Ruckus Wireless Training

SMARTZONE

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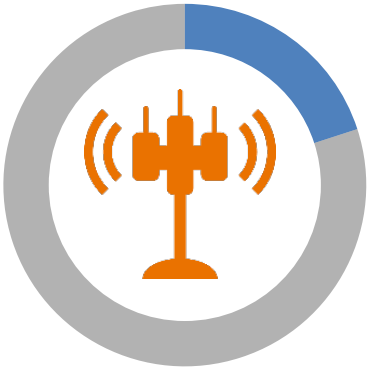
JLEAD

議程

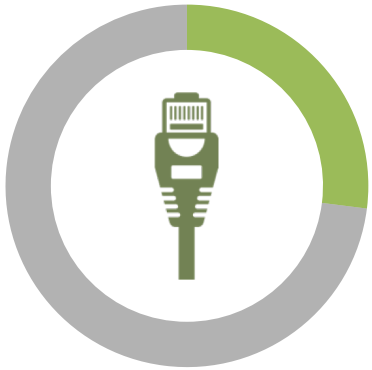
- 無線網路趨勢
- Ruckus 無線技術 & 產品
- SMARTZONE 產品架構
- SMARTZONE initial
- AccessPoint initial
- Base config , WLAN config , others
- Lab

2021 全球流量預估統計



20%
行動通信

53%
無線網路



27%
有線網路

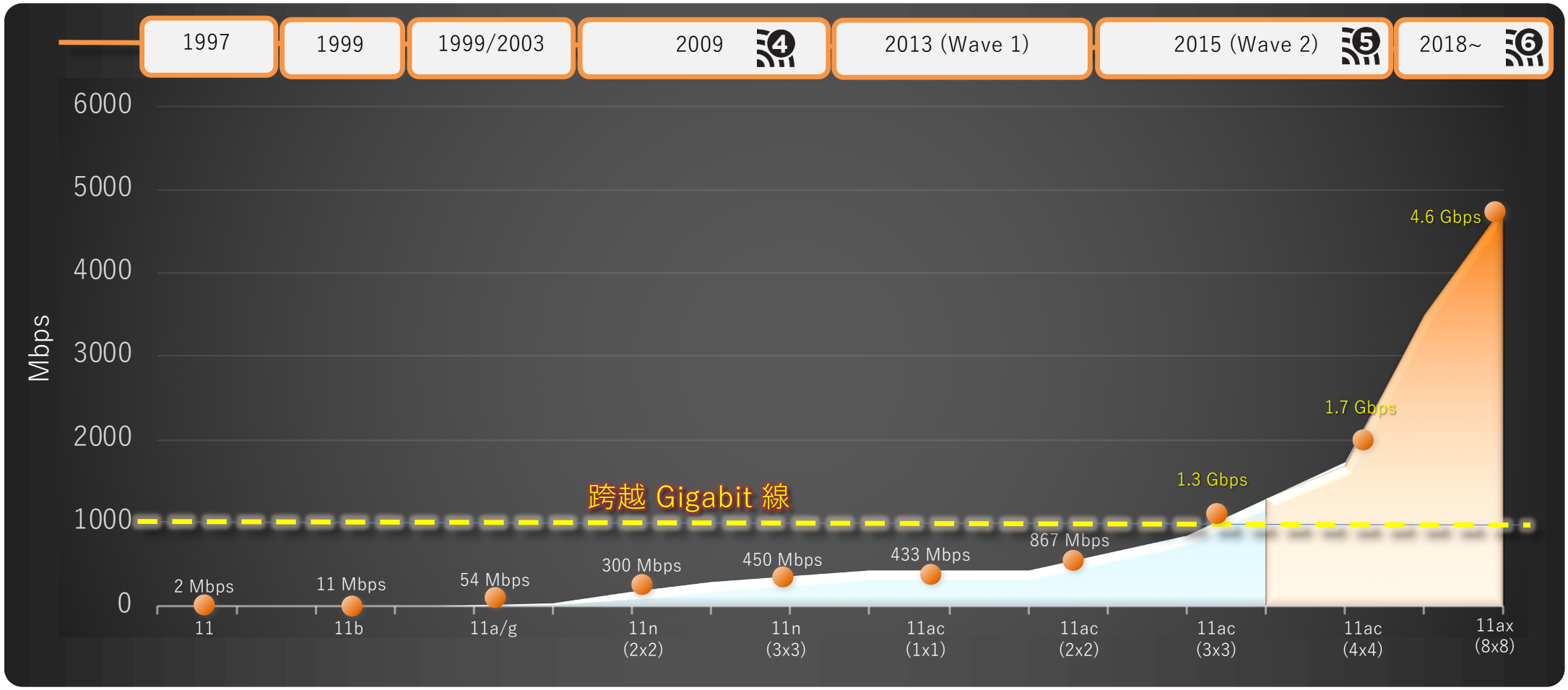
問題來了: 您.準備好了嗎?

- 超過 1000 倍以上的頻寬用量
- 超過 200億個物聯網設備(IoT)
- 超過 50% 的設備與設備間互聯

資料來源: Global Internet Traffic (2021)

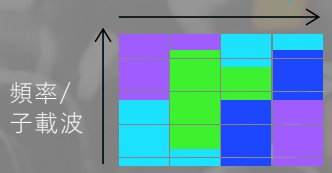

Ruckus 為您帶來全新無線體驗

越來越快的 WiFi 傳輸速度



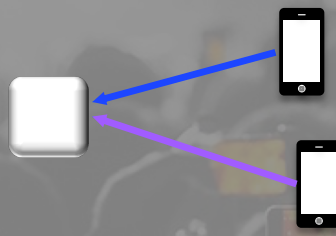
即將席捲全球的無線技術規格 802.11ax

更有效率



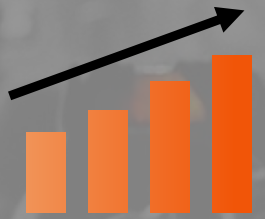
支援 OFDMA

更多設備



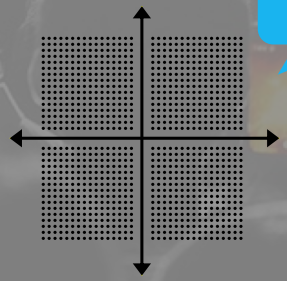
上行
MU-MIMO

傳得更快



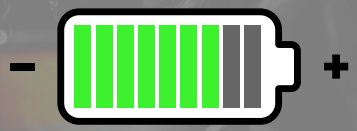
實體層及網路層效率提升

更有效率



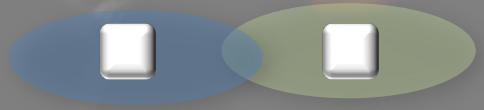
更多相位 1024-QAM

用戶省電



電源效率提升

更有效率



BSS 顏色識別技術

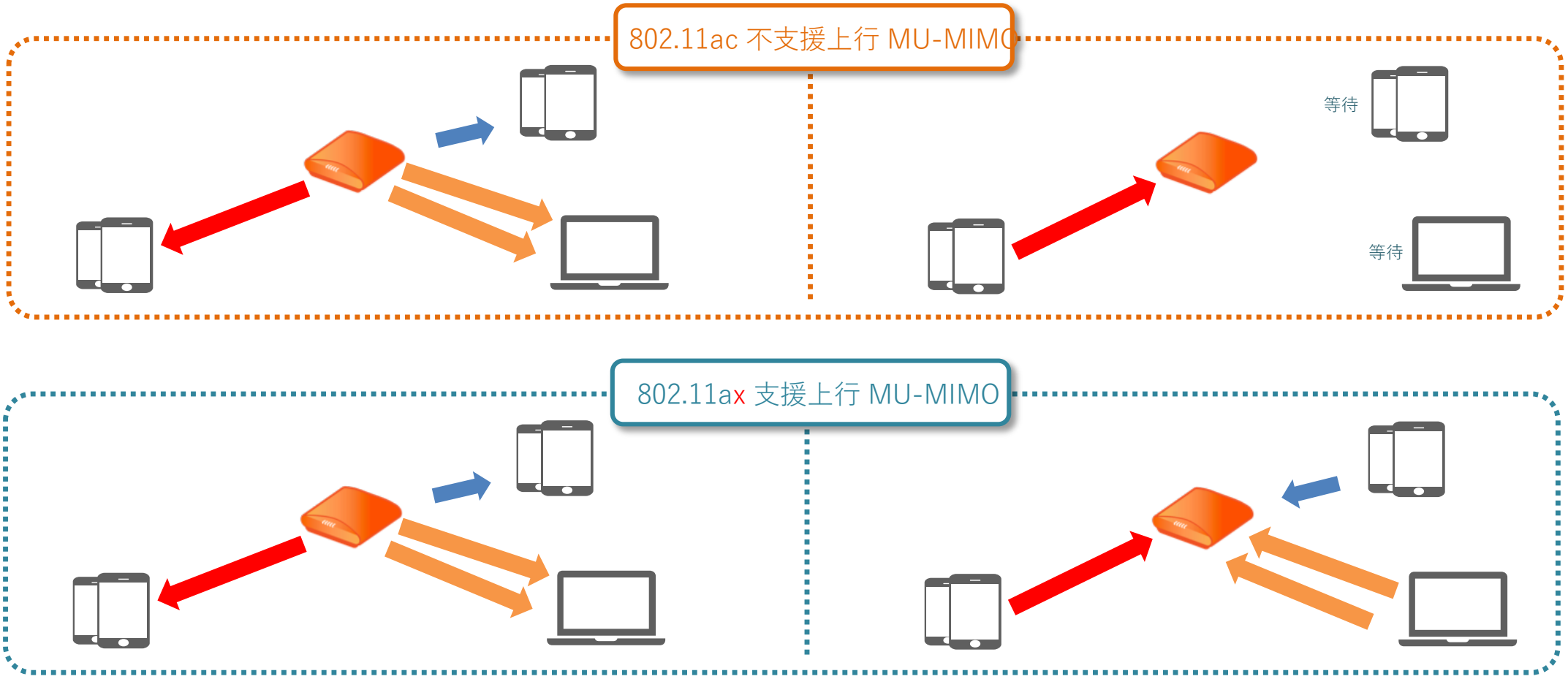
OFDMA 如何提升傳輸效率

目前 WiFi 5 (11ac)網路

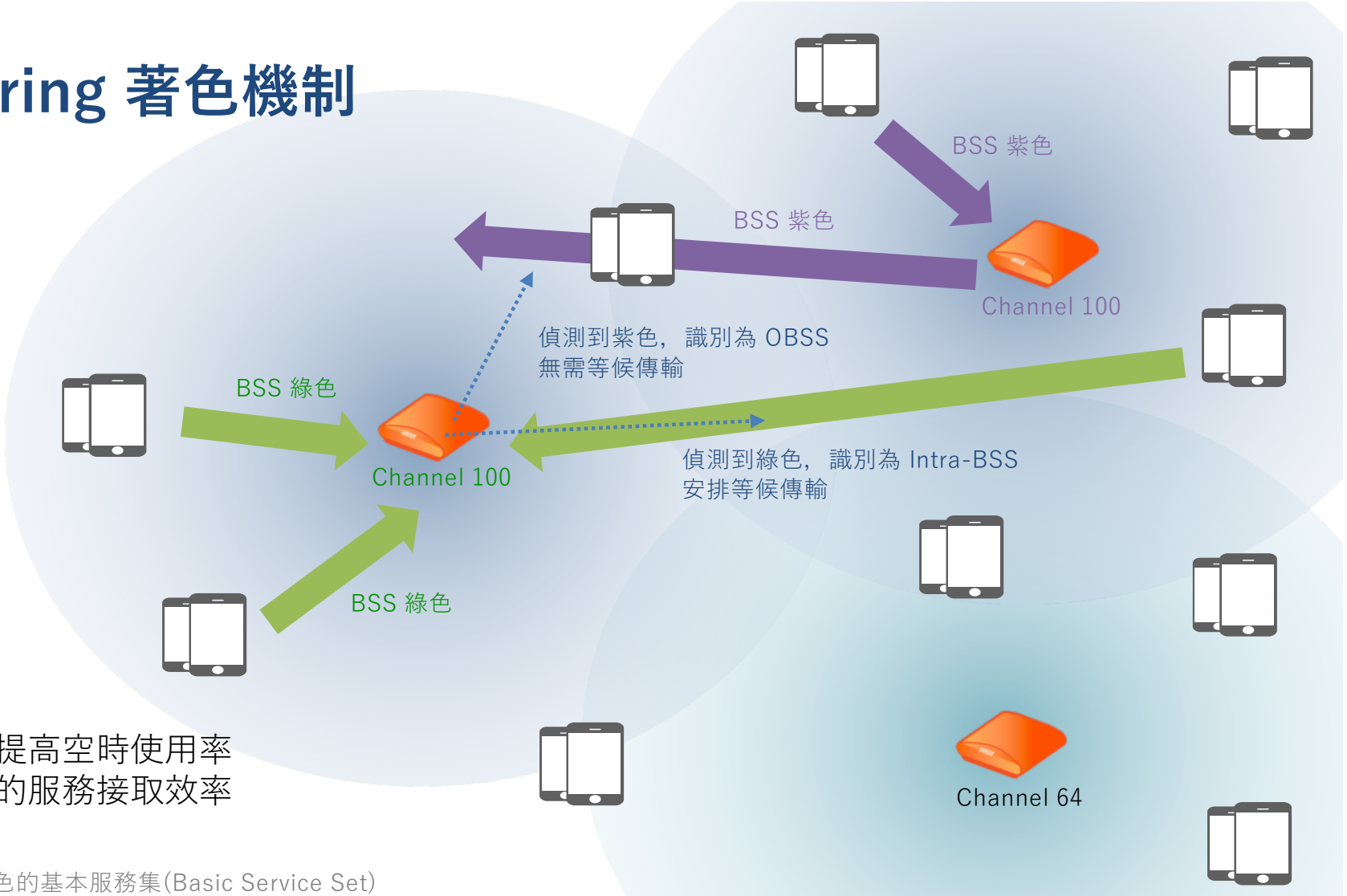
OFDMA 如何提升傳輸效率

WiFi 6 網路(11ax)

上行 MU-MIMO



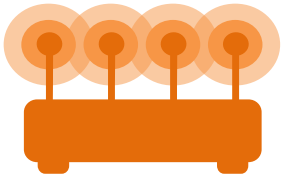
BSS Coloring 著色機制

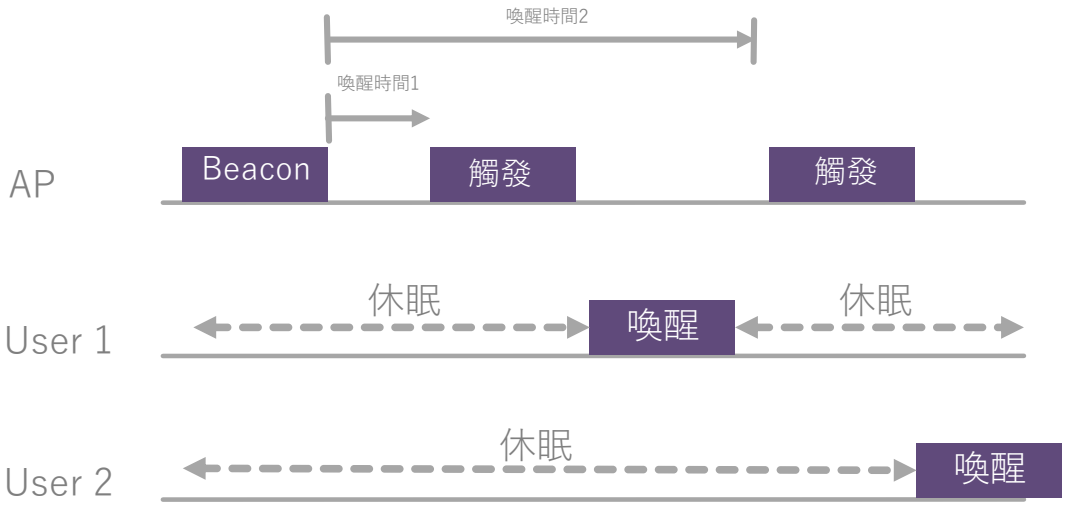


- 實現空間重複利用，提高空時使用率
- 提升高密度部署環境的服務接取效率

OBSS (Overlap BSS)：重疊頻道非同色的基本服務集(Basic Service Set)

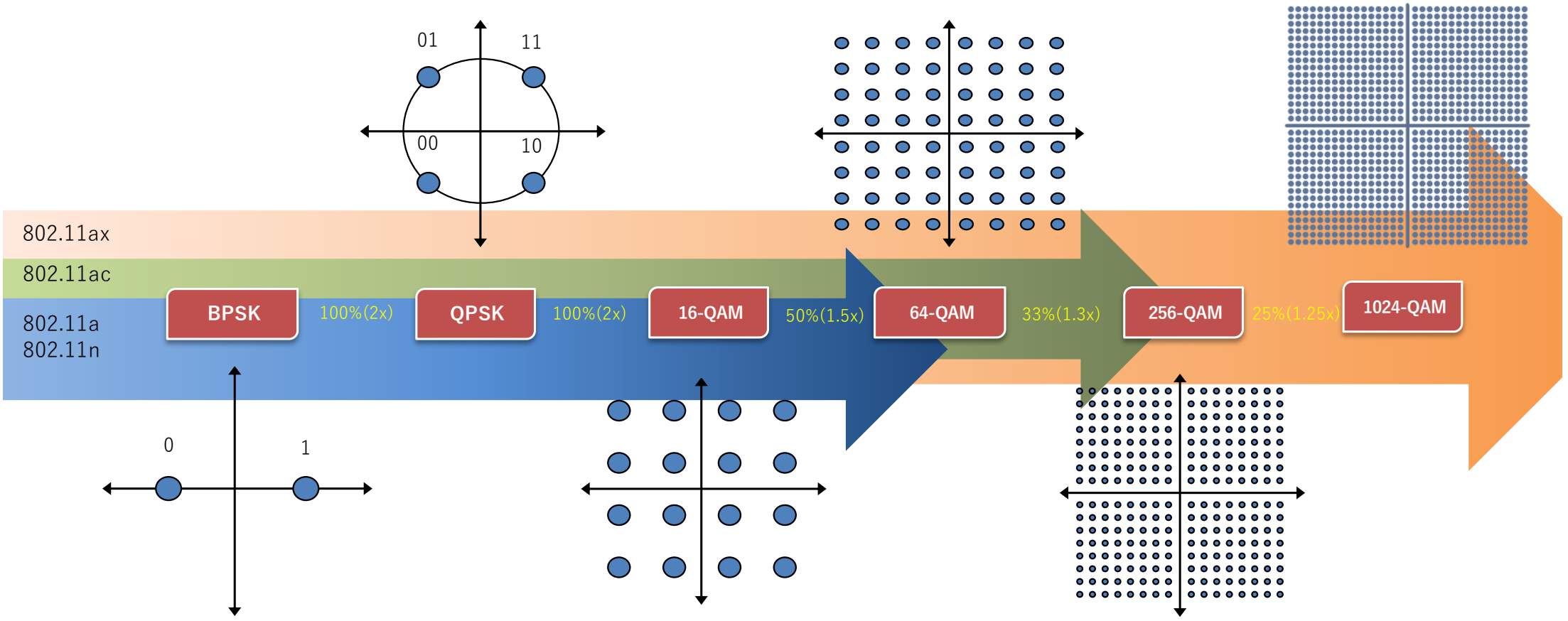
強化設備省電機制 Target Wake Time (TWT)





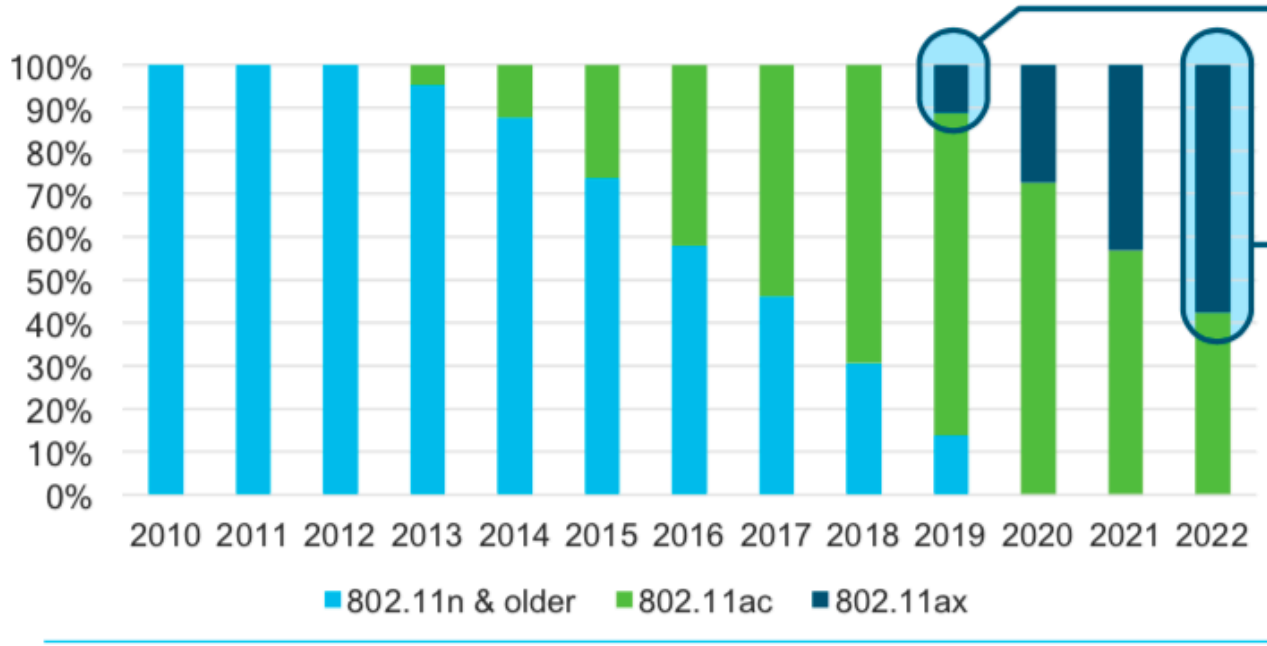
- 基地台會跟裝置協商，並且相互定義喚醒各自的時間
- 減少每個用戶端的爭用跟重疊時間
- 大幅增加設備休眠時間，以減少耗電

11ax 更密集的相位偏移調變模式



再不開始準備 WiFi 6，就真的慢了

802.11ax 終端設備成長指數



今年有11%的WiFi 6
終端設備開始販售

2022年將會有超過
56%的 WiFi 6 新設備

Ruckus 無線技術 & 產品

需要改變的是天線

Ruckus 全新的天線設計突破了無線網路的最大瓶頸

傳統的散射性天線

針對終端設備信號源不一致
(everyone else)

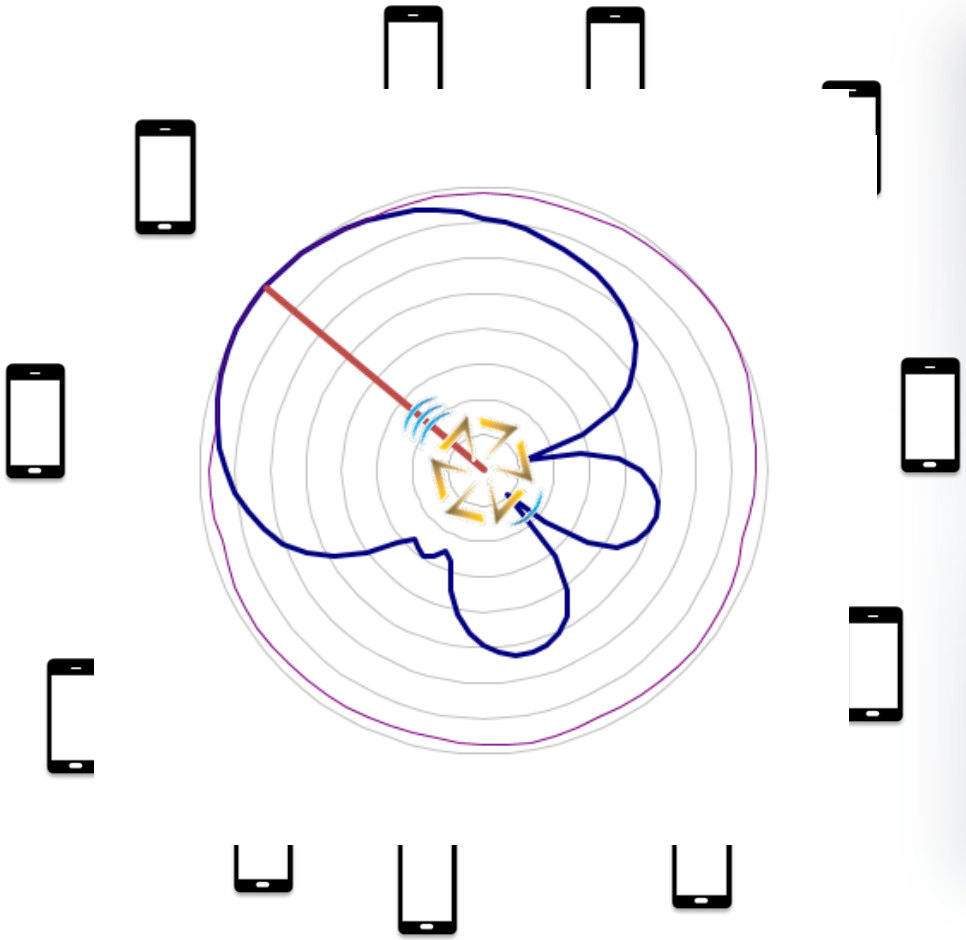
亮度不足的燈泡

指向式智慧型天線

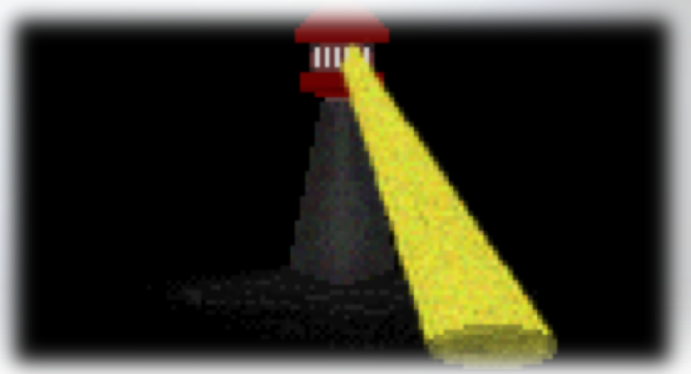
針對終端設備提供最佳的訊號
(Ruckus)

聚焦方向的探照燈

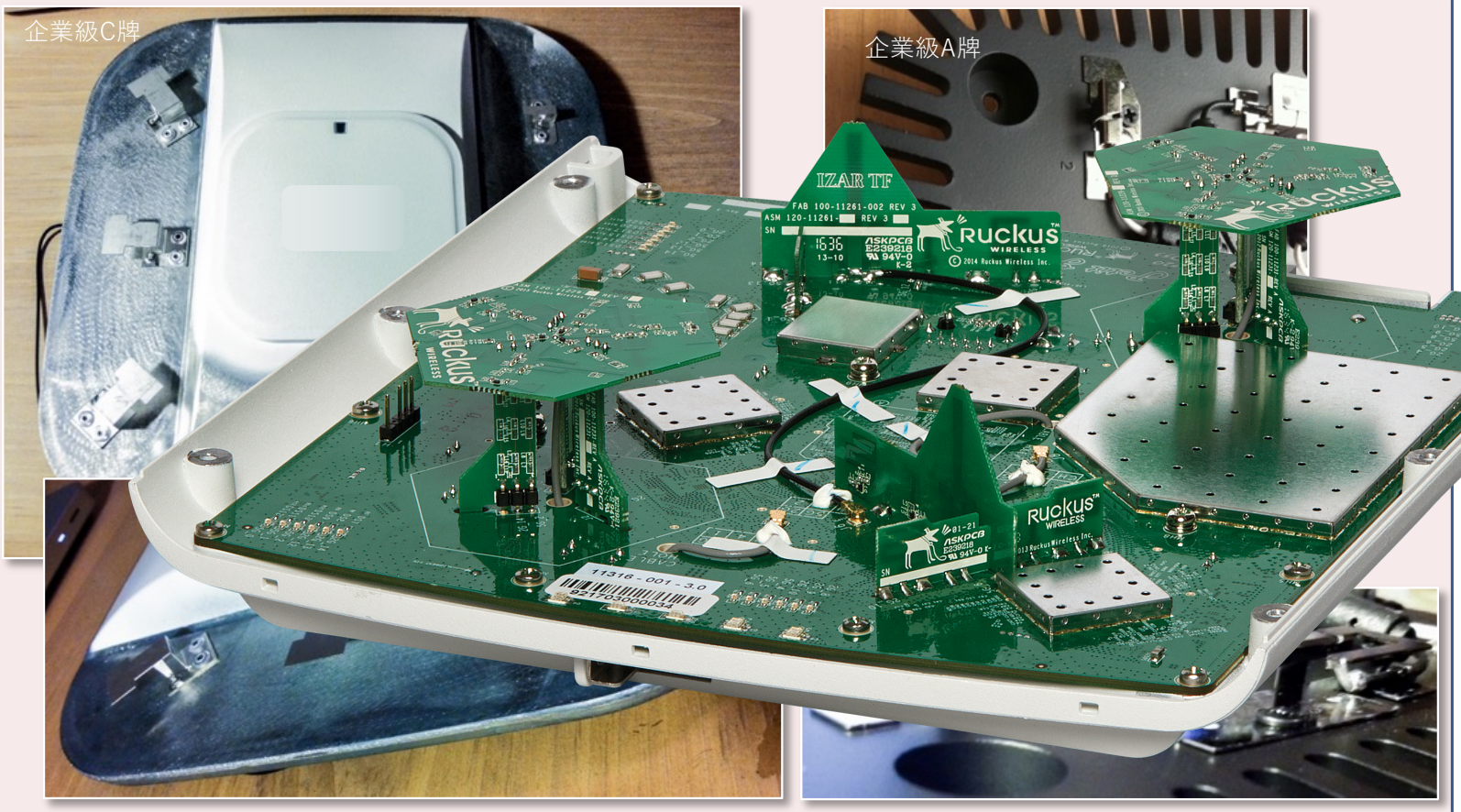
關鍵來自於專利 BeamFlex 技術



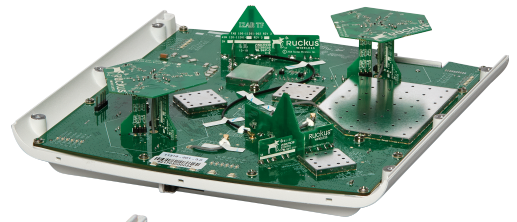
- 依終端的每個封包選擇傳輸的天線元素
- 適應天線適時地將資料傳遞到特定方位
- 指向天線能夠更加強力將訊號送往用戶端
- 針對周邊基地台跟用戶降低更少的干擾



來看看用料跟設計的差異



平面型倒F天線(Planarinverted-F antenna)(簡稱 PIFA)

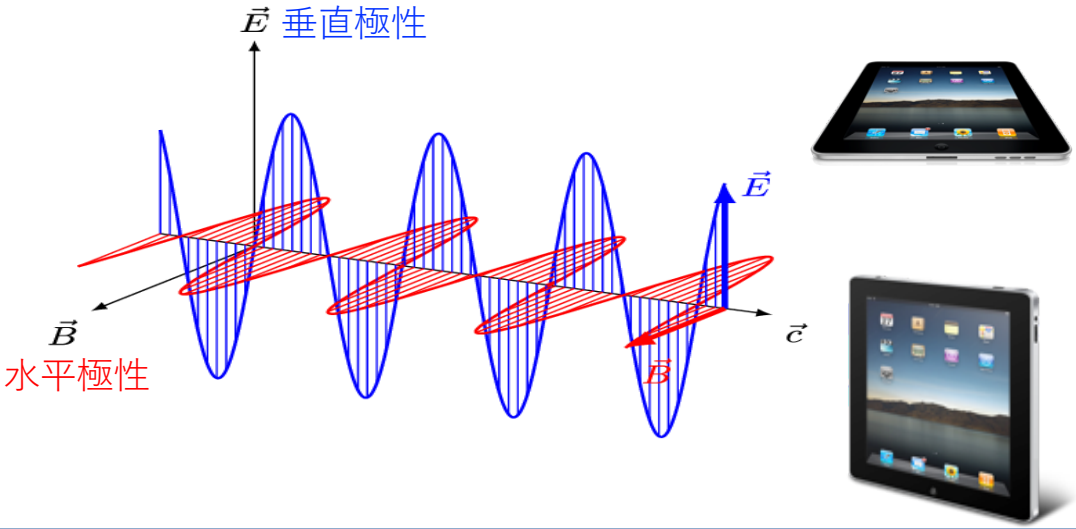


BeamFlex 智慧型矩陣天線

手持行動設備可以調整方向，但基地台的天線呢？

5x 因應設備角度，決定溝通天線極性，可以有效提升將近5倍的效率

- 更好的接收能力：
  - 專利天線偏振分極技術(PD-MRC)讓手持設備能夠更清晰的接收訊號
- 更好的傳輸能力：
  - 依據設備角度給予正確的資料傳輸波型，可有效提高傳輸率

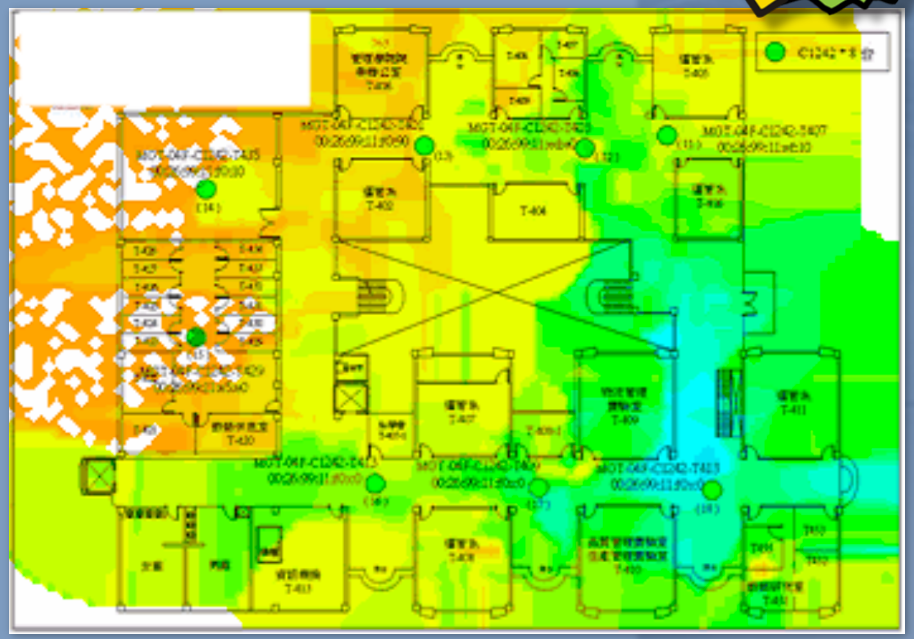


Ruckus 給您涵蓋範圍更大的無線連線

實際大樓平面涵蓋分佈測試

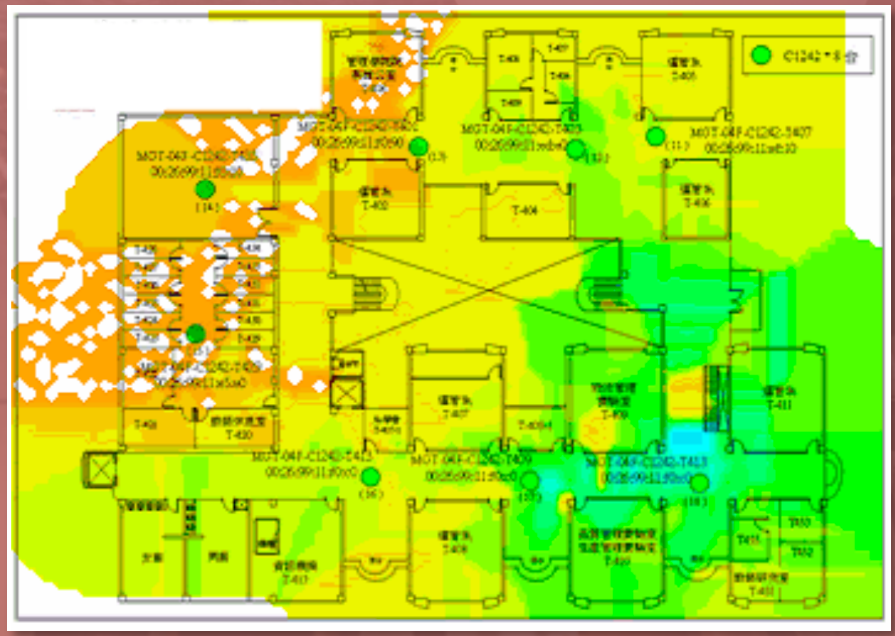
WIN!

Ruckus 涵蓋範圍



V.S

企業級 他牌 涵蓋範圍



CommScope Ruckus 智慧網路全產品架構

軟體保固支援服務

Ruckus Cloud

Ruckus Analytics

Yagna® 雲端無線評估系統

行動設備 APPS

IoT Suite 物聯網套件

無線管理系統
- FlexMaster
- UMM(Unleashed Multi-Site Manager)

Cloudpath 入網認證系統

SmartCell Insight 無線分析系統

SPoT 智慧定位分析系統

Unleashed 可互管型基地台

ZoneDirector 無線控制器

SmartZone 無線控制器

Smart Zone DP

無線網路基地台

無線橋接基地台

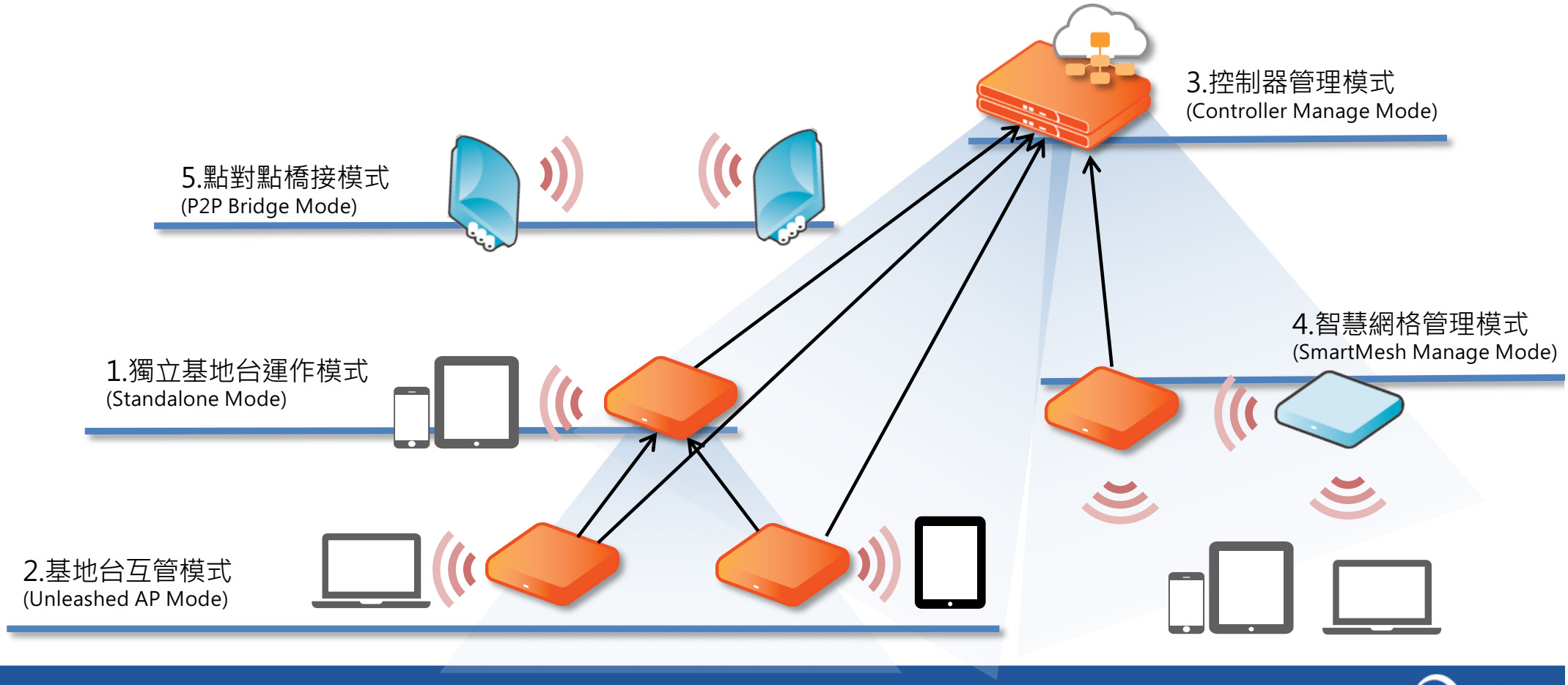
ICX 交換器

Ruckus 全系列無線網路基地台

Ruckus 控制器種類跟授權數

	小型架構		中小型架構		中大型架構		大型架構	
								
	Unleashed		ZD 1200		SZ-100	vSZ-E	SZ-300	vSZ-H
	200.6	200.7	Version 9	Version 10				
管理AP數:	25	50	75	150	1,024	1,024	10,000	10,000
管理用戶數:	512		2000		25,000	25,000	150,000	100,000
設備大小:	1024		4000		1RU	N/A	2RU	N/A
穿隧容量:	無控制器		桌上型		10 Gbps	vSZ-D	40 Gbps	vSZ-D
備援機制:	不支援		200Mbps		3+1 叢集 (Cluster)		3+1 叢集 (Cluster)	
	所有AP皆備援		Active-Standby					
管理AP數:					3,000	3,000	30,000	30,000
管理用戶數:					60,000	60,000	450,000	300,000
部署類型	小型單位(SMB) 單據點		中小型單位 多據點		中大型單位 企業多據點	中大型單位 企業多據點	服務供應商 管理服務	服務供應商 管理服務

Ruckus 多種彈性設計帶來更多效益



Ruckus ICX 全系列交換器

初階 邊際存取

中階 匯聚 / 存取

高階 匯聚 / 核心

價格

Function and Scalability 效能與功能

10G SFP+ 上行 / 堆疊

ICX 7150 Z-Series
+ High Availability
+ Multi-gigabit (2.5 GbE)

ICX 7150

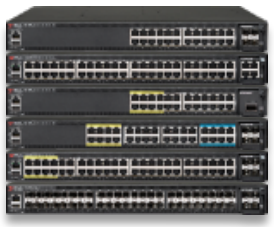
+ 12/24/48-Port
+ PoE/PoE+ or non-PoE

ICX 7250

+ 8xSFP+ uplinks
+ L3: VRF/GRE
+ EEE
+ PoE/PoE+ or non-PoE

40G QSFP 上行 / 堆疊

ICX 7450



+ 10G/40G Modules
+ Hot-swap PSU & Fans
+ L3: BGP
+ PoE/PoE+ or non-PoE

100G QSFP28 上行 / 堆疊

ICX 7650

+ 10G/40G/100G
+ Hot-swap PSU & Fans
+ Multigigabit 2.5/5/10G
+ MCT

40G QSFP 上行 / 堆疊

ICX 7750

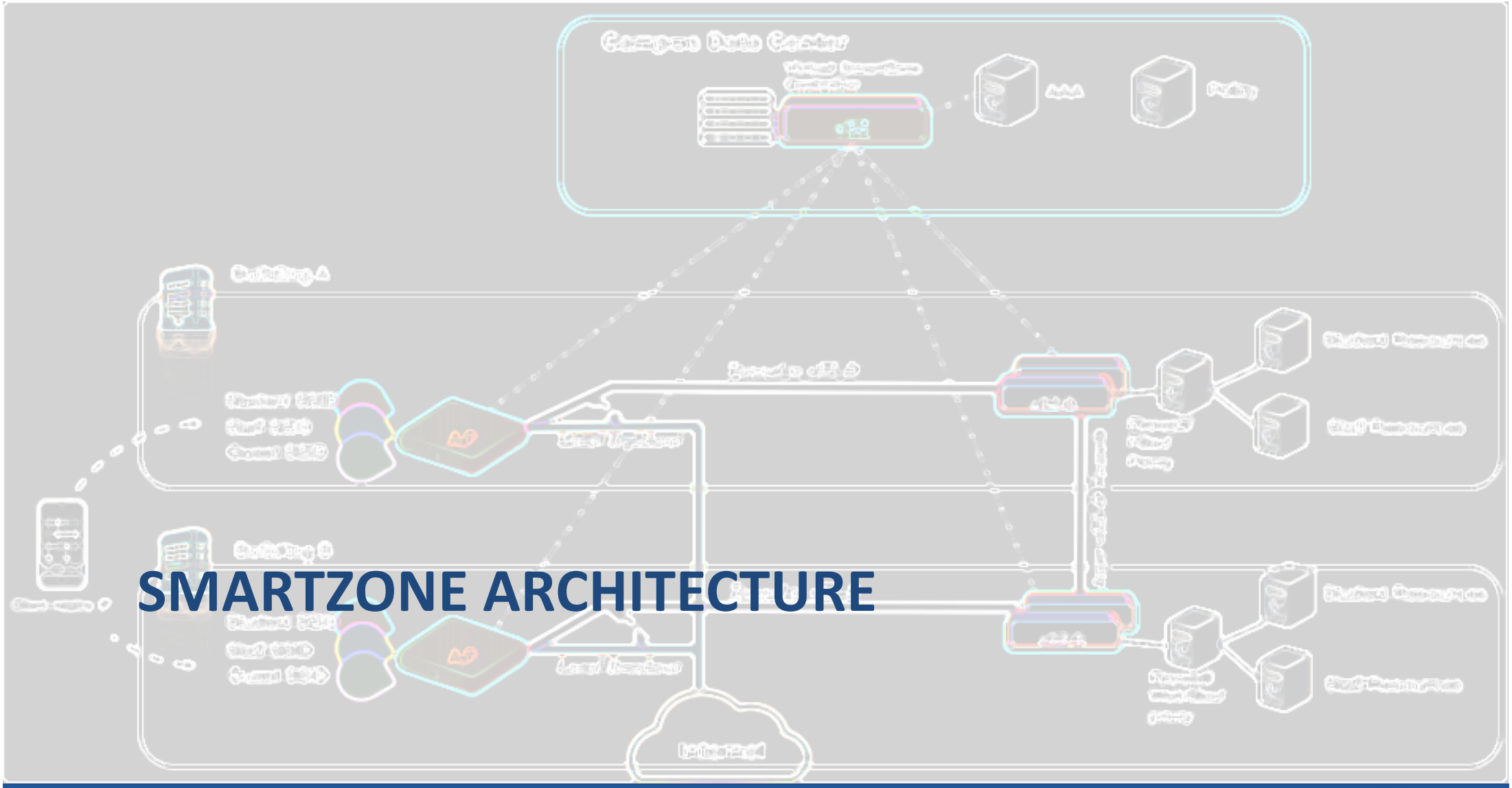
+ High density 10G/40G
+ Hot-swap PSU & Fans
+ Campus Fabric Control Bridge
+ MCT

100G QSFP28 上行 / 堆疊

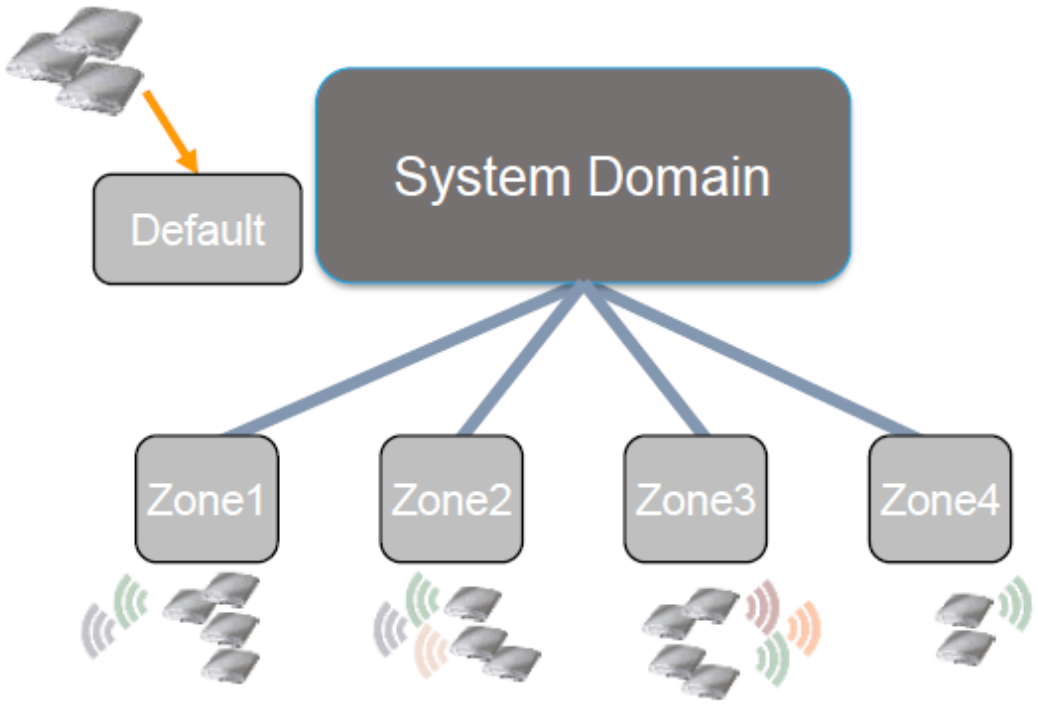
ICX 7850

+ High density 10G/25G/40G/100G
+ Hot-swap PSU & Fans
+ High density 10G MACsec
+ MCT
+ Campus Fabric Control Bridge

SMARTZONE ARCHITECTURE



Essentials Scale

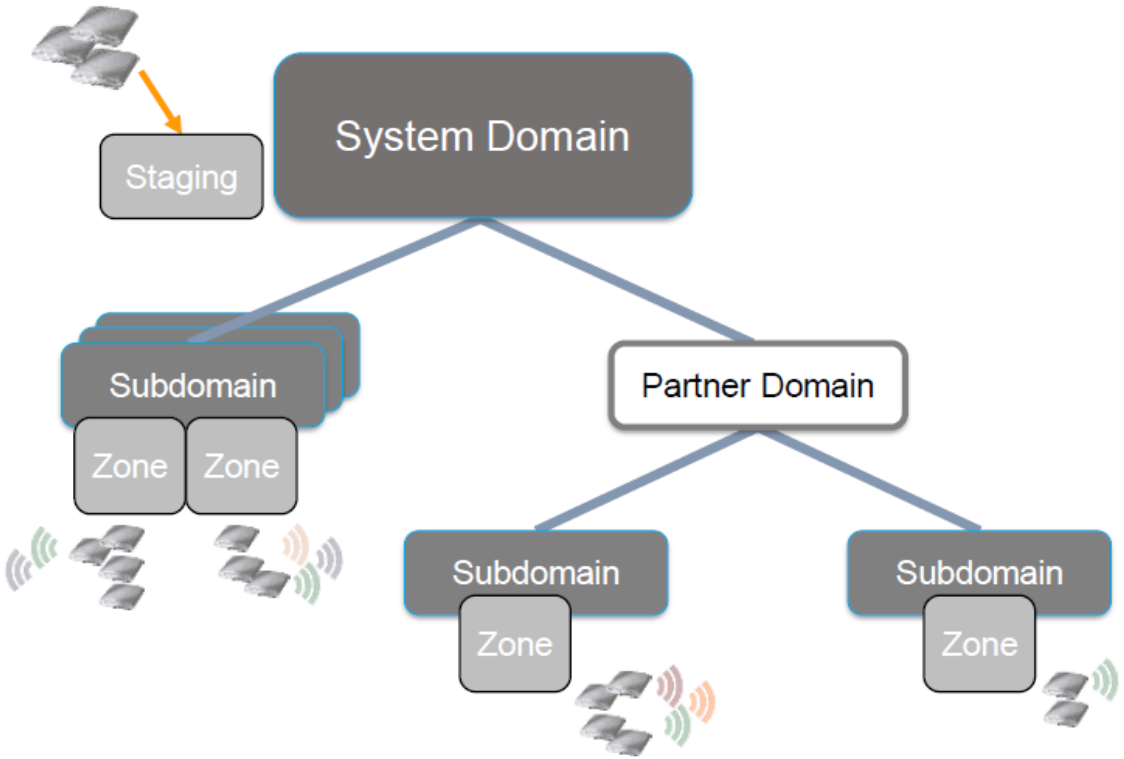


- SmartZone Essentials:

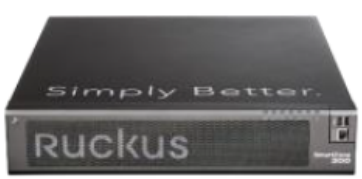
vSZ-E

  - Single System Domain
  - Multiple Zones

High Scale



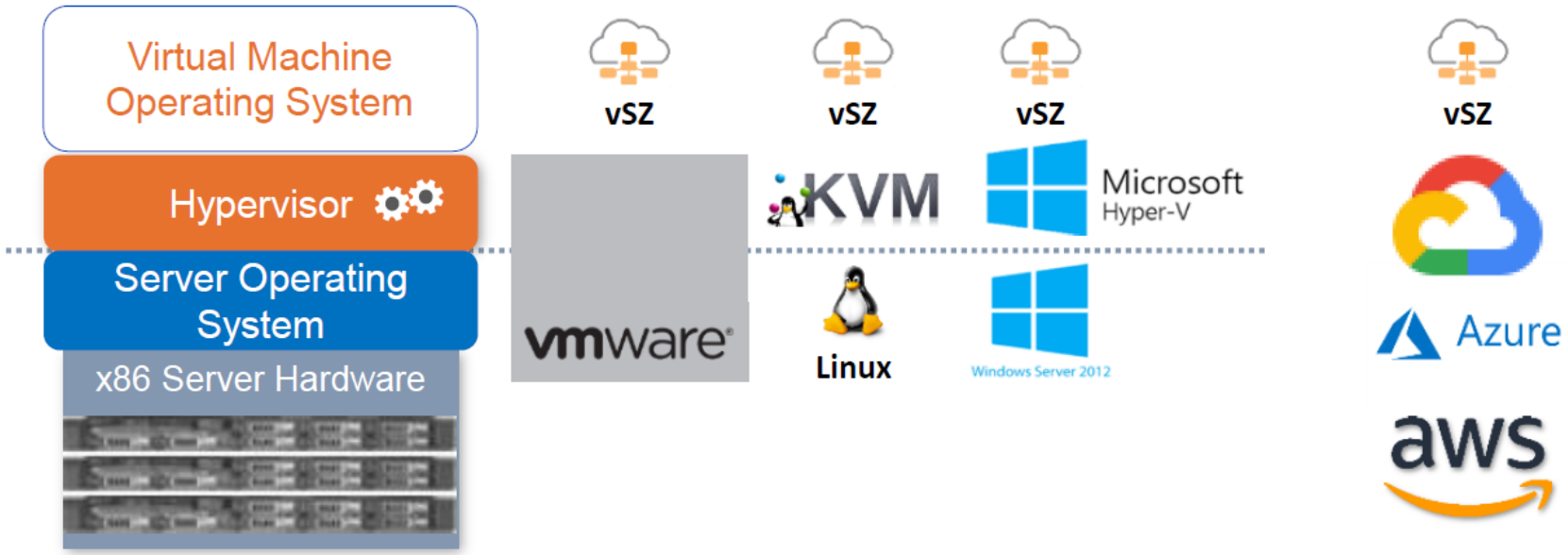
- SmartZone High Scale:



vSZ-H

  - Top level System Domain
  - AP Staging Zone
  - Multiple Subdomains
  - Partner Domains

Virtual



At the time this course was created, the supported options are:

- VMware
- Linux
- Microsoft Windows Server

- **Minimum Requirements to run:**
  - 100GB disk space
  - 13 GB of RAM

Cloud Service

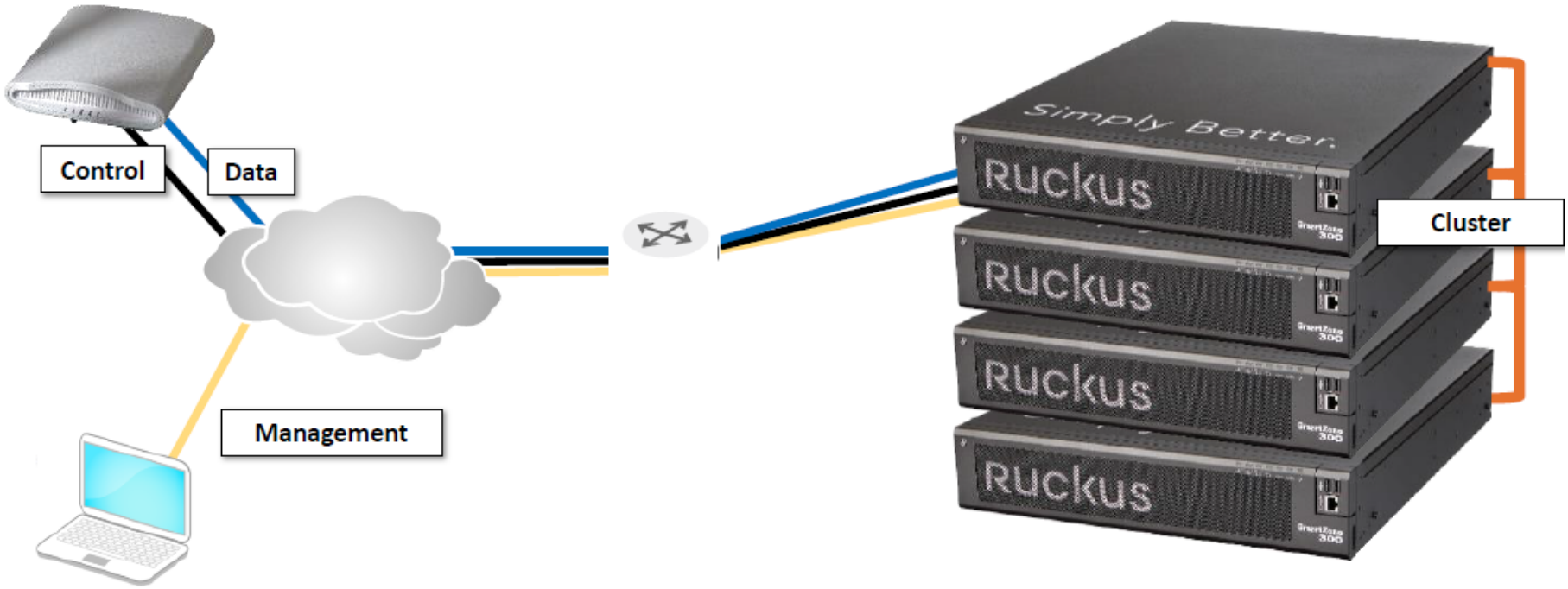
Cloud-ready WLAN controller

- Service providers and enterprises
- Flexibility, resiliency, and scale

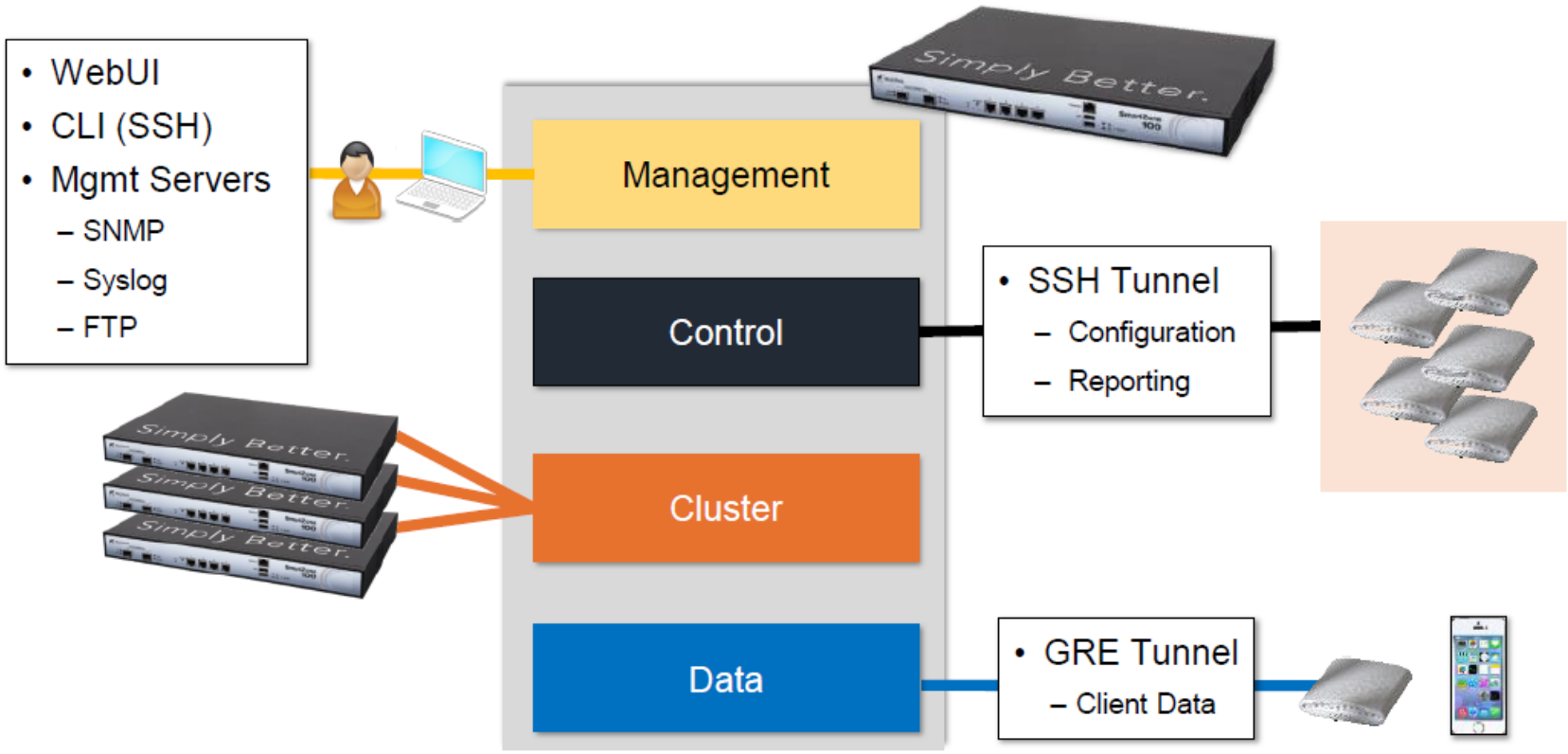
• Can be deployed

- High Scale
- Essentials

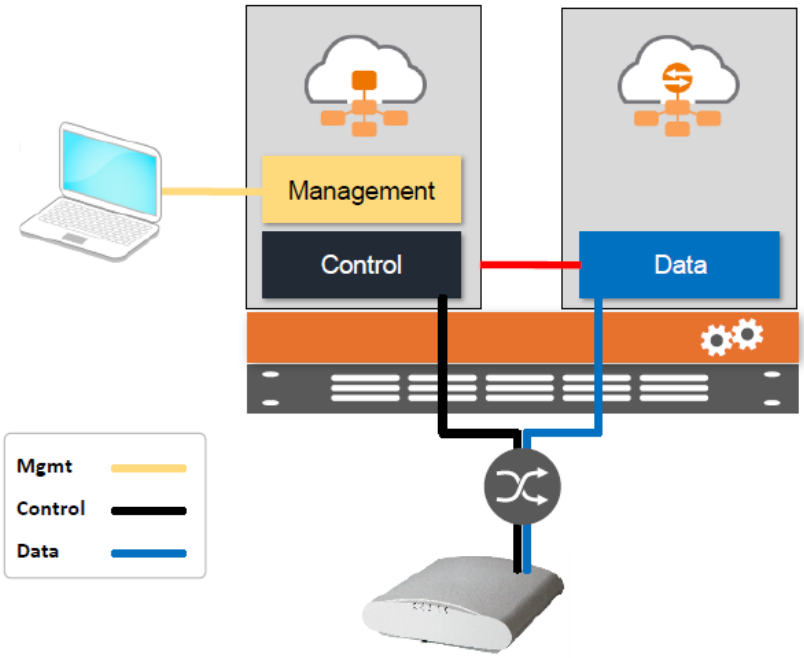
Controller Interfaces Overview



Controller Interfaces Communications

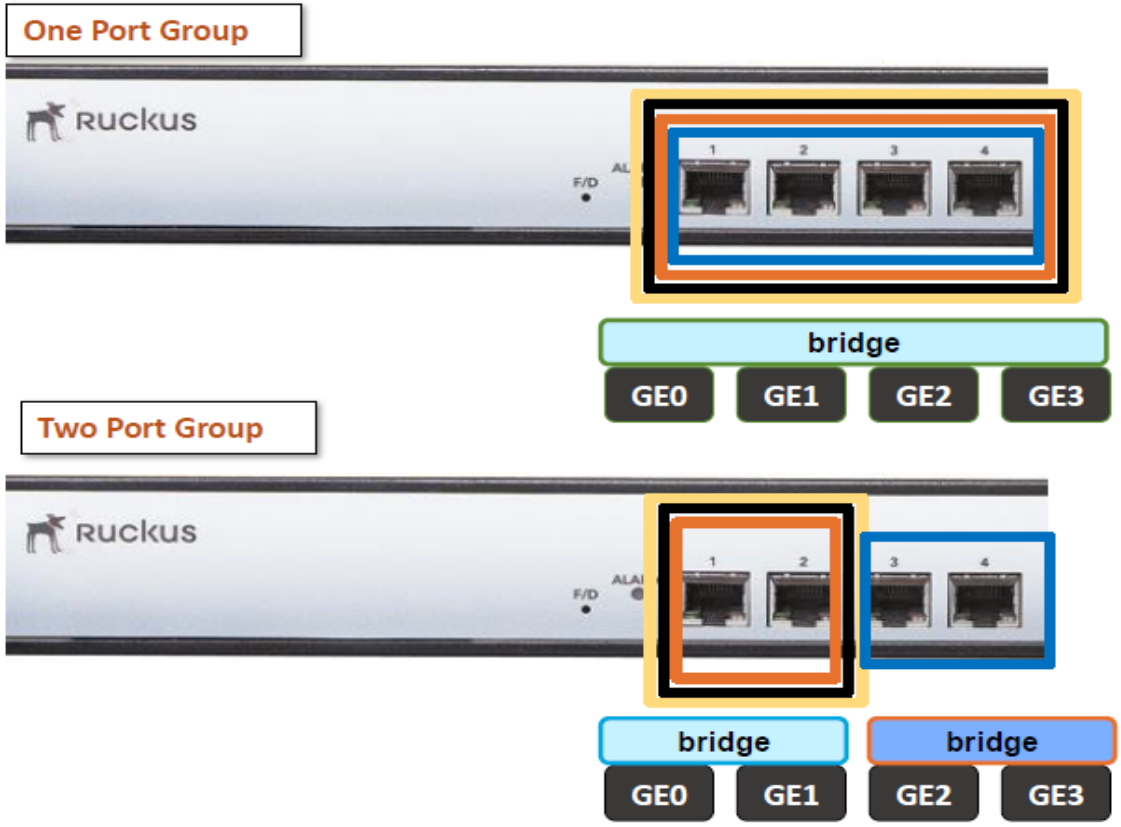


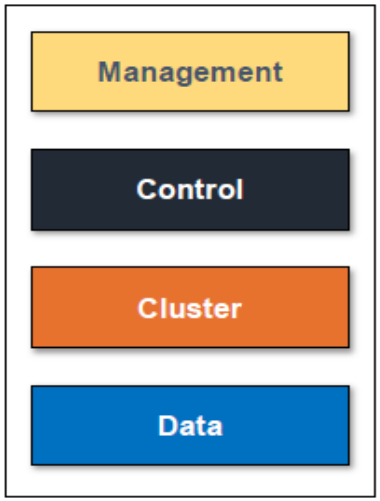
Virtual SmartZone Data Plane (vSZ-D)



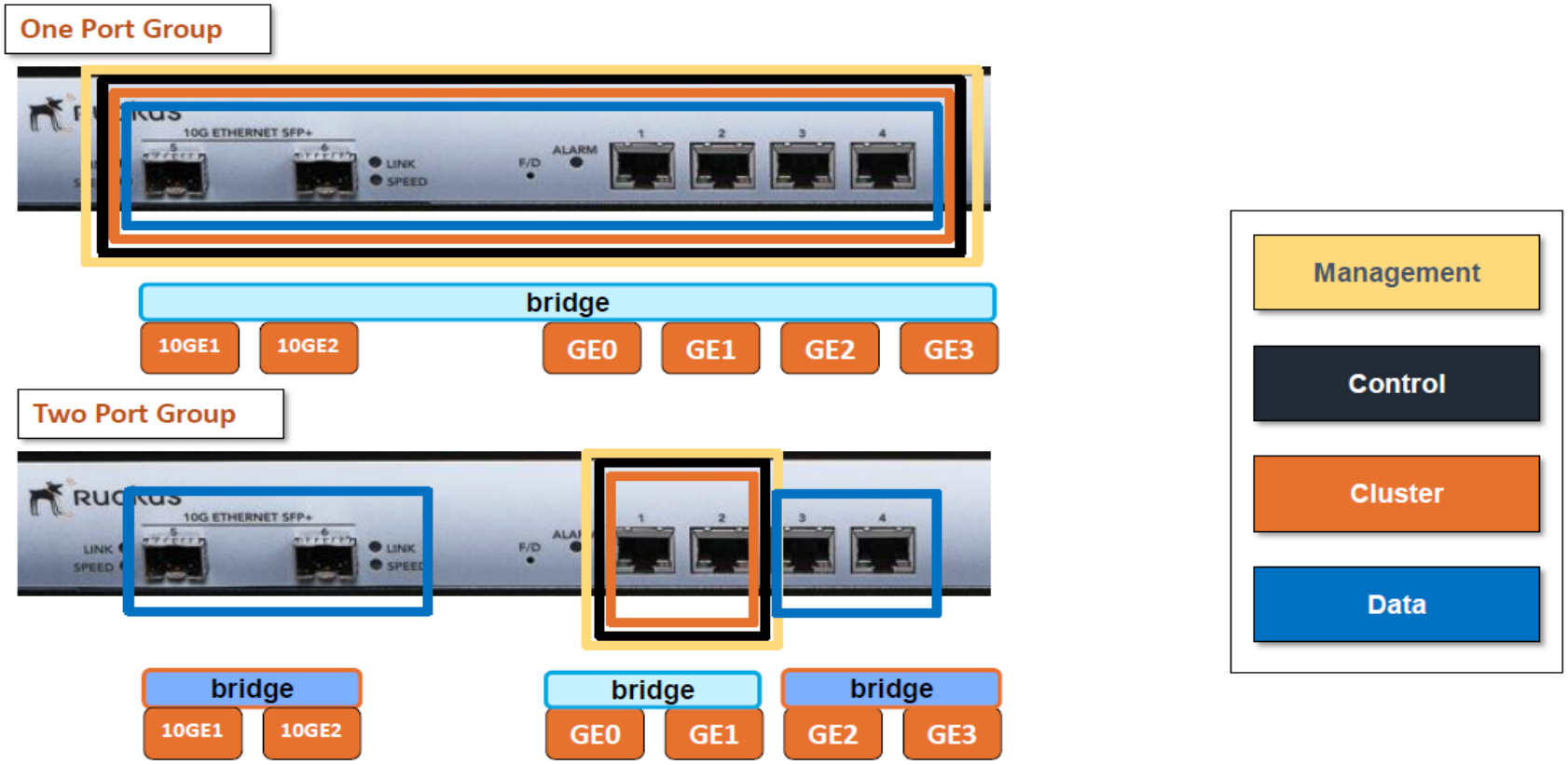
- NFV architecture
- Encrypts payload traffic
  - Compliance requirements
- Provides flexibility with:
  - Large deployments
    - Policy Control
    - QoS
  - Diverse environments

SmartZone 100: S-104



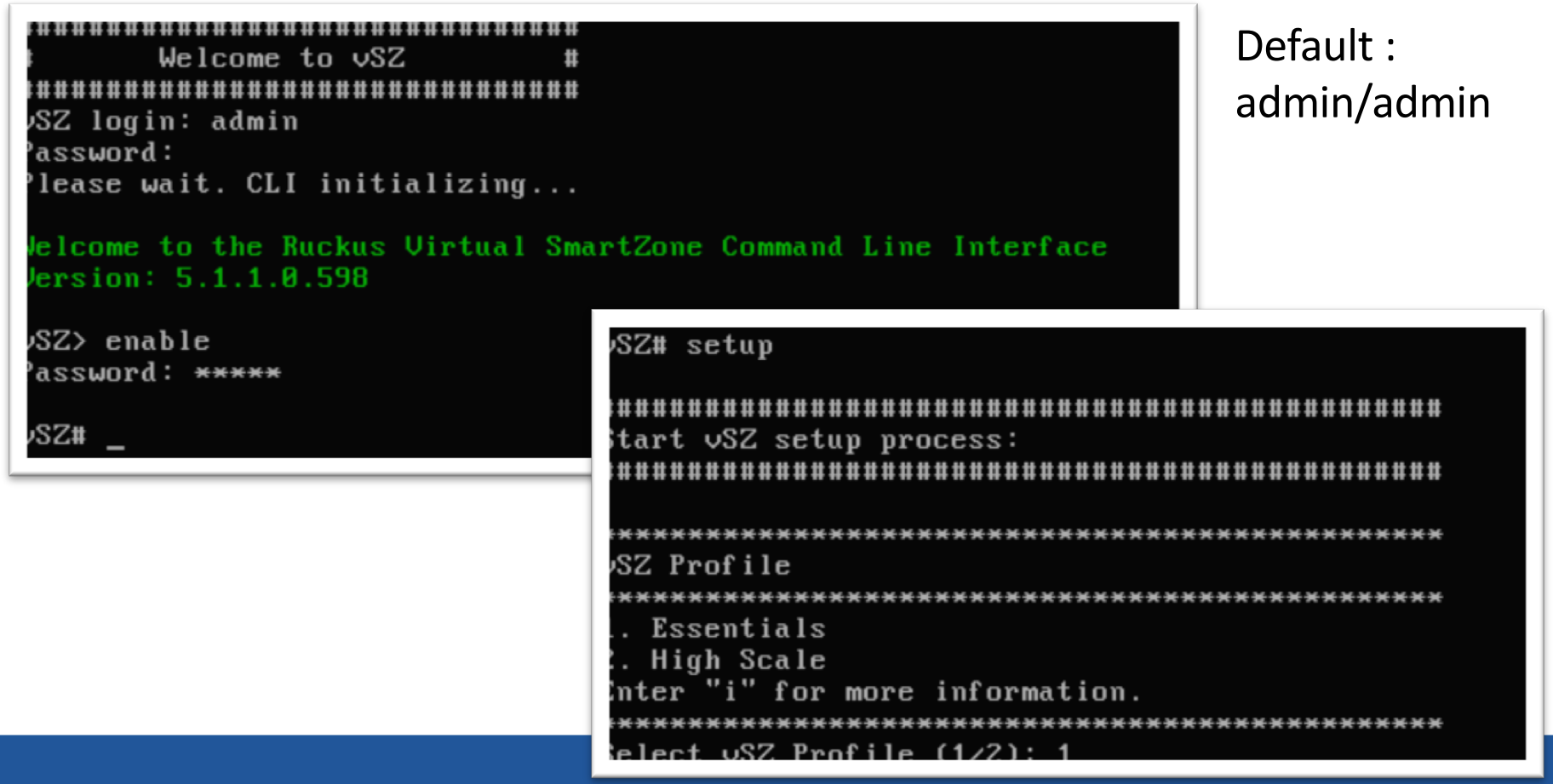


SmartZone 100: S-124



SMARTZONE INITIAL

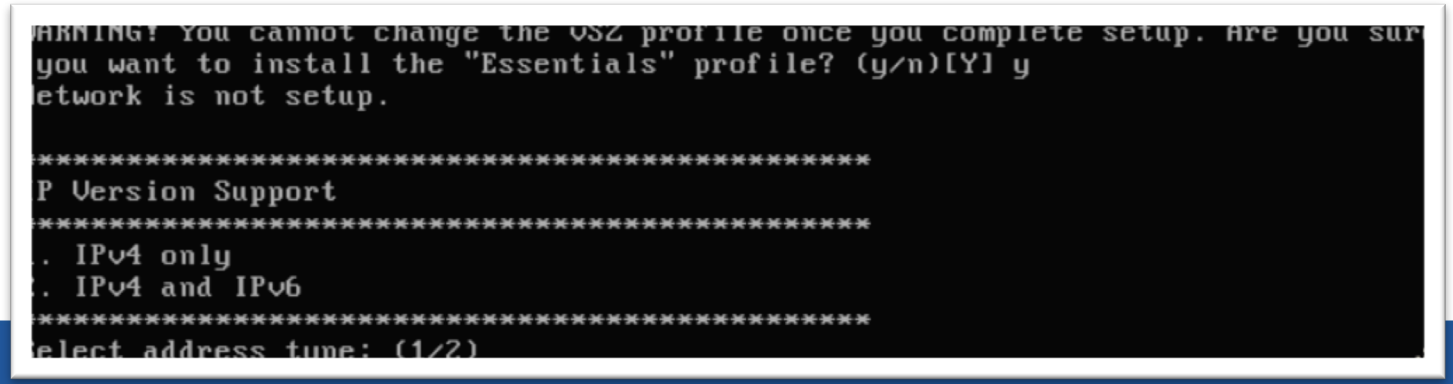
vSZ initial



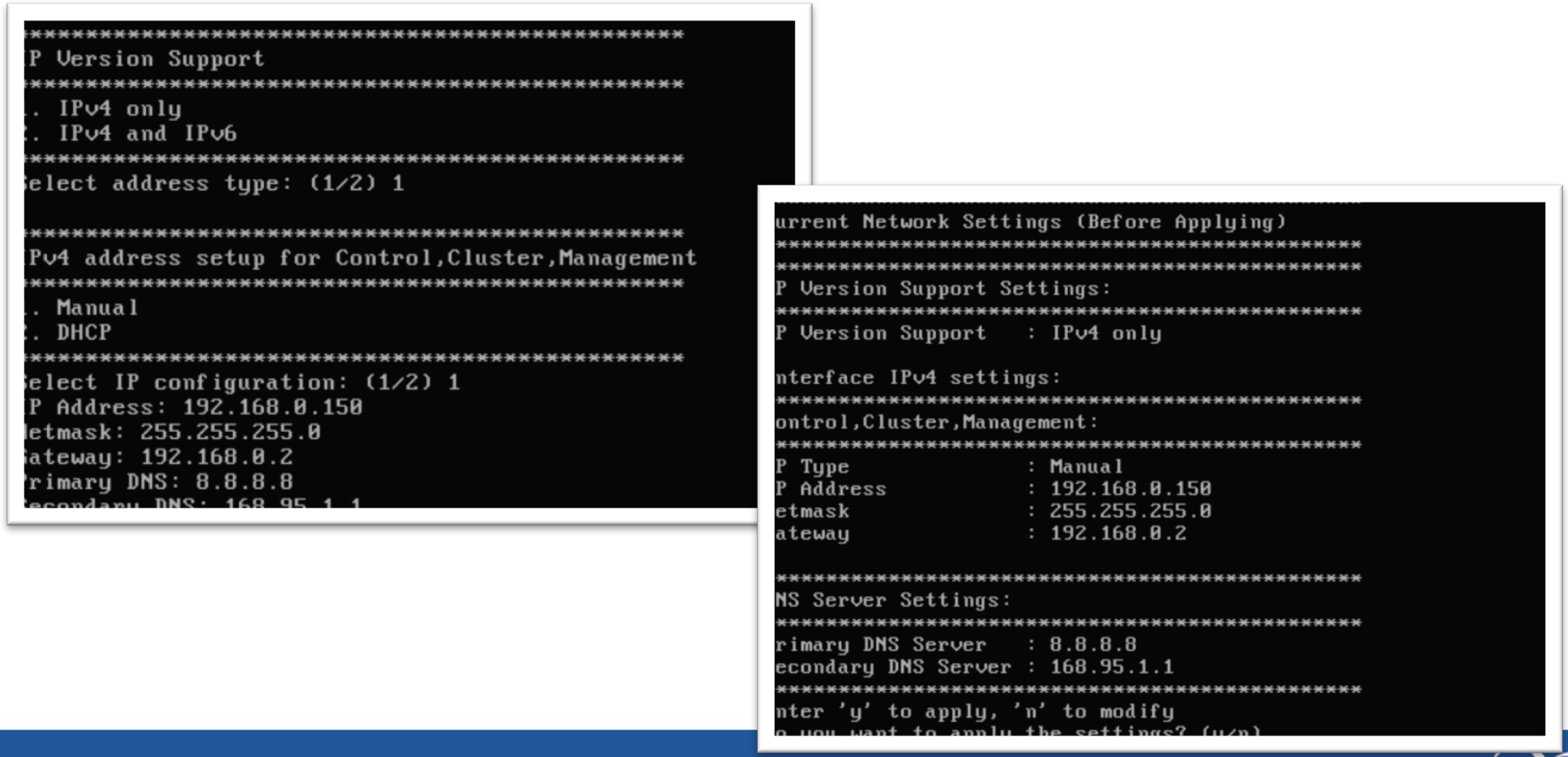
Default :
admin/admin

vSZ initial.

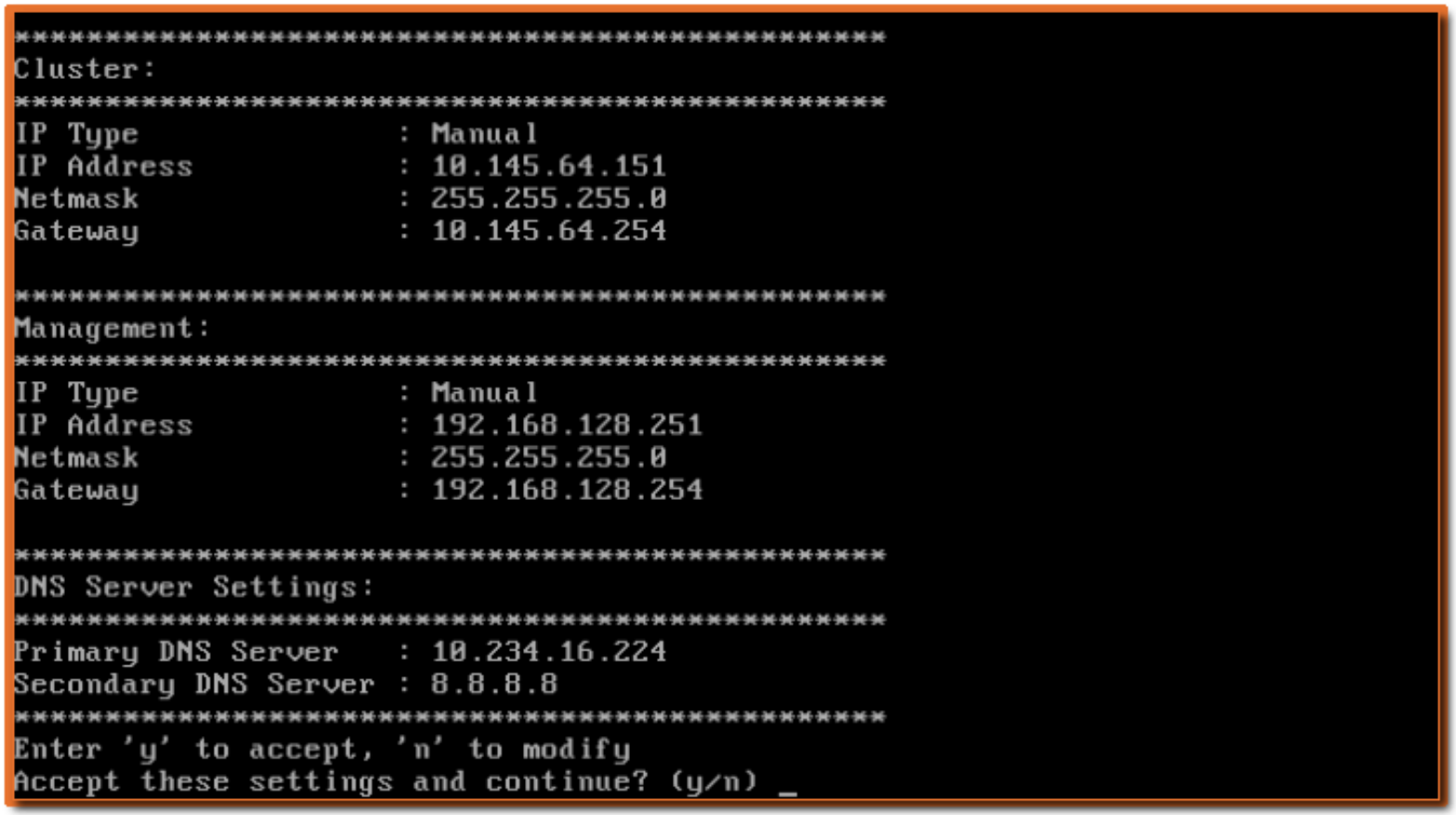

SZ# setup
##########
tart vSZ setup process:
##########
****
SZ Profile
****
. Essentials
. High Scale
nter "i" for more information.
****
elect vSZ Profile (1/2): 1
ARNING! You cannot change the vSZ profile once you complete setup. Are you sur


ARNING! You cannot change the vSZ profile once you complete setup. Are you sur
you want to install the "Essentials" profile? (y/n)[Y] y
etwork is not setup.
****
P Version Support
****
. IPv4 only
. IPv4 and IPv6
****
elect address type: (1/2)

vSZ initial.

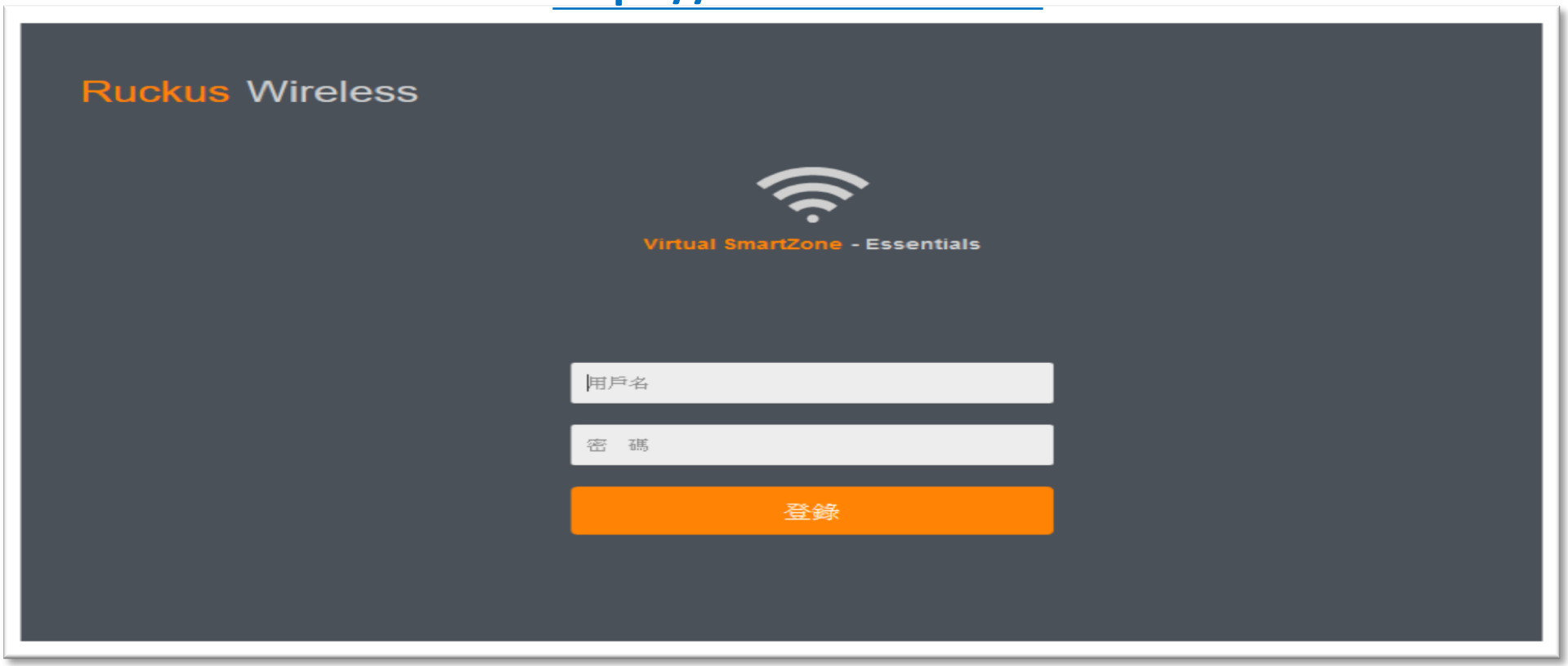

P Version Support
. IPv4 only
. IPv4 and IPv6
elect address type: (1/2) 1
Pv4 address setup for Control,Cluster,Management
. Manual
. DHCP
elect IP configuration: (1/2) 1
P Address: 192.168.0.150
etmask: 255.255.255.0
ateway: 192.168.0.2
rimary DNS: 8.8.8.8
urrent Network Settings (Before Applying)
P Version Support Settings:
P Version Support : IPv4 only
nterface IPv4 settings:
ontrol,Cluster,Management:
P Type : Manual
P Address : 192.168.0.150
etmask : 255.255.255.0
ateway : 192.168.0.2
NS Server Settings:
rimary DNS Server : 8.8.8.8
econdary DNS Server : 168.95.1.1
nter 'y' to apply, 'n' to modify

vSZ initial.

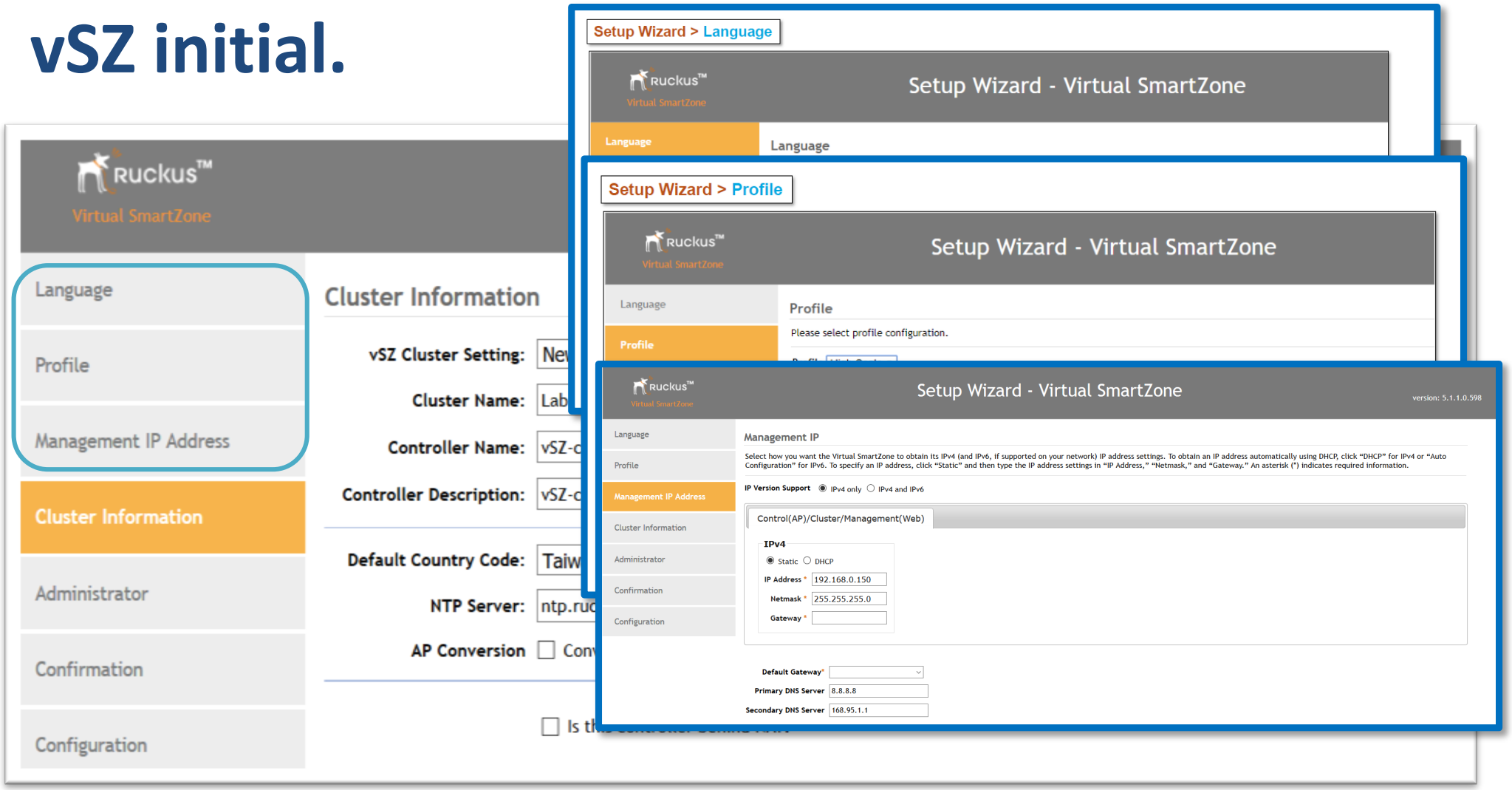

****
Cluster:
****
IP Type : Manual
IP Address : 10.145.64.151
Netmask : 255.255.255.0
Gateway : 10.145.64.254
****
Management:
****
IP Type : Manual
IP Address : 192.168.128.251
Netmask : 255.255.255.0
Gateway : 192.168.128.254
****
DNS Server Settings:
****
Primary DNS Server : 10.234.16.224
Secondary DNS Server : 8.8.8.8
****
Enter 'y' to accept, 'n' to modify
Accept these settings and continue? (y/n) _

vSZ initial.

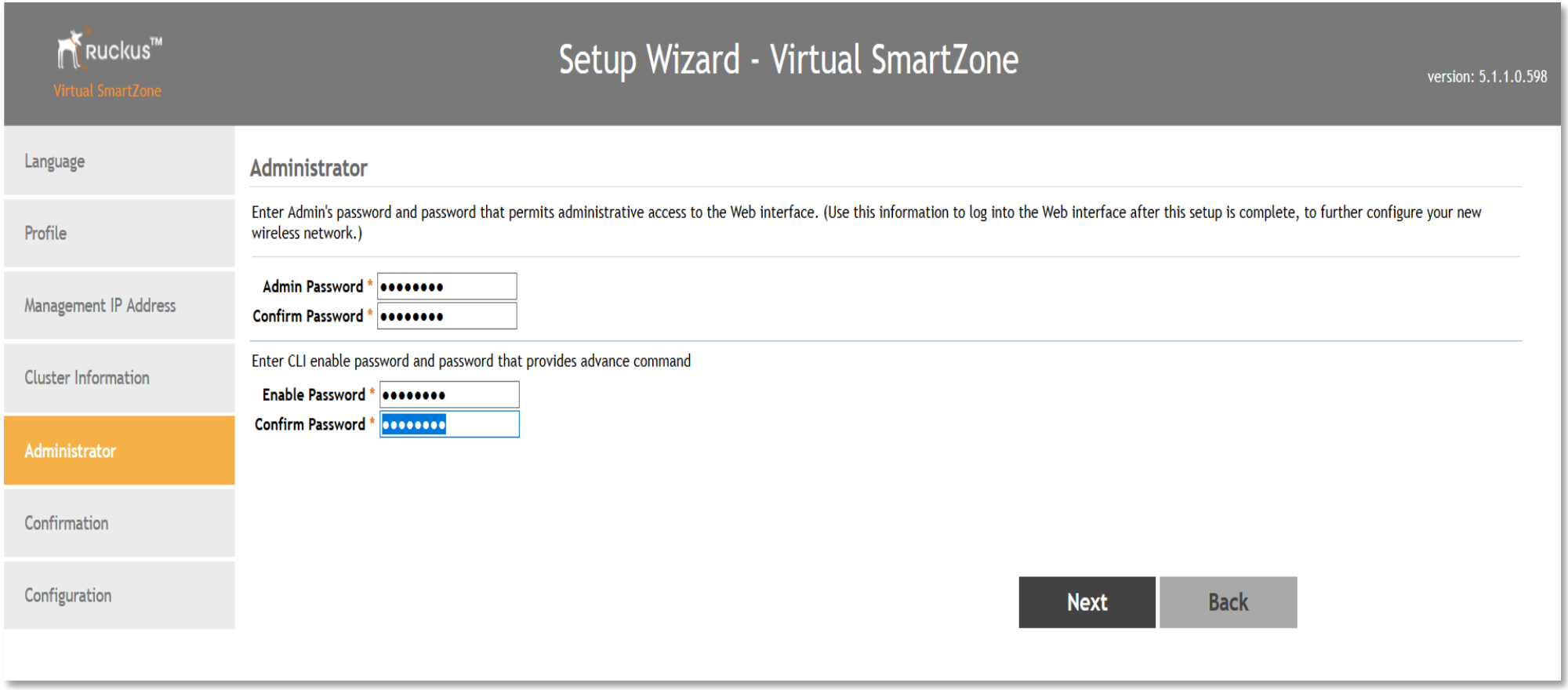
https://IP-address:8443



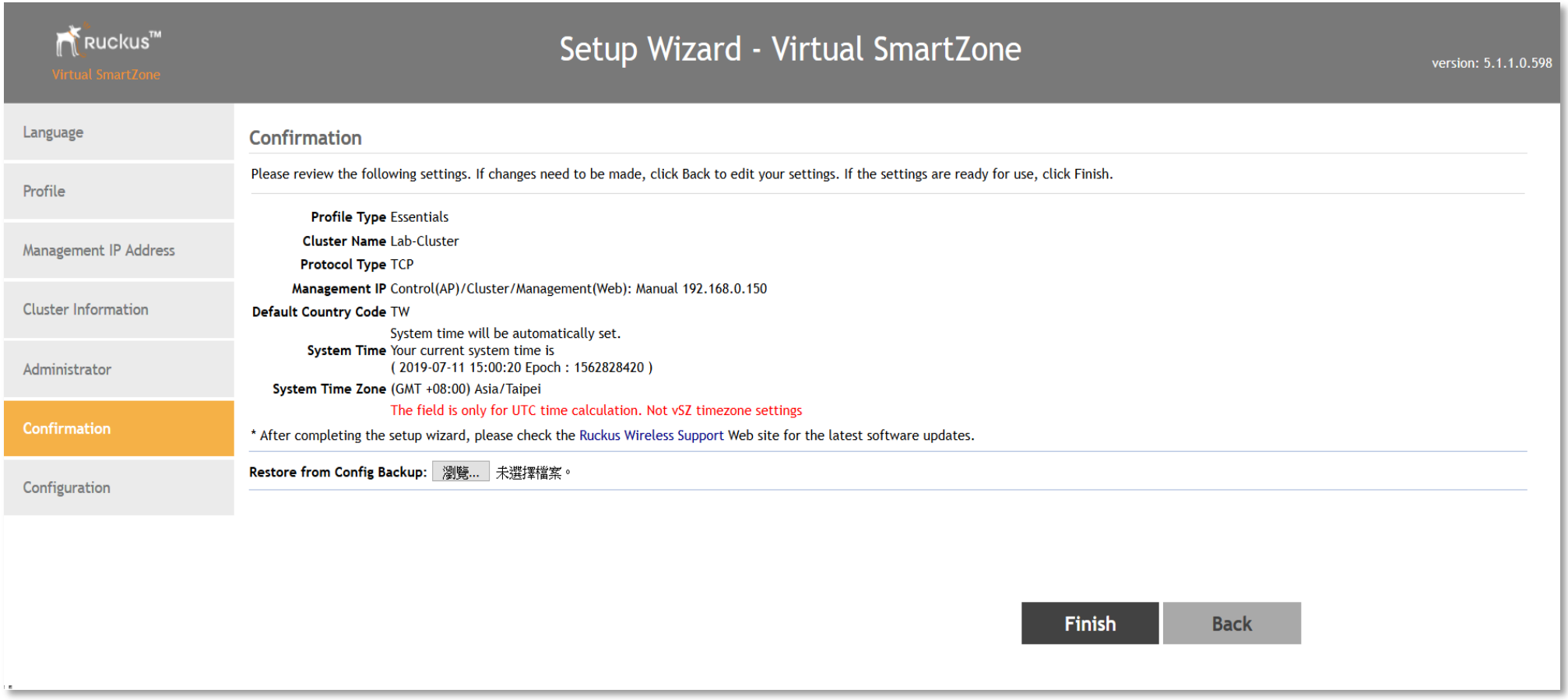
vSZ initial.


Setup Wizard > Language
Ruckus™
Virtual SmartZone
Setup Wizard - Virtual SmartZone
Language
Language
Setup Wizard > Profile
Ruckus™
Virtual SmartZone
Setup Wizard - Virtual SmartZone
Language
Profile
Please select profile configuration.
Profile
Ruckus™
Virtual SmartZone
Setup Wizard - Virtual SmartZone
version: 5.1.1.0.598
Language
Profile
Management IP Address
Cluster Information
Administrator
Confirmation
Configuration
Management IP
Select how you want the Virtual SmartZone to obtain its IPv4 (and IPv6, if supported on your network) IP address settings. To obtain an IP address automatically using DHCP, click "DHCP" for IPv4 or "Auto Configuration" for IPv6. To specify an IP address, click "Static" and then type the IP address settings in "IP Address," "Netmask," and "Gateway." An asterisk (*) indicates required information.
IP Version Support
IPv4 only
IPv4 and IPv6
Control(AP)/Cluster/Management(Web)
IPv4
Static
DHCP
IP Address *
192.168.0.150
Netmask *
255.255.255.0
Gateway *
Default Gateway*
Primary DNS Server
8.8.8.8
Secondary DNS Server
168.95.1.1
Ruckus™
Virtual SmartZone
Language
Profile
Management IP Address
Cluster Information
Administrator
Confirmation
Configuration
Cluster Information
vSZ Cluster Setting:
Cluster Name:
Controller Name:
Controller Description:
Default Country Code:
NTP Server:
AP Conversion

vSZ initial.

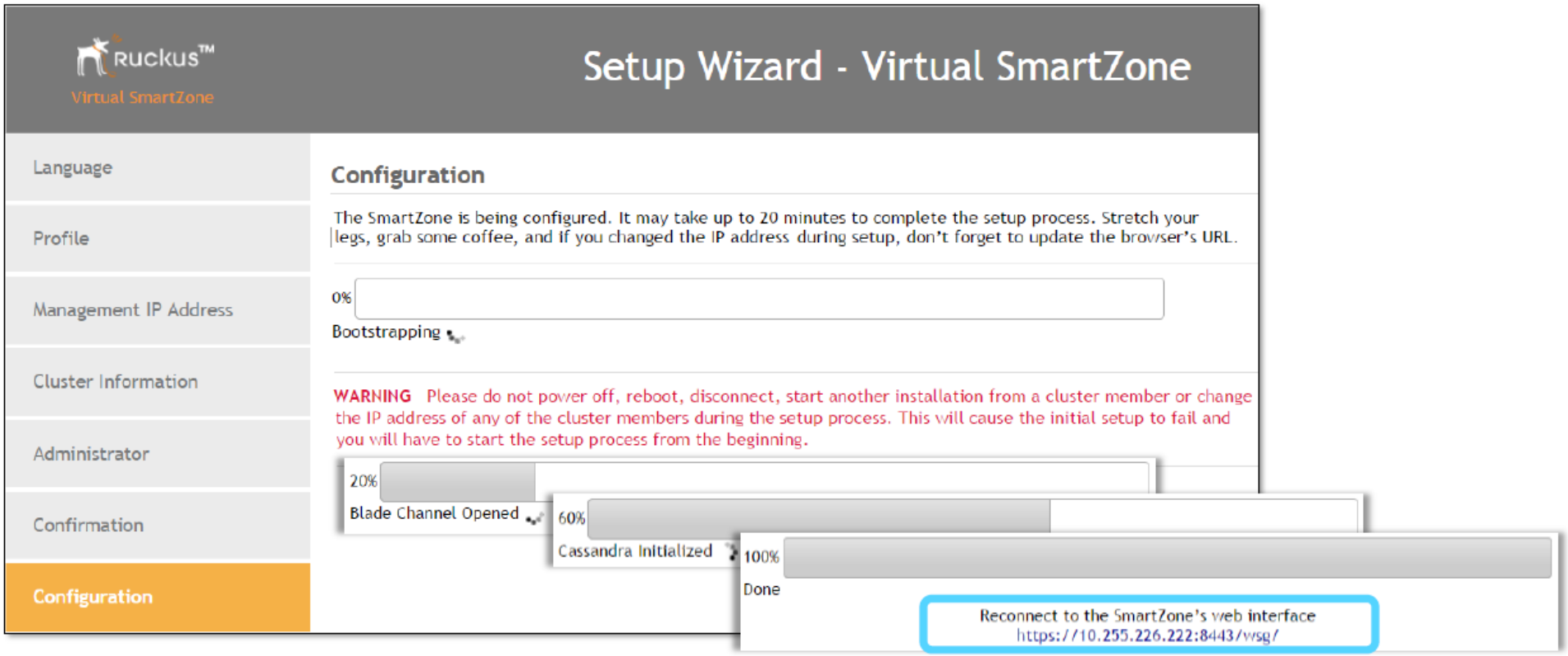

Ruckus™
Virtual SmartZone
Setup Wizard - Virtual SmartZone
version: 5.1.1.0.598
Language
Profile
Management IP Address
Cluster Information
Administrator
Confirmation
Configuration
Administrator
Enter Admin's password and password that permits administrative access to the Web interface. (Use this information to log into the Web interface after this setup is complete, to further configure your new wireless network.)
Admin Password *
Confirm Password *
Enter CLI enable password and password that provides advance command
Enable Password *
Confirm Password *
Next
Back

vSZ initial.


Ruckus™
Virtual SmartZone
Setup Wizard - Virtual SmartZone
version: 5.1.1.0.598
Language
Profile
Management IP Address
Cluster Information
Administrator
Confirmation
Configuration
Confirmation
Please review the following settings. If changes need to be made, click Back to edit your settings. If the settings are ready for use, click Finish.
Profile Type Essentials
Cluster Name Lab-Cluster
Protocol Type TCP
Management IP Control(AP)/Cluster/Management(Web): Manual 192.168.0.150
Default Country Code TW
System Time System time will be automatically set.
Your current system time is
(2019-07-11 15:00:20 Epoch : 1562828420)
System Time Zone (GMT +08:00) Asia/Taipei
The field is only for UTC time calculation. Not vSZ timezone settings
* After completing the setup wizard, please check the Ruckus Wireless Support Web site for the latest software updates.
Restore from Config Backup: 瀏覽... 未選擇檔案。
Finish
Back

vSZ initial.

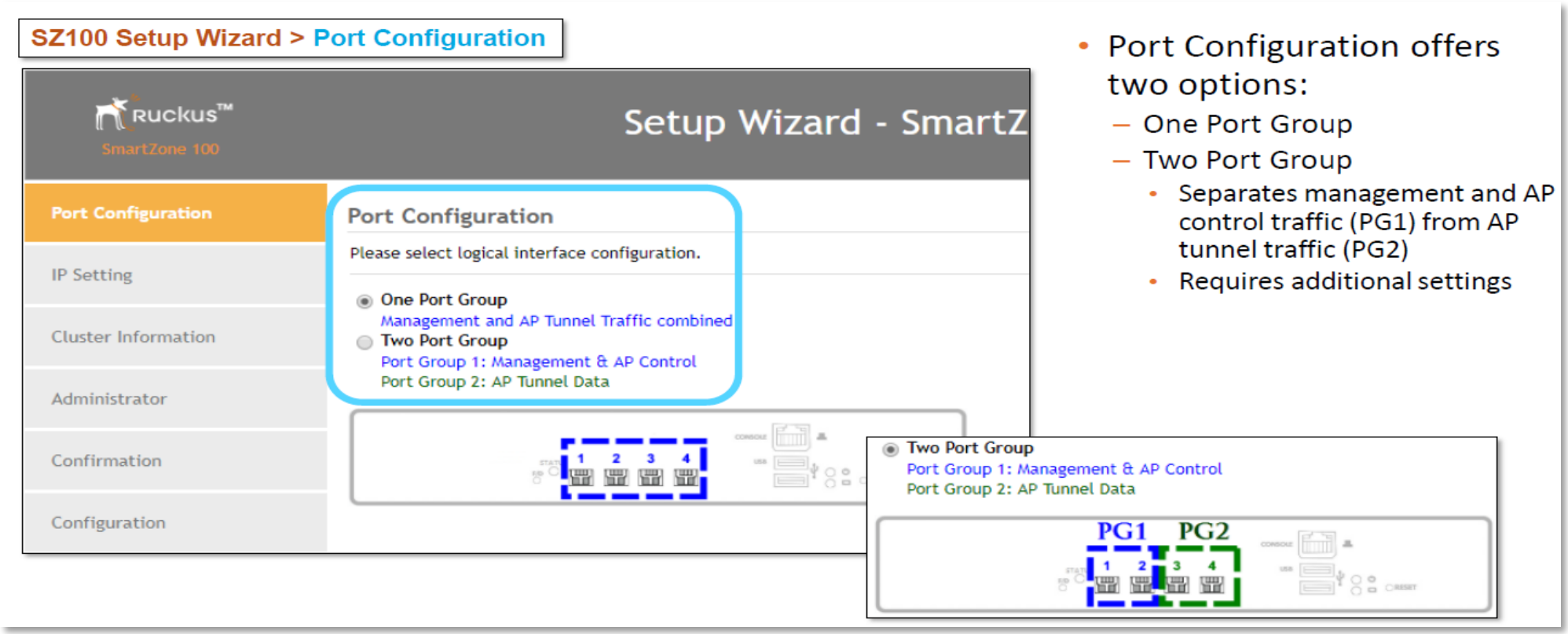
Setup Wizard > Configuration



P.S_vSZ VM


編輯設定 - vSZ (ESXi 5.0 虛擬機器)
虛擬硬體
虛擬機器選項
新增硬碟
新增網路介面卡
新增其他裝置
CPU
4
記憶體
13312
MB
up to 16g
硬碟 1
100
GB
SCSI 控制器 0
LSI Logic SAS
網路介面卡 1
VM Network
連線
網路介面卡 2
VM Network
連線
網路介面卡 3
VM Network
連線
視訊卡
指定自訂設定
編輯設定 - vSZ (ESXi 5.0 虛擬機器)
虛擬硬體
虛擬機器選項
新增硬碟
新增網路介面卡
新增其他裝置
CPU
4
記憶體
13312
MB
up to 16g
硬碟 1
100
GB
SCSI 控制器 0
LSI Logic SAS
網路介面卡 1
VM Network
連線
視訊卡
指定自訂設定

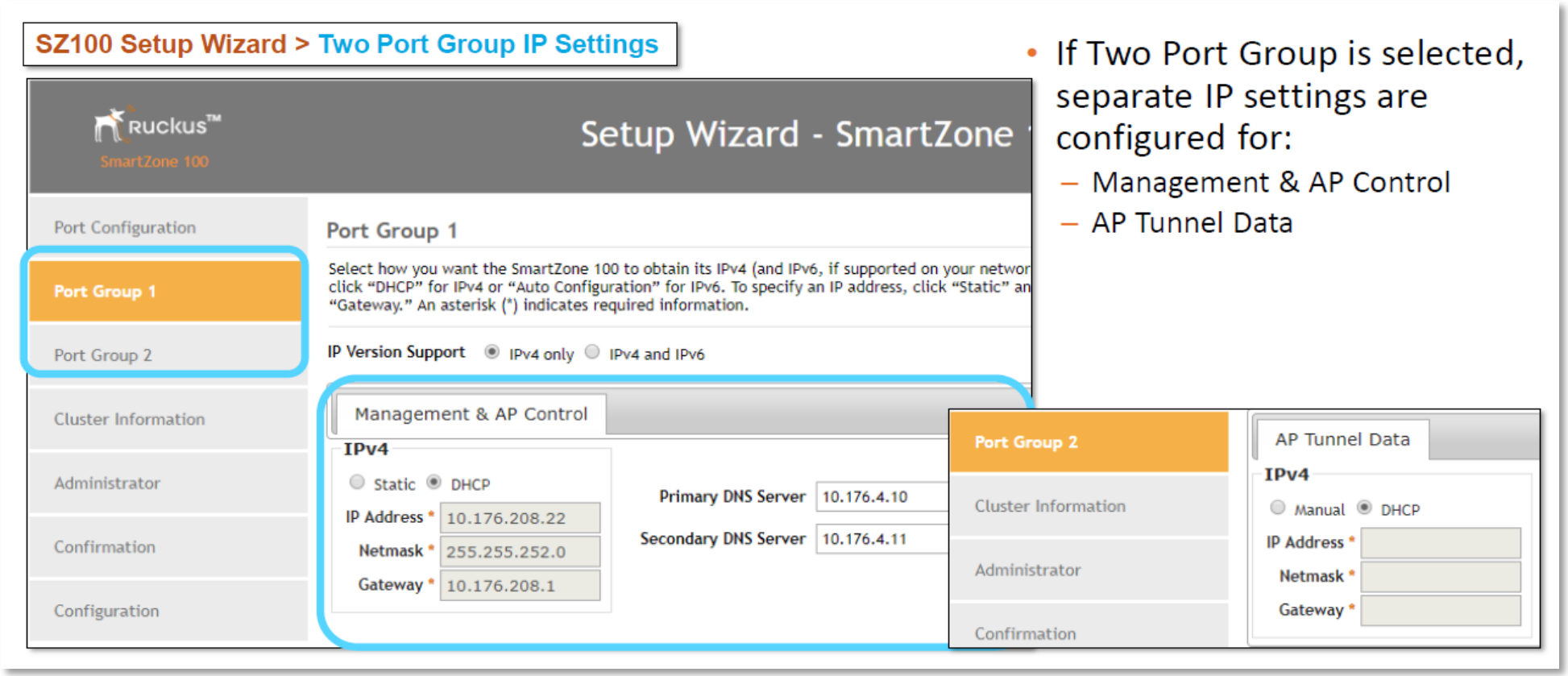
P.S_SZ100 initial



- Port Configuration offers two options:
  - One Port Group
  - Two Port Group
    - Separates management and AP control traffic (PG1) from AP tunnel traffic (PG2)
    - Requires additional settings

https://192.168.2.2:8443

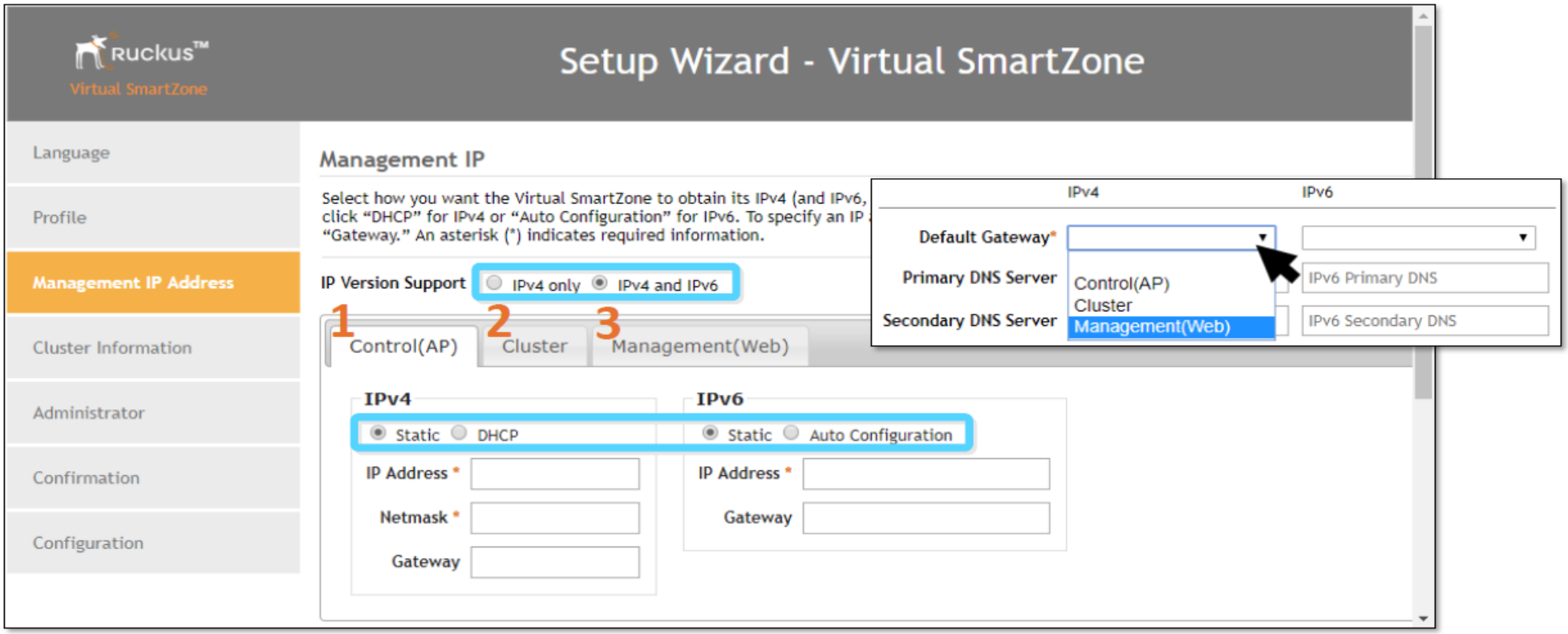
P.S_SZ100 initial.



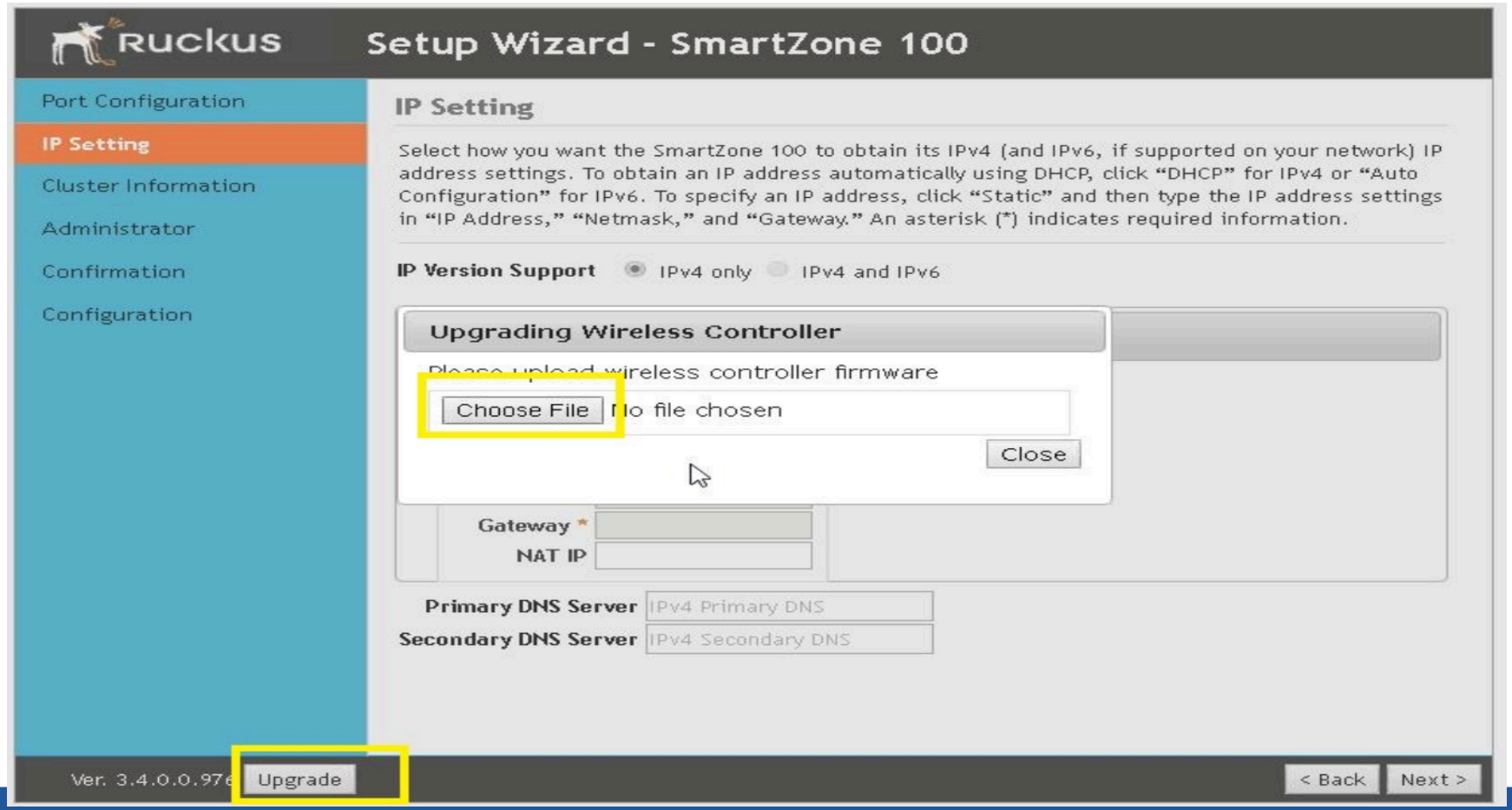
- If Two Port Group is selected, separate IP settings are configured for:
  - Management & AP Control
  - AP Tunnel Data

P.S_three interface initial

Setup Wizard > Management IP Address



P.S_SZ100 Upgrade software



ACCOUNT POINT INITIAL

AP initial

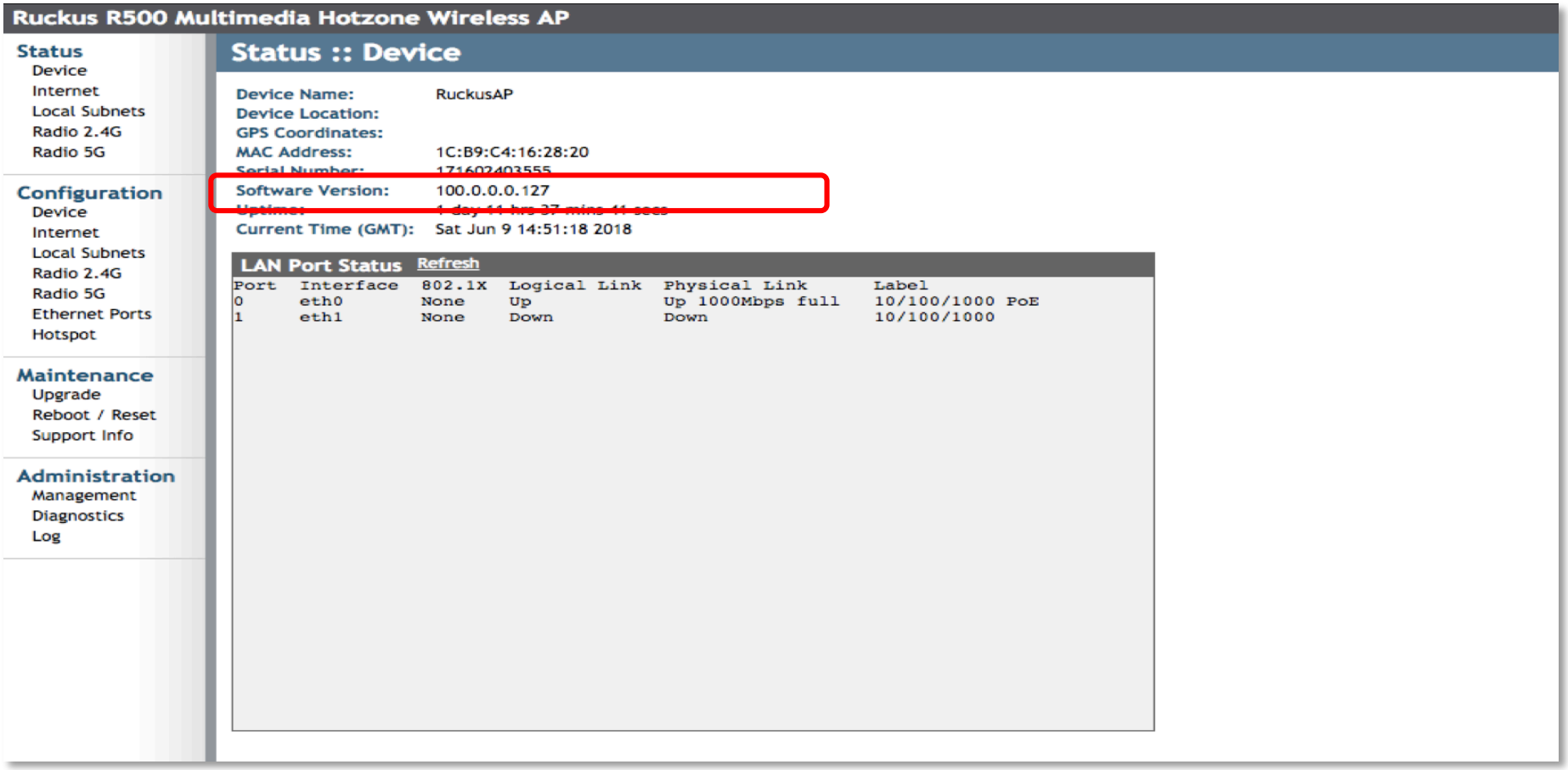
Default IP: 192.168.0.1

super

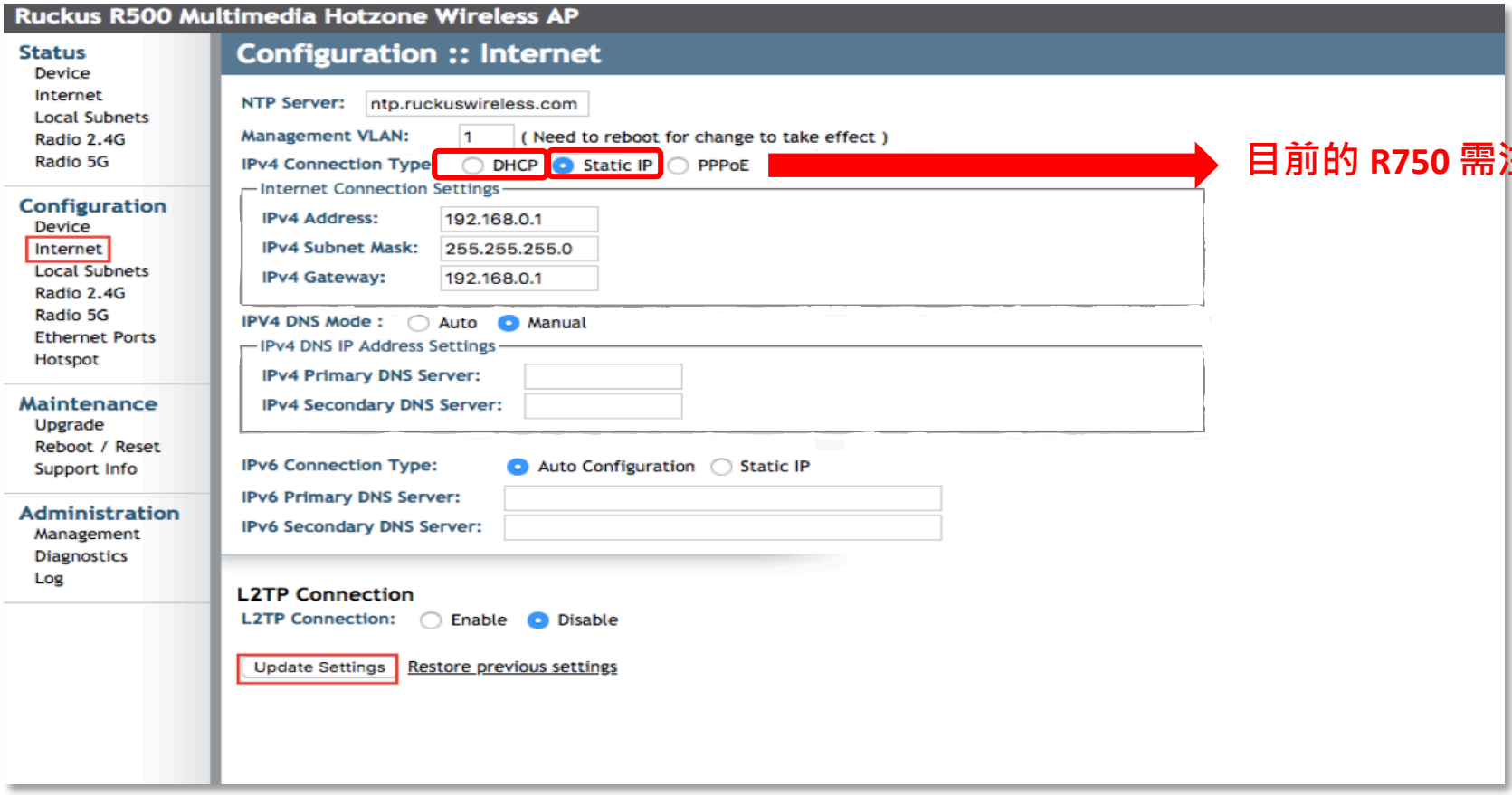
sp-admin

ver.112 or 114 default use “https“

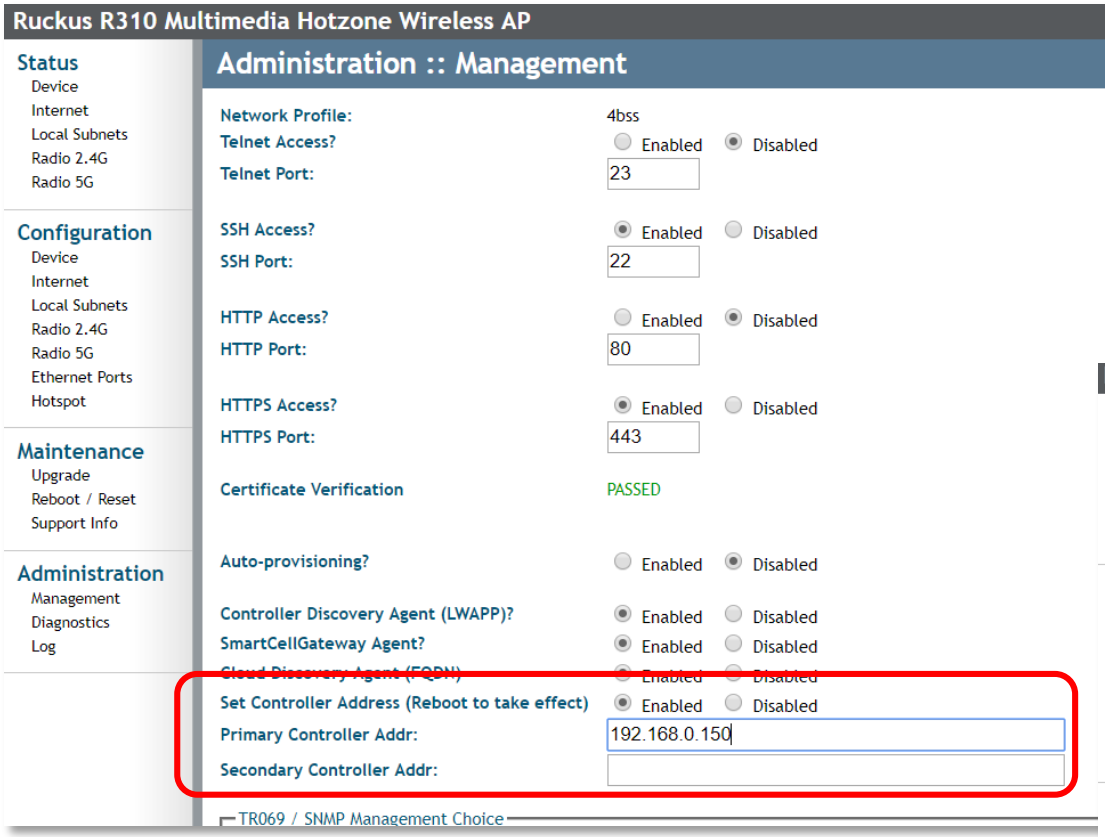
AP initial.

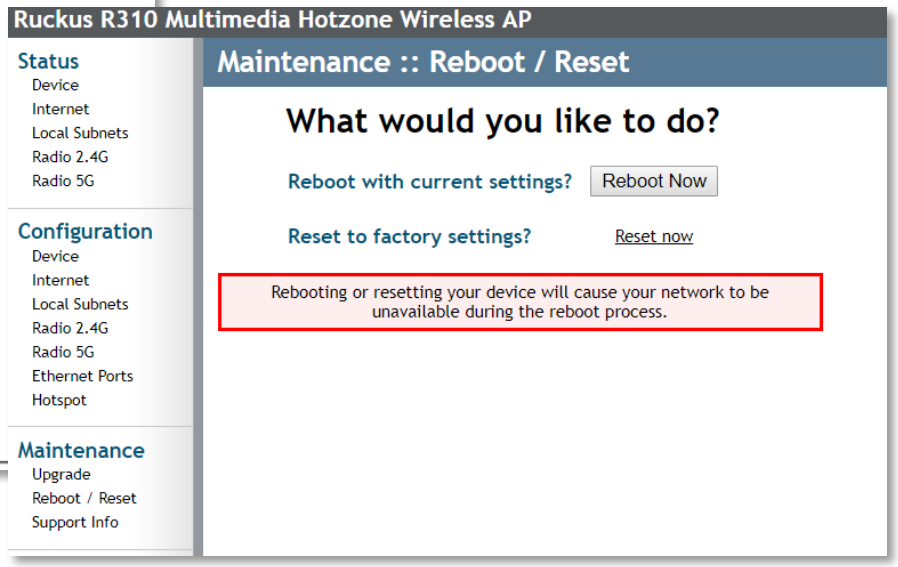

Ruckus R500 Multimedia Hotzone Wireless AP
Status
Device
Internet
Local Subnets
Radio 2.4G
Radio 5G
Configuration
Device
Internet
Local Subnets
Radio 2.4G
Radio 5G
Ethernet Ports
Hotspot
Maintenance
Upgrade
Reboot / Reset
Support Info
Administration
Management
Diagnostics
Log
Status :: Device
Device Name: RuckusAP
Device Location:
GPS Coordinates:
MAC Address: 1C:B9:C4:16:28:20
Software Version: 100.0.0.0.127
Current Time (GMT): Sat Jun 9 14:51:18 2018
LAN Port Status Refresh
Port Interface 802.1X Logical Link Physical Link Label
0 eth0 None Up Up 1000Mbps full 10/100/1000 PoE
1 eth1 None Down Down 10/100/1000

AP initial.


Ruckus R500 Multimedia Hotzone Wireless AP
Status
Device
Internet
Local Subnets
Radio 2.4G
Radio 5G
Configuration
Device
Internet
Local Subnets
Radio 2.4G
Radio 5G
Ethernet Ports
Hotspot
Maintenance
Upgrade
Reboot / Reset
Support Info
Administration
Management
Diagnostics
Log
Configuration :: Internet
NTP Server: ntp.ruckuswireless.com
Management VLAN: 1 (Need to reboot for change to take effect)
IPv4 Connection Type: DHCP Static IP PPPoE
Internet Connection Settings
IPv4 Address: 192.168.0.1
IPv4 Subnet Mask: 255.255.255.0
IPv4 Gateway: 192.168.0.1
IPV4 DNS Mode : Auto Manual
IPv4 DNS IP Address Settings
IPv4 Primary DNS Server:
IPv4 Secondary DNS Server:
IPv6 Connection Type: Auto Configuration Static IP
IPv6 Primary DNS Server:
IPv6 Secondary DNS Server:
L2TP Connection
L2TP Connection: Enable Disable
Update Settings
Restore previous settings
目前的 R750 需注意

AP initial.


Ruckus R310 Multimedia Hotzone Wireless AP
Status
Device
Internet
Local Subnets
Radio 2.4G
Radio 5G
Configuration
Device
Internet
Local Subnets
Radio 2.4G
Radio 5G
Ethernet Ports
Hotspot
Maintenance
Upgrade
Reboot / Reset
Support Info
Administration
Management
Diagnostics
Log
Administration :: Management
Network Profile: 4bss
Telnet Access? Enabled Disabled
Telnet Port: 23
SSH Access? Enabled Disabled
SSH Port: 22
HTTP Access? Enabled Disabled
HTTP Port: 80
HTTPS Access? Enabled Disabled
HTTPS Port: 443
Certificate Verification PASSED
Auto-provisioning? Enabled Disabled
Controller Discovery Agent (LWAPP)? Enabled Disabled
SmartCellGateway Agent? Enabled Disabled
Set Controller Address (Reboot to take effect) Enabled Disabled
Primary Controller Addr: 192.168.0.150
Secondary Controller Addr:
TR069 / SNMP Management Choice


Ruckus R310 Multimedia Hotzone Wireless AP
Status
Device
Internet
Local Subnets
Radio 2.4G
Radio 5G
Configuration
Device
Internet
Local Subnets
Radio 2.4G
Radio 5G
Ethernet Ports
Hotspot
Maintenance
Upgrade
Reboot / Reset
Support Info
Maintenance :: Reboot / Reset
What would you like to do?
Reboot with current settings? Reboot Now
Reset to factory settings? Reset now
Rebooting or resetting your device will cause your network to be unavailable during the reboot process.

P.S_ AP Join information - CLI

```
rkscli: get scg

------ SCG Information ------
SCG Service is enabled.
AP is managed by SCG.
State: IMG_REQ_STATE
Server List: 10.10.100.51
SSH tunnel connected to 10.10.100.51
Failover List: Not found
Failover Max Retry: 2
DHCP Opt43 Code: 6
Server List from DHCP (Opt43/Opt52): Not found
SCG default URL: RuckusController
SCG config|heartbeat intervals: 30|30
SCG gwloss|serverloss timeouts: 1800|7200
Controller Cert Validation : disable
-----------------------------
OK
rkscli:
```

P.S_ AP Join information - LED

- Off: Standalone mode

- Green: The AP is being managed by a controller.

- Slow flashing green (one flash every two seconds):
The AP is being managed by a controller, but is currently unable to communicate with the controller.

- Fast flashing green (two flashes every second):
The AP is being managed by a controller and is currently receiving configuration settings (provisioning) or an image update.

P.S_R750 問題

R750 Default software > Ver.114

Join SMARTZONE > Ver.5.2

>>> 需要先在 AP 上面將 ip mode 指定 ipv4

```
rkscli: set ipmode wan ipv4
IP Mode is already set as ipv4.
OK
rkscli:
```

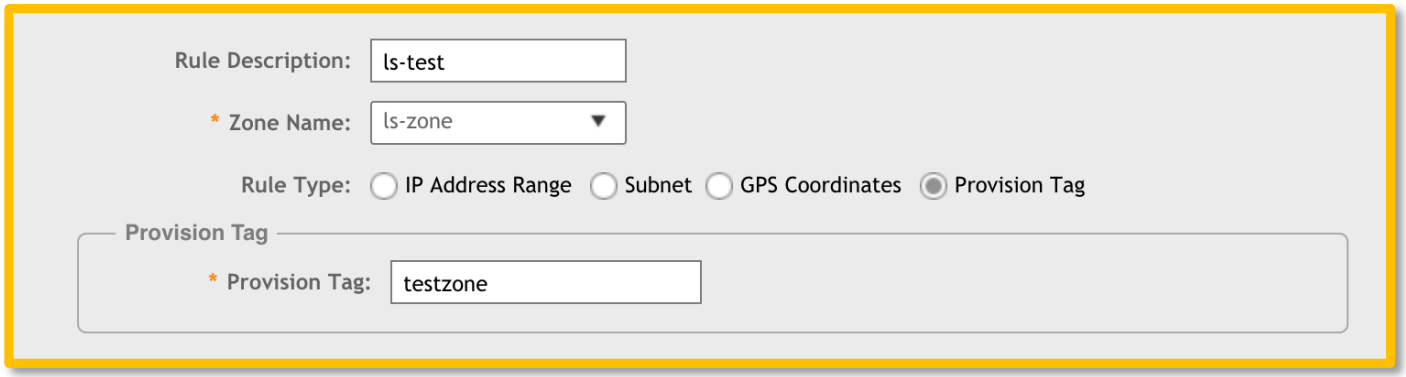
```
rkscli: set ip
Commands starting with 'set ip' :
set ipaddr : set ipaddr {wan|wan-lte|video|mgmt} [vlan <vlan id>] {options}
                -> <ipaddr> <netmask> <gateway> "static IP case"
                -> dynamic                      "DHCP case     "
                For wan-lte, only dynamic configuration is supported
                -- Modify IP address
set ipmode : set ipmode {wan|lan|video|mgmt} {ipv4 | ipv6 | dual }
              ipv6-only cannot be set when hotspot or router mode is enabled
 -- Modify IP Mode
set ipv6addr : set ipv6addr {wan|video|mgmt} [vlan <vlan id>] {options}
                -> <ipv6addr> <prefixlen> <gateway> "static IP case,prefix length:<16..128>"
                -> autoconfig                       "auto configuration case"
                -- Modify IPv6 address
set ipv6ctrl : set ipv6ctrl <wlan name> {options}
                -> [nd-proxy    {enable|disable|counter-reset}  ]
                -> [ns-suppress {enable|disable|counter-reset}  ]
                -> [ra-proxy    {enable|disable|counter-reset}  ]
                -> [rsra-guard  {enable|disable|counter-reset}  ]
                -> [ra-throttle <enable maximum_ra_allowed time_interval_in_minutes>  ]
                -> [ra-throttle  disable|counter-reset  ]
                -> [ counter-reset ]
                -- counter-reset - Reset the counter value to 0
                        -- Set IPv6 Control features
```

P.S_Provision ID

AP-CONFIG

set scg ip 2xx.99.1xx.99 , 2xx.99.1xx.98

set provisioning-tag TID77888877



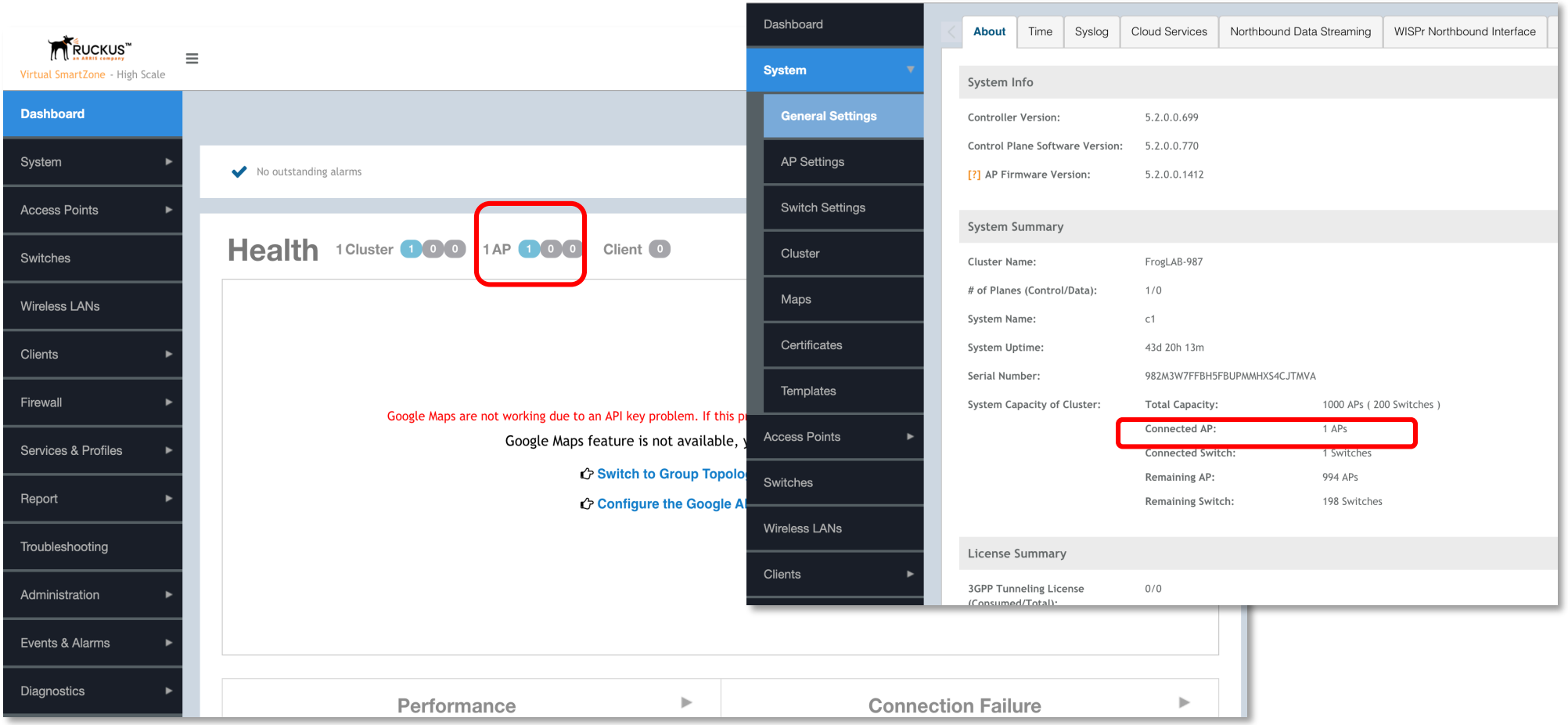
P.S_Software Ver

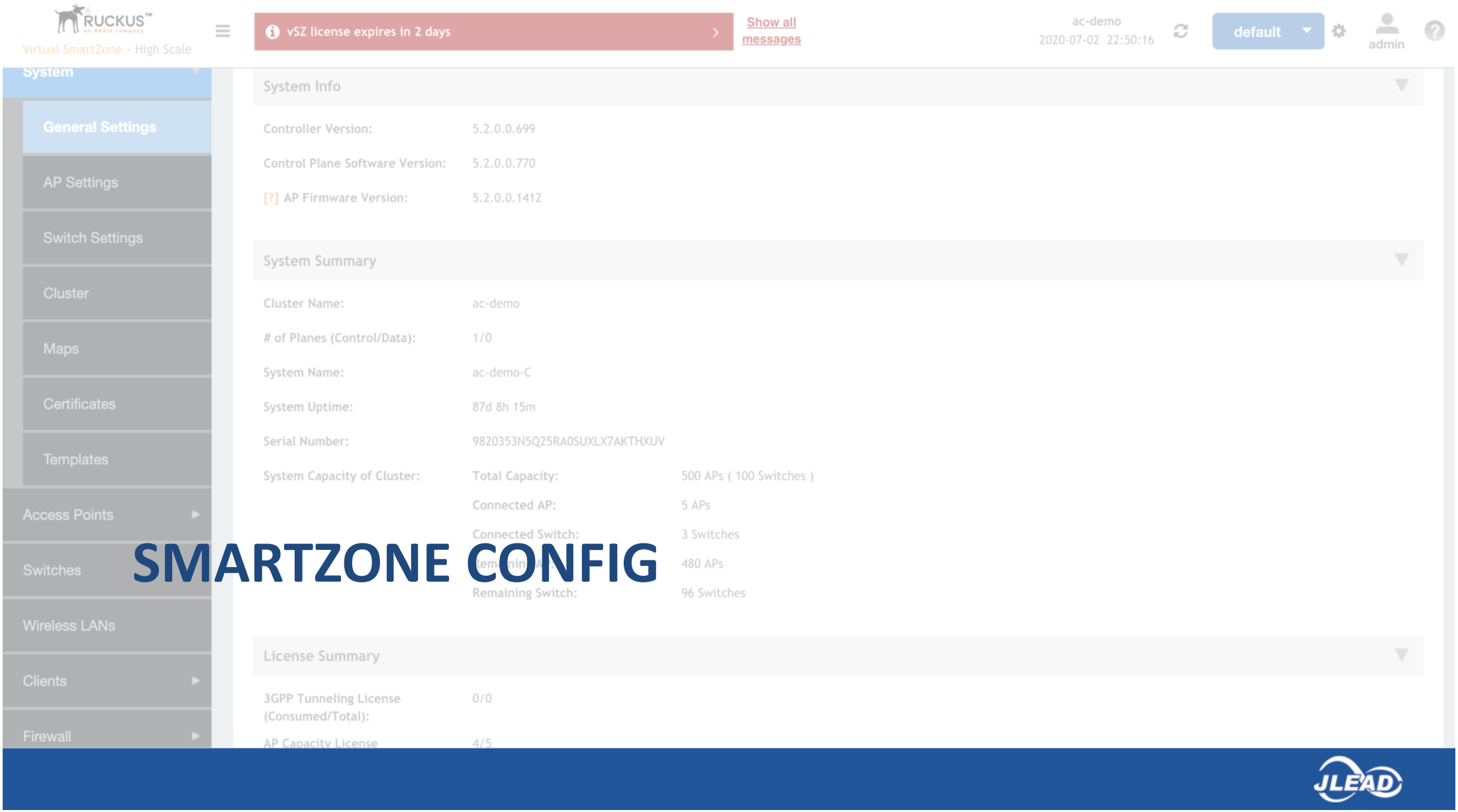
5.x	
5.2.0.0.699	R750 只能夠搭配此版本
5.1.2.0.302	
5.1.1.0.598	
5.1.1.0.589	

3.x	
3.6.2.0.250	7982 , 7372
3.6.2.0.222	
3.6.1.0.227	

AP default
114.0.0.0.1392
112.1.0.0.2146
110.0.0.0.663
104.1.0..298

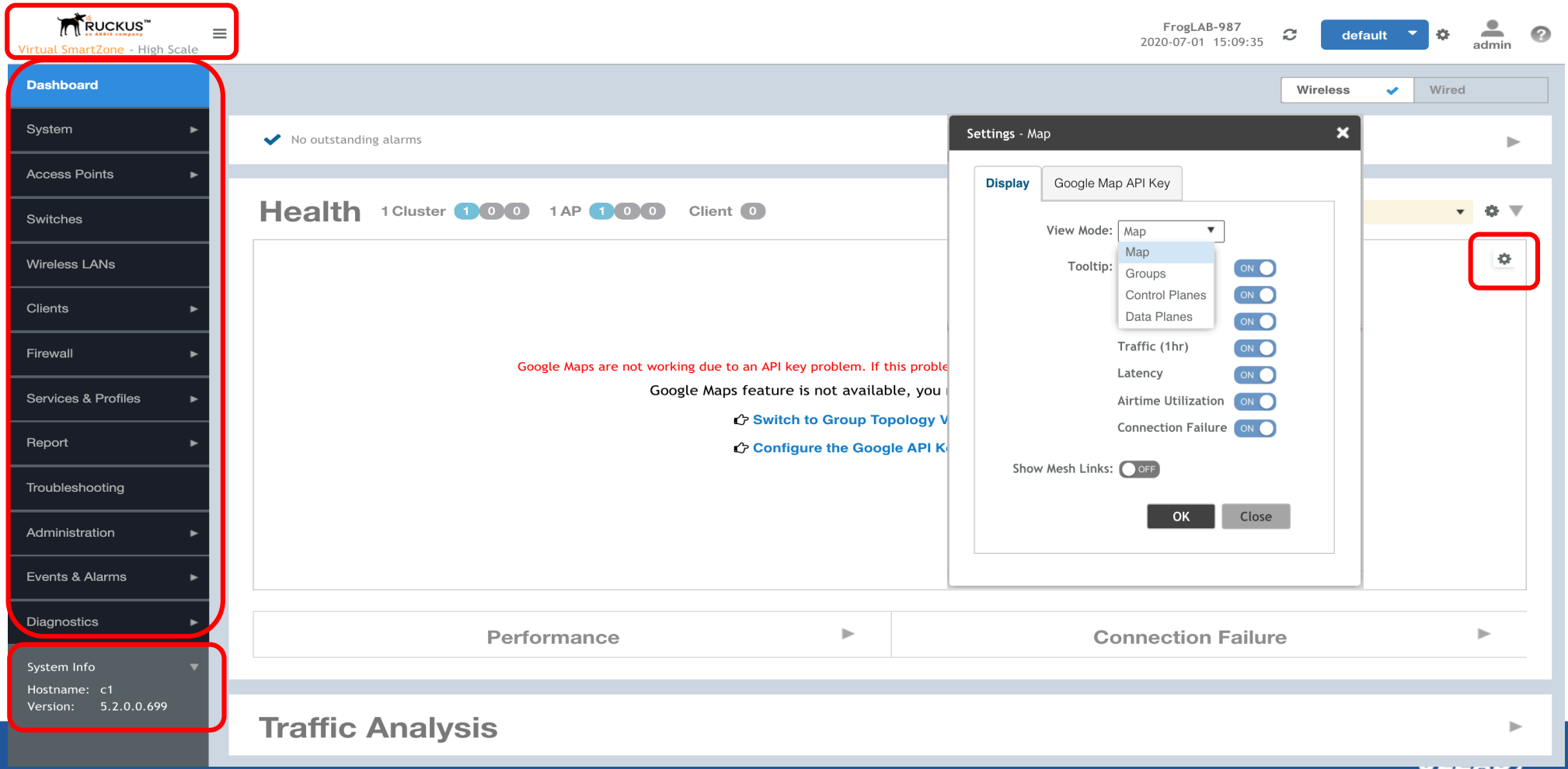
Complete


RUCKUS
Virtual SmartZone - High Scale
Dashboard
System
Access Points
Switches
Wireless LANs
Clients
Firewall
Services & Profiles
Report
Troubleshooting
Administration
Events & Alarms
Diagnostics
No outstanding alarms
Health
1 Cluster 1 0 0
1 AP 1 0 0
Client 0
Google Maps are not working due to an API key problem. If this p
Google Maps feature is not available,
Switch to Group Topolo
Configure the Google A
Performance
Connection Failure
Dashboard
System
General Settings
AP Settings
Switch Settings
Cluster
Maps
Certificates
Templates
Access Points
Switches
Wireless LANs
Clients
About
Time
Syslog
Cloud Services
Northbound Data Streaming
WISPr Northbound Interface
System Info
Controller Version: 5.2.0.0.699
Control Plane Software Version: 5.2.0.0.770
[?] AP Firmware Version: 5.2.0.0.1412
System Summary
Cluster Name: FrogLAB-987
# of Planes (Control/Data): 1/0
System Name: c1
System Uptime: 43d 20h 13m
Serial Number: 982M3W7FFBH5FBUPMMHXS4CJTMVA
System Capacity of Cluster:
Total Capacity: 1000 APs (200 Switches)
Connected AP: 1 APs
Connected Switch: 1 Switches
Remaining AP: 994 APs
Remaining Switch: 198 Switches
License Summary
3GPP Tunneling License (Consumed/Total): 0/0

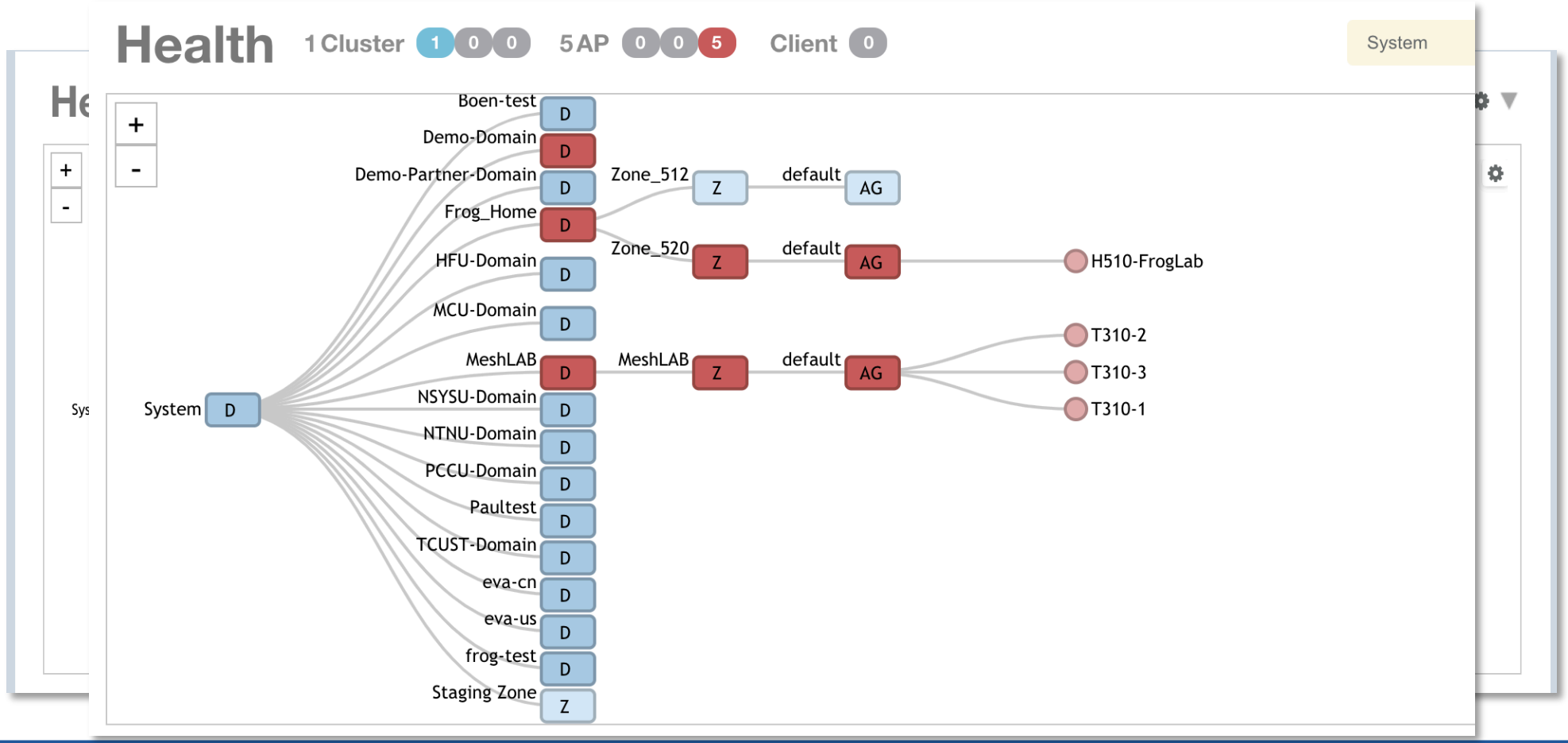


SMARTZONE CONFIG

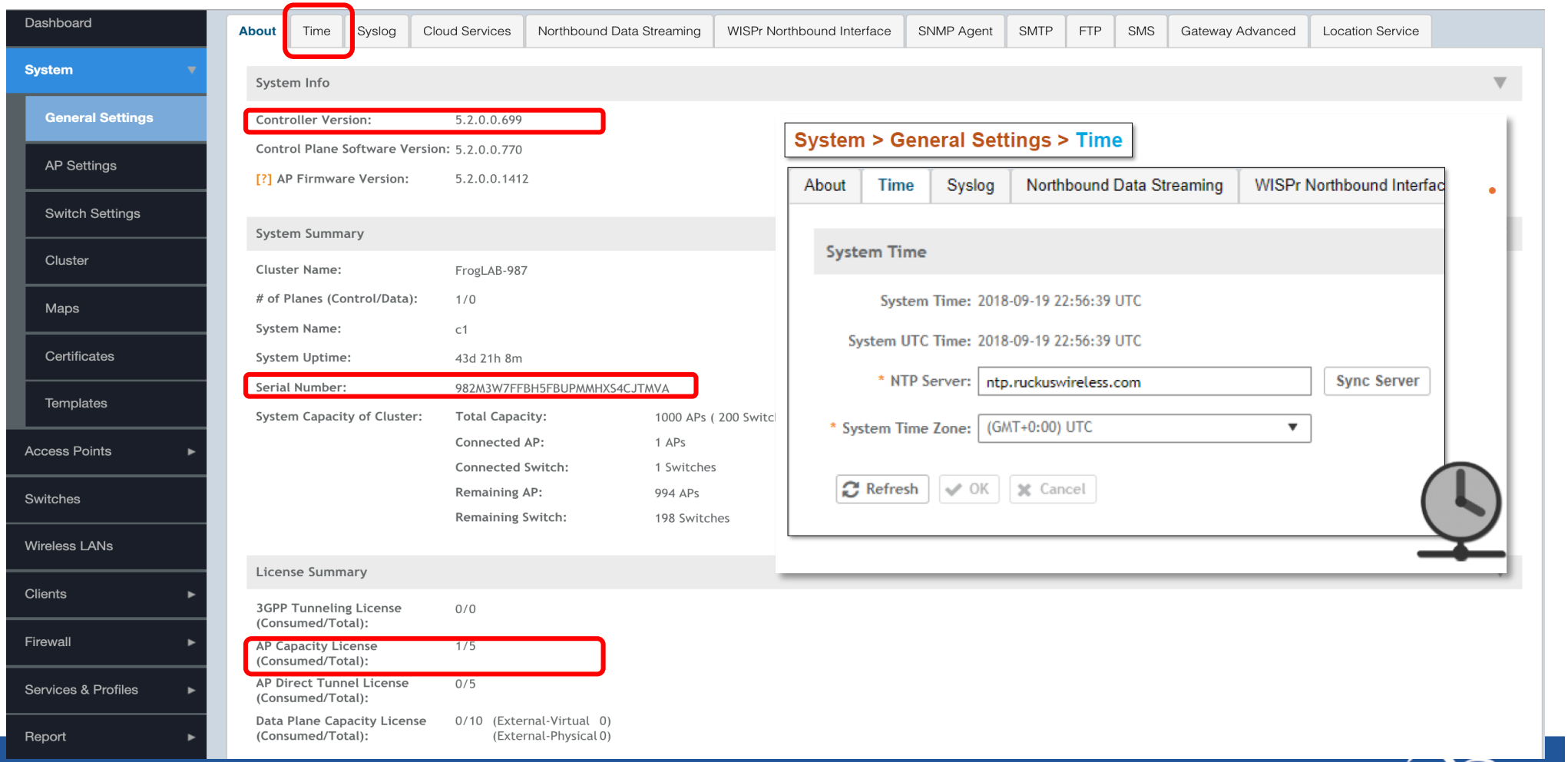
Dashboard


RUCKUS
Virtual SmartZone - High Scale
FrogLAB-987
2020-07-01 15:09:35
default
admin
Dashboard
System
Access Points
Switches
Wireless LANs
Clients
Firewall
Services & Profiles
Report
Troubleshooting
Administration
Events & Alarms
Diagnostics
System Info
Hostname: c1
Version: 5.2.0.0.699
Wireless
Wired
No outstanding alarms
Health
1 Cluster 1 0 0
1 AP 1 0 0
Client 0
Google Maps are not working due to an API key problem. If this proble
Google Maps feature is not available, you
Switch to Group Topology V
Configure the Google API K
Settings - Map
Display
Google Map API Key
View Mode: Map
Tooltip:
Map
Groups
Control Planes
Data Planes
Traffic (1hr)
Latency
Airtime Utilization
Connection Failure
Show Mesh Links: OFF
OK
Close
Performance
Connection Failure
Traffic Analysis

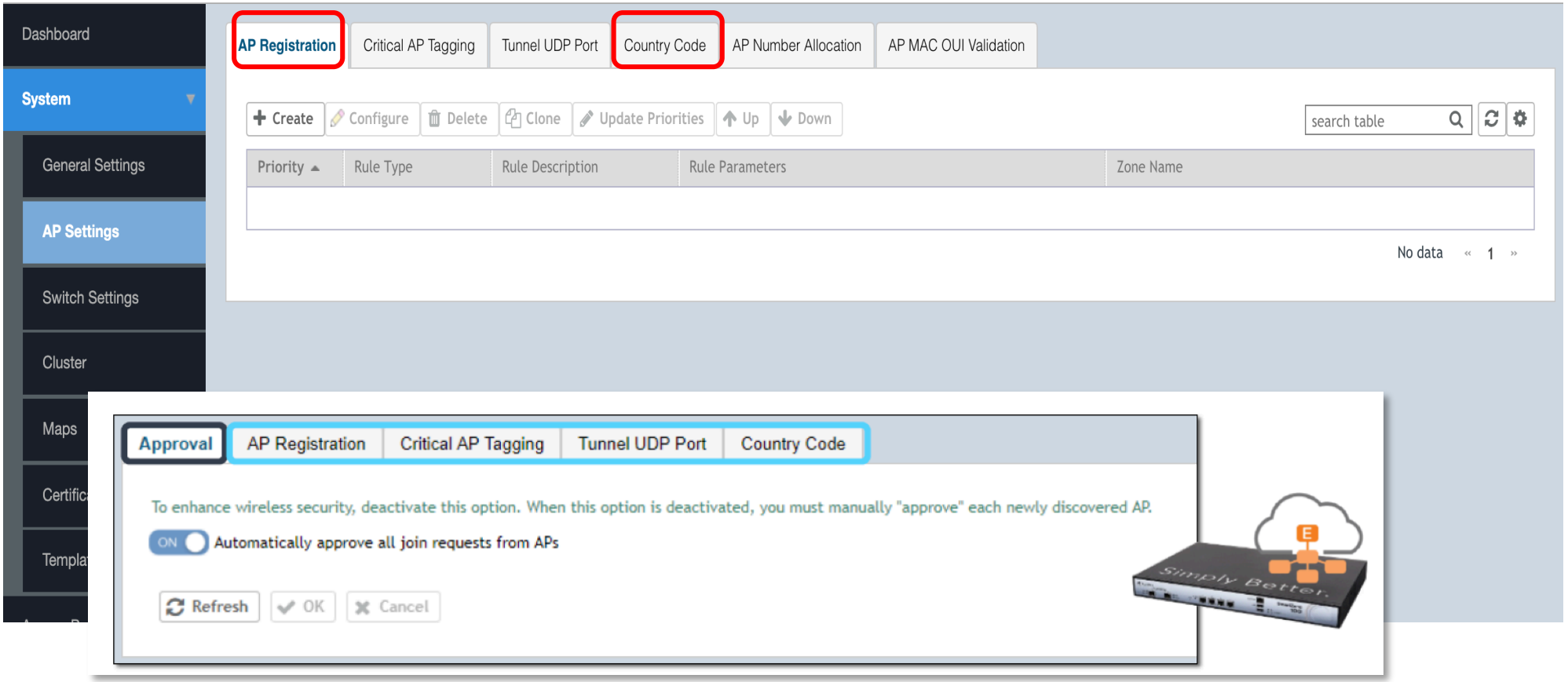
Dashboard.


Health
1 Cluster 1 0 0
5 AP 0 0 5
Client 0
System
+
-
System
D
Boen-test
Demo-Domain
Demo-Partner-Domain
Frog_Home
HFU-Domain
MCU-Domain
MeshLAB
NSYSU-Domain
NTNU-Domain
PCCU-Domain
Paultest
TCUST-Domain
eva-cn
eva-us
frog-test
Staging Zone
Zone_512
Zone_520
MeshLAB
Z
default
AG
H510-FrogLab
T310-2
T310-3
T310-1

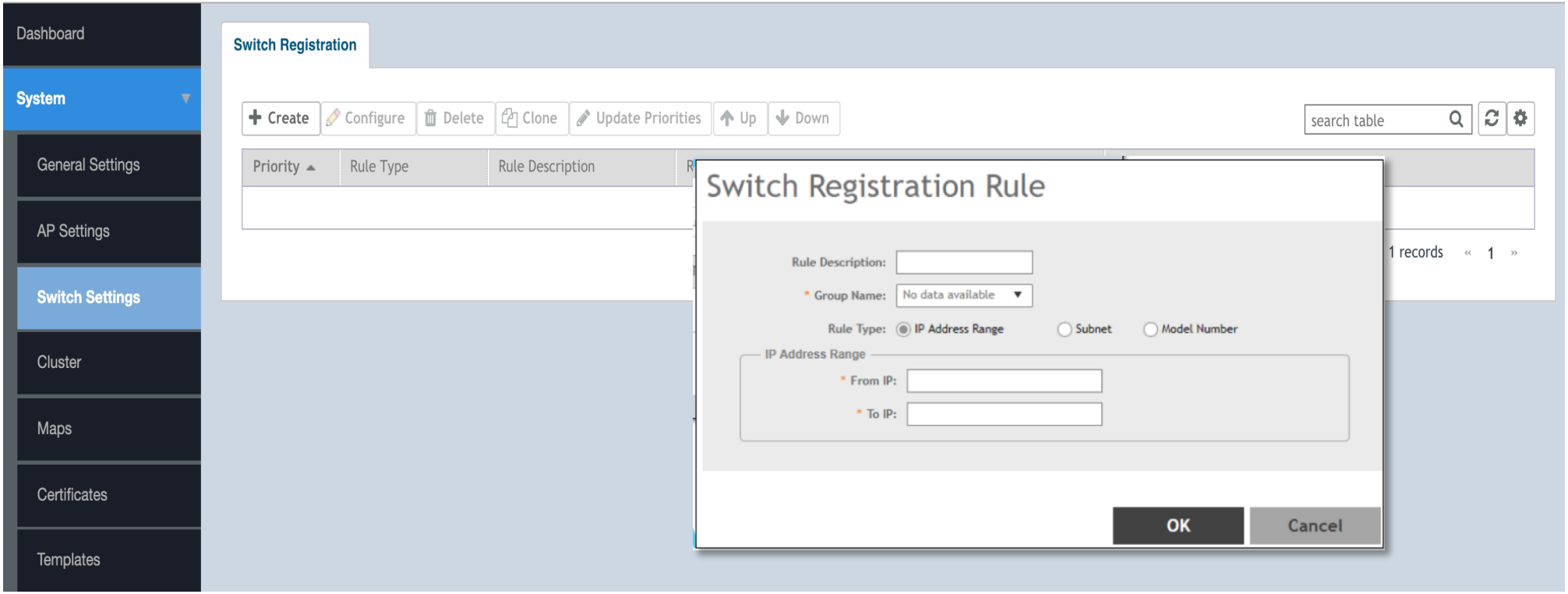
System


Dashboard
System
General Settings
AP Settings
Switch Settings
Cluster
Maps
Certificates
Templates
Access Points
Switches
Wireless LANs
Clients
Firewall
Services & Profiles
Report
About
Time
Syslog
Cloud Services
Northbound Data Streaming
WISPr Northbound Interface
SNMP Agent
SMTP
FTP
SMS
Gateway Advanced
Location Service
System Info
Controller Version: 5.2.0.0.699
Control Plane Software Version: 5.2.0.0.770
[?] AP Firmware Version: 5.2.0.0.1412
System Summary
Cluster Name: FrogLAB-987
# of Planes (Control/Data): 1/0
System Name: c1
System Uptime: 43d 21h 8m
Serial Number: 982M3W7FFBH5FBUPMMHXS4CJTMVA
System Capacity of Cluster: Total Capacity: 1000 APs (200 Switc
Connected AP: 1 APs
Connected Switch: 1 Switches
Remaining AP: 994 APs
Remaining Switch: 198 Switches
License Summary
3GPP Tunneling License (Consumed/Total): 0/0
AP Capacity License (Consumed/Total): 1/5
AP Direct Tunnel License (Consumed/Total): 0/5
Data Plane Capacity License (Consumed/Total): 0/10 (External-Virtual 0) (External-Physical 0)
System > General Settings > Time
About
Time
Syslog
Northbound Data Streaming
WISPr Northbound Interfac
System Time
System Time: 2018-09-19 22:56:39 UTC
System UTC Time: 2018-09-19 22:56:39 UTC
* NTP Server: ntp.ruckuswireless.com
Sync Server
* System Time Zone: (GMT+0:00) UTC
Refresh
OK
Cancel

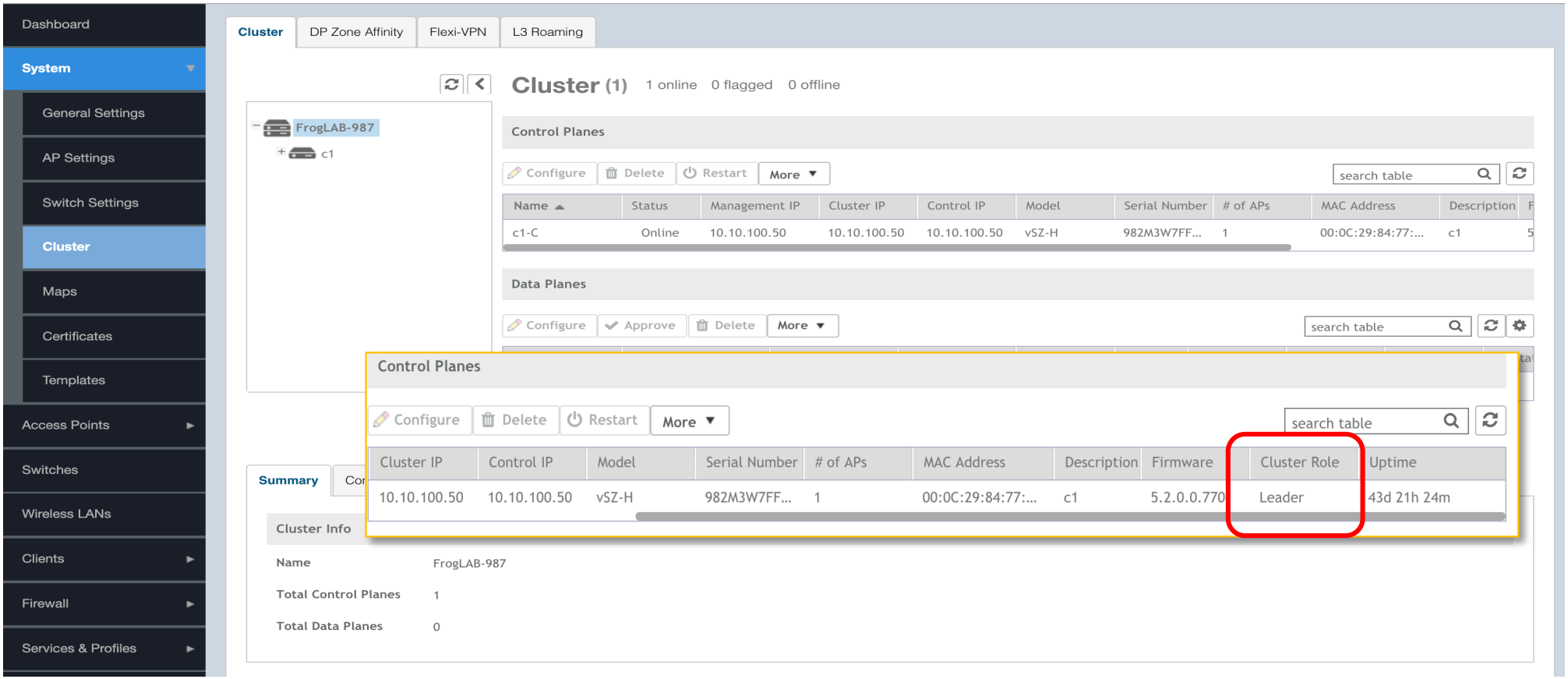
System.


Dashboard
System
General Settings
AP Settings
Switch Settings
Cluster
Maps
Certific
Templa
AP Registration
Critical AP Tagging
Tunnel UDP Port
Country Code
AP Number Allocation
AP MAC OUI Validation
Create
Configure
Delete
Clone
Update Priorities
Up
Down
search table
Priority
Rule Type
Rule Description
Rule Parameters
Zone Name
No data
1
Approval
AP Registration
Critical AP Tagging
Tunnel UDP Port
Country Code
To enhance wireless security, deactivate this option. When this option is deactivated, you must manually "approve" each newly discovered AP.
ON
Automatically approve all join requests from APs
Refresh
OK
Cancel
Simply Better.

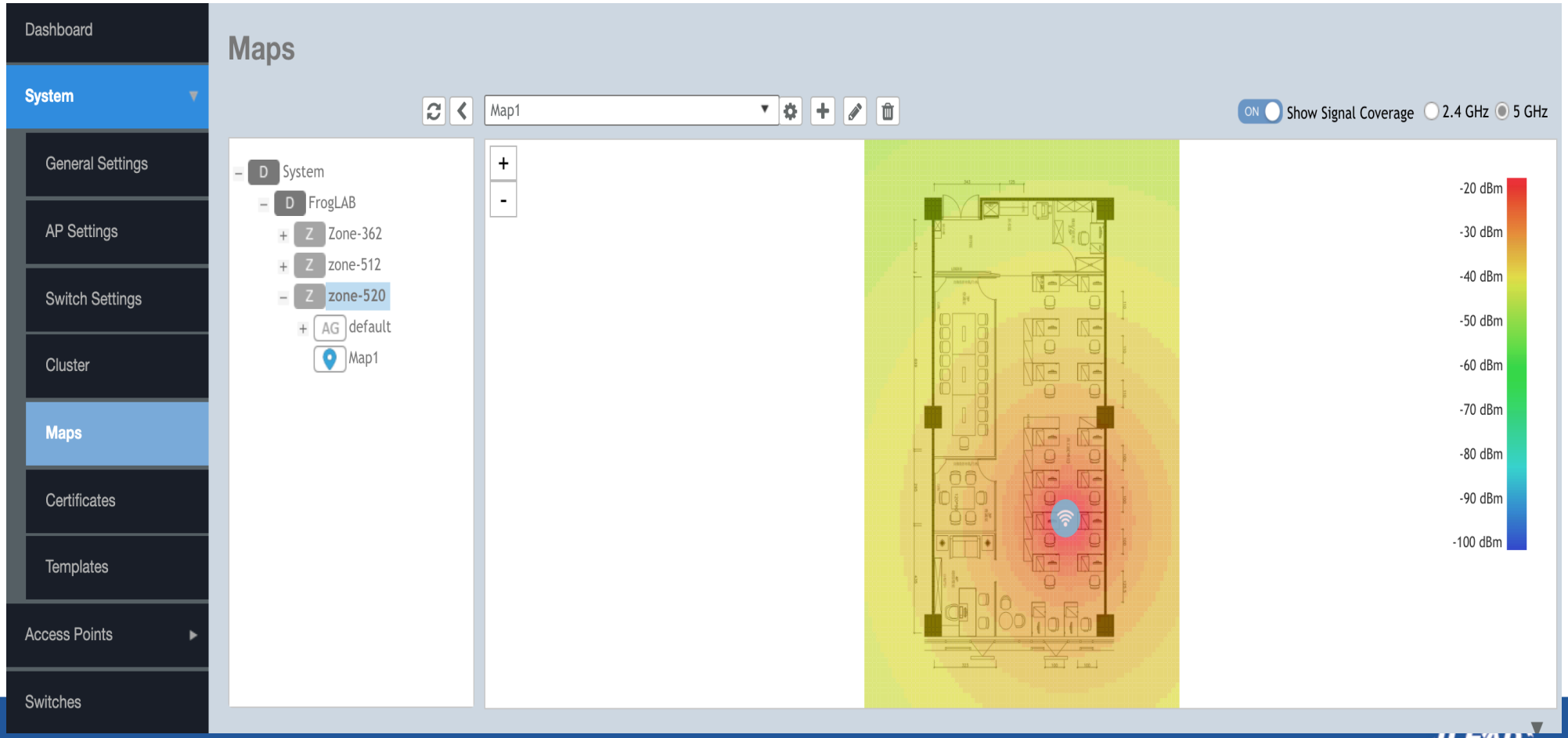
System.


Dashboard
System
General Settings
AP Settings
Switch Settings
Cluster
Maps
Certificates
Templates
Switch Registration
Create
Configure
Delete
Clone
Update Priorities
Up
Down
search table
Priority
Rule Type
Rule Description
1 records
1
Switch Registration Rule
Rule Description:
* Group Name:
No data available
Rule Type:
IP Address Range
Subnet
Model Number
IP Address Range
* From IP:
* To IP:
OK
Cancel

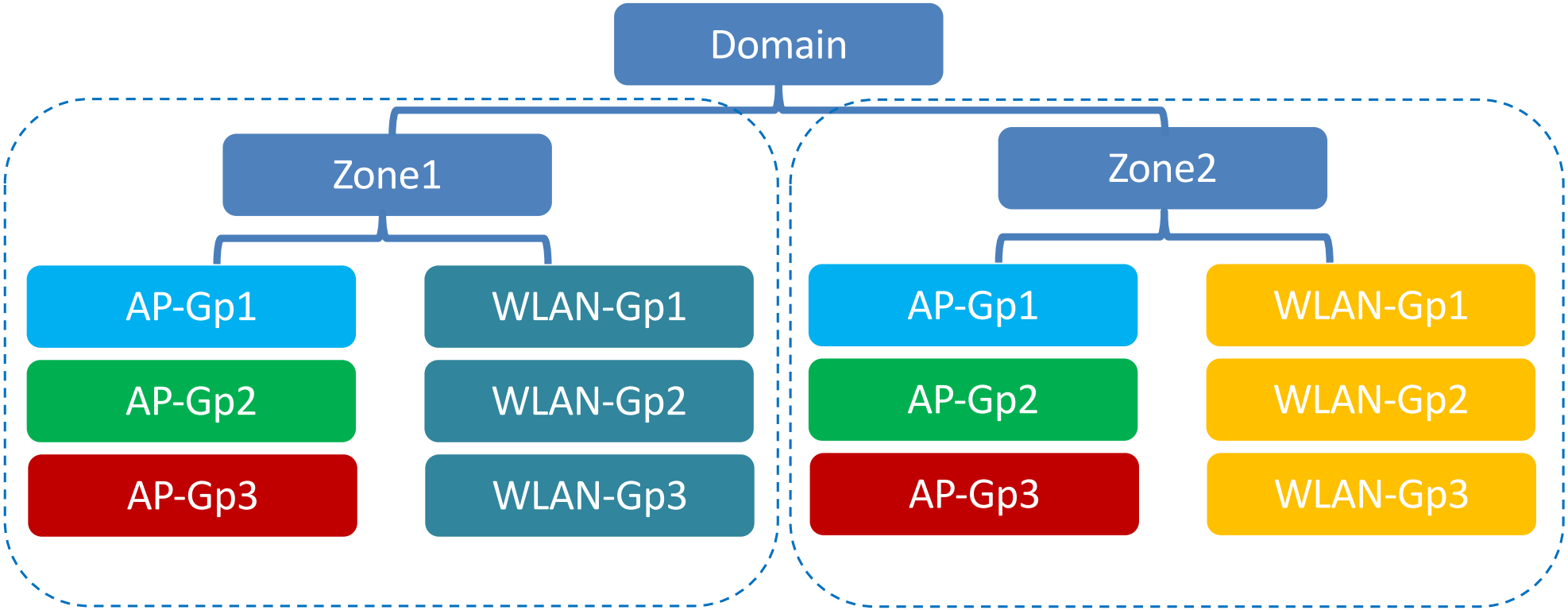
System.


Dashboard
System
General Settings
AP Settings
Switch Settings
Cluster
Maps
Certificates
Templates
Access Points
Switches
Wireless LANs
Clients
Firewall
Services & Profiles
Cluster
DP Zone Affinity
Flexi-VPN
L3 Roaming
Cluster (1) 1 online 0 flagged 0 offline
FrogLAB-987
c1
Control Planes
Configure
Delete
Restart
More
search table
Name
Status
Management IP
Cluster IP
Control IP
Model
Serial Number
# of APs
MAC Address
Description
c1-C
Online
10.10.100.50
10.10.100.50
10.10.100.50
vSZ-H
982M3W7FF...
1
00:0C:29:84:77:...
c1
Data Planes
Configure
Approve
Delete
More
search table
Control Planes
Configure
Delete
Restart
More
search table
Cluster IP
Control IP
Model
Serial Number
# of APs
MAC Address
Description
Firmware
Cluster Role
Uptime
10.10.100.50
10.10.100.50
vSZ-H
982M3W7FF...
1
00:0C:29:84:77:...
c1
5.2.0.0.770
Leader
43d 21h 24m
Summary
Cluster Info
Name
FrogLAB-987
Total Control Planes
1
Total Data Planes
0

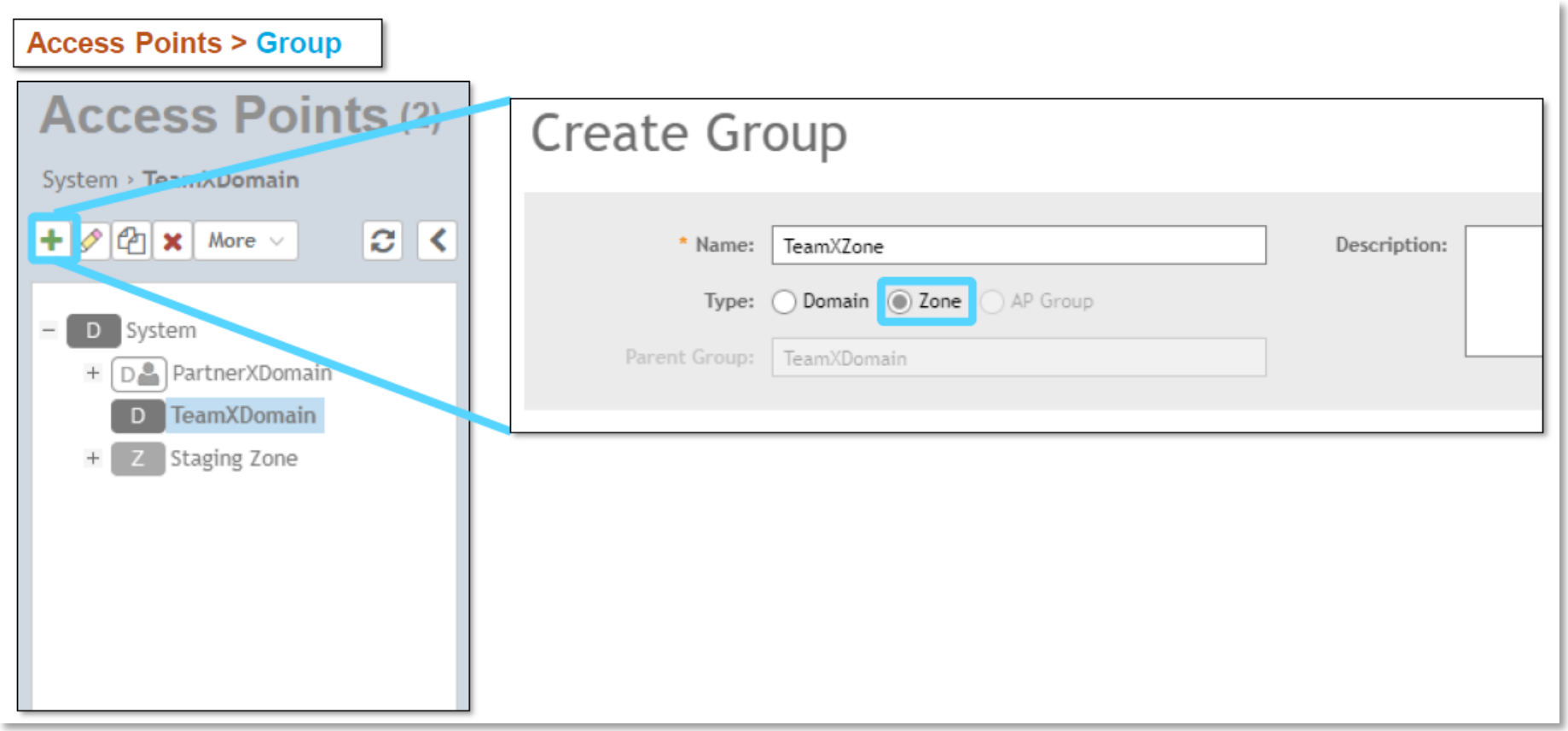
System.


Dashboard
System
General Settings
AP Settings
Switch Settings
Cluster
Maps
Certificates
Templates
Access Points
Switches
Maps
Map1
ON
Show Signal Coverage
2.4 GHz
5 GHz
System
FrogLAB
Zone-362
zone-512
zone-520
default
Map1
+
-
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
-100 dBm

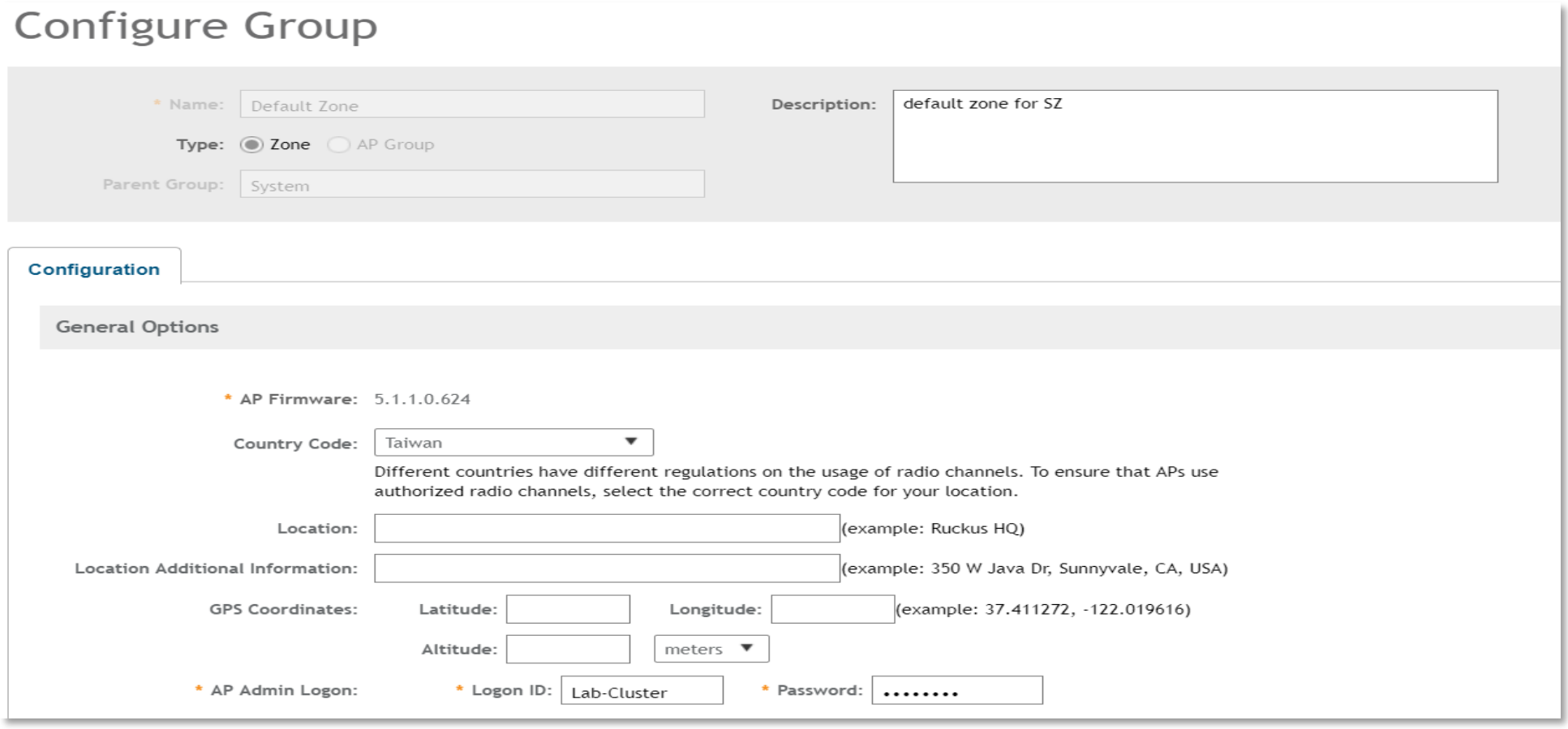
Domain - Zone - Group



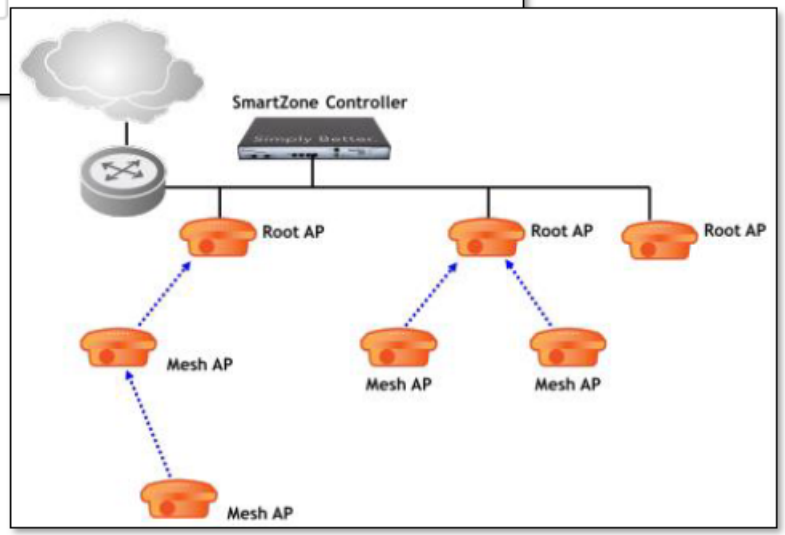
Zone


Access Points > Group
Access Points (2)
System › TeamXDomain
More
D System
D PartnerXDomain
D TeamXDomain
Z Staging Zone
Create Group
* Name: TeamXZone
Description:
Type: Domain Zone AP Group
Parent Group: TeamXDomain

Zone.

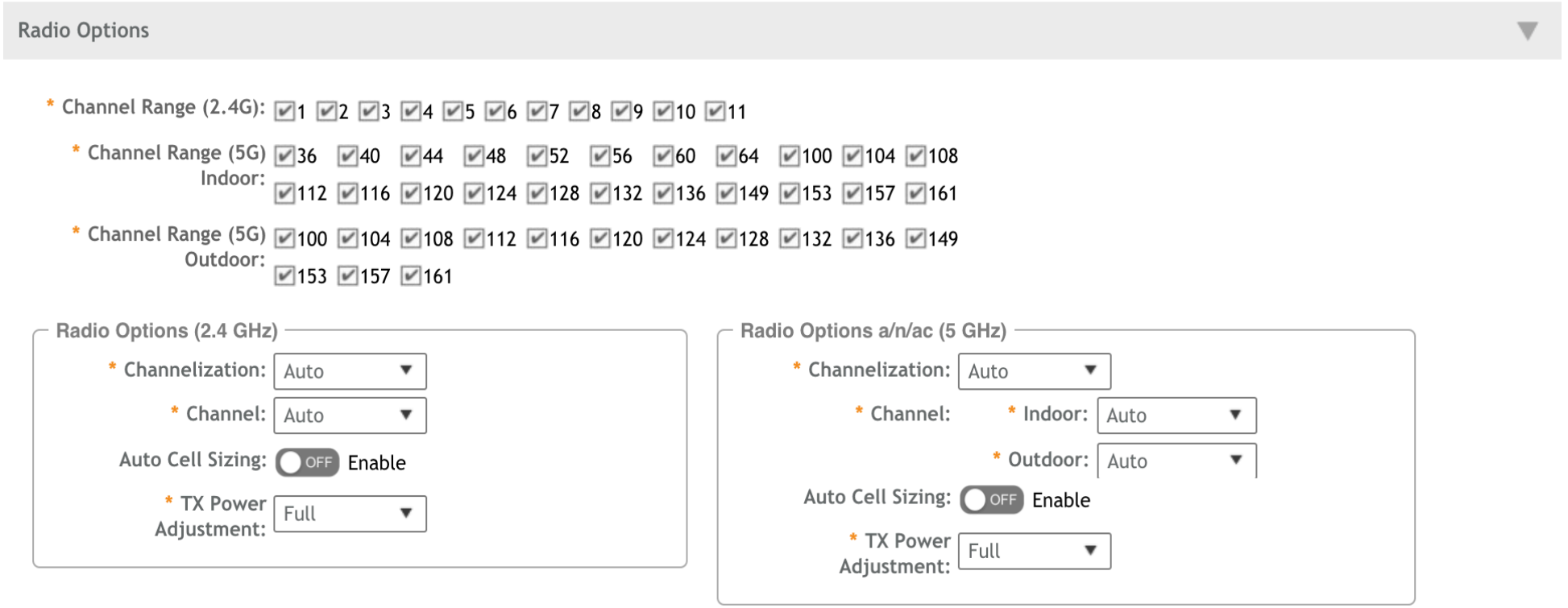

Configure Group
* Name: Default Zone
Description: default zone for SZ
Type: Zone AP Group
Parent Group: System
Configuration
General Options
* AP Firmware: 5.1.1.0.624
Country Code: Taiwan
Different countries have different regulations on the usage of radio channels. To ensure that APs use authorized radio channels, select the correct country code for your location.
Location: (example: Ruckus HQ)
Location Additional Information: (example: 350 W Java Dr, Sunnyvale, CA, USA)
GPS Coordinates: Latitude: Longitude: (example: 37.411272, -122.019616)
Altitude: meters
* AP Admin Logon: * Logon ID: Lab-Cluster * Password: ••••••••

Zone.



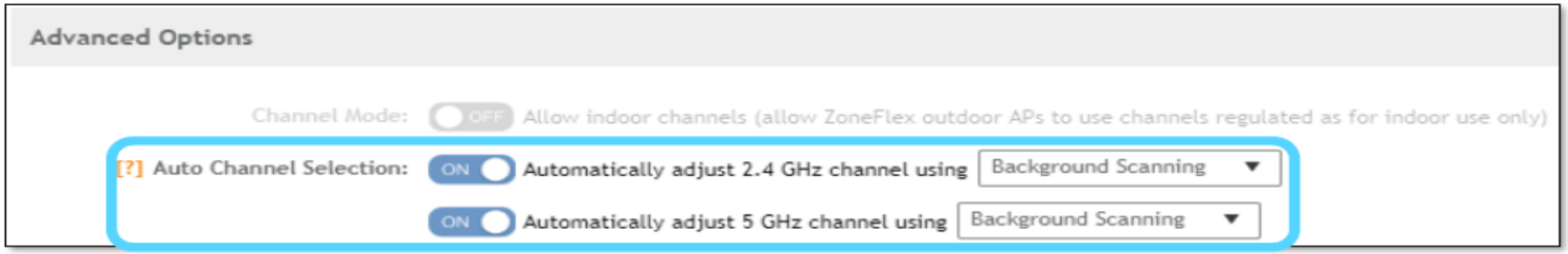
- Mesh options
  - Zone ONLY
  - Document Mesh Name and Passphrase details for:
    - Troubleshooting
    - AP Recovery
  - Zero Touch for completely wireless setup

Zone.

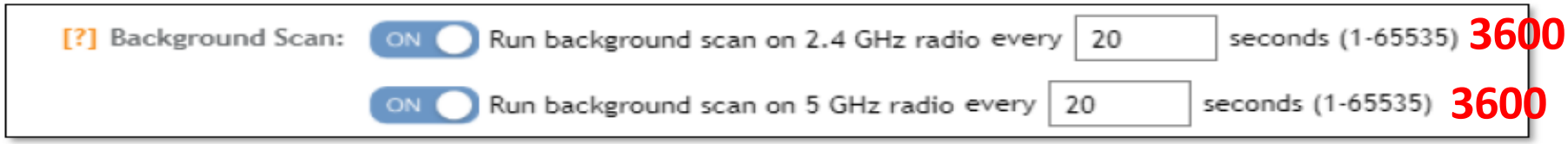

Radio Options
* Channel Range (2.4G): 1 2 3 4 5 6 7 8 9 10 11
* Channel Range (5G) Indoor: 36 40 44 48 52 56 60 64 100 104 108 112 116 120 124 128 132 136 149 153 157 161
* Channel Range (5G) Outdoor: 100 104 108 112 116 120 124 128 132 136 149 153 157 161
Radio Options (2.4 GHz)
* Channelization: Auto
* Channel: Auto
Auto Cell Sizing: OFF Enable
* TX Power Adjustment: Full
Radio Options a/n/ac (5 GHz)
* Channelization: Auto
* Channel: * Indoor: Auto
* Outdoor: Auto
Auto Cell Sizing: OFF Enable
* TX Power Adjustment: Full

Zone.

Access Points > Group > Create New > Advanced Options > Auto Channel Selection



Access Points > Group > Create New > Advanced Options > Background Scan



Zone.

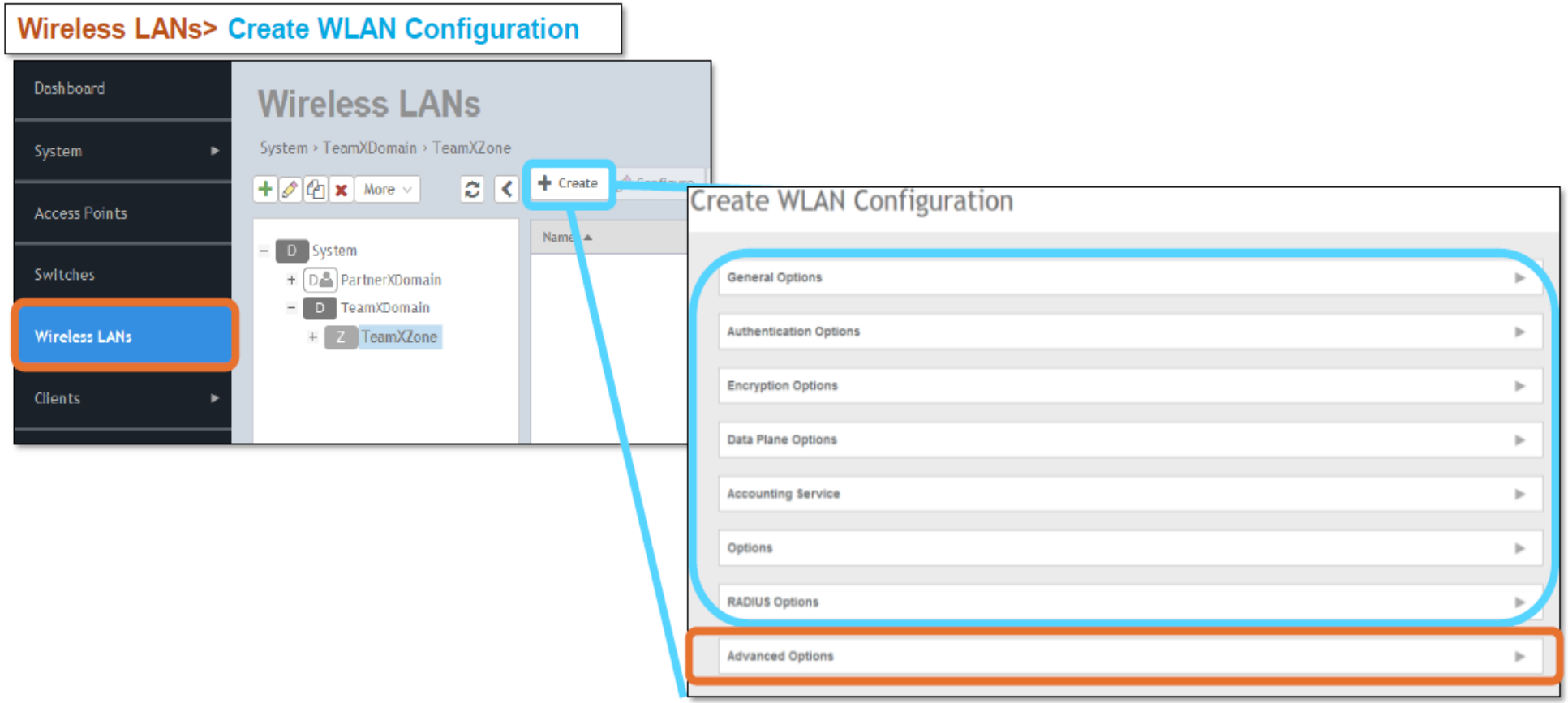
AP Reboot Timeout:

* Reboot AP if it cannot reach default gateway after: 30 minutes

* Reboot AP if it cannot reach the controller after: 2 hours

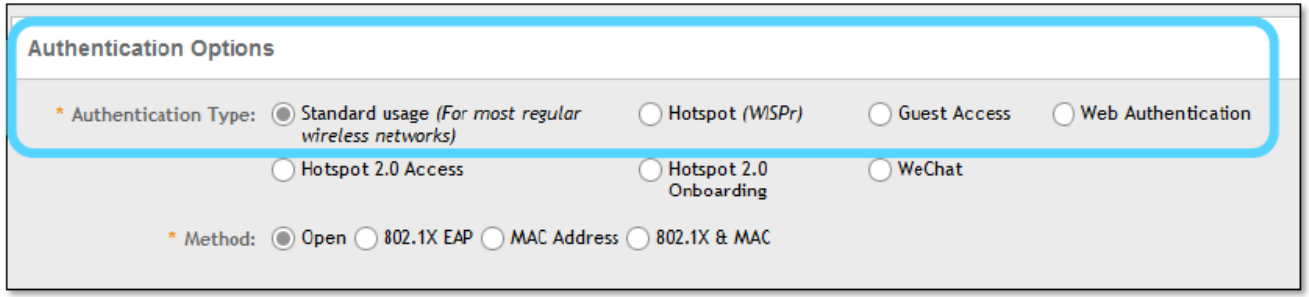
You can disable the reboot by setting the timer to 0 (Never Reboot). The range is from a minimum of 0 (Never Reboot) to a maximum of 24 hours. The timing should be set according to your redundancy strategy and your WLAN settings and requirements

WLAN


Wireless LANs> Create WLAN Configuration
Dashboard
System
Access Points
Switches
Wireless LANs
Clients
Wireless LANs
System › TeamXDomain › TeamXZone
More
Create
System
PartnerXDomain
TeamXDomain
TeamXZone
Create WLAN Configuration
General Options
Authentication Options
Encryption Options
Data Plane Options
Accounting Service
Options
RADIUS Options
Advanced Options

WLAN.

Wireless LANs> Create WLAN Configuration > Authentication Options



- Define the type of authentication flow for the WLAN

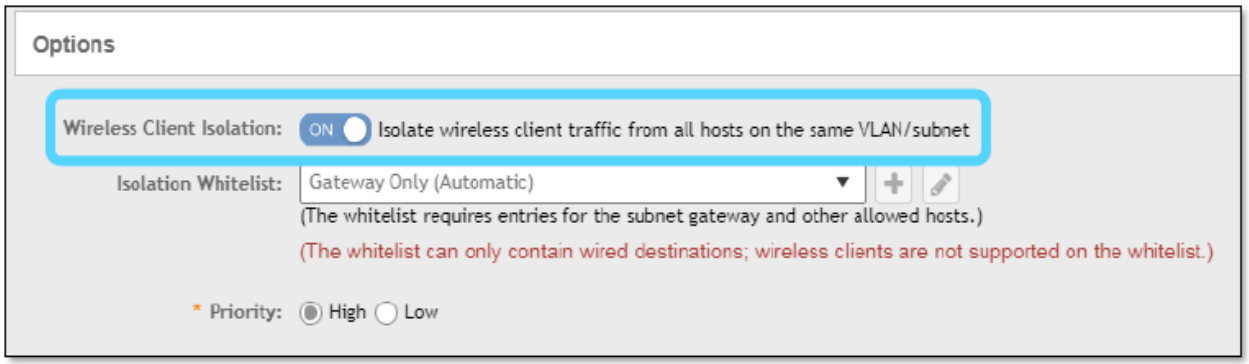
Authentication Type	Use
Standard	Regular WLAN
Hotspot (WISPr)	Hotspot
Guest Access + Hotspot 2.0 Onboarding	Guest access with Guest passes
Web Authentication	Web based logon
Hotspot 2.0 Access	Hotspot 2.0 Operator Profile
Hotspot 2.0 Secure Onboarding *(OSEN)*	Hotspot with Online Sign Up
WeChat	WeChat mobile app users

WLAN.

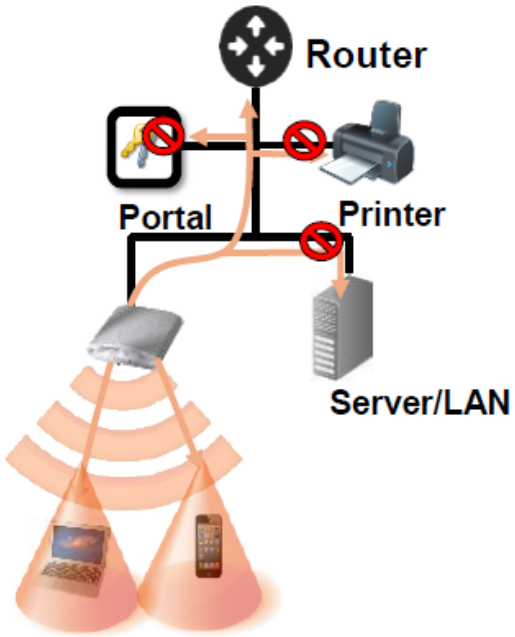

Encryption Options
* Method: WPA2 WPA3 WPA2/WPA3-Mixed OWE WPA-Mixed WEP-64 (40 bits) WEP-128 (104 bits) None
* Algorithm: AES AUTO AES-GCMP-256
Passphrase: OFF Show
802.11r Fast Roaming: OFF
* 802.11w MFP: Disabled Capable Required
* Dynamic PSK: Disable Internal External

WLAN.

Wireless LANs> Create WLAN Configuration > Options

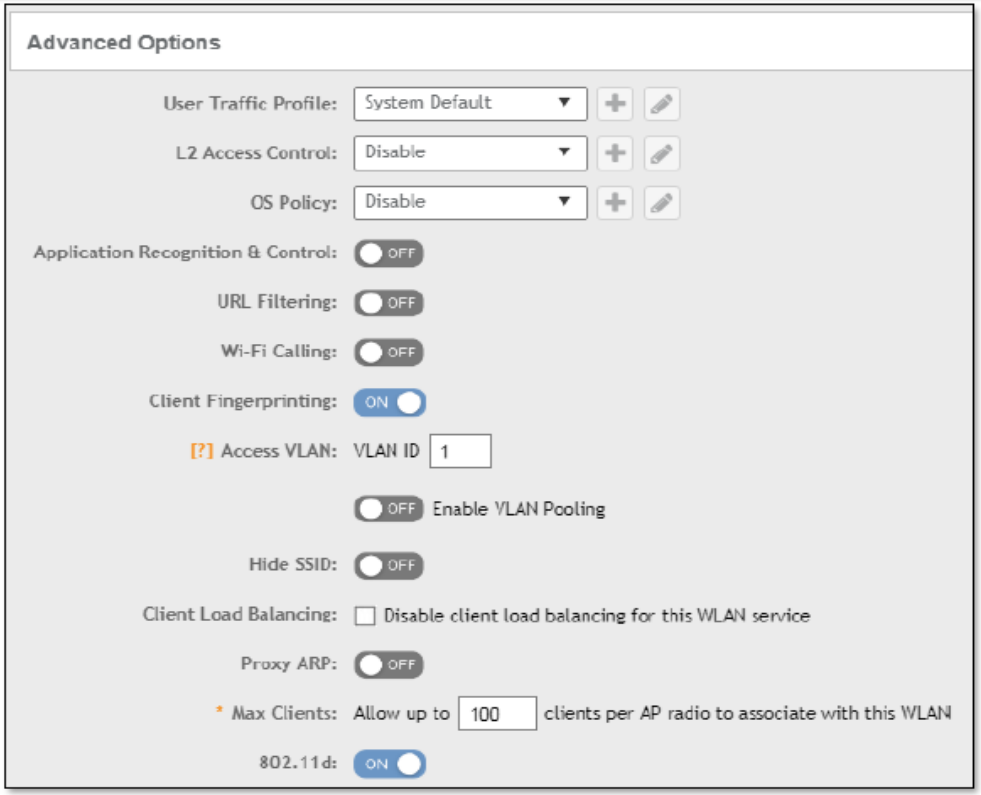


- Disable - devices are able to see all other devices on the subnet (default)
- Enable - devices are blocked from seeing other devices on the network
- Customized by User Traffic Profiles



WLAN.

Wireless LANs> Create WLAN Configuration > Advanced Options



- Fine tune the WLAN including:
  - Device control
  - Load/band balancing
  - Data rates

WLAN.

Wireless LANs> Create WLAN Configuration > Advanced Options

Application Recognition & Control: OFF

- Allows the controller to identify the applications in use on the client devices

WLAN.

Wireless LANs> Create WLAN Configuration > Advanced Options

Client Fingerprinting: ON

- Identifies device OS
- Enabled by default on a per WLAN basis

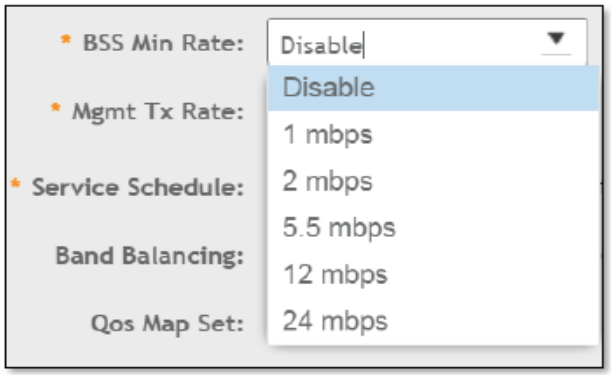
This feature is enabled on a per WLAN basis, and is enabled for all new WLANs by default.

WLAN.

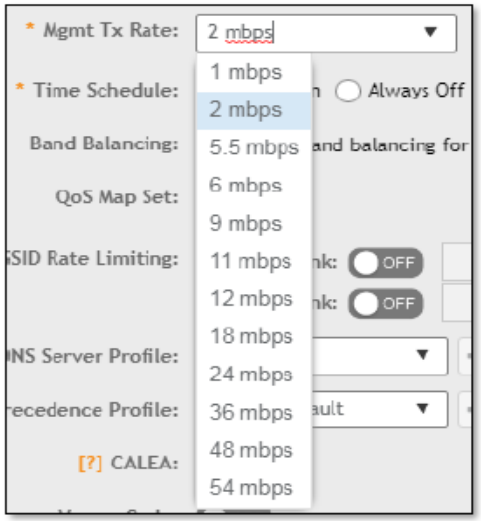
Wireless LANs> Create WLAN Configuration > Advanced Options

- Disables DSSS/HR-DSSS

- Minimum rate for data frames



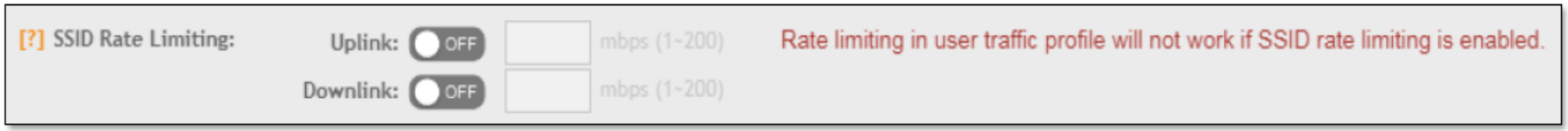
- TX rate for management frames
- Disabled by OFDM Only



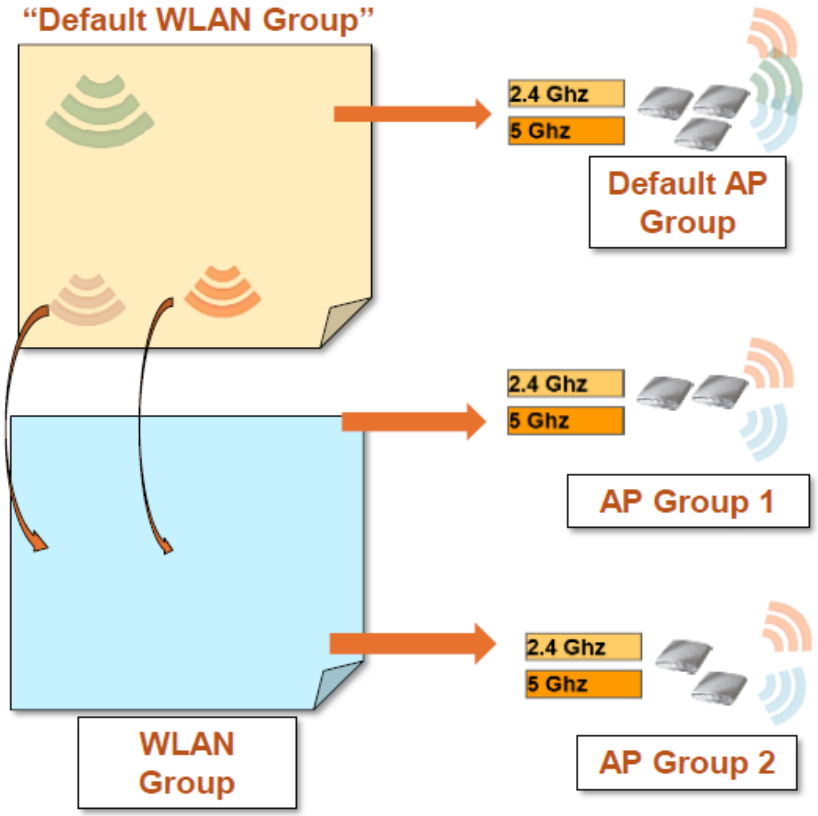
WLAN.

Wireless LANs> Create WLAN Configuration > Advanced Options

- Enforces an aggregate rate limit for all users of the WLAN



Domain - Zone - Group.



- WLAN Groups
  - Create the WLANs
  - Create the WLAN Group
  - Add the WLANs to the Group
  - Associate the WLAN Group with the AP Group

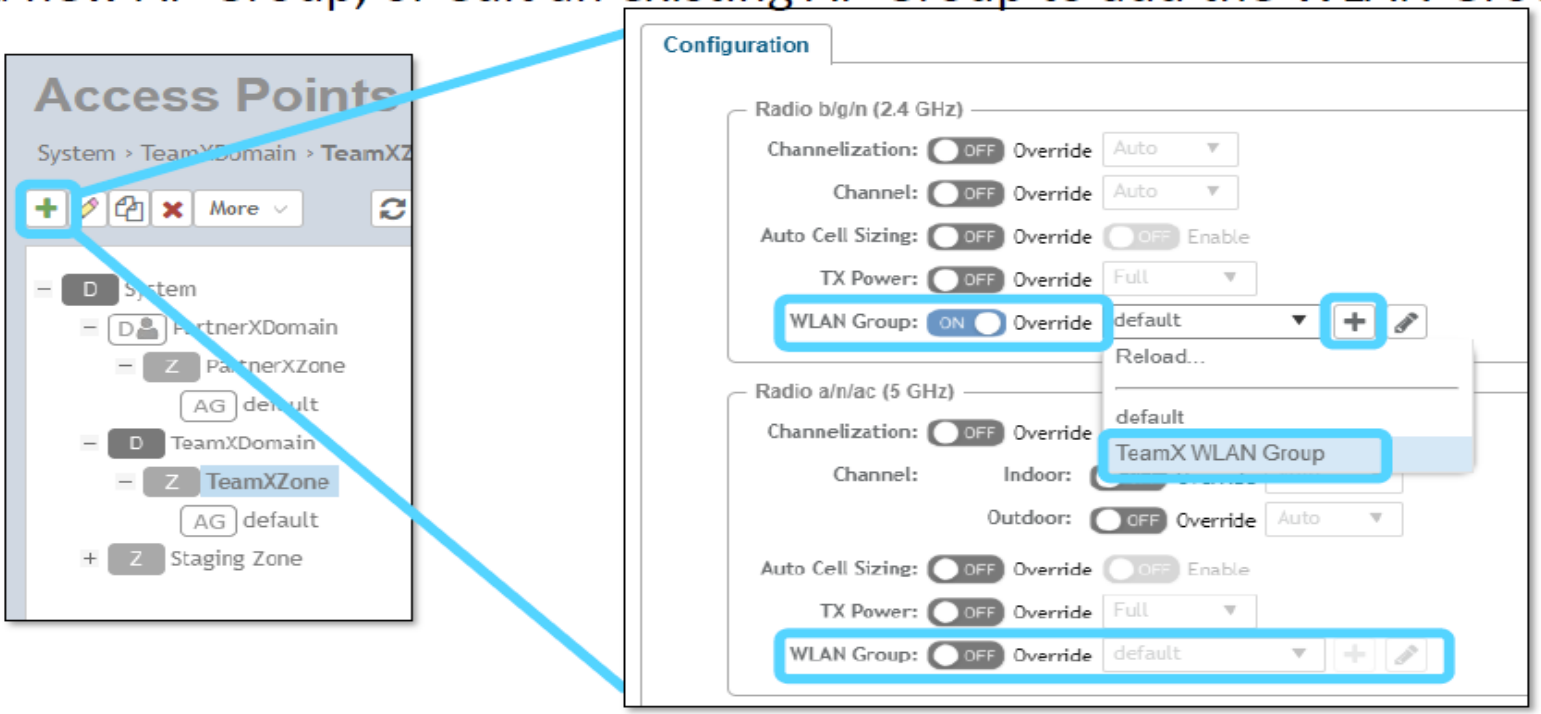
A WLAN Group can include a maximum of 27 member WLANs

For dual radio APs,each radio can be assigned to only one WLAN Group

Domain - Zone - Group.

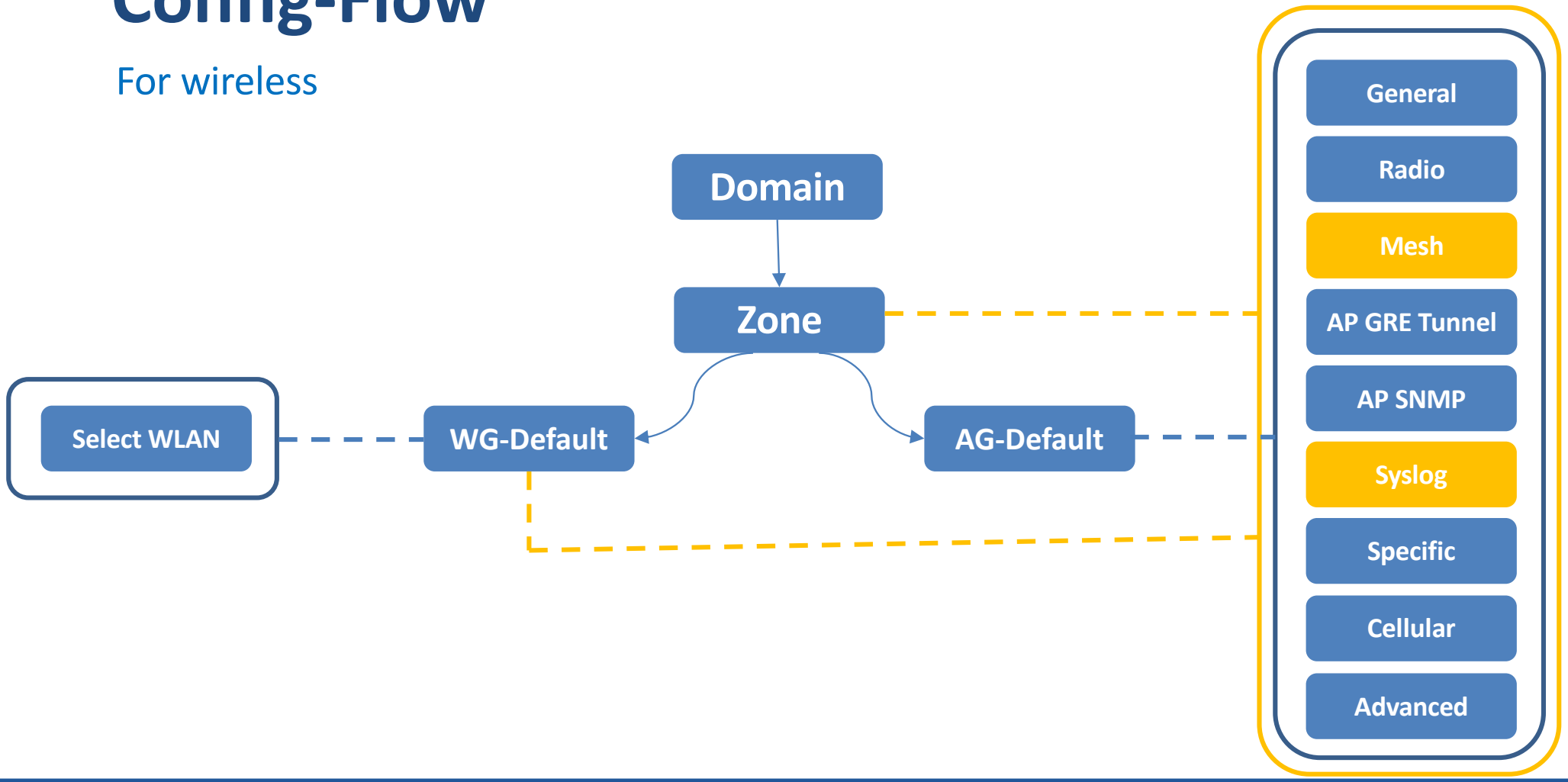
Access Points > Create Group > Configuration > Radio Options

- Create a new AP Group, or edit an existing AP Group to add the WLAN Group



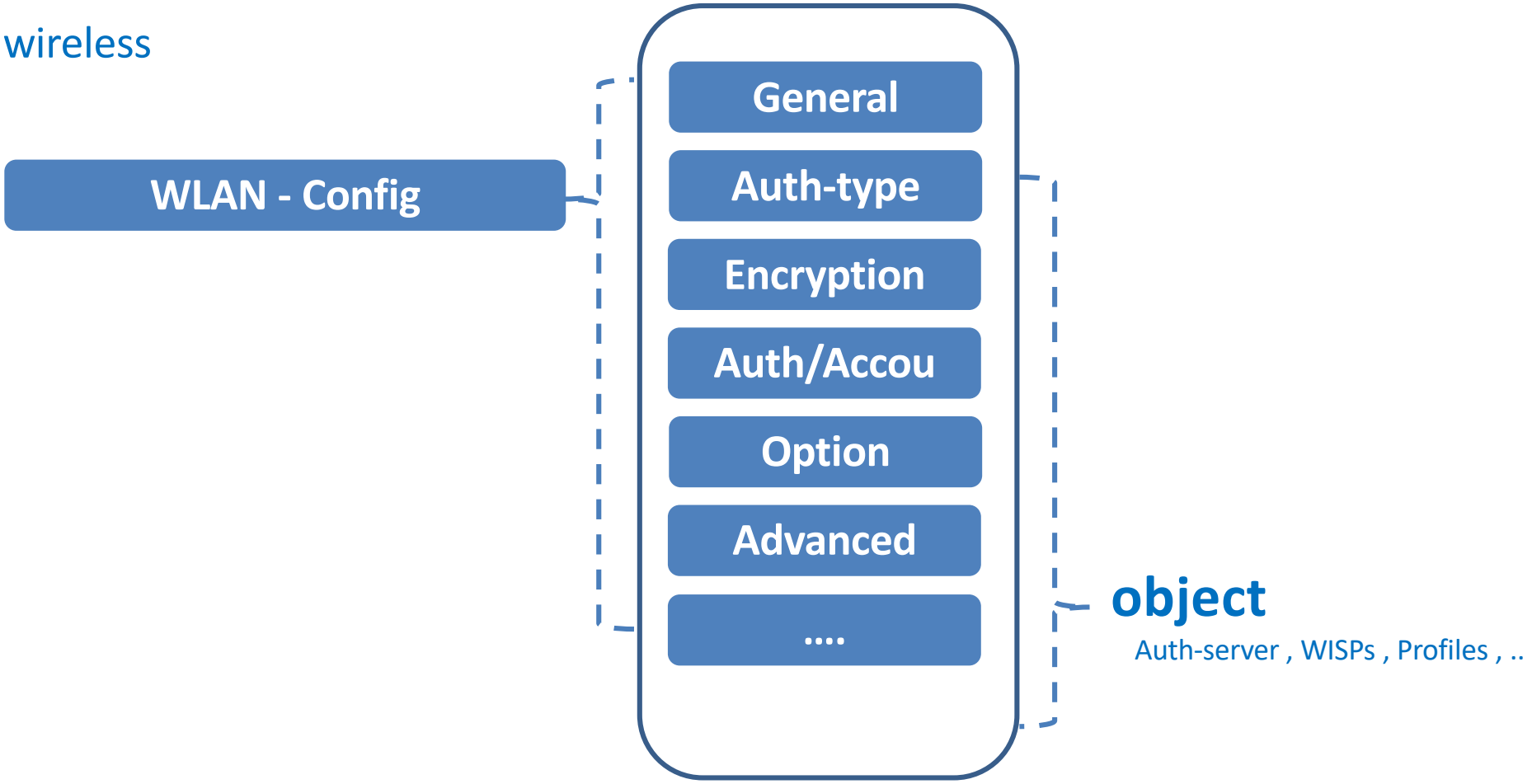
Config-Flow

For wireless



Config-Flow.

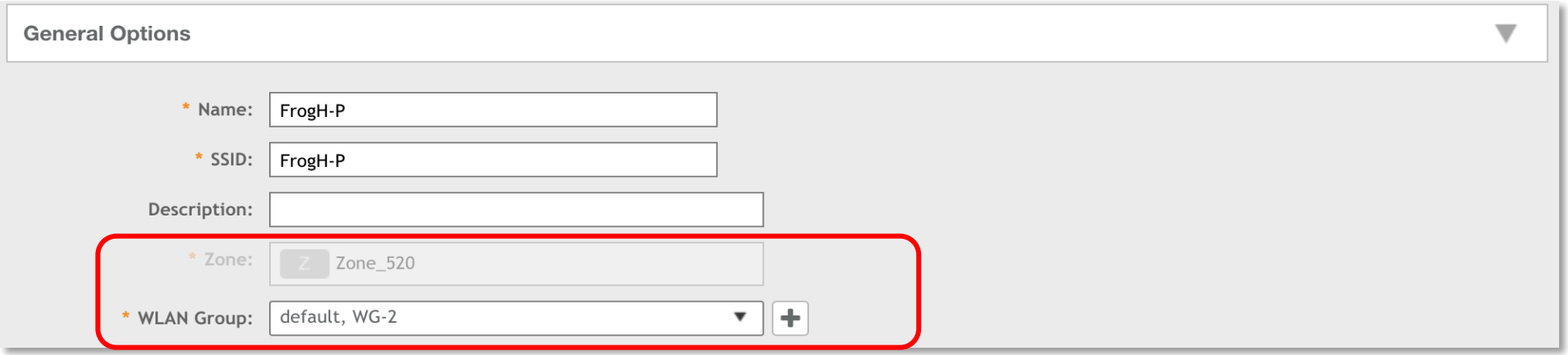
For wireless



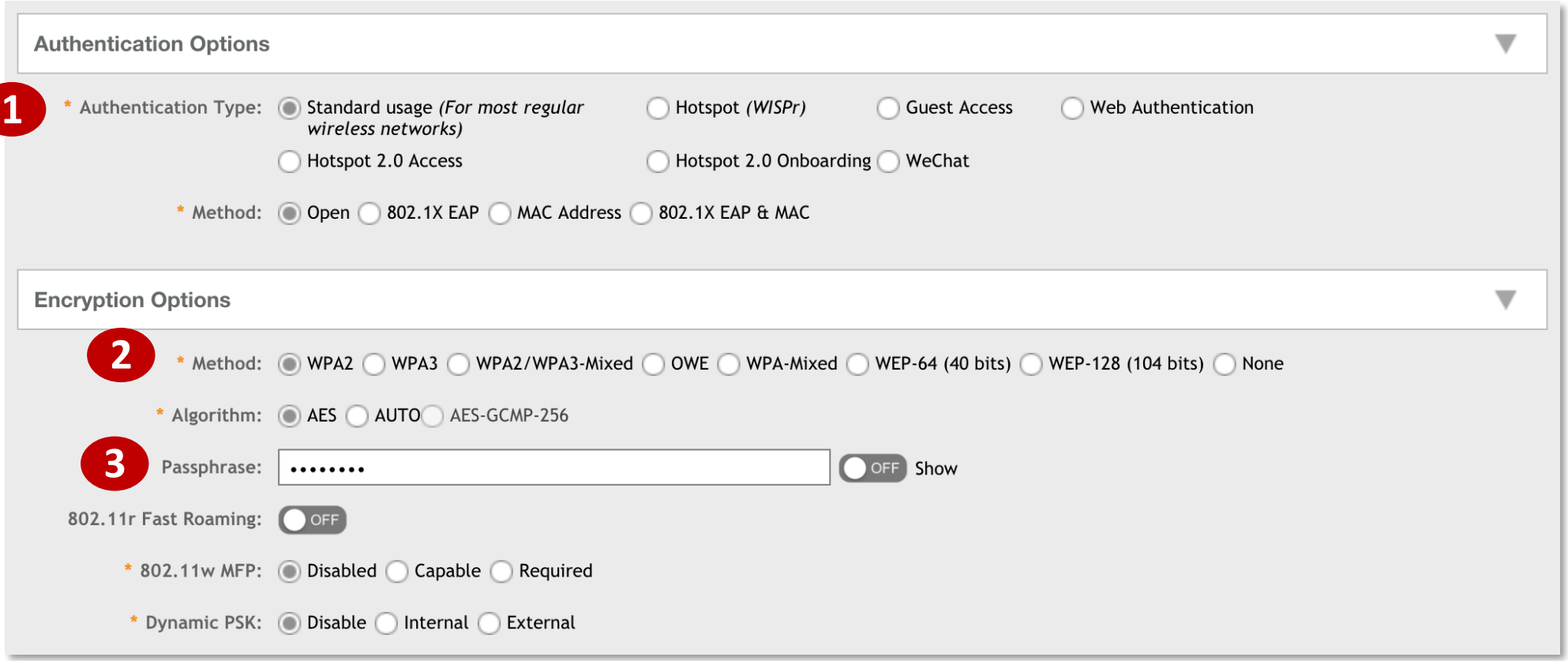
WLAN CONFIG

WLAN-1_PSK

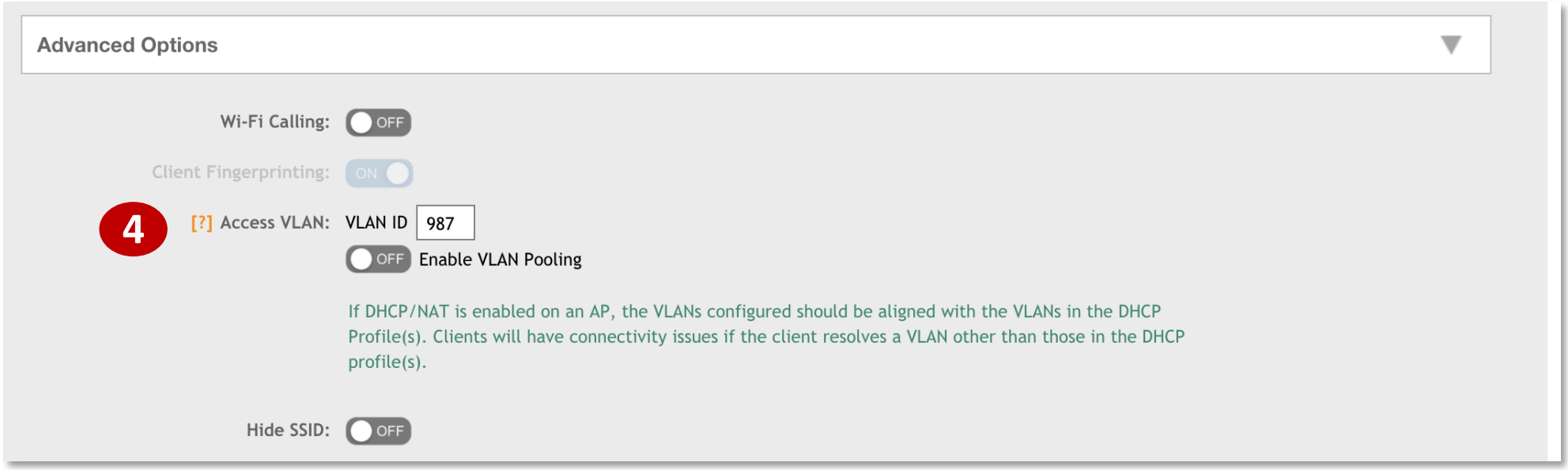
建立 PSK 驗證方式的無線環境



WLAN-1_PSK.

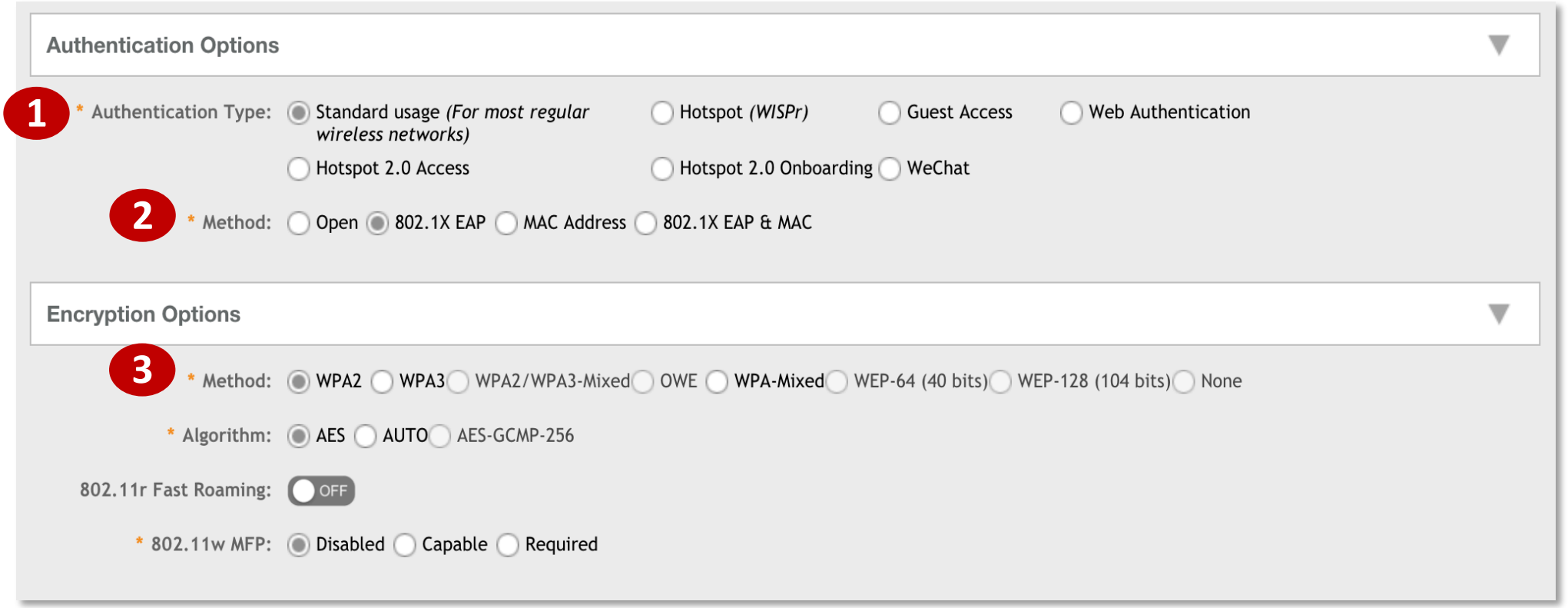

Authentication Options
1
* Authentication Type:
Standard usage (For most regular wireless networks)
Hotspot (WISPr)
Guest Access
Web Authentication
Hotspot 2.0 Access
Hotspot 2.0 Onboarding
WeChat
* Method:
Open
802.1X EAP
MAC Address
802.1X EAP & MAC
Encryption Options
2
* Method:
WPA2
WPA3
WPA2/WPA3-Mixed
OWE
WPA-Mixed
WEP-64 (40 bits)
WEP-128 (104 bits)
None
* Algorithm:
AES
AUTO
AES-GCMP-256
3
Passphrase:
••••••••
OFF
Show
802.11r Fast Roaming:
OFF
* 802.11w MFP:
Disabled
Capable
Required
* Dynamic PSK:
Disable
Internal
External

WLAN-1_PSK.

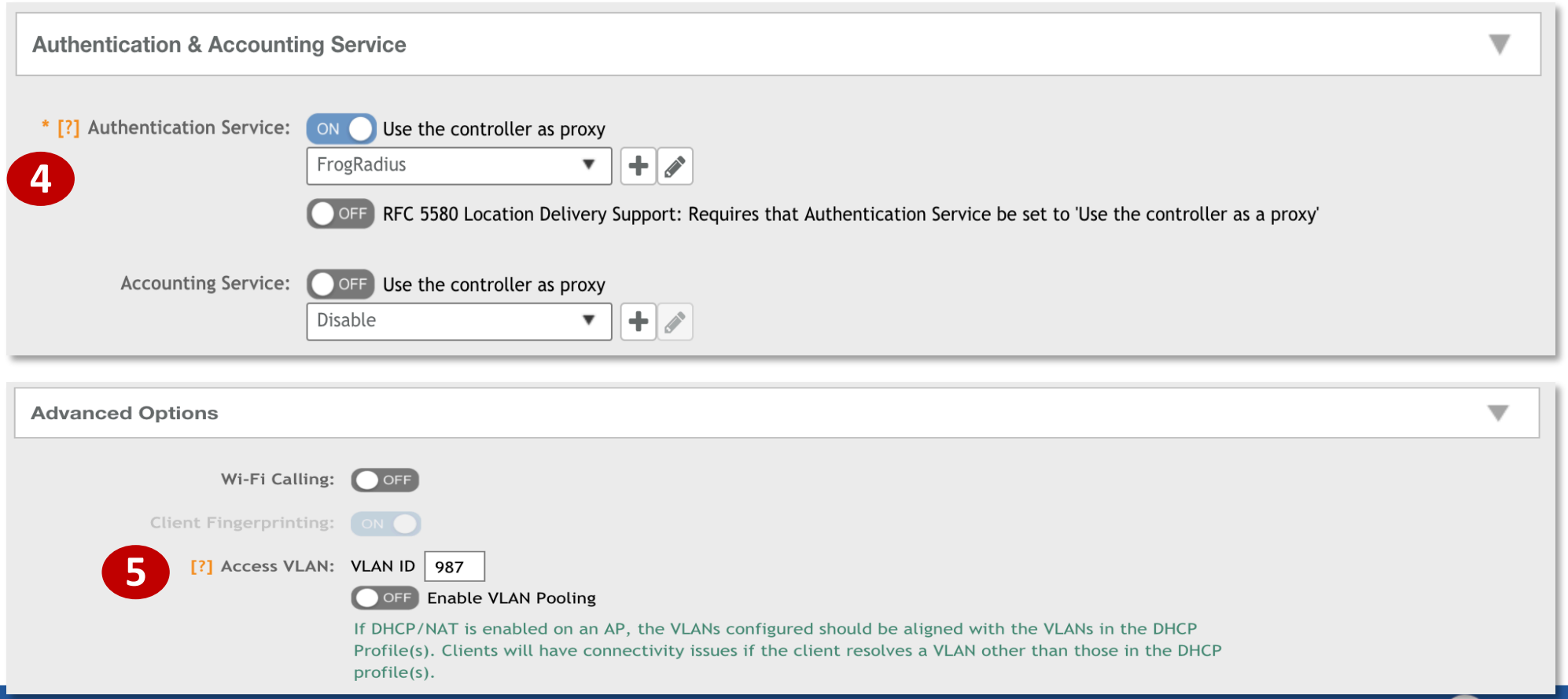

Advanced Options
Wi-Fi Calling:
OFF
Client Fingerprinting:
ON
4
[?] Access VLAN:
VLAN ID
987
OFF
Enable VLAN Pooling
If DHCP/NAT is enabled on an AP, the VLANs configured should be aligned with the VLANs in the DHCP Profile(s). Clients will have connectivity issues if the client resolves a VLAN other than those in the DHCP profile(s).
Hide SSID:
OFF

WLAN-2_802.1x

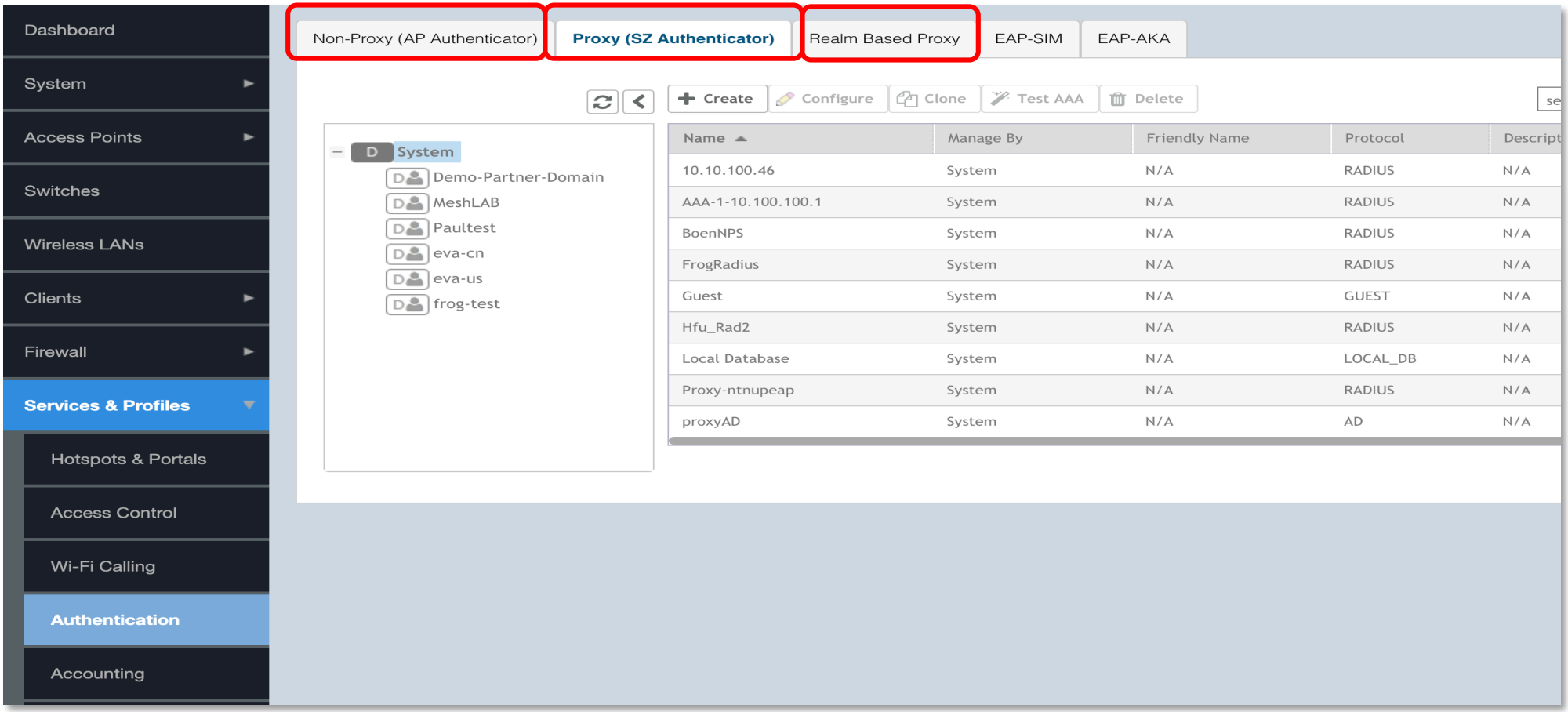
建立 802.1x 驗證方式的無線環境



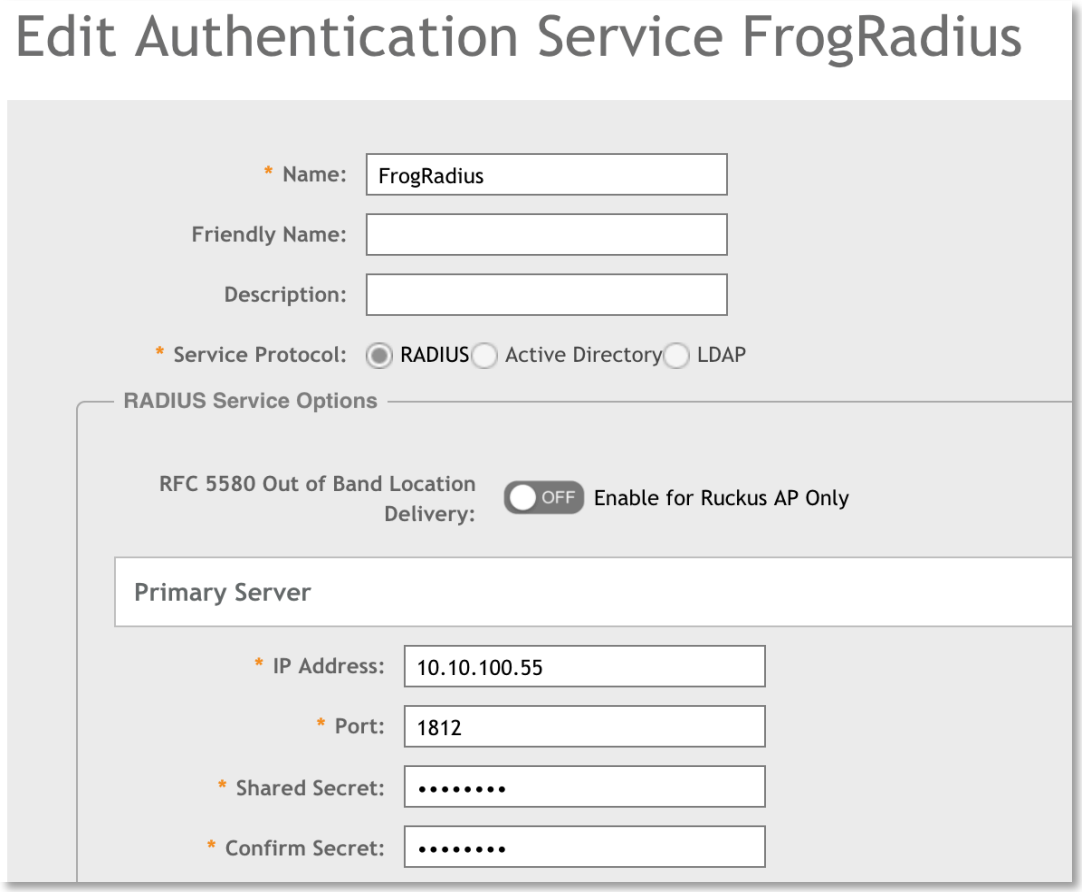
WLAN-2_802.1x.


Authentication & Accounting Service
* [?] Authentication Service:
ON
Use the controller as proxy
FrogRadius
4
OFF
RFC 5580 Location Delivery Support: Requires that Authentication Service be set to 'Use the controller as a proxy'
Accounting Service:
OFF
Use the controller as proxy
Disable
Advanced Options
Wi-Fi Calling:
OFF
Client Fingerprinting:
ON
5
[?] Access VLAN:
VLAN ID
987
OFF
Enable VLAN Pooling
If DHCP/NAT is enabled on an AP, the VLANs configured should be aligned with the VLANs in the DHCP Profile(s). Clients will have connectivity issues if the client resolves a VLAN other than those in the DHCP profile(s).

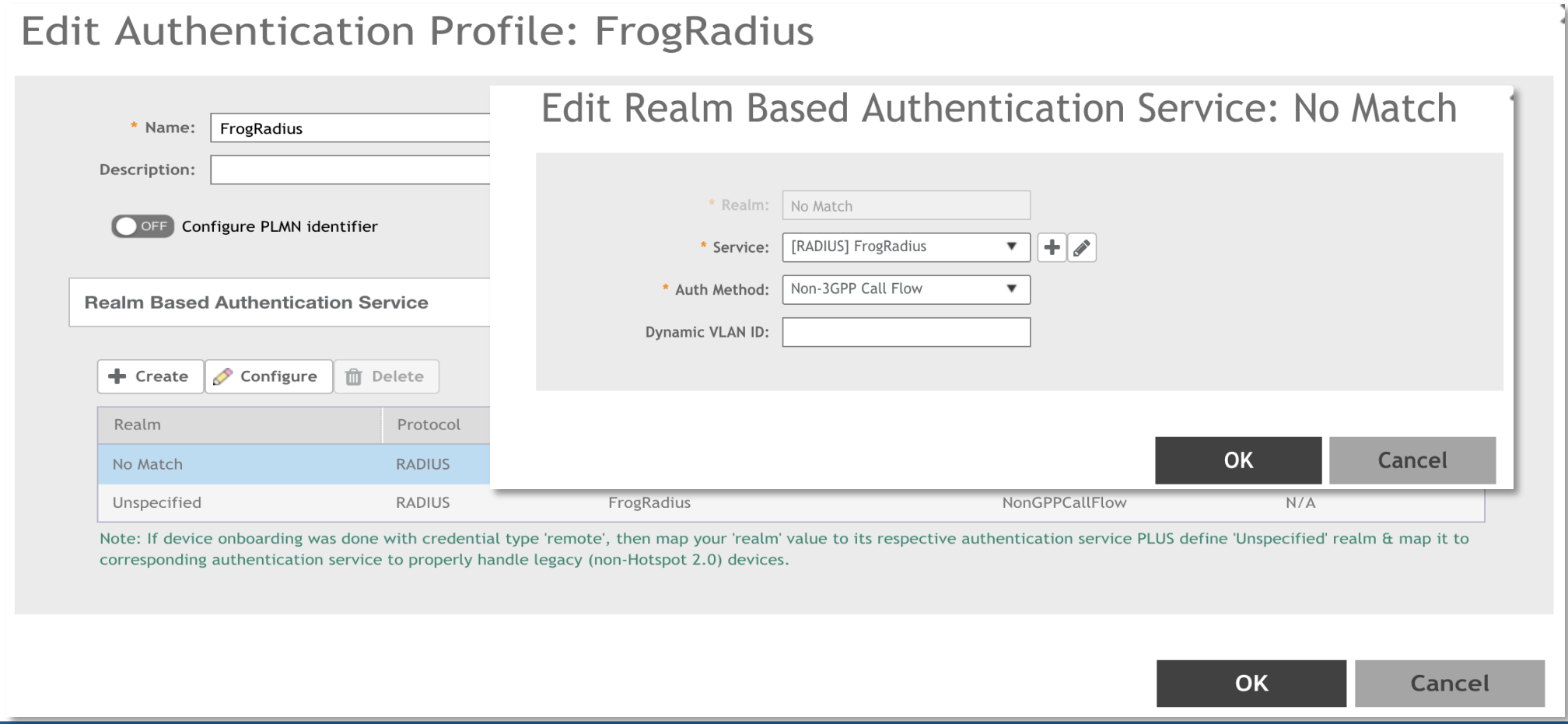
WLAN-2_802.1x.


Dashboard
System
Access Points
Switches
Wireless LANs
Clients
Firewall
Services & Profiles
Hotspots & Portals
Access Control
Wi-Fi Calling
Authentication
Accounting
Non-Proxy (AP Authenticator)
Proxy (SZ Authenticator)
Realm Based Proxy
EAP-SIM
EAP-AKA
Create
Configure
Clone
Test AAA
Delete
System
Demo-Partner-Domain
MeshLAB
Paultest
eva-cn
eva-us
frog-test
Name
Manage By
Friendly Name
Protocol
10.10.100.46 System N/A RADIUS N/A
AAA-1-10.100.100.1 System N/A RADIUS N/A
BoenNPS System N/A RADIUS N/A
FrogRadius System N/A RADIUS N/A
Guest System N/A GUEST N/A
Hfu_Rad2 System N/A RADIUS N/A
Local Database System N/A LOCAL_DB N/A
Proxy-ntnupeap System N/A RADIUS N/A
proxyAD System N/A AD N/A

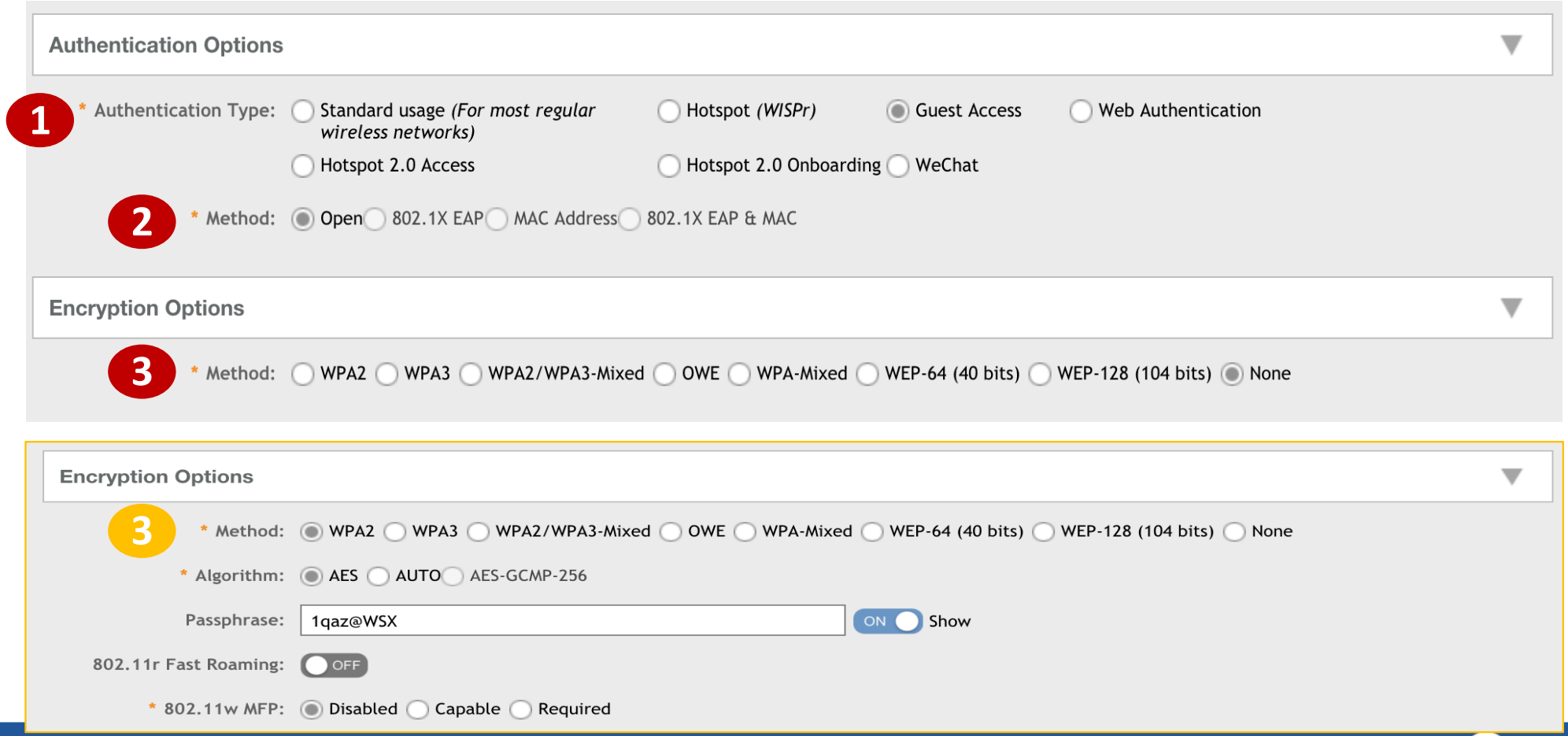
WLAN-2_802.1x.


Edit Authentication Service FrogRadius
* Name:
FrogRadius
Friendly Name:
Description:
* Service Protocol:
RADIUS
Active Directory
LDAP
RADIUS Service Options
RFC 5580 Out of Band Location Delivery:
OFF
Enable for Ruckus AP Only
Primary Server
* IP Address:
10.10.100.55
* Port:
1812
* Shared Secret:
* Confirm Secret:

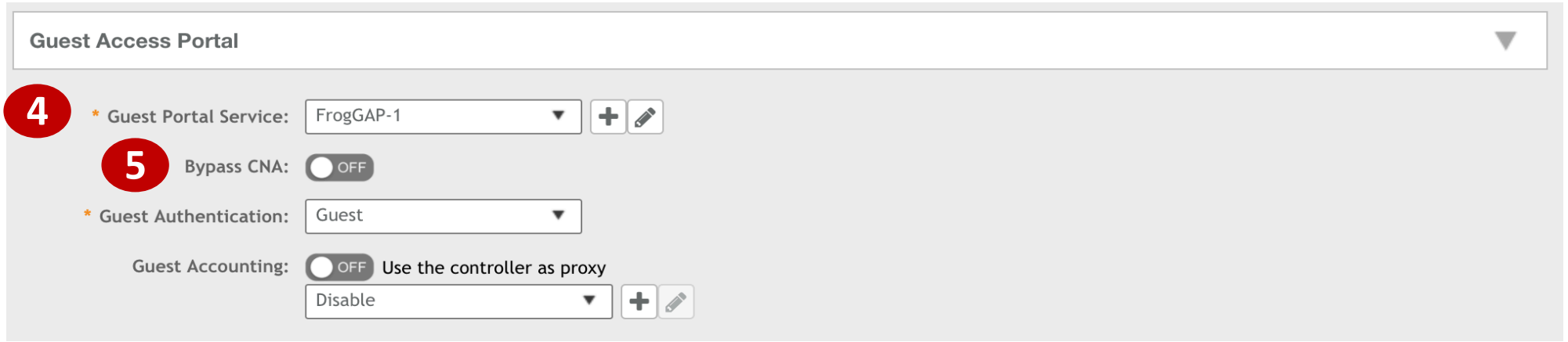
WLAN-2_802.1x.


Edit Authentication Profile: FrogRadius
* Name: FrogRadius
Description:
OFF Configure PLMN identifier
Realm Based Authentication Service
Create
Configure
Delete
Realm
Protocol
No Match
RADIUS
Unspecified
RADIUS
FrogRadius
NonGPPCallFlow
N/A
Note: If device onboarding was done with credential type 'remote', then map your 'realm' value to its respective authentication service PLUS define 'Unspecified' realm & map it to corresponding authentication service to properly handle legacy (non-Hotspot 2.0) devices.
OK
Cancel
Edit Realm Based Authentication Service: No Match
* Realm: No Match
* Service: [RADIUS] FrogRadius
* Auth Method: Non-3GPP Call Flow
Dynamic VLAN ID:
OK
Cancel

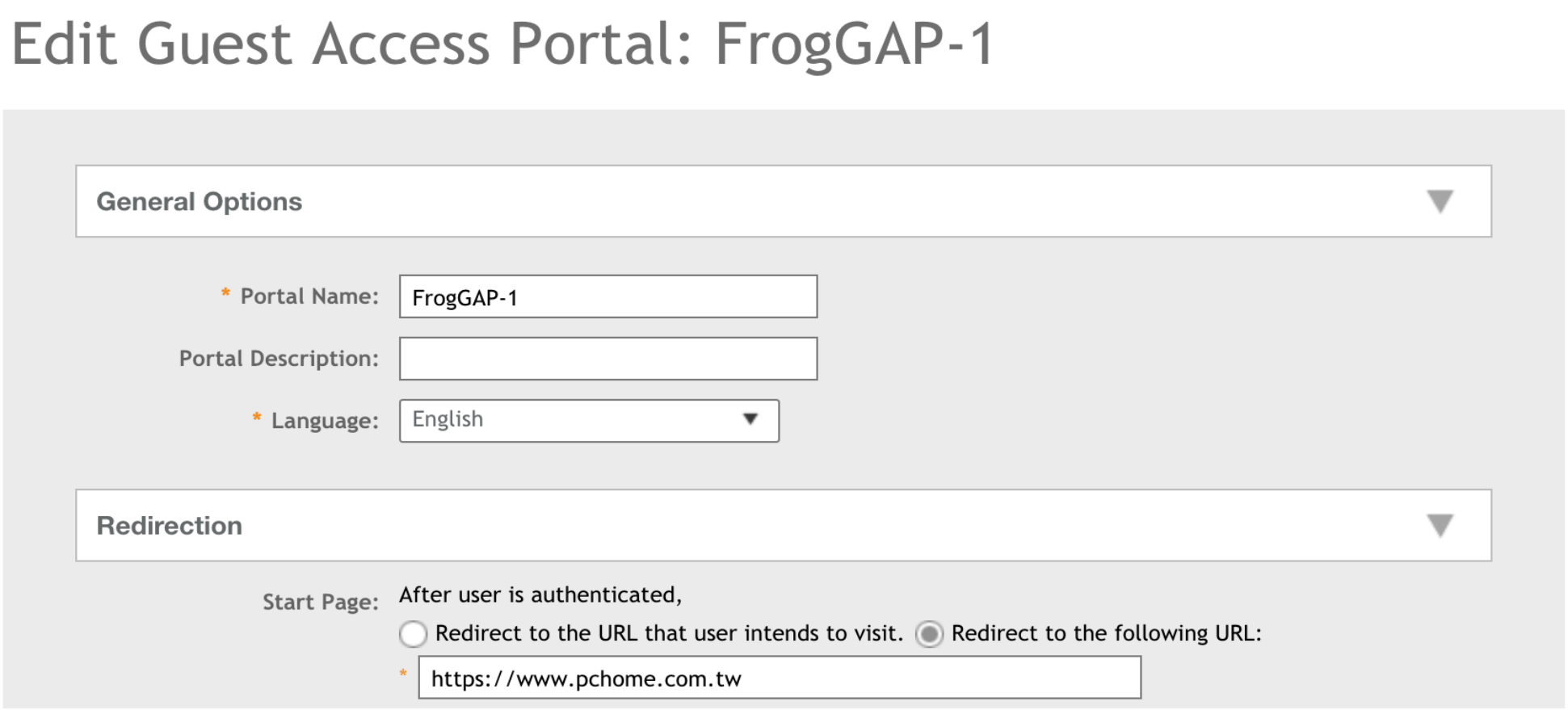
WLAN-3_Guest


Authentication Options
1
* Authentication Type:
Standard usage (For most regular wireless networks)
Hotspot (WISPr)
Guest Access
Web Authentication
Hotspot 2.0 Access
Hotspot 2.0 Onboarding
WeChat
2
* Method:
Open
802.1X EAP
MAC Address
802.1X EAP & MAC
Encryption Options
3
* Method:
WPA2
WPA3
WPA2/WPA3-Mixed
OWE
WPA-Mixed
WEP-64 (40 bits)
WEP-128 (104 bits)
None
Encryption Options
3
* Method:
WPA2
WPA3
WPA2/WPA3-Mixed
OWE
WPA-Mixed
WEP-64 (40 bits)
WEP-128 (104 bits)
None
* Algorithm:
AES
AUTO
AES-GCMP-256
Passphrase:
1qaz@WSX
ON
Show
802.11r Fast Roaming:
OFF
* 802.11w MFP:
Disabled
Capable
Required

WLAN-3_Guest.

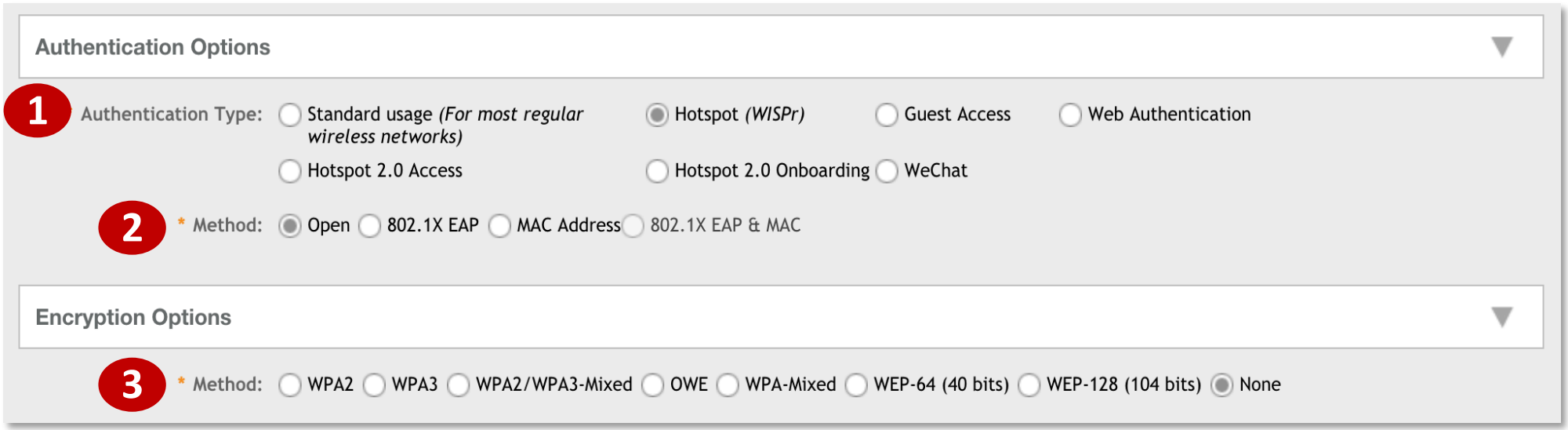

Guest Access Portal
4
* Guest Portal Service:
FrogGAP-1
5
Bypass CNA:
OFF
* Guest Authentication:
Guest
Guest Accounting:
OFF
Use the controller as proxy
Disable

WLAN-3_Guest.

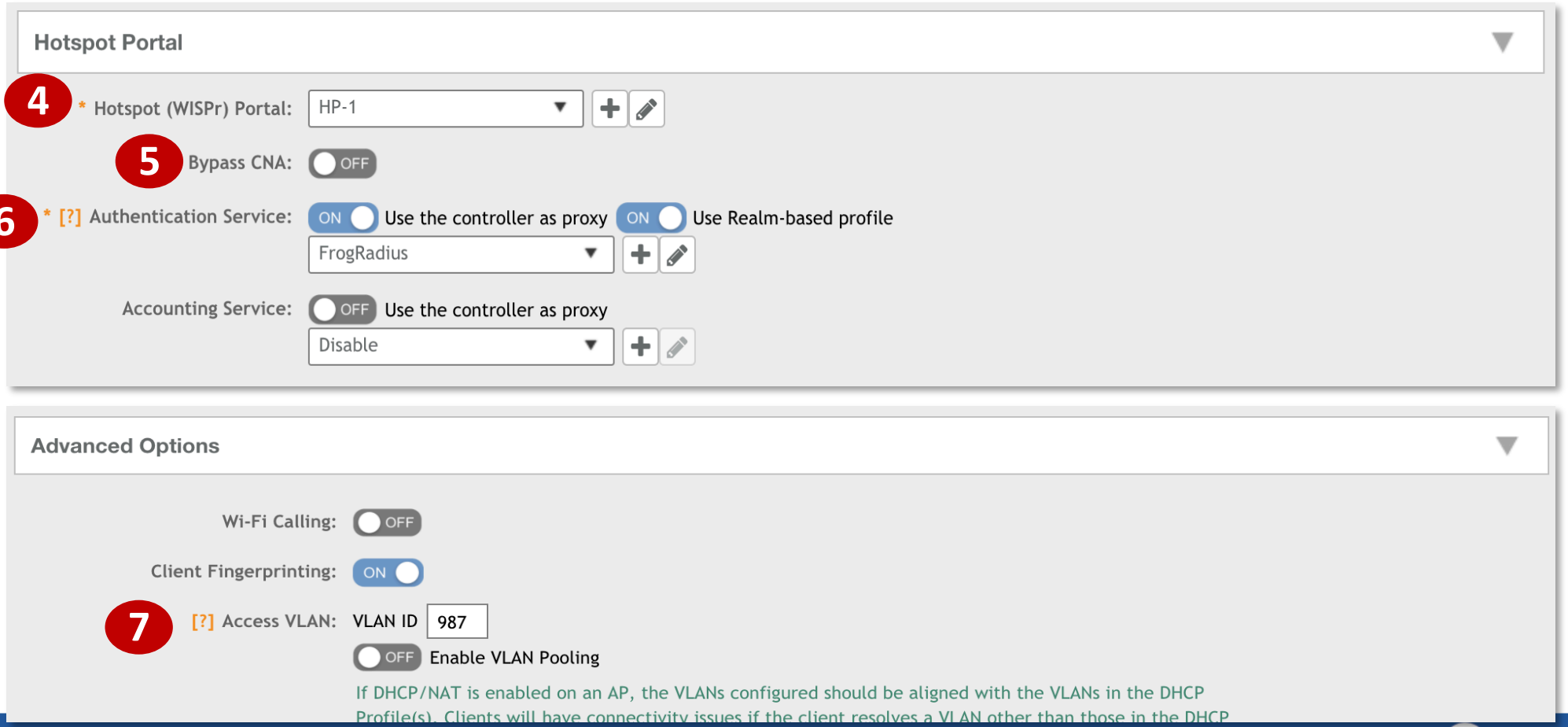

Edit Guest Access Portal: FrogGAP-1
General Options
* Portal Name:
FrogGAP-1
Portal Description:
* Language:
English
Redirection
Start Page:
After user is authenticated,
Redirect to the URL that user intends to visit.
Redirect to the following URL:
*
https://www.pchome.com.tw

WLAN-4_web

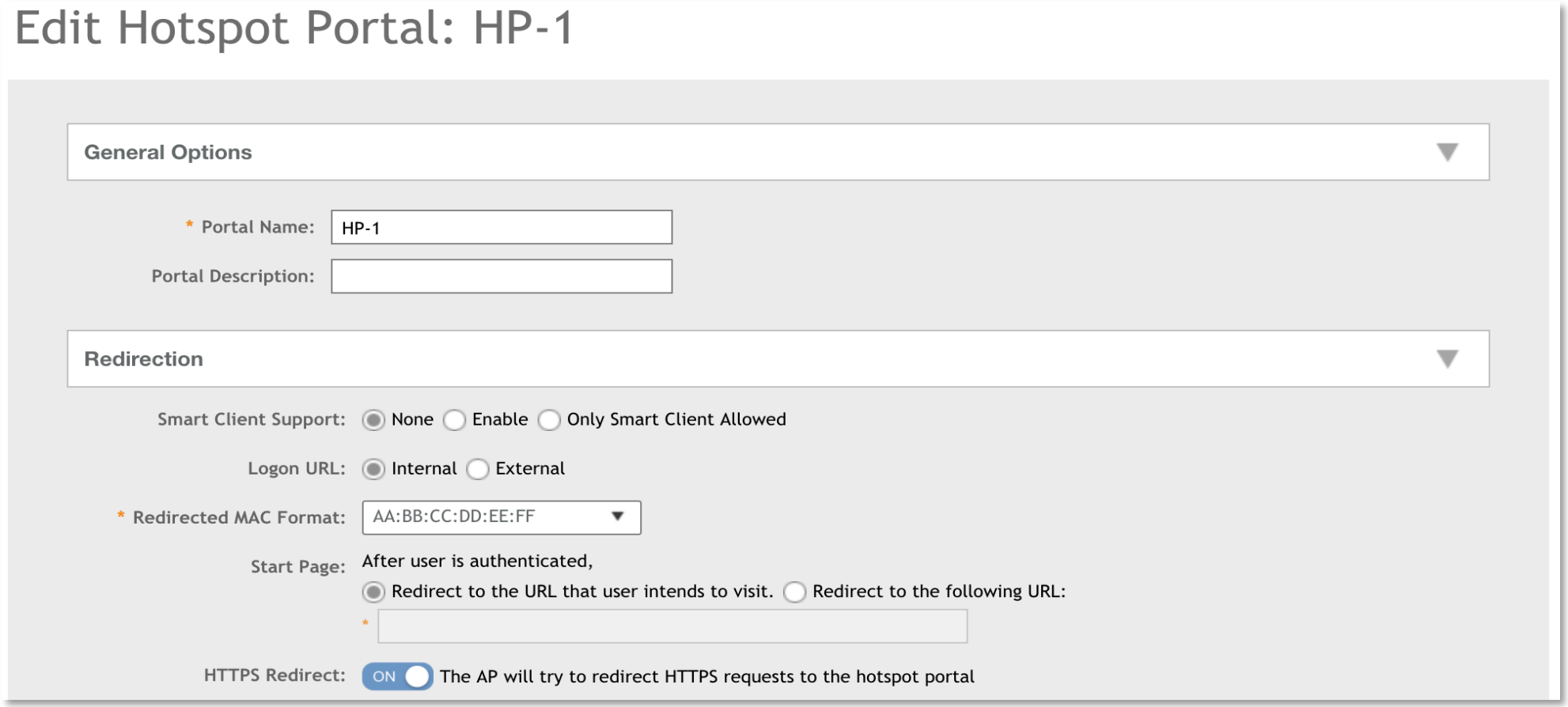
建立 web 802.1x 驗證方式的無線環境



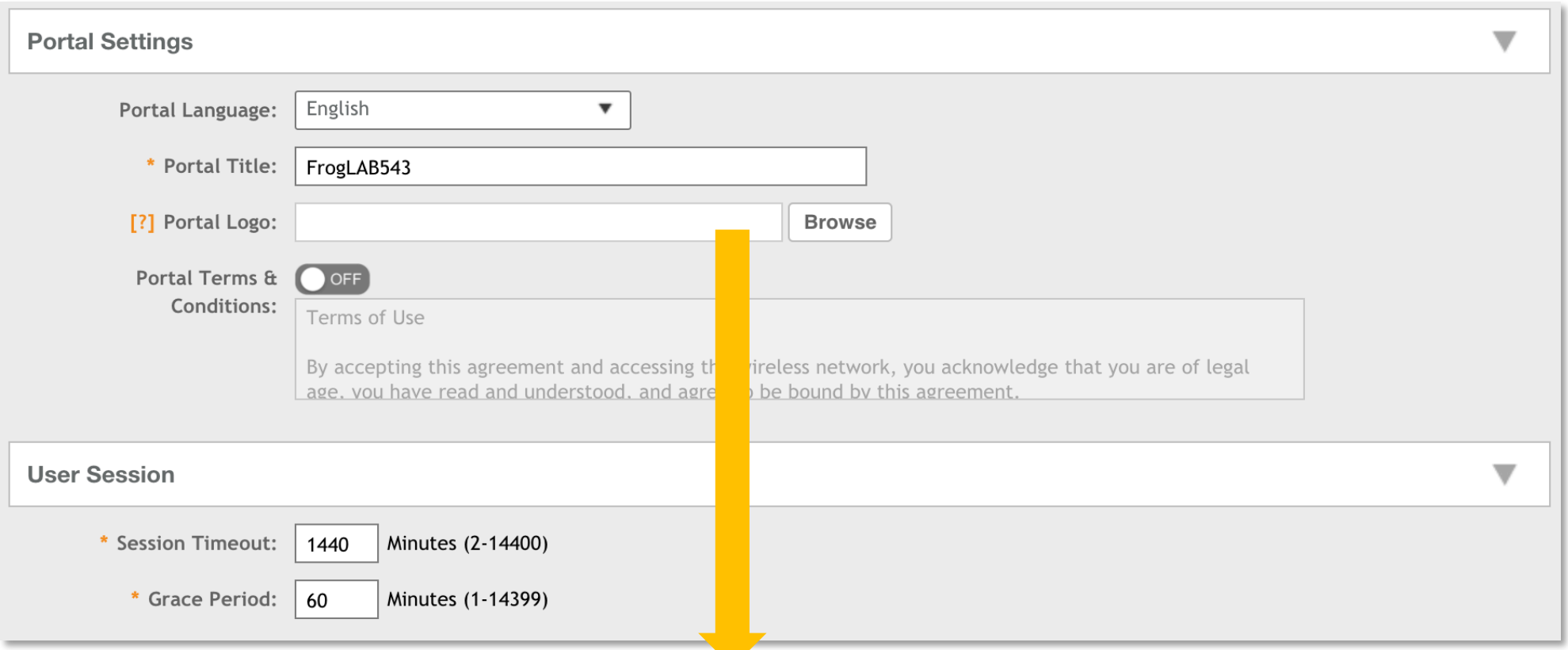
WLAN-4_web.


Hotspot Portal
4
* Hotspot (WISPr) Portal:
HP-1
5
Bypass CNA:
OFF
6
* [?] Authentication Service:
ON
Use the controller as proxy
ON
Use Realm-based profile
FrogRadius
Accounting Service:
OFF
Use the controller as proxy
Disable
Advanced Options
Wi-Fi Calling:
OFF
Client Fingerprinting:
ON
7
[?] Access VLAN:
VLAN ID
987
OFF
Enable VLAN Pooling
If DHCP/NAT is enabled on an AP, the VLANs configured should be aligned with the VLANs in the DHCP
Profile(s). Clients will have connectivity issues if the client resolves a VLAN other than those in the DHCP

WLAN-4_web.


Edit Hotspot Portal: HP-1
General Options
* Portal Name:
HP-1
Portal Description:
Redirection
Smart Client Support:
None
Enable
Only Smart Client Allowed
Logon URL:
Internal
External
* Redirected MAC Format:
AA:BB:CC:DD:EE:FF
Start Page:
After user is authenticated,
Redirect to the URL that user intends to visit.
Redirect to the following URL:
*
HTTPS Redirect:
ON
The AP will try to redirect HTTPS requests to the hotspot portal

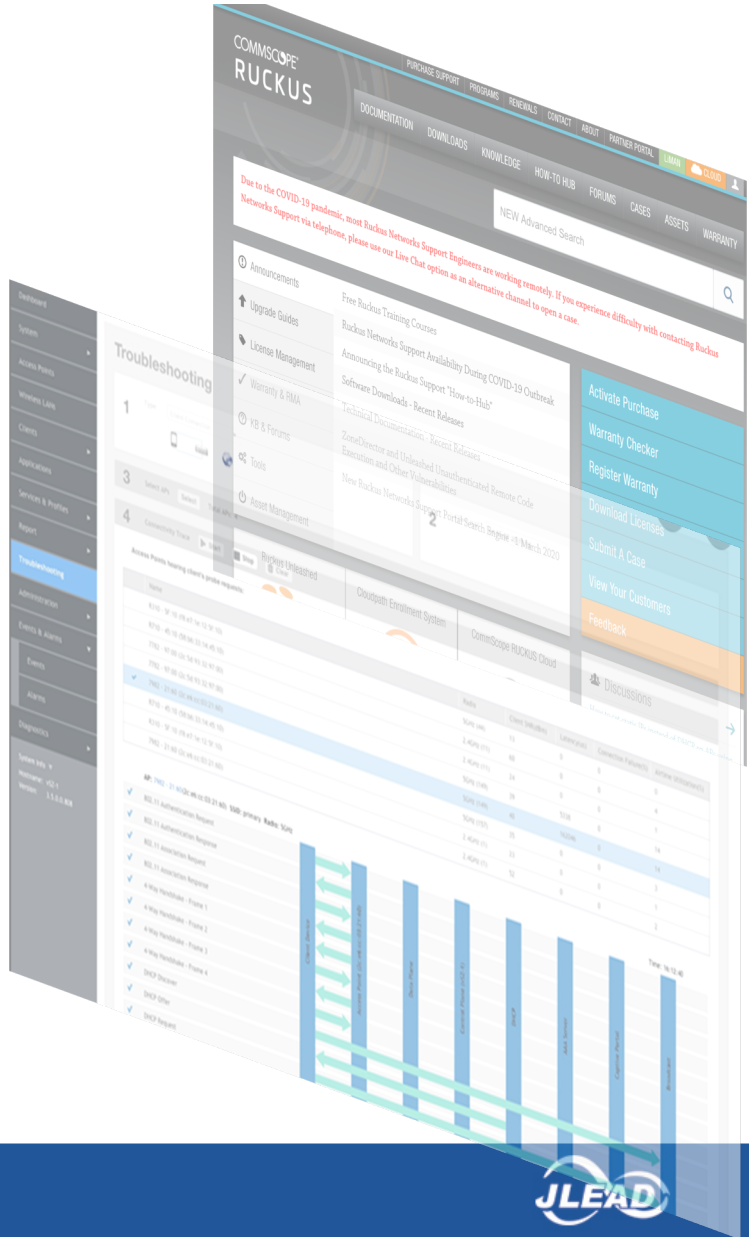
WLAN-4_web.



Use of .PNG file format is highly recommended for the logo. The maximum file size is 250 KB, and logo's width * height must not exceed 526 * 200 pixels.

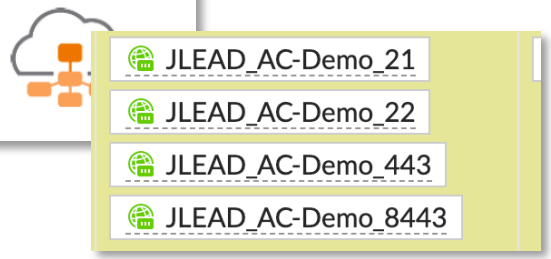
Others

- **L2/L3 filter >>> Firewall profile**
- **Service & Profile**
  - Authentication
  - Hotspots&Portals
- **Management**
  - Cluster
  - Troubleshooting
  - Event & Alarm
- **License & Service**
  - Smart License , LiMAN



Other.

Source	Port	Destination	Plane	Purpose
Controller	21 TCP	**FTP**	**Control**	FTP upload of reports, stats and config backups
AP	22 TCP	**Controller**	**Control**	SSH Tunnel
AP	91,11443 TCP	**Controller**	**Control**	Access Point firmware upgrade
AP	443 TCP	**Controller**	**Control**	Registration Request
SWIPE App	7443 TCP	**Controller**	**Management**	SWIPE App communication
Any	8443 TCP	**Controller**	**Management**	Access to web interface via HTTPS
AP	23232 TCP	**Controller**	**Data**	GRE Tunnel
AP	23233 TCP	**Controller**	**Data**	GRE Tunnel (GRE over UDP)
AP	12222,12223 UDP	**Controller**	**Control**	LWAPP Discovery
Controller/AP	1812,1813	**AAA**	**Management**	AAA Authentication and Accounting




Thank
You!