在Catalyst 9800 WLC上使用Cisco 8821為語音配置WLAN

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簡介

本檔案介紹如何在中央交換和FlexConnect本地交換上使用Cisco 8821聽筒為語音部署設定9800無線LAN控制器(WLC)。

必要條件

需求

思科建議您瞭解以下主題：

- Catalyst無線9800組態型號
- FlexConnect
- 802.11r
- 通話認可控制(CAC)

採用元件

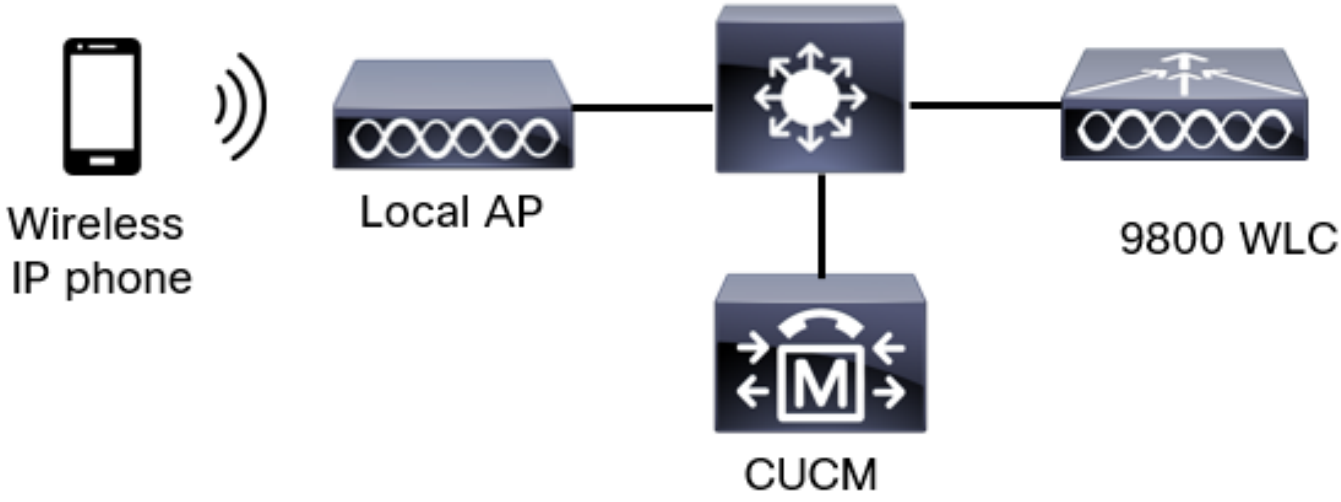
本檔案中的資訊是根據9800L v17.6.1

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

配置SSID

選項 A：中央交換

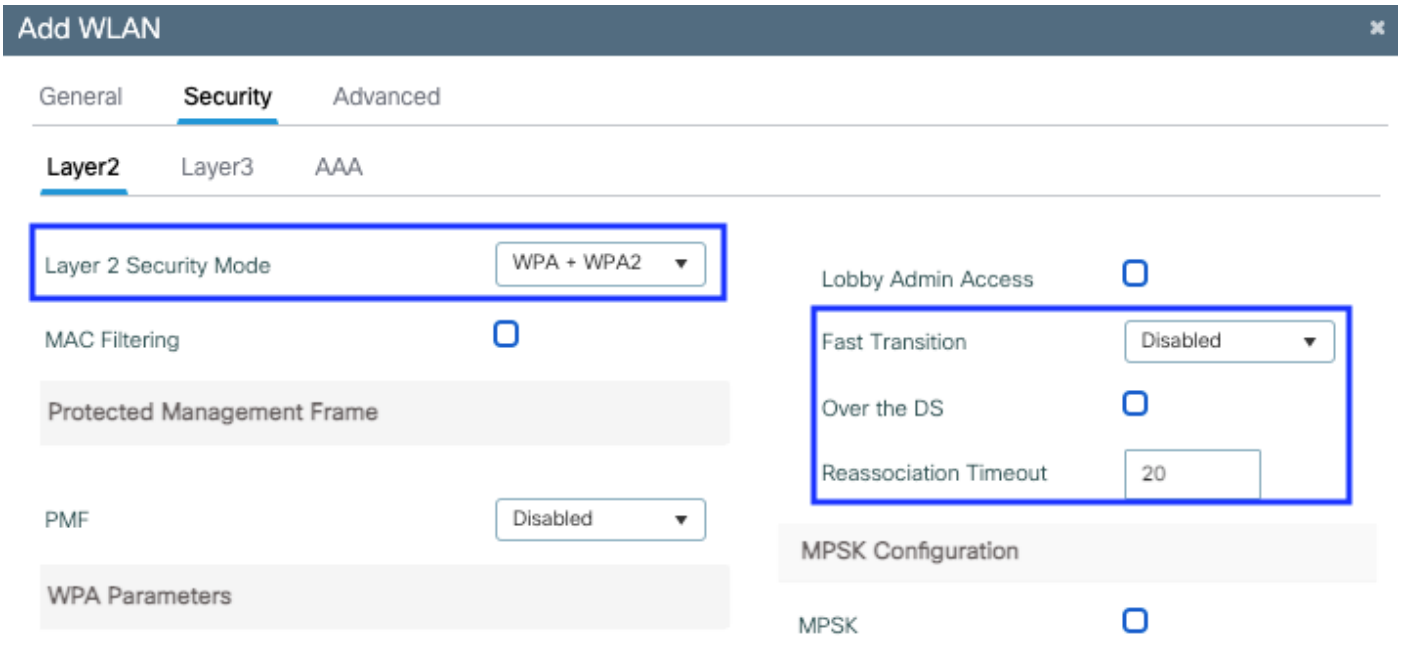
中央交換網路圖

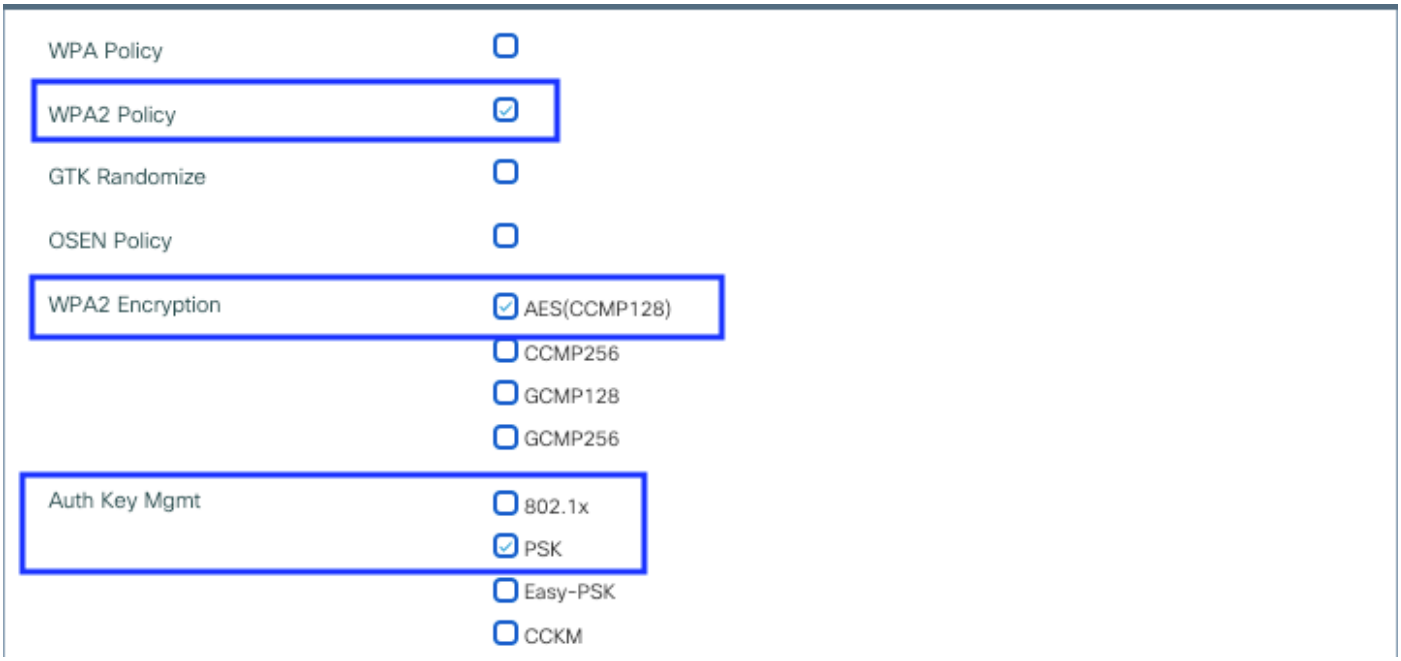


中央交換：標籤和配置檔案

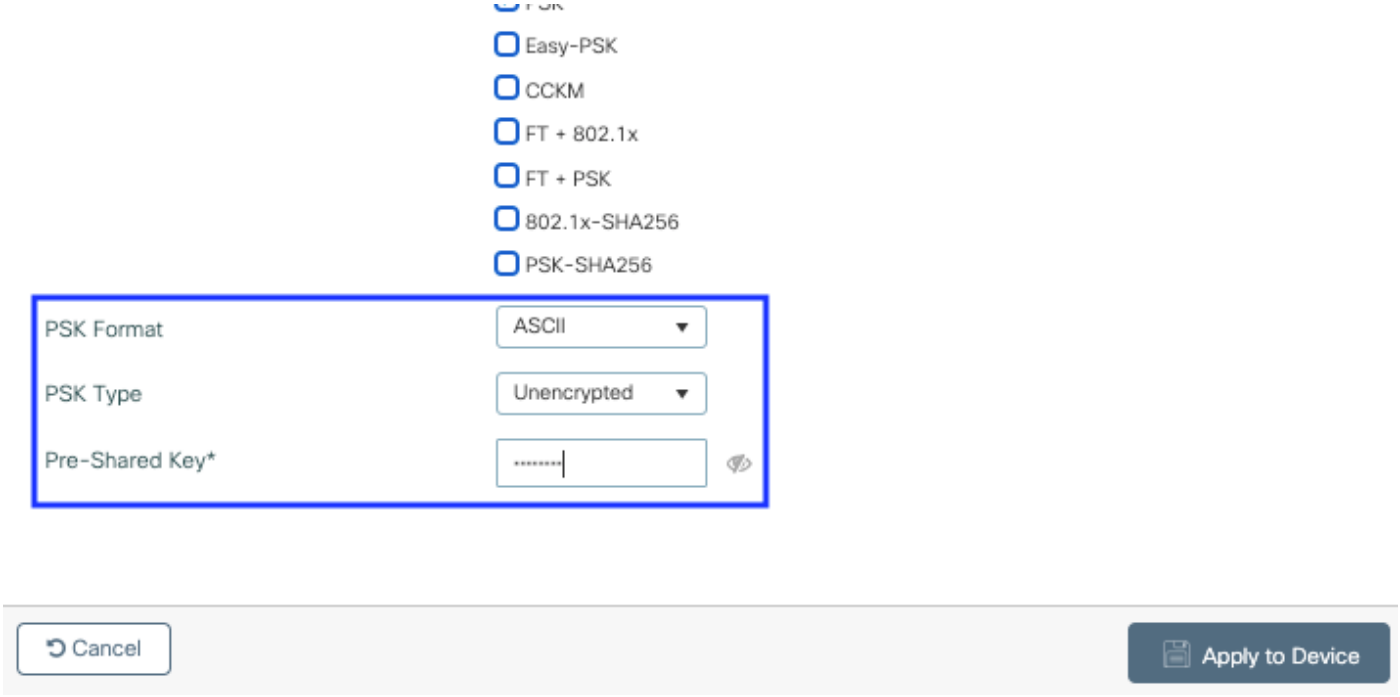
在本檔案中，所有標籤和配置檔案的配置均使用**高級無線設定**完成，因為所有標籤和配置檔案都可以在同一個選單上配置。

步驟1。導覽至**Configuration > Wireless Setup > Advanced > Start Now > WLAN Profile**，然後按一下**+Add**以建立一個新的WLAN。配置SSID、配置檔名稱、WLAN ID和WLAN的狀態。然後，導覽至**Security > Layer 2**，並設定設定：





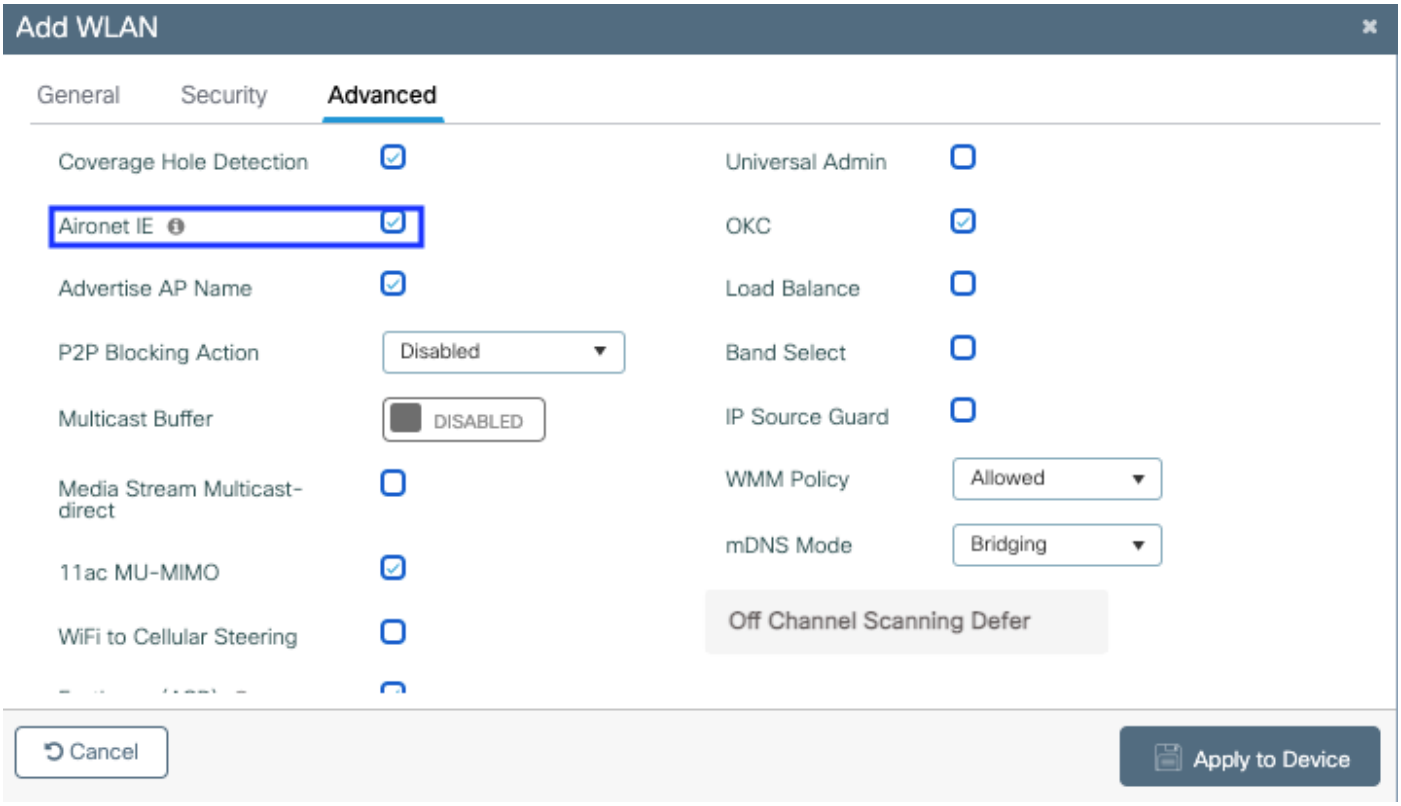
語音SSID安全設定第2部分



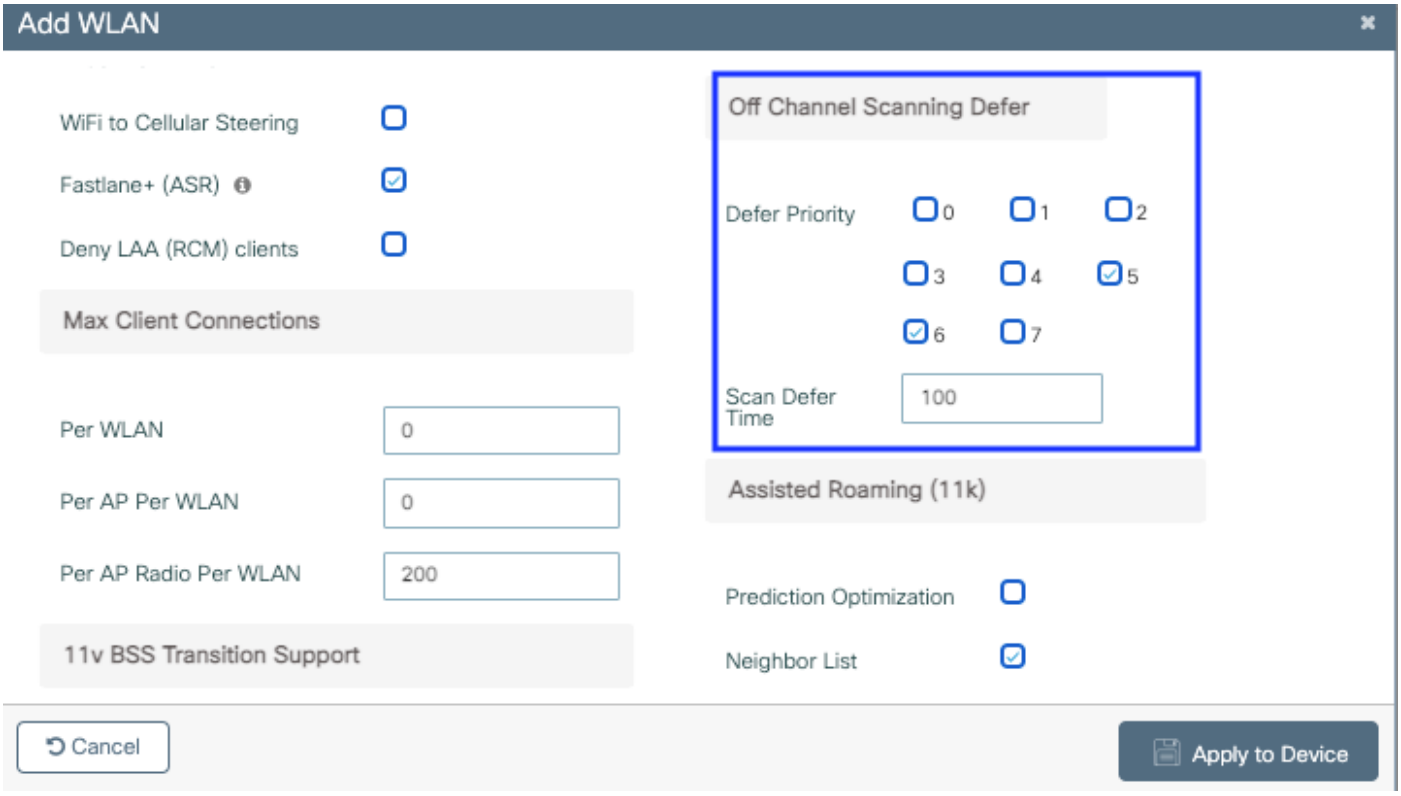
語音SSID安全設定第3部分語音SSID安全設定第1部分

> **附註**：使用PSK SSID時，沒有必要啟用FT，因為漫遊期間的握手時間很短。配置802.1X WPA企業時，建議將FT+802.1X啟用為AKM，並啟用快速轉換，但將「通過DS」保持為禁用狀態。您也可以配置FT+PSK，但為了簡單起見，此示例使用常規PSK。

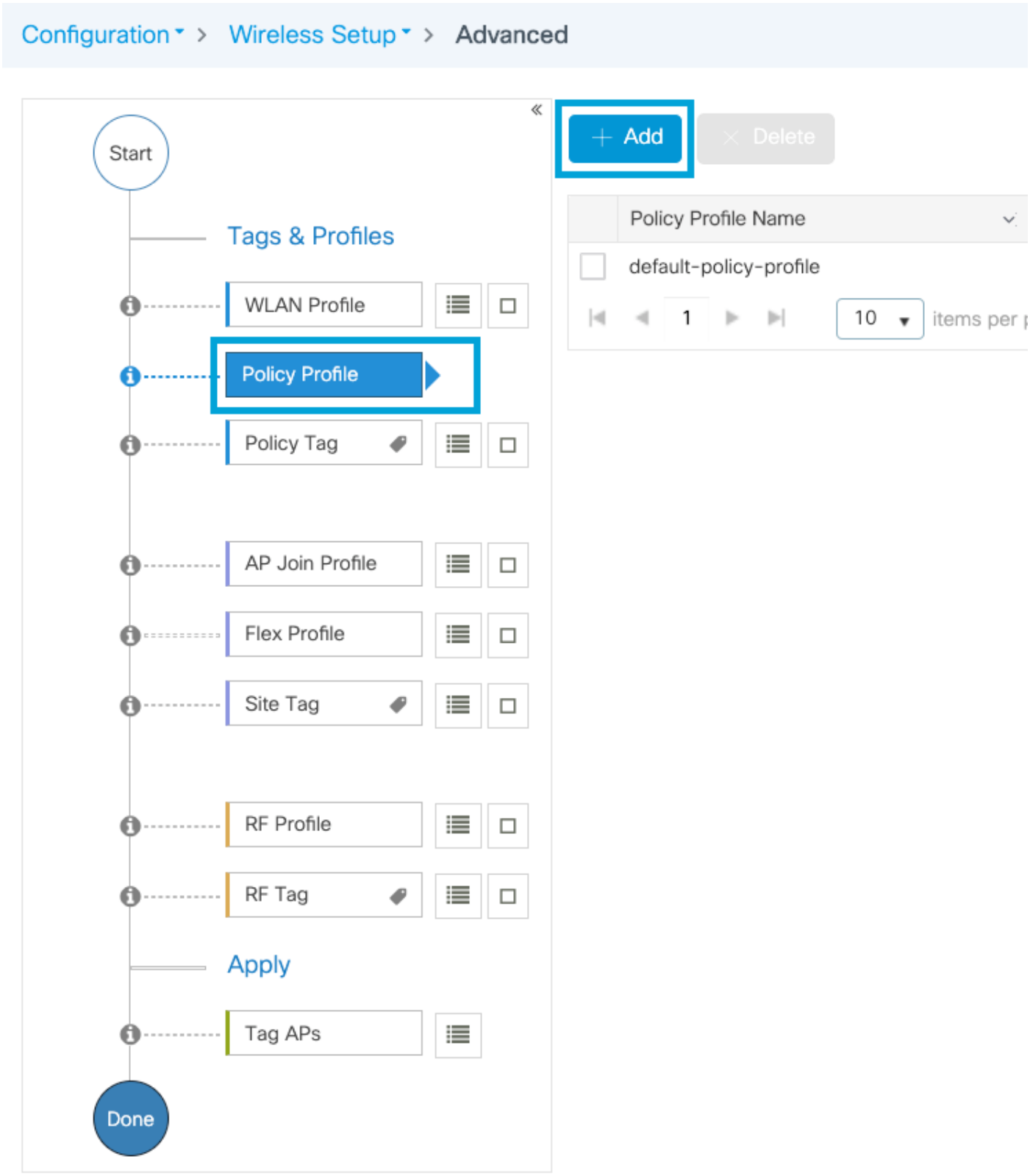
步驟2.導航到**Advanced**頁籤並啟用Aironet IE。確保禁用負載平衡和頻寬選擇：



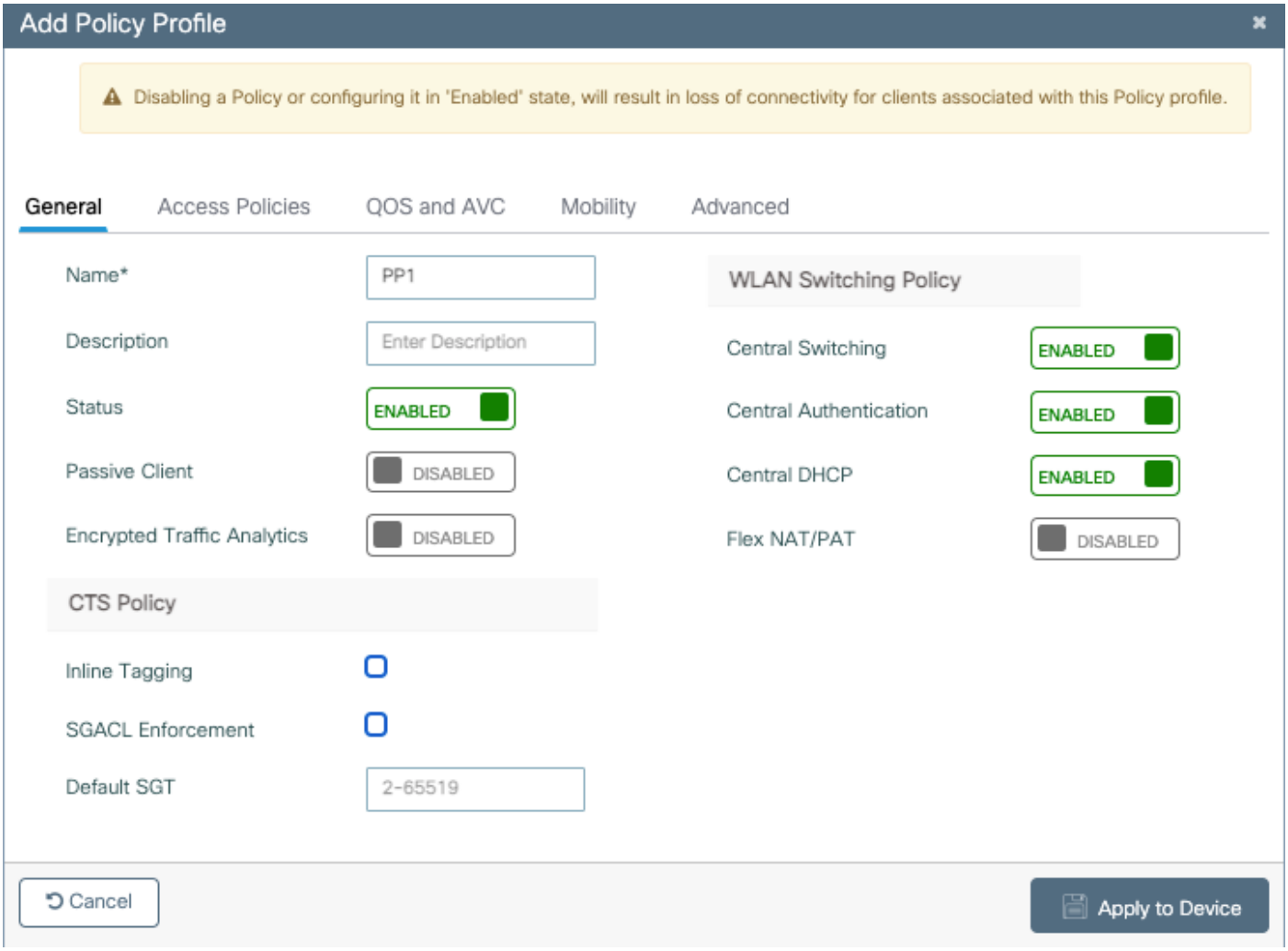
在同一頁中，確保為優先順序5、6和7啟用非通道掃描延遲。這可以防止在收到具有這些UP優先順序的幀（基本上是語音幀）後AP在100毫秒內離開通道。



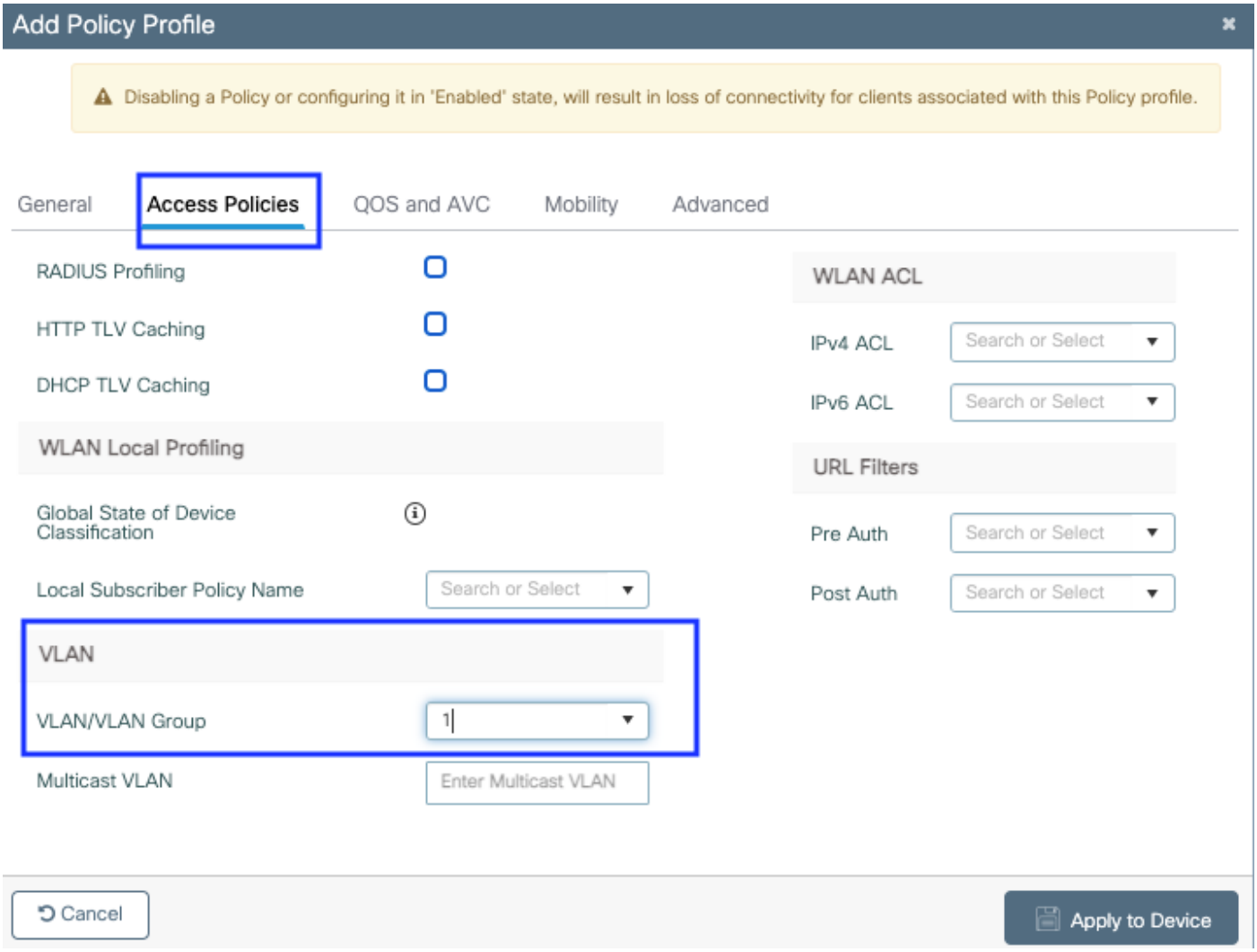
步驟3.選擇**Policy Profile**，然後按一下**Add:**



配置策略配置檔名稱，將Status（狀態）設定為Enabled（啟用），並啟用集中交換、身份驗證、DHCP和關聯（17.6之後，集中關聯覈取方塊消失）：

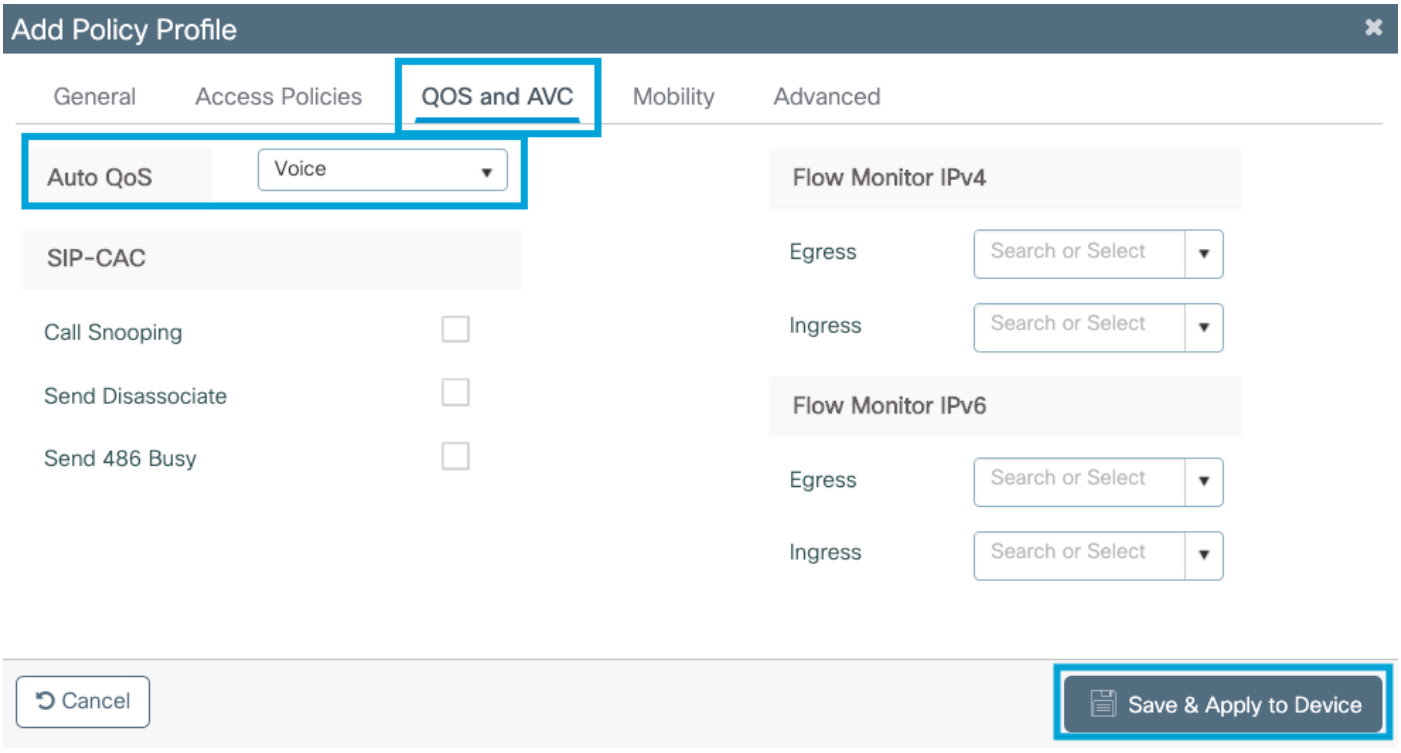


按一下**Access Policies**並配置無線客戶端在連線到SSID **Voice**時將分配到的VLAN:

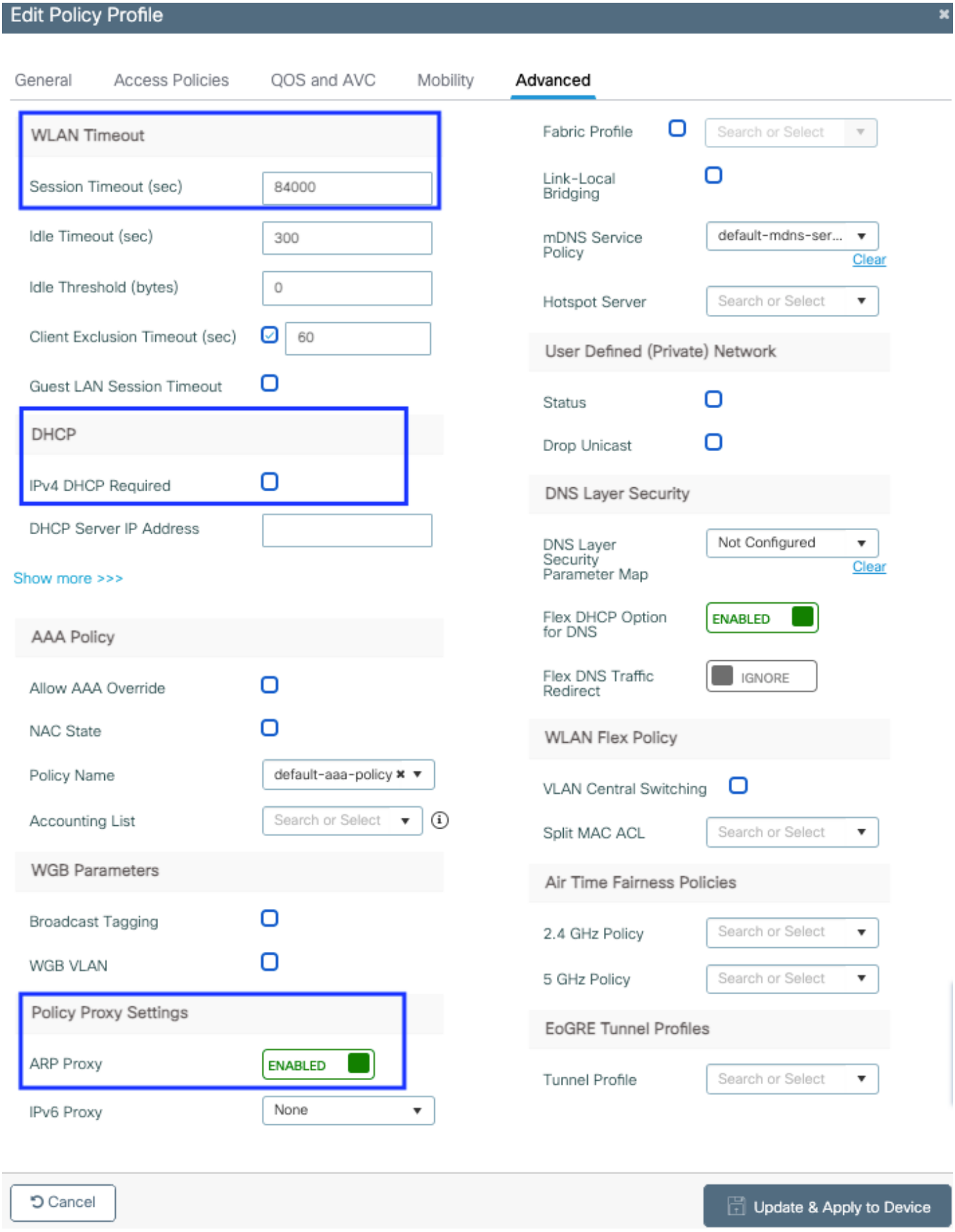


策略配置檔案訪問策略設定頁

按一下**QoS和AVC，並將Auto QoS引數配置為Voice。按一下「Save & Apply to Device」。**

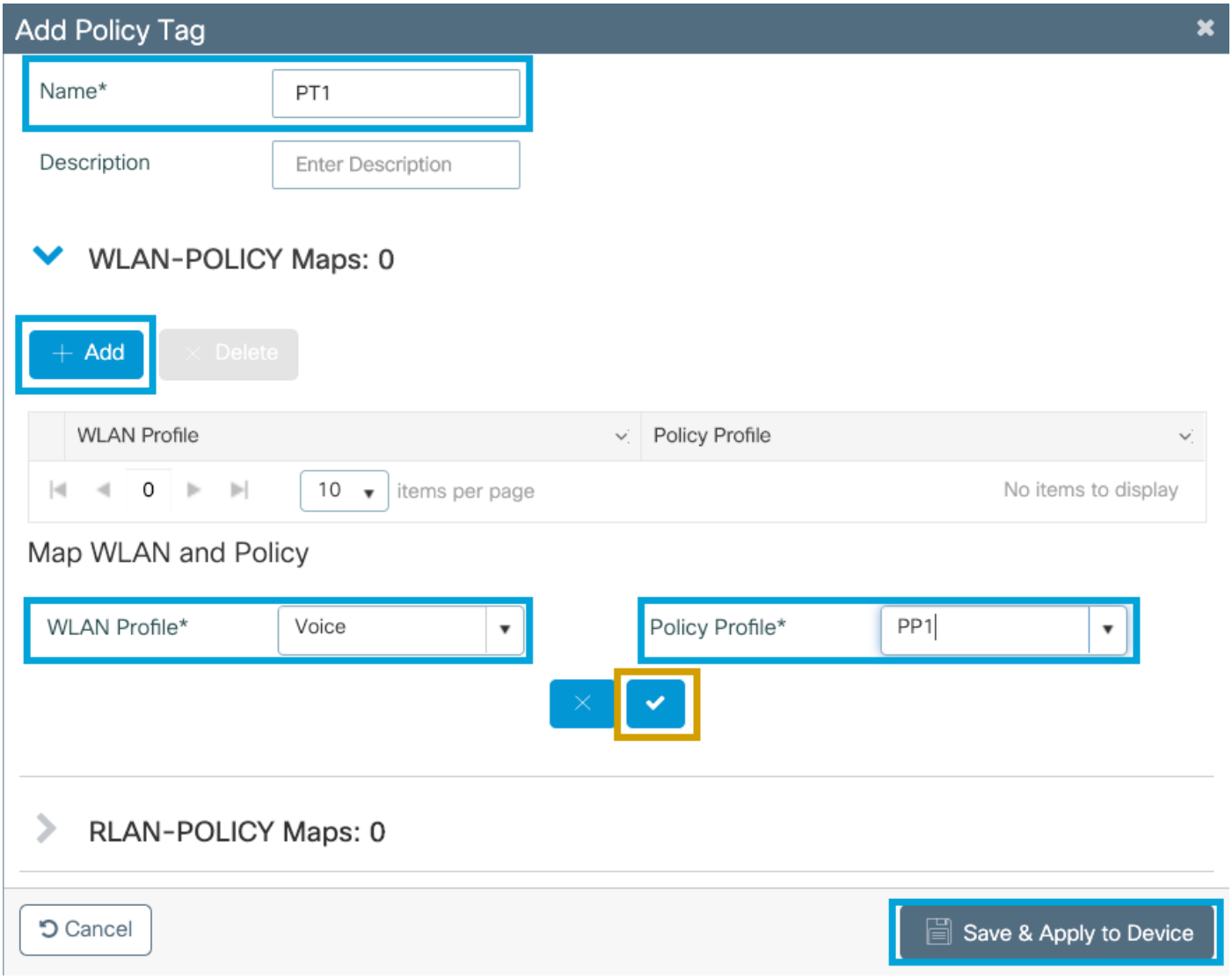


按一下**Advanced**，將會話超時設定為84000，確保禁用所需的IPv4 DHCP並啟用ARP代理。

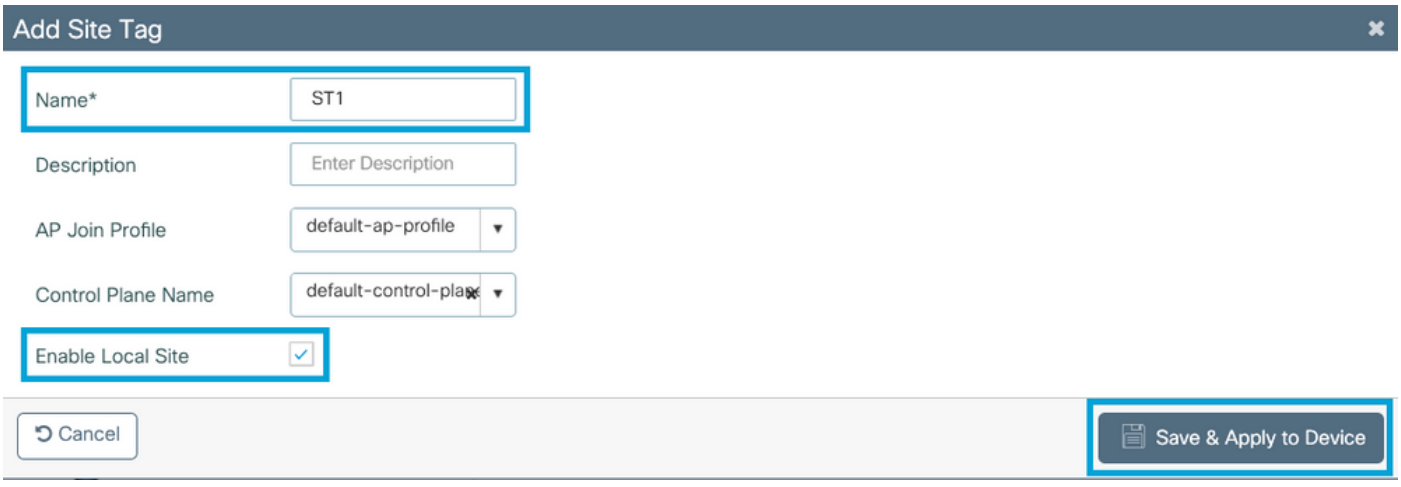


策略配置檔案高級設定頁

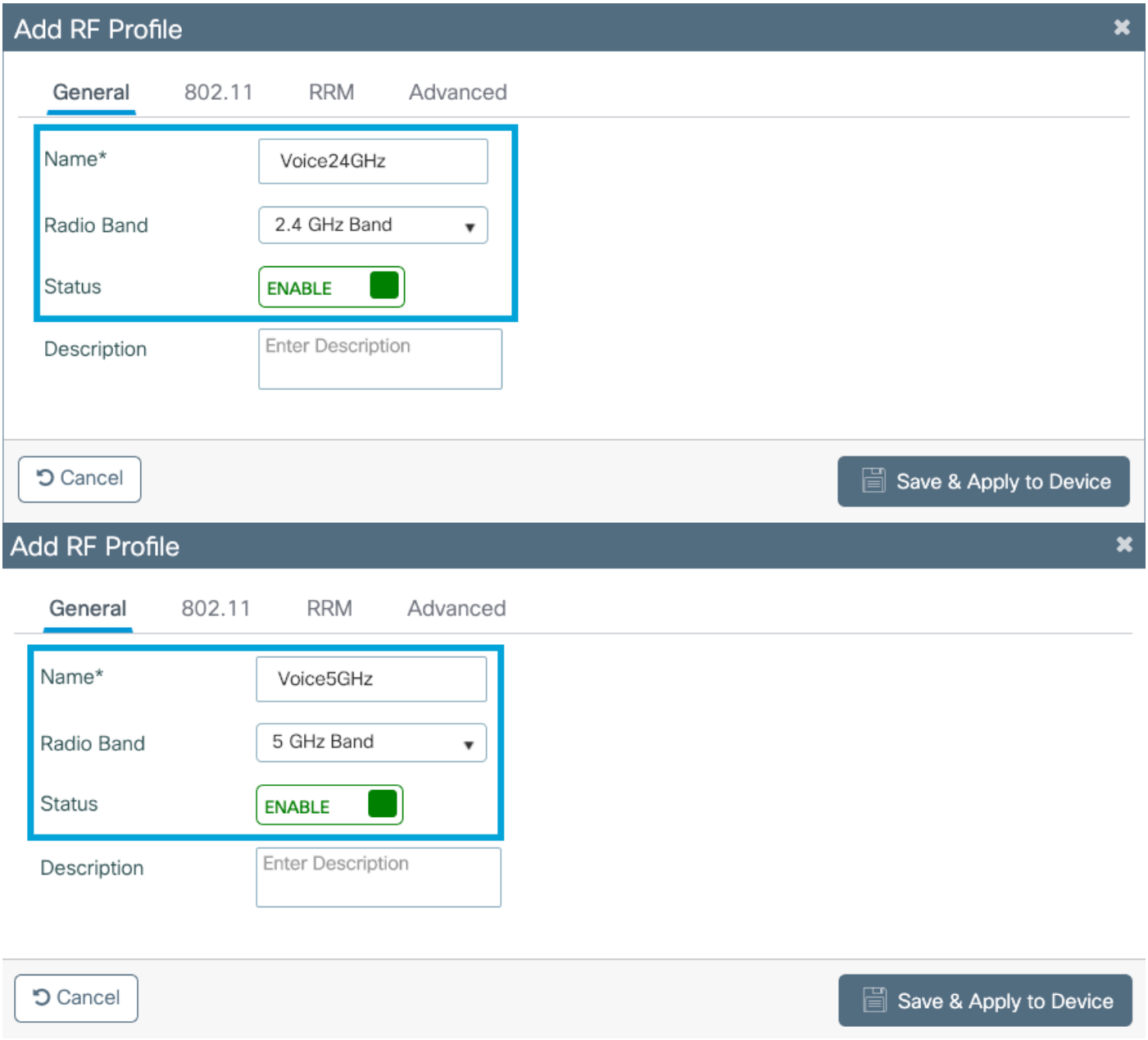
步驟4.選擇**Policy Tag**，然後按一下**Add**。配置策略標籤名稱。在**WLAN-Policy Maps**下，按一下**+Add**。從下拉選單中選擇**WLAN Profile**和**Policy Profile**，按一下選中要配置的對映。然後，點選**儲存並應用到裝置。**



步驟5.選擇**Site Tag**，然後按一下**Add**。選中**Enable Local Site**框，以使AP在本地模式下**運行**。然後點選**儲存並應用到裝置**：

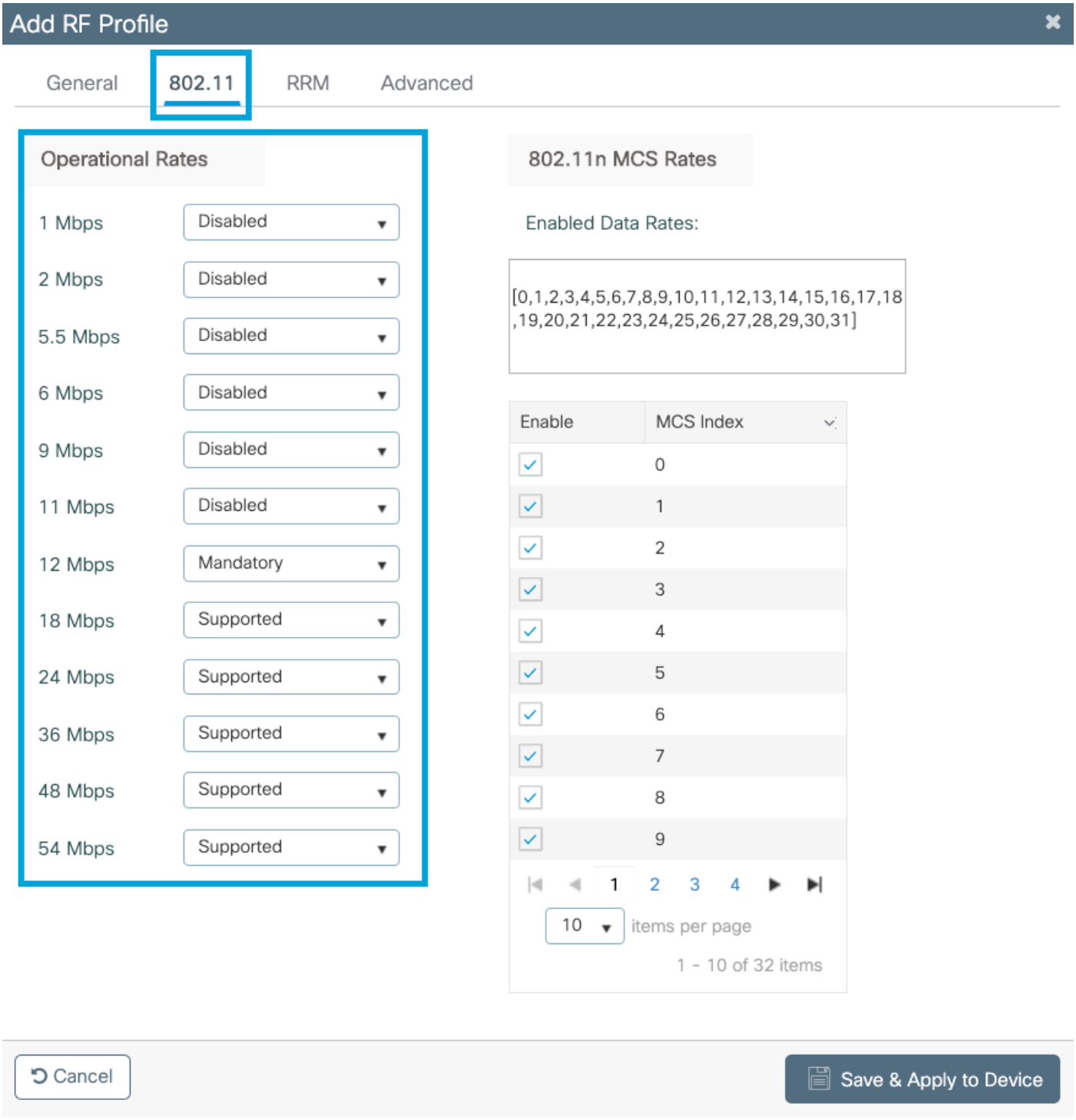


步驟6.選擇**RF配置檔案**，然後按一下**Add**。為每個頻段配置RF配置檔案。

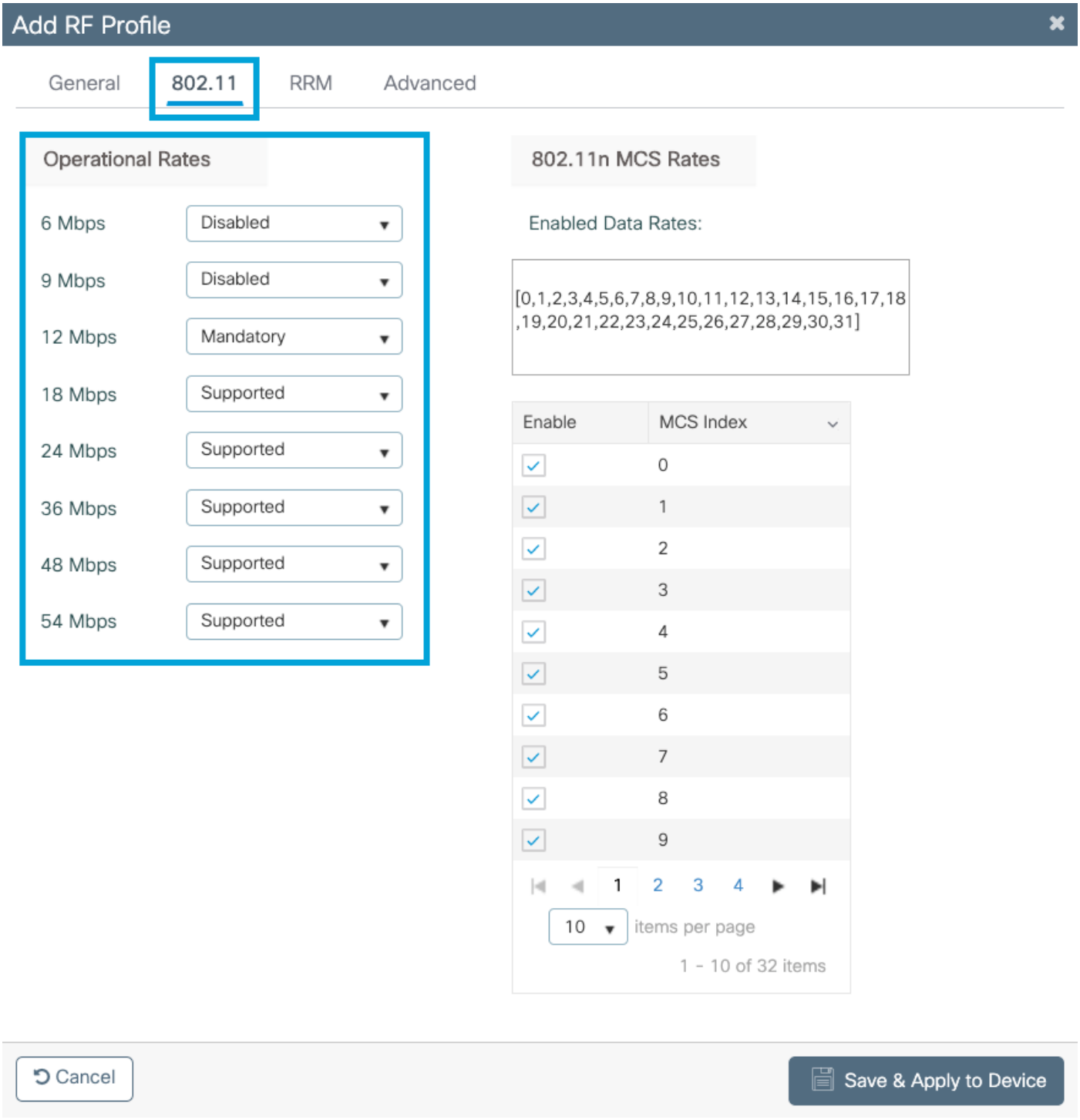


導航到**802.11**選單。禁用所有低於12Mbps的速率，將12Mbps設定為強制速率，並將兩個頻段均支援的18 Mbps及以上速率設定為強制速率。

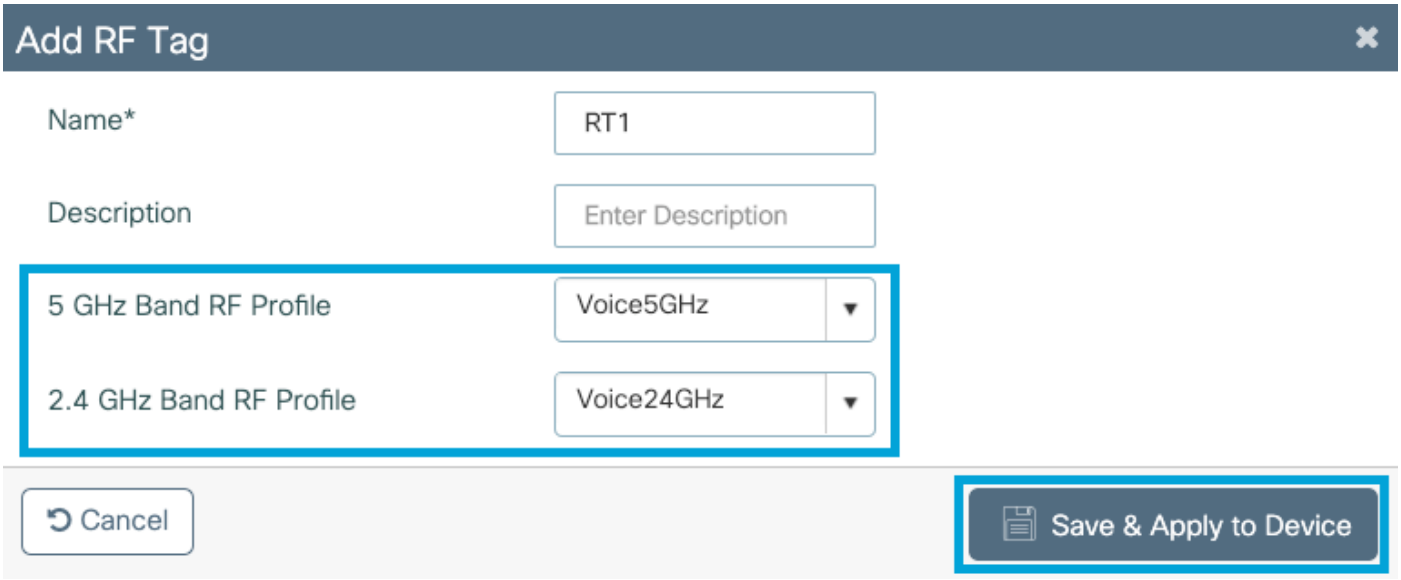
2.4 GHz資料速率：


Add RF Profile
General
802.11
RRM
Advanced
Operational Rates
1 Mbps
Disabled
2 Mbps
Disabled
5.5 Mbps
Disabled
6 Mbps
Disabled
9 Mbps
Disabled
11 Mbps
Disabled
12 Mbps
Mandatory
18 Mbps
Supported
24 Mbps
Supported
36 Mbps
Supported
48 Mbps
Supported
54 Mbps
Supported
802.11n MCS Rates
Enabled Data Rates:
[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31]
Enable
MCS Index
0
1
2
3
4
5
6
7
8
9
1
2
3
4
10
items per page
1 - 10 of 32 items
Cancel
Save & Apply to Device

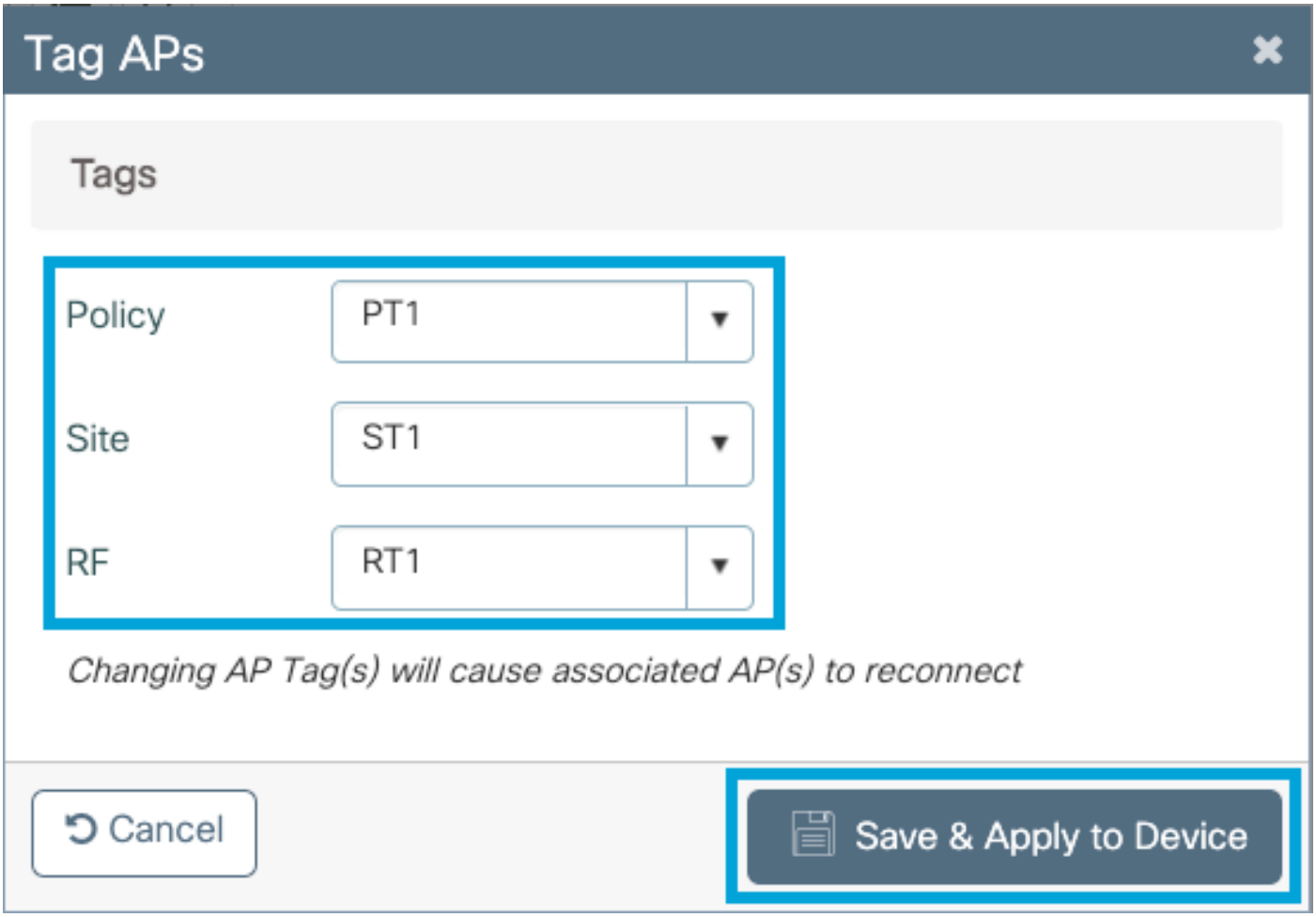
5 GHz資料速率：



步驟7.選擇**RF** Tag並點選**Add**。選擇在此部分的第5步中建立的RF配置檔案。然後，點選**儲存並應用到裝置。**



步驟8.選擇**標籤AP**，選擇AP並新增之前建立的策略、站點和RF標籤。然後，點選**儲存並應用到裝置。**



中央交換：命令列介面(CLI)

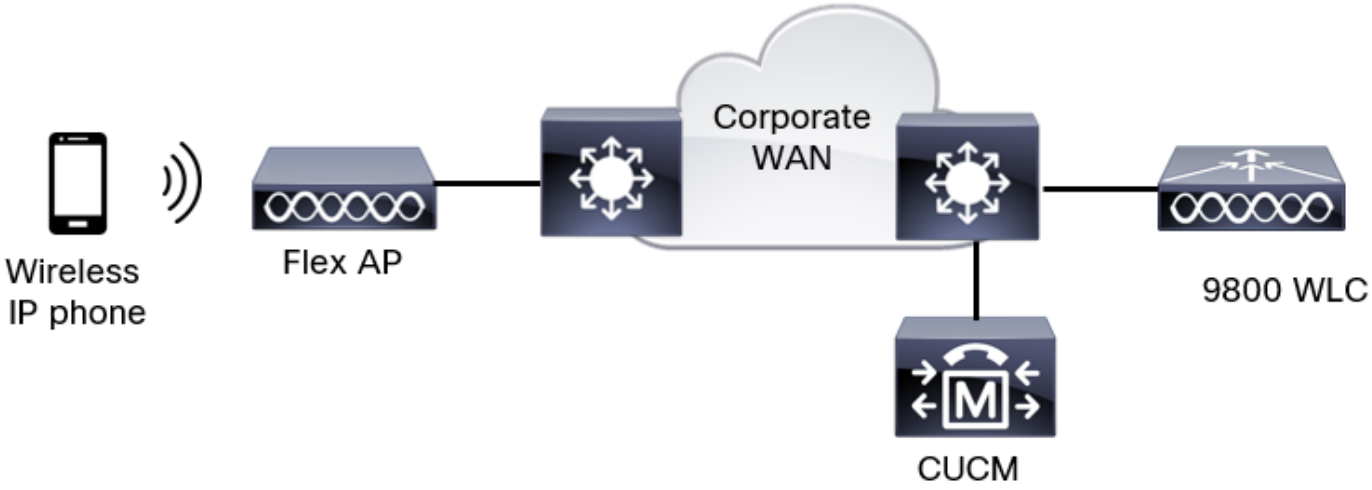
在CLI中運行以下命令：

```
//////// WLAN Configuration
wlan Voice 1 Voice
 ccx aironet-iesupport
```

```
no security ft adaptive
security wpa psk set-key ascii 0 Cisco123
no security wpa akm dot1x
security wpa akm psk
no shutdown

//////// Policy Profile Configuration
wireless profile policy PP1
autoqos mode voice
ipv4 arp-proxy
service-policy input platinum-up
service-policy output platinum
session-timeout 84000
vlan 1
no shutdown

//////// Policy Tag Configuration
wireless tag policy PT1
wlan Voice policy PP1

//////// Site Tag Configuration
wireless tag site ST1
local-site

//////// 2.4 GHz RF Profile Configuration
ap dot11 24ghz rf-profile Voice24GHz
rate RATE_11M disable
rate RATE_12M mandatory
rate RATE_1M disable
rate RATE_2M disable
rate RATE_5_5M disable
rate RATE_6M disable
rate RATE_9M disable
no shutdown

//////// 5 GHz RF Profile Configuration
ap dot11 5ghz rf-profile Voice5GHz
rate RATE_24M supported
rate RATE_6M disable
rate RATE_9M disable
no shutdown

//////// RF Tag Configuration
wireless tag rf RT1
24ghz-rf-policy Voice24GHz
5ghz-rf-policy Voice5GHz

//////// AP Configuration
ap a023.9f86.52c0
policy-tag PT1
rf-tag RT1
site-tag ST1
```

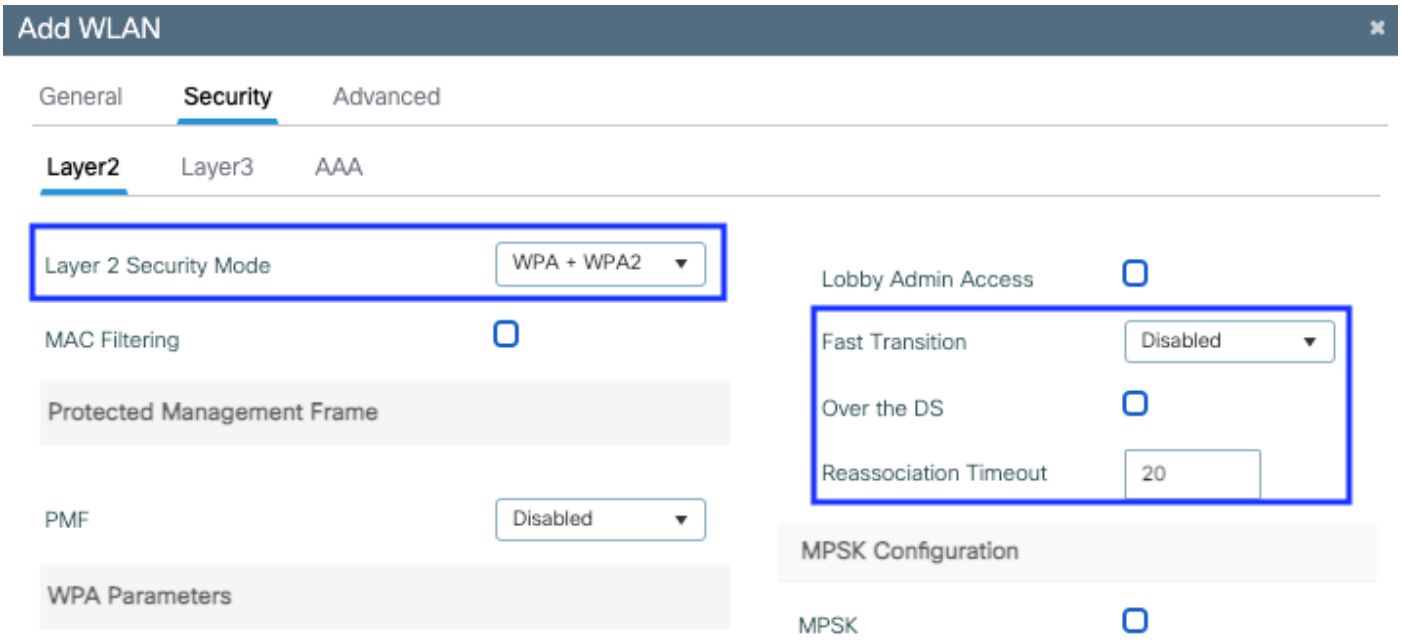
選項 B：FlexConnect本地交換

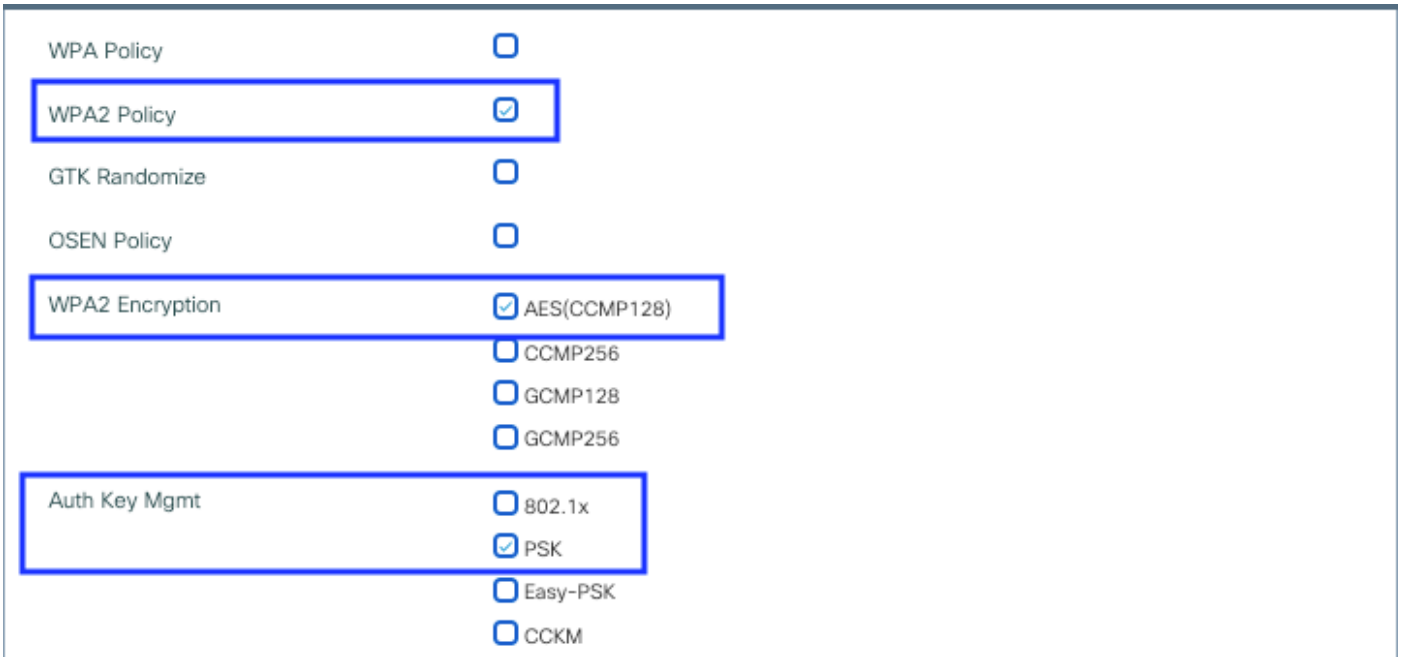
Flexconnect本地交換網路圖



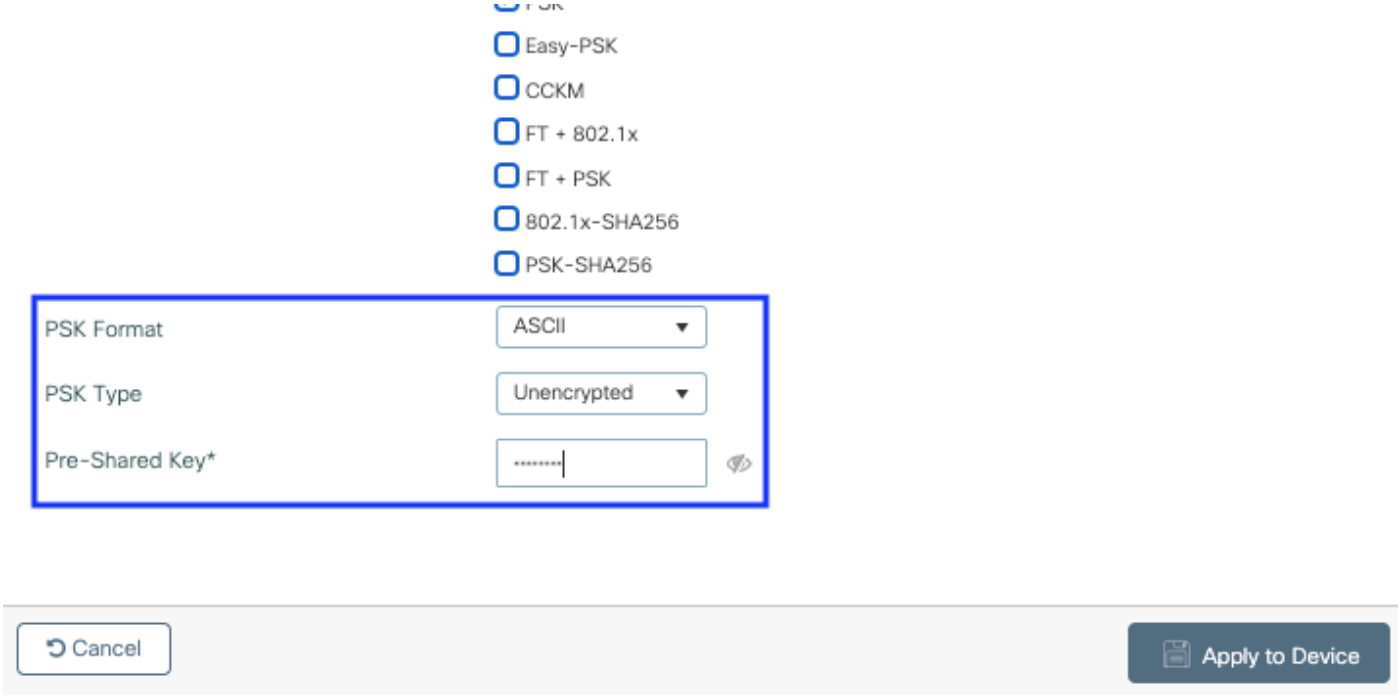
Flexconnect本地交換標籤和配置檔案

步驟1。導覽至**Configuration > Wireless Setup > Advanced > Start Now > WLAN Profile**，然後按一下**+Add**以建立一個新的WLAN。配置SSID、配置檔名稱、WLAN ID和WLAN的狀態。然後，導覽至**Security > Layer 2**，並設定設定：





語音SSID安全設定第2部分



語音SSID安全設定第3部分語音SSID安全設定第1部分

> **附註**：使用PSK SSID時，沒有必要啟用FT，因為漫遊期間的握手時間很短。配置802.1X WPA企業時，建議將FT+802.1X啟用為AKM，並啟用快速轉換，但將「通過DS」保持為禁用狀態。您也可以配置FT+PSK，但為了簡單起見，此示例使用常規PSK。

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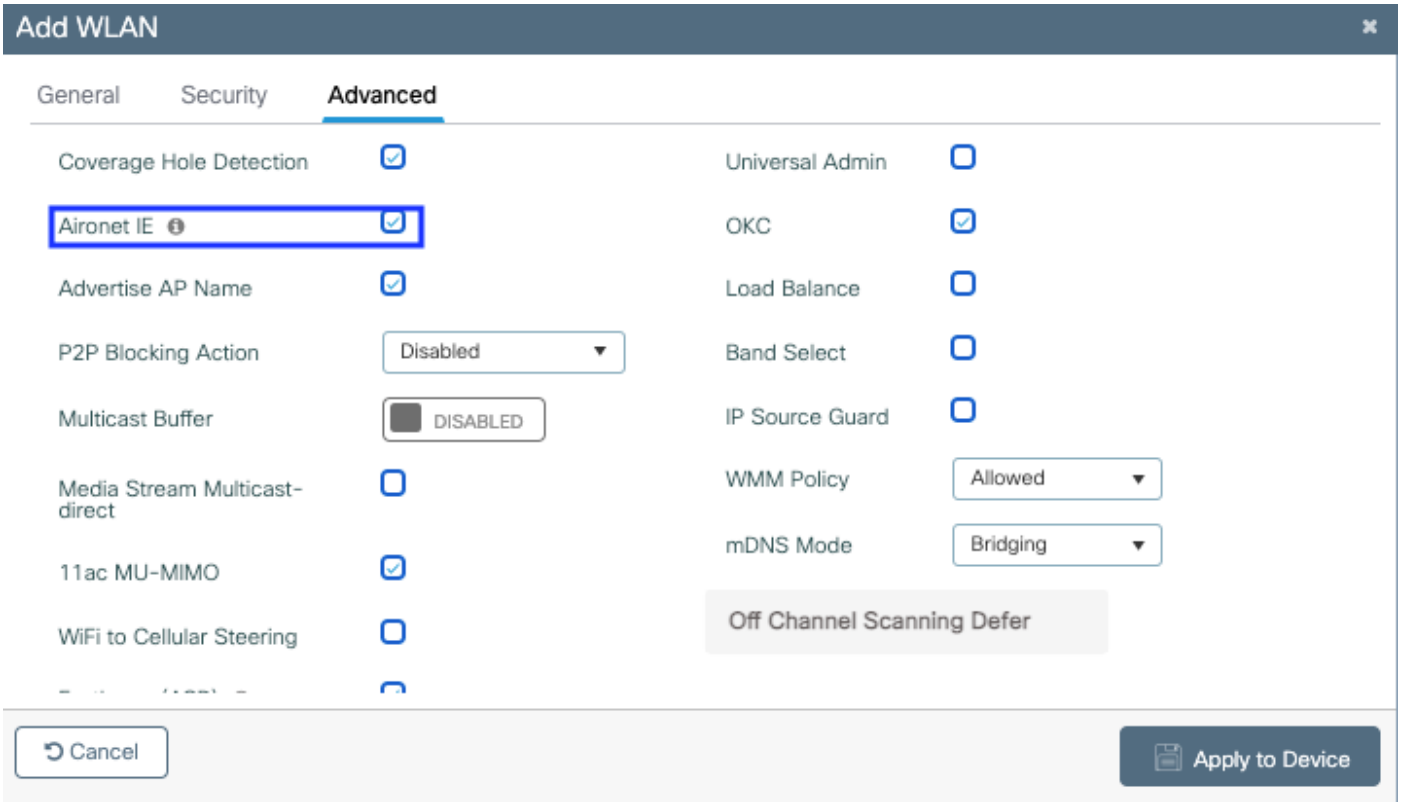
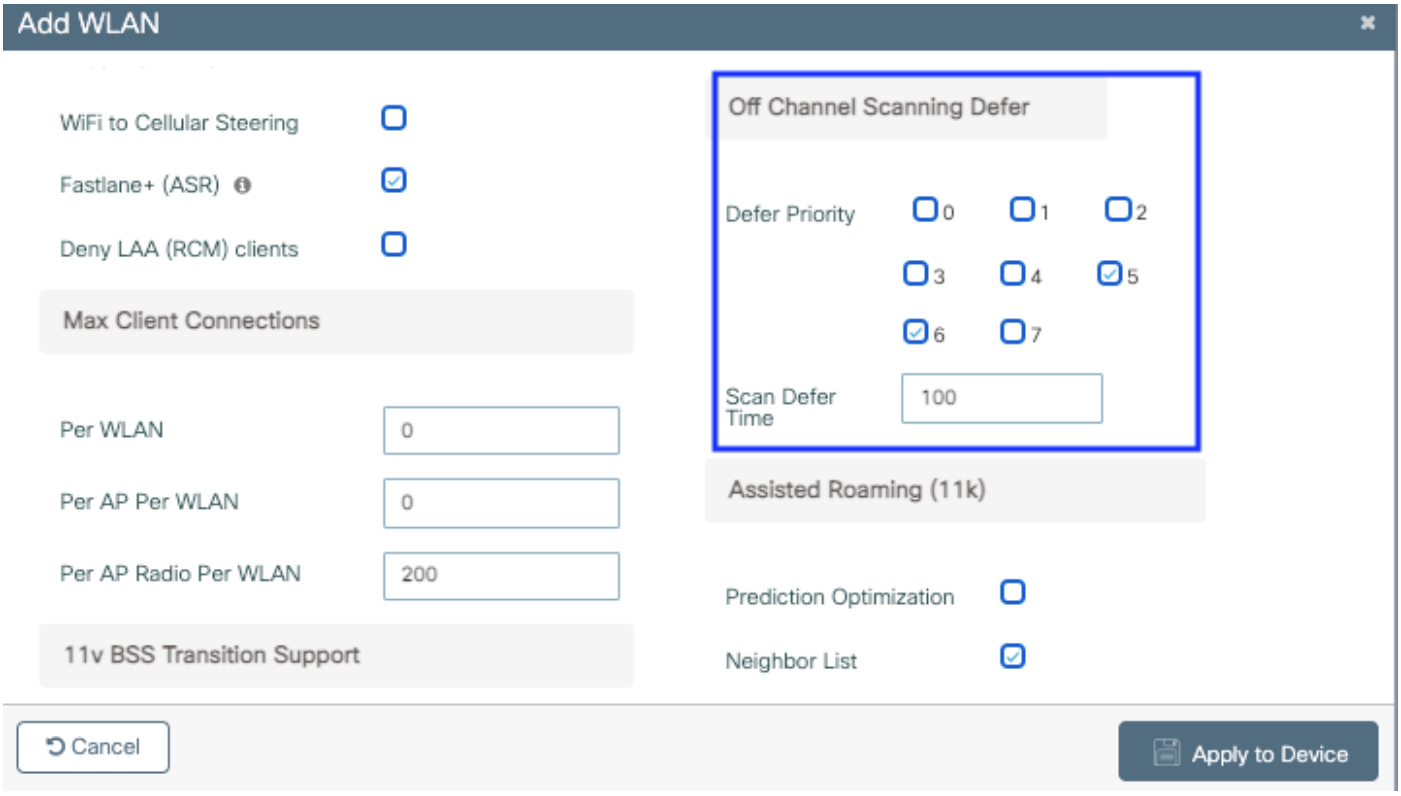
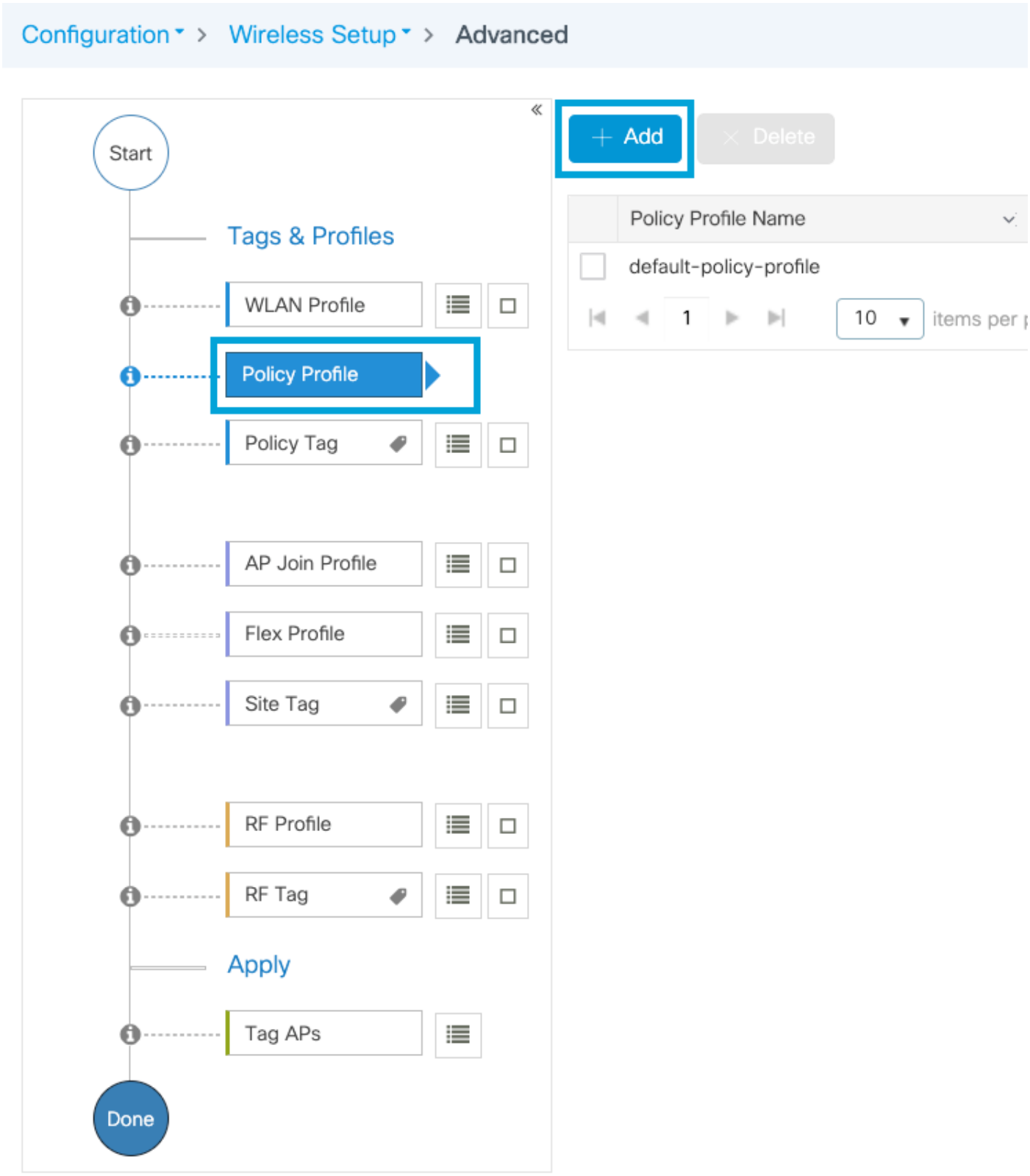


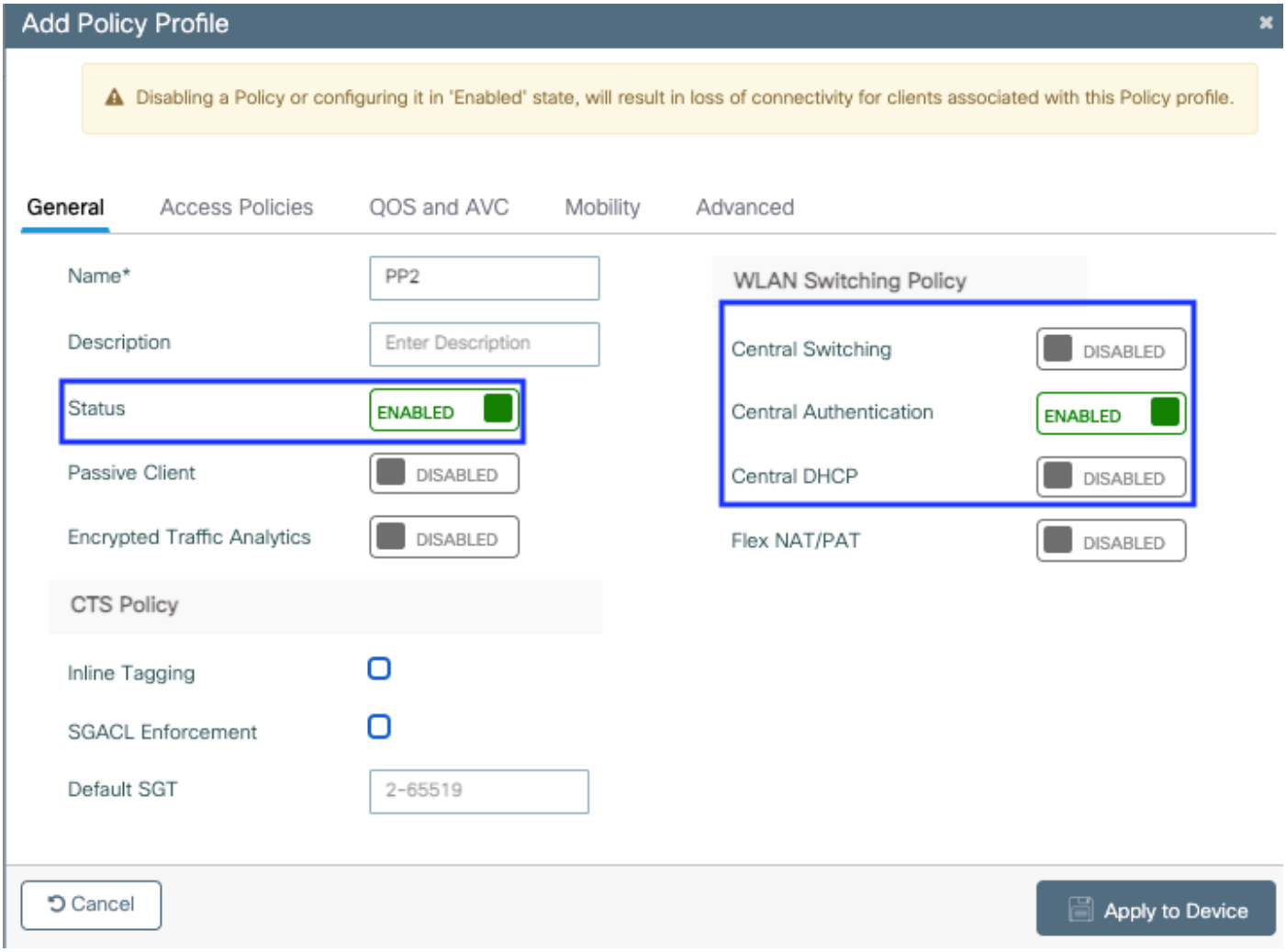
在同一頁中，確保為優先順序5、6和7啟用非通道掃描延遲。這可以防止在收到具有這些UP優先順序的幀（基本上是語音幀）後AP在100毫秒內離開通道。



步驟3.選擇**Policy Profile**，然後按一下**Add:**



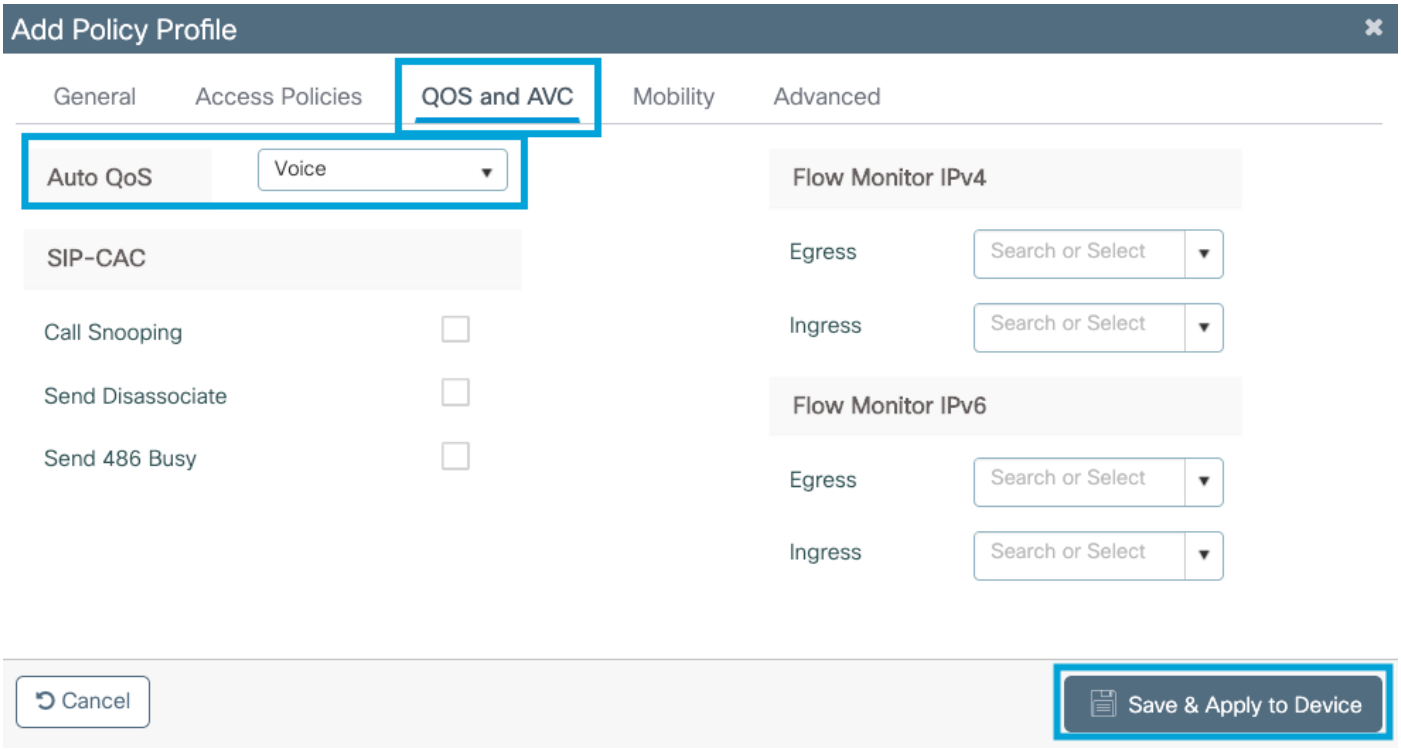
配置策略配置檔名稱，將Status設定為Enabled，禁用Central Switching和Central DHCP。對於PSK SSID，可將身份驗證移至本地，以便讓接入點承擔驗證PSK的角色。對於802.1X，您通常希望WLC繼續執行802.1X身份驗證。



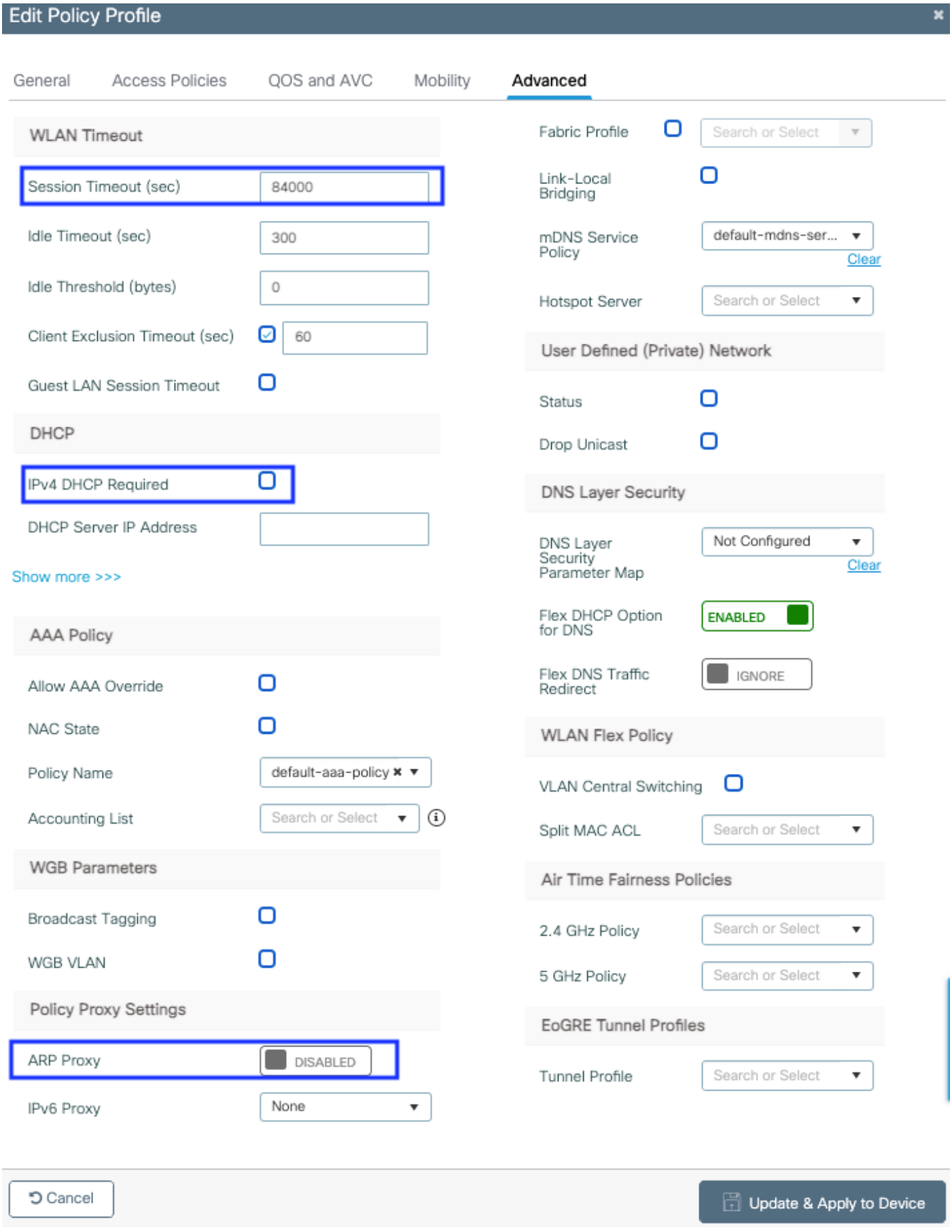
Flex Local交換策略配置檔案配置

導航到**Access Policies**頁籤，分配無線客戶端在預設情況下連線到此WLAN時分配到的VLAN。您可以從下拉選單中選擇一個VLAN名稱，也可以手動鍵入VLAN ID。

按一下**QoS和AVC，並將Auto QoS引數配置為Voice。按一下「Save & Apply to Device」**。



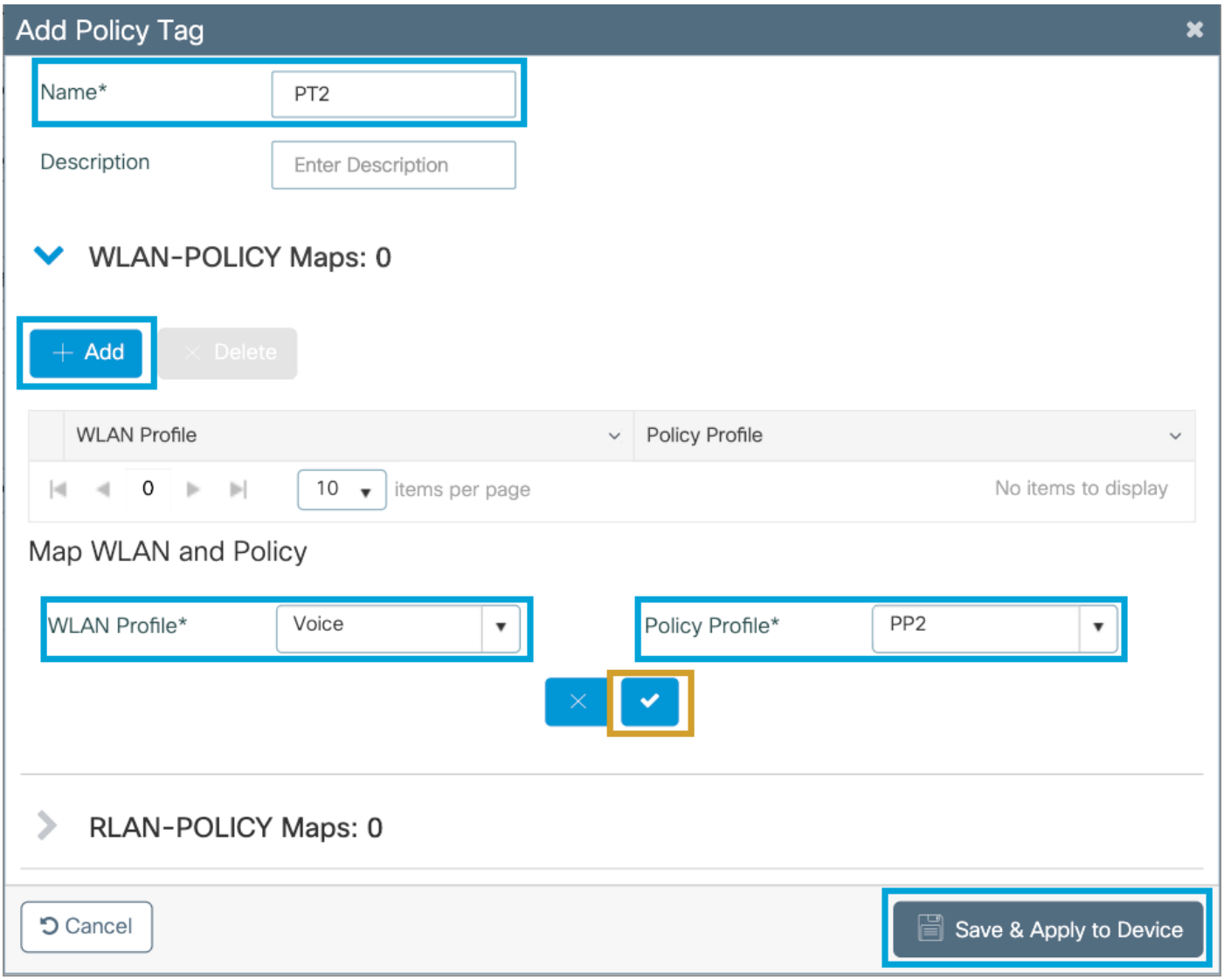
按一下**Advanced**，將會話超時設定為84000，確保禁用所需的IPv4 DHCP並禁用ARP代理。



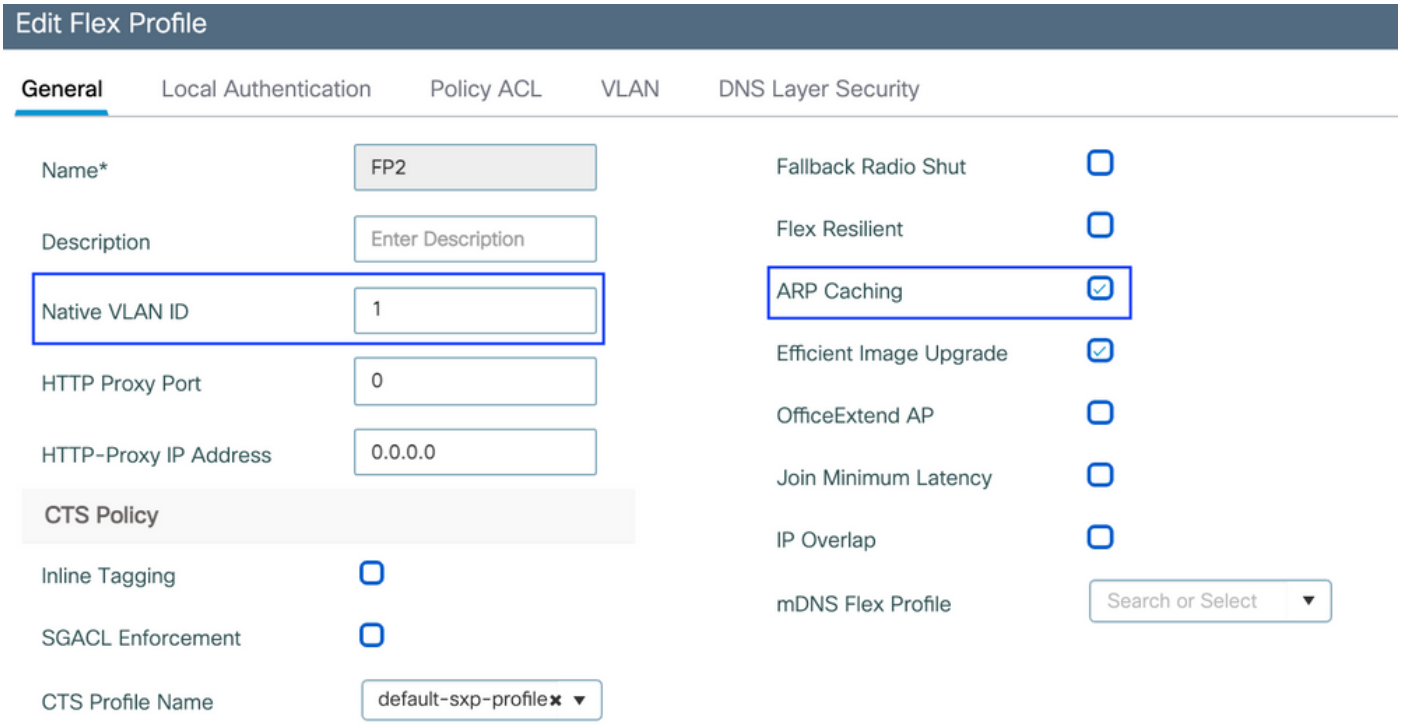
彈性策略配置檔案的高級設定

步驟4.選擇**Policy Tag**，然後按一下**Add**。配置策略標籤名稱。在**WLAN-Policy Maps**下，按一下**+Add**。從下拉選單中選擇**WLAN Profile**和**Policy Profile**，然後按一下檢查要配置的對映。然後，點

選**儲存並應用到裝置。**



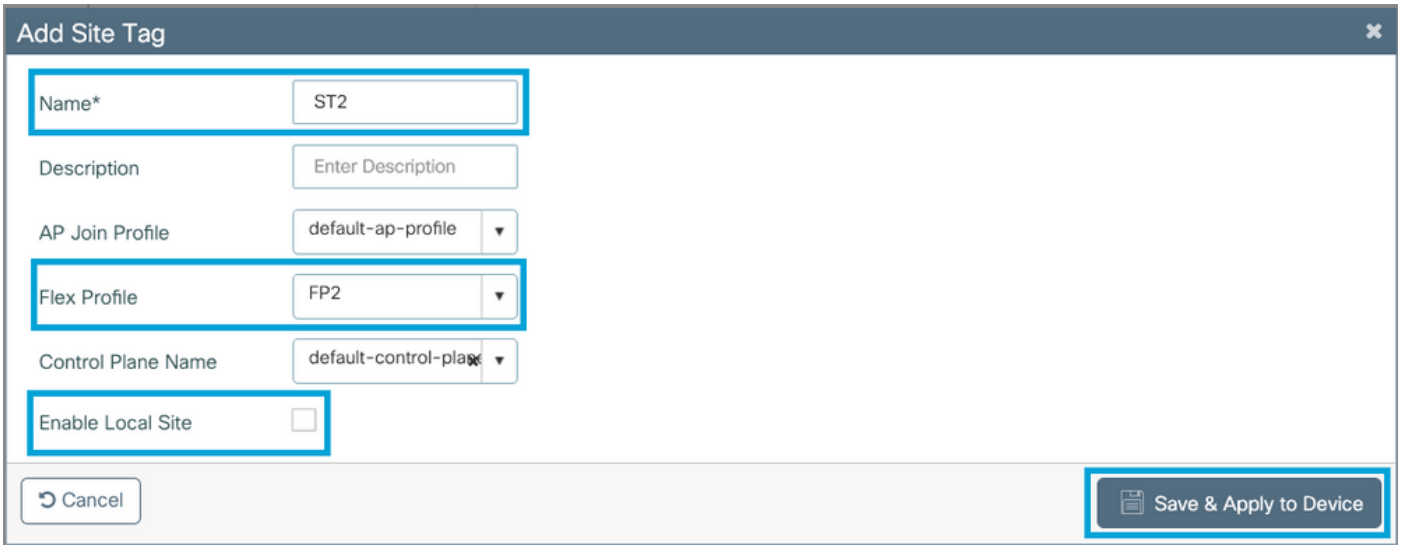
步驟5.按一下**Flex Profile**，然後按一下**Add。**配置Flex配置檔名稱、本地VLAN ID和啟用ARP快取：



Flex配置檔案策略設定

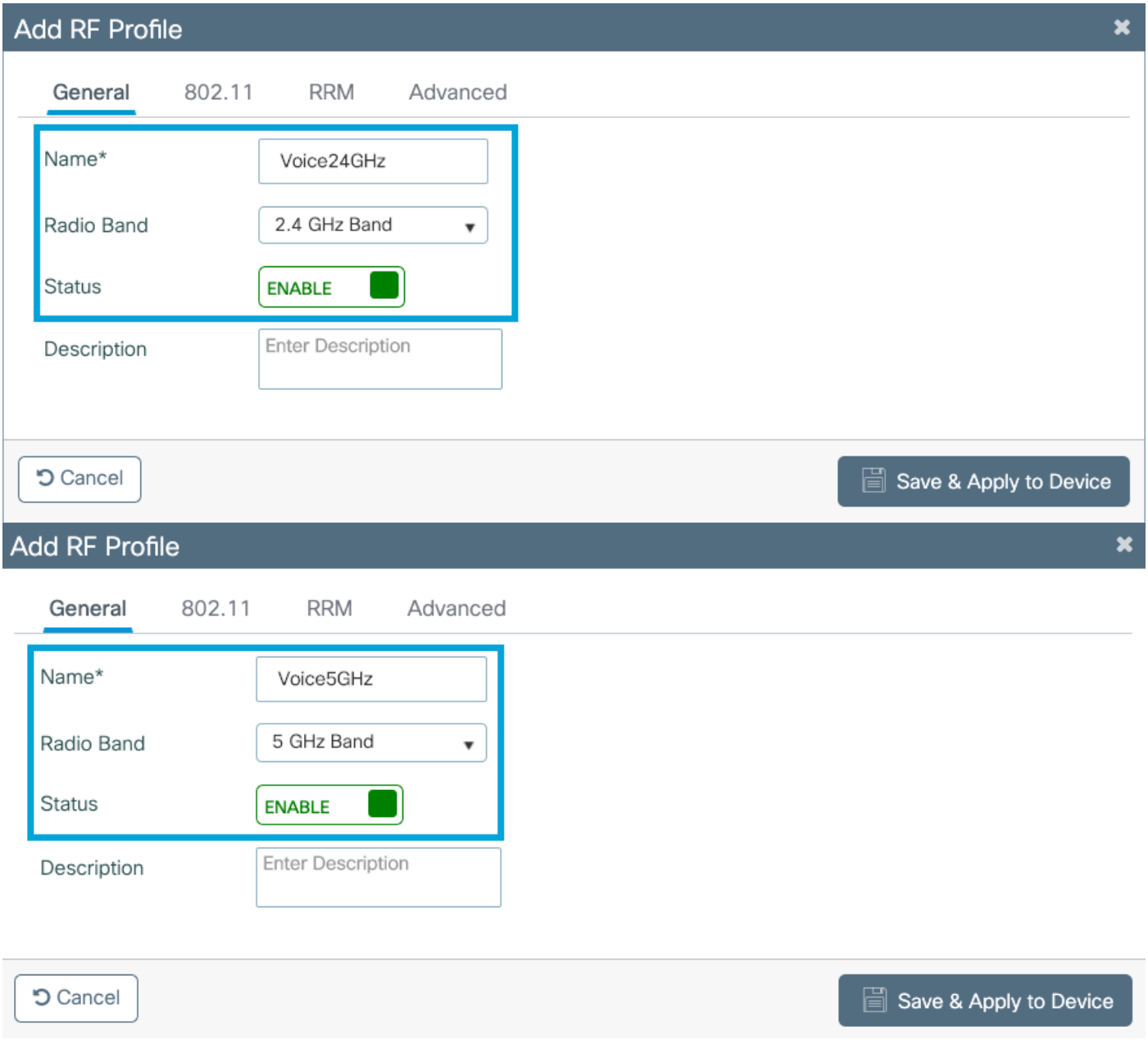
附註：本徵VLAN ID是指在AP所連線的交換機埠中配置的本徵VLAN（與此Flex配置檔案關聯）。

步驟6.選擇**Site Tag**，然後按一下**Add**。 配置站點標籤名稱，取消選中**Enable Local Site**選項並新增Flex配置檔案。然後，按一下**Save & Apply to Device**。



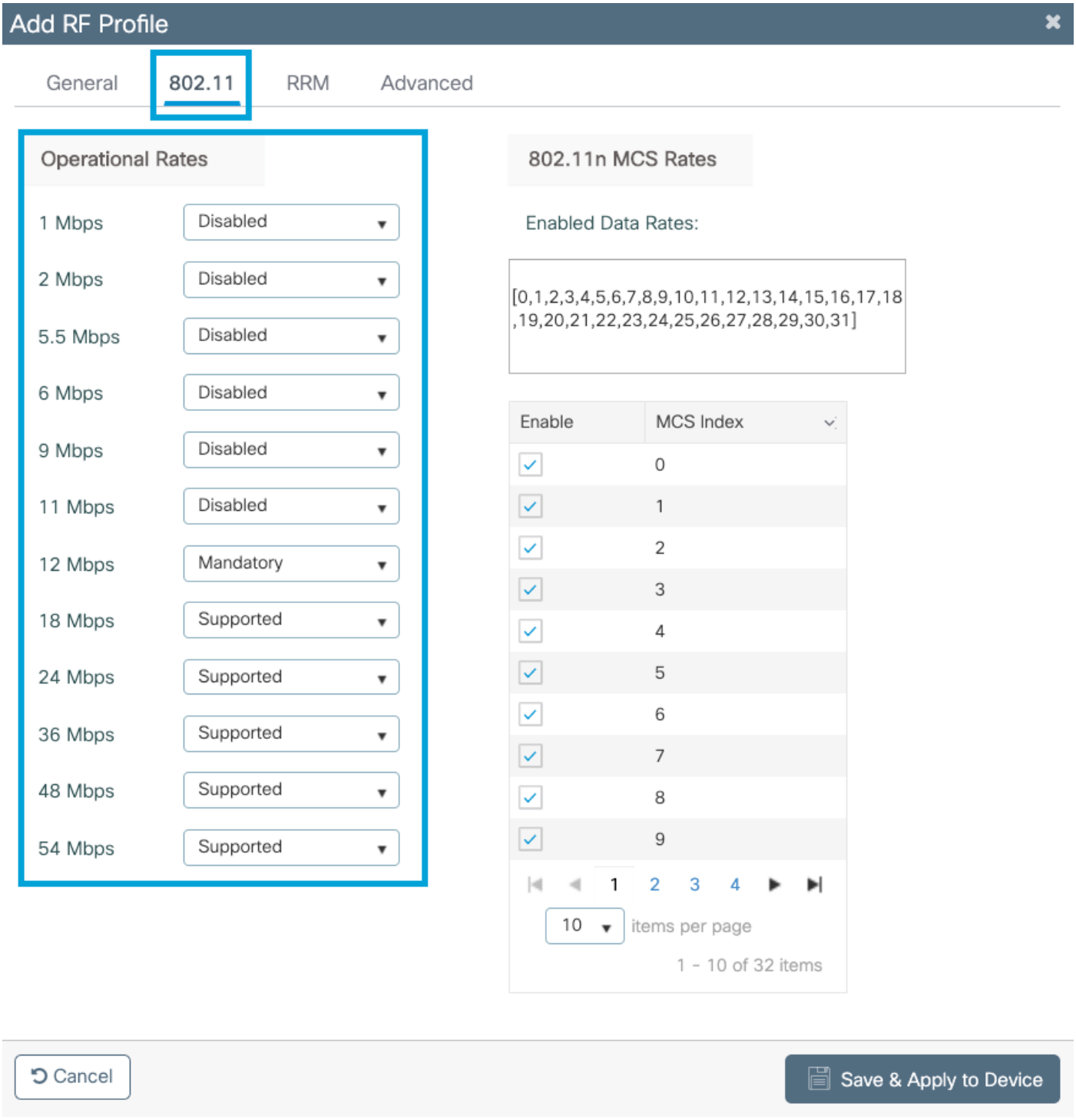
附註：禁用啟用本地站點後，分配給此站點標籤的AP將自動配置為FlexConnect AP。

步驟7.選擇**RF配置檔案**，然後按一下**Add**。為每個頻段配置RF配置檔案。

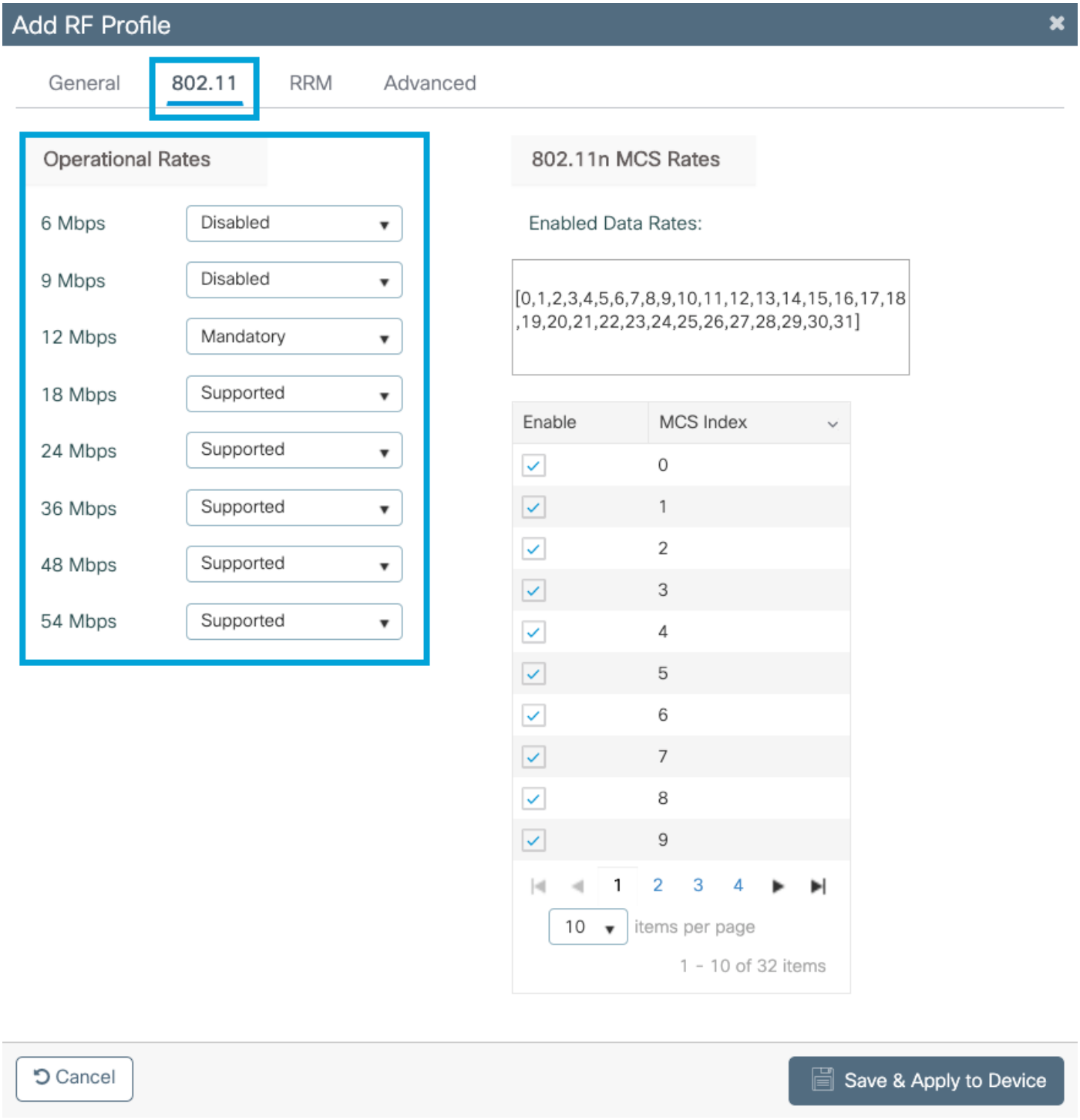


導航到**802.11**選單。禁用所有低於12Mbps的速率，將12Mbps設定為強制速率，並將兩個頻段均支援設定為18 Mbps及更高的速率。

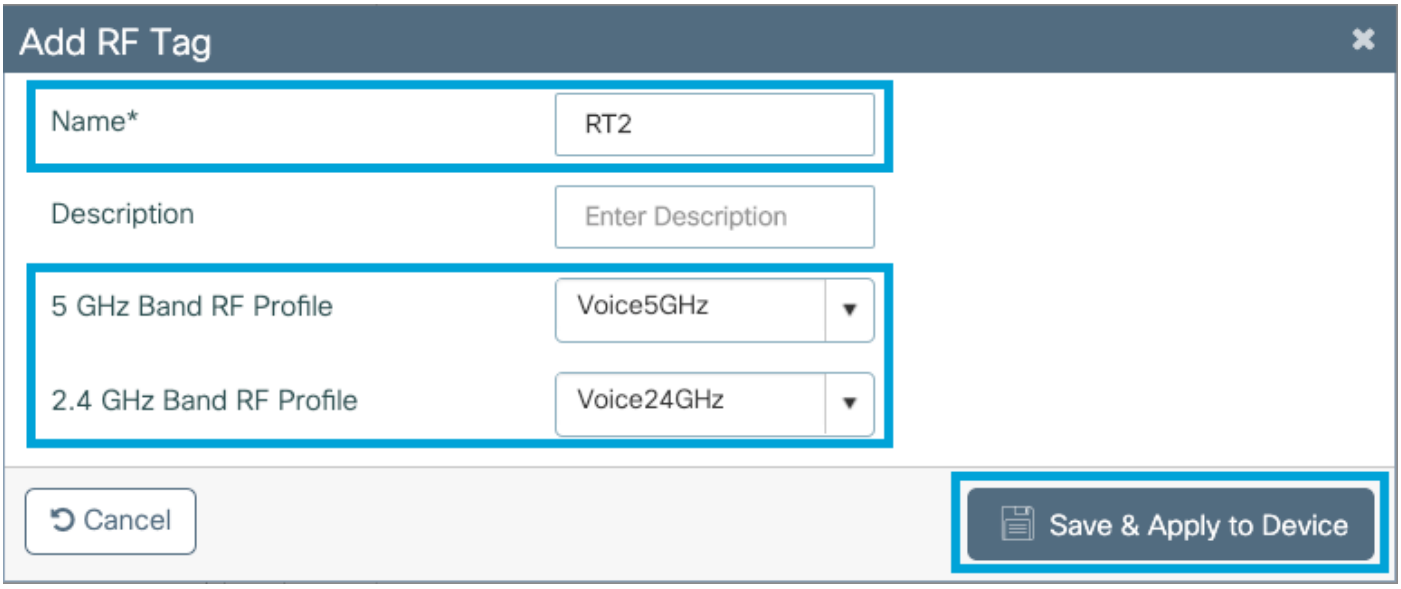
2.4 GHz資料速率：


Add RF Profile
General
802.11
RRM
Advanced
Operational Rates
1 Mbps
Disabled
2 Mbps
Disabled
5.5 Mbps
Disabled
6 Mbps
Disabled
9 Mbps
Disabled
11 Mbps
Disabled
12 Mbps
Mandatory
18 Mbps
Supported
24 Mbps
Supported
36 Mbps
Supported
48 Mbps
Supported
54 Mbps
Supported
802.11n MCS Rates
Enabled Data Rates:
[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31]
Enable
MCS Index
0
1
2
3
4
5
6
7
8
9
1
2
3
4
10
items per page
1 - 10 of 32 items
Cancel
Save & Apply to Device

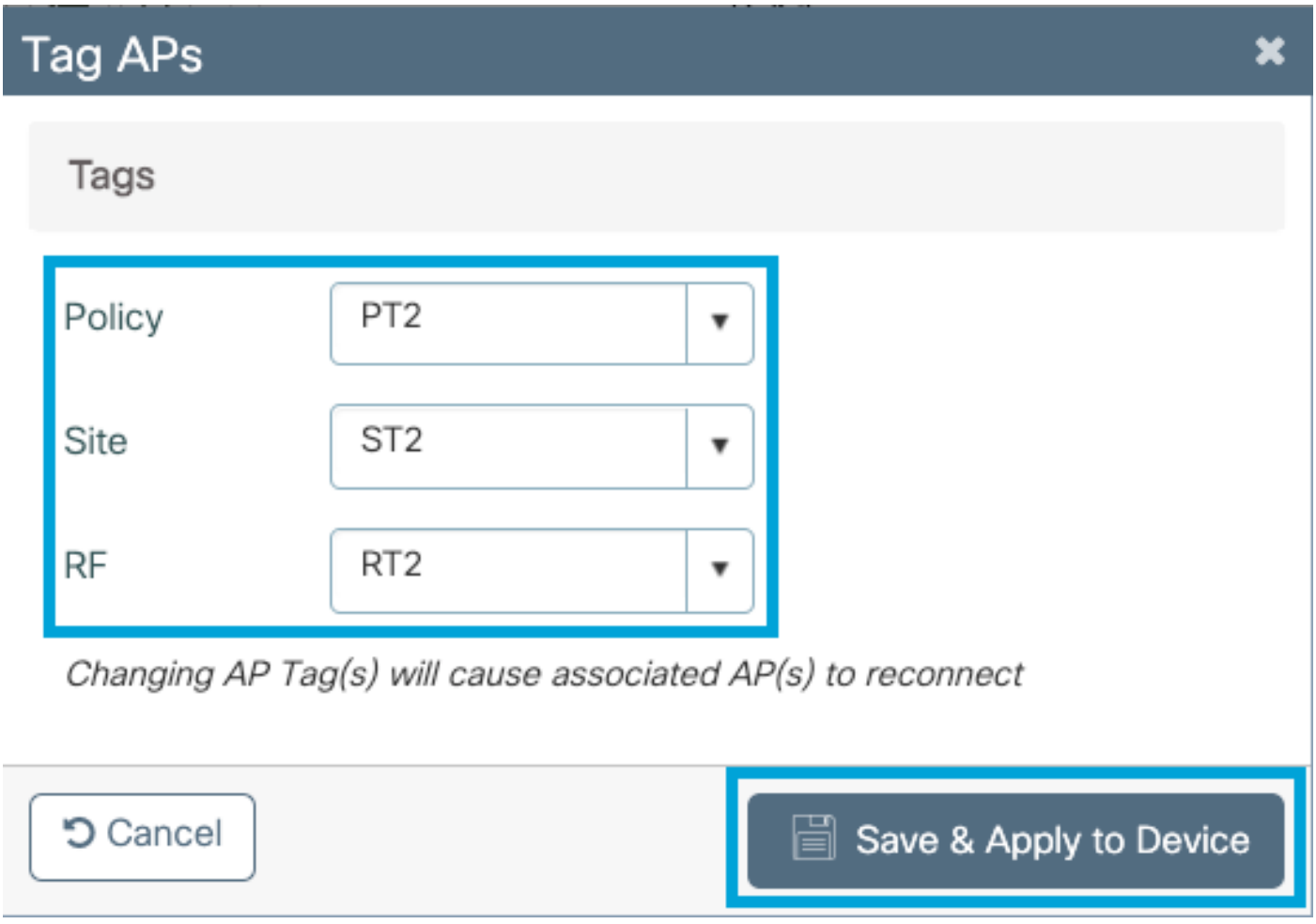
5 GHz資料速率：



步驟8.選擇**RF** Tag並點選**Add**。配置在本節的步驟6中建立的RF配置檔案。然後，點選**儲存並應用到裝置。**



步驟9.選擇**標籤AP**，選擇AP並新增之前建立的策略、站點和RF標籤。然後，點選**儲存並應用到裝置。**



AP將重新啟動其CAPWAP隧道，並返回9800 WLC。導覽至**Configuration > Wireless > Access Points**，確認AP模式為**Flex:**

AP Name	Total Slots	AP Model	Base Radio MAC	AP Mode	Admin Status	Operation Status	Policy Tag	Site Tag	RF Tag	Tag Source	Location	Country
AP2802I-21	2	AIR-AP2802I-B-K9	a023.9f86.52c0	Flex	Enabled	Registered	PT2	ST2	RT2	Static	default location	US

Flexconnect本地交換命令列介面(CLI)

在CLI中運行以下命令：

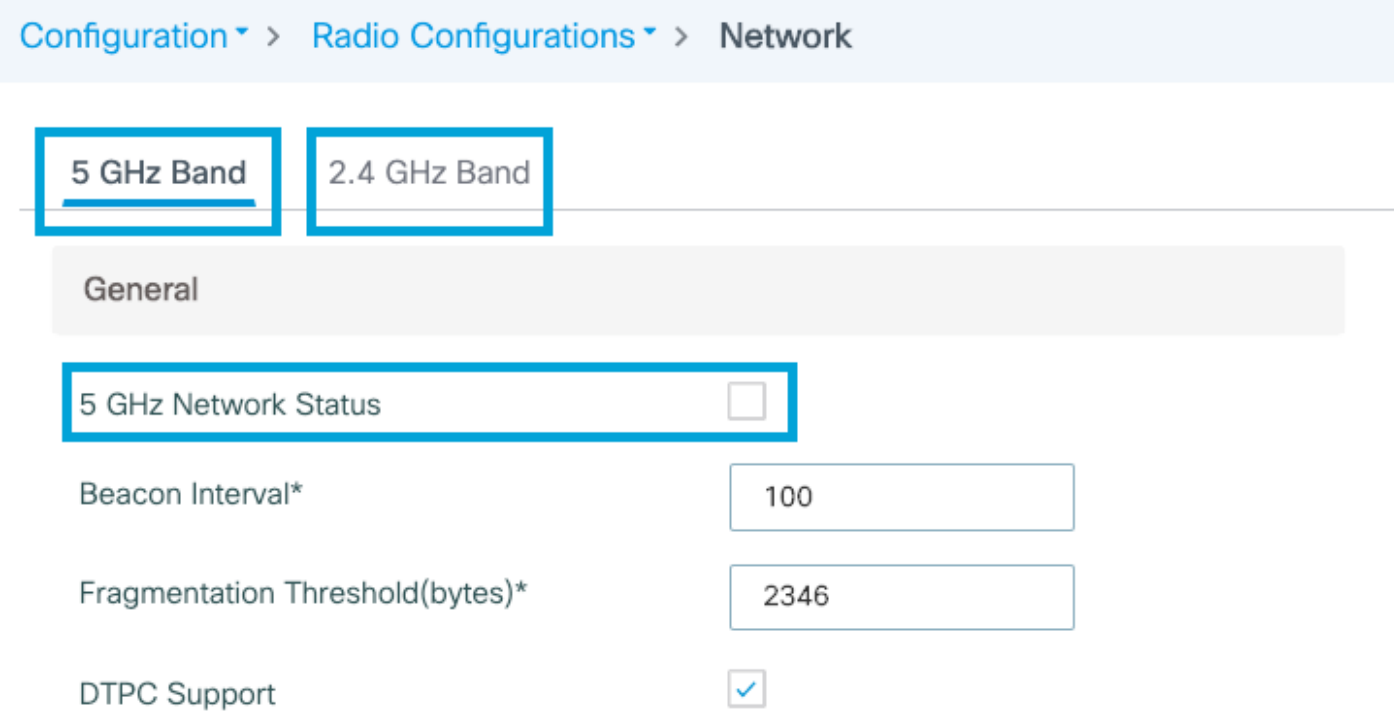
```
//////// WLAN Configuration
wlan Voice 1 Voice
 ccx aironet-iesupport
no security ft adaptive
security wpa psk set-key ascii 0 Cisco123
no security wpa akm dot1x
security wpa akm psk
no shutdown

//////// Policy Profile Configuration
wireless profile policy PP2
do wireless autoqos policy-profile PP2 mode voice
service-policy input platinum-up
service-policy output platinum
vlan 2672
no shutdown

//////// Policy Tag Configuration
wireless tag policy PT2
wlan Voice policy PP2

//////// Flex Profile Configuration
wireless profile flex FP2
arp-caching
vlan-name 1
native-vlan-id 1

//////// Site Tag Configuration
wireless tag site ST2
no local-site
flex-profie FP2

//////// 2.4 GHz RF Profile Configuration
ap dot11 24ghz rf-profile Voice24GHz
rate RATE_11M disable
rate RATE_12M mandatory
rate RATE_1M disable
rate RATE_2M disable
rate RATE_5_5M disable
rate RATE_6M disable
rate RATE_9M disable
no shutdown

//////// 5 GHz RF Profile Configuration
ap dot11 5ghz rf-profile Voice5GHz
rate RATE_24M supported
rate RATE_6M disable
rate RATE_9M disable
no shutdown

//////// RF Tag Configuration
wireless tag rf RT2
24ghz-rf-policy Voice24GHz
5ghz-rf-policy Voice5GHz

//////// AP Configuration
ap a023.9f86.52c0
policy-tag PT2
rf-tag RT2
site-tag ST2
```

配置介質引數

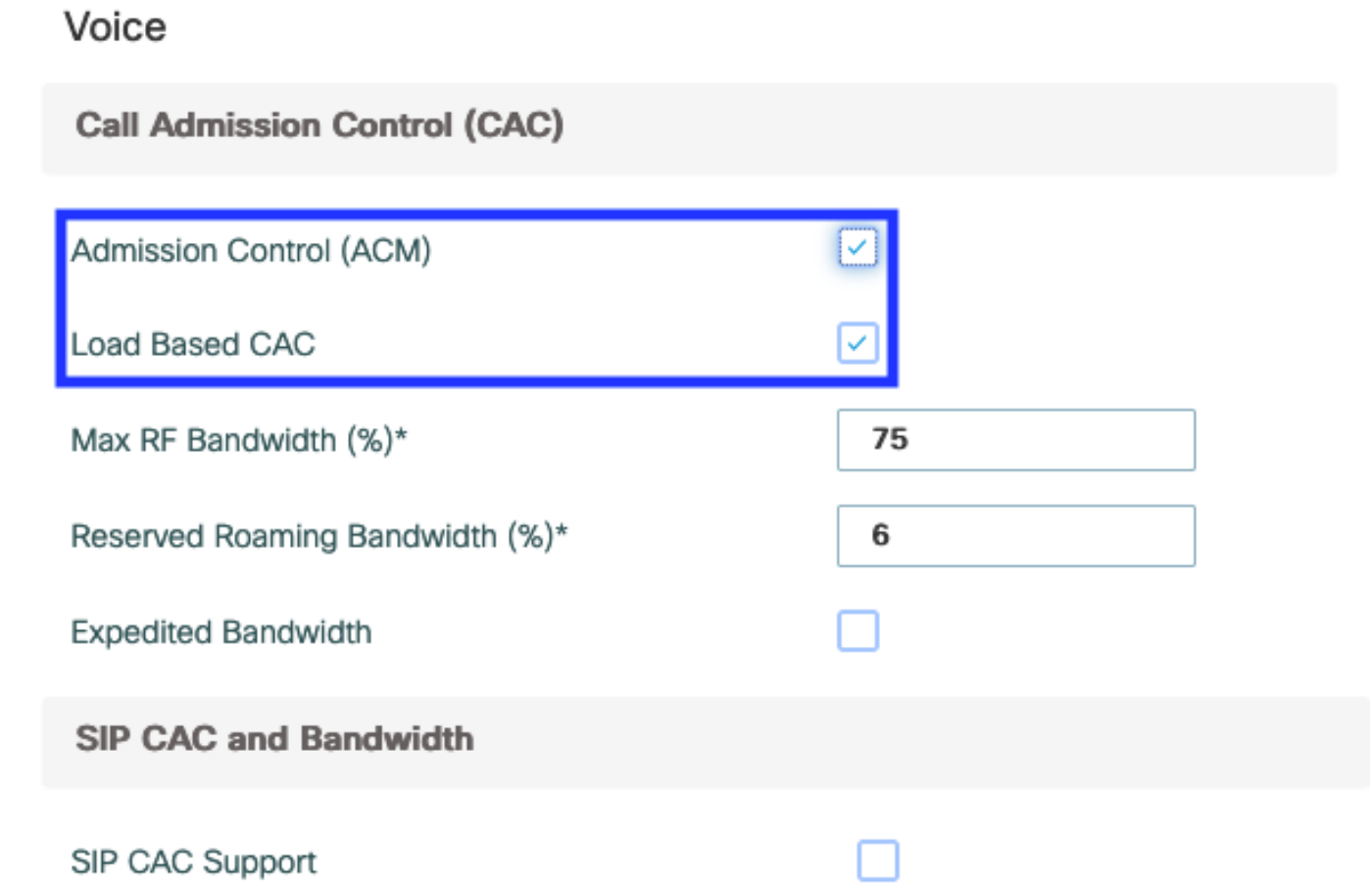
GUI配置

步驟1.導覽至**Configuration > Radio Configuration > Network。**禁用5 GHz和2.4 Ghz頻段，然後按一下 **應用。**

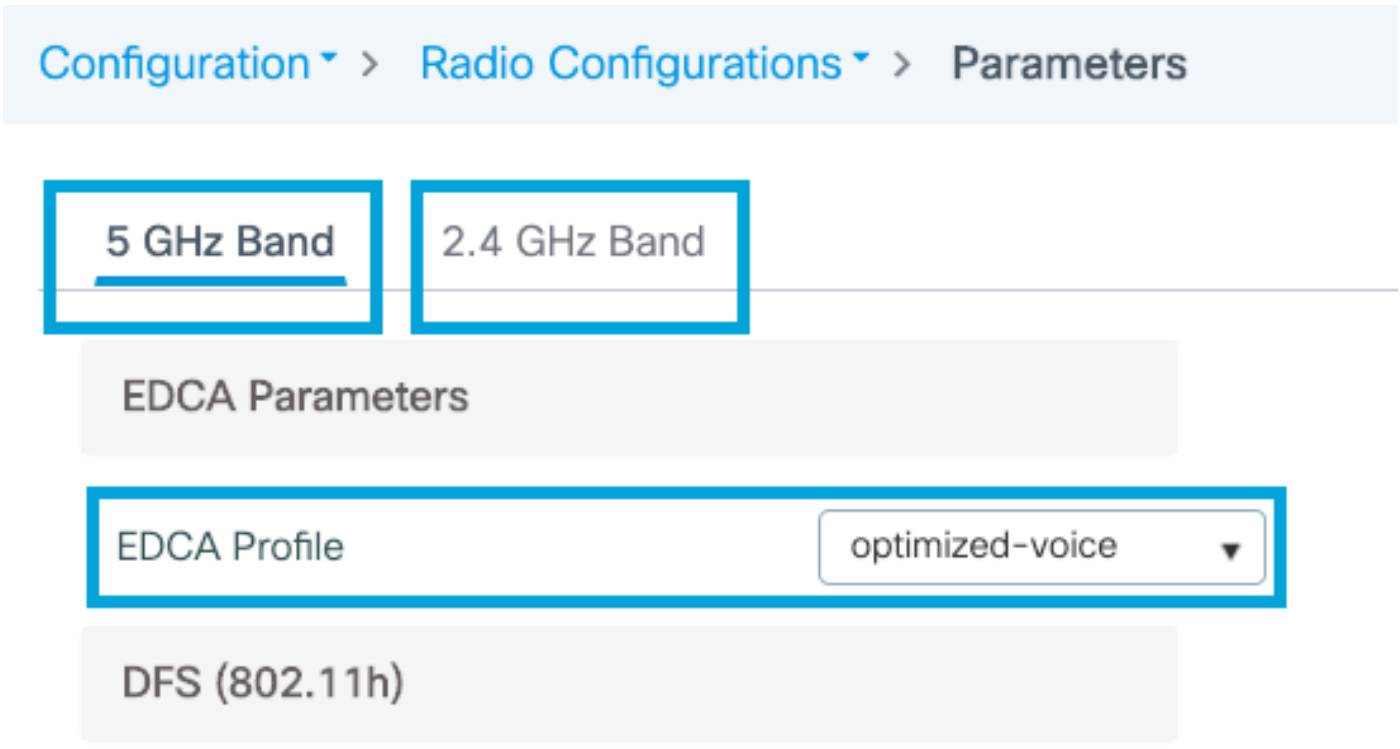
請注意，這將暫時禁用所有5ghz wifi網路！僅在處於維護視窗時運行此命令



步驟2.導覽至**Configuration > Radio Configuration > Media Parameters。在2.4 GHz和5 GHz頻段上啟用准入控制和基於負載的呼叫准入控制(CAC)，然後按一下Apply**:



步驟3.導覽至**Configuration > Radio Configurations > Parameters**。在兩個頻段上將EDCA配置檔案配置為**optimized-voice**，然後按一下**Apply**。



步驟4.導覽至**Configuration > Radio Configuration > Network**。啟用5 GHz和2.4 Ghz頻段，然後點選**Apply**。

命令列介面(CLI)

在CLI上運行以下命令：

```
Andressi_9800(config)#ap dot11 24ghz shutdown
Andressi_9800(config)#ap dot11 5ghz shutdown

Andressi_9800(config)#dot11 24ghz cac voice acm

Andressi_9800(config)#dot11 5ghz cac voice acm

Andressi_9800(config)#ap dot11 24ghz edca-parameters optimized-voice
Andressi_9800(config)#ap dot11 5ghz edca-parameters optimized-voice

Andressi_9800(config)#no ap dot11 24ghz shutdown
Andressi_9800(config)#no ap dot11 5ghz shutdown
```

驗證

您可以使用這些命令驗證當前配置：

```
# show wlan { summary | id | name | all }
# show run wlan
# show run aaa
# show aaa servers
# show ap config general
# show ap name <ap-name> config general
# show ap tag summary
# show ap name <AP-name> tag detail
# show wlan { summary | id | name | all }
# show wireless tag policy detailed <policy-tag-name>
# show wireless profile policy detailed <policy-profile-name>
```

要檢視CAC統計資訊和呼叫控制指標，請運行以下命令：

```
#show ap name AP2802I-21 dot11 5ghz voice stats
#show ap name <ap-name> dot11 5ghz call-control metrics
```

疑難排解

條件式偵錯和無線電主動式追蹤

Radio Active(RA)跟蹤為與指定條件（本例中為客戶端MAC地址）互動的所有進程提供調試級別跟蹤。 若要啟動條件式偵錯，請遵循以下步驟執行。我們重點介紹9800 WLC在通話期間提供的輸出。

步驟1.確保未啟用調試條件。

```
# clear platform condition all
```

步驟2.為要監控的無線客戶端MAC地址啟用調試條件。此命令開始監控提供的mac地址達30分鐘（1800秒）。 您可選擇將此時間增加至 2085978494 秒。

```
# debug wireless mac <8821-MAC-address> {monitor-time <seconds>}
```

注意:為了同時監控多個客戶端，請對每個mac地址運行debug wireless mac <aaaa.bbb.cccc>命令。

注意:您看不到終端會話上客戶端活動的輸出，因為所有內容都在內部緩衝，供以後檢視。

步驟3.從8821 Cisco IP電話建立呼叫。

步驟4.當呼叫完成時或在預設或配置的監控時間到期前重現問題時，停止調試。

```
# no debug wireless mac <8821-MAC-address>
```

當監控時間結束或偵錯無線停止後，9800 WLC 會產生本機檔案，名稱如下：

ra_trace_MAC_aaaabbbbcccc_HHMMSS.XXX_timezone_DayWeek_Month_Day_year.log

步驟5. 收集mac地址活動的檔案。您可以將ra跟蹤.log複製到外部伺服器，也可以直接在螢幕上顯示輸出。檢查RA跟蹤檔案的名稱

```
# dir bootflash: | inc ra_trace
```

將檔案複製到外部伺服器：

```
# copy bootflash:ra_trace_MAC_aaaabbbbcccc_HHMMSS.XXX_timezone_DayWeek_Month_Day_year.log
tftp://a.b.c.d/ra-FILENAME.txt
```

顯示內容：

```
# more bootflash:ra_trace_MAC_aaaabbbbcccc_HHMMSS.XXX_timezone_DayWeek_Month_Day_year.log
```

步驟6.刪除調試條件。

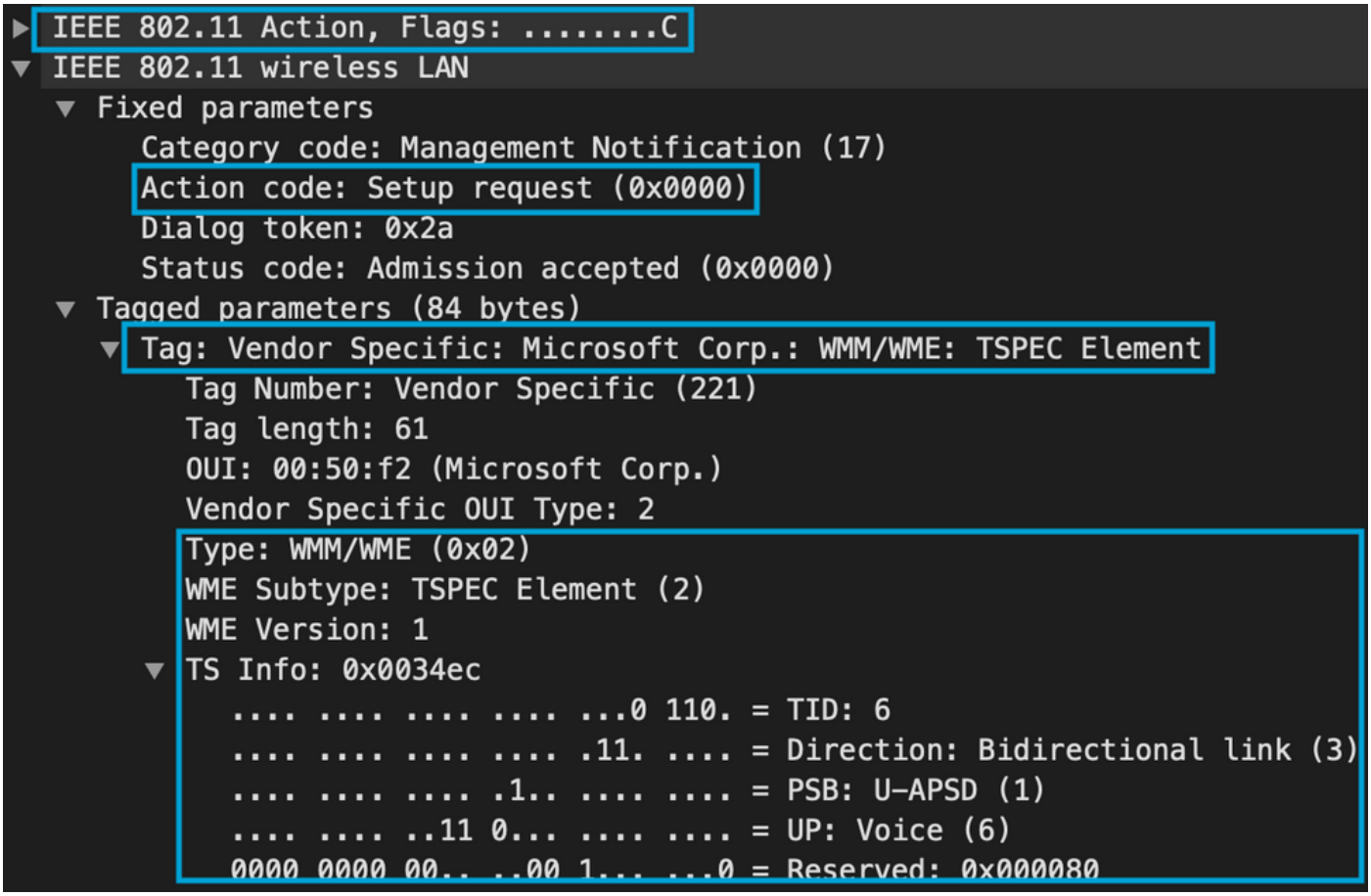
```
# clear platform condition all
```

附註：疑難排解作業階段後，請務必移除偵錯條件。

在RA跟蹤的輸出中，將發生流量規範(TSPEC)協商，這將確定8821是否允許將其流量標為使用者優先順序6，以及是否可以建立呼叫。為了協商使用隊列6,8821會傳送請求許可權的運算元據包。

```
2019/08/25 18:53:54.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Got action frame from this client.
2019/08/25 18:53:54.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Received Action frame with code 0: ADDTS request
2019/08/25 18:53:54.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Got LBCAC Metrics IE:
2019/08/25 18:53:54.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
ADD TS from mobile slot_id 1 direction = 3
up = 6, tid = 6, upsd = 1, medium_time = 653, TSRSIE: No
2019/08/25 18:53:54.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
```

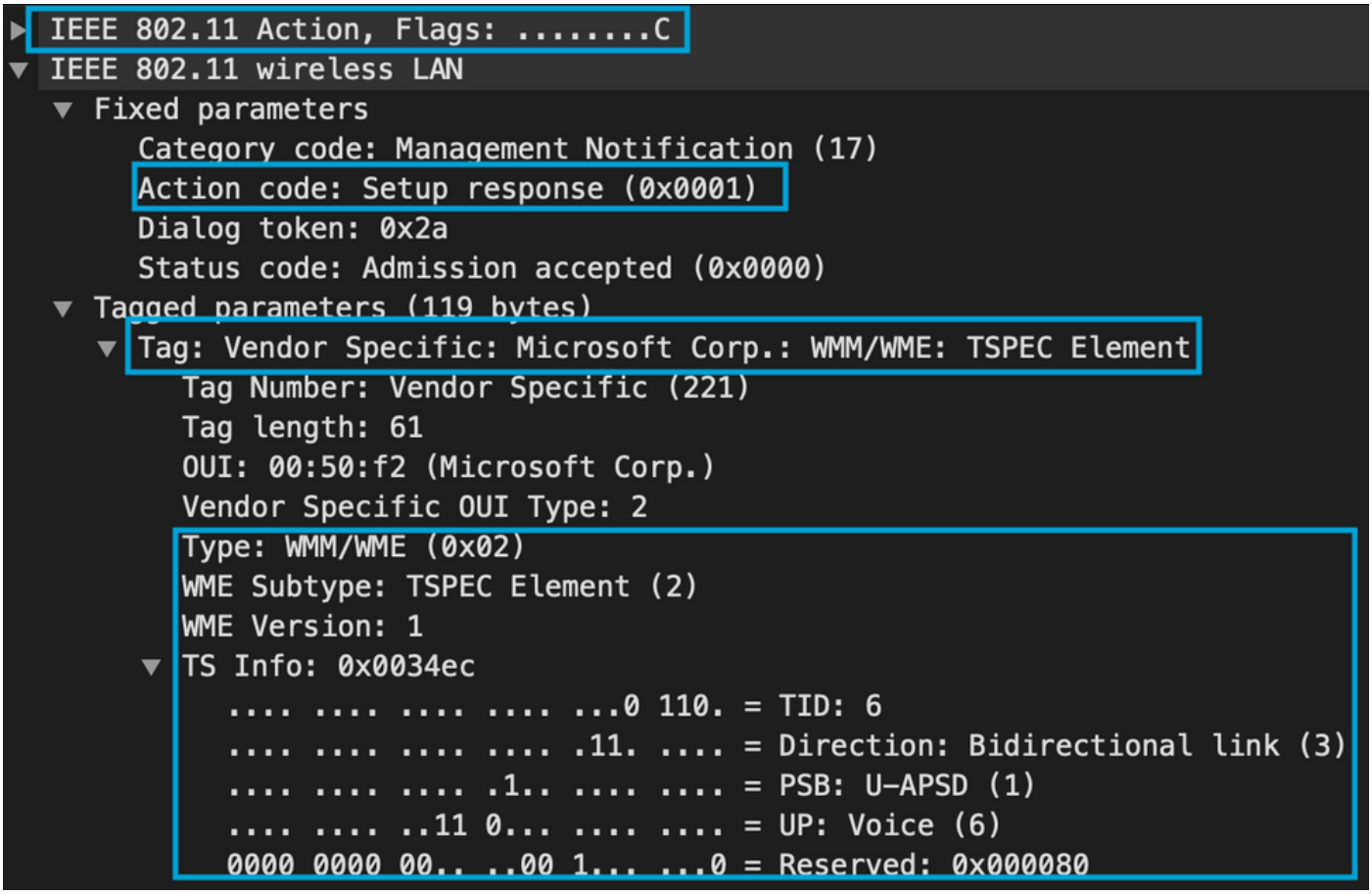
U-APSD Power save
在封包擷取中：



WLC會判斷是否有足夠的頻寬來分配呼叫，如果是，則會傳送接受TSPEC交涉的操作框架：

```
2019/08/25 18:53:54.510 {wncd_x_R0-0}{1}: [auth-mgr] [18106]: (info): [0000.0000.0000:unknown]
Session info 0x559e2019/08/25 18:53:54.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info):
MAC: 0027.902a.ab24 LBCAC checks for tspec PASSED for ms slot_id 1 bw_req = 653, tot_available
MT for tspecs = 22031 tx_queue_req = 20, current tx queue util = 0
2019/08/25 18:53:54.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): Calls in progress
incremented to 1
2019/08/25 18:53:54.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): allocating voice bw
for client: maxBW = 23437, BW requested = 653, total voice bw alloc = 653
2019/08/25 18:53:54.511 {wncd_x_R0-0}{1}: [ewlc-qos-client] [18106]: (info): MAC: 0027.902a.ab24
Call Accepted for tspec client
2019/08/25 18:53:54.511 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (ERR): MAC: 0027.902a.ab24
TCLAS Set Not used for TCLAS of tid=6
2019/08/25 18:53:54.511 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): Recommended rate
6500kbps:MCS 0 is not operational for radio: 6
2019/08/25 18:53:54.511 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): Recommended rate
13000kbps:MCS 1 is not operational for radio: 6
2019/08/25 18:53:54.511 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): Recommended rate
26000kbps:MCS 3 is not operational for radio: 6
2019/08/25 18:53:54.511 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Sending Successful ADD TS resp to mobile slot_id 1
2019/08/25 18:53:54.511 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Build ADD TS slot:1, tid:6, user_priority:6, upsd_enable:1, dir:3,bandwidth:653, avail_bw:0,
inactive_timer:0, tsm_req_id:0
2019/08/25 18:53:54.511 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: a023.9f86.52c0
send qos ADD TS payload to AP
```

在封包擷取中：



然後，通過SIP與呼叫管理器建立呼叫，並轉發RTP流量。

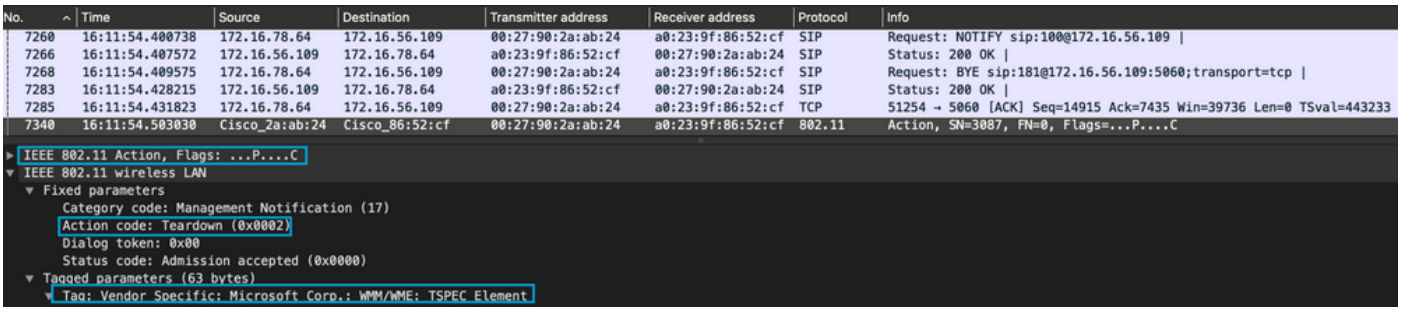
Time	Source	Destination	Transmitter address	Receiver address	Protocol	Info
16:11:41.860804	172.16.78.64	172.16.56.109	00:27:90:2a:ab:24	a0:23:9f:86:52:cf	SIP/SDP	Request: INVITE sip:181@172.16.56.109;user=phone |
16:11:41.864384	172.16.56.109	172.16.78.64	a0:23:9f:86:52:cf	00:27:90:2a:ab:24	SIP	Status: 100 Trying |
16:11:42.529759	172.16.56.109	172.16.78.64	a0:23:9f:86:52:cf	00:27:90:2a:ab:24	SIP	Status: 180 Ringing |
16:11:47.581067	172.16.56.109	172.16.78.64	a0:23:9f:86:52:cf	00:27:90:2a:ab:24	SIP/SDP	Status: 200 OK |
16:11:47.594494	172.16.78.64	172.16.56.109	00:27:90:2a:ab:24	a0:23:9f:86:52:cf	SIP	Request: ACK sip:181@172.16.56.109:5060;transport=tcp |

RTP資料包：

16:11:47.700968	172.16.78.65	172.16.78.64	00:eb:d5:db:00:d6	a0:23:9f:86:52:cf	RTP
16:11:47.701470	172.16.78.65	172.16.78.64	a0:23:9f:86:52:cf	00:27:90:2a:ab:24	RTP
16:11:47.717783	172.16.78.65	172.16.78.64	00:eb:d5:db:00:d6	a0:23:9f:86:52:cf	RTP
16:11:47.718528	172.16.78.65	172.16.78.64	a0:23:9f:86:52:cf	00:27:90:2a:ab:24	RTP
16:11:47.730826	172.16.78.65	172.16.78.64	00:eb:d5:db:00:d6	a0:23:9f:86:52:cf	RTP
16:11:47.731395	172.16.78.65	172.16.78.64	a0:23:9f:86:52:cf	00:27:90:2a:ab:24	RTP
16:11:47.751602	172.16.78.65	172.16.78.64	00:eb:d5:db:00:d6	a0:23:9f:86:52:cf	RTP
16:11:47.752316	172.16.78.65	172.16.78.64	a0:23:9f:86:52:cf	00:27:90:2a:ab:24	RTP
16:11:47.766859	172.16.78.64	172.16.78.65	00:27:90:2a:ab:24	a0:23:9f:86:52:cf	RTP
16:11:47.776488	172.16.78.65	172.16.78.64	00:eb:d5:db:00:d6	a0:23:9f:86:52:cf	RTP

然後，8821通知呼叫管理器呼叫已終止，並通過傳送另一個操作幀通知WLC不再使用隊列6:

```
2019/08/25 18:54:08.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Got action frame from this client.
2019/08/25 18:54:08.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Received Action frame with code 2: DELTS request
2019/08/25 18:54:08.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
DEL TS from mobile slot_id 1up = 6, tid = 6, bw deleted = 653
2019/08/25 18:54:08.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Call Terminated for tspec client
2019/08/25 18:54:08.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Calls in progress - 1, Roam calls in progress - 0
```

```
2019/08/25 18:54:08.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: 0027.902a.ab24
Build DELETE TS slot:1 tid:6 up:6 upsd_enable:1 avail_bw: 0
2019/08/25 18:54:08.510 {wncd_x_R0-0}{1}: [ewlc-qos-voice] [18106]: (info): MAC: a023.9f86.52c0
send qos DELETE TS payload to AP
```

SIP終止和操作幀：