在Catalyst 9800 WLC上使用Cisco 8821配置语音WLAN

目录

简介

本文档介绍如何在中央交换和FlexConnect本地交换上使用Cisco 8821听筒配置9800无线LAN控制器(WLC)以进行语音部署。

先决条件

要求

Cisco 建议您了解以下主题：

- Catalyst无线9800配置型号
- FlexConnect
- 802.11r
- 呼叫准入控制 (CAC)

使用的组件

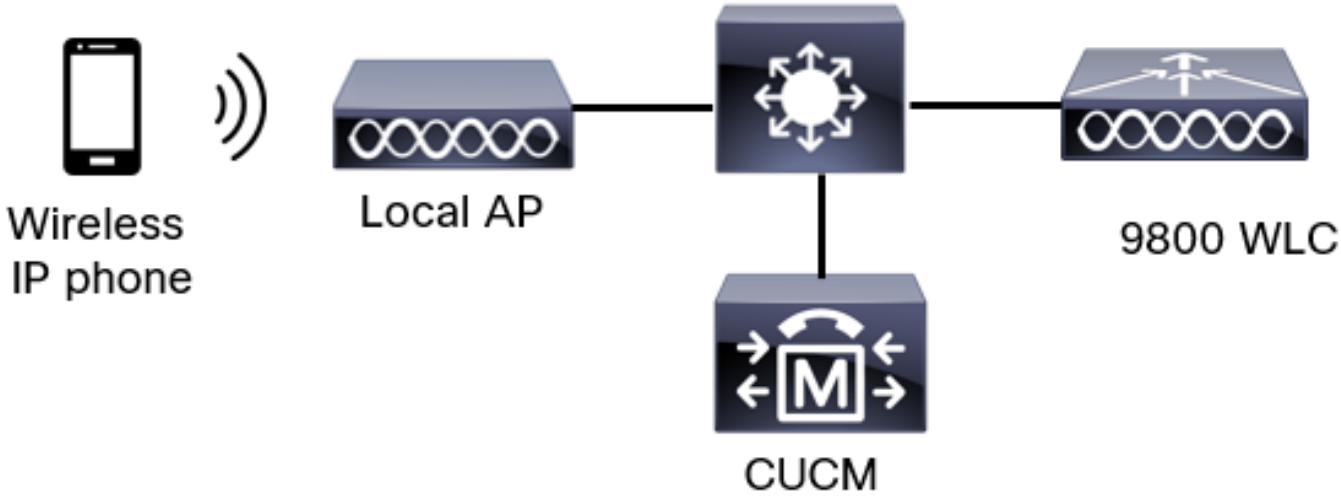
本文档中的信息基于9800L v17.6.1

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

配置SSID

方案 A：中央交换

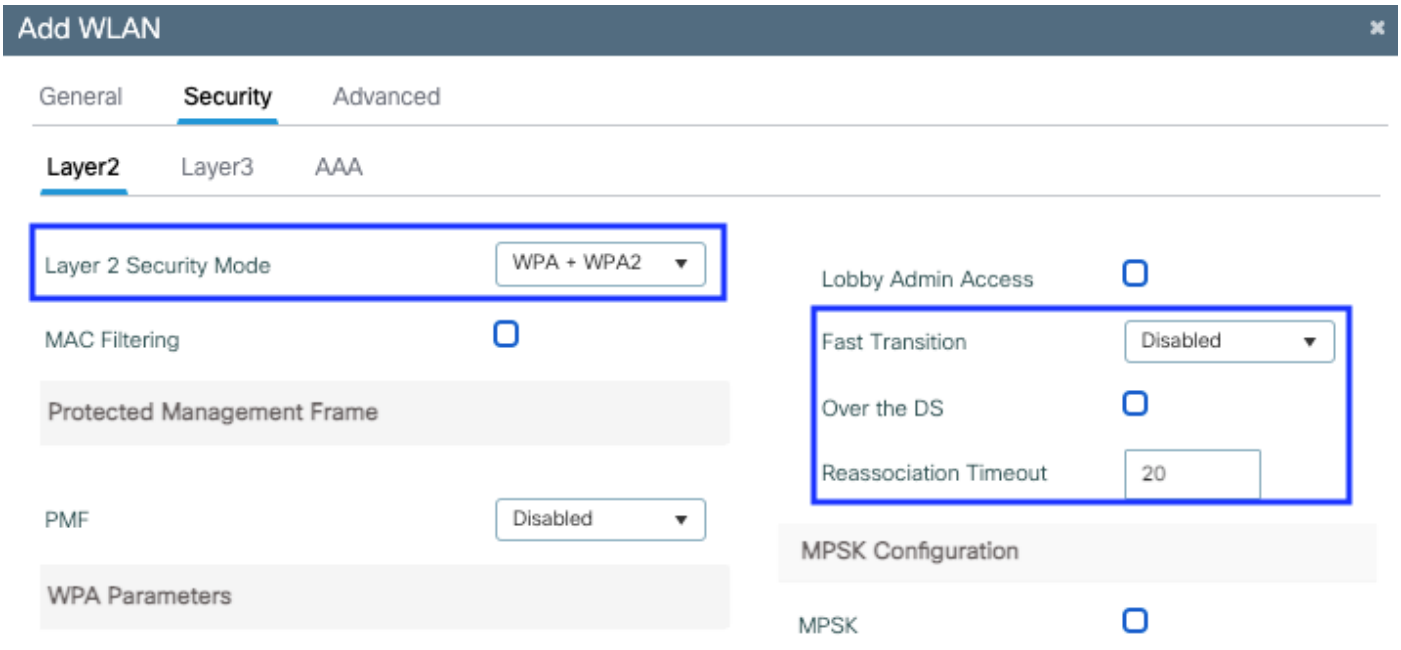
中央交换网络图

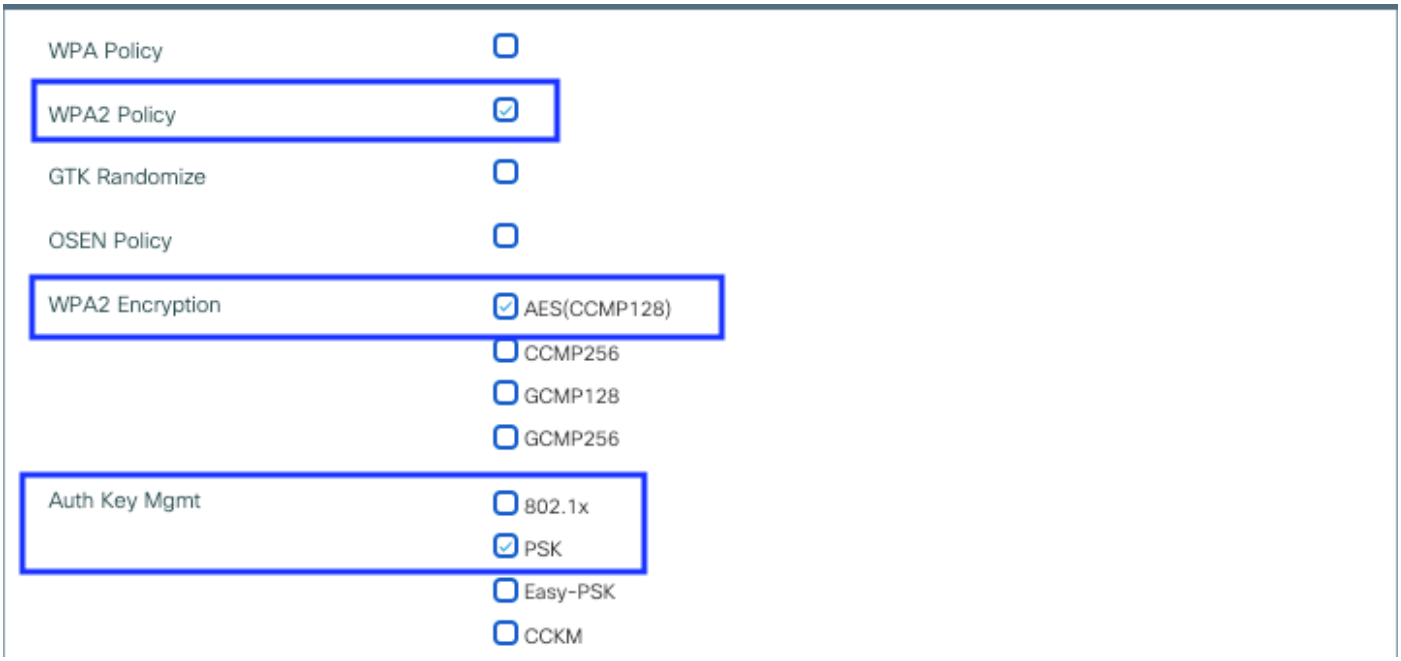


集中交换：标记和配置文件

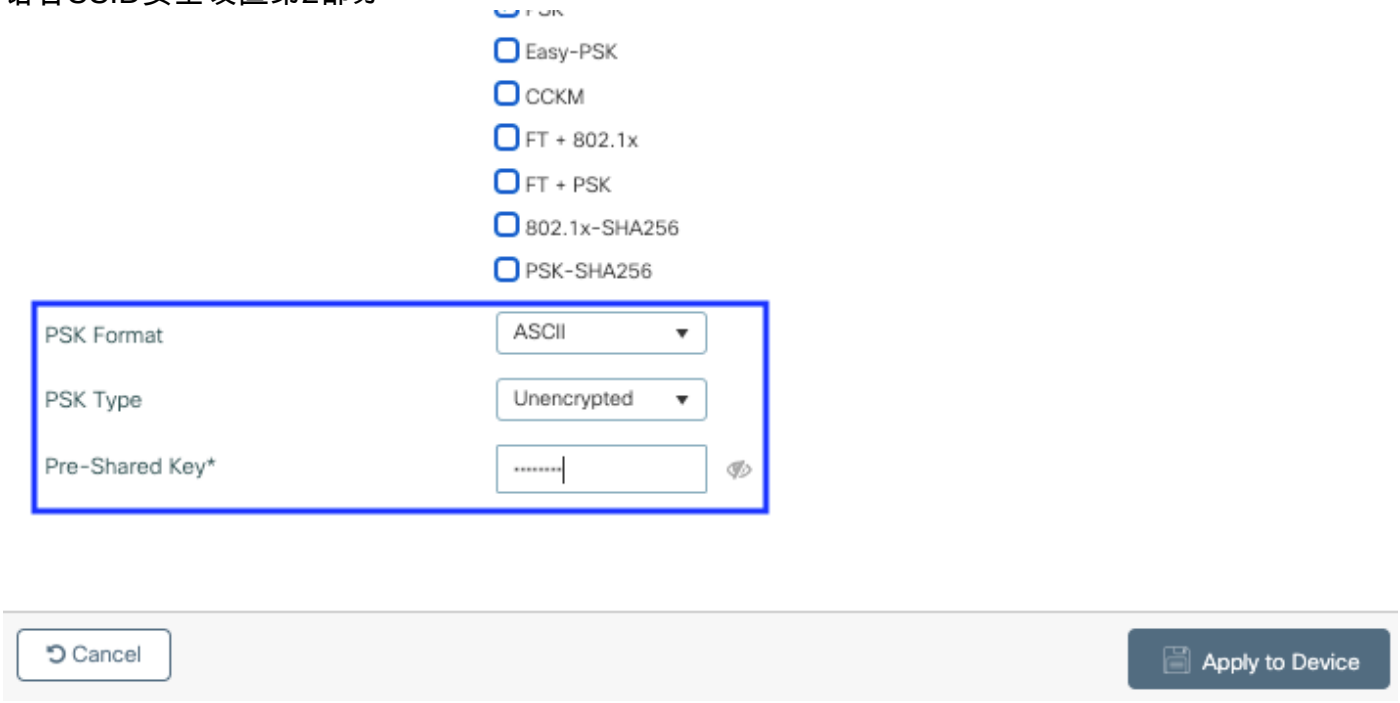
在本文档中，所有标记和配置文件的配置都使用高级无线设置完成，因为所有标记和配置文件都可以在同一菜单上配置。

步骤1.导航至**Configuration > Wireless Setup > Advanced > Start Now > WLAN Profile**，然**后单击**+Add以创建新的WLAN。配置SSID、配置文件名称、WLAN ID和WLAN的状态。然后，导航至**Security > Layer 2**并配置设置：





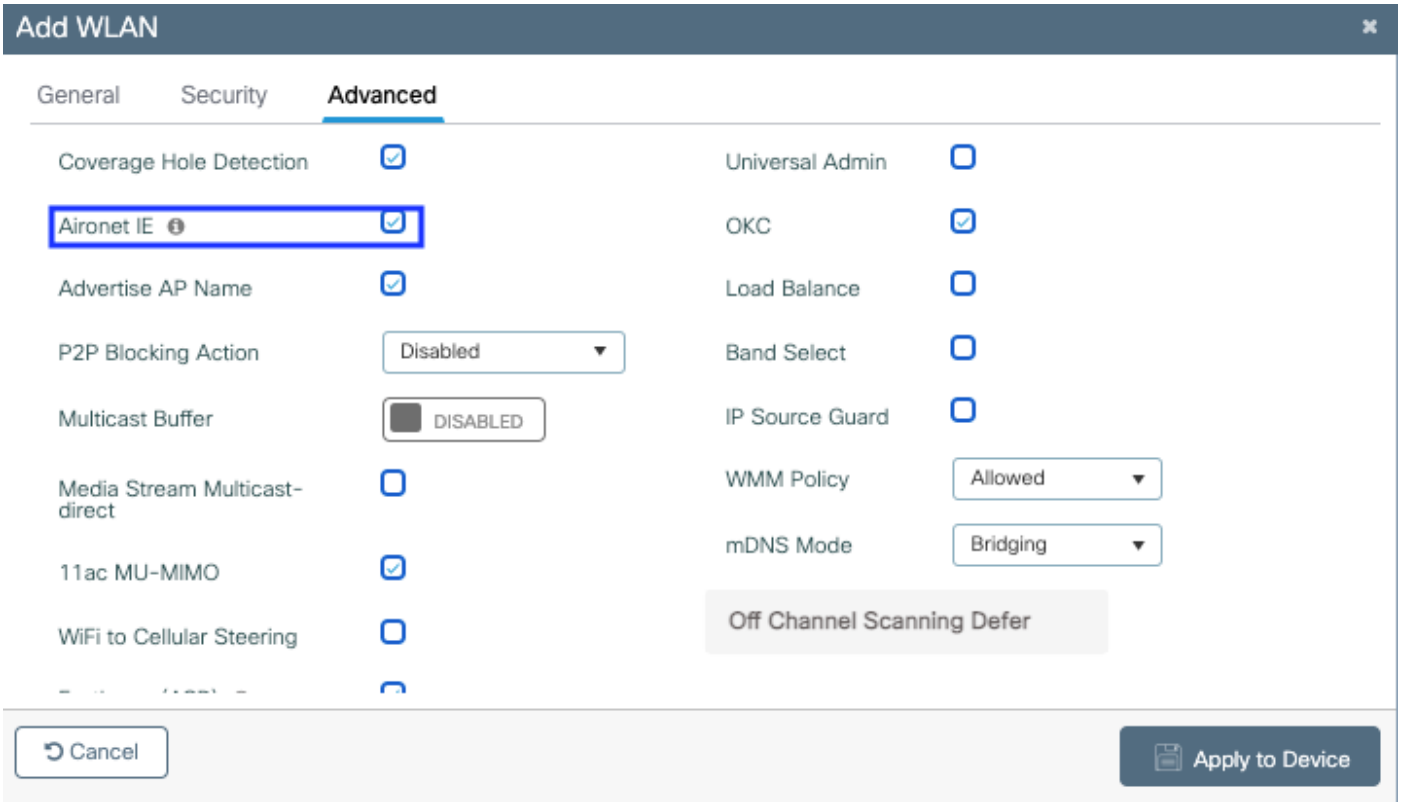
语音SSID安全设置第2部分



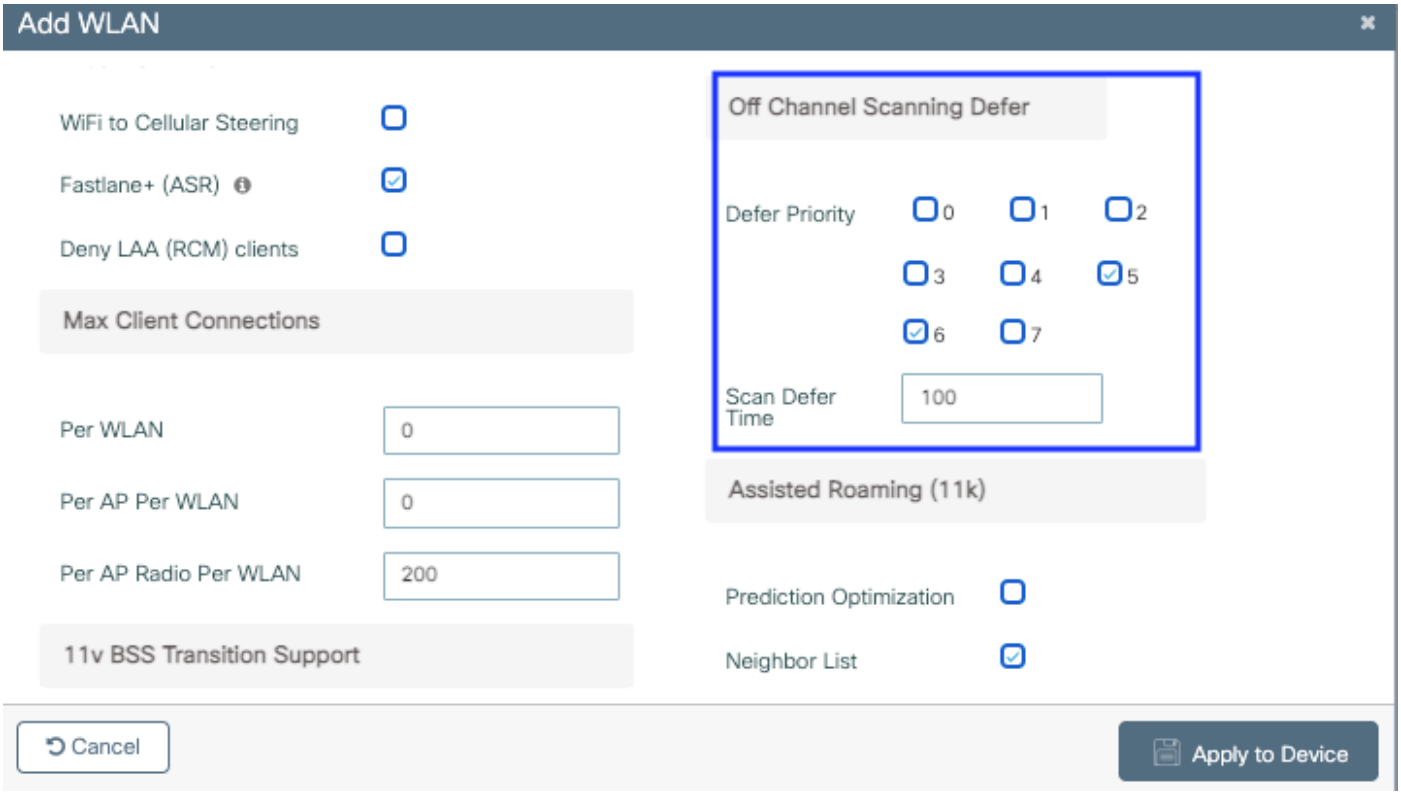
语音SSID安全设置第3部分语音SSID安全设置第1部分

注意：使用PSK SSID时，无需启用FT，因为漫游期间的握手很短。配置802.1X WPA企业时，建议启用FT+802.1X作为AKM并启用快速过渡，但将“Over the DS”保持为禁用状态。您也可以配置FT+PSK，但为简单起见，本示例使用常规PSK。

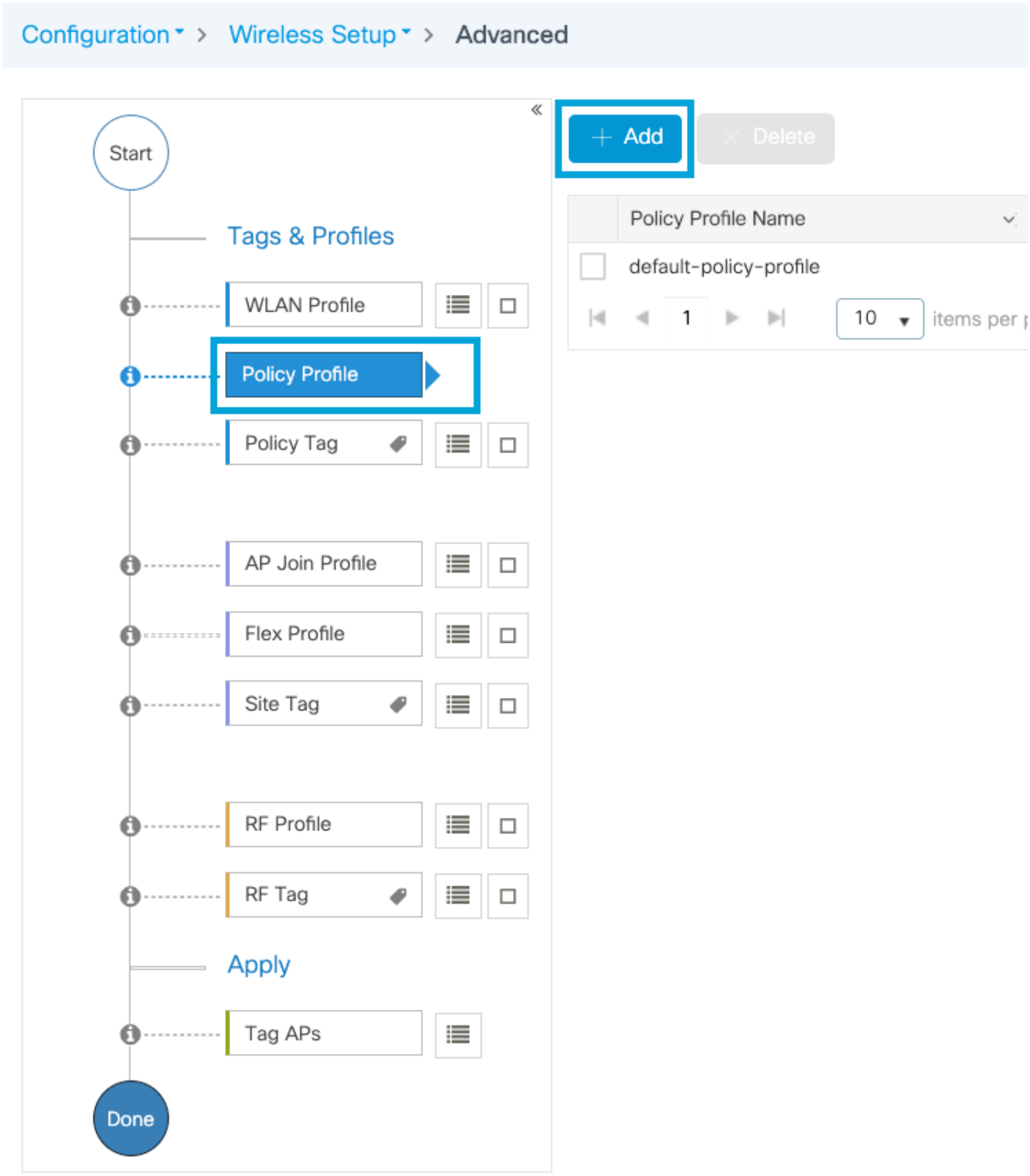
步骤2.导航至“高级”**选项**卡并启用Aironet IE。确保已禁用负载平衡和频段选择：



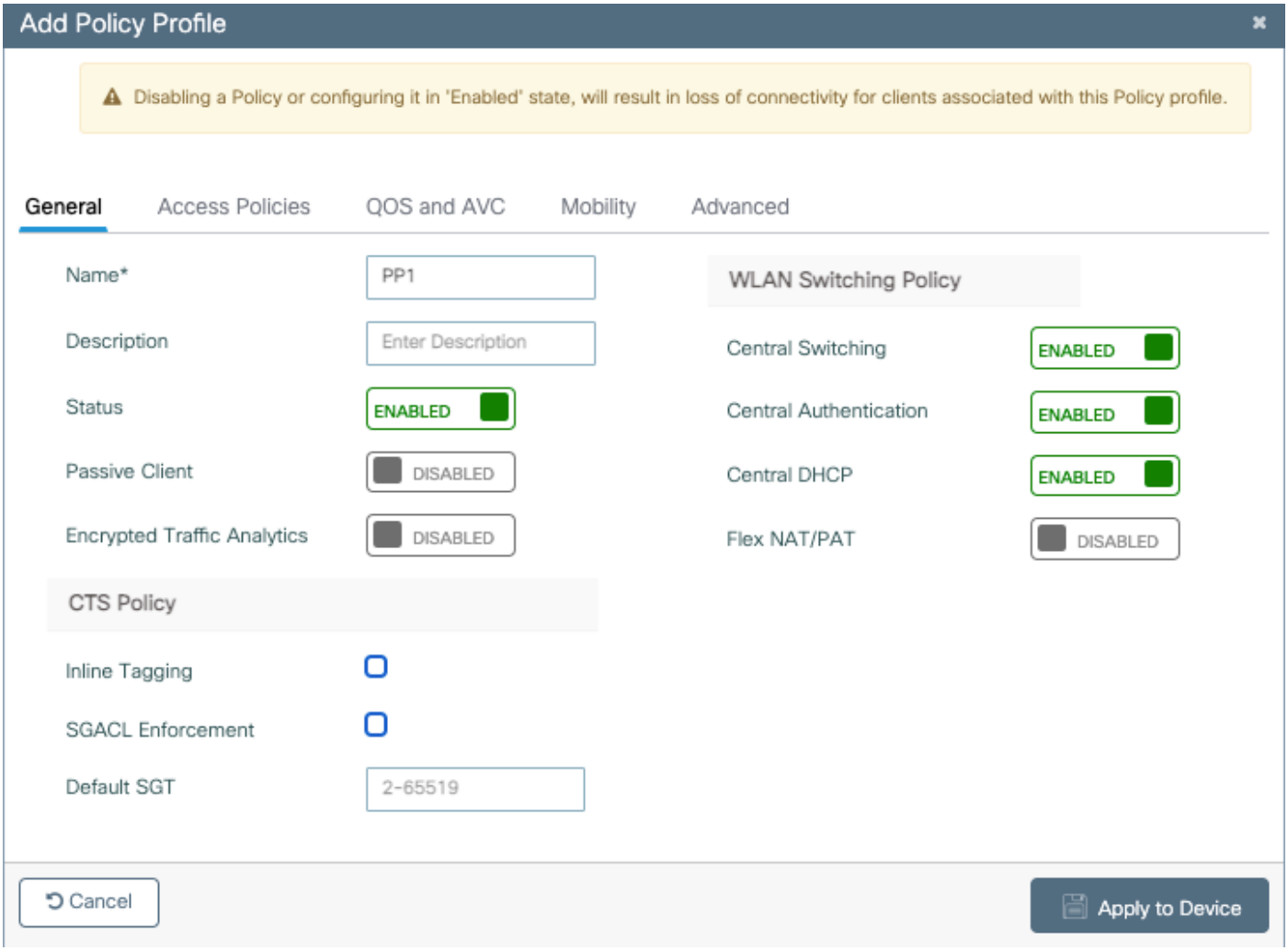
在同一页中，确保为优先级5、6和7启用了信道外扫描延迟。这可以防止AP在收到具有这些UP优先级的帧（基本上是语音帧）后100毫秒内信道外扫描。



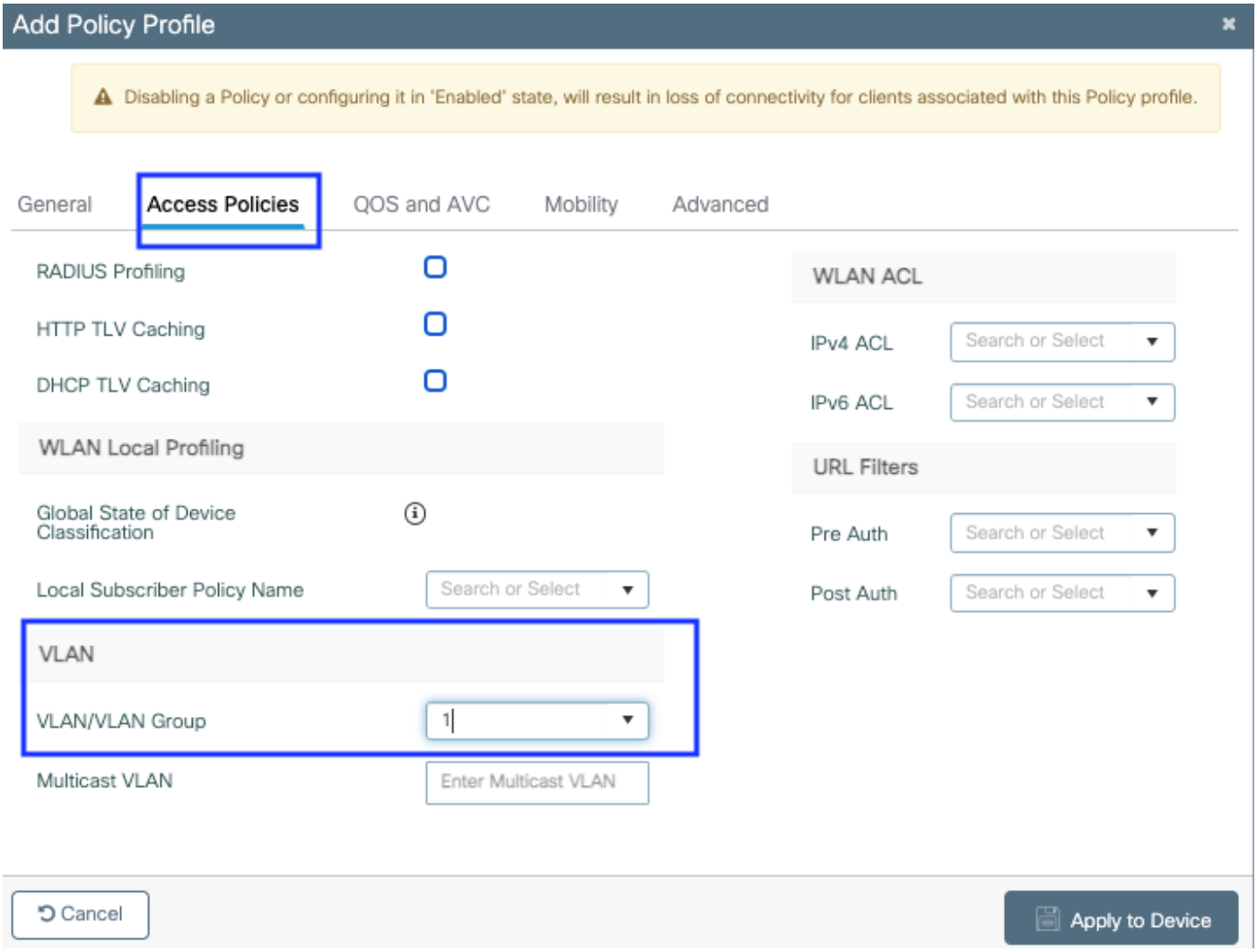
步骤3.选择Policy Profile，然后单击Add:



配置策略配置文件名称，将状态设置为启用，并保持中心交换、身份验证、DHCP和关联（在17.6之后，中心关联复选框消失）已启用：

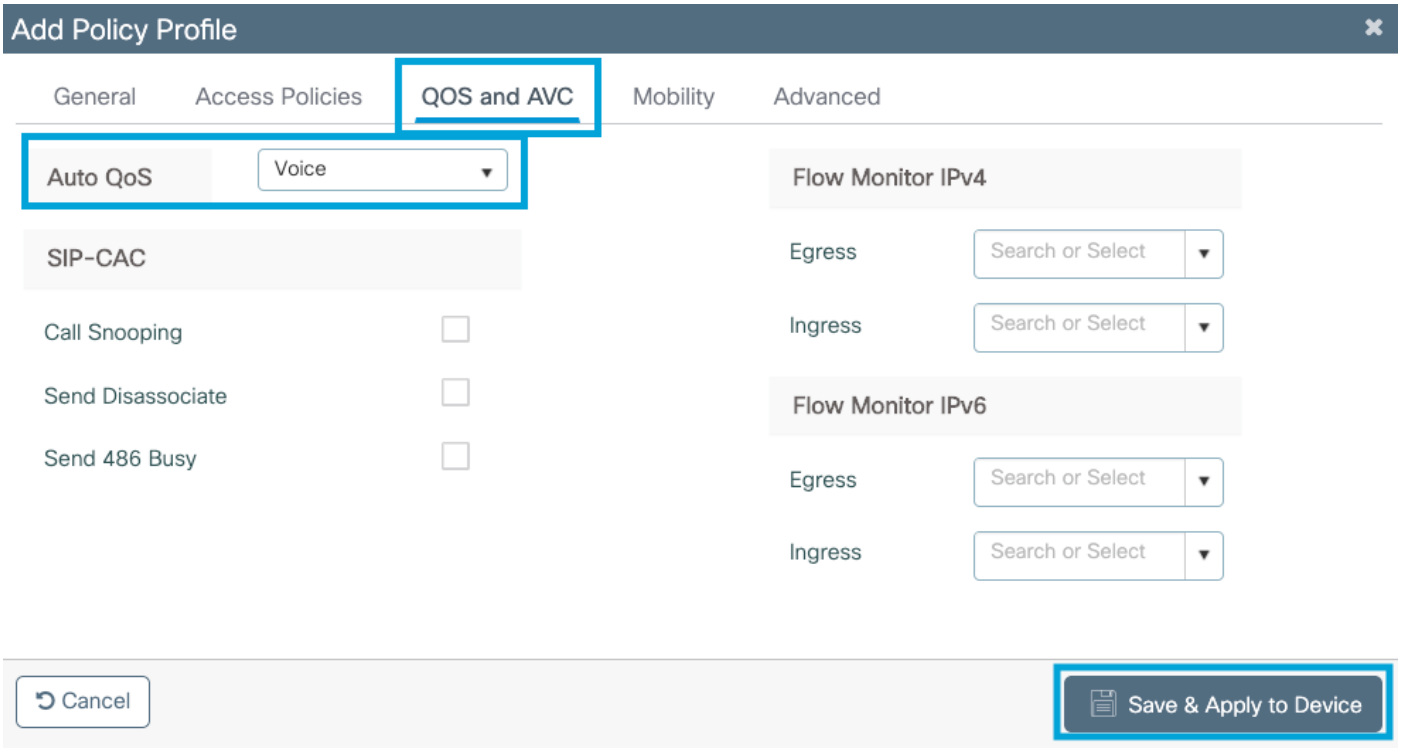


单击**Access Policies**并配置无线客户端在连接到SSID Voice：时将分配到的VLAN。



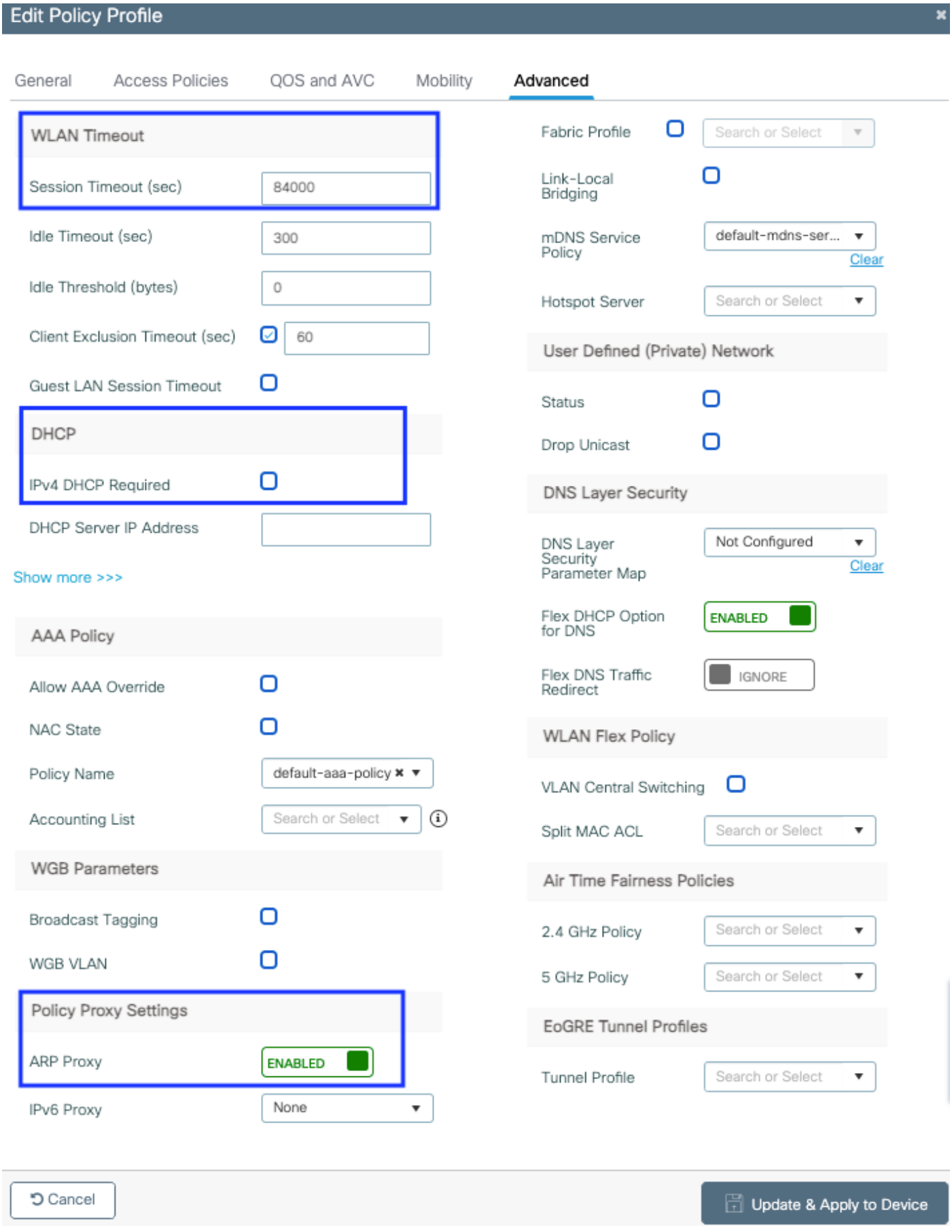
策略配置文件访问策略设置页面

单击QoS**和AVC，并**将Auto QoS参**数配置为**Voice**。**单击**Save & Apply to Device**。**



单击"**Advanced（高级）**"，将会话超时设置为84000，确保禁用所需的IPv4 DHCP并启用ARP代理

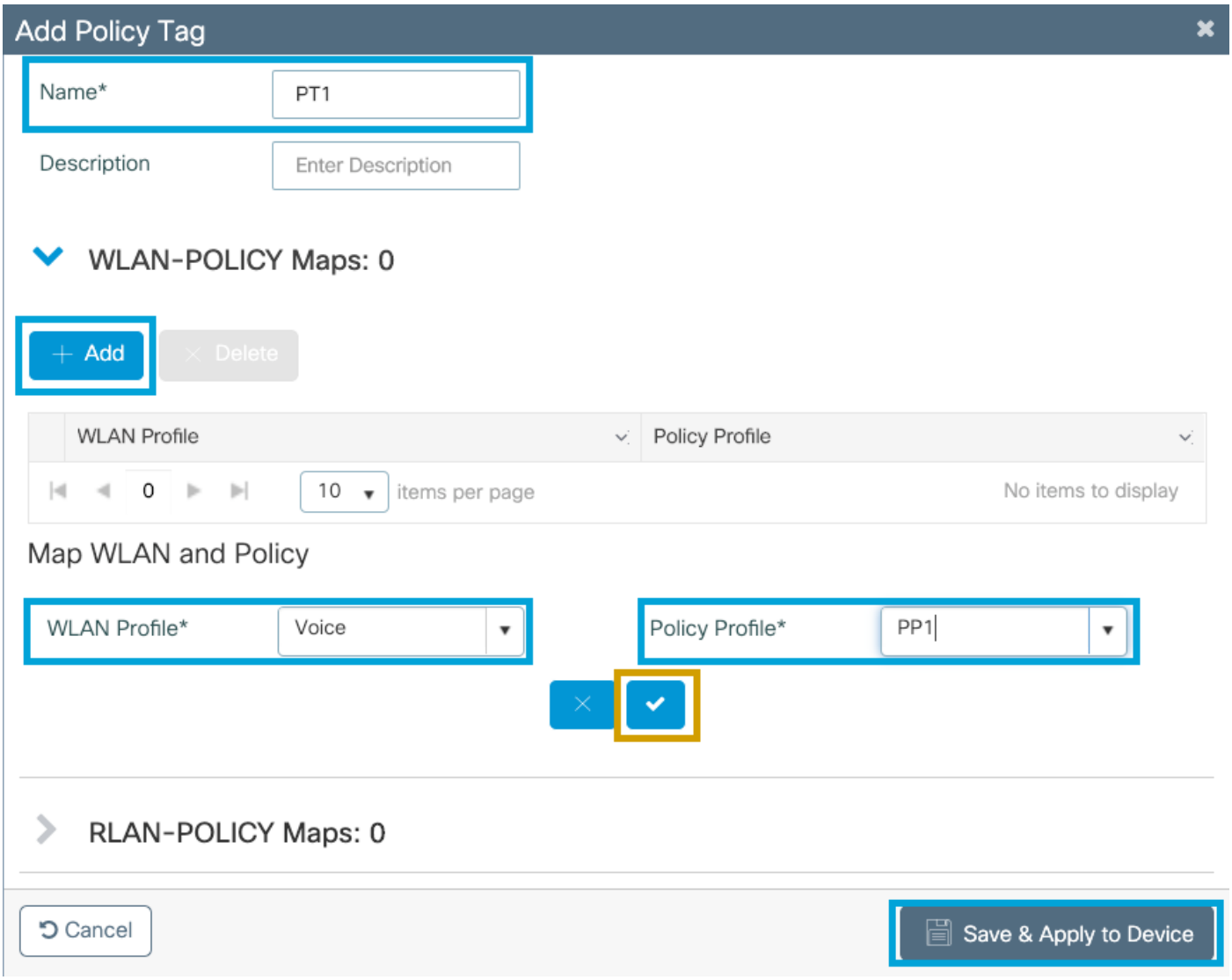
。



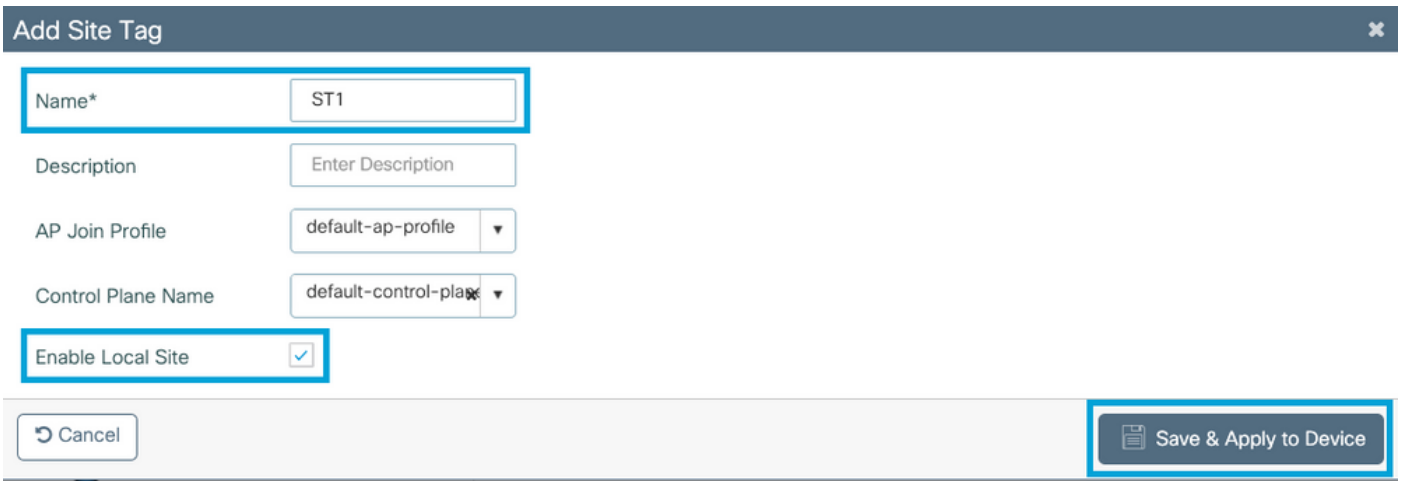
策略配置文件高级设置页面

步骤4.选择Policy **Tag并单**击Add。配置策略标记名称。在“WLAN-**Policy Maps”下，**单击“**+Add”。**从下拉**菜单中选**择**WLAN配置文件**和**策略配置文件**，然后单击要配置的映射的检查。然后，单击**保存**

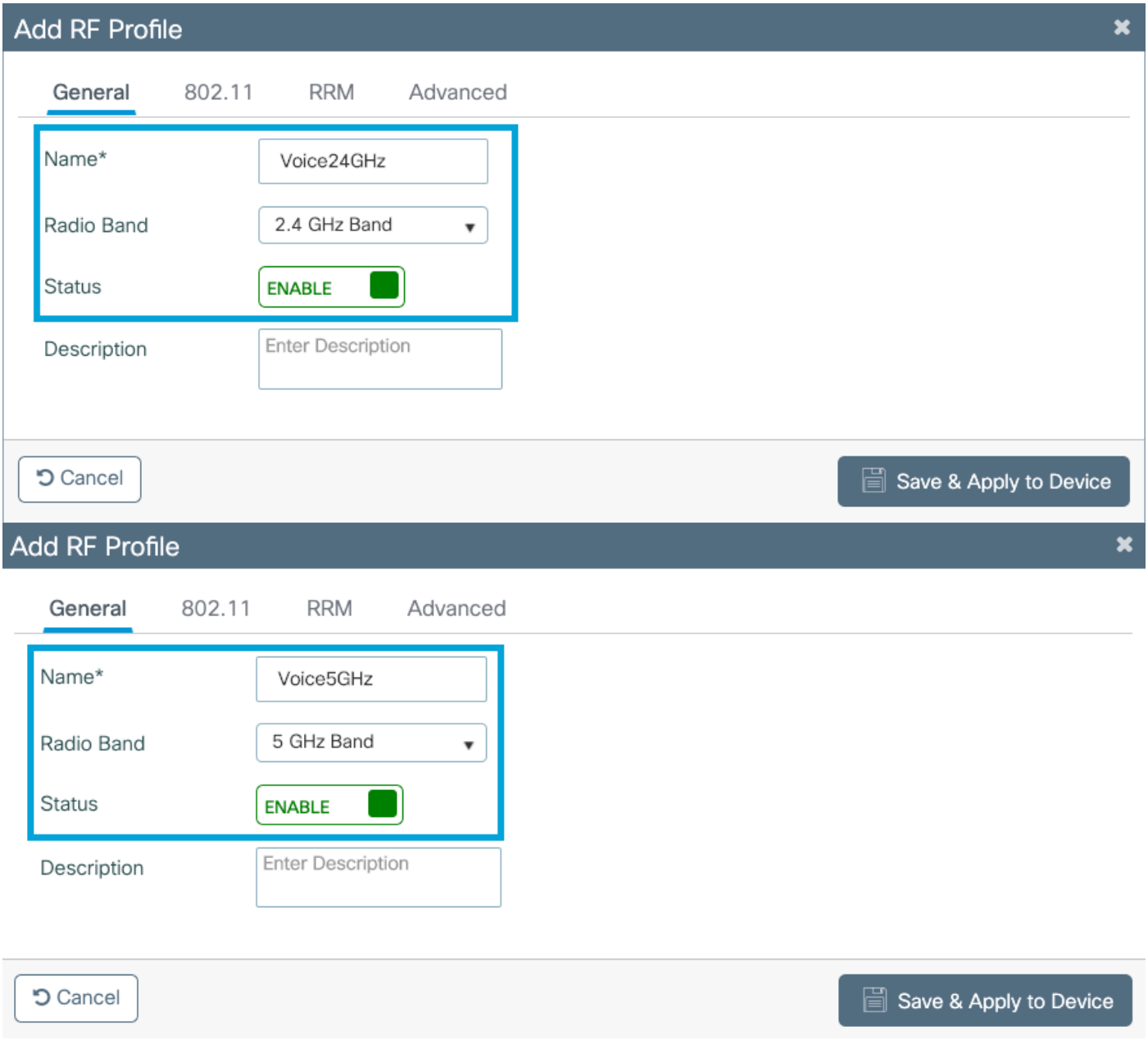
并应用到设备。



步骤5.选择“站**点标记”**并单击“**添加”。**选中**启用本地**站点框，使AP在本地模式下**运行。**然后，单击**Save & Apply to Device:**

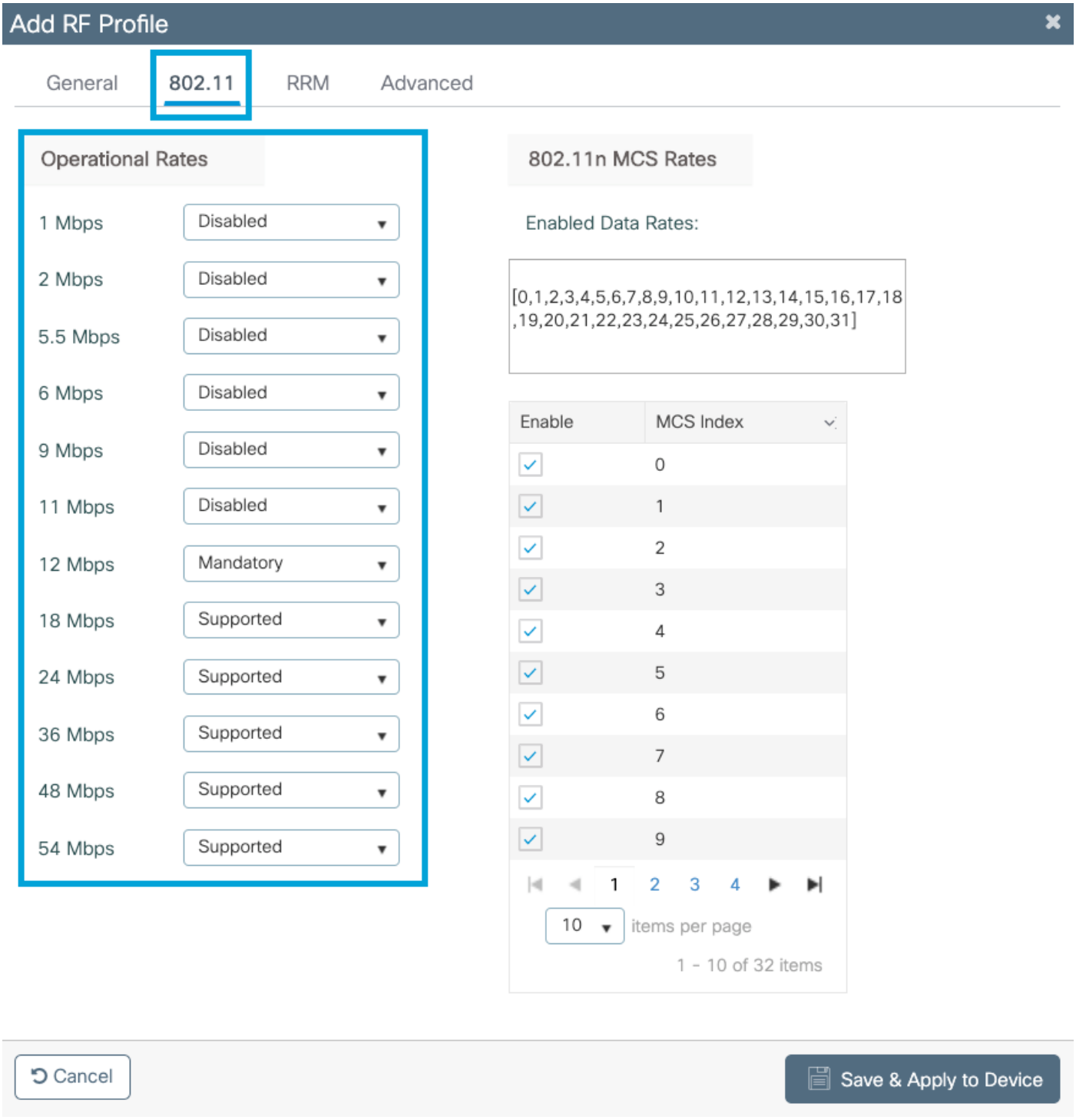


步骤6.选择RF配**置文件**并单击**添加。**按频段配置RF配置文件。

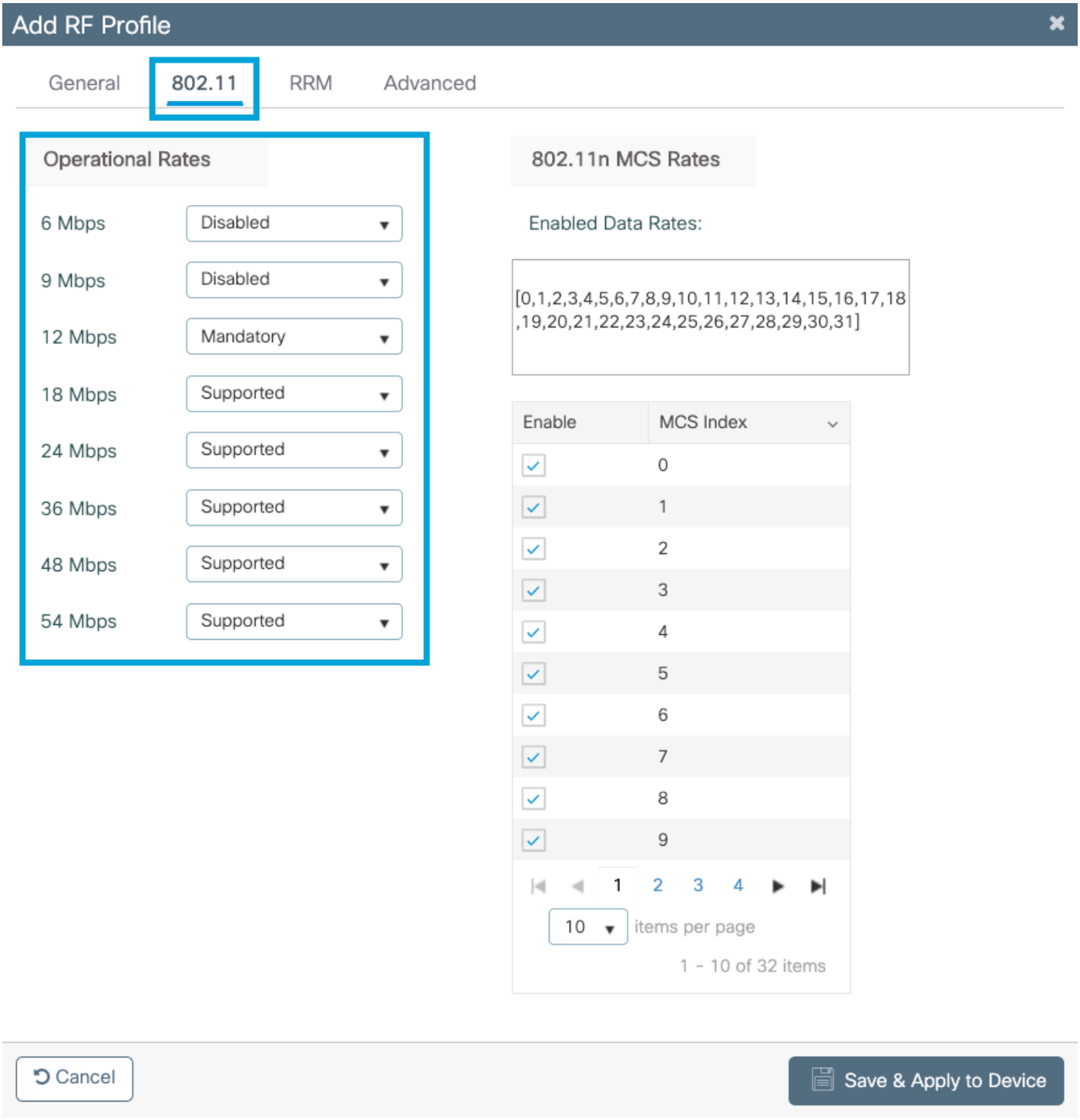


导航至**802.11菜**单。禁用所有低于12Mbps的速率，将12Mbps设置为强制速率，并根据两个频段的支持设置18 Mbps或更高速率。

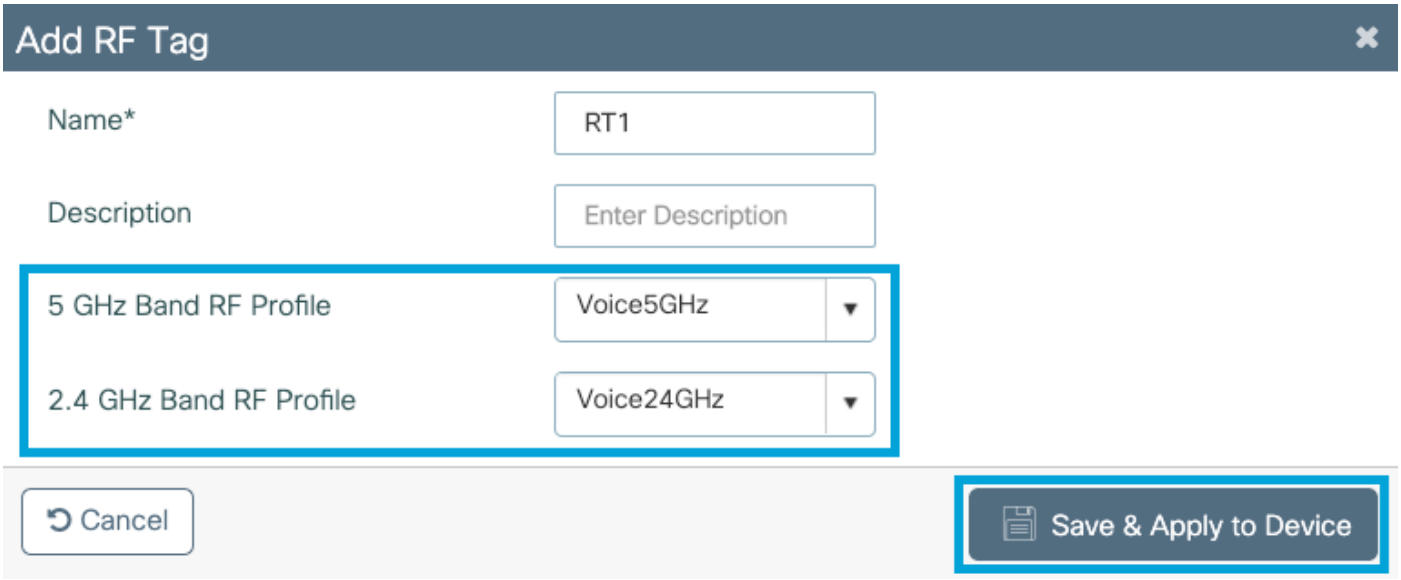
2.4 GHz数据速率：


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

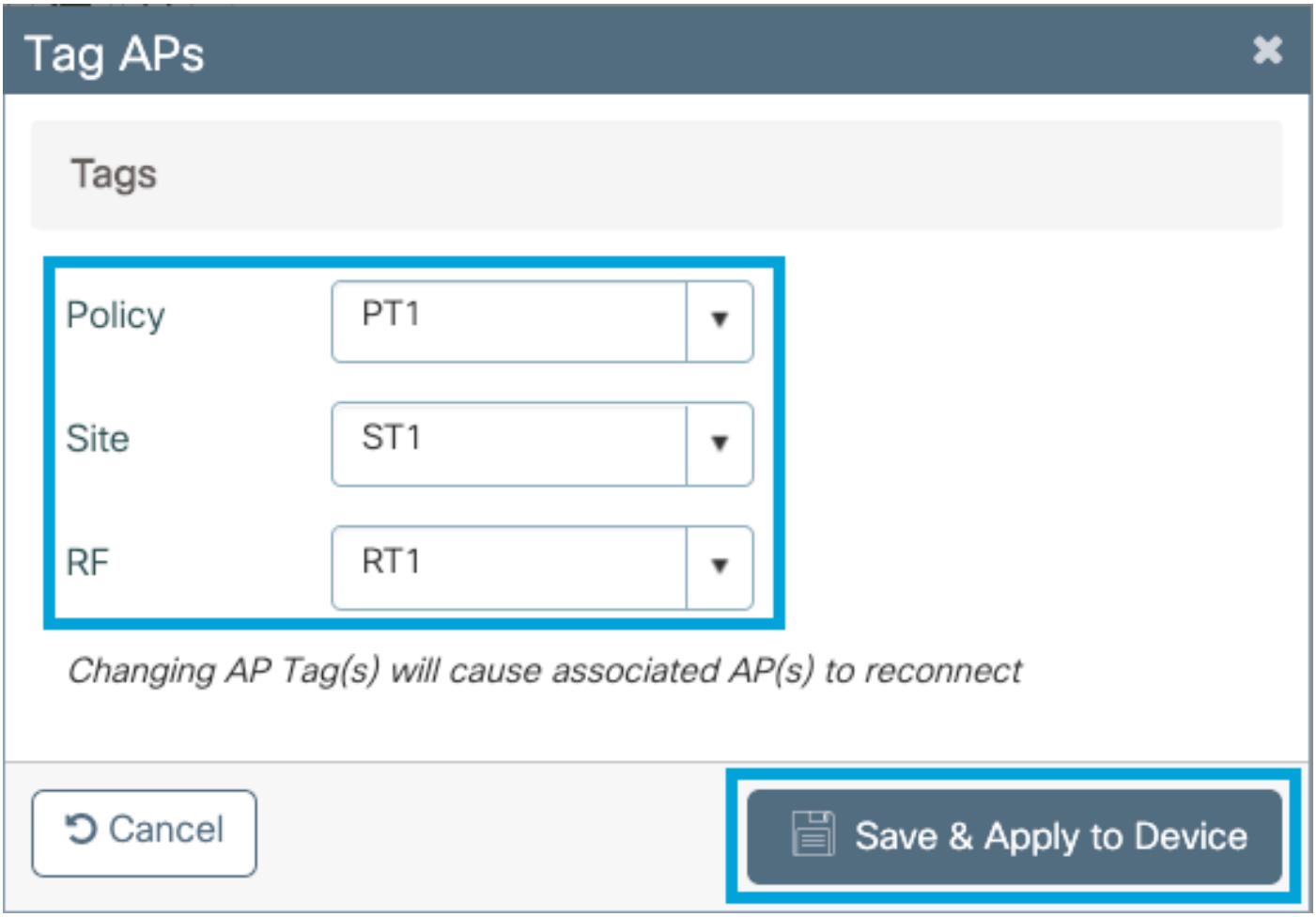
5 GHz数据速率：



步骤7.选择RF **Tag(RF**标签)，然后单**击Add。**选择在本节第5步中创建的RF配置文件。然后，单击**保存并应用到设备。**



步骤8.选择**Tag APs**，选择AP并添加之前创建的策略、站点和RF标记。然后，单击**保存并应用到设备。**



集中交换：命令行界面 (CLI)

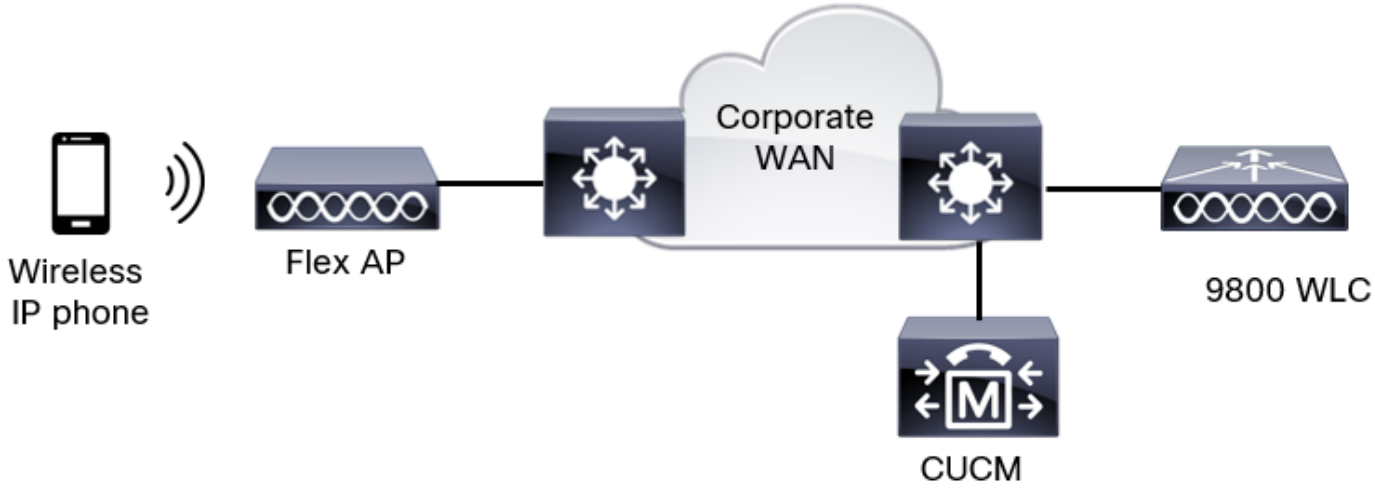
从CLI运行以下命令：

```
//////// 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
```

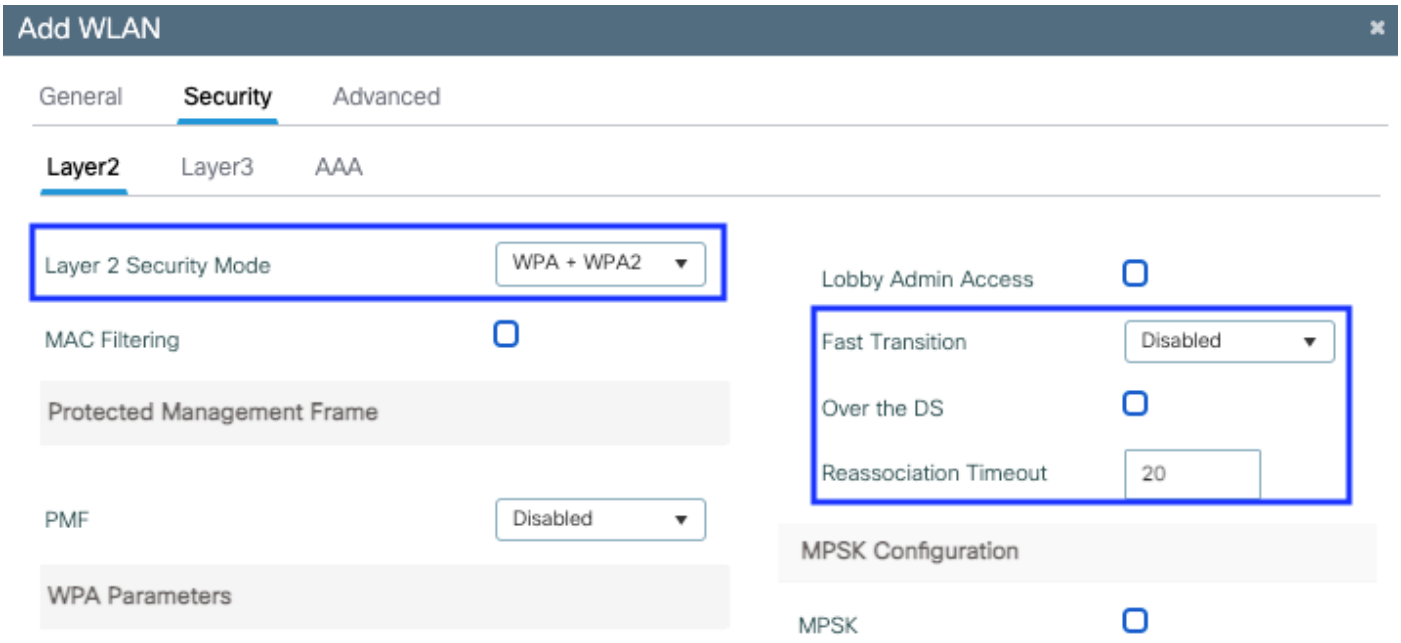
方案 B：FlexConnect本地交换

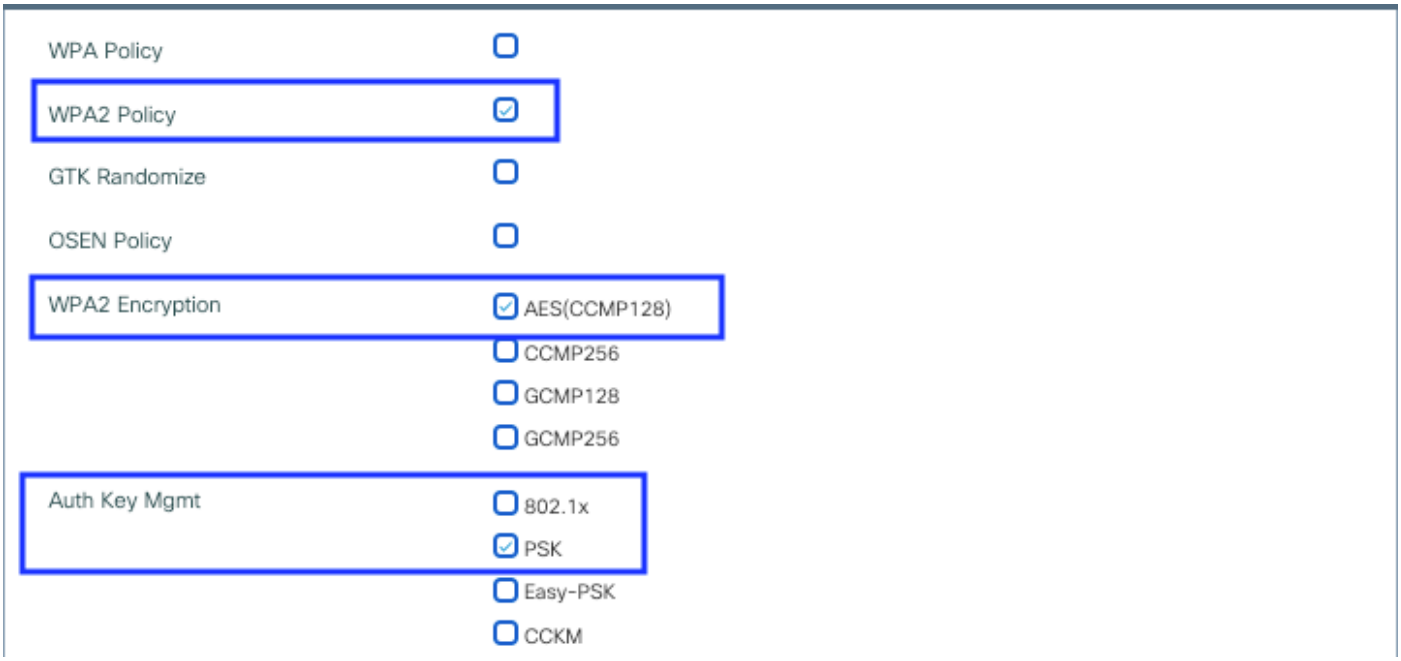
FlexConnect本地交换网络图



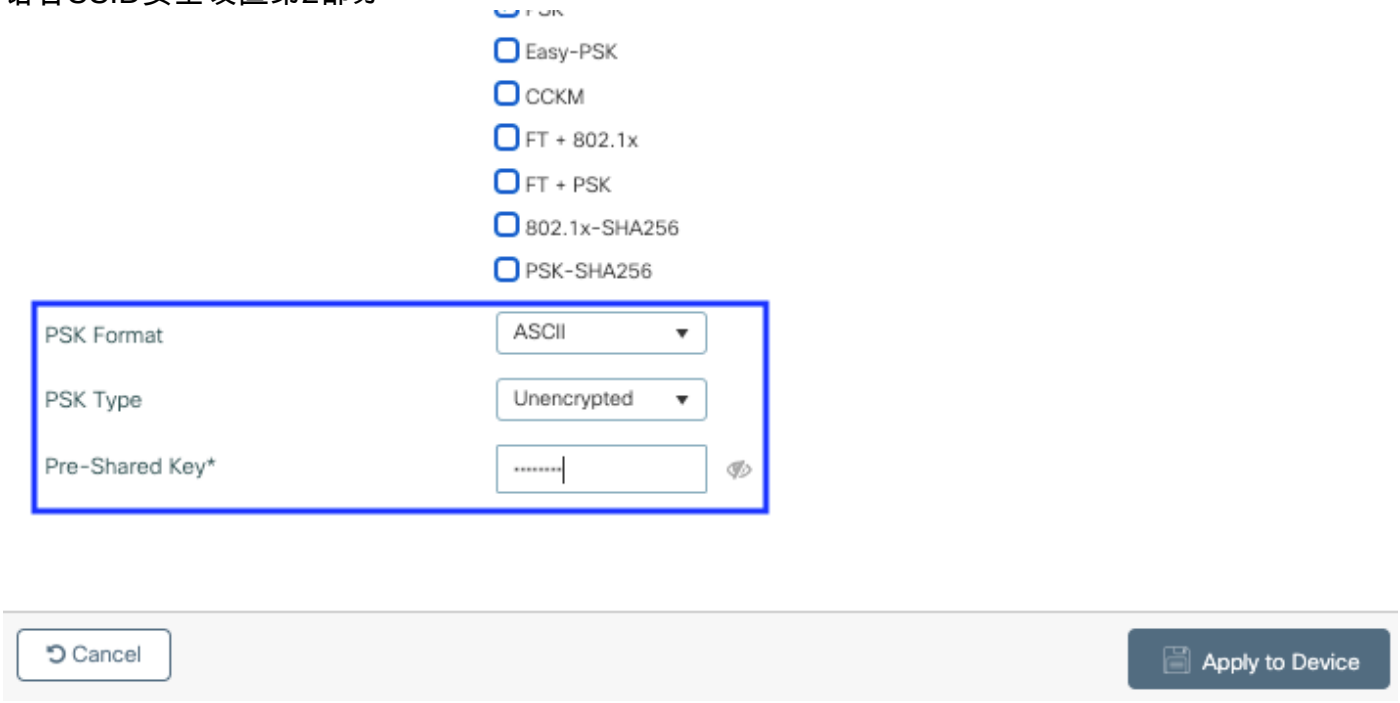
FlexConnect本地交换标签和配置文件

步骤1.导航至**Configuration > Wireless Setup > Advanced > Start Now > WLAN Profile**，然后单击+Add以创建新的WLAN。配置SSID、配置文件名称、WLAN ID和WLAN的状态。然后，导航至**Security > Layer 2**并配置设置：





语音SSID安全设置第2部分



语音SSID安全设置第3部分语音SSID安全设置第1部分

注意：使用PSK SSID时，无需启用FT，因为漫游期间的握手很短。配置802.1X WPA企业时，建议启用FT+802.1X作为AKM并启用快速过渡，但将“Over the DS”保持为禁用状态。您也可以配置FT+PSK，但为简单起见，本示例使用常规PSK。

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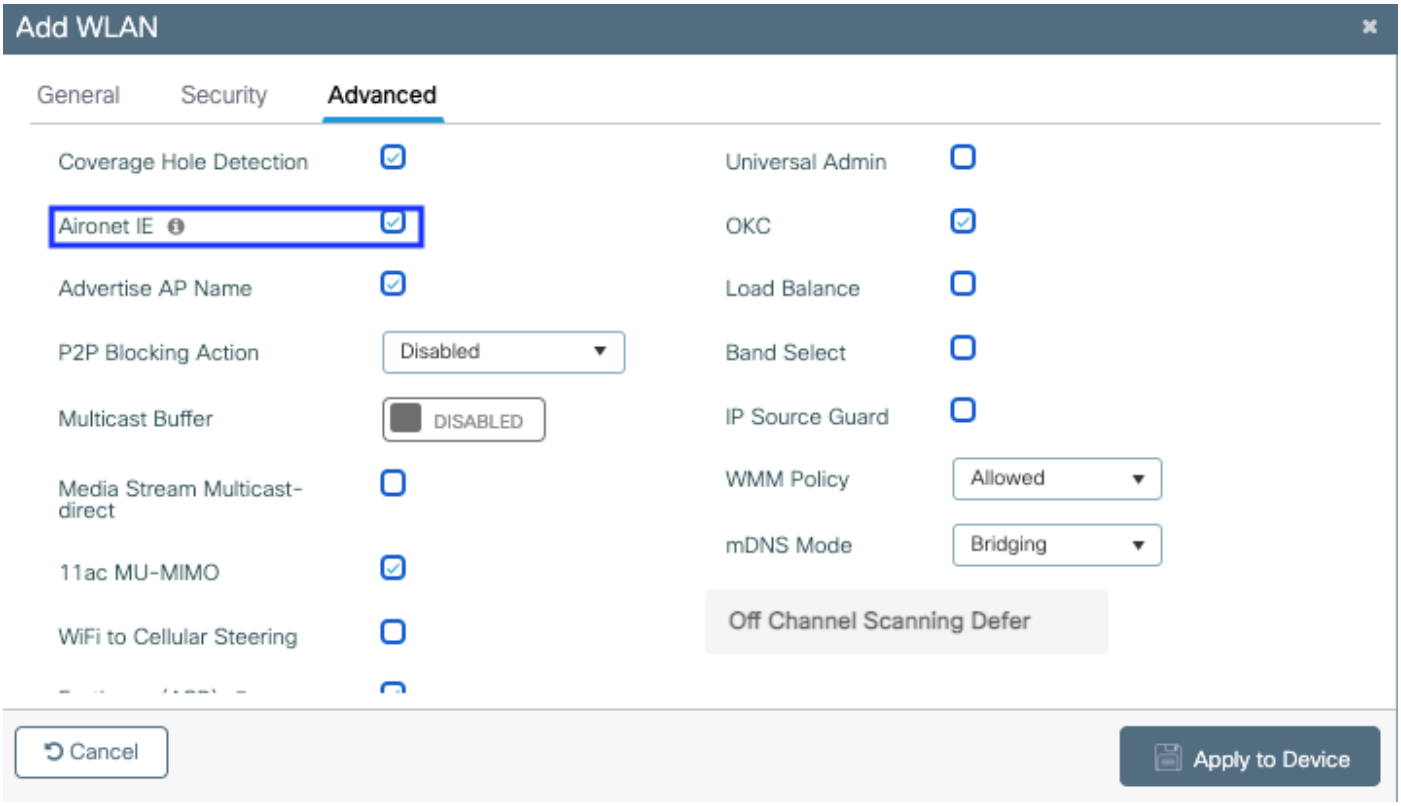

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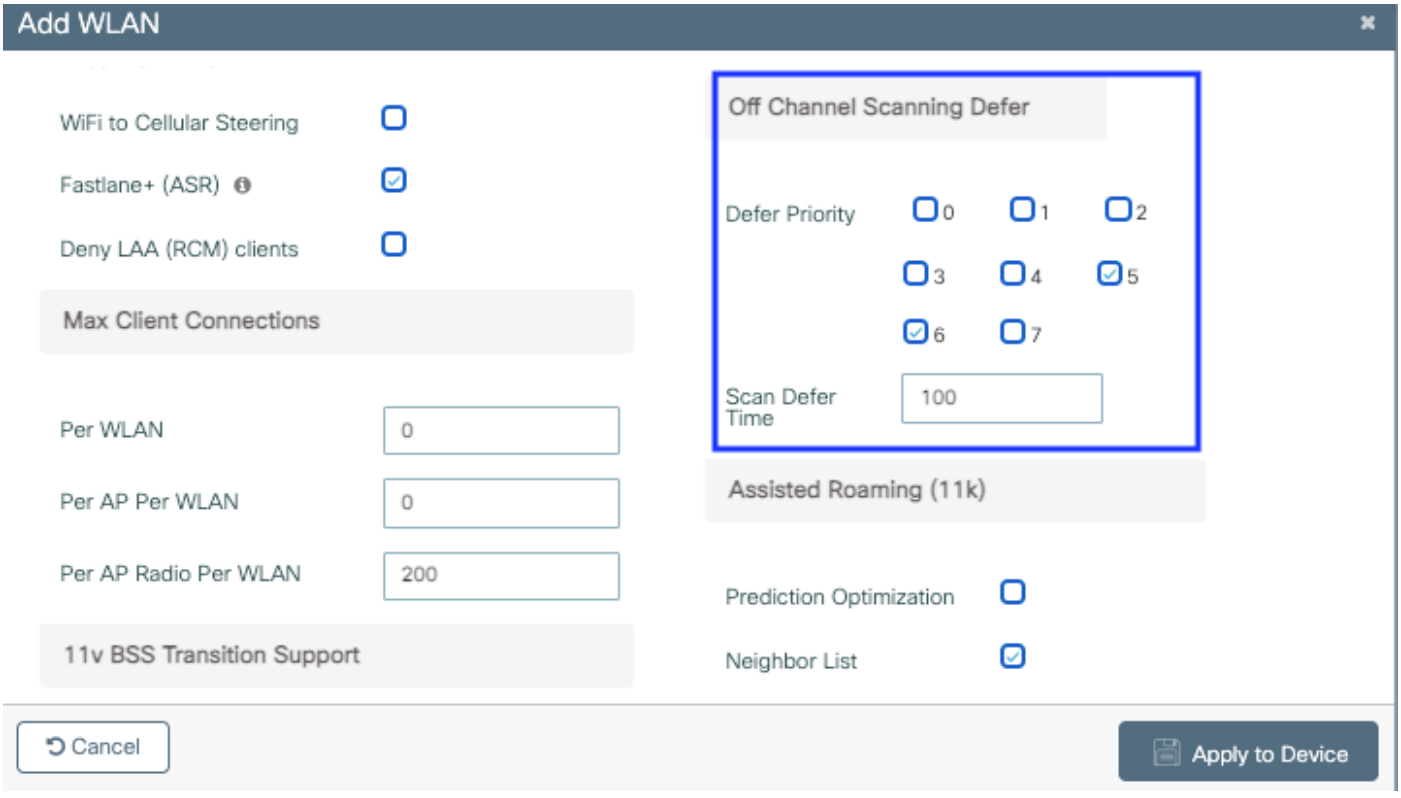
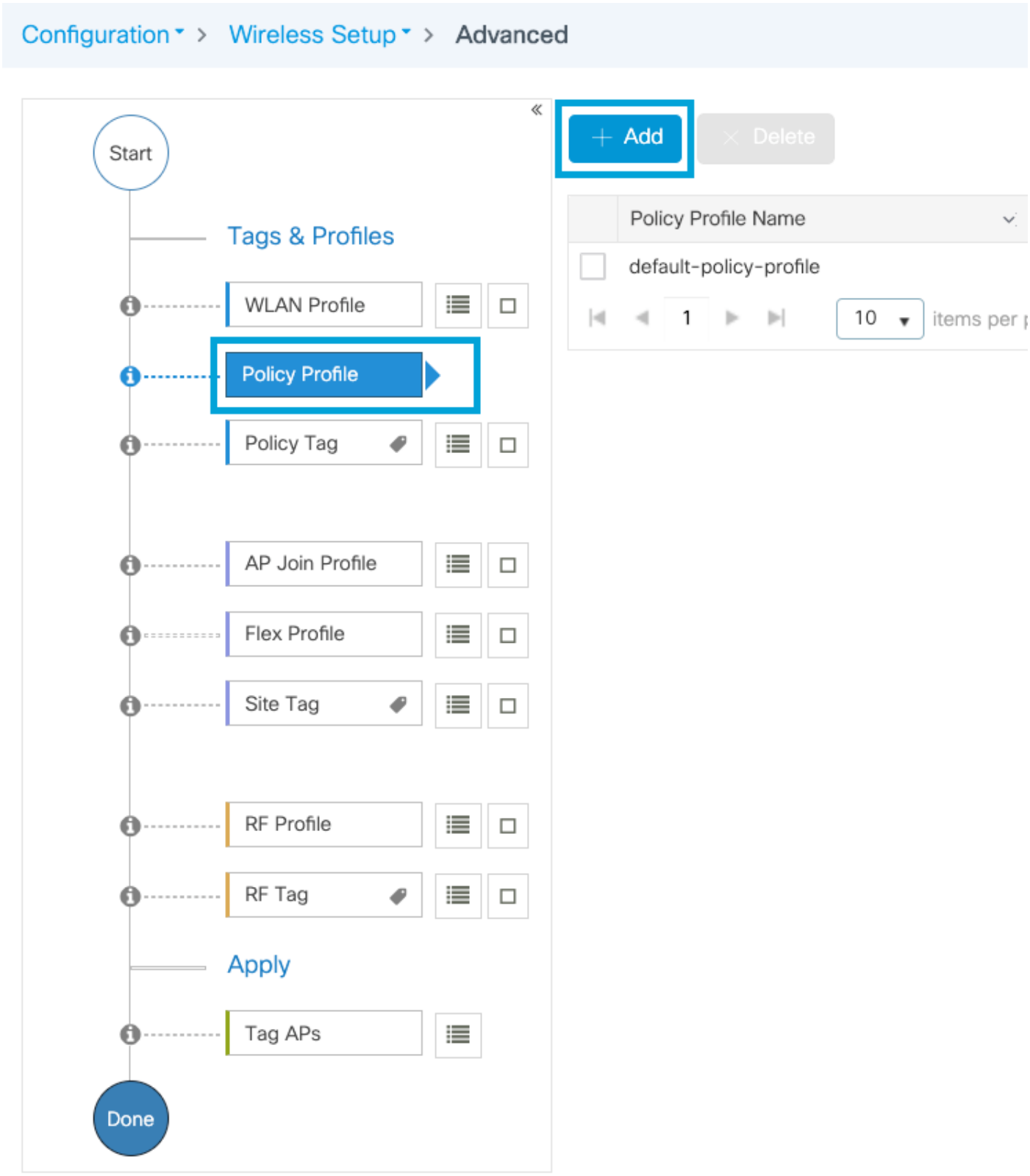
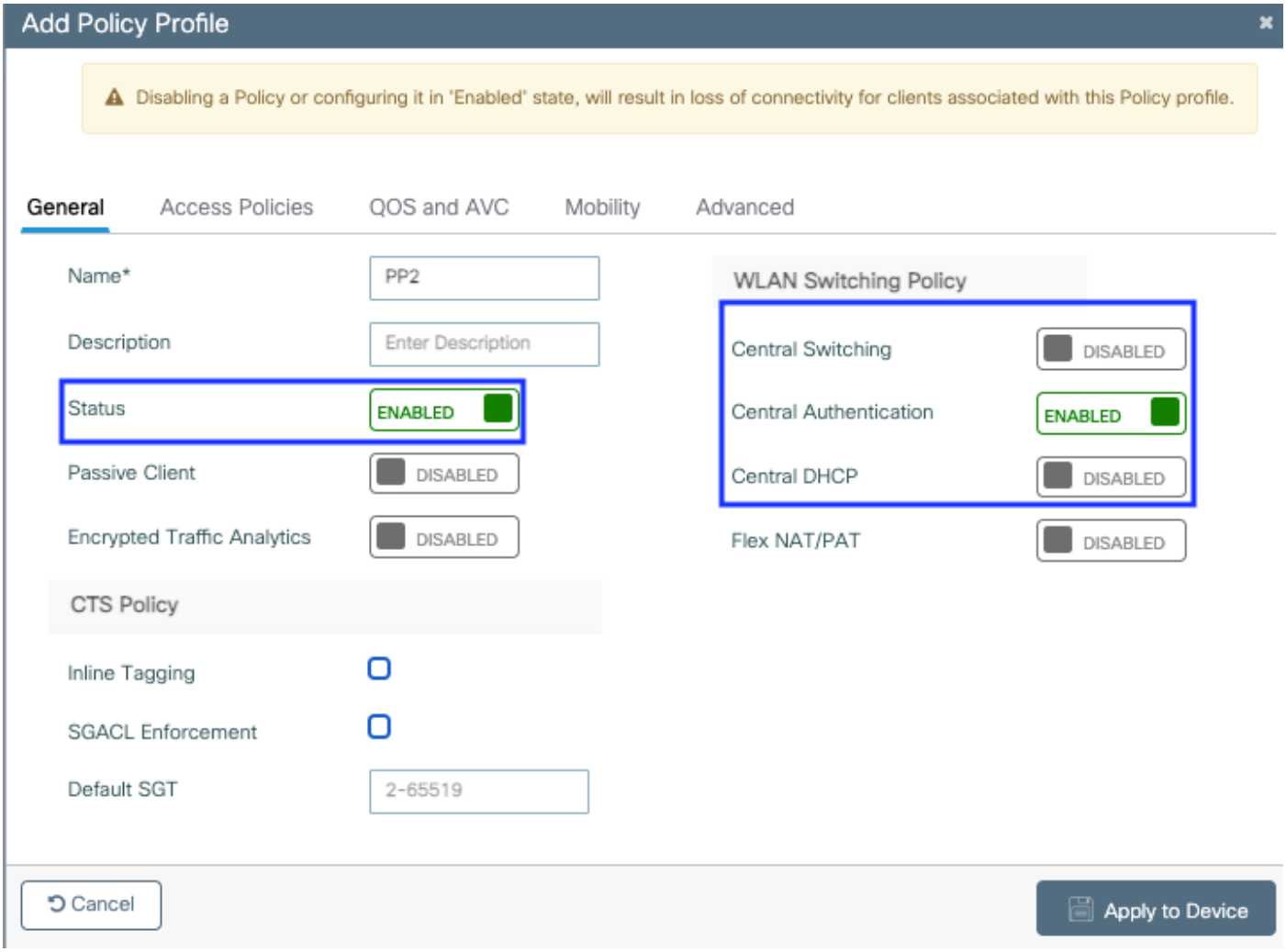


步骤3.选择Policy Profile，然后单击Add:



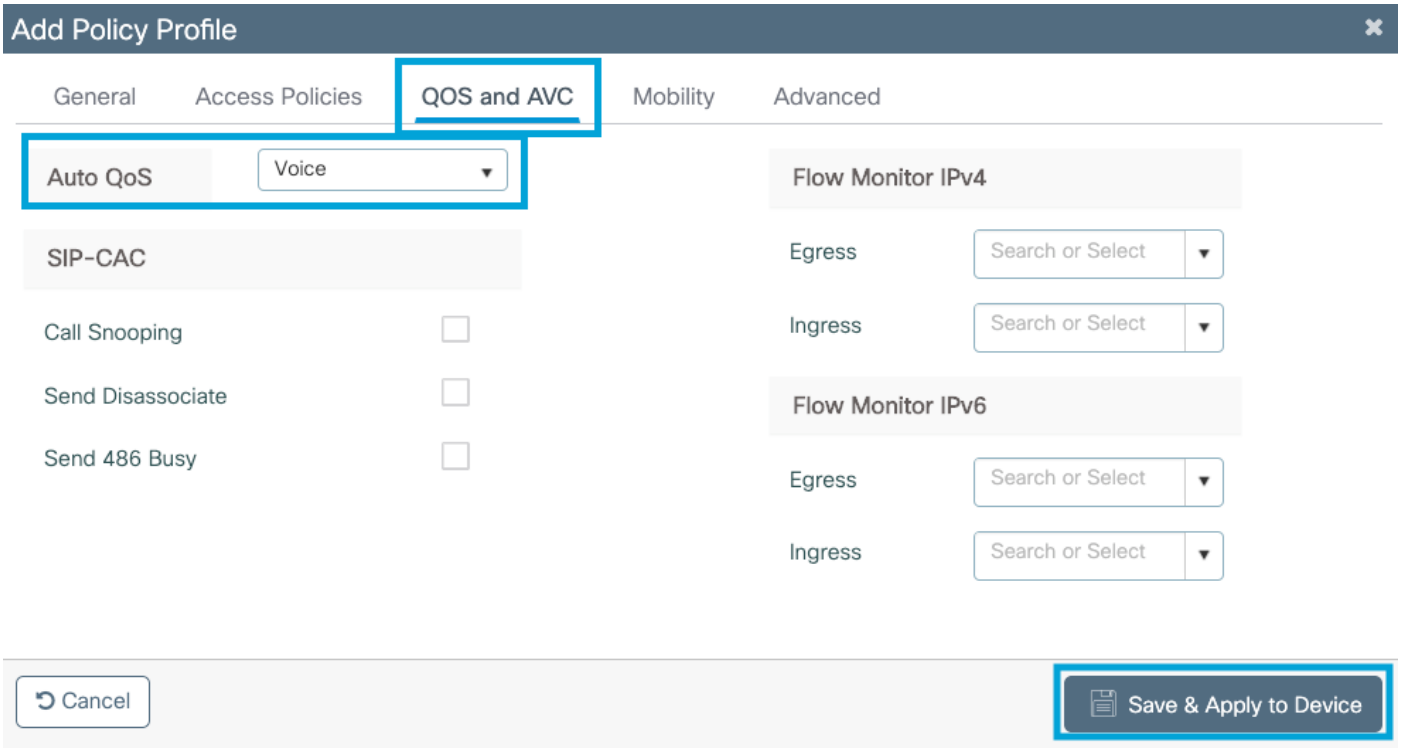
配置策略配置文件名称，将状态设置为启用，禁用中央交换和中央DHCP。对于PSK SSID，身份验证可移至本地，以便让接入点承担检验PSK的角色。对于802.1X，通常希望WLC继续执行802.1X身份验证。



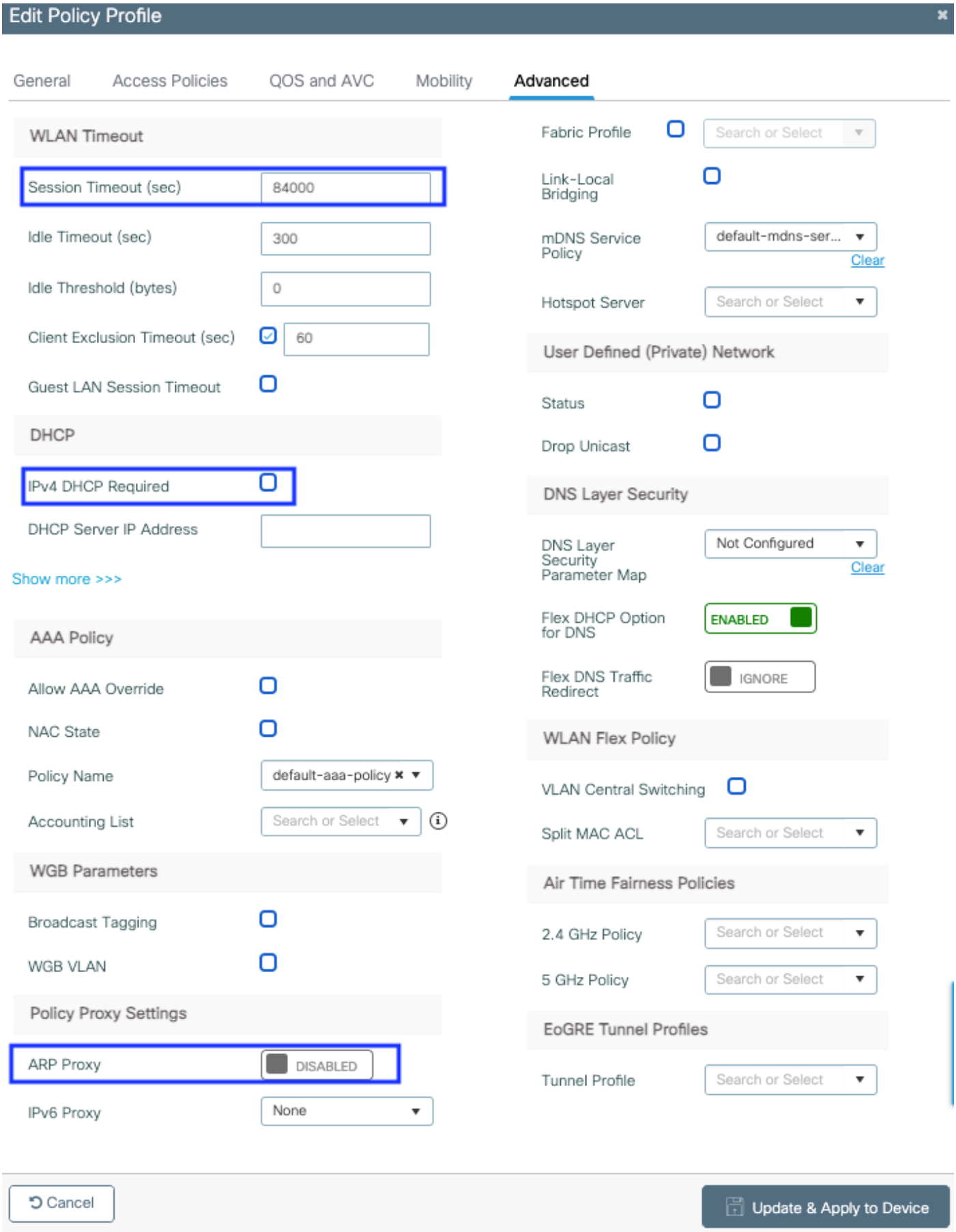
Flex Local交换策略配置文件配置

导航至**Access Policies**选项卡，以分配无线客户端在默认情况下连接到此WLAN时分配到的VLAN。您可以从下拉列表中选择一个VLAN名称，或手动键入VLAN ID。

单击QoS**和AVC，并**将Auto QoS参**数配置为**Voice。单击**Save & Apply to Device**。



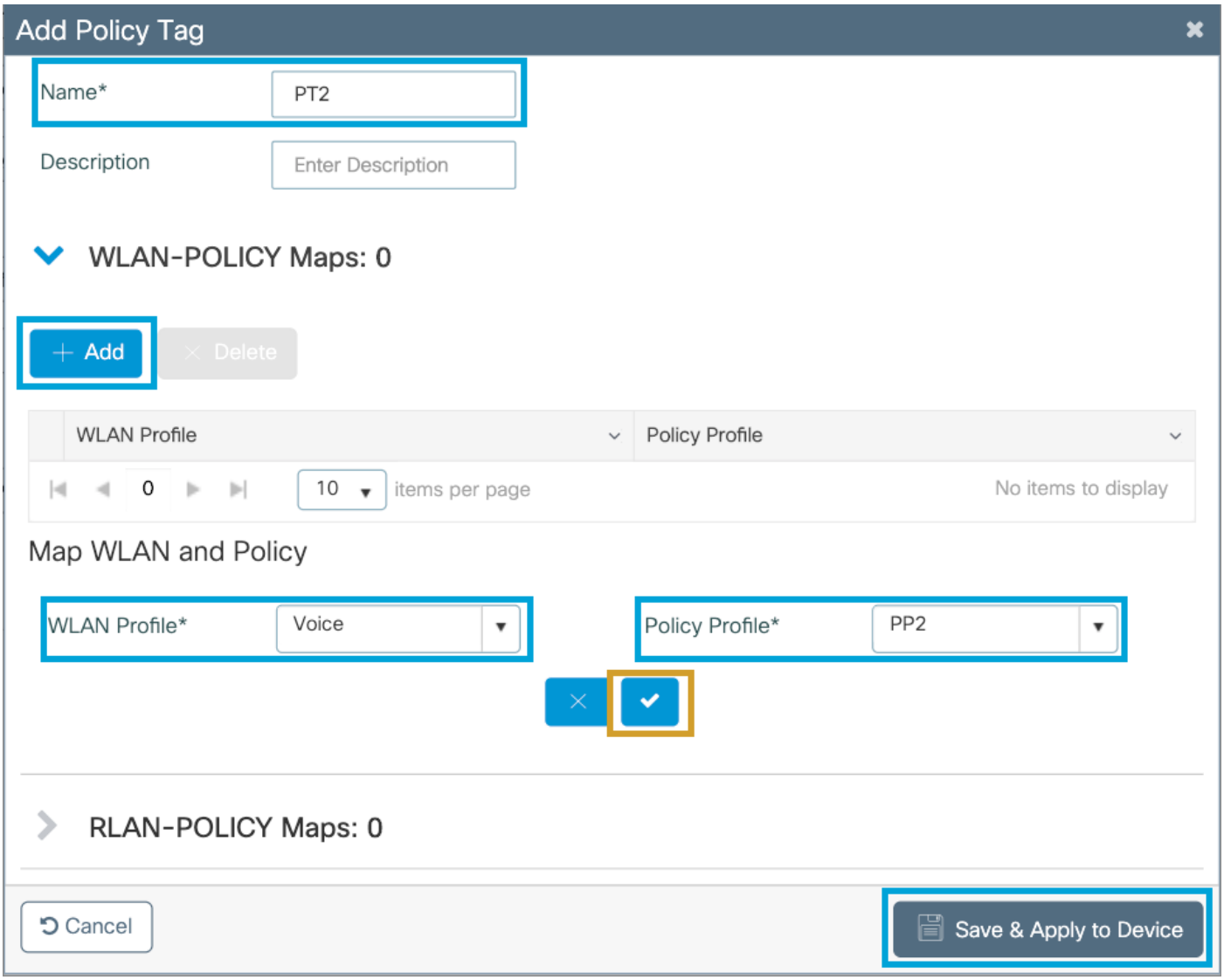
单击“**Advanced（高级）**”，将会话超时设置为84000，确保禁用所需的IPv4 DHCP并禁用ARP代理。



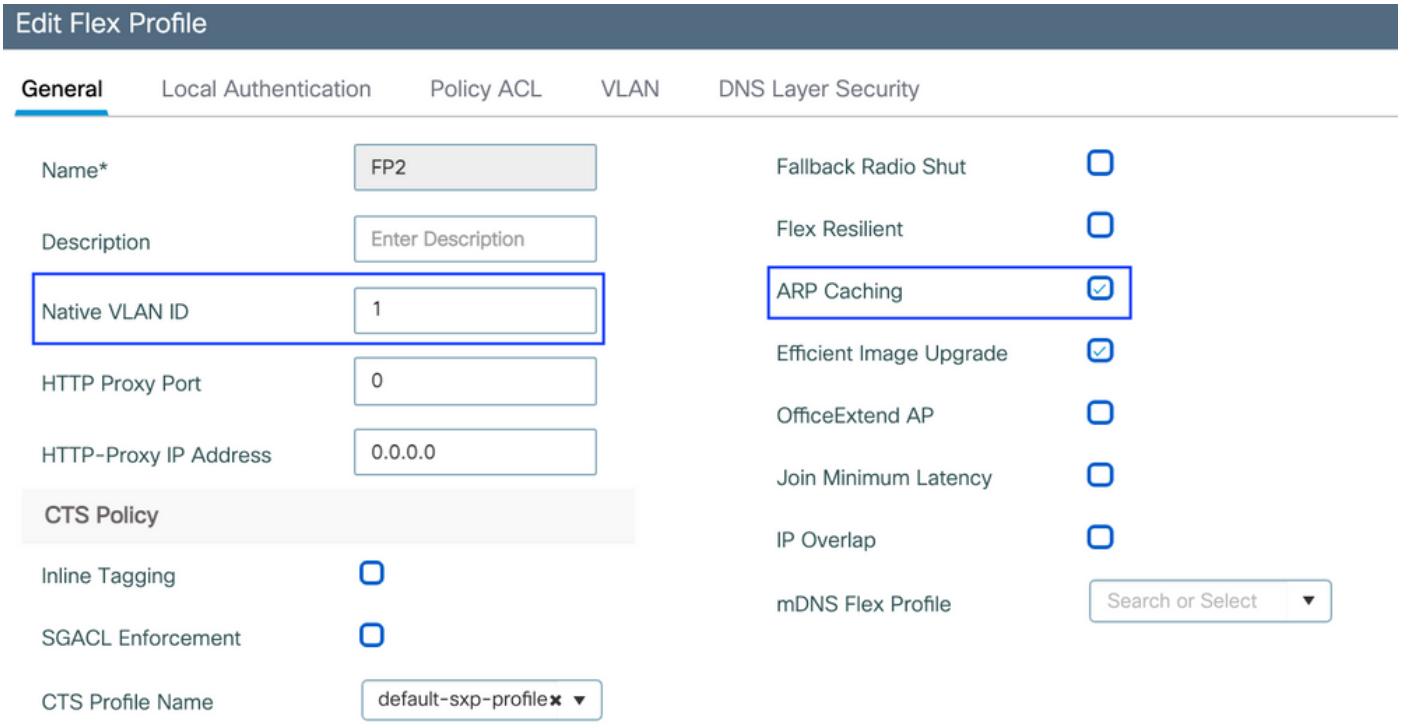
弹性策略配置文件的高级设置

步骤4.选择Policy **Tag并单**击Add。配置策略标记名称。在“WLAN-**Policy Maps”下，单**击“**+Add”。**从

下拉菜单**中选择WLAN配置**文件**和策略配置文件**，然后单击要配置的映射的检查。然后，单击**保存并应用到设备。**



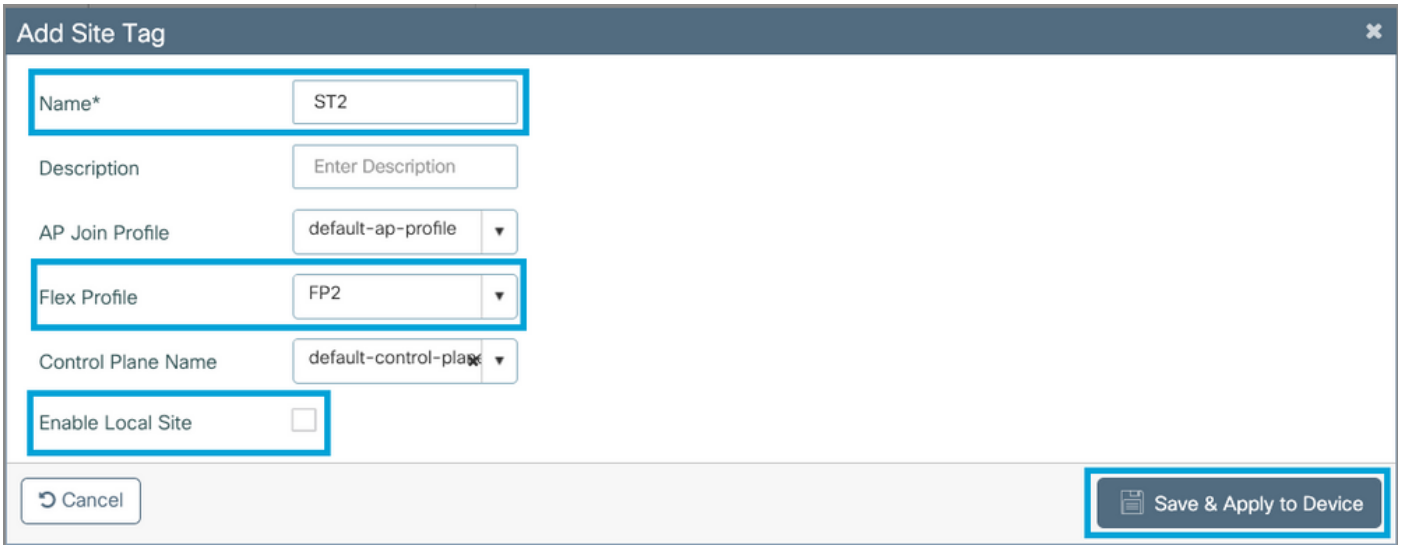
步骤5.单击“Flex Profile”，**然后单击**“添加”**。**配置Flex Profile名称、本征VLAN ID和启用ARP缓存：



Flex配置文件策略设置

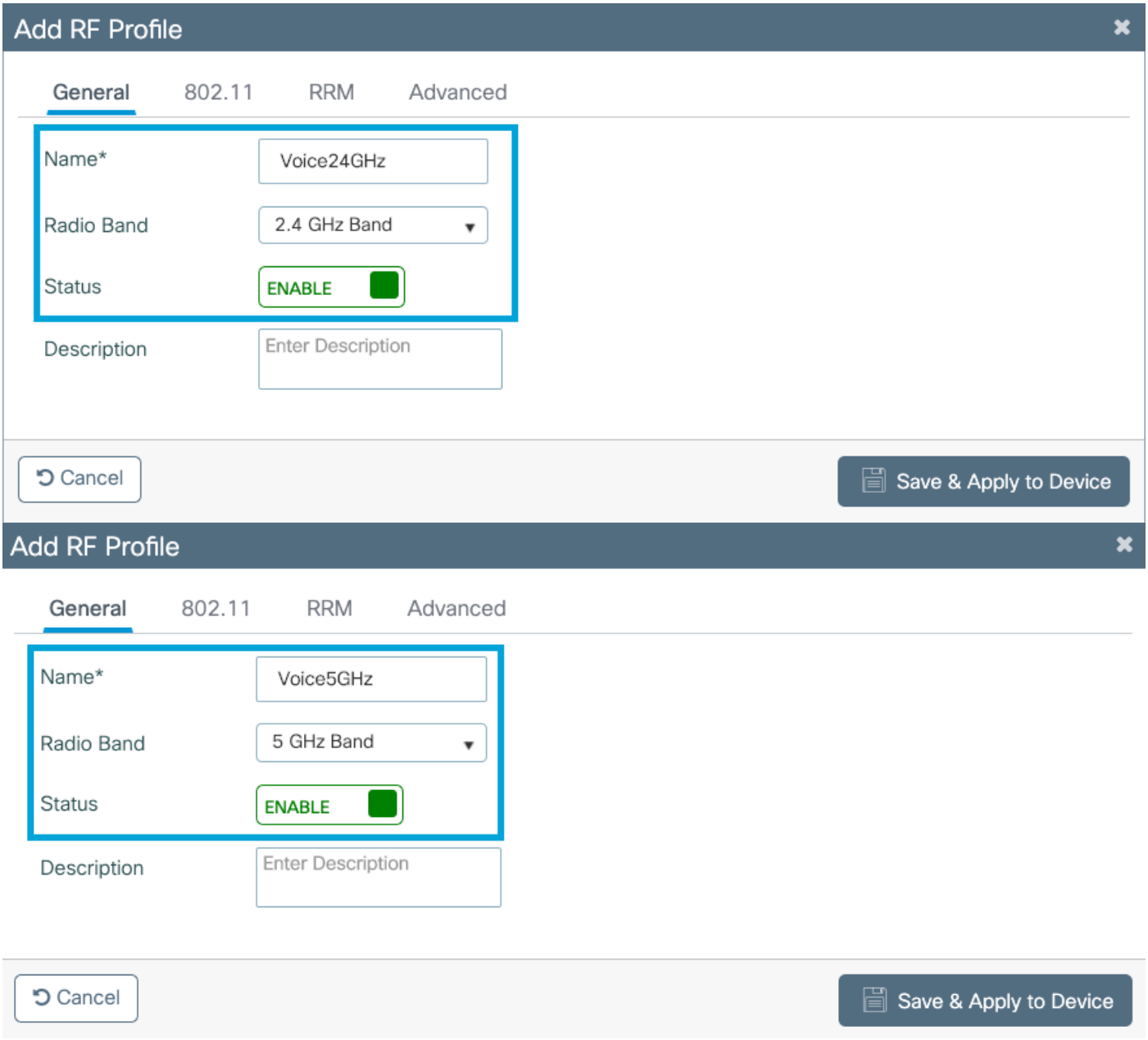
注意：本征VLAN ID是指在交换机端口中配置的本征VLAN，与此Flex Profile关联的AP连接到该交换机端口。

步骤6.选择**站点标**记并单**击添**加。配置站点标记名称，取消选中**启用本地站点**选项并添加Flex配置文件。然后，单击**保存并应用到设备**。



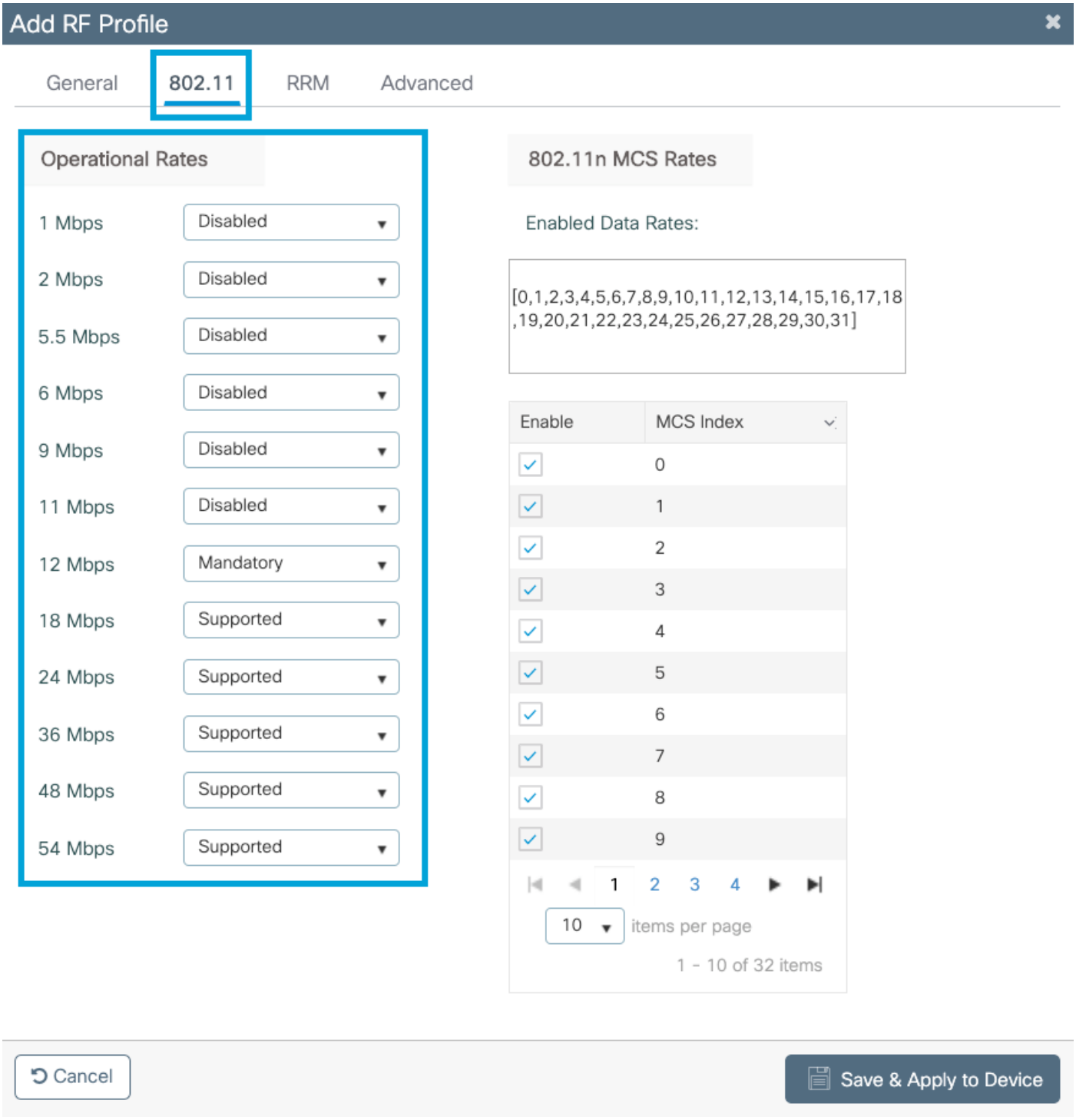
注意：禁用"启用本地站点"后，分配给此站点标记的AP将自动配置为FlexConnect AP。

步骤7.选择RF配**置文件**并单击**添加。**按频段配置RF配置文件。

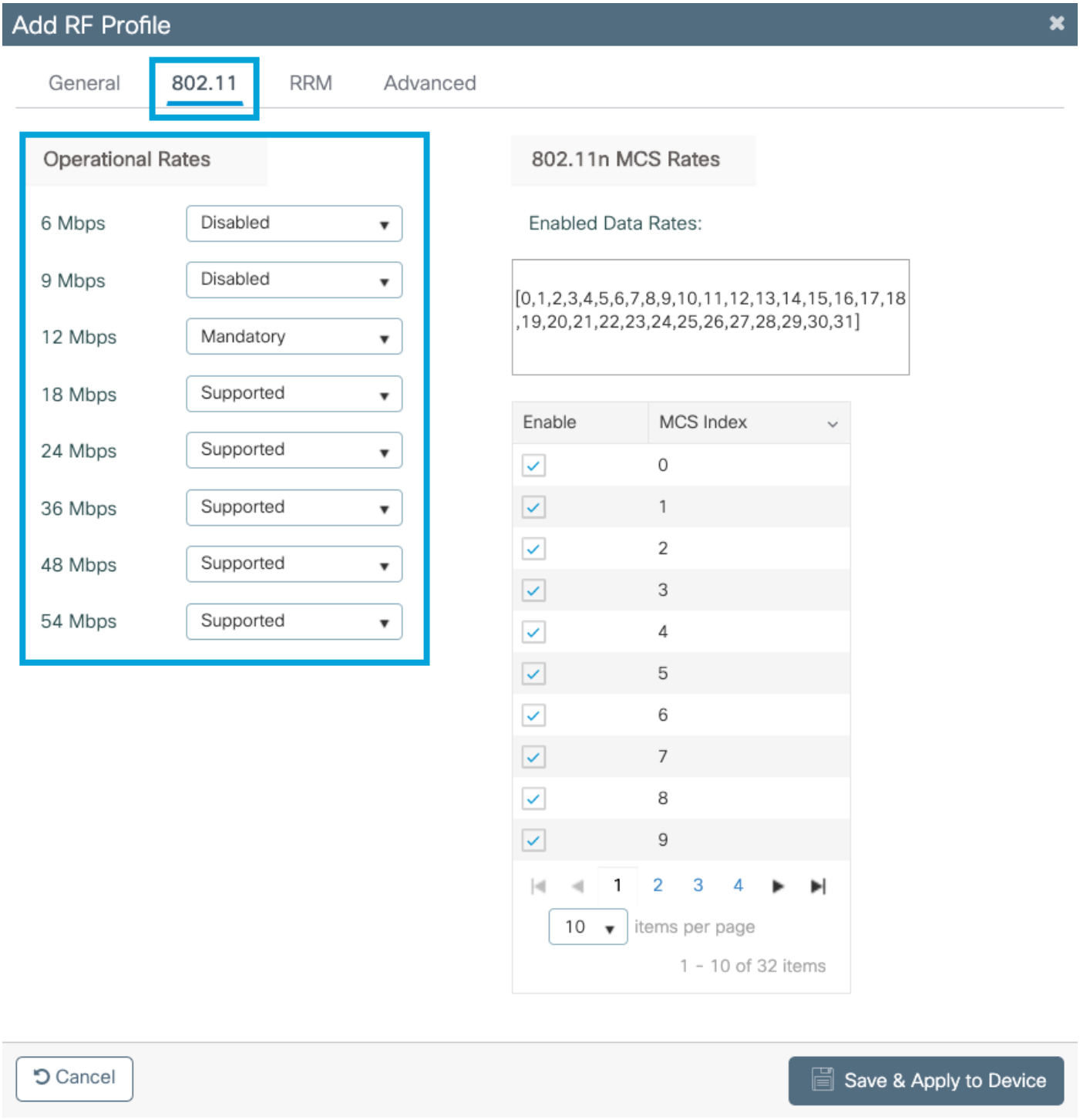


导航至**802.11菜**单。禁用所有低于12Mbps的速率，将12Mbps设置为强制速率，将两个频段支持的速率设置为18 Mbps及更高。

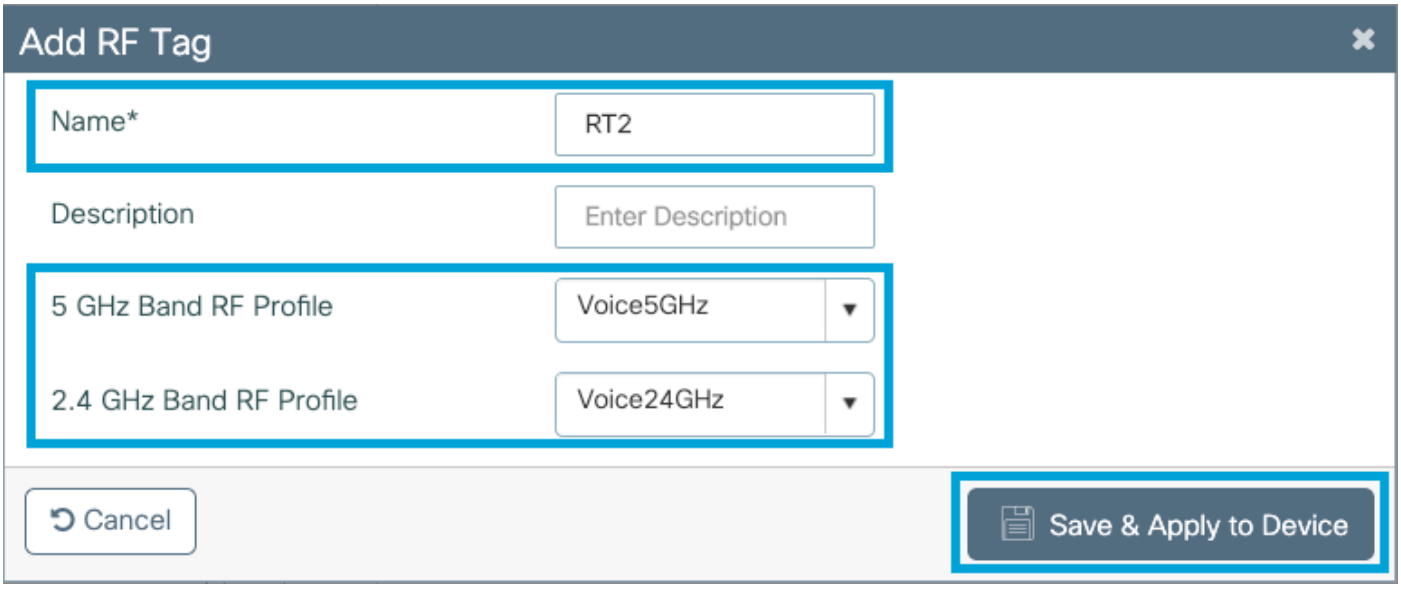
2.4 GHz数据速率：


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

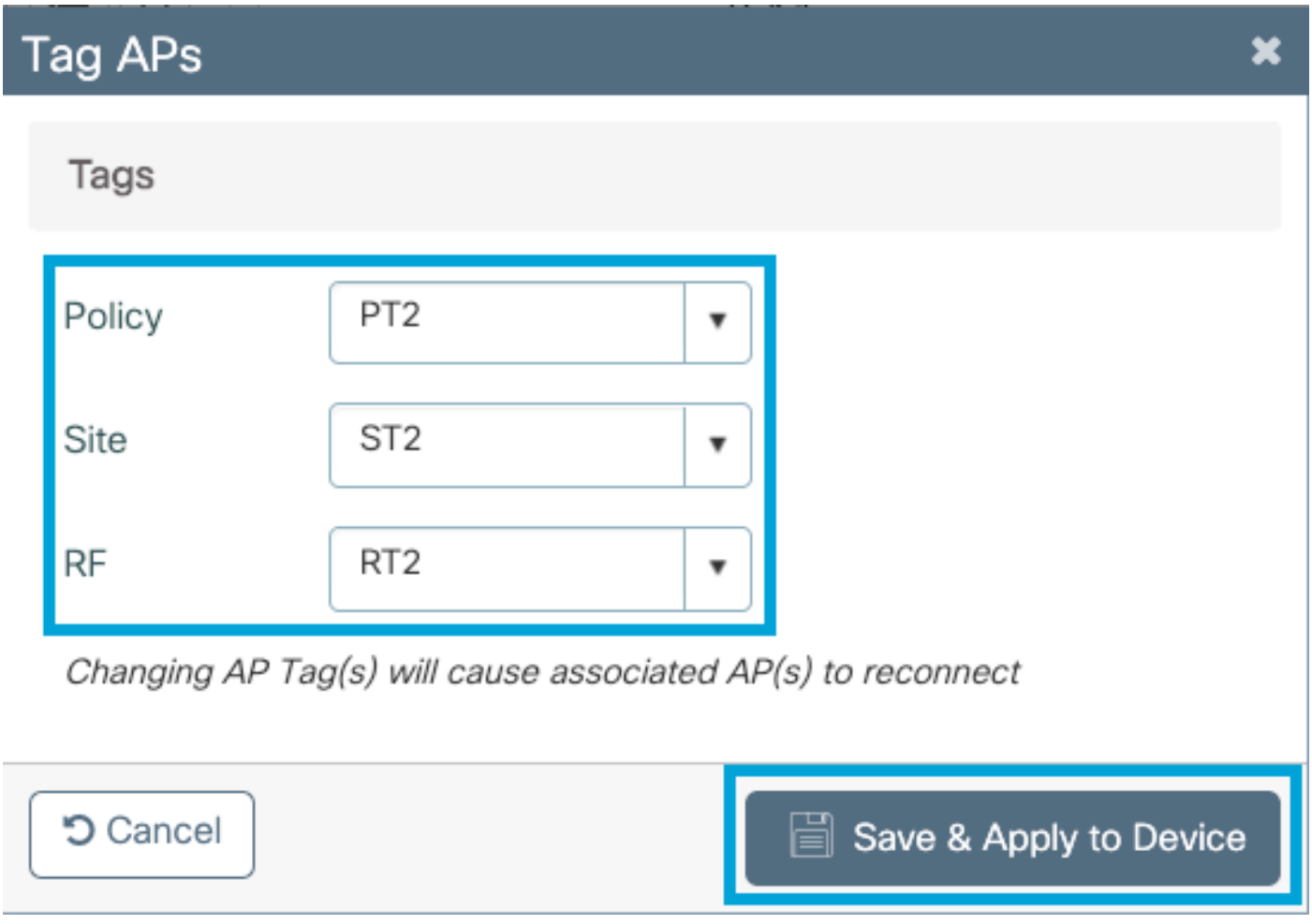
5 GHz数据速率：



步骤8.选择RF Tag(RF标签)并单击**Add（添加）**。配置在本节第6步中创建的RF配置文件。然后，单击**保存并应用到设备**。



步骤9.选择**Tag APs**，选择AP并添加之前创建的策略、站点和RF标记。然后，单击**保存并应用到设备。**



AP将重新启动其CAPWAP隧道并重新加入9800 WLC。导航至**Configuration > Wireless > Access Points**，并确认AP模式为**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本地交换命令行界面(CLI)

从CLI运行以下命令：

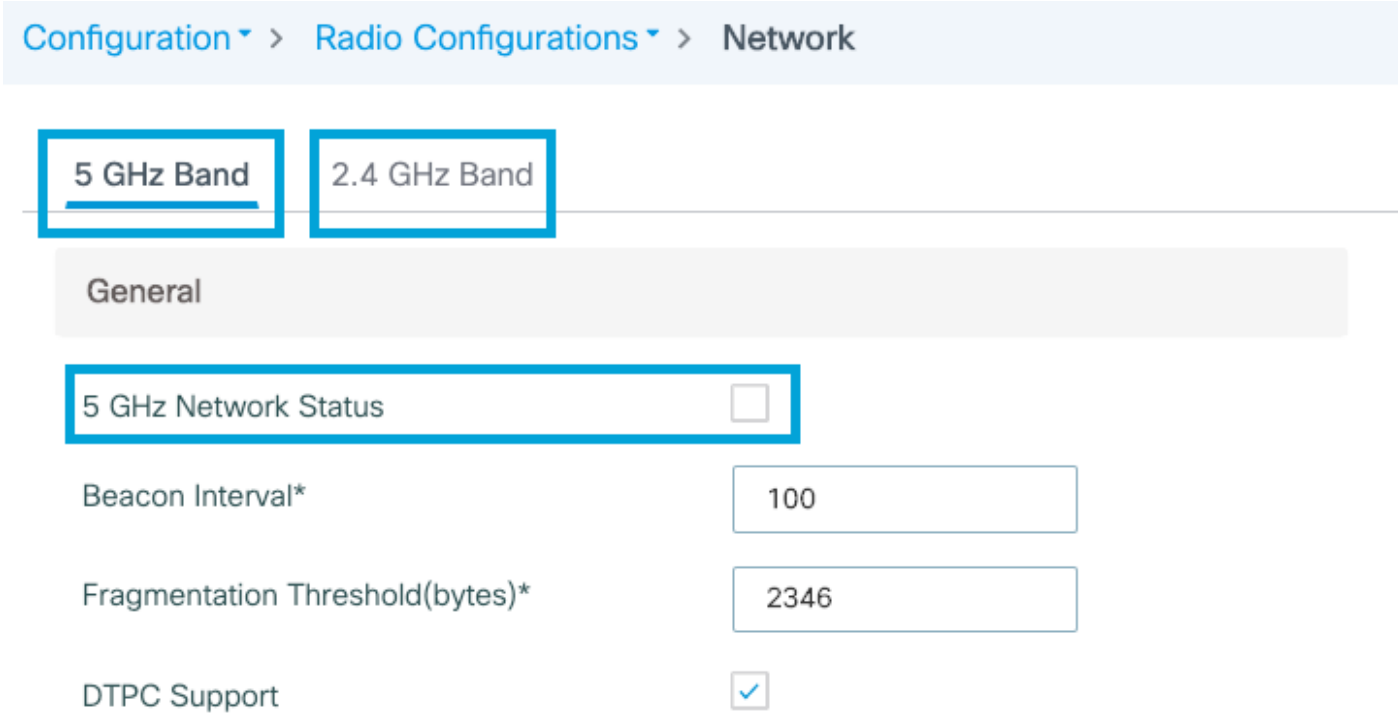
```
//////// WLAN Configuration
wlan Voice 1 Voice
 ccx aironet-iesupport
no security ft adaptive
security wpa psk set-key ascii 0 Cisco123
no security wpa akm dot1x
security wpa akm psk
no shutdown

//////// 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
```

配置介质参数

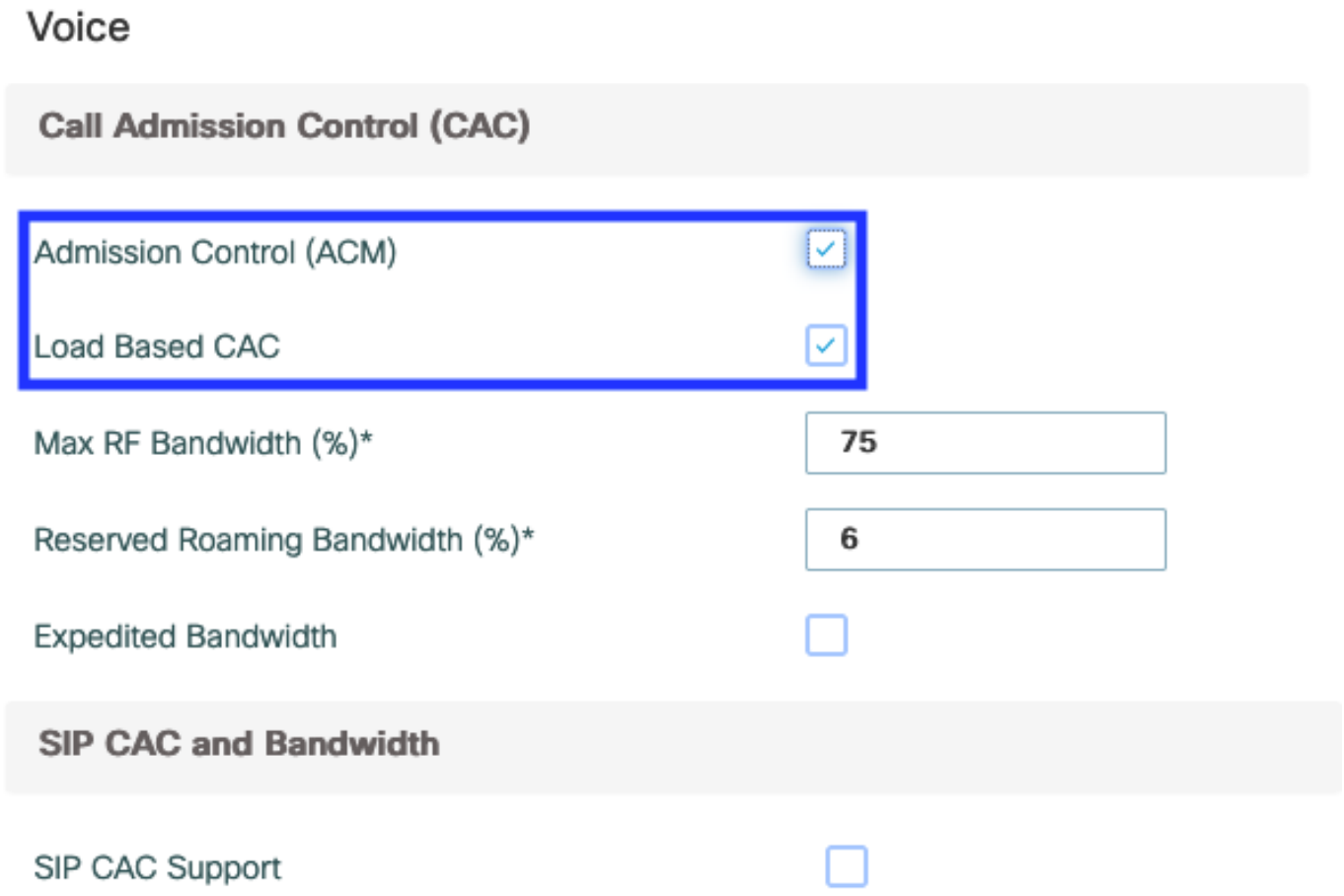
GUI 配置

步骤1.导航至**Configuration > Radio Configuration > Network。**禁用5 GHz和2.4 Ghz频段，然后单击 。

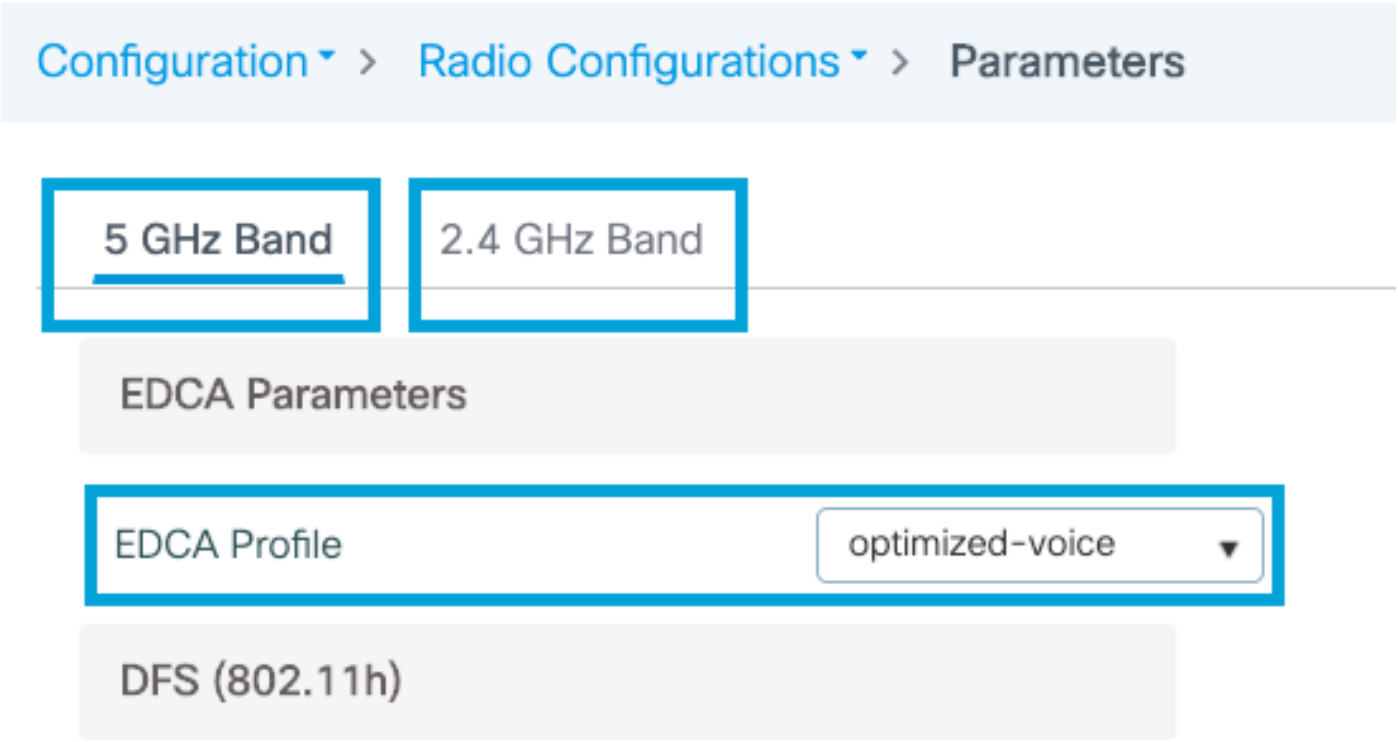
请注意，这将暂时禁用您的所有5ghz wifi网络！仅在您处于维护窗口时运行此命令



步骤2.导航至**Configuration > Radio Configuration > Media Parameters。**在2.4 GHz和5 GHz频段上启用准入控制和基于负载的呼叫准入控制(CAC)，然后单击**应用**:



步骤3.导航至**Configuration > Radio Configurations > Parameters**。在两个频段上将EDCA配**置文件配置为**优化语音，然后单击“应**用”**。



步骤4.导航至**Configuration > Radio Configuration > Network**。同时启用5 GHz和2.4 Ghz频段，然后单击**Apply**。

命令行界面 (CLI)

从CLI运行以下命令：

```
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
```

验证

您可以使用以下命令验证当前配置：

```
# 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>
```

要查看CAC统计信息和呼叫控制度量，请运行以下命令：

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

故障排除

条件调试和无线电活动跟踪

Radio Active(RA)跟踪为与指定条件（本例中为客户端MAC地址）交互的所有进程提供调试级别跟踪。 要启用条件调试，请执行以下步骤。我们重点介绍9800 WLC在呼叫期间提供的输出。

步骤1.确保未启用调试条件。

```
# clear platform condition all
```

步骤2.启用要监控的无线客户端MAC地址的调试条件。此命令开始监控提供的MAC地址30分钟（1800秒）。 您可以选择将此时间增加到2085978494秒。

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

注意: **要一次监控多个客户端，请按mac地址运行debug wireless mac <aaaa.bbbb.cccc>命令。**

注意:**您看不到终端会话上客户端活动的输出，因为所有内容都在内部缓冲，以备以后查看。**

步骤3.从8821 Cisco IP电话建立呼叫。

步骤4.当呼叫完成或问题在默认或配置的监控时间开启之前重现时停止调试。

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

监控时间过去或调试无线停止后，9800 WLC将生成名为：

ra_trace_MAC_aaabbbbcccc_HHMMSS.XXX_timezone_DayWeek_Month_Day_year.log

步骤5.收集MAC地址活动的文件。您可以将ra trace .log复制到外部服务器或直接在屏幕上显示输出。检查RA跟踪文件的名称

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

将文件复制到外部服务器：

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

显示内容：

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

步骤6.删除调试条件。

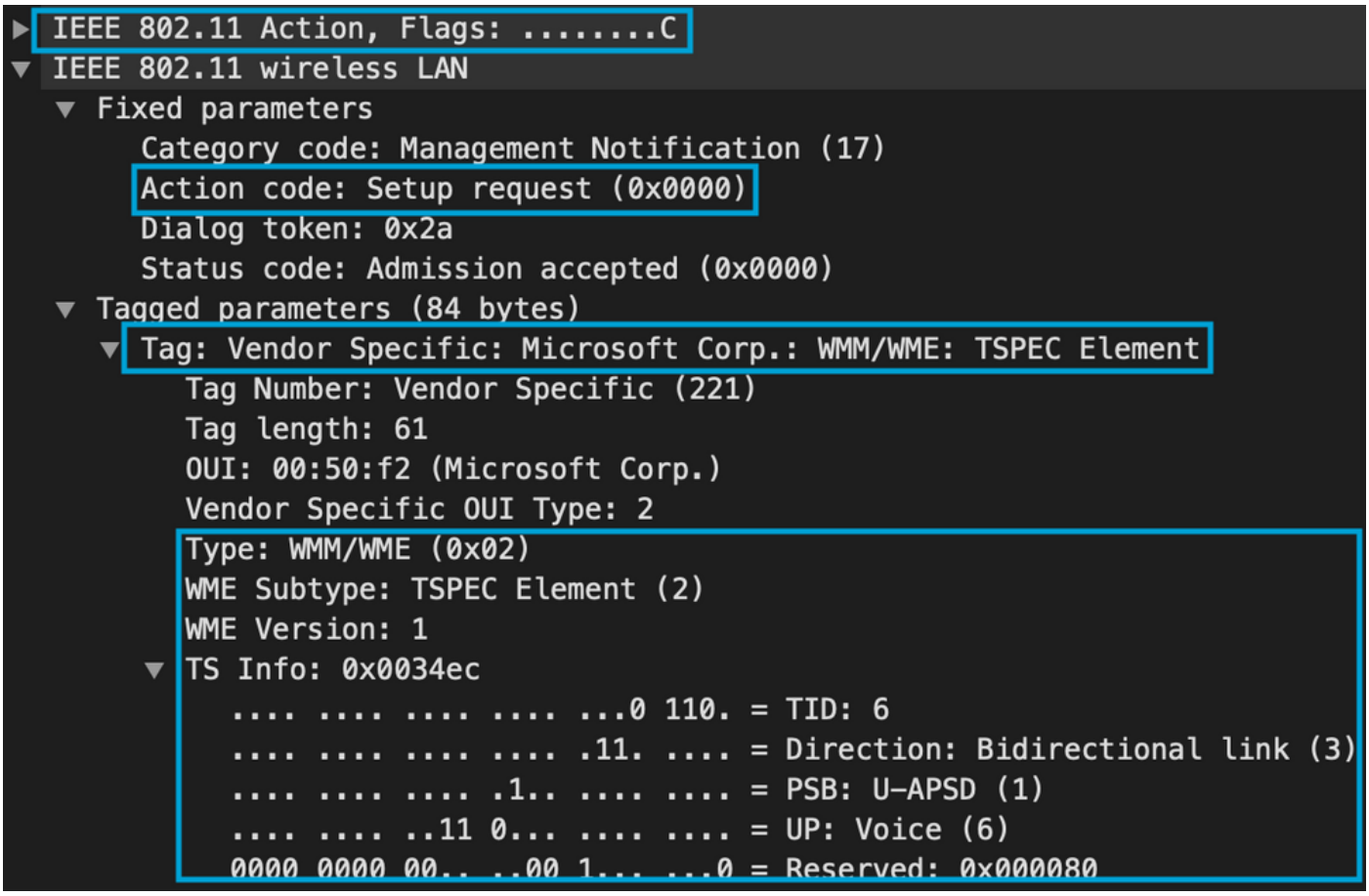
```
# clear platform condition all
```

注意：确保在故障排除会话后始终删除调试条件。

在RA跟踪的输出中，会进行流量规范(TSPEC)协商，这将确定是否允许8821以用户优先级6标记其流量，以及是否可以建立呼叫。要协商队列6的使用，8821发送和操作数据包请求权限。

```
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
```

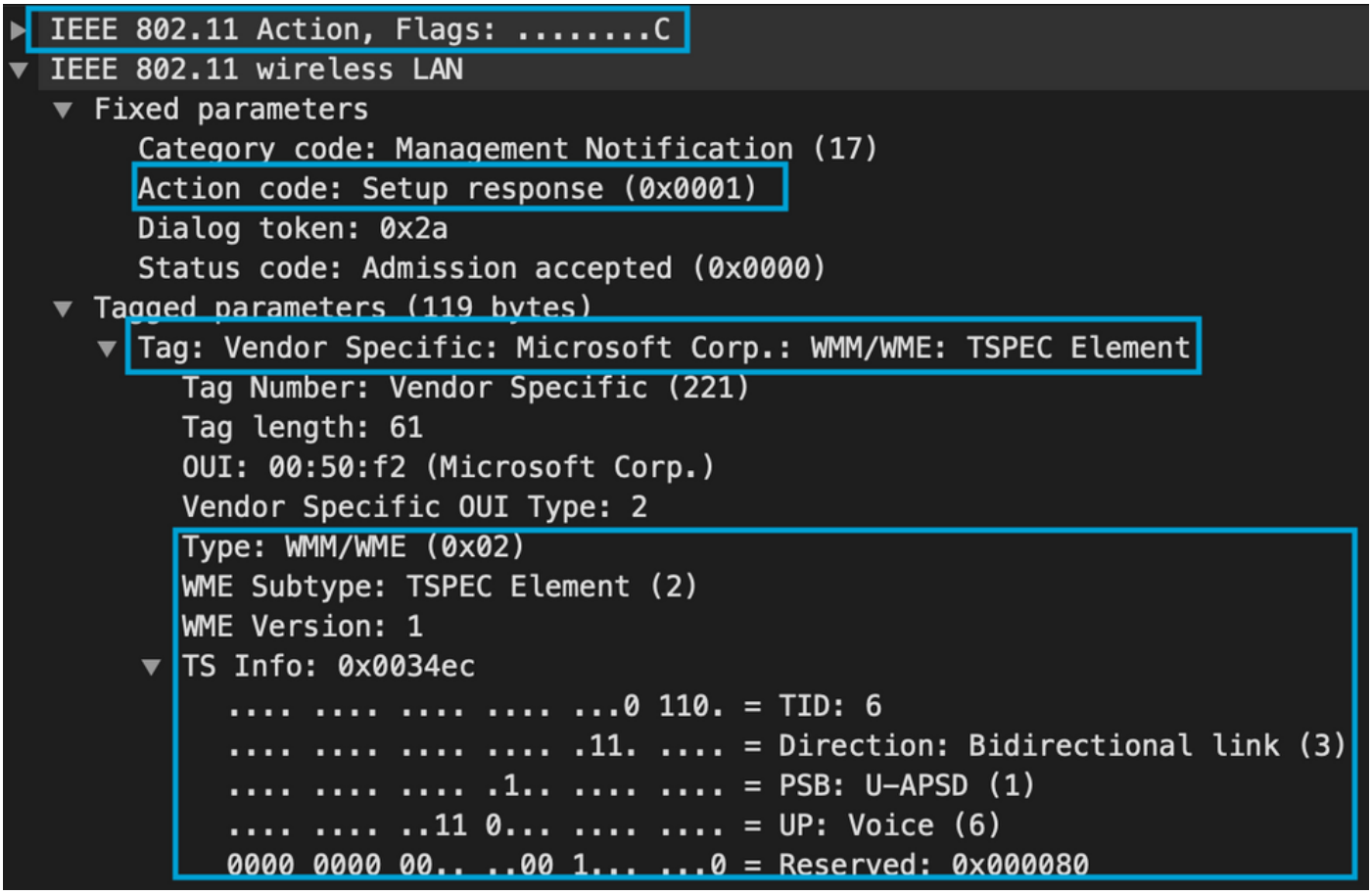
在数据包捕获中：



WLC确定是否有足够的带宽来分配呼叫，如果有，它会发送接受TSPEC协商的操作帧：

```
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
```

在数据包捕获中：



之后，通过SIP与呼叫管理器建立呼叫，并转发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数据包：

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

然后，8821通知呼叫管理器呼叫已终止，并通过发送另一个操作帧通知不再使用队列6的WLC:

```
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终止和操作帧：