◆ 2016年底，一個名為「Mirai」的殭屍網路病毒利用 IPCAM、CCTV、DVR、IoT 裝置等系統發動了有史以來最大的一樁分散式阻斷服務 (DDoS) 攻擊。結果造成網際網路流量瞬間暴增至平常的50 倍，創下 1.2 Tbps的歷史新高。
- ◆ 2017年底，法國雲端服務商OVH遭駭客攻擊; 調查發現，駭客也是以 DDoS方式，攻擊網路監控攝影機(IP Cam)。這些例子顯示，全球的網路監視器都暴露在被入侵的風險

1. 千萬不要使用預設的帳號密碼
2. 千萬記得更新設備韌體
3. 千萬不要讓設備直接連上internet



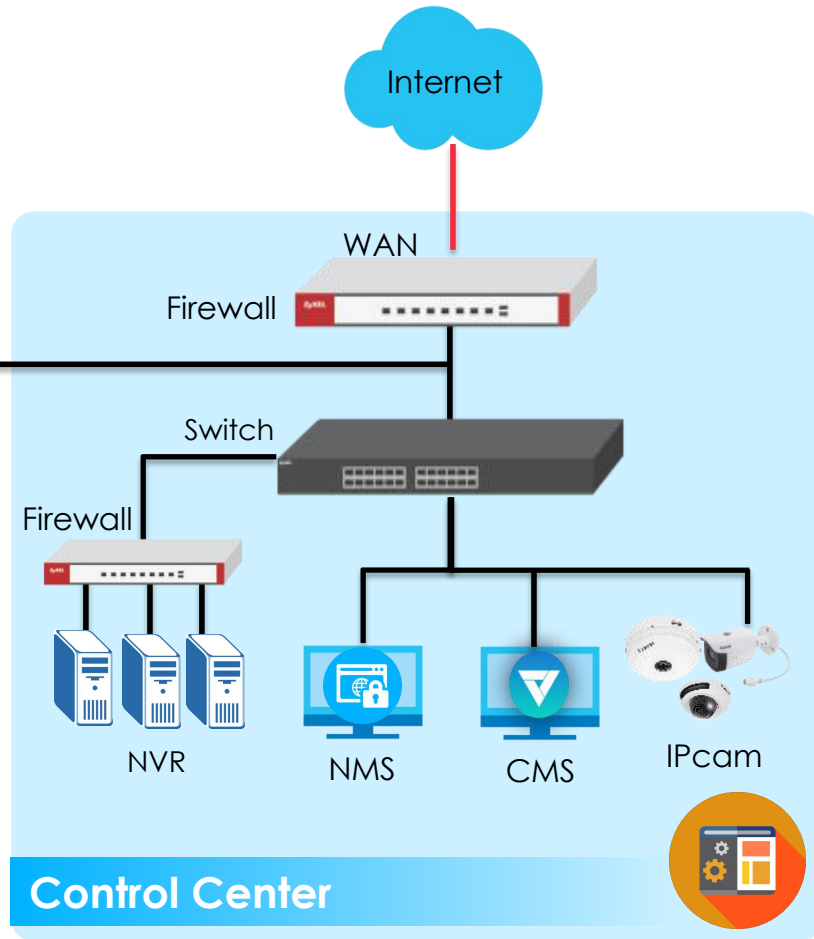
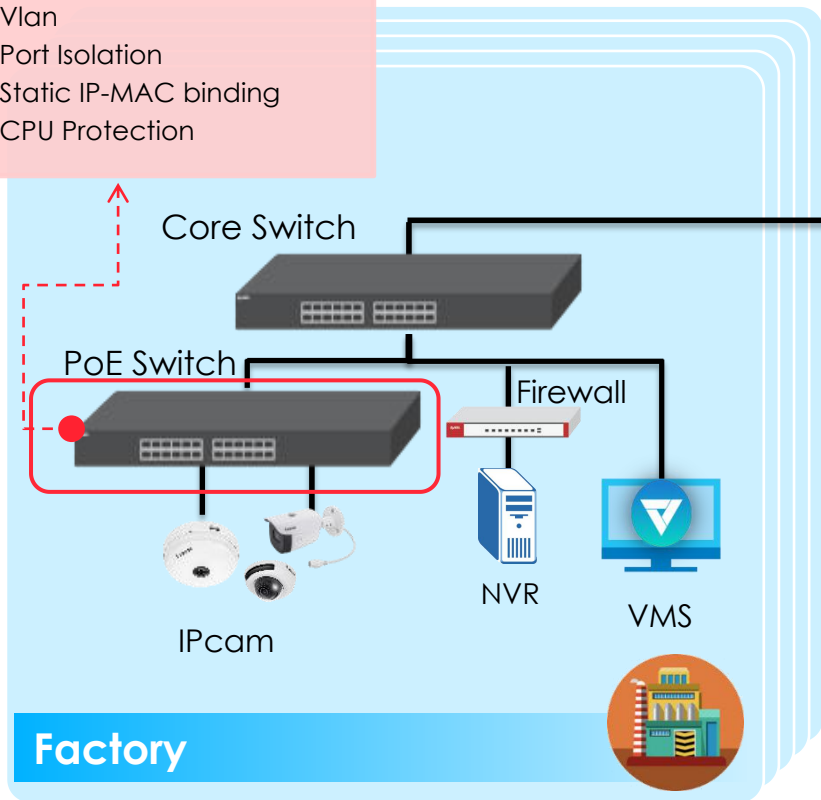
# 安全連線

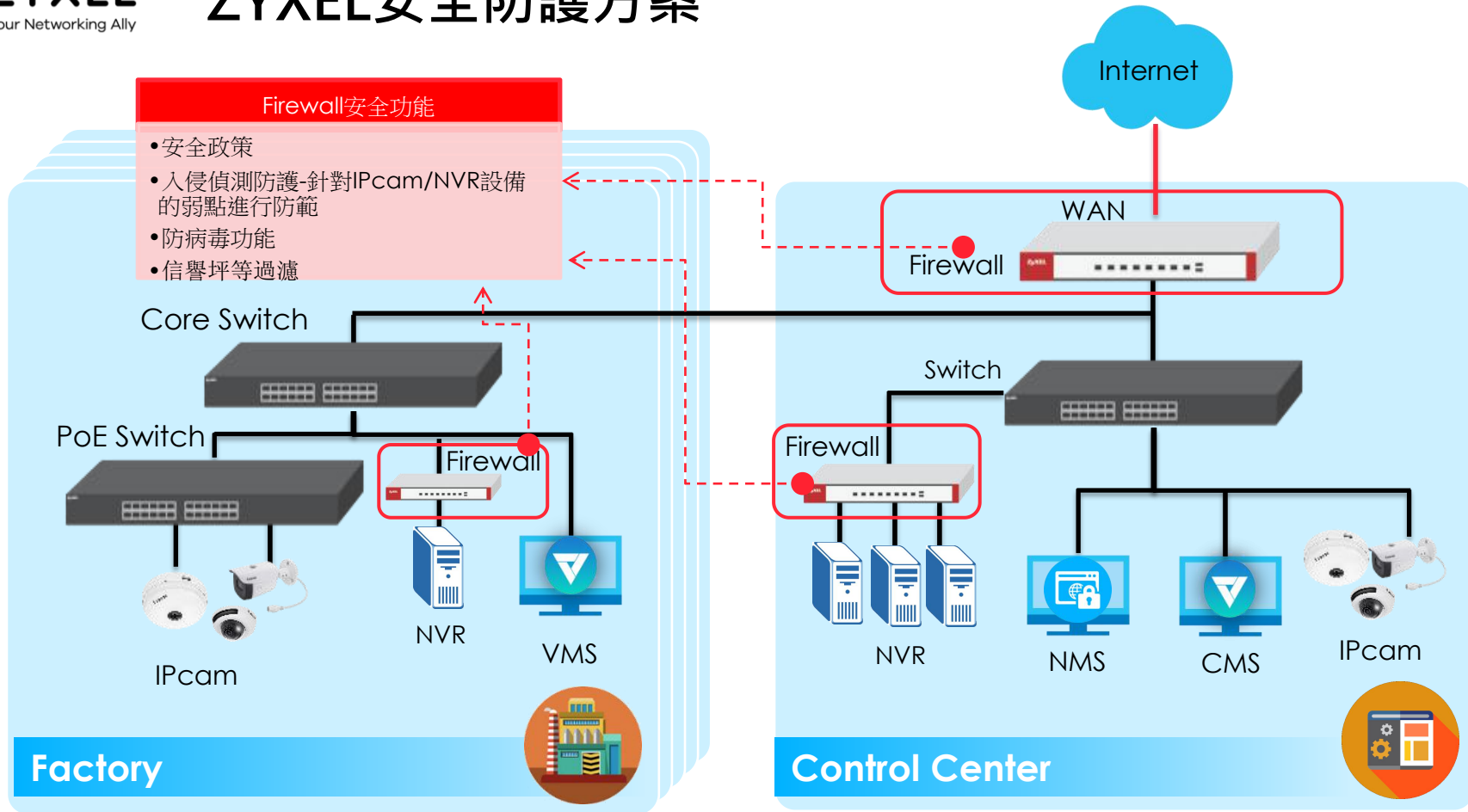
保護您的監控系統  
監控系統應增加資安防護



## Switch安全功能

- Vlan
- Port Isolation
- Static IP-MAC binding
- CPU Protection





# 選擇PoE交換器要點

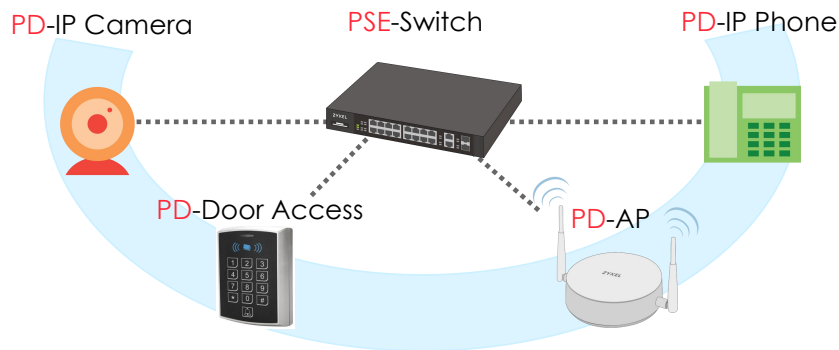
# 02





# 什麼是PoE

- 通過一條以太網路傳輸電源和數據
- PoE系統由PSE和PD組成
  - 供電端設備 (PSE, Power Sourcing Equipment)
  - 受電端設備 (PD, Power Device)



# PoE 標準協定

標準協定	類型	分級	Min. PSE Power	Max. PD Power
IEEE 802.3af PoE	Type 1	0	15.4W	12.95W
		1	4W	3.84W
		2	7W	6.49W
		3	15.4W	12.95W
IEEE 802.3at PoE+	Type 2	4	30W	25.5W
IEEE 802.3bt PoE++	Type 3	5	45W	40W
		6	60W	51W

# 標準PoE供電過程

- 檢測：設備是否為受電設備
- 分級：如果是受電設備，則對其進行分級供電
- 供電：分級完後進行穩定供電

# 非標準PoE供電問題

- 非標準PoE供電設備一接通就立刻傳輸給受電設備
- 危險一：受電端不能進行穩壓工作不穩定將縮短受電終端工作壽命；
- 危險二：燒壞設備、觸電、線路老化漏水短路火災問題



# 電力額度事項

- 市面上的大多數PoE交換器具有較低的電力額度以降低成本
  - 適用於辦公室中僅需要3-4瓦的IP電話和無線AP。
- 對於需要大功率的CCTV攝影機（如PTZ，紅外線和高速DOM）
  - 大多數攝影機僅指定最低功耗預算要求
  - 有時攝影機規格中未列出需要更多功耗的高級功能
- 選擇錯誤的PoE交換器
  - 攝影機無法在晚上開啟紅外線或PTZ，導致監視系統可能會出錯
  - 這兩種情況都需要更多的電力才能操作

**Larger PoE PWR budget delivers worry-free installation experience for camera installers.**

# 直覺的PoE顯示

## GS1350 SERIES

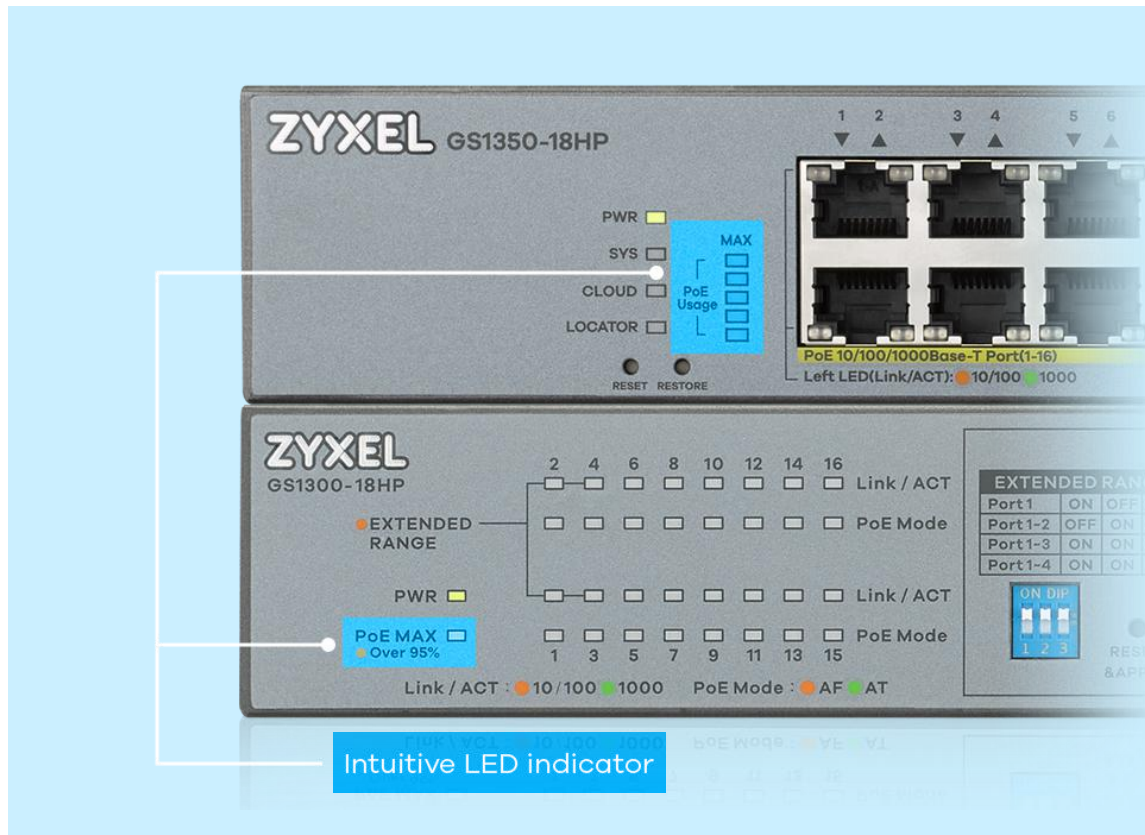
MANAGED

- 5段PoE消耗顯示可得知當前PoE消耗電力

## GS1300 SERIES

UNMANAGED

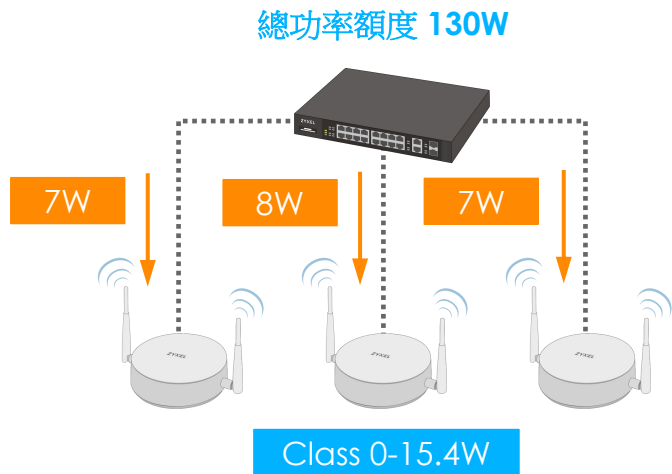
- PoE最大LED顯示PoE消耗何時耗盡 (>95%)



# PoE 供電分配模式 (1/2)

- 分類模式 (Classification Mode)
  - 根據被供電設備的類別保留功率。
  - 缺點是無法充分利用總功率額度，導致交換器連接較少的被供電設備。
- 功耗模式(Consumption Mode)
  - 根據被供電設備的實際消耗功率分配總功率額度。
  - 缺點是如果實際使用量超過了總功率額度，則**低優先級PD**將會先被斷電。

# PoE 供電分配模式 (2/2)



## 分類模式 (Classification Mode)

消耗功率	$7+8+7 = 22\text{W}$
分配功率	$15.4+15.4+15.4 = 46.2\text{W}$
剩餘功率	$130-46.2 = 83.8\text{W}$

## 消耗模式 (Consumption Mode)

消耗功率	$7+8+7 = 22\text{W}$
分配功率	N/A
剩餘功率	$130-22 = 108\text{W}$



# 點選式的PoE選項

- PoE交換器為支援更多的PoE裝置，提供精細的選項可進行調整
- Zyxel提供了詳盡的PoE選項來解決這些IOP問題

PoE Setup				<a href="#">PoE Status</a>		
PoE Mode		<input type="radio"/> Classification <input checked="" type="radio"/> Consumption				
Continuous PoE		Active <input checked="" type="checkbox"/>				
Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI
*	<input type="checkbox"/>	Critical ▼	802.3af ▼		<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>

# 監控專用硬體

03





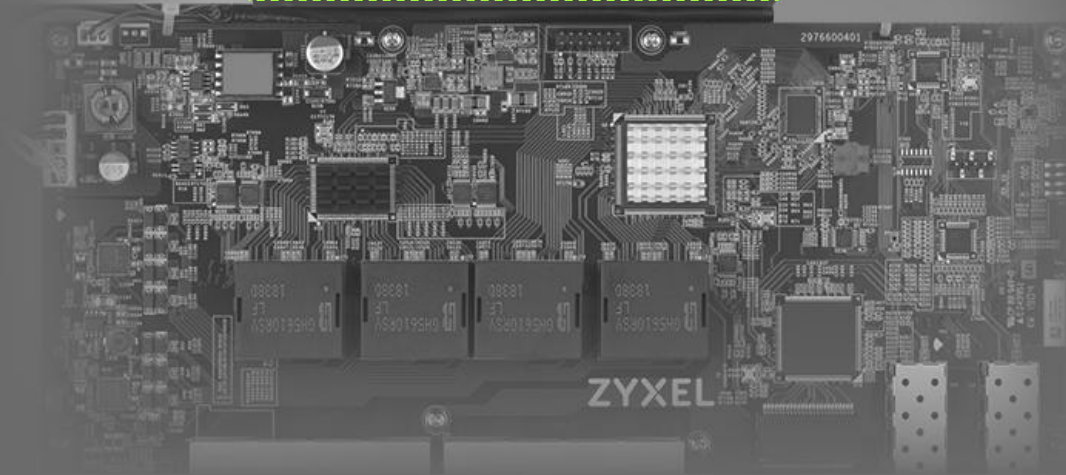
監控交換器採用獨特的  
硬體設計，可提供堅固的保  
護，以保護交換器免受雷電  
感電和ESD造成的損壞和網  
路不穩定。

# 獨特硬體設計

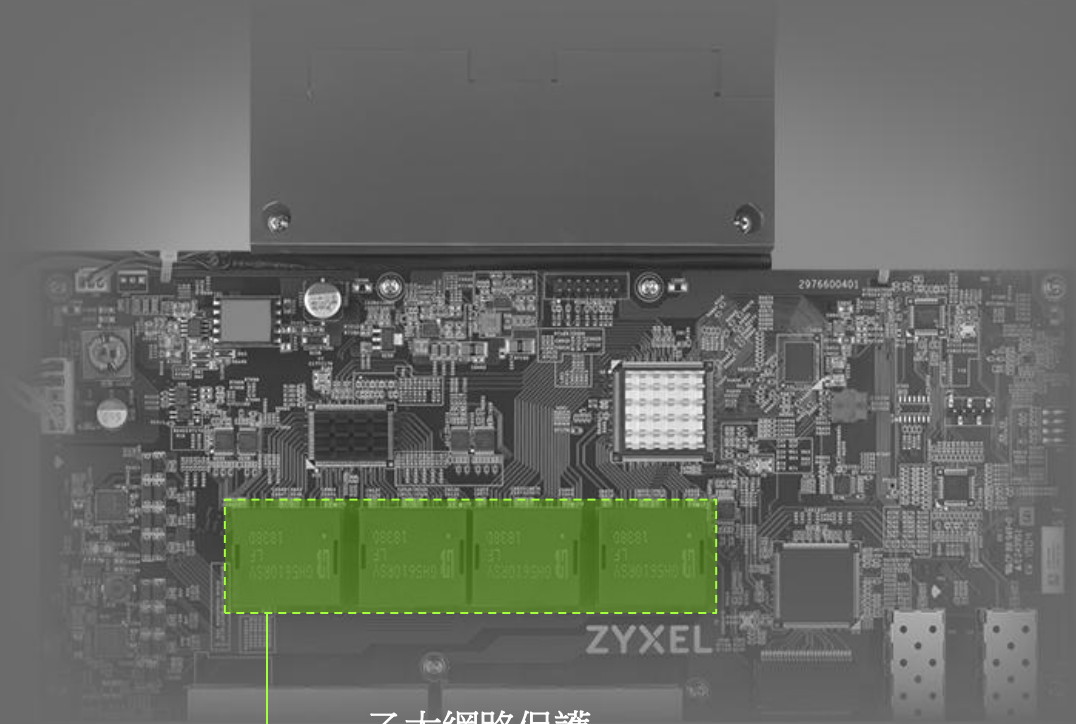


● 電源供應器

2X 突波及靜電保護



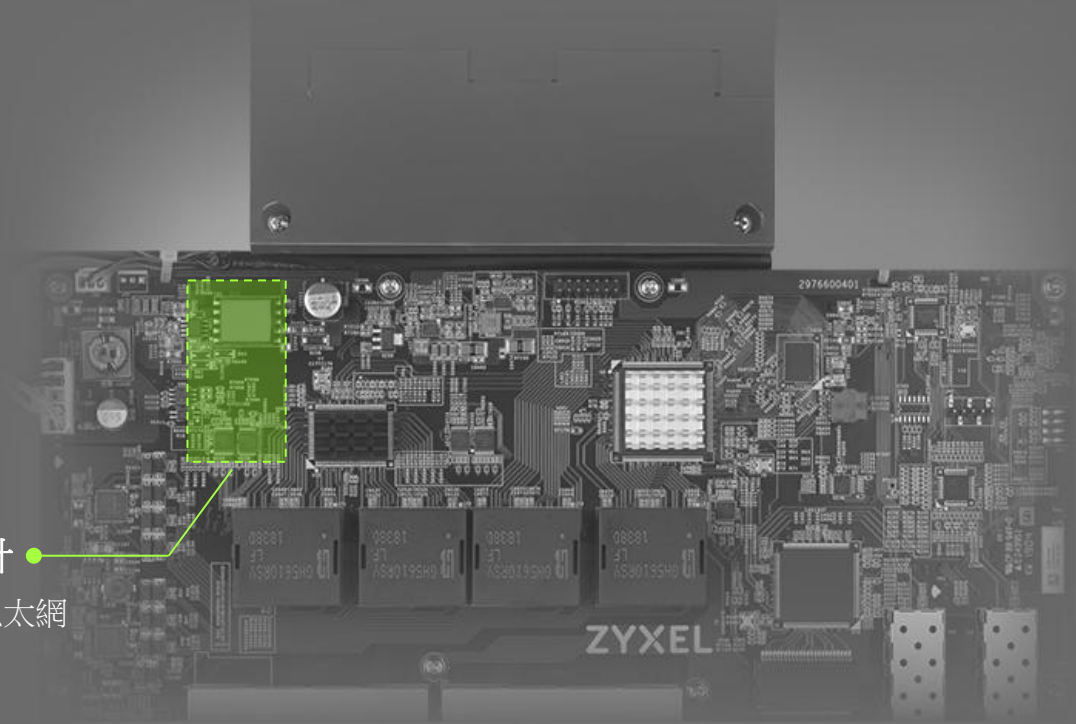
# 獨特硬體設計



## 乙太網路保護

- 4X 突波保護
- 2X 靜電保護

# 獨特硬體設計



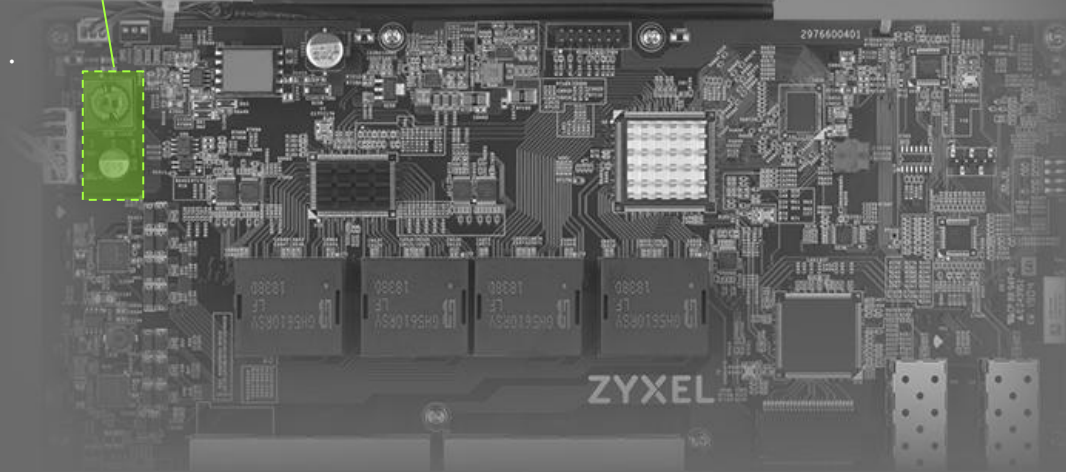
## 隔離電路設計

將隔離突波已提供以太網路和電源保護

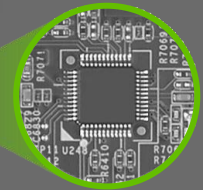
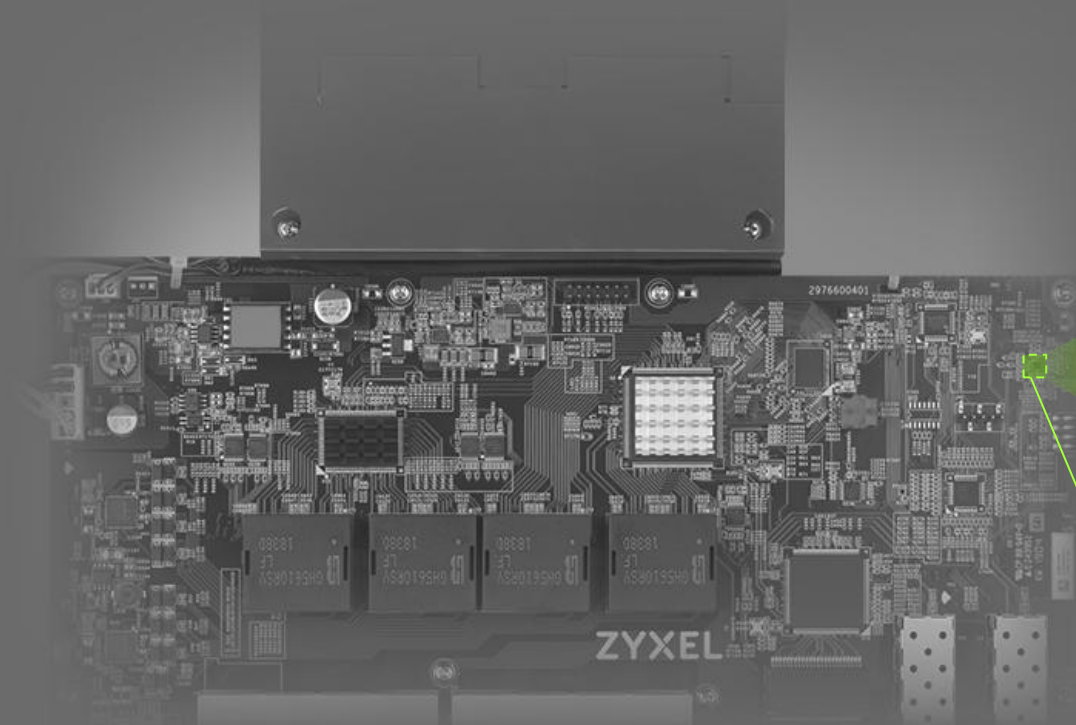
# 獨特硬體設計

穩定電源

過濾電噪和突波，以確保  
為PoE和系統提供穩定的  
電源



# 獨特硬體設計



● 智能系統監控器  
使系統保持正常運行



# 雷擊突波/ESD保護

	GS1350 Series	GS1300 Series
<b>Ethernet port</b> 突波保護	4 KV	2 KV
<b>Ethernet Port</b> 靜電防護	15 KV (Air) 8 KV (Contact)	8 KV (Air) 4 KV (Contact)
<b>Power supply</b> 突波保護	4 KV	4 KV

# 監控模式及ONVIF

04



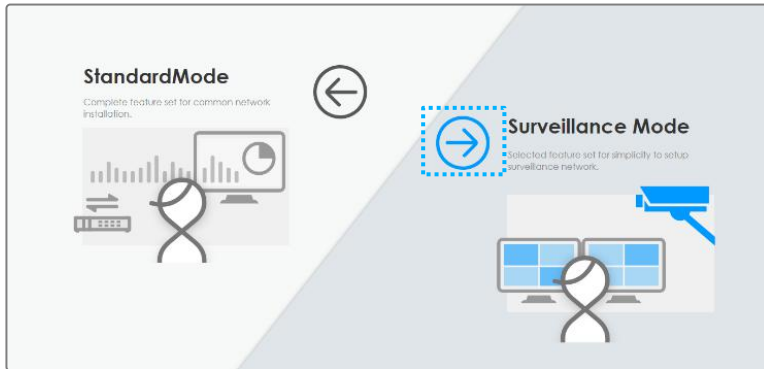
# 監控模式-Surveillance Mode

- 為何使用 **Surveillance Mode**?
  - 提供直覺的 Web 界面方便 IP 監控安裝
  - 提供安裝 IP camera 交換器 Port 口的必要資訊

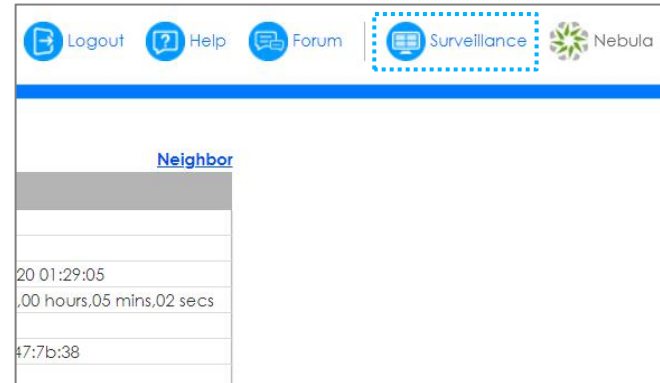
# Surveillance Mode

- 如何切換至 **Surveillance Mode**?
  - 初次使用設備在登入設備後可以直接選擇
  - 從主控面板的右上角進行切換

## After first user login



## From Main Dashboard



# Surveillance Mode

- 摘要資訊面板



### PD 健康狀態

- 透過Auto PD Recovery 偵測並顯示

### CRC

- 顯示交換器 Port 上的錯誤格式封包數

### Summary

- 顯示透過 ONVIF 學到的設備
- 顯示 PoE 供電狀態

### 設備清單

- 透過 LLDP 或 ONVIF 找到的裝置

# Surveillance Mode

- 摘要資訊面板 – PD Health

- 當 Auto PD Recovery 功能在 Switch Port 上啟用後
- 3 種可能的狀態：
  - 綠燈 – 交換器透過 LLDP/Ping 機制在 polling interval 期間偵測到設備正常回應
  - 紅燈 – 交換器透過 LLDP/Ping 機制在 polling interval 期間偵測到設備異常
  - 橘燈 – 交換器 Port 在 resume power interval 或 resume polling interval (設備偵測異常重開還未回復至正常工作狀態)

被供電設備 健康狀態

- 透過 Auto PD Recovery 偵測並顯示

Port	Port Name	PD Health	Link Speed	Port Draw	Bandwidth Tx/Rx(M)	CRC	Extended Range	Device Type	System Name	IP	Discovered Devices	Action
1		●	100M/F	9.1	0.0/0.0	0	Disable	IP camera	WV-SFW532L	192.168.10.11	1	Reboot Default
2		●	100M/F	12.2	0.0/0.0	0	Disable	IP camera	WV-SFV781L	192.168.10.12	1	Reboot Default
3		●	100M/F	10.6	100/100	1	Disable	IP camera	WV-42550L	192.168.10.13	1	Reboot Default
4		●	100M/F	12	100/0.0	0	Disable	IP camera	WV-06131	192.168.10.14	1	Reboot Default
5		●	100M/F	4.1	100/100	1	Disable	IP camera	DS-2CD2025FWD	192.168.10.15	1	Reboot Default
6		●	100M/F	5	100/0.0	0	Disable	IP camera	IPC-HFW1430S	192.168.10.16	1	Reboot Default

# Surveillance Mode

## • 摘要資訊面板 – Cyclic Redundancy Check (CRC)

- 顯示進入交換器 Port 的錯誤或損毀封包數量
- 正常的網路此數值應為 “0”
- CRC 可能會因為不良的線路品質而增加
- CRC 如果持續增加應考慮更換網路線

Port	Port Name	PD Health	Link Speed	Port Draw	Bandwidth Tx/Rx(M)	CRC	Extended Range	Device Type	System Name	IP	Discovered Devices	Action
1		●	100M/F	9.1	0.0/0.0	0	Disable	IP camera	WV-SFW532L	192.168.10.11	1	Reboot Default
2		●	100M/F	12.2	0.0/0.0	0	Disable	IP camera	WV-SFV751L	192.168.10.12	1	Reboot Default
3		●	100M/F	10.6	100/100	1	Disable	IP camera	WV-S2550L	192.168.10.13	1	Reboot Default
4		●	100M/F	12	100/0.0	0	Disable	IP camera	WV-S4131	192.168.10.14	1	Reboot Default
5		●	100M/F	4.1	100/100	1	Disable	IP camera	DI-2CD0025PWD	192.168.10.15	1	Reboot Default
6		●	100M/F	5	100/0.0	0	Disable	IP camera	IPC-HFW1450S	192.168.10.16	1	Reboot Default

### CRC

- 顯示交換器 Port 上的錯誤格式封包數

# Surveillance Mode

- **Quick Setup Panel**

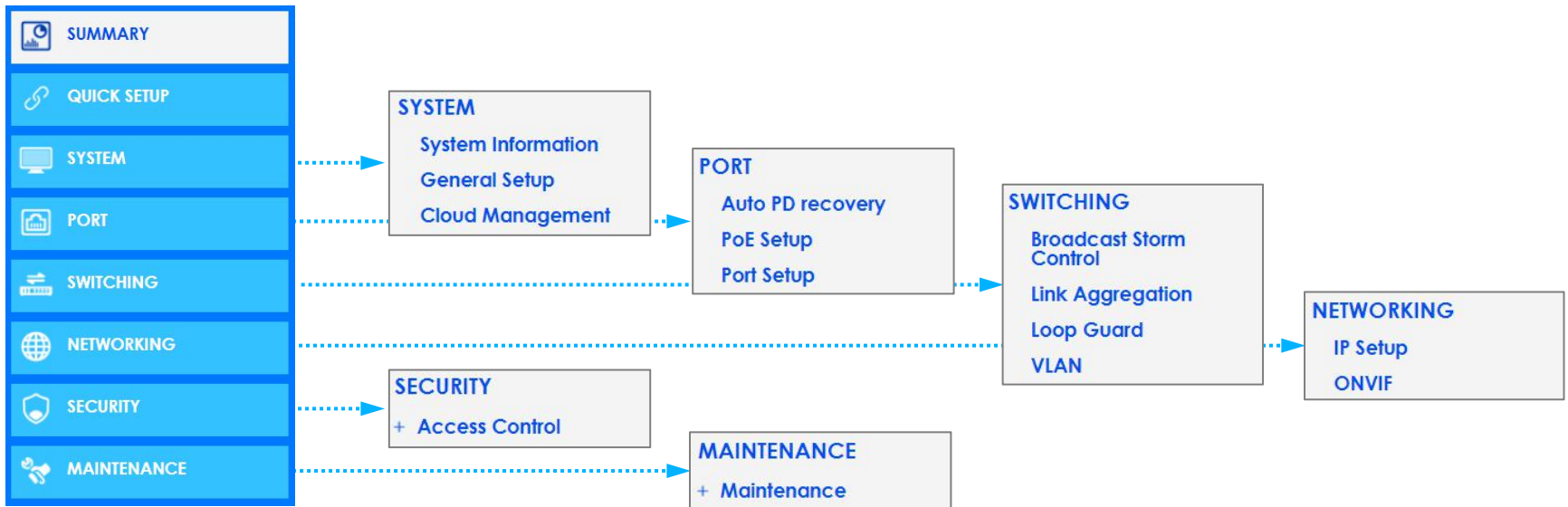
- Provides quick links to surveillance-related setup

The screenshot displays the ZYXEL GS1350 web interface. At the top, the header includes the ZYXEL logo, the model number GS1350, and navigation icons for Refresh, Save, Wizard, Logout, Help, Forum, Standard, and Nebula. A vertical sidebar on the left contains menu items: SUMMARY, QUICK SETUP (highlighted), SYSTEM, PORT, SWITCHING, NETWORKING, SECURITY, and MAINTENANCE. The main content area is divided into two sections. The 'IP Address Information' section shows the IPv4 Address as 172.21.56.68, the Subnet Mask as 255.255.252.0, and the Default Gateway as 172.21.59.254, with a link to 'IP Setup'. The 'Quick Links' section features four icons with corresponding links: 'Auto Camera Recovery', 'PoE Setup', 'Extended Range & Port Setup', and 'ONVIF'.



# Surveillance Mode

- Navigation Panel



# Surveillance: ONVIF

- 成立目的
  - 促進不同品牌網路視訊監控設備間的整合
  - 幫助生產製造商、軟體開發商及獨立軟體供應商確保產品間的可互通性
  - 提供網路管理者資訊以辨識連結設備

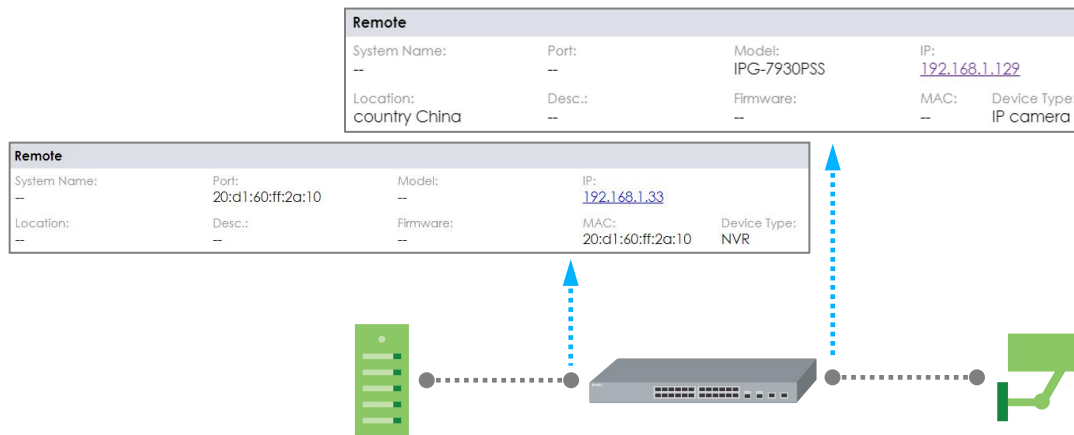
# Surveillance: ONVIF

- Open Network Video Interface Forum
- 於 2008 年由下列公司制定：
  - Axis Communications,
  - Bosch Security Systems
  - Sony Corporations
- 開放性組織，專注於網路IP安防產品，如網絡攝影機連接到網絡錄影機(NVR)，網絡攝影機連接到監控軟體(VMS)，及門禁系統的全球標準制定。
- 統一開放的標準作為網路攝影機、影像伺服器、門禁設備及中央管理系統之溝通協定，使監控系統更易於整合及擴充。
- 規範中的管理及控制介面，均使用瀏覽器操作設定

# Surveillance: ONVIF

- **Web Service Dynamic Discovery (WS-Discovery)**

- 使用 Multicast 的方式進行 IP 安全產品的搜尋
- 目的位址: **239.255.255.250**
- 使用 UDP port **3702**
- Packet Types:
  - Hello
  - Probe
  - Probe Match
  - Bye



# Surveillance: ONVIF

- **WS-Discovery**

- 交換器啟用 ONVIF 後會聽取 WS-Discovery 訊息
  - **Probe** 訊息由 **NVR** 送出
  - **Probe-Match** 訊息由 **IP cameras** 送出
  - **Bye** 訊息在設備準備離開網路時送出
  - 交換器每 30sec 送出 probe messages 到 ONVIF 啟用的 ports
  - 交換器會改掉 (unlearn) 裝置狀態在裝置沒有活動的 120 秒後
  - 如果裝置從交換器 Port 移除或斷線，那 Port 上的裝置狀態會被移除

# Surveillance: ONVIF

- Web GUI: Surveillance Mode

NETWORKING

ONVIF

ZYXEL | GS1350

Refresh Save Wizard Logout Help Forum Standard Nebula

NETWORKING

IP Setup

ONVIF

ONVIF

Active  ON

Apply Cancel

VLAN

+ Add Edit Delete

Index	VID	Port
1	1	1-24
2	10	1-20

+Add

- 最多增加2個VLAN

Surveillance Mode

## Active (dial)

- 預設“OFF”
- 設定“ON”, WS-discovery顯示下面VLAN /Port的訊息

# Surveillance: ONVIF

- Web GUI: Surveillance Mode

## SUMMARY

Auto Refresh 60 Sec.

Neighbor Detail >

### Summary

Connect Ports

2 / 26

IP CAM: 0  
NVR: 0  
Others: 2

Power Usage(W): 0

Port	Port Name	PD Health	Link Speed	PoE Draw	Bandwidth Tx/Rx(%)	CRC	Extended Range	Device Type	Sys No
1	--	1G/F	0.0	0.0/0.0	0	Disable	--		
2	--	Down	0.0	0.0/0.0	0	Disable	--		
3	--	Down	0.0	0.0/0.0	0	Disable	--		

### Neighbor Detail

Search Ports...

Flush All

Flush

Reboot

Default

**Port 1**

Port Name:	PD Health:	Link Speed:	PoE Draw:
--	--	100M/F	2.1
Bandwidth Tx/Rx(%):	CRC:	Extend Range:	PD Failed Count:
0.0/0.0	0	Disable	0

**Remote**

System Name:	Port:	Model:	IP:	
--	--	IPG-7930PSS	192.168.1.129	
Location:	Desc.:	Firmware:	MAC:	Device Type:
country China	--	--	--	IP camera

NOTE: ONVIF 設備搜尋只在 **Surveillance Mode** 才會出現

# Surveillance: ONVIF

- Web GUI: Standard Mode

Advance Application

ONVIF

The screenshot shows the ONVIF configuration page. At the top, there is a section for 'ONVIF' with a checkbox labeled 'Active' which is checked. Below this are 'Apply' and 'Cancel' buttons. The next section is 'VLAN', which contains input fields for 'VID' and 'Port', and 'Add', 'Cancel', and 'Clear' buttons. At the bottom, there is a table with columns 'Index', 'VID', 'Port', and a checkbox. The table contains two rows: Index 1 with VID 1 and Port 1-24, and Index 2 with VID 10 and Port 1-20. Below the table are 'Delete' and 'Cancel' buttons.

Index	VID	Port	<input type="checkbox"/>
1	1	1-24	<input type="checkbox"/>
2	10	1-20	<input type="checkbox"/>

## Active (checkbox)

- 預設“沒打勾”
- “打勾”後WS-discovery顯示下面VLAN /Port的訊息

## +Add

- 最多增加2個VLAN



# Surveillance: ONVIF

- **What information is displayed in Neighbor Detail page?**
  - Mix of information gathered from LLDP and WS-Discovery
  - Switch prioritizes WS-Discovery over LLDP information

## CLI

```
GS1350# show onvif info interface port-channel 1
```

```
Port 1
Discovered Devices : 1

Device Name : ONVIF_CAMERA
Device Type : IP Camera
Model : IPG-7930PSS
IP Address : 192.168.1.129
Location : country China
```

```
GS1350#
```

## WEB GUI

**Neighbor Detail** [Summary](#)

Search Ports...

**Port 1**

Port Name:	PD Health:	Link Speed:	PoE Draw:
	--	100M/F	2.1
Bandwidth Tx/Rx(%):	CRC:	Extend Range:	PD Failed Count:
0.0/ 0.0	0	Disable	0

**Remote**

System Name:	Port:	Model:	IP:
--	--	IPG-7930PSS	<a href="#">192.168.1.129</a>
Location:	Desc.:	Firmware:	MAC:
country China	--	--	--

**Device Type:** IP camera

### Device Type

- Determined by WS-Discovery
- Either "IP camera" or "NVR"

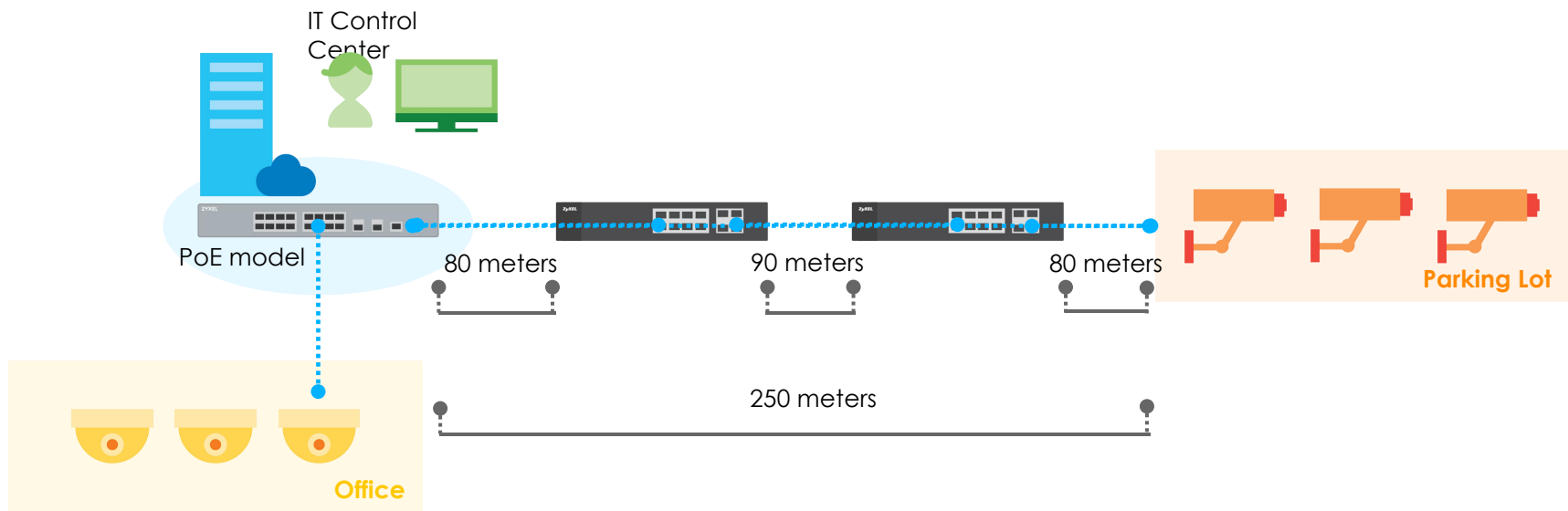
# 遠距離佈建

05



# 背景

- 傳統佈建上需要額外的PoE交換器才能將供電和數據延伸到100米以上



# Is It Standard?

- 在延伸距離上，交換器將鏈接速度固定為10Mbps
  - 符合IEEE802.3i 10BASE-T標準
- 在延伸距離上，克服長距離電纜的功率損耗
  - PoE電源模式基於IEEE 802.3at標準

# 需求

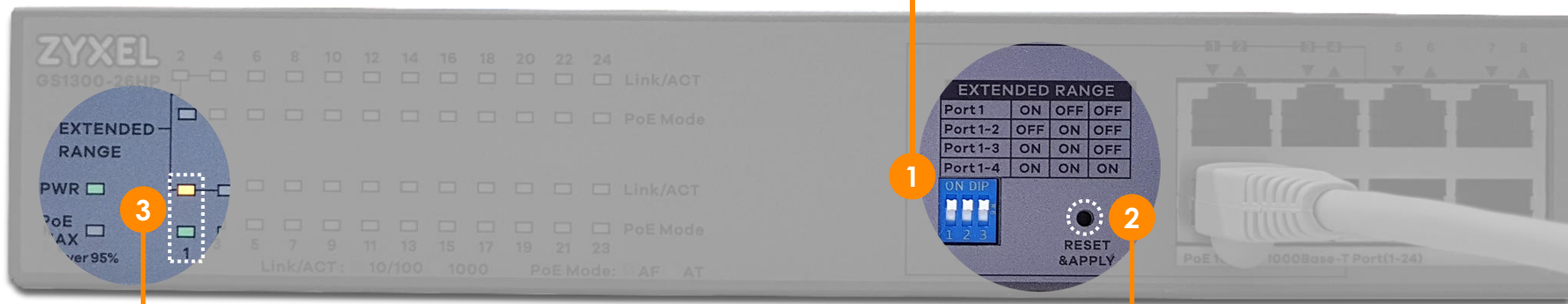
- 合勤解決方案
  - 基於標準以太網路10Mbps
  - 受電設備應為
    - 802.3af模式
    - 能夠以10Mbps的連接速度運行
  - 配置延展距離的供電端設備網路接口
    - 強制802.3at模式
    - 供電功率高達33W
    - 連接速度固定為10Mbps
- 以太網路電纜要求Cat.5e以上
- GS1300系列可以將被供電設備的電源延伸到250米

# 3-Step for Extended Range on GS1300 Series

## STEP 1

撥動所選網路埠的DIP開關

*\*only 2/4 ports on GS1300*



## STEP 3

確認:

Link LED 顯示橘燈(10Mbps)

PoE LED 顯示綠燈(802.3at)

## STEP 2

重新啟動交換器

# 2-Step for Extended Range on GS1350 Series

1. 在特定網路埠啟用此功能

- **Basic Setting > Port Setup**

**STEP 1.1**  
Configure the particular port

Port	Active	Name	Speed / Duplex	Extended Range	Flow Control	802.1p Priority
*	<input type="checkbox"/>		Auto	<input type="checkbox"/>	<input type="checkbox"/>	0
1	<input checked="" type="checkbox"/>		Auto	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0
2	<input checked="" type="checkbox"/>		Auto	<input type="checkbox"/>	<input type="checkbox"/>	0
3	<input checked="" type="checkbox"/>		Auto	<input type="checkbox"/>	<input type="checkbox"/>	0
4	<input checked="" type="checkbox"/>		Auto	<input type="checkbox"/>	<input type="checkbox"/>	0
5	<input checked="" type="checkbox"/>		Auto	<input type="checkbox"/>	<input type="checkbox"/>	0
6	<input checked="" type="checkbox"/>		Auto	<input type="checkbox"/>	<input type="checkbox"/>	0

Buttons: Refresh, Save, Status

Buttons: Apply, Cancel

**STEP 1.3**

Click to save the configuration

**2**

**STEP 1.2**

Click to apply the setting

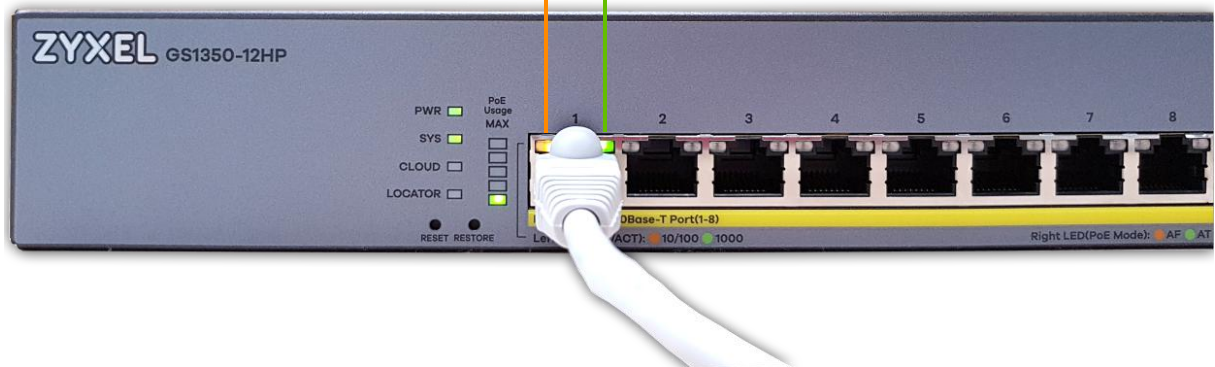
# 確認狀態

## 2. 網路重新連線

- Link LED: **Amber**
- PoE LED: **Green**

Link LED shows **amber** for 10Mbps

PoE LED shows **green** for 802.3at





# 可能遇到的障礙

- IP攝影機不同類型與型號（Dome，PTZ ..）
- 由於硬體電氣設計的原因，供電端設備和IP攝影機之間的最大數據傳輸長度會有所不同。
- 網路線的品質也會影響傳輸期間的數據信號
- 一些帶有尾纜的IP攝影機往往很難具有與標準以太網網路線相似的品質



# 提示

- 在部署延伸模式的攝影機之前，請進行以下測試
  1. 檢查攝影機是否可以開機，以確保電源無異常
  2. 執行ping測試以檢查數據傳輸是否正常
  3. 如果ping測試失敗
    - 將以太網路線更改為更好的Cat5e或Cat6品牌
    - 縮短線路長度\*小於250m

\* According to our internal tests, 200m seems to work in most cases.

- Relevant IOP test report, please visit [the zypartner website](#)

# IP-CAM自動救援

06



# 畫網路架構的好幫手-LLDP

- Main Status > Neighbor

Switch Neighbor										<a href="#">Status</a>	<a href="#">Neighbor Detail</a>
Port	Port Name	PD Health	Link	PoE Draw (W)	System Name	IP	PWR Cycle	Reset to Default			
1	--	--	1G/F	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
2	AP1	<span style="color: green;">●</span>	1G/F	4.3	WAC6502D-E	<a href="#">192.168.1.28</a>	Cycle	Reset	<input type="checkbox"/>		
3	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
4	AP2	<span style="color: green;">●</span>	1G/F	4.1	WAC6503D-S	<a href="#">192.168.1.30</a>	Cycle	Reset	<input type="checkbox"/>		
5	SwitchD	--	1G/F	0.0	XGS4600-32F	<a href="#">192.168.1.4</a>	Cycle	Reset	<input type="checkbox"/>		
6	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
7	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
8	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
9	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
10	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
11	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
12	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
13	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
14	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
15	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
16	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
17	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		
18	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>		

[Flush](#)

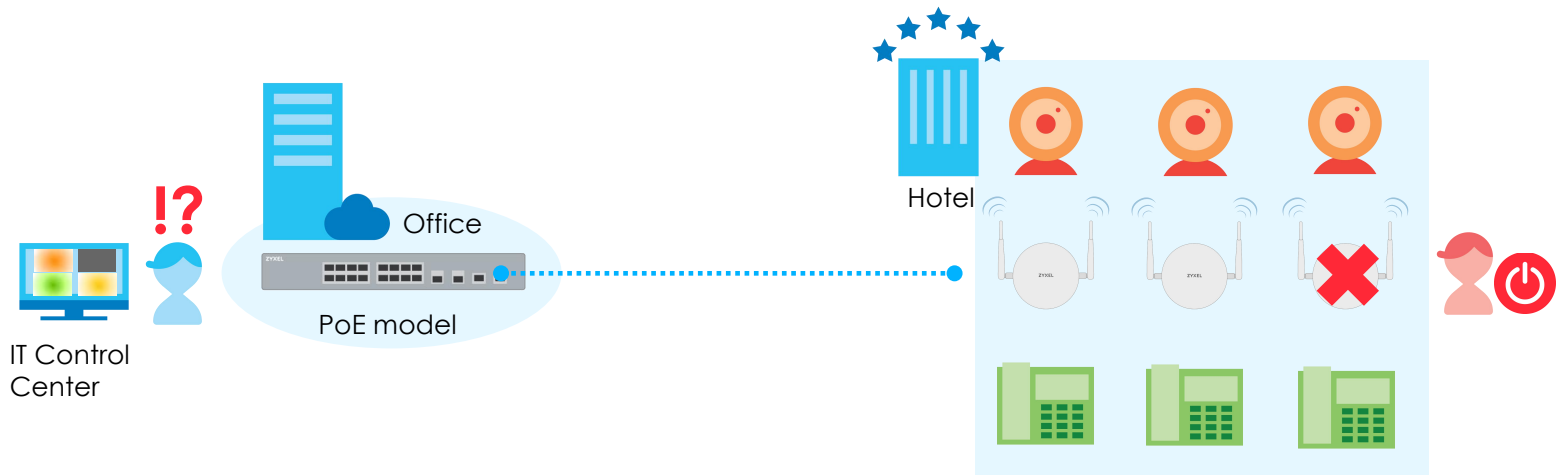
# Switch 鄰居表詳細頁面

- [Main Status > Neighbor > Neighbor Detail](#)
- 每個Port保留多達10個設備信息

Local Port 5									
Desc.	SwitchD	PD Health	--	Link	10M/H	PoE Draw (W)	0.0	PWR Cycle	Cycle
Remote									
System Name	WAC6502D-E	Model	WAC6502D-E	Firmware	V5.40(AASD.0)	IP		<a href="#">192.168.1.28</a>	
Port 1	Desc. UPLINK	Location	Port2	MAC	A0-E4-CB-84-94-18	Reset to Default		Reset	
System Name	WAC6502D-S	Model	WAC6502D-S	Firmware	V5.40(AASE.0)	IP		--	
Port 1	Desc. UPLINK	Location	--	MAC	A0-E4-CB-7E-EC-22	Reset to Default		Reset	
System Name	NWA1123-AC-HD	Model	NWA1123-AC-HD	Firmware	V5.46(ABIN.0)	IP		<a href="#">192.168.1.2</a>	
Port 1	Desc. UPLINK	Location	--	MAC	60-31-97-0F-8D-28	Reset to Default		Reset	
System Name	SwitchC	Model	GS2210-8HP	Firmware	V4.50(AASQ.2)   02/27/2018	IP		<a href="#">192.168.1.1</a>	
Port 1	Desc.	Location		MAC	4c-9f-ff-7f-03-dc	Reset to Default		Reset	
System Name	NWA5123-AC-HD	Model	NWA5123-AC-HD	Firmware	V5.40(ABIM.0)-DF-2019-04-25	IP		--	
Port 1	Desc. UPLINK	Location	--	MAC	5C-E2-8C-9F-F5-D5	Reset to Default		Reset	
System Name	NWA1123-ACv2	Model	NWA1123-ACv2	Firmware	V5.35(ABEL.4)	IP		192.168.1.2	
Port 1	Desc. lan	Location	--	MAC	1C-74-0D-FF-B8-36	Reset to Default		Reset	
System Name	nwa1121-ni	Model	NWA1121-NI	Firmware	V2.10(AABJ.0)	IP		192.168.1.2	
Port 1	Desc. eth0	Location	--	MAC	4c-9e-ff-6c-e3-ed	Reset to Default		Reset	
System Name	wac6502d-e	Model	WAC6502D-E	Firmware	V4.23(AASD.2)-DF-2017-10-11	IP		192.168.1.2	
Port 1	Desc. UPLINK	Location	--	MAC	4C-9E-FF-90-B0-58	Reset to Default		Reset	
System Name	NWA5121-NI	Model	NWA5121-NI	Firmware	V5.10(AAID.6)-DF-2019-02-15	IP		192.168.1.2	
Port 1	Desc. lan	Location	--	MAC	B0-B2-DC-71-B4-2E	Reset to Default		Reset	
System Name	XGS4600-32F	Model	XGS4600-32F	Firmware	V4.60(ABBI.0)   11/26/2018	IP		192.168.1.4	
Port 25	Desc.	Location		MAC	B8-EC-A3-0F-CE-D3	Reset to Default		Reset	

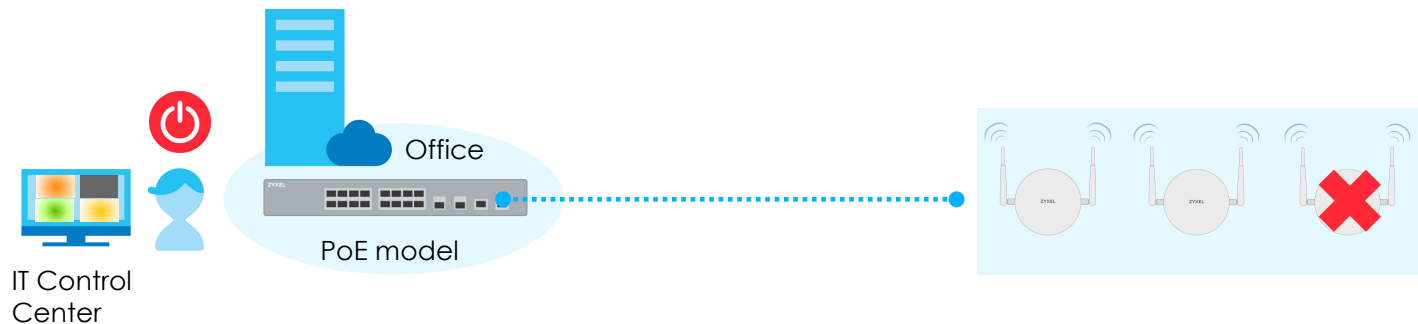
# 情況

- 當發現受電端無法正常工作時，通過PoE交換器重新啟動
- 但是如果未發現呢？



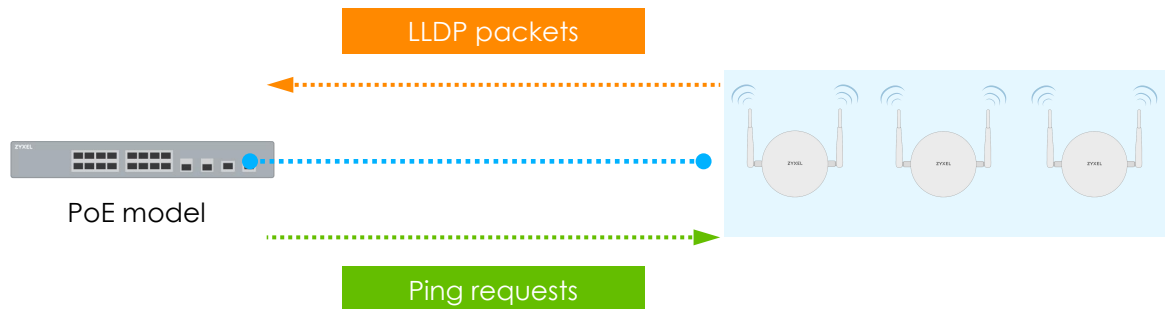
# Auto PD Recovery

- 重置被供電設備的電源
- 確保網路的可靠性
- 減少耗時的故障排除



# Auto PD Recovery Mode

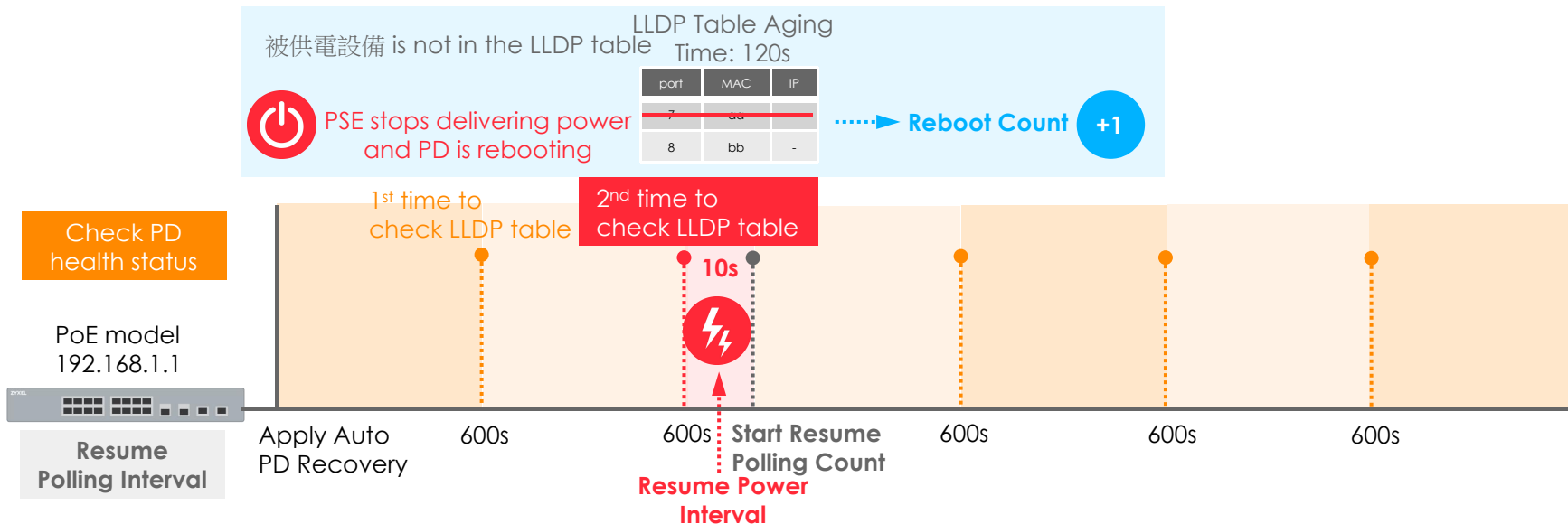
- LLDP mode
  - 被動監視來自於被供電設備的LLDP數據
- Ping mode
  - 主動通過執行ping請求來檢測被供電設備狀態





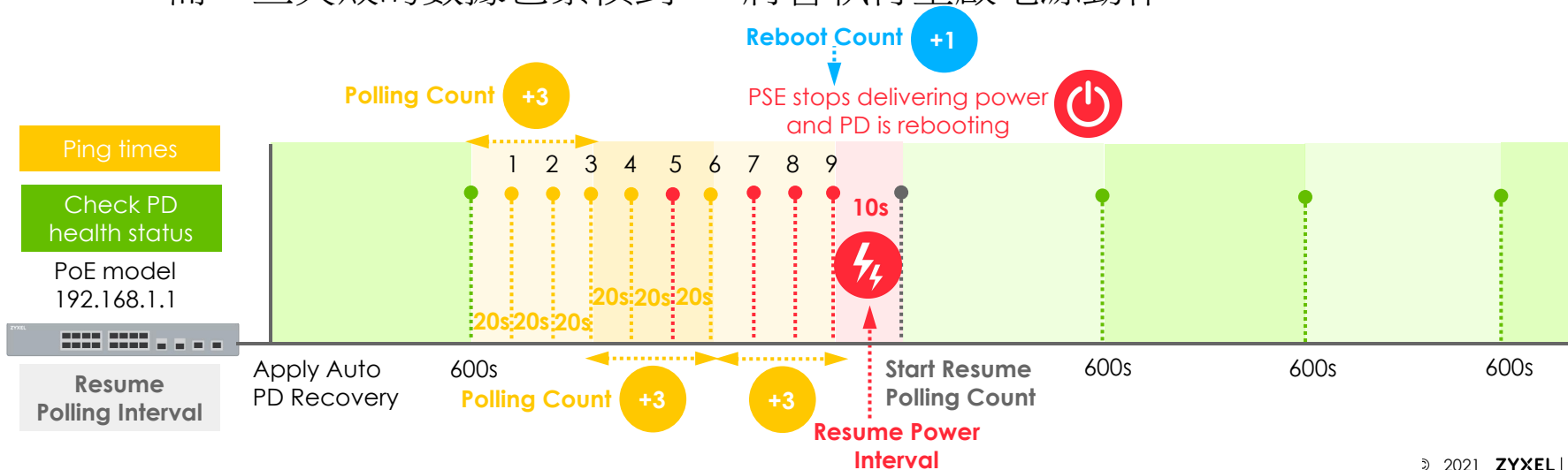
# LLDP Mode

- 交換器預設為LLDP模式
- 監控來自於被供電設備的LLDP數據
- 當LLDP表中發現被供電設備不存在，將執行重啟電源動作



# Ping Mode

- 通過執行ping請求來檢測被供電設備狀態
  - 每階段運行3次ping
  - 每20秒執行一階段
- 開始計算沒有收到ping失敗的數據
- 而一旦失敗的數據包累積到9，將會執行重啟電源動作



# Web GUI

- Advanced Application > Auto PD Recovery

Auto PD Recovery									
Auto PD Recovery <input type="checkbox"/> Active <input checked="" type="checkbox"/>									
Port	Active	Mode	Neighbor	Polling Interval (sec)	Polling Count	Action	Resume Polling Interval (sec)	PD Reboot Count	Resume Power Interval (sec)
.	<input type="checkbox"/>	<input type="radio"/> LLDP <input type="radio"/> Ping				Reboot-Alarm ▼	600		
1	<input checked="" type="checkbox"/>	<input type="radio"/> LLDP <input checked="" type="radio"/> Ping		20	3	Reboot-Alarm ▼	600	1	10
2	<input checked="" type="checkbox"/>	<input type="radio"/> LLDP <input type="radio"/> Ping		20	3	Reboot-Alarm ▼	600	1	10
3	<input checked="" type="checkbox"/>	<input type="radio"/> LLDP <input checked="" type="radio"/> Ping	192.168.1.30	20	3	Reboot-Alarm ▼	600	1	10
4	<input checked="" type="checkbox"/>	<input type="radio"/> LLDP <input type="radio"/> Ping		20	3	Reboot-Alarm ▼	600	1	10
5	<input checked="" type="checkbox"/>	<input type="radio"/> LLDP <input type="radio"/> Ping		20	3	Reboot-Alarm ▼	600	1	10
6	<input checked="" type="checkbox"/>	<input type="radio"/> LLDP <input type="radio"/> Ping		20	3	Reboot-Alarm ▼	600	1	10

LLDP mode

Ping mode

# 被供電設備健康狀態 (1/2)

- **Main Status > Neighbor**

- LLDP mode: 依恢復輪詢間隔進行更新
- Ping mode: 依恢復輪詢間隔和輪詢間隔進行更新

Switch Neighbor										<a href="#">Status</a>	<a href="#">Neighbor Detail</a>
Port	Port Name	PD Health	Link	PoE Draw (W)	System Name	IP	PWR Cycle	Reset to Default			
1	--	--	1G/F	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
2	--	●	1G/F	3.7	WAC6502D-E	<a href="#">192.168.1.28</a>	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
3	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
4	--	●	1G/F	3.9	WAC6503D-S	<a href="#">192.168.1.30</a>	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
5	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
6	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
7	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
8	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
9	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
10	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
11	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
12	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
13	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
14	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
15	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
16	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
17	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		
18	--	--	Down	0.0	--	--	<a href="#">Cycle</a>	<a href="#">Reset</a>	<input type="checkbox"/>		

[Flush](#)

# 被供電設備健康狀態 (2/2)

- 燈號顯示狀態

設備正常

Switch Neighbor								<a href="#">Status</a>	<a href="#">Neighbor Detail</a>
Port	Port Name	PD Health	Link	PoE Draw (W)	System Name	IP	PWR Cycle	Reset to Default	
1	--	--	1G/F	0.0	--	--	Cycle	Reset	<input type="checkbox"/>
2	AP1	●	1G/F	4.4	WAC6502D-E	192.168.1.26	Cycle	Reset	<input type="checkbox"/>
3	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>
4	AP2	●	1G/F	4.1	WAC6503D-S	192.168.1.30	Cycle	Reset	<input type="checkbox"/>
5	SwitchD	--	1G/F	0.0	XGS4600-32F	192.168.1.4	Cycle	Reset	<input type="checkbox"/>
6	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>

Switch Neighbor								<a href="#">Status</a>	<a href="#">Neighbor Detail</a>
Port	Port Name	PD Health	Link	PoE Draw (W)	System Name	IP	PWR Cycle	Reset to Default	
1	--	--	1G/F	0.0	--	--	Cycle	Reset	<input type="checkbox"/>
2	AP1	●	1G/F	3.6	WAC6502D-E	192.168.1.26	Cycle	Reset	<input type="checkbox"/>
3	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>
4	AP2	●	Down	4.1	WAC6503D-S	192.168.1.30	Cycle	Reset	<input type="checkbox"/>
5	SwitchD	--	1G/F	0.0	XGS4600-32F	192.168.1.4	Cycle	Reset	<input type="checkbox"/>
6	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>

設備重啟

設備異常

Switch Neighbor								<a href="#">Status</a>	<a href="#">Neighbor Detail</a>
Port	Port Name	PD Health	Link	PoE Draw (W)	System Name	IP	PWR Cycle	Reset to Default	
1	--	--	1G/F	0.0	--	--	Cycle	Reset	<input type="checkbox"/>
2	AP1	●	1G/F	3.7	WAC6502D-E	192.168.1.26	Cycle	Reset	<input type="checkbox"/>
3	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>
4	AP2	●	1G/F	4.5	WAC6503D-S	192.168.1.30	Cycle	Reset	<input type="checkbox"/>
5	SwitchD	--	1G/F	0.0	XGS4600-32F	192.168.1.4	Cycle	Reset	<input type="checkbox"/>
6	--	--	Down	0.0	--	--	Cycle	Reset	<input type="checkbox"/>

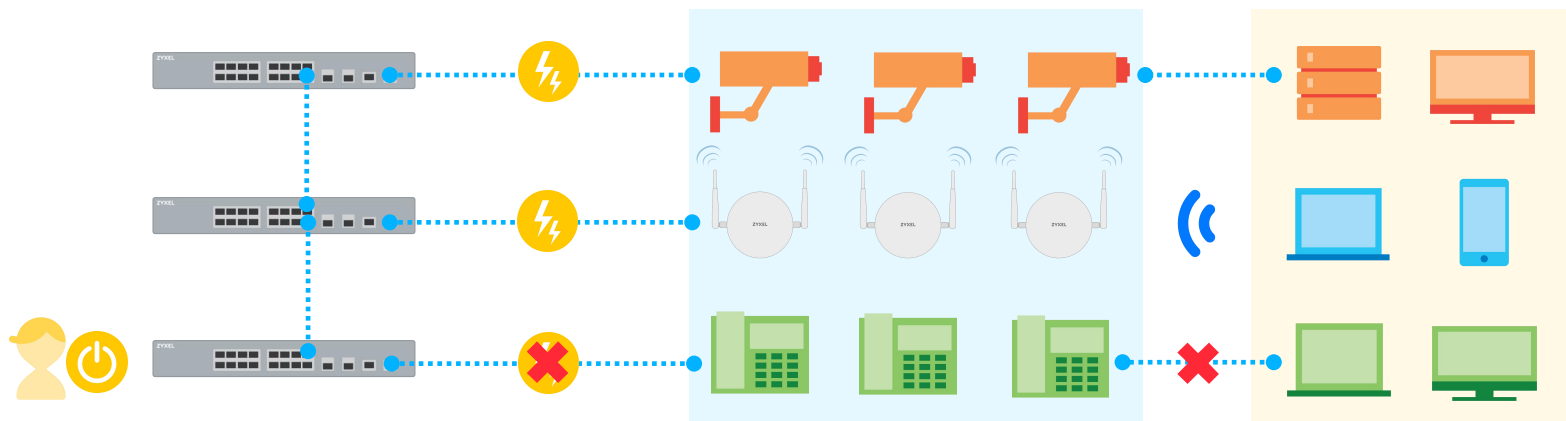
# IP-CAM供電不中斷

07



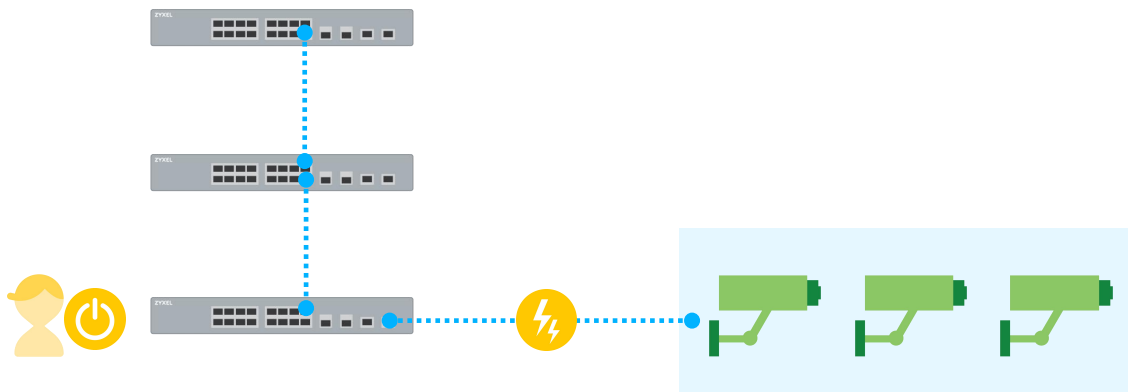
# 動機

- 有時需要更新PoE交換器韌體來獲得系統安全補丁或新增功能
  - PoE交換器重新啟動時，被供電設備供電中斷會導致服務中斷
  - 客戶不希望停機
  - 設備老舊重啟後異常



# 連續PoE供電

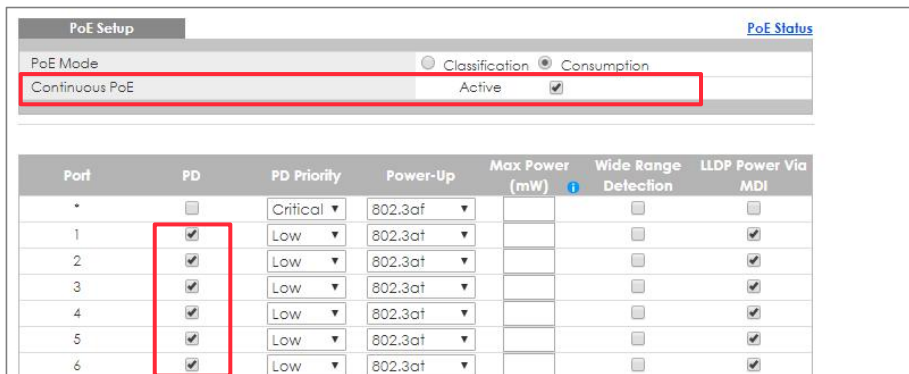
- 即使重新啟動PoE交換器，也可確保受電設備電源不中斷
- 建立穩定可靠的監控網路
- 好處
  - 具有內部儲存器的攝影機服務仍可運行
  - 減少維護所需的時間而無需重新啟動IP攝影機





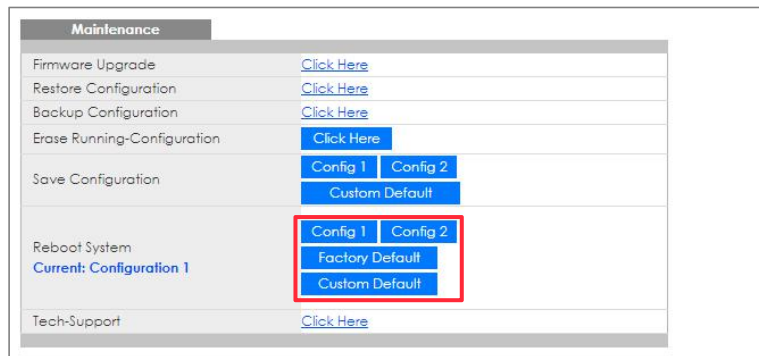
# 機制 (1/2)

- Enabled
  - **Basic Setting > PoE Setup > PoE Setup**
  - 交換器將在reloading 以下設定檔時**持續對被供電設備 供電**
    - Configuration
    - Factory-default
    - Custom-default



The screenshot shows the PoE Setup configuration page. At the top, there is a 'PoE Mode' section with a red box around the 'Continuous PoE' dropdown and the 'Active' checkbox. Below this is a table with columns: Port, PD, PD Priority, Power-Up, Max Power (mW), Wide Range Detection, and LLDP Power Via MDI. The PD checkboxes for ports 1 through 6 are highlighted with a red box.

Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI
*	<input type="checkbox"/>	Critical	802.3af		<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	Low	802.3at		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	Low	802.3at		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	Low	802.3at		<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	Low	802.3at		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	Low	802.3at		<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	<input checked="" type="checkbox"/>	Low	802.3at		<input type="checkbox"/>	<input checked="" type="checkbox"/>

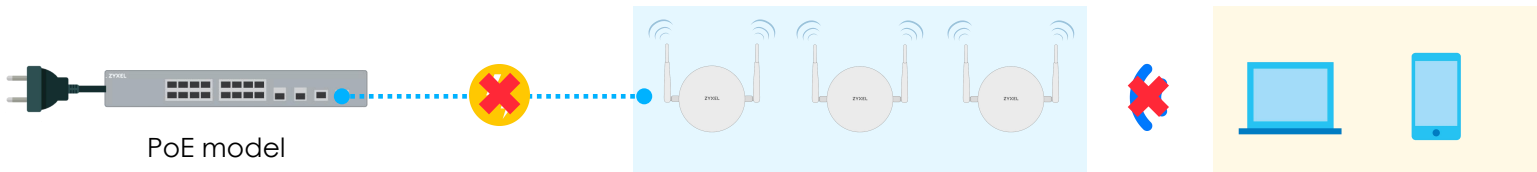


The screenshot shows the Maintenance configuration page. It lists various actions with buttons for configuration. The 'Reboot System' section is highlighted with a red box, showing 'Config 1', 'Config 2', 'Factory Default', and 'Custom Default' buttons.

Action	Buttons
Firmware Upgrade	<a href="#">Click Here</a>
Restore Configuration	<a href="#">Click Here</a>
Backup Configuration	<a href="#">Click Here</a>
Erase Running-Configuration	<a href="#">Click Here</a>
Save Configuration	<a href="#">Config 1</a> <a href="#">Config 2</a> <a href="#">Custom Default</a>
Reboot System	<a href="#">Config 1</a> <a href="#">Config 2</a> <a href="#">Factory Default</a> <a href="#">Custom Default</a>
Tech-Support	<a href="#">Click Here</a>

# 機制 (2/2)

- 交換器若用以下方式重新啟動系統時，將中斷被供電設備供電
  - 電源線重新拔插
  - 用CLI執行Boot configuration



```
GS1350# boot config 1  
Do you really want to reboot system with configuration file 1? [y/N]y
```

# 啟用連續PoE供電提醒 (1/2)

- Web GUI
  - Reload configuration

192.168.1.1 says

In order to keep current settings, please save or backup any unsaved changes. PDs will be kept powered on during system reboots. Do you wish to proceed to reboot?

- Reload factory-default/custom-default

192.168.1.1 says

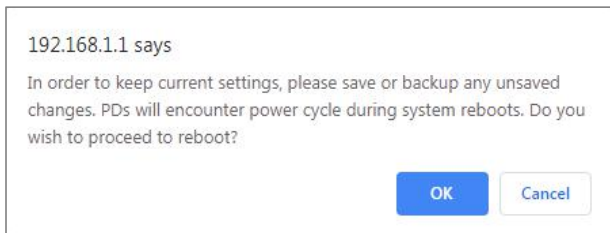
PDs will be kept powered on during system reboots. Do you wish to restore settings to factory default and reboot?

192.168.1.1 says

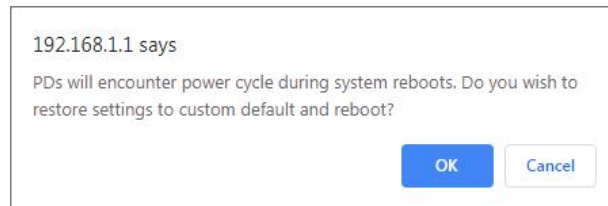
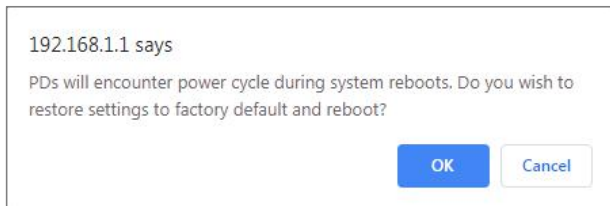
PDs will be kept powered on during system reboots. Do you wish to restore settings to custom default and reboot?

# 關閉Continuous PoE 提醒 (1/2)

- Web GUI
  - Reload configuration



- Reload factory-default/custom-default



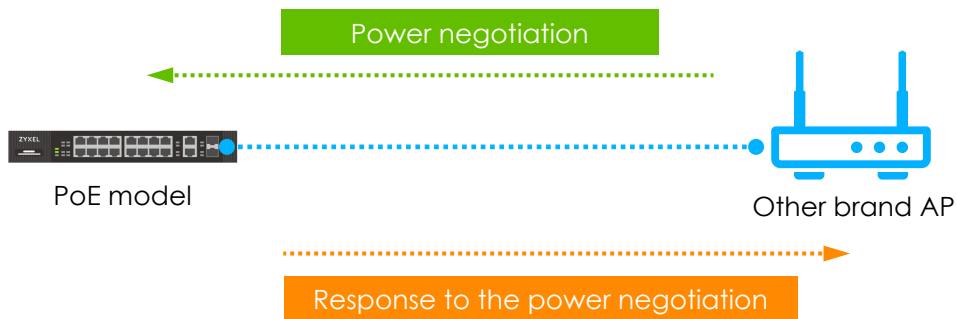
# LLDP Power-via-MDI

08



# 背景

- 某些被供電設備僅通過MDI TLV供電通過LLDP處理PoE協商



# Mechanism

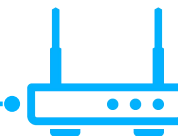
- LLDP with power-via-MDI TLV
  - PD requested power
  - PSE allocated power

```
▶ IEEE 802.3 - MAC/PHY Configuration/Status
└─ IEEE 802.3 - Power Via MDI
  1111 111. .... = TLV Type: Organization Specific (127)
  .... ..0 0000 1100 = TLV Length: 12
  Organization Unique Code: IEEE 802.3 (0x00120f)
  IEEE 802.3 Subtype: Power Via MDI (0x02)
  ▶ MDI Power Support: 0x00
  PSE Power Pair: 1
  Power Class: 4 (5)
  01.. .... = Power Type: Type 2 PD Device (1)
  ..01 .... = Power Source: 1 PSE
  ... 0000 = Power Priority: Unknown (0)
  PD Requested Power Value: 25.0. Watt
  PSE Allocated Power Value: 0.0. Watt
▶ End of LLDPDU
```

LLDP with power-via-MDI TLV  
- PD requested power  
- PSE allocated power: 0



PoE model



Other brand AP

```
▶ IEEE 802.1 - Port VLAN ID
└─ IEEE 802.3 - Power Via MDI
  1111 111. .... = TLV Type: Organization Specific (127)
  .... ..0 0000 1100 = TLV Length: 12
  Organization Unique Code: IEEE 802.3 (0x00120f)
  IEEE 802.3 Subtype: Power Via MDI (0x02)
  ▶ MDI Power Support: 0x07
  PSE Power Pair: 1
  Power Class: 4 (5)
  00.. .... = Power Type: Type 2 PSE Device (0)
  ..01 .... = Power Source: 1 Primary Power Source
  ... 0000 = Power Priority: Unknown (0)
  PD Requested Power Value: 25.0. Watt
  PSE Allocated Power Value: 25.0. Watt
▶ End of LLDPDU
```

LLDP with power-via-MDI TLV  
- PD requested power  
- PSE allocated power

# Web GUI

- Basic Setting > PoE Setup > PoE Setup

PoE Setup							<a href="#">PoE Status</a>
PoE Mode		<input type="radio"/> Classification <input checked="" type="radio"/> Consumption					
Continuous PoE		Active <input checked="" type="checkbox"/>					
Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI	
*	<input type="checkbox"/>	Critical ▼	802.3af ▼		<input type="checkbox"/>	<input type="checkbox"/>	
1	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
9	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
10	<input checked="" type="checkbox"/>	Low ▼	802.3at ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>	



# CLI

- Switch(config)# **interface port-channel <port ID>**
- Switch(config-interface)# **lldp org-specific-tlv dot3 power-via-mdi**

```
GS2210# config
GS2210(config)# interface port-channel 2
GS2210(config-interface)# lldp org-specific-tlv dot3 power-via-mdi
GS2210(config-interface)# exit
GS2210(config)# exit
```

# Power-up Mode 802.3bt

09



# 應用

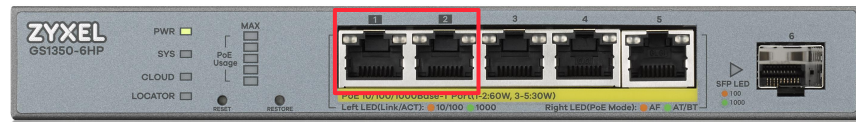
- 高功率攝影機
- POS終端機
- 802.11ax WiFi6 AP

標準協定	類型	分級	Min. PSE Power	Max. PD Power
IEEE 802.3bt PoE++	Type 3	5	45W	40W
		6	60W	51W



# 支援型號

- GS1350-6HP
  - 802.3bt: Port 1 and Port 2
  - Default system power budget 60W



# Web GUI

- Basic Setting > PoE Setup > PoE Setup

Port 1 – 2

- 802.3bt
- 802.3af
- Legacy
- Pre-802.3at
- 802.3at
- 802.3bt

- 802.3at
- 802.3af
- Legacy
- Pre-802.3at
- 802.3at

Port 3 – 5

PoE Setup [PoE Status](#)

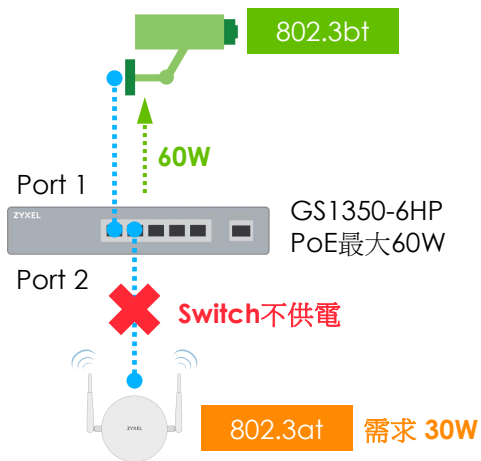
PoE Mode  Classification  Consumption

Continuous PoE  Active

Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI
*	<input type="checkbox"/>	Critical	802.3af		<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	Low	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	Low	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	Low	802.3af		<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	Low	802.3af		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	Low	802.3af		<input type="checkbox"/>	<input checked="" type="checkbox"/>

# 情境 1

- Default
  - Port 1 連接802.3bt的受電設備



PoE Setup [PoE Status](#)

PoE Mode  Classification  Consumption

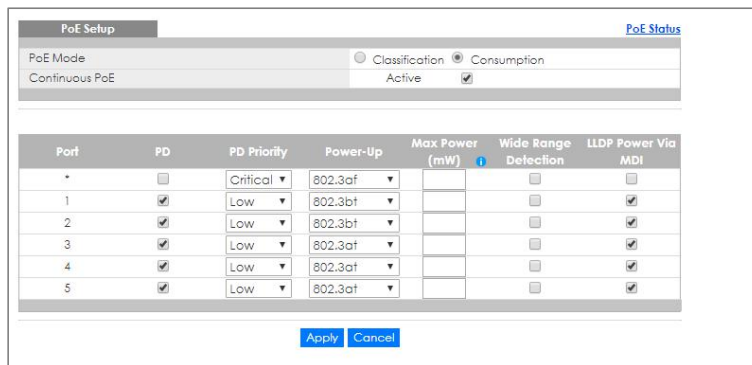
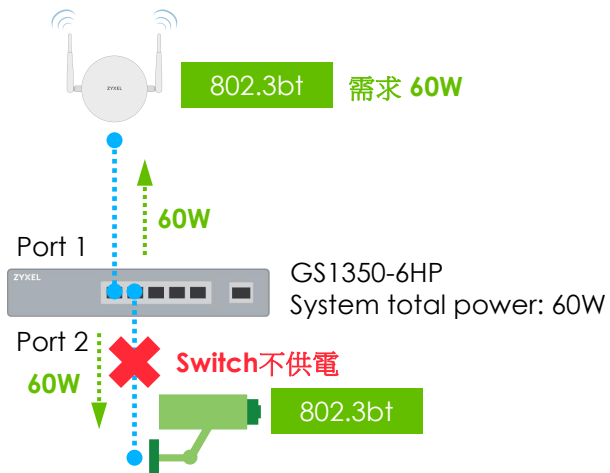
Continuous PoE  Active

Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI
*	<input type="checkbox"/>	Critical	802.3af		<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	Low	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	Low	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	Low	802.3at		<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	Low	802.3at		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	Low	802.3at		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Port	Power-up	PD Mode
1	802.3bt	802.3bt
2	802.3bt	802.3at

# 情境 2-1

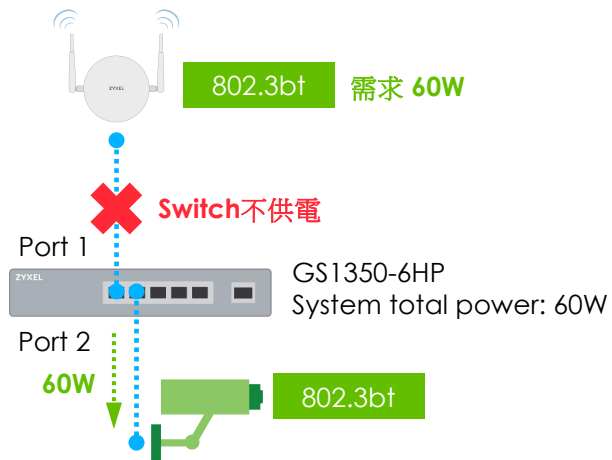
- Default
  - Port 2 連接802.3bt的受電設備



Port	Power-up	PD Mode
1	802.3bt	802.3bt
2	802.3bt	802.3bt

# 情境 2-2

- 被供電設備優先順序
  - Port 2設定為Critical



PoE Setup PoE Status

PoE Mode  Classification  Consumption

Continuous PoE  Active

Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI
*	<input type="checkbox"/>	Critical	802.3af		<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	Low	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	Critical	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	Low	802.3af		<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	Low	802.3af		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	Low	802.3af		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Port	Power-up	PD Mode
1	802.3bt	802.3bt
2	802.3bt	802.3bt



# 大功率PoE供電

10



# 最大電源功率

- 交換器可以將最大電源功率傳遞給被供電設備
- 適用於消耗模式(consumption mode)
- 802.3bt ports(GS1350-6HP) 不支援

Power-up	PD Mode	PD Class	Standard	Max Power
802.3af	802.3 af	0	15.4W	22W
		1	4W	22W
		2	7W	22W
		3	15.4W	22W
	802.3at	4	30W	22W

Power-up	PD Mode	PD Class	Standard	Max Power
802.3at	802.3 af	0	15.4W	22W
		1	4W	22W
		2	7W	22W
		3	15.4W	22W
	802.3at	4	30W	33W

# Web GUI

- Basic Setting > PoE Setup > PoE Setup

PoE Setup [PoE Status](#)

PoE Mode  Classification  Consumption

Continuous PoE  Active

Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI
*	<input type="checkbox"/>	Critical ▼	802.3af ▼		<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼	10000	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	<input checked="" type="checkbox"/>	Low ▼	802.3af ▼		<input type="checkbox"/>	<input checked="" type="checkbox"/>

# 情境 (1/3)

- Default

PoE Setup PoE Status

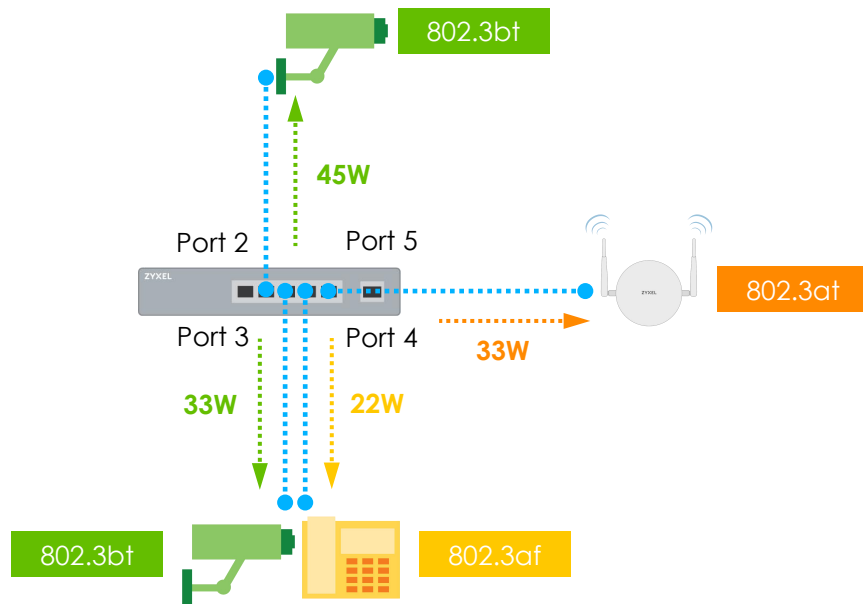
PoE Mode:  Classification  Consumption

Continuous PoE:  Active

Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI
*	<input type="checkbox"/>	Critical	802.3af		<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	Low	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	Low	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	Low	802.3af		<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	Low	802.3af		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	Low	802.3af		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Apply Cancel

Port	Power-up	PD Mode	Max Power
2	802.3bt	802.3bt	45-60W
3	802.3af	802.3bt	33W
4	802.3af	802.3af	22W
5	802.3af	802.3af	33W



# 情境 (2/3)

- Configure as 25W

PoE Setup PoE Status

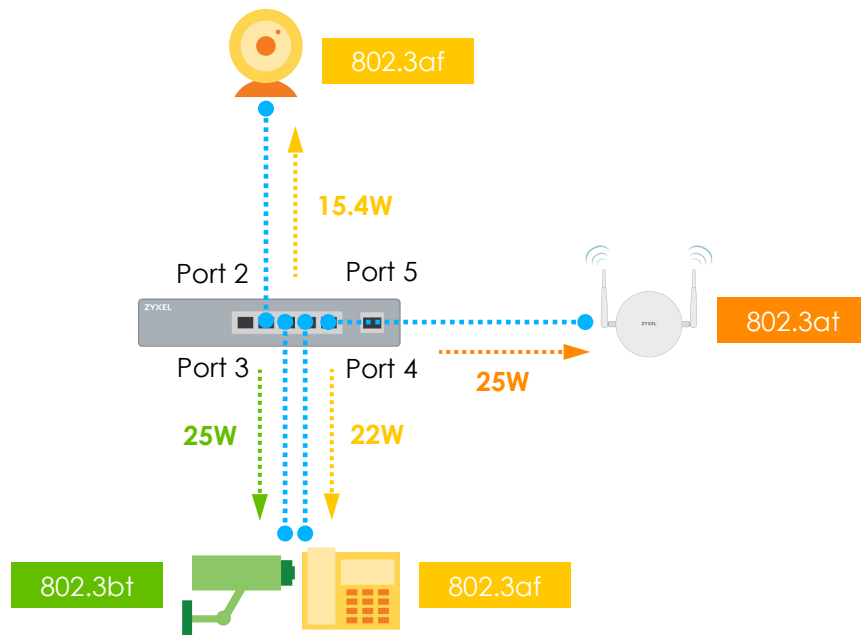
PoE Mode:  Classification  Consumption

Continuous PoE:  Active

Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI
*	<input type="checkbox"/>	Critical	802.3af		<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	Low	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	Low	802.3bt	25000	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	Low	802.3at	25000	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	Low	802.3at	25000	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	Low	802.3at	25000	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Apply Cancel

Port	Power-up	PD Mode	Max Power
2	802.3bt	802.3af	15.4W
3	802.3at	802.3bt	25W
4	802.3at	802.3af	22W
5	802.3at	802.3at	25W



# 情境 (3/3)

- Configure as 14W

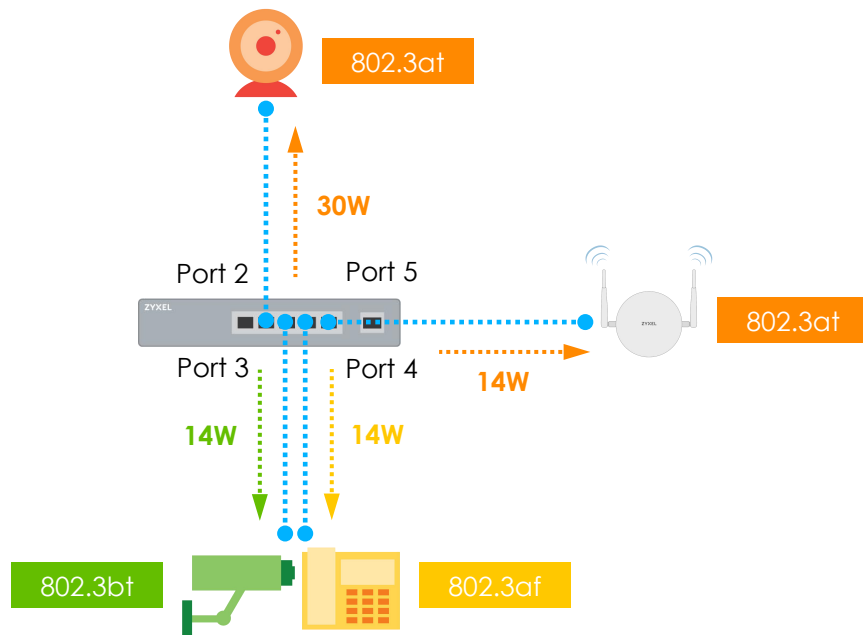
PoE Setup PoE Status

PoE Mode:  Classification  Consumption

Continuous PoE:  Active

Port	PD	PD Priority	Power-Up	Max Power (mW)	Wide Range Detection	LLDP Power Via MDI
*	<input type="checkbox"/>	Critical	802.3af		<input type="checkbox"/>	<input type="checkbox"/>
1	<input checked="" type="checkbox"/>	Low	802.3bt		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input checked="" type="checkbox"/>	Low	802.3bt	14000	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	Low	802.3at	14000	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input checked="" type="checkbox"/>	Low	802.3at	14000	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input checked="" type="checkbox"/>	Low	802.3at	14000	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Port	Power-up	PD Mode	Max Power
2	802.3bt	802.3at	30W
3	802.3at	802.3bt	14W
4	802.3at	802.3af	14W
5	802.3at	802.3at	14W



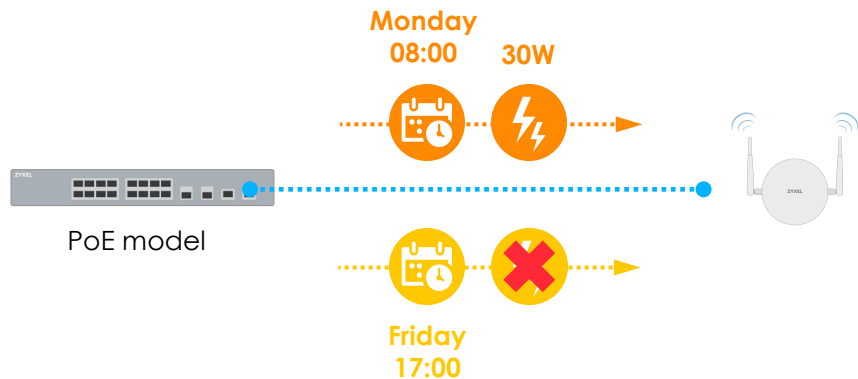
# PoE供電排程

11



# 為什麼需要排程

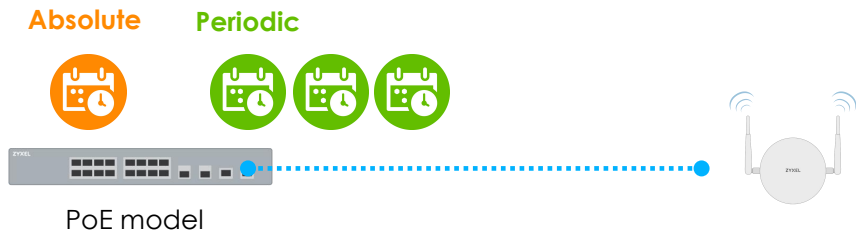
- 利用排程來計畫性的對被供電設備供電
- 好處
  - 具備彈性
  - 智能管理





# 機制

- 時間範圍
  - 絕對時間(Absolute time range)
  - 定期時間(Periodic time range)
- 網路埠可以套用
  - 一個絕對時間
  - 多個定期時間
- 交換器根據時間範圍設定檔開始對網路埠供電



# 絕對時間(Absolute Time Range)

- **Advanced Application > Time Range**
  - 從何時開始
  - 到何時結束

Time Range	
Name	time01
Type	<input checked="" type="radio"/> Absolute <input type="radio"/> Periodic
Absolute	Start 2019 05 01 08 : 00 End 2019 05 10 17 : 00
Periodic	<input checked="" type="radio"/> Monday 00 : 00 to Monday 00 : 00 <input type="checkbox"/> Mon <input type="checkbox"/> Tue <input type="checkbox"/> Wed <input type="checkbox"/> Thu <input type="checkbox"/> Fri <input type="checkbox"/> Sat <input type="checkbox"/> Sun <input type="checkbox"/> Weekdays <input type="checkbox"/> Weekend <input type="radio"/> Daily 00 : 00 to 00 : 00

# 定期時間(Periodic Time Range)

- **Advanced Application > Time Range**
- 特定時間
  - 從每週幾點開始
  - 到每週幾點結束
- 一個特定的間隔時間
  - 選擇要在一周中的那幾天執行

The screenshot displays the 'Time Range' configuration window. The 'Name' field is set to 'time02'. The 'Type' is set to 'Periodic'. The 'Absolute' section is disabled. The 'Periodic' section is active, showing a selection for 'Monday' and a time range from '08:00' to '17:00'. The days of the week are selected as Mon, Tue, and Thu. The 'Daily' option is also visible. At the bottom, there are 'Add', 'Cancel', and 'Clear' buttons.

Time Range	
Name	time02
Type	<input type="radio"/> Absolute <input checked="" type="radio"/> Periodic
Absolute	Start: 1970-01-01 00:00 End: 1970-01-01 00:00
Periodic	<input type="radio"/> Monday 00:00 to Monday 00:00 <input checked="" type="radio"/> <input checked="" type="checkbox"/> Mon <input checked="" type="checkbox"/> Tue <input type="checkbox"/> Wed <input checked="" type="checkbox"/> Thu <input type="checkbox"/> Fri <input type="checkbox"/> Sat <input type="checkbox"/> Sun <input type="checkbox"/> Weekdays <input type="checkbox"/> Weekend <input type="checkbox"/> Daily 08:00 to 17:00

[Add](#) [Cancel](#) [Clear](#)

# Apply Time Range Profile to PoE Port

- [Basic Setting](#) > [PoE Setup](#) > [PoE Time Range Setup](#)

PoE Time Range Setup [PoE Status](#)

Port: 4

Time Range: time01, time02, time03, time04, time05

Port	Time Range Profiles	<input type="checkbox"/>
1	time01	<input type="checkbox"/>
2	time02	<input type="checkbox"/>
3	time03	<input type="checkbox"/>
4	time02,time03	<input type="checkbox"/>
5	time03,time06	<input type="checkbox"/>
6	-	<input type="checkbox"/>
7	-	<input type="checkbox"/>
8	-	<input type="checkbox"/>
9	-	<input type="checkbox"/>
10	-	<input type="checkbox"/>

ZYXEL

Your Networking Ally