

WiFi6、IoT物聯網結合應用

加速實現智慧校園

May, 2020

David Chen

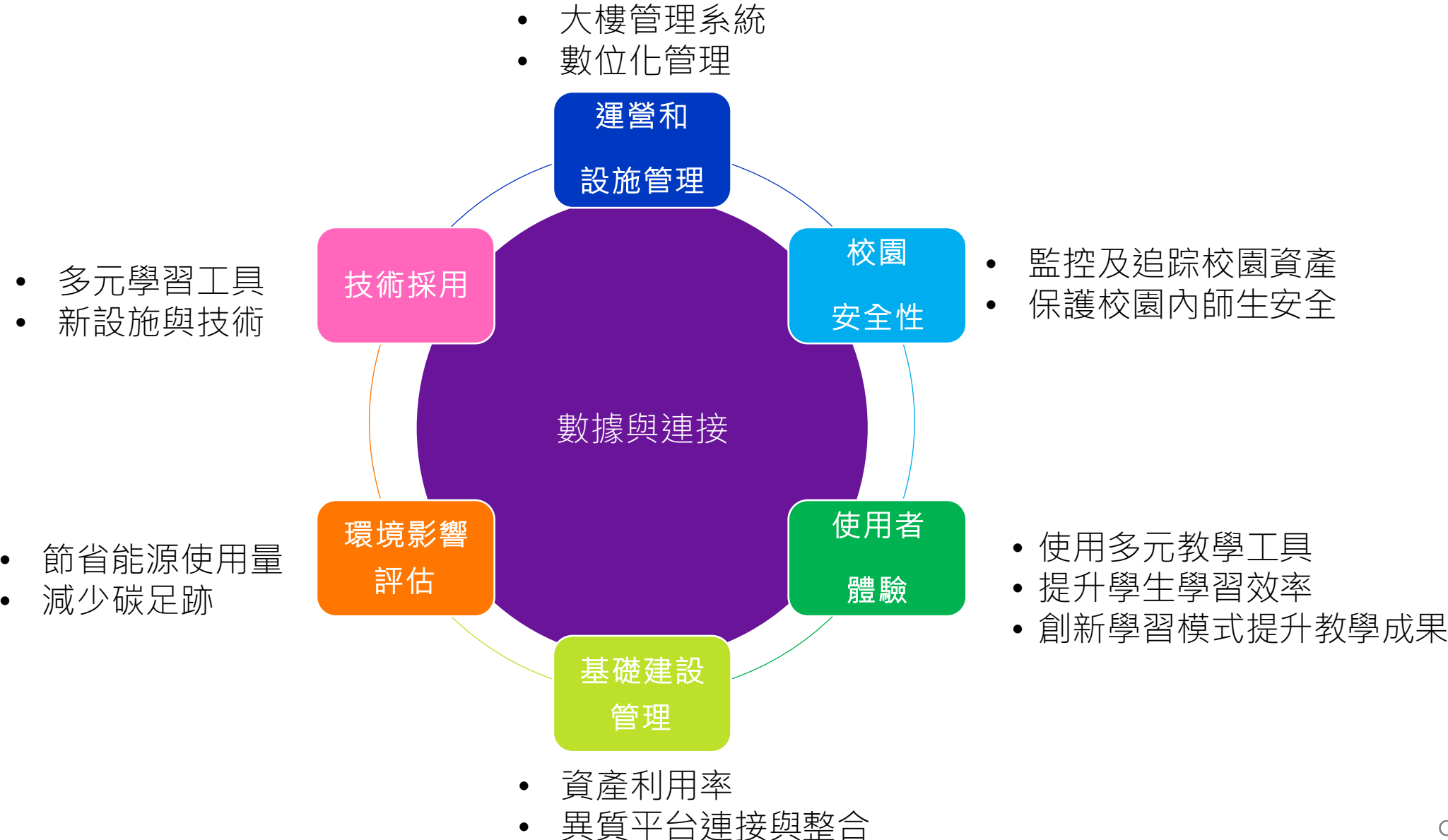
Technical Manager

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學校發展新趨勢 – 智慧校園

如何在節省運營成本的情況下，還能持續發展具備吸引學生的優勢？

邁向智慧校園的趨勢與驅動力



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

物件追蹤



- 資產、人、物之尋找與管理
- 緊急按鈕安全監控
- 自動化出席統計

安全監控



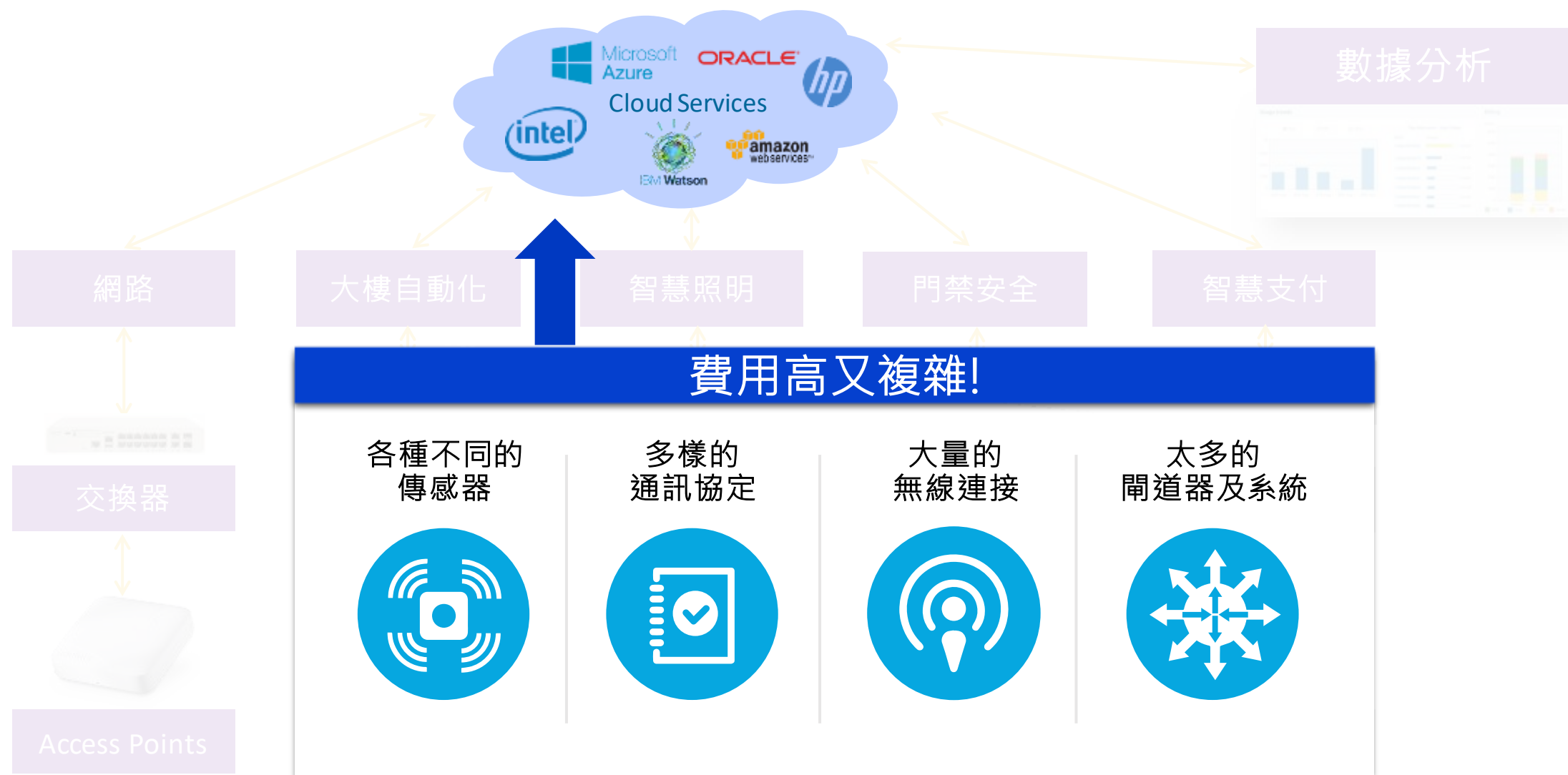
- 攝像機與監控整合
- 門禁管制
- 安全警報狀況監控
- 辨識建築物佔用狀況、監測及報告

數據遙測



- 環境狀況監控
- 設備狀態偵測
- 運送管理監控
- 物料運送稽核

物聯網環境的挑戰 – 太多閘道器及系統

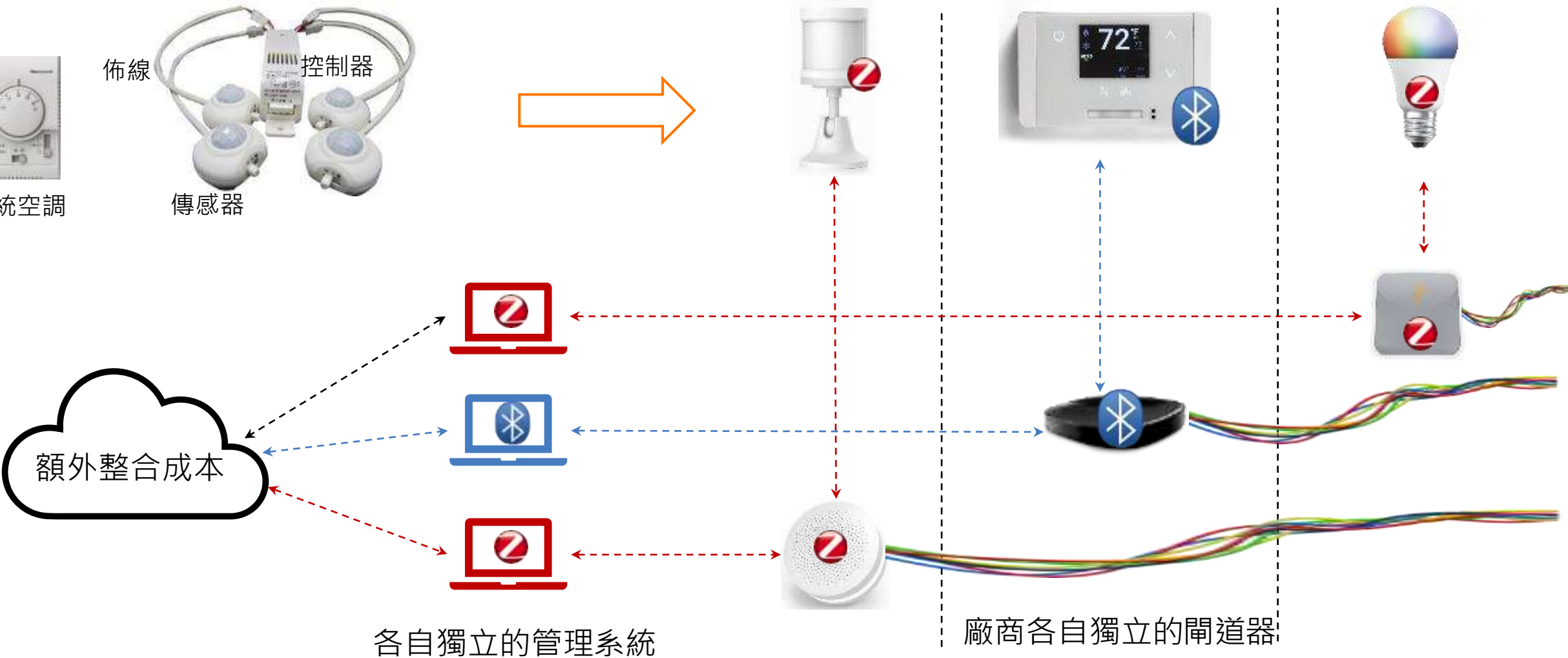


各自獨立的協定與系統

傳統傳感器- 佈線麻煩,整合不易



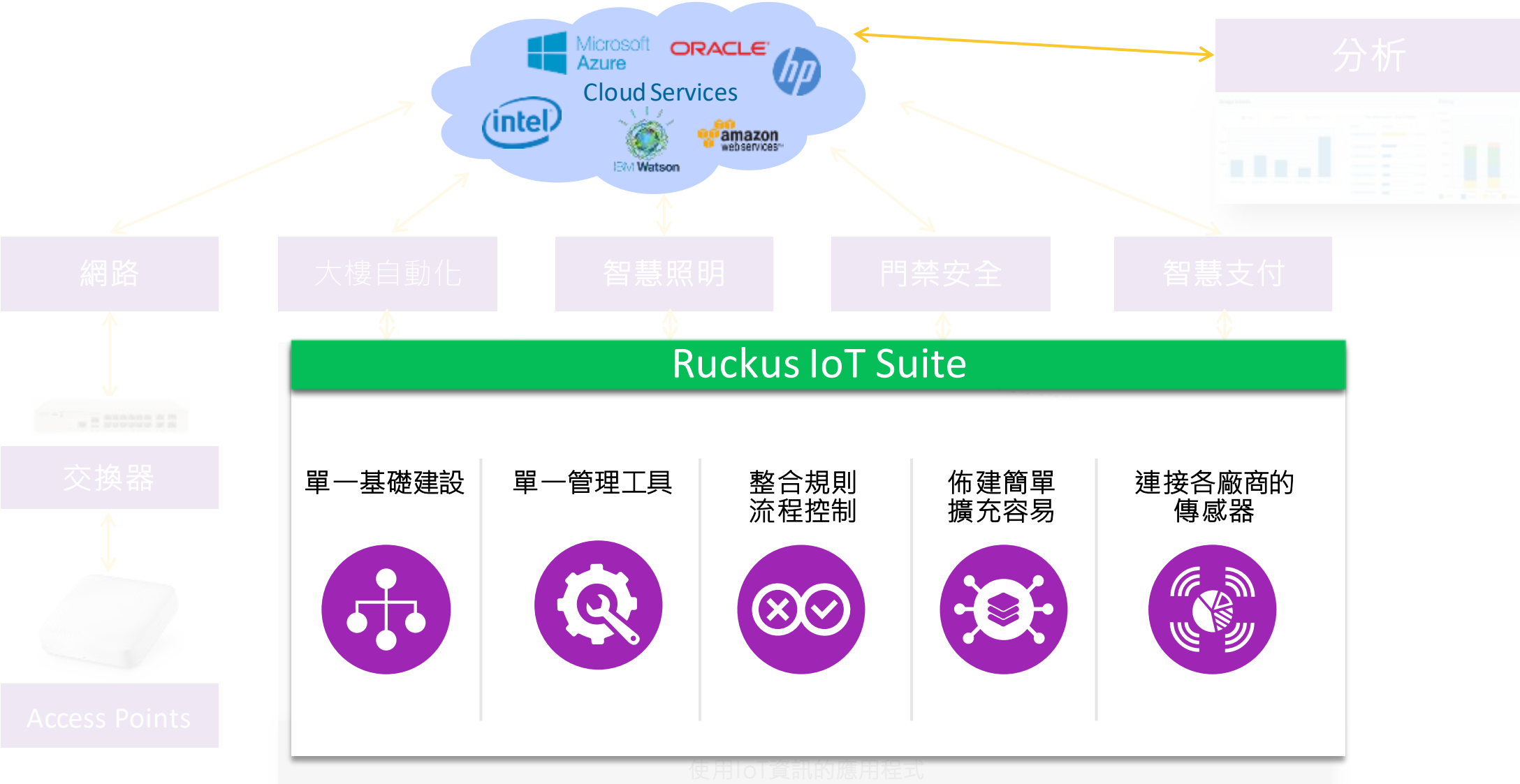
使用不同通訊協定的傳感器



Ruckus整合WiFi6+IoT存取網路

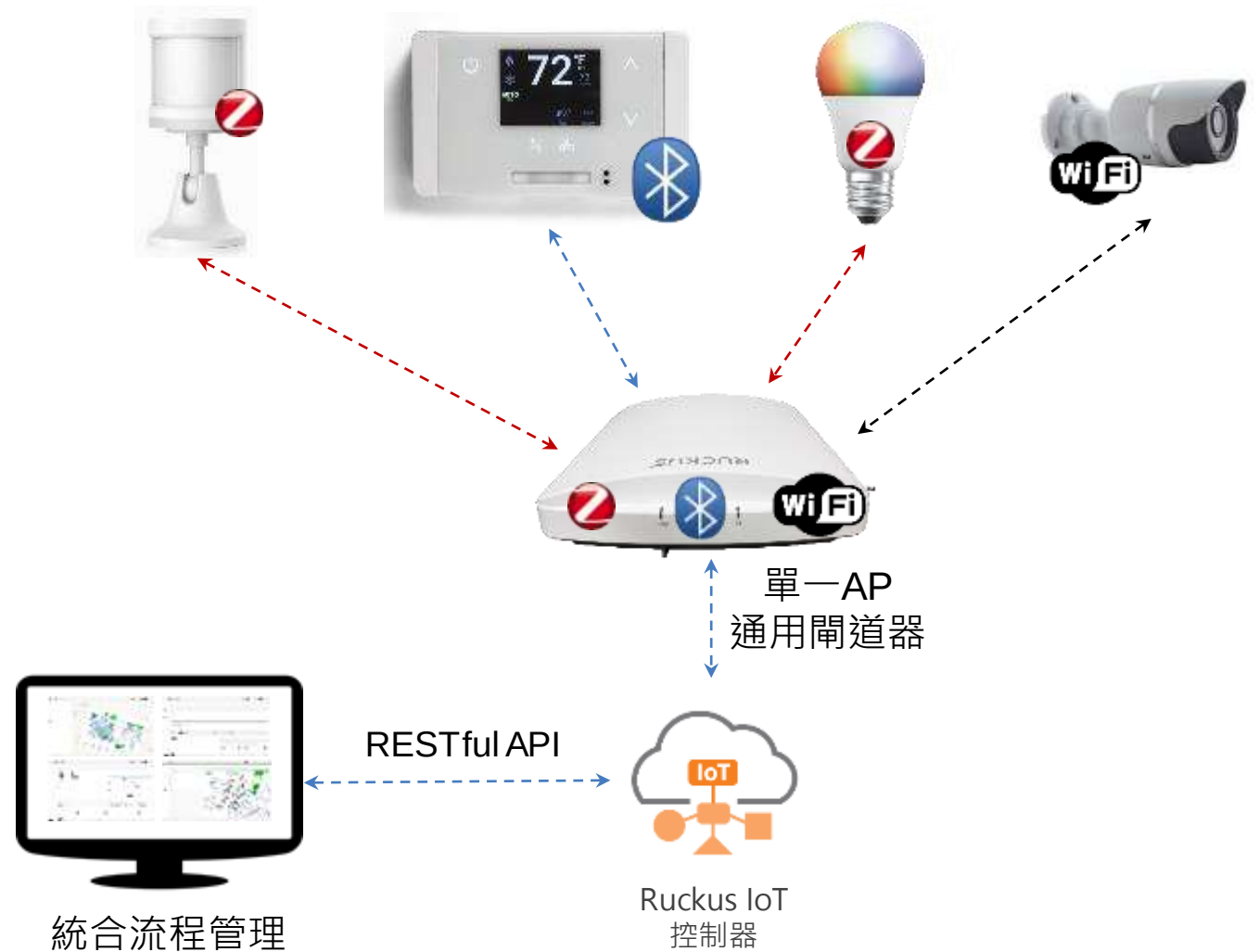


Ruckus IoT Suite整合方案

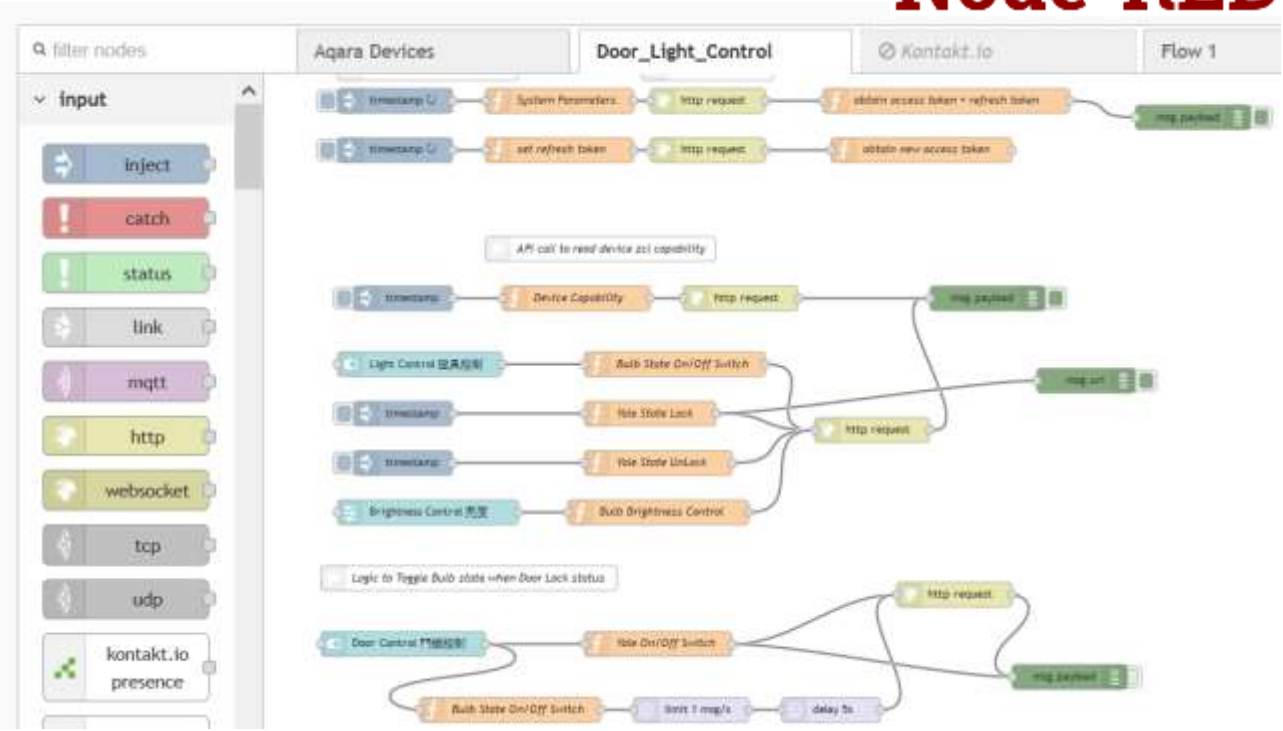
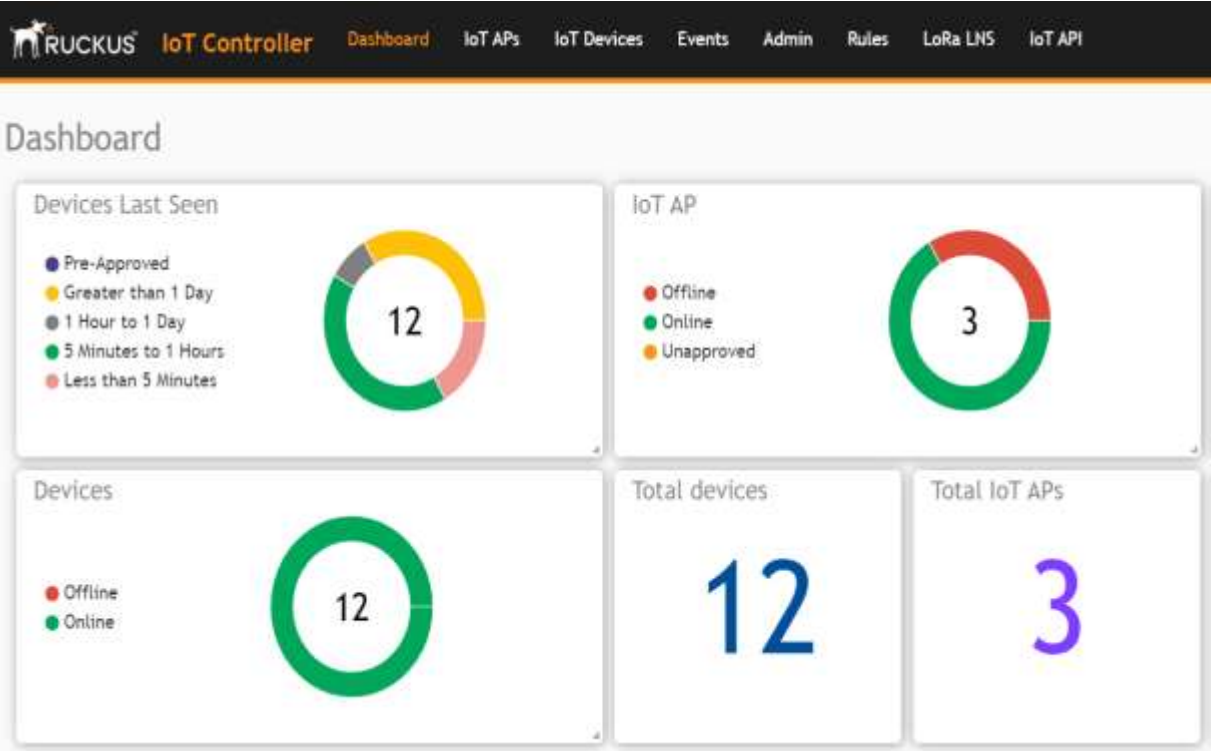


Ruckus IoT整合架構簡化網路

- 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



Ruckus IoT控制器及內建規則引擎



Devices

Beacons

Pre-Approve IoT Devices

Batch Actions:

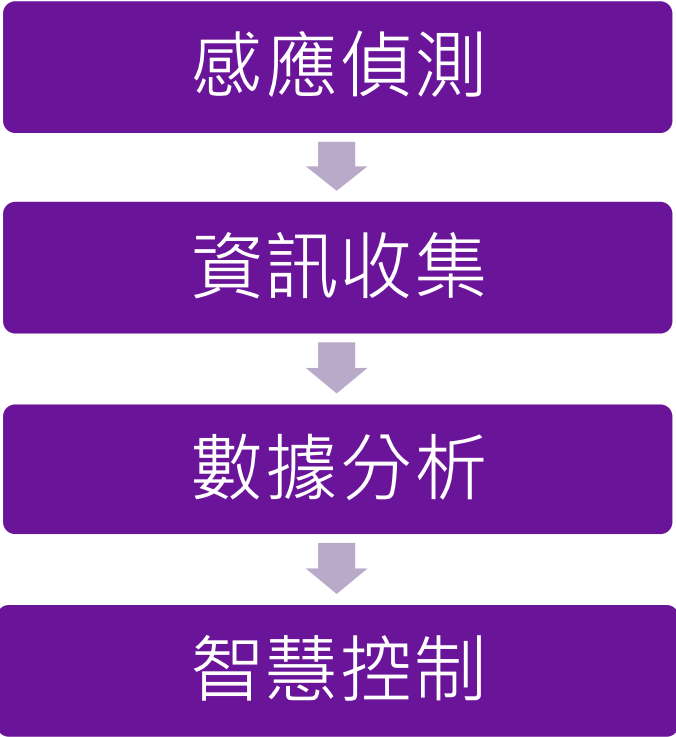
Select

▼

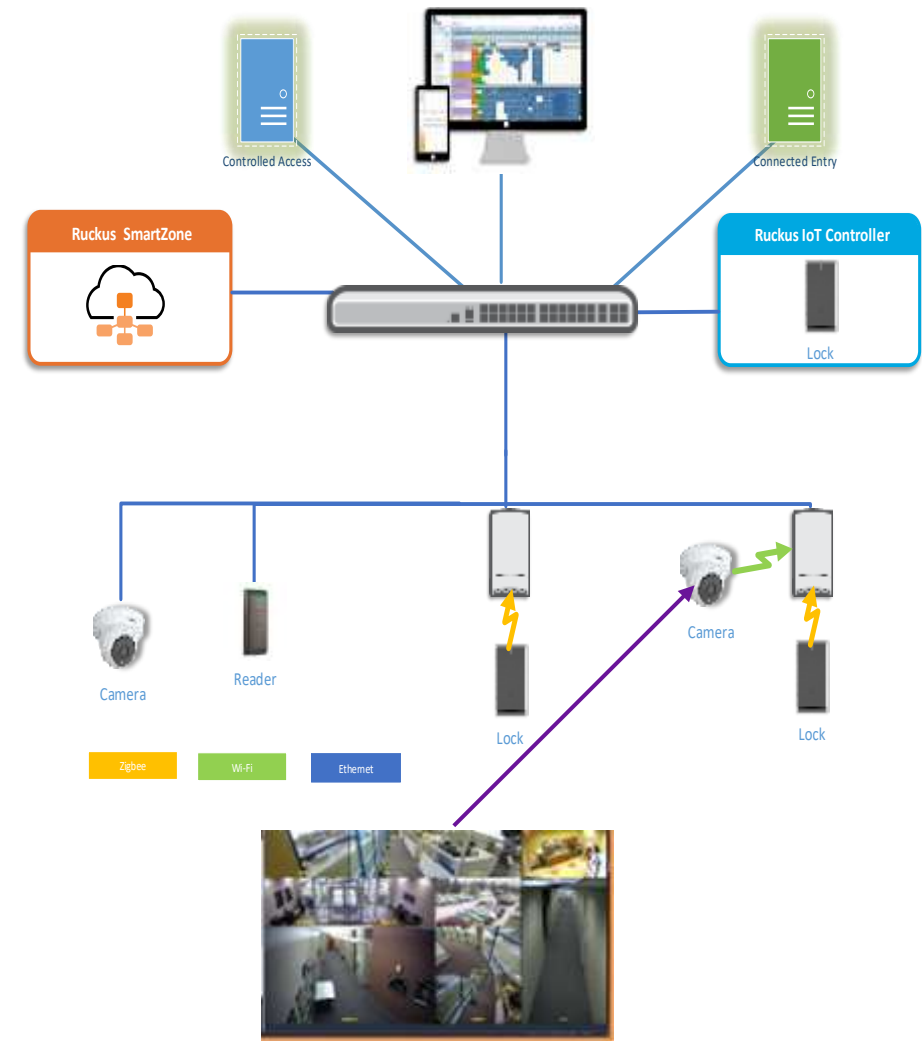
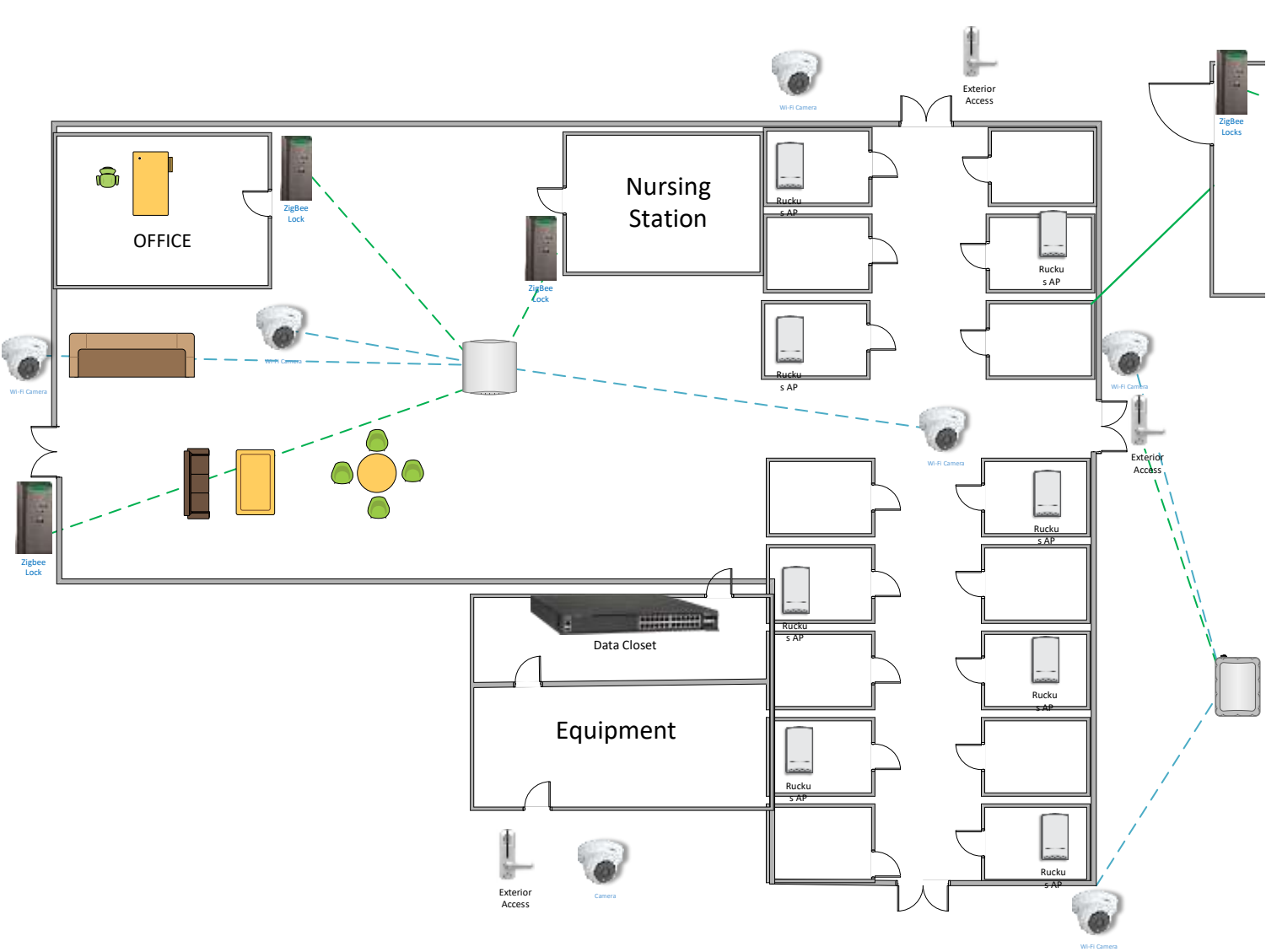
Apply

☐		Name	MAC ID	IoT AP MAC	Protocol	Type	LQI	RSSI	Last Seen	Action	Tags
☐		Light	84:18:26:00:00:04:A6:69	44:1E:98:22:1D:90	zigbee	Color Dimmable Light	88	-44	28 minutes ago		All Light
☐		MI_Smart_Plug	00:15:8D:00:04:14:2C:58	44:1E:98:22:1D:90	zigbee	Smart plug	97	-38	6 minutes ago		All MI_Smart_Plug
☐		Aqara_Square	00:15:8D:00:02:A6:FD:AE	44:1E:98:22:1D:90	zigbee	Simple Sensor	100	-30	12 minutes ago		All Aqara_Square
☐		ZEN Thermostat	00:24:46:00:00:12:89:5D	44:1E:98:22:1D:90	zigbee	Thermostat	100	-18	14 hours ago		All ZEN Thermostat

智慧校園環境應用



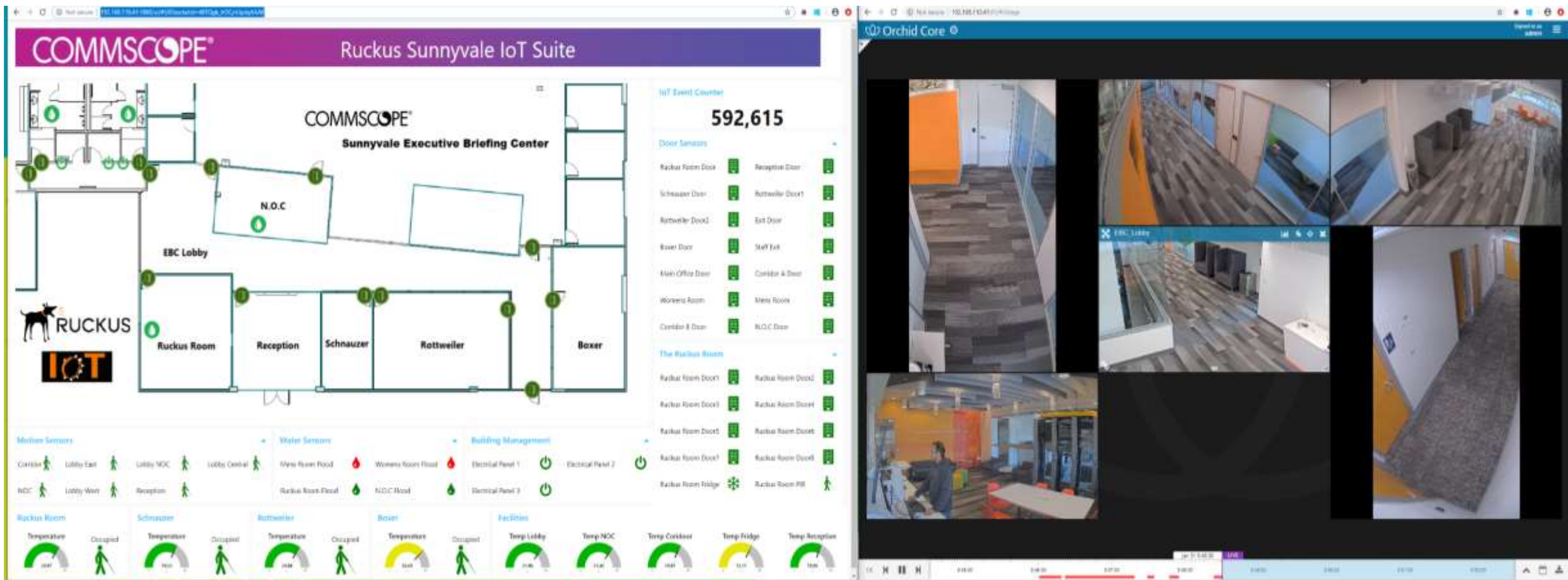
安全監控環境



監視器

自動化監控事件與規則引擎整合

- 大量的事件記錄(門, 移動, 漏水偵測, 溫度, 環境狀態)
- 傳感器事件與監視器連動整合記錄



完整豐富的IoT生態合作系統

TODAY

ASSA ABLOY
CONNECTED ENTRY



I/CONFIGURE
AXIS
COMMUNICATIONS
VIDEO / VMS



TraknProtect
PANIC BUTTON



SOTER
VAPE DETECTION



kontakt.io
AVSYSTEM
LOCATION SERVICES



telkonet
ENERGY MANAGEMENT



Std.
IoT



UP NEXT

dormakaba
CONNECTED ENTRY



REACT
mobile
PANIC BUTTON



SmartThings
HOME AUTOMATION (MDU)



OMRON
HEALTHCARE



更多設備支援，輕鬆升級物聯網環境



門窗傳感器



人體傳感器



震動傳感器



溫濕度傳感器



智慧插座



單火開關

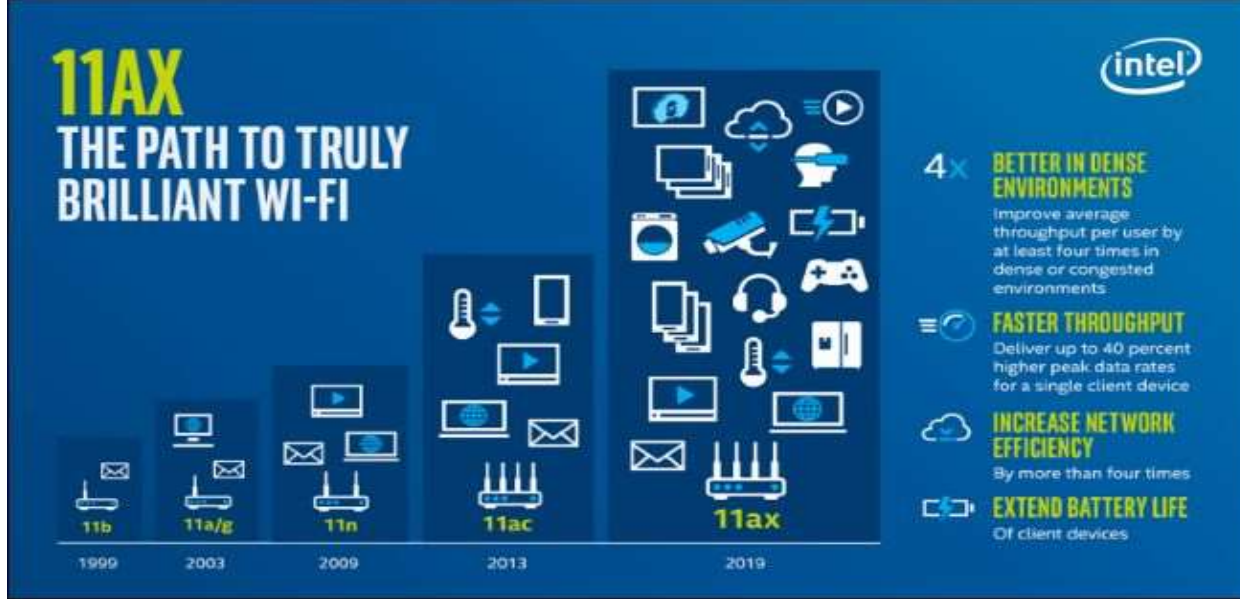


零火開關

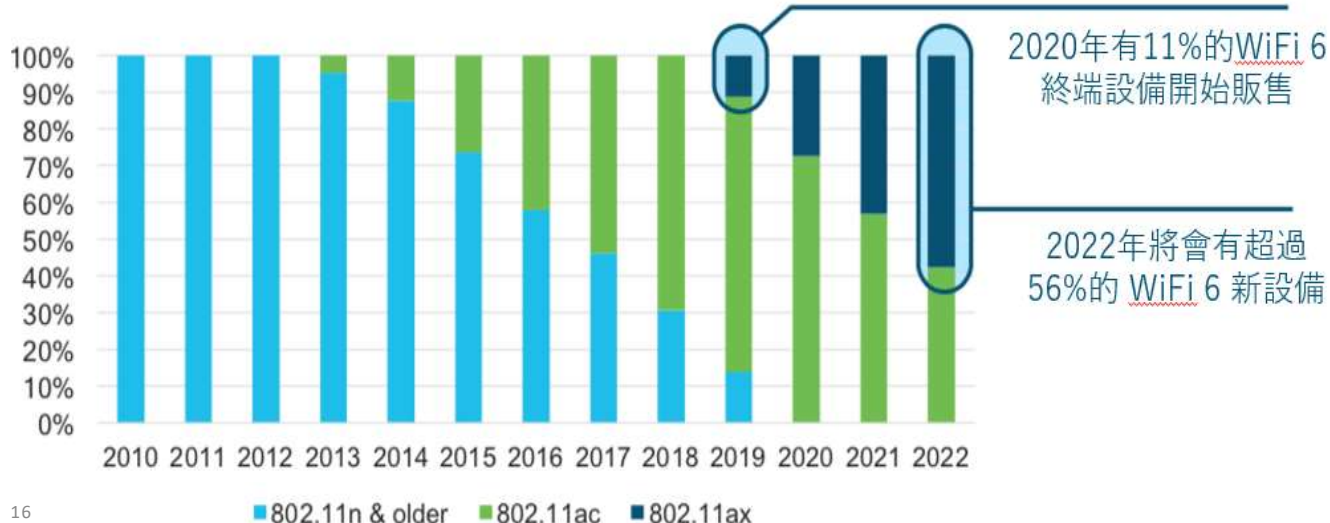


埋入式插座

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)



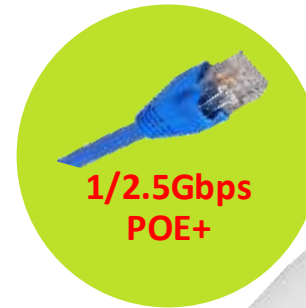
Wi-Fi 6 (11ax)

WiFi-6 Target Wake Time – 7x 電池續航力



Ruckus高階WiFi6 AP – R750

4x4:4 + 2.5G Ethernet



同時支援多種無線通訊協定

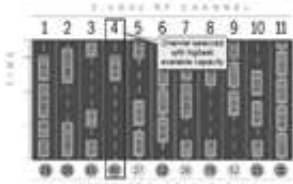
Ruckus WiFi 6 系列AP

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

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



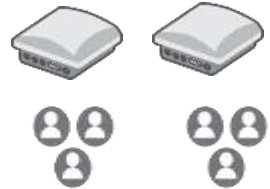
自動調適基地台
含蓋範圍



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

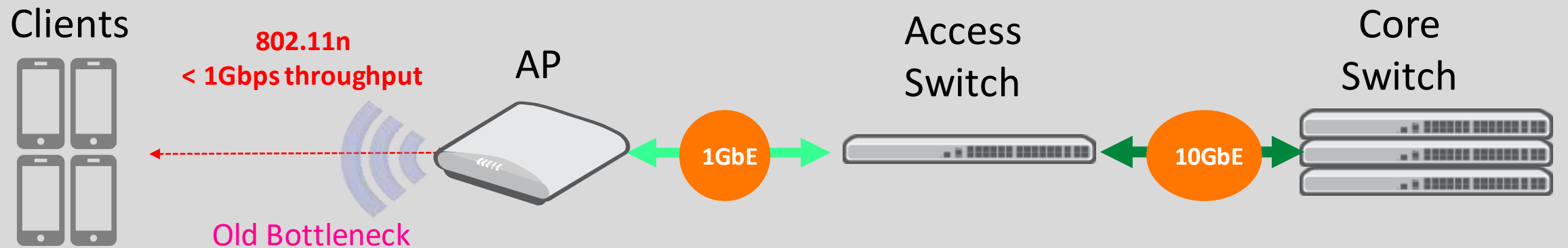
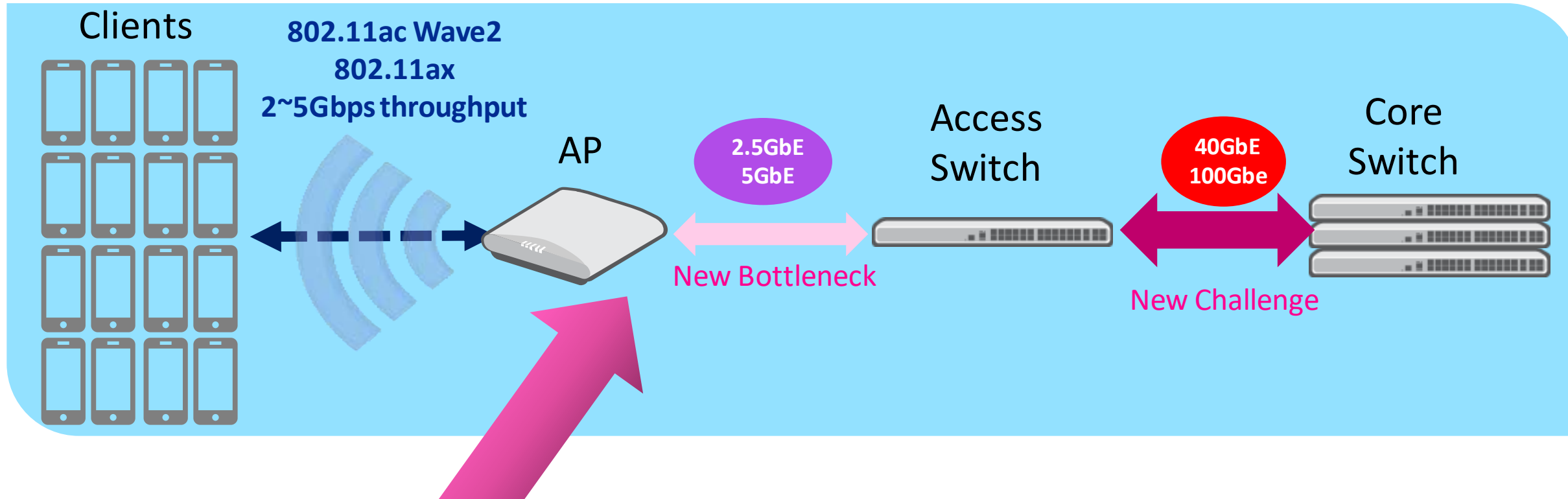
偵測臨近基地台訊號，自動調整訊號範圍來優化無線頻道涵蓋，同時減少同頻干擾，取得更好的網路效能

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

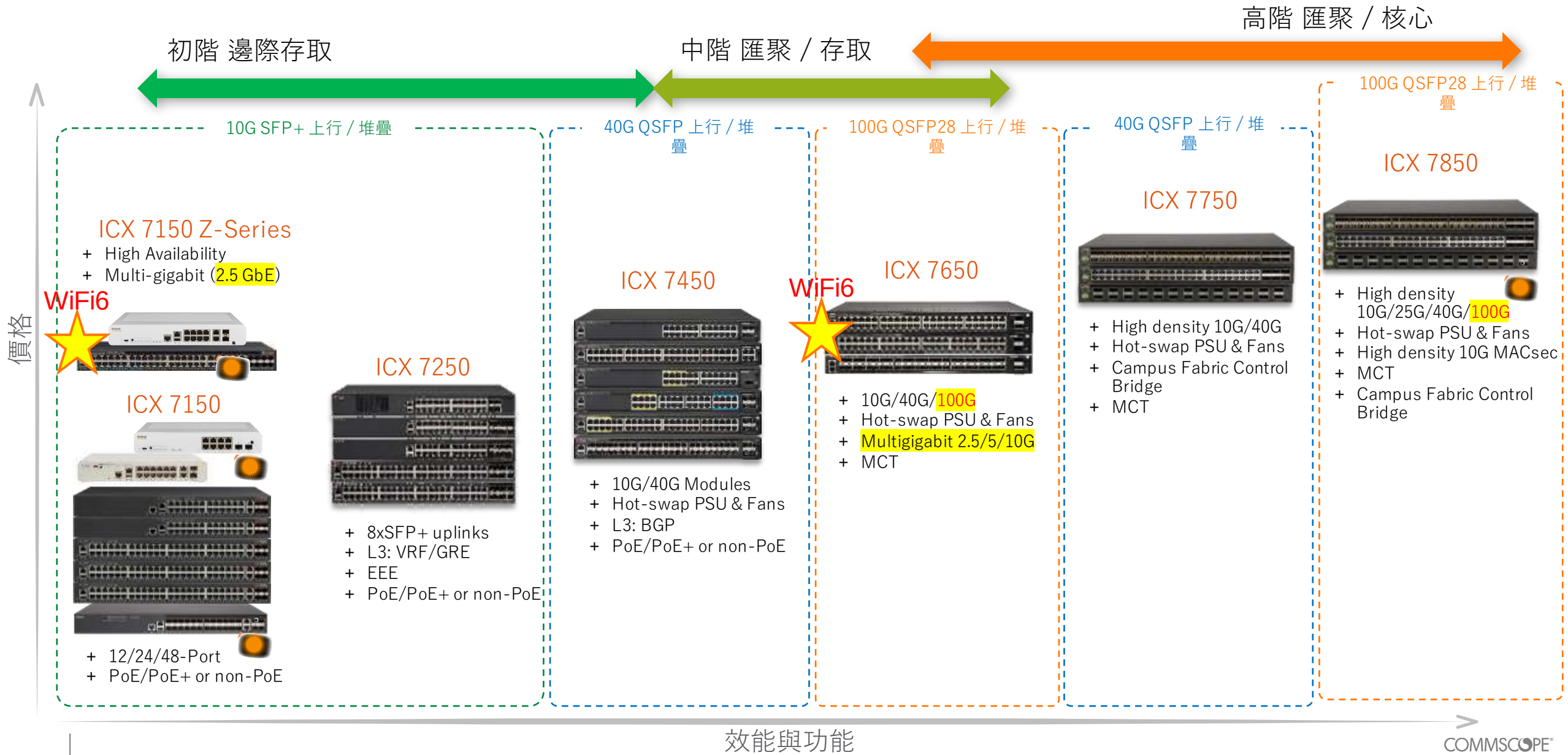
透過減少壅擠環境中的管理流量，提高可用無線空時，有效提升頻譜利用率及設備效能

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

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



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+



2.5GbE PoE+/Overdrive

2.5GbE PoH/3bt

2.5/5/10GbE PoH/3bt

1/10GE SFP+

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 ICX switches under the heading 'ICX Switches'. The table below lists several switches with their respective details.

Name	MAC	Model	Ports	Port Status	Alerts
MySwitch1	X000000000000	XXXXXX	24	24	0
MySwitch2	X000000000000	XXXXXX	24	24	0
StackMember1	X000000000000	XXXXXX	24	24	0
StackMember2	X000000000000	XXXXXX	24	24	0
MySwitch3	X000000000000	XXXXXX	24	24	0
MySwitch4	X000000000000	XXXXXX	24	24	0
MySwitch5	X000000000000	XXXXXX	24	24	0

ICX 軟體管理

The 'Upgrade Firmware' dialog box contains the following fields and options:

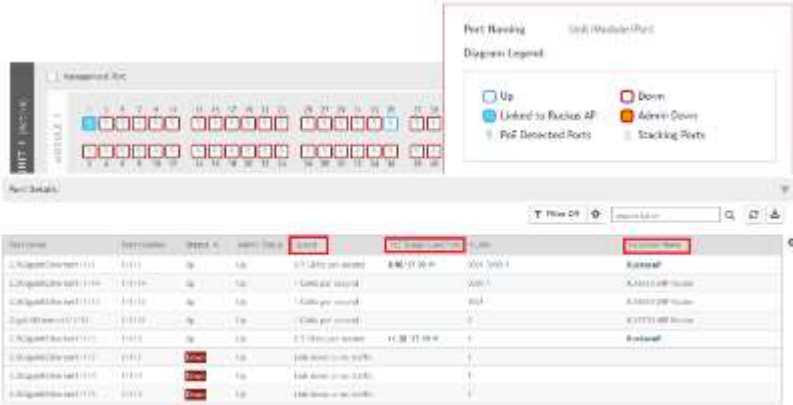
- Uploaded Firmwares: A dropdown menu showing 'Firmware'.
- Firmware Type: Radio buttons for 'Switch' and 'Router'.
- Apply Firmware: Radio buttons for 'Now' and 'Later'.
- Schedule Firmware: A text input field.
- Note: Schedule will be executed based on local(browser) timezone.
- Warning: Make sure firmware upgrade is not scheduled at same time when an demand or automatic config backup [run at 00:00 hours everyday] is scheduled for the selected switch(es).
- Buttons: 'OK' and 'Cancel'.

ICX 設定檔管理

The 'Switch Config Diff' interface displays a table comparing configurations between two switches. The table has columns for 'Left Switch', 'Right Switch', 'Config Item', 'Status', and 'Details'.

Left Switch	Right Switch	Config Item	Status	Details
Switch1	Switch2	System Name	Match	Switch1: MySwitch1, Switch2: MySwitch1
Switch1	Switch2	System MAC	Match	Switch1: X000000000000, Switch2: X000000000000
Switch1	Switch2	System Model	Match	Switch1: XXXXXX, Switch2: XXXXXX
Switch1	Switch2	System Ports	Match	Switch1: 24, Switch2: 24
Switch1	Switch2	System Port Status	Match	Switch1: 24, Switch2: 24
Switch1	Switch2	System Alerts	Match	Switch1: 0, Switch2: 0

交換器連接埠管理



ICX 功能設定

The 'ICX Function Settings' interface displays various configuration options for a switch, including:

- Switch: A dropdown menu.
- ACL: A dropdown menu.
- Layer: A dropdown menu.
- Port: A dropdown menu.
- Port ID: A text input field.
- Port Name: A text input field.
- Port Type: A dropdown menu.
- Port Status: A dropdown menu.
- Port Details: A text input field.
- Buttons: 'OK' and 'Cancel'.

連線裝置追蹤



內建故障分析工具

RUCKUS
SmartZone 100

Lab-SZ-100
2020-02-14 12:13:23 default user

Dashboard

System

Access Points

- Access Points
- Monitoring APs

Switches

Wireless LANs

Clients

Firewall

Services & Profiles

Report

Troubleshooting

Administration

Events & Alarms

Diagnostics

System Info

- Hostname: SZ-101
- Version: S.L.6.3.0.69

Troubleshooting

Type: Client Connection

[?] Client: DE2DAB1C134E9V

Select APs Select Global APs: 2

Connectivity Tools Start Stop Clear

Connection

Click and drag in the plot area to zoom in.

AP: R/SZ (L3-LB-A8299150) SSID: lab-4sec-wifi Radio: 2.4GHz

Client Status

Authenticating Request

Authenticating Response

Association Request

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

Client Status

Access Point (R/SZ-DAB1C134E9)

Basic Plane

Control Plane (S/L-BT)

Data

Mobility Server

LDP

Authentication Server

Capwap Tunnel

Trunking

Info

Error

Info

Info

Info

Info

建構新一代100G + Multi-gig + WiFi6 + IoT網路

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

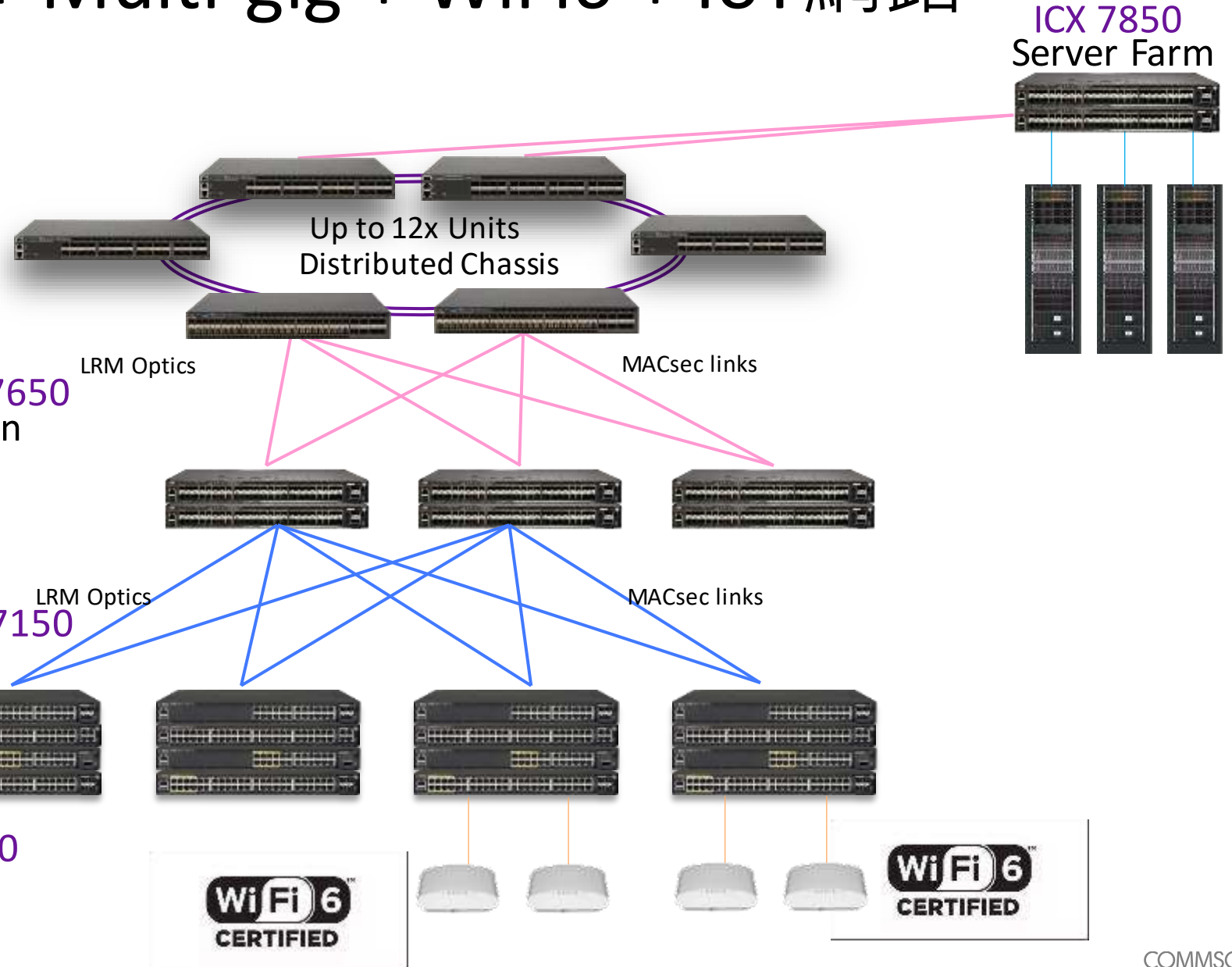
R850 Wi-Fi 6 w/5GbE
R750 Wi-Fi 6 w/2.5GbE
R650 Wi-Fi 6 w/2.5GbE

ICX 7850
Core

ICX 7850/7650
Aggregation

ICX 7650/7150
Access

R750/R650
Wi-Fi 6



Thank You

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