



COMMScope®

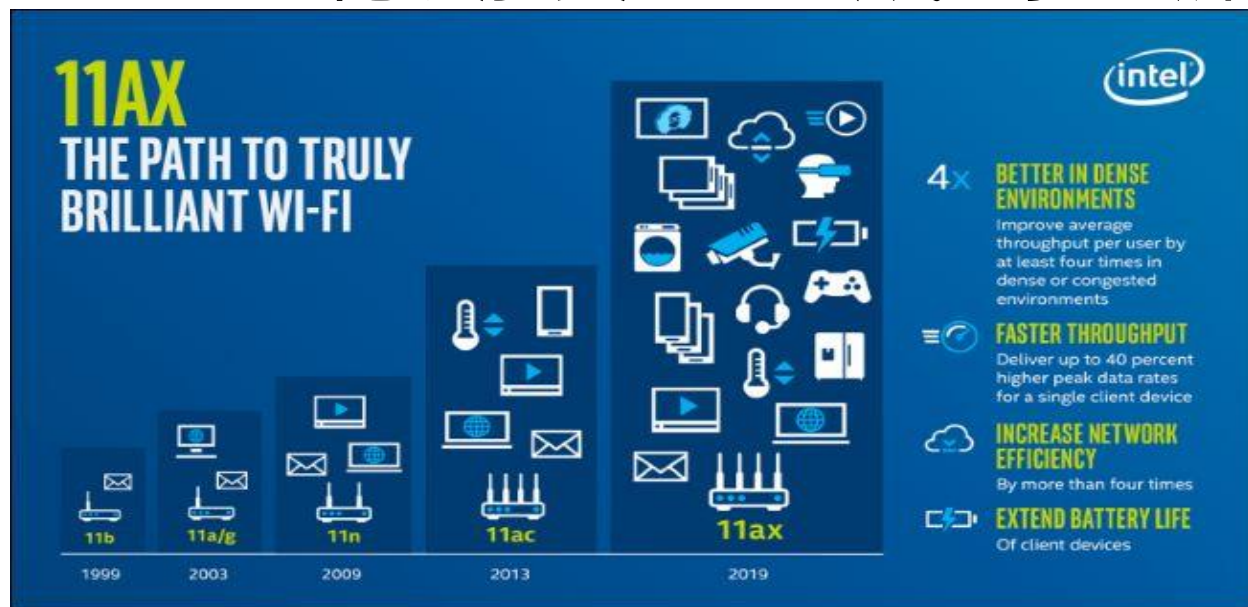
CommScope Ruckus 帶給您別人做不到的 Wi-Fi 6 新境界

David Chen

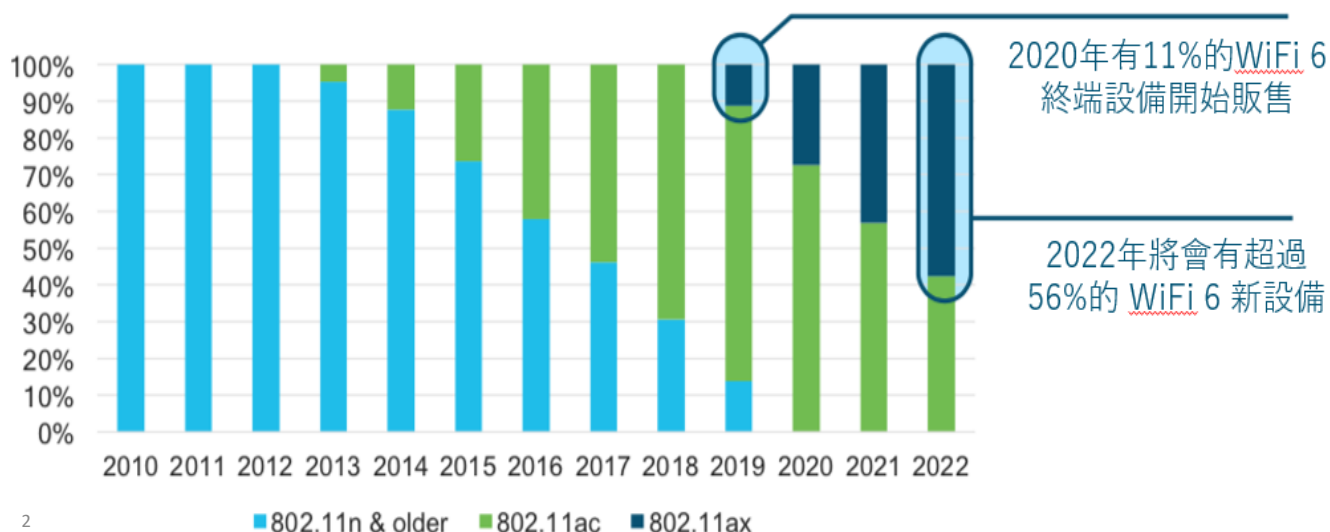
Technical Manager

david.chen2@commscope.com

WiFi 6行動裝置已成為主流



802.11ax 終端設備成長指數



iPhone

SAMSUNG

- 40% 速度提升
 - 1024-QAM vs 256-QAM(11ac)
- 4X 承載密度提升
 - OFDMA
 - DL & UL MU-MIMO
 - BSS-colouring
- 7X 電池壽命提升
 - TWT (target wake time bit)

WiFi6改善傳輸效率

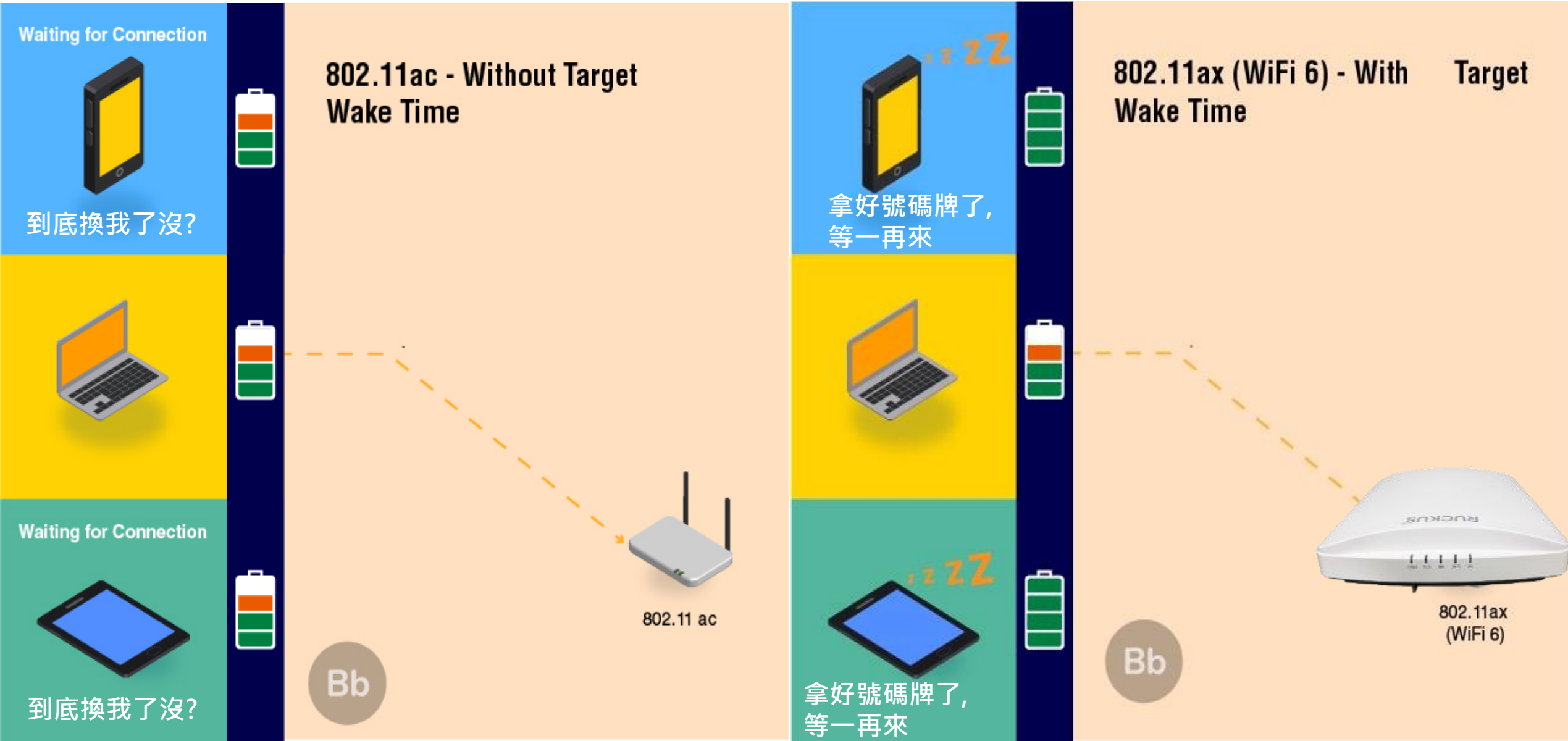


Wi-Fi 5 (11ac)



Wi-Fi 6 (11ax)

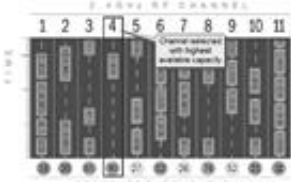
WiFi-6 Target Wake Time – 7x 電池續航力



Ruckus創新無線技術提升WiFi6至更高層次



BeamFlex+
專利智慧天線



ChannelFly
進階頻道選取



封包式動態
調適功率



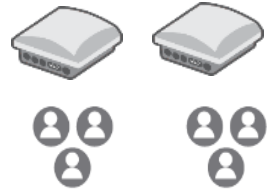
自動調適基地台
含蓋範圍



臨時性路過
用戶端優化管理



傳輸空時
耗用疏導



優化網路
承載效率

優化無線品質, 提升使用體驗

專利智慧天線技術，可大幅提升有效訊號強度並改善訊噪比，為長距離具挑戰性的環境提供最佳通訊品質

監測各無線頻道訊號品質，自動切換至最佳頻道以優化整體效能

每個傳輸封包動態調整傳輸功率 = 降低多餘訊號，最佳化傳輸效能

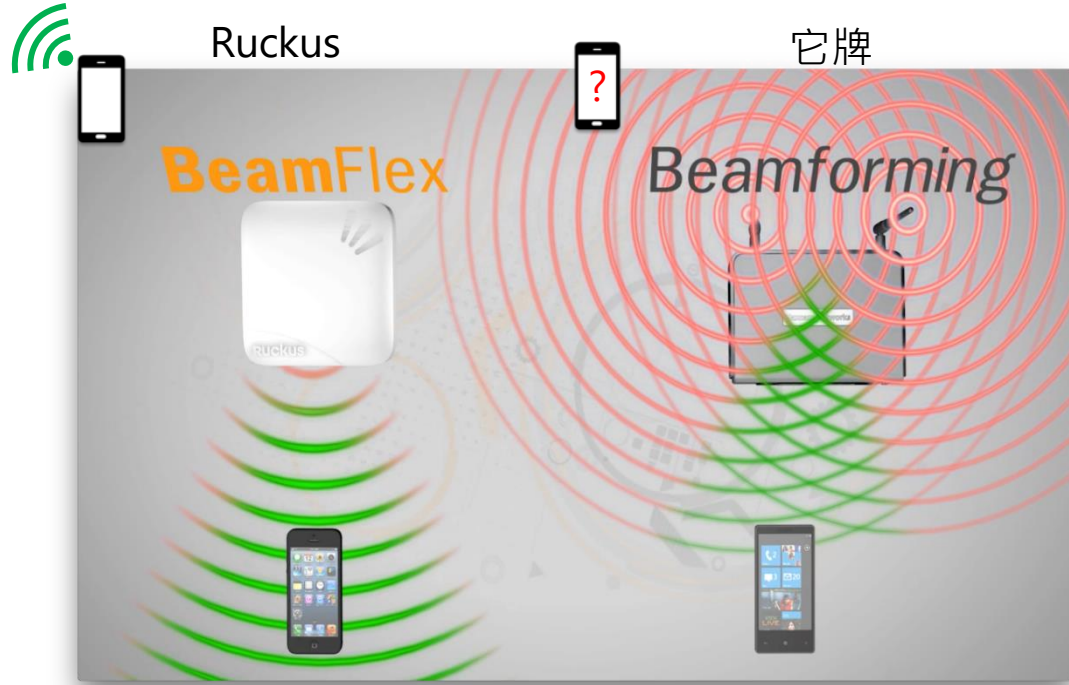
偵測臨近基地台訊號，自動調整訊號範圍來優化無線頻道涵蓋，同時減少同頻干擾，取得更好的網路效能

避免瞬間大量臨時性路過用戶設備，影響即有連線網路效能，並提升穩定度

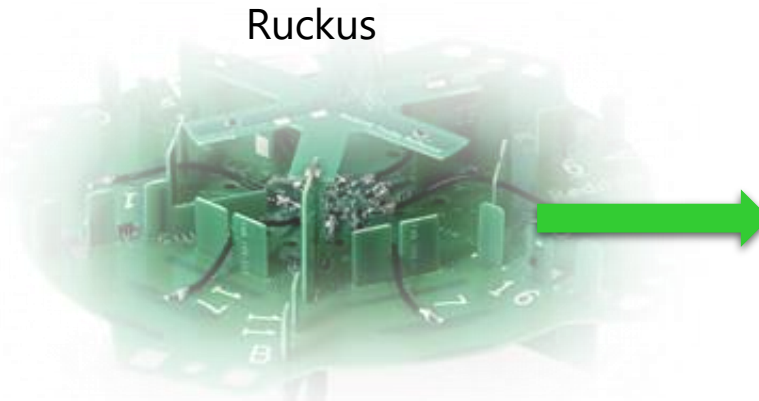
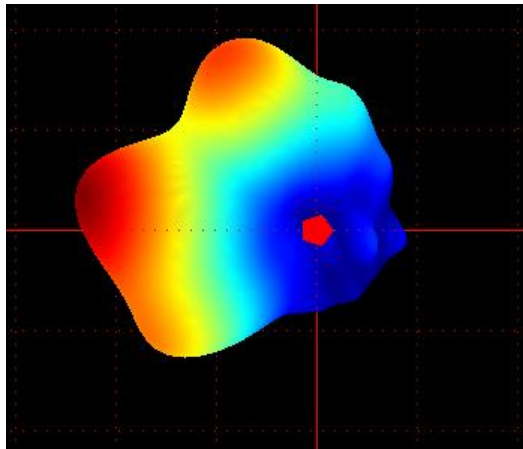
透過減少壅擠環境中的管理流量，提高可用無線空時，有效提升頻譜利用率及設備效能

即時將每個客戶端引導到最佳無線資源，以實現最佳連接品質

Ruckus BeamFlex : 具備更佳的效果



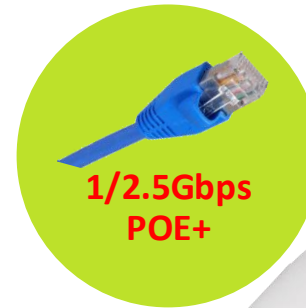
BeamFlex技術減少干擾



- 超過4,000 種天線格式組合
- BeamFlex 可提升高達10dB的降噪效益

Ruckus高階WiFi6 AP – R750

4x4:4 + 2.5G Ethernet



Manage radio coexistence

Ruckus WiFi 6 系列AP

頂級 - R850 (近期供應)	中階 - R650	入門 - R550 (近期供應)	戶外型 - T750
			
2.4 GHz radio: 4x4:4 802.11b/g/n/ax 1148 Mbps max PHY rate 5 GHz radio: 8x8:8 802.11a/n/ac/ax 4800 Mbps max PHY rate - Up to 1024 client associations 1x 1/2.5/5G Base-T, 1x10/100/1000Base-T Ethernet Ports 802.3at, uPoE, PoH input, 48VDC input - BLE / Zigbee IoT Radio (selectable)	2.4 GHz radio: 2x2:2 802.11b/g/n/ax 574 Mbps max PHY rate 5 GHz radio: 4x4:4 802.11a/n/ac/ax 2400 Mbps max PHY rate - Up to 512 client associations 1x 1/2.5G Base-T, 1x10/100/1000Base-T Ethernet Ports 802.3at PoE input, 48VDC input - BLE / Zigbee IoT Radio (Concurrent)	2.4 GHz radio: 2x2:2 802.11b/g/n/ax 574 Mbps max PHY rate 5 GHz radio: 2x2:2 802.11a/n/ac/ax 1200 Mbps max PHY rate - Support for onboard IoT radios, BLE & ZigBee (selectable) - Up to 512 client associations 2x10/100/1000Base-T Ethernet Ports 802.3at PoE input, 48VDC input	2.4 GHz radio: 4x4:4 802.11b/g/n/ax 1148 Mbps max PHY rate 5 GHz radio: 4x4:4 802.11a/n/ac/ax 2400 Mbps max PHY rate - Up to 1024 client associations 1x 1/2.5G Base-T, 1xSFP/SFP+, 1 x 1000Base-T 802.3bt PoE input, AC input - BLE / Zigbee IoT Radio (selectable) - Omni / Sector / External antennas options

WiFi 6 – 不僅是速度的提升 專為高效能、高密度及大量IoT連線設備所設計



IoT物聯網應用

環境管理



- 自動化消防、漏水及有毒氣體監測
- 空間佔用偵測與管控
- 自主設施電源管理
- 自動照明排程控制

資產追蹤



- 資產、人、物之尋找與管理
- 緊急按鈕安全監控
- 自動化出勤統計

安全監控



- 攝像機和視頻監控整合
- 門禁管制
- 安全警報狀況監控
- 辨識建築物佔用狀況、監測及報告

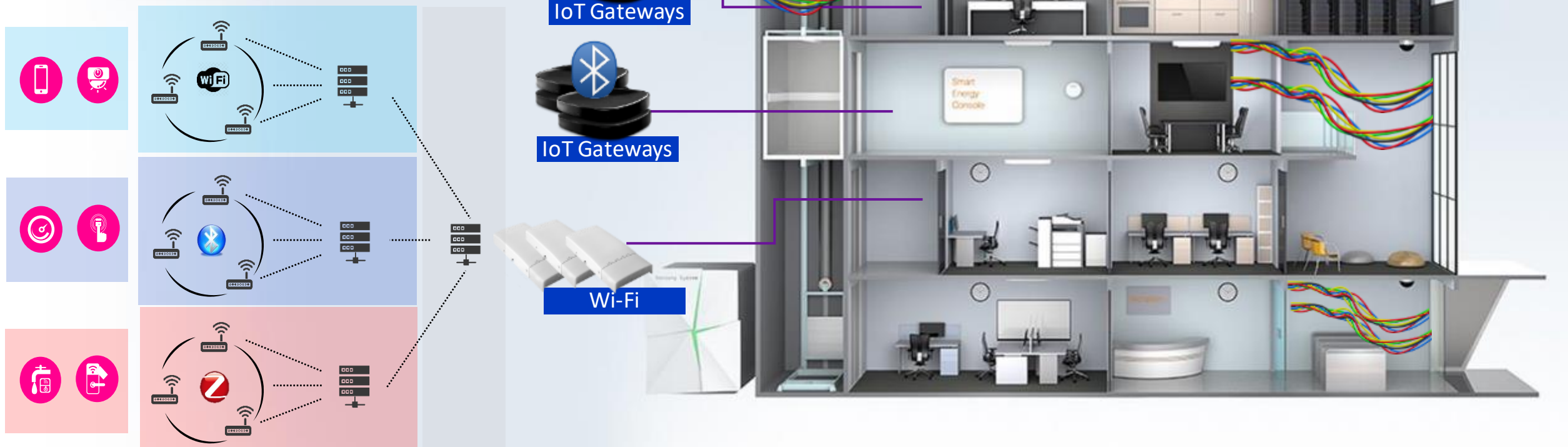
數據遙測



- 環境狀況監控
- 物品掉落偵測
- 自動運送管理監控
- 物料運送稽核

打造物聯網環境的挑戰

- 連接傳感器之佈線
- 不同通訊協定的傳感器
- 廠商各自獨立的閘道器
- 各自獨立的管理系統
- 整體投資成本

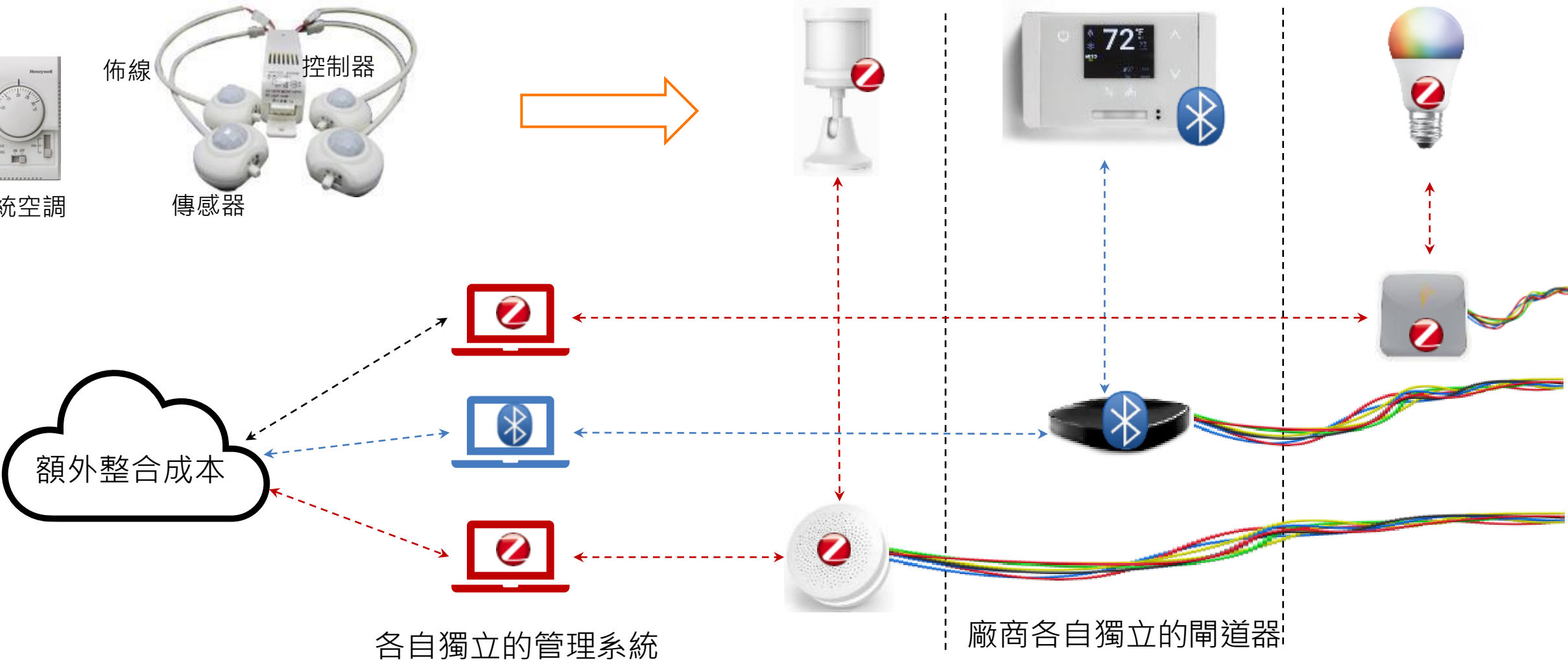


各自獨立的協定與系統

傳統傳感器- 佈線麻煩,整合不易



使用不同通訊協定的傳感器

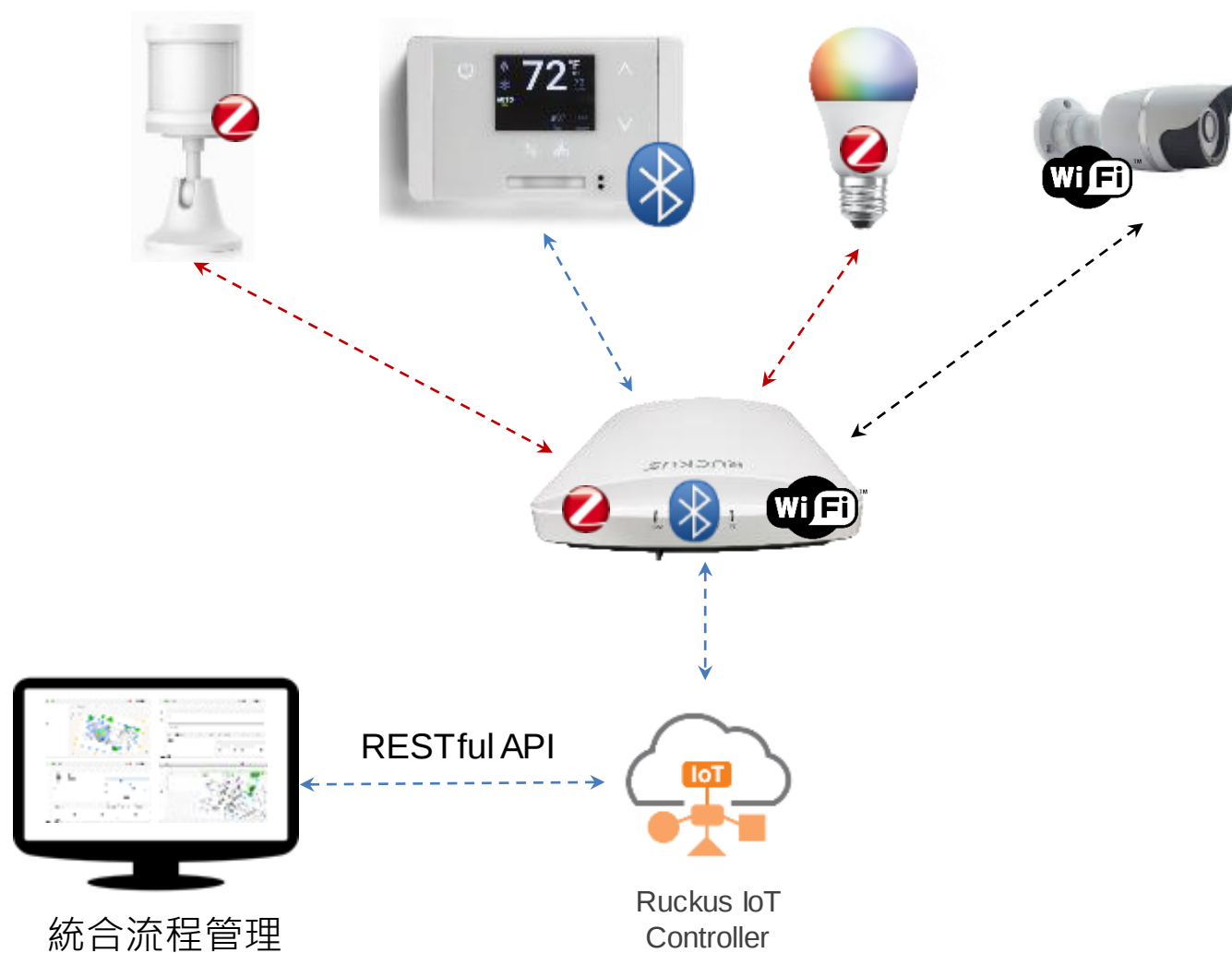


Ruckus整合WiFi6+IoT存取網路



Ruckus IoT整合架構簡化網路

- AP 同時支援WiFi + IoT
- 單一通用閘道器，連接各廠商IoT設備
- 減少佈線 = 減少交換器數量
- 統合管理，整合容易
- 節省總體持有成本

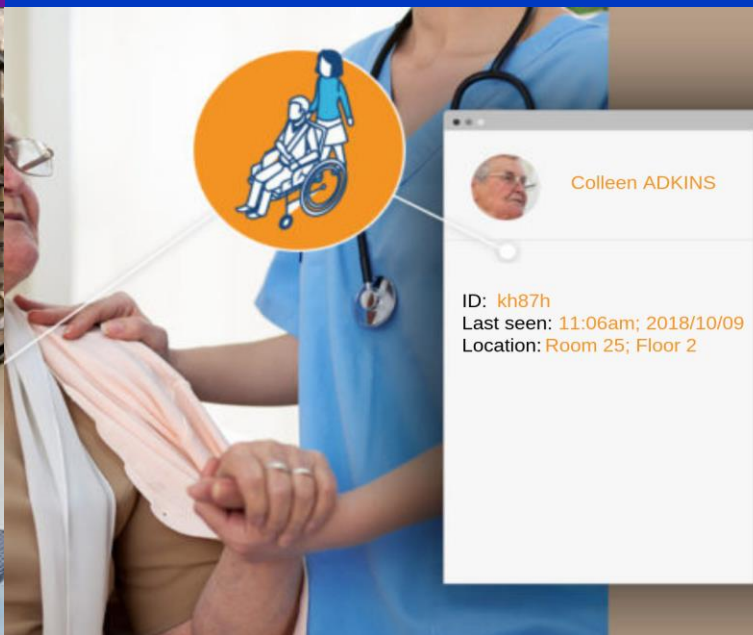


定位型服務應用

Asset Tracking 資產追蹤



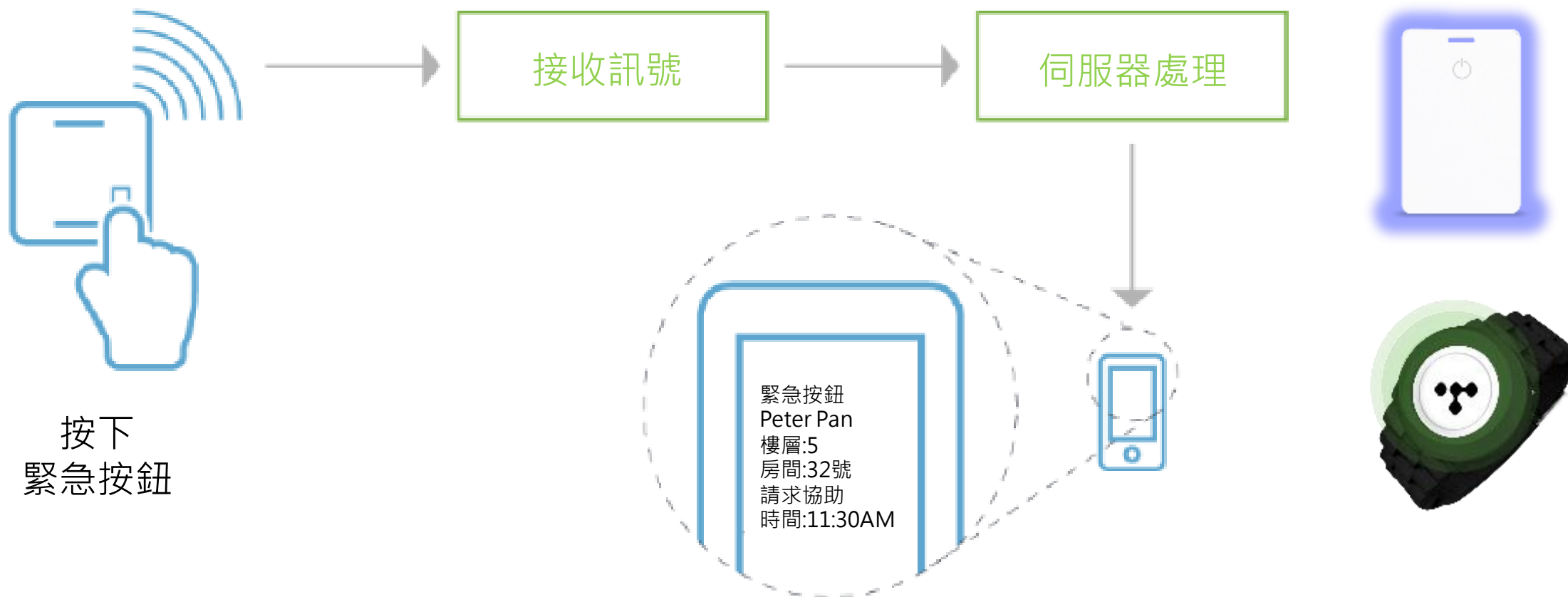
Geofencing 地理圍欄



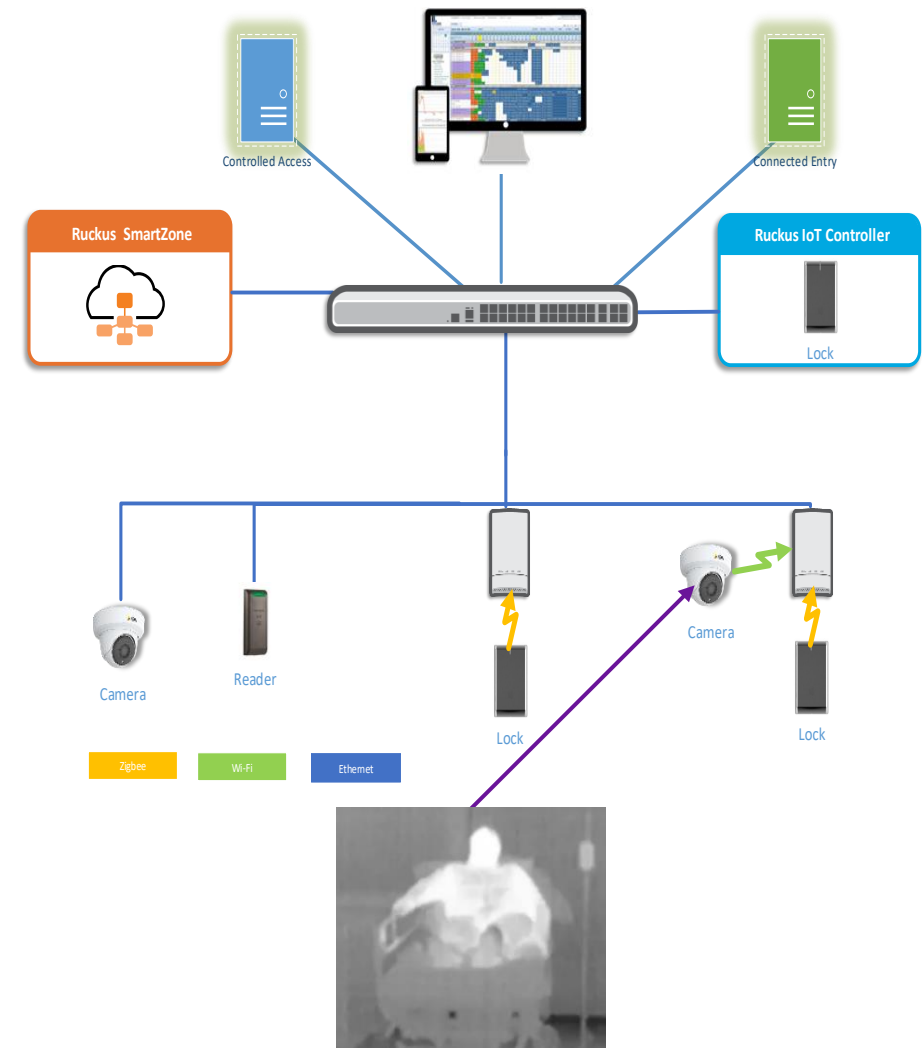
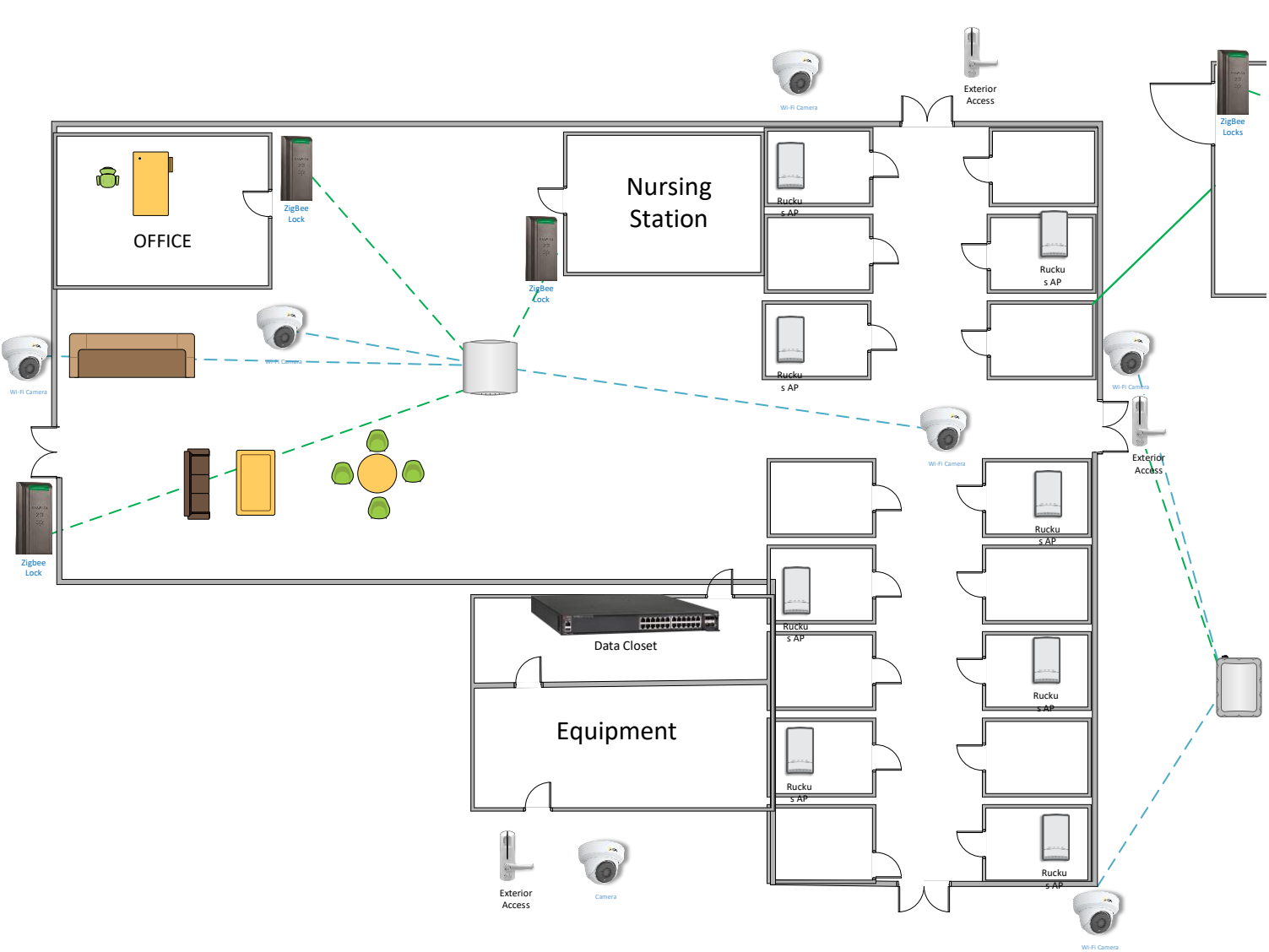
Condition Monitoring 狀態監測



緊急按鈕



安全監控環境

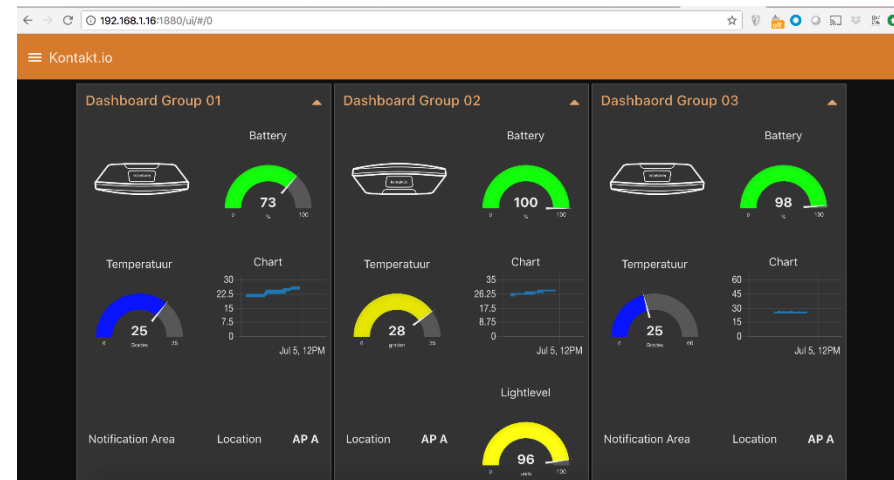


熱感監視器

智慧製造環境應用需求



Source: png from pngtree.com



感應偵測



資訊收集

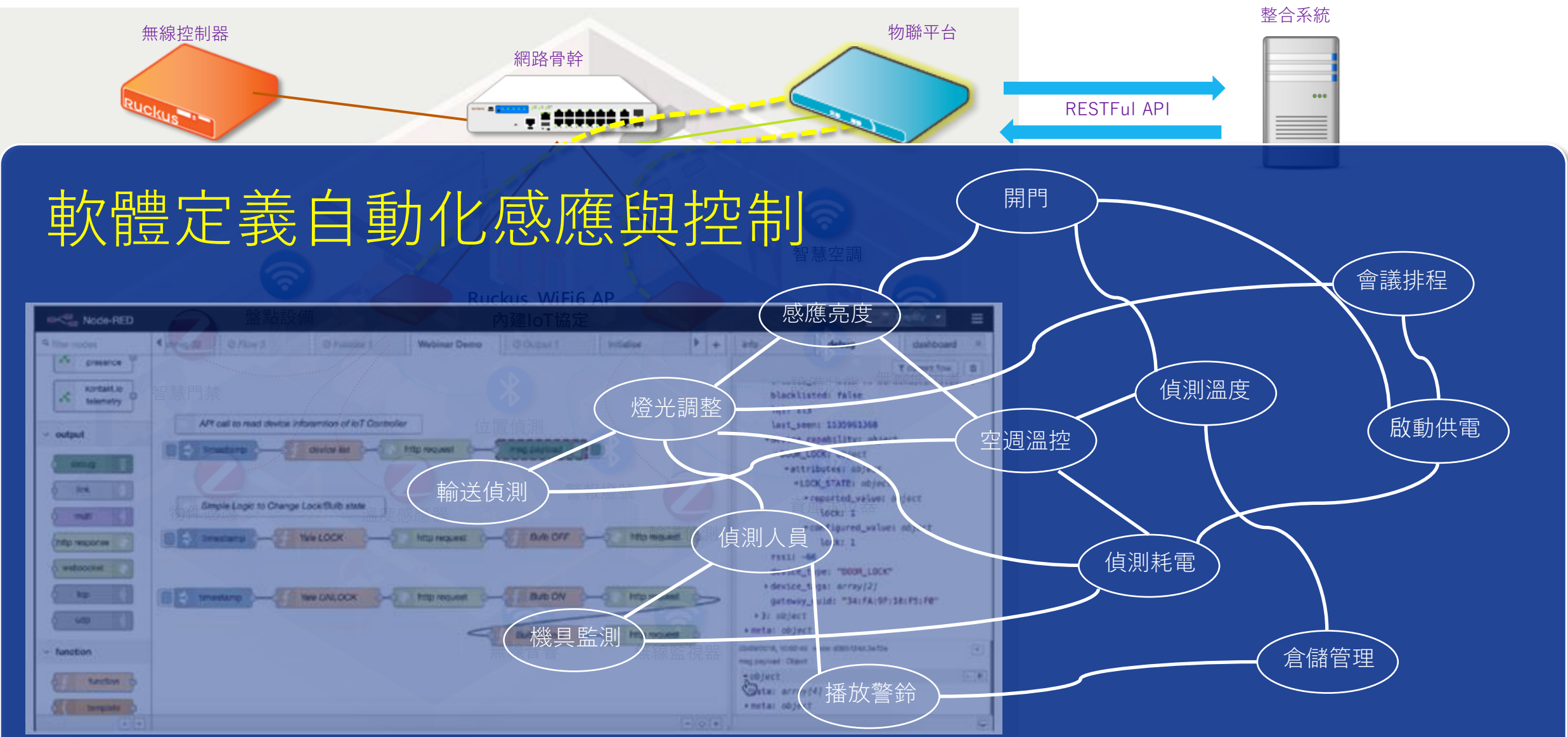


數據分析

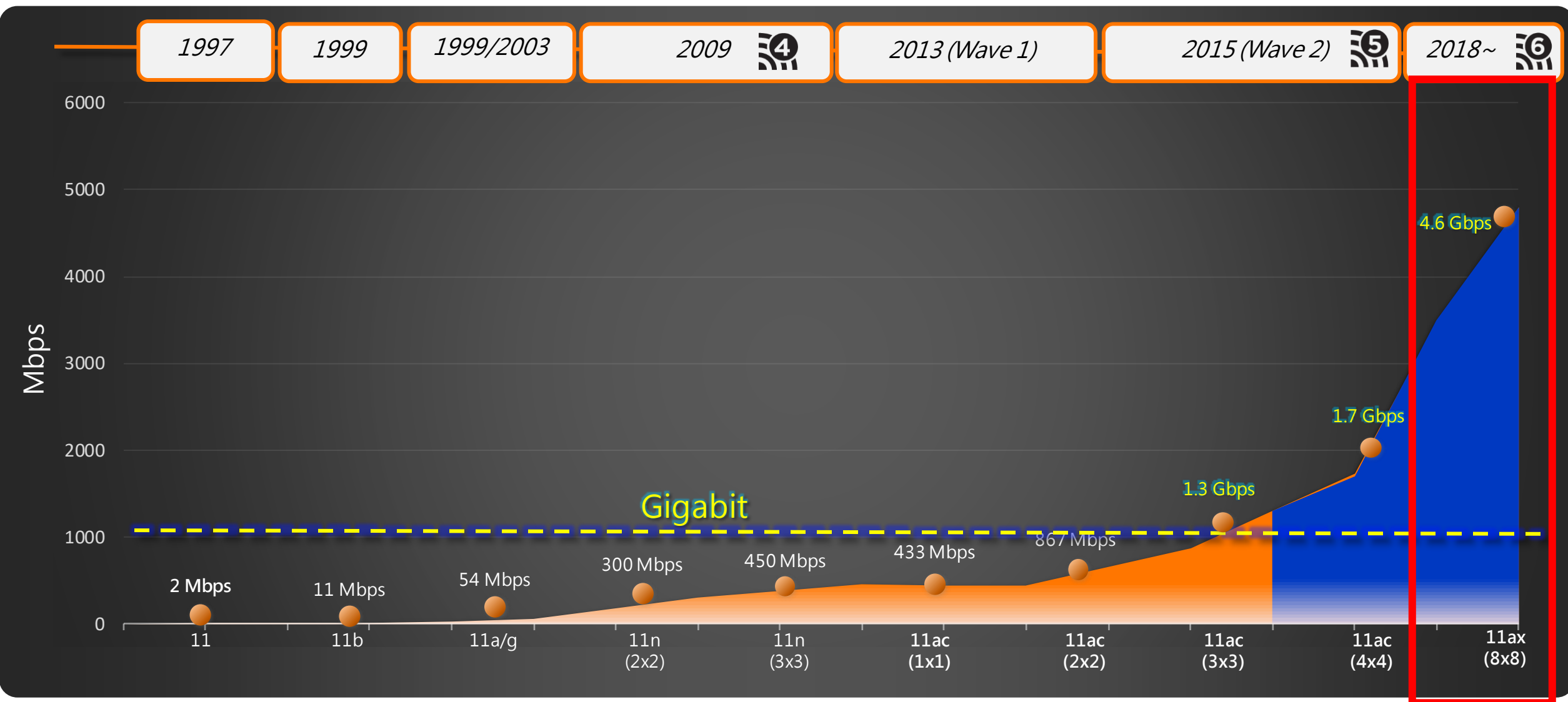


智慧處理

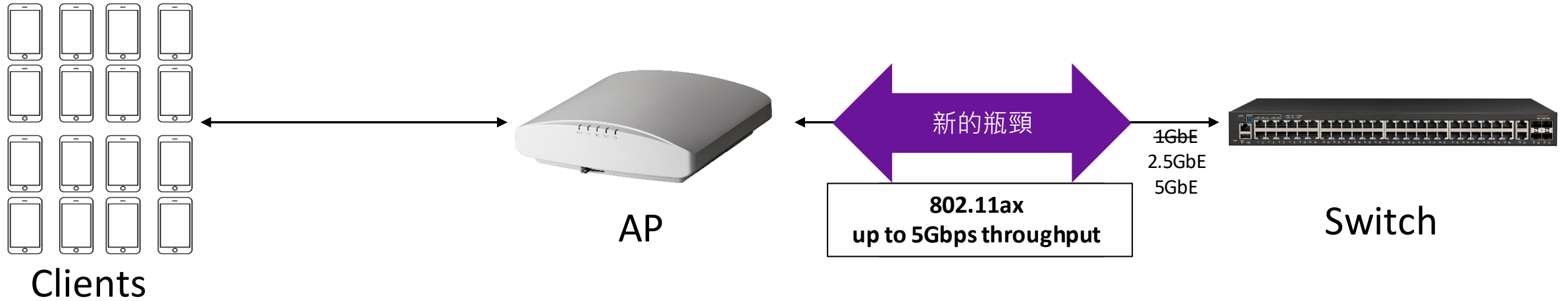
透過物聯平台串連全新智慧製造



超越有線1GbE的無線傳輸速度 – WiFi6



網路瓶頸點改變了



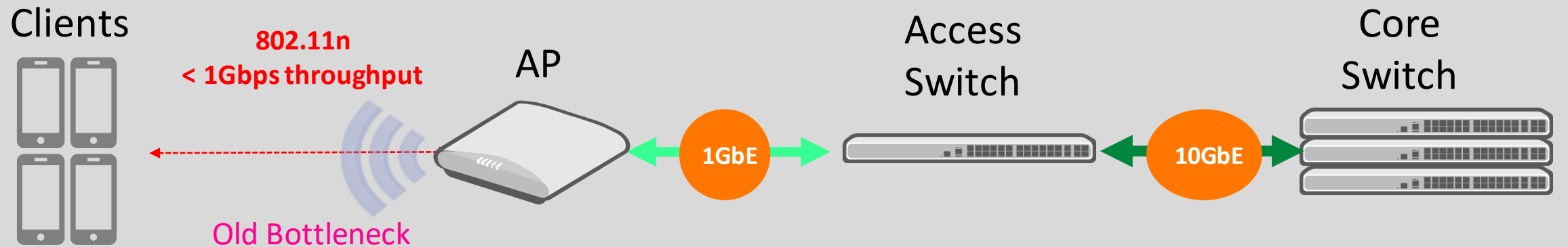
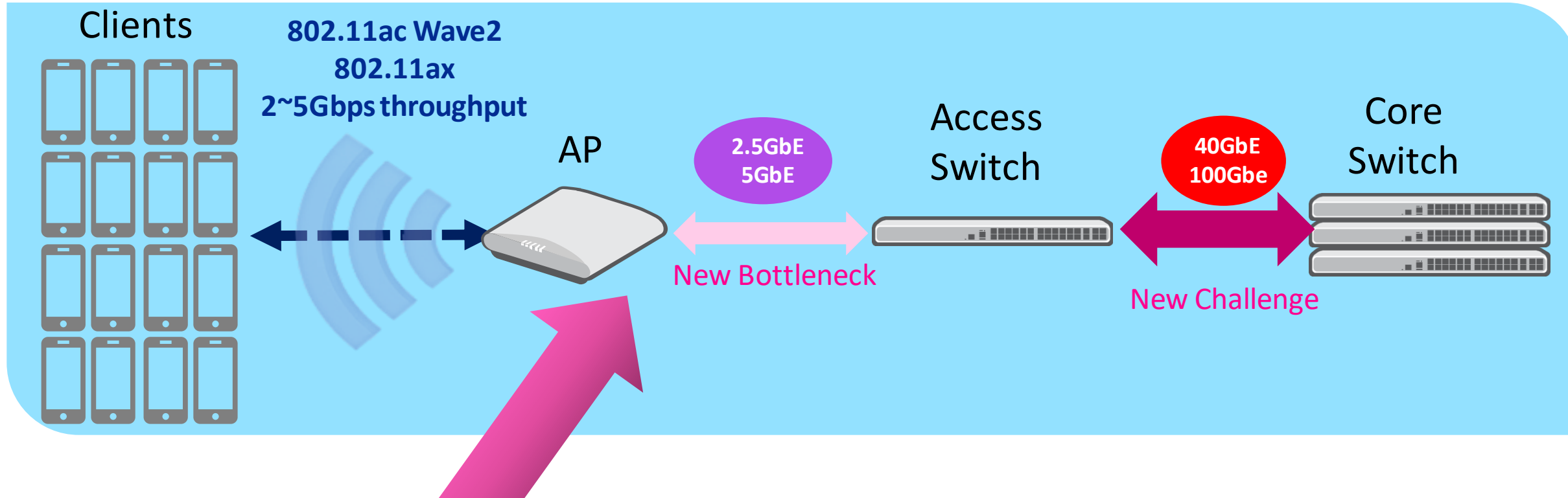
新的網路瓶頸點已經由AP對行動裝置，
改變到AP與交換器間的上連頻寬

是時候該考慮提升比1G更高的頻寬了

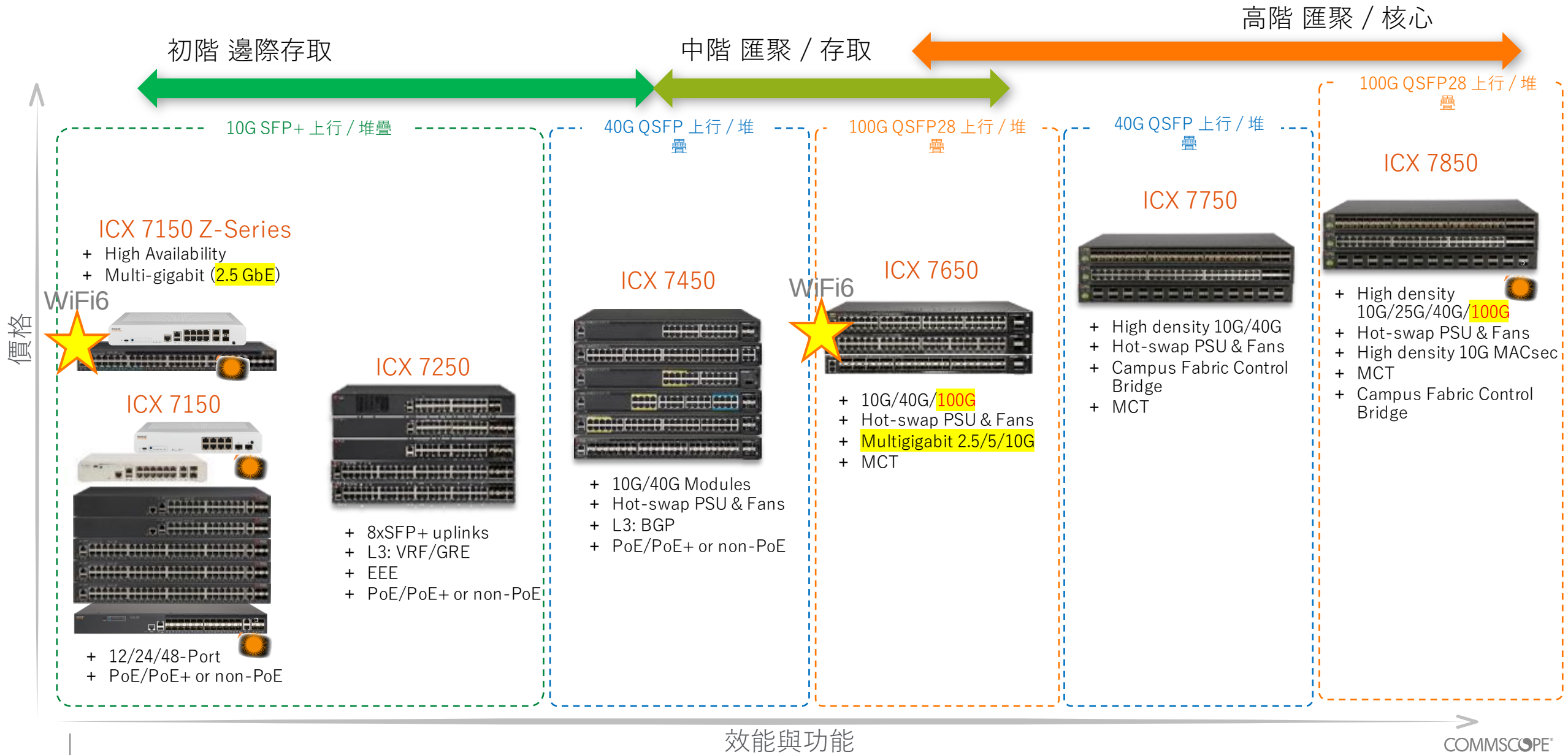
註:

- 自2018年起802.11ac Wave 2 佔接近100% 的AP出貨量 - Dell 'Oro
- 兩埠1GbE或許可以增加頻寬，但需要兩倍的佈線及兩倍的交換器埠(成本效益不佳)

Wi-Fi 6 改變了存取層到核心層的網路需求



Ruckus ICX 全系列交換器



ICX7850 100G 高效交换器

-32Q:

- 32-port QSFP8 40/100G
 - 20x100G ports for uplink
 - 12x100G ports for uplink or stacking
- All ports breakout to 4x10G/4x25G giving maximum 128 ports

-48FS:

- 48-port 1/10GE SFP+, 8 QSFP28 40/100G with 1588 Version
 - 48x10G ports for access, support LRM and MACsec.
 - 8x100G ports for stacking/uplink
- Uplink ports breakout to 4x10G/4x25G giving maximum 80 ports

-48F:

- 48-port 1/10/25GE SFP28, 8 QSFP28 40/100GE
 - 48x25G ports for access, no LRM, no MACsec support
 - 8x100G ports for uplink and stacking
- Uplink ports breakout to 4x10G/4x25G giving maximum 80 ports



Data Center

Campus Core & Aggregation

Multi-Service Operators

ICX7850 受到各電信業者的青睞

<https://www.crn.com/slide-shows/mobility/crn-s-2019-products-of-the-year/8>

Winner Of CRN2019 Products of The Year

- ✓ ICX 7850 provide high density aggregation with up to 100G, good for multi-Gigabit network growth.
- ✓ ICX 7850 offers advanced stacking, upto 12 switches
- ✓ SmartZone network controller provides configuration, monitoring and troubleshooting capabilities.
- High-performance
- Use existing fiber and network infrastructure
- Simple upgrade to the enterprise edge network
- Ruckus, now part of CommScope, is bringing more Gigabit throughput from the core to the edge of the network.



Ruckus ICX 7650 交換器

多量高階WiFi6佈建選擇

ICX 7650-48ZP

- 24x 1/2.5/5/10GE PoH (802.3bt*)
- 24x 1GE PoE+



Aggregation/Core

ICX 7650-48F

- 24x 1/10GE SFP+
- 24x 1GE SFP Fiber ports



* IEEE 802.3bt pending ratification (90 Watts) - Compatible with 60W UPoE



Ruckus ICX 7150-Z 交換器

Software Features / Capabilities

Same SW features as other ICX 7150 models

Uplinks / Stacking

8x1/10GE SFP+

Stacks with other ICX 7150 models
(First 4 Ports usable for stacking)



16x 2.5GBase-T UPoE/PoH ports
802.11ac Wave 2 AP Compatible
(up to 90 Watt per port)

32x 1G POE+ ports

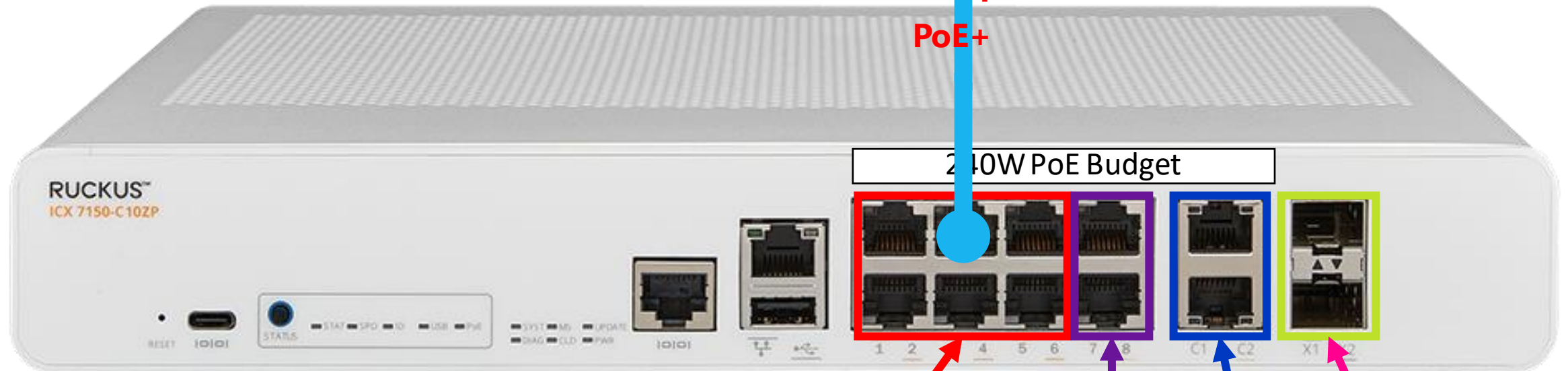
多量WiFi6佈建選擇

ICX 7150-C10ZP 滿足 WIFI-6 效能需求

- **8 x 2.5G** , 2 x 10GbE , **2 x 10G SFP+**
- 240W PoE budget (8 x WIFI6 AP)
- Unified management for wifi + wired
- Compact size (30.4cm x 30.5cm x 4.4cm)



**2.5Gbps
PoE+**



240W PoE Budget

2.5GbE PoE+/Overdrive

2.5GbE PoH/3bt

2.5/5/10GbE PoH/3bt

1/10GE SFP+

建構新一代100G + Multi-gig + WiFi6網路 (ICX7850+ICX7650/7150)

Core/Backbone

100 GbE High Performance Backbone

Aggregation/Core

10/40/100GbE Aggregation

Multi-Gigabit Access

ICX7650-48ZP Advanced Performance
ICX7150-48ZP High Performance
ICX7150-C10ZP Compact Performance

Wireless Access Points

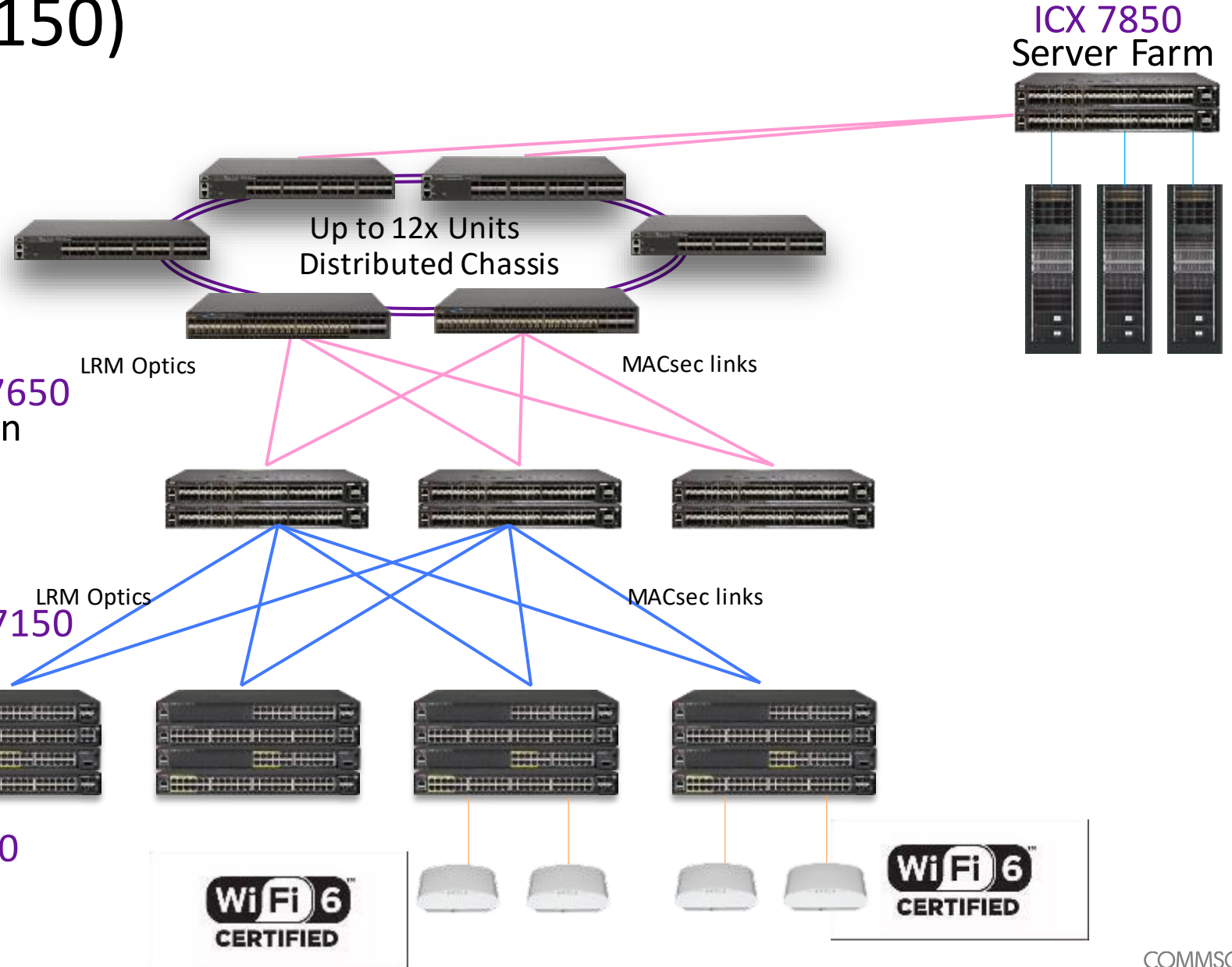
R730 Wi-Fi 6 w/5GbE
R750 Wi-Fi 6 w/2.5GbE
R720 Wi-Fi 5 w/2.5GbE

ICX 7850
Core

ICX 7850/7650
Aggregation

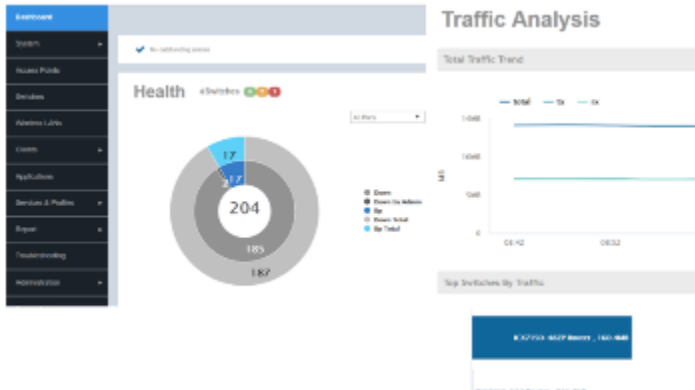
ICX 7650/7150
Access

R730/R750
Wi-Fi 6



整合有線無線管理

儀表板及流量統計



ICX交換器管理

The interface shows a list of switches with columns for Name, MAC, Model, Ports, Port Status, and Alerts. A tree view on the left shows the hierarchy of switches.

Name	MAC	Model	Ports	Port Status	Alerts
MySwitch1	XCC0000000000	XCC0000000000	XX	XX	XX
MySwitch2	XCC0000000000	XCC0000000000	XX	XX	XX
MySwitch3	XCC0000000000	XCC0000000000	XX	XX	XX
MySwitch4	XCC0000000000	XCC0000000000	XX	XX	XX
MySwitch5	XCC0000000000	XCC0000000000	XX	XX	XX
MySwitch6	XCC0000000000	XCC0000000000	XX	XX	XX
MySwitch7	XCC0000000000	XCC0000000000	XX	XX	XX

ICX 軟體管理

The dialog box contains fields for 'Firmware Type' (Switch/Router), 'Apply Firmware' (Now/Later), and 'Schedule'. It also includes a warning message about firmware upgrade scheduling.

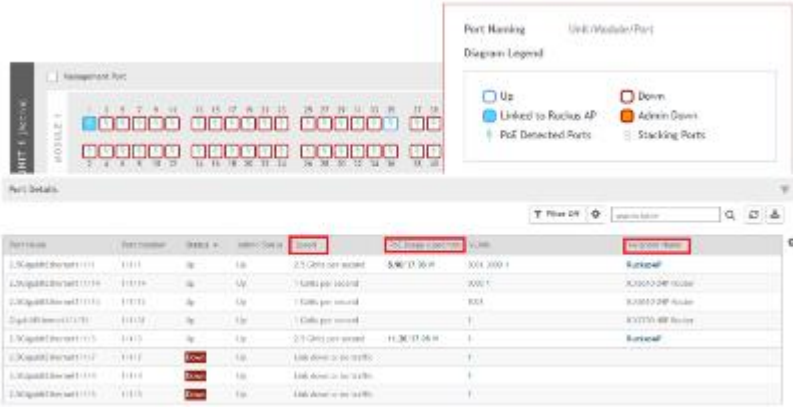
Warning: Make sure firmware upgrade is not scheduled at same time when on-demand or automatic config-backup [run at 00:00 hours everyday] is scheduled for the selected switch(es).

ICX 設定檔管理

The table shows configuration differences between two switches, including fields for Name, Date and Time, Type, Status, Config Backup, and Feature Backup.

Name	Date and Time	Type	Status	Config Backup	Feature Backup
MySwitch1	2023-12-12 10:00:00	Switch	Up	Success	Success
MySwitch2	2023-12-12 10:00:00	Switch	Up	Success	Success
MySwitch3	2023-12-12 10:00:00	Switch	Up	Success	Success
MySwitch4	2023-12-12 10:00:00	Switch	Up	Success	Success
MySwitch5	2023-12-12 10:00:00	Switch	Up	Success	Success
MySwitch6	2023-12-12 10:00:00	Switch	Up	Success	Success
MySwitch7	2023-12-12 10:00:00	Switch	Up	Success	Success

交換器連接埠管理



ICX 功能設定

The configuration page shows settings for 'Layer 2', including 'VLANs', 'Ports', and 'Stacking Ports'. It includes fields for 'VLAN Name', 'VLAN ID', and 'Port ID'.

連線裝置追蹤



內建故障分析工具

Lab-SZ-100
2023-02-14 12:13:23

default

Dashboard
System
Access Points
Monitoring APs
Switches
Wireless LANs
Clients
Firewall
Services & Profiles
Report
Troubleshooting
Administration
Events & Alarms
Diagnostics
System Info
Hostname: SZ-101
Version: 5.2.0.3.689

Troubleshooting

1
Type: Client Connection

2
Client: 08:00:1B:1C:34:67

3
Select APs: Select Global APs: 2

4
Connectivity Tools: Start Stop Clear

Connection

Click and drag in the plot area to zoom in

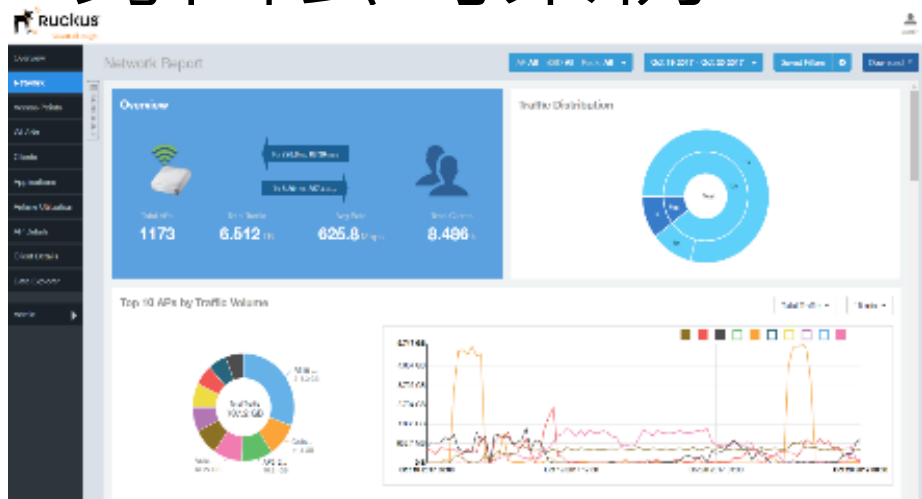
10 Feb 17 Feb

AP: 0/20 (1B:1C:34:67:1C:34:67) SSID: lab-4x-wifi11 Radio: 2.4GHz

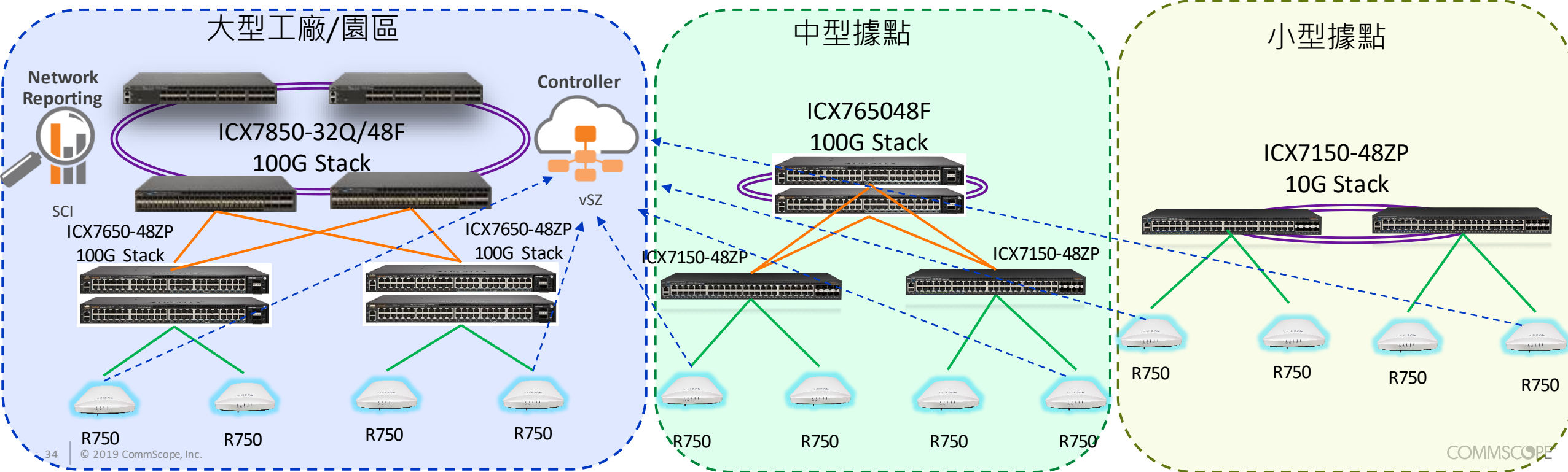
✓	802.11 Authentication Request
✓	802.11 Authentication Response
✓	802.11 Association Request
✓	802.11 Association Response
✓	4-Way Handshake - Frame 1
✓	4-Way Handshake - Frame 2
✓	4-Way Handshake - Frame 3
✓	4-Way Handshake - Frame 4
✓	DHCP Request
✓	DHCP NAK
✓	DHCP Discover
✓	DHCP Discover
✓	DHCP Discover
✓	DHCP Discover
✓	DHCP Discover

成功案例分享

跨國公司案例



- 全球200+ 業務據點
- 50+個大型工廠/園區
- 全球標準化採用Ruckus 有線 (ICX) + 無線整合方案
- 2020年起採用WiFi 6為標準配備
- SCI + IoT + SPoT(定位)應用



Thank You

David Chen

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