

Grandstream Networks, Inc.

WP820 Wi-Fi Roaming Application Note







Table of Contents

OVERVIEW	7
WP820 WI-FI FREQUENCY AND CHANNEL	7
WP820 WI-FI ROAMING	7
DEPLOYMENT REQUIREMENTS	8
IMPORTANT WI-FI PARAMETERS ON AP	9
Beacon Interval DTIM Unicast Mode and Multicast Mode	
WMM (Wi-Fi Multimedia) Band Steering	
GWN7600	12
Wireless Configuration Band Steering	
CISCO MERAKI	17
Wireless Configuration Band Steering	
ARUBA CENTRAL	20
Wireless Configuration Band Steering	
RUIJIE CLOUD	25
Wireless Configuration Band Steering	
UBIQUITI UNIFI	29
Wireless Configuration Band Steering	31
MIST	





Wireless Configuration	33
Band Steering	35
HUAWEI CLOUD	36
Wireless Configuration	36
EZMASTER	39
Wireless Configuration	39
Band Steering	41
CLOUDTRAX	43
Wireless Configuration	43
TP-LINK	46
Wireless Configuration	46
Band Steering	48





Table of Figures

Figure 1: Wireless AP Deployment	9
Figure 2: GWN7600 Access Points Configuration	12
Figure 3: GWN7600 SSID Configuration	13
Figure 4: GWN7600 Edit SSID	13
Figure 5: GWN7600 Band Steering - 1	16
Figure 6: GWN7600 Band Steering - 2	16
Figure 7: Cisco Meraki – Add AP	17
Figure 8: Cisco Meraki – Additional Configurations	18
Figure 9: Cisco Meraki – Band Steering	18
Figure 10: Aruba Central - App Selector	20
Figure 11: Aruba Central – Create New SSID	21
Figure 12: Aruba Central – DTIM	22
Figure 13: Aruba Central – Radio Parameters	
Figure 14: Aruba Central – Band Steering	24
Figure 15: RuiJie Cloud – Create New Network	25
Figure 16: RuiJie Cloud – Create New AP	26
Figure 17: RuiJie Cloud – AP List	26
Figure 18: Ruijie Cloud – Wireless Configuration	27
Figure 19: RuJjie Cloud – Roaming Configuration	27
Figure 20: RuiJie Cloud – Band Steering	28
Figure 21: UNIFI – Wireless Network Settings	29
Figure 22: UNIFI – Create New WLAN Group	
Figure 23: UNIFI – Edit a Wireless Network	30
Figure 24: UNIFI – DTIM	31
Figure 25: UNIFI – Band Steering	32
Figure 26: Mist – Claim APs	33
Figure 27: Mist – New WLAN	34
Figure 28: Mist – Filtering	35
Figure 29: Mist – Band Steering	35
Figure 30: Huawei Cloud – Create SSID	36
Figure 31: Huawei Cloud – SSID Configuration	37
Figure 32: Huawei Cloud – Radio Parameters	38
Figure 33: ezMaster – Add Device	39
Figure 34: ezMaster – Create New Project	40
Figure 35: ezMaster – Device Configuration	40





Figure 36: ezMaster – Wireless Radio Settings	41
Figure 37: ezMaster – Band Steering	42
Figure 38: CloudTrax – Create New Network	43
Figure 39: CloudTrax – Add Access Point	44
Figure 40: CloudTrax – Edit SSID	45
Figure 41: TP-Link – Add Wireless Network	46
Figure 42: TP-Link – Add SSID	47
Figure 43: TP-Link – Configure Advanced Wireless Parameters	47
Figure 44: TP-Link – Band Steering	48





Table of Tables

Table 1: WP820 Wi-Fi Frequency and Channel	7
Table 2: WP820 Wi-Fi Roaming Options	8
Table 3: Important Wi-Fi Parameters	11
Table 4: GWN7000 Wi-Fi Parameters	. 14
Table 5: Huawei Cloud SSID Configuration Parameters	36





OVERVIEW

The WP820 is a portable Wi-Fi phone designed to suit a variety of enterprises and vertical market applications, including retail, logistics, medical and security. This powerful, portable Wi-Fi phone comes equipped with integrated dual-band 802.11a/b/g/n Wi-Fi support, advanced antenna design and roaming support, and integrated Bluetooth for pairing with headsets and mobile devices. With the growing coverage of Wi-Fi network, wireless access point (AP) is now widely used for small/medium enterprises, multiple-floor offices, commercial locations and branch offices to provide seamless Wi-Fi access and mobile solutions. This document provides a guideline for network administrator to deploy WP820 in different Wi-Fi environment to achieve the best communication guality.

WP820 WI-FI FREQUENCY AND CHANNEL

The WP820 has built-in dual-band 802.11a/b/g/n Wi-Fi support. Below frequency and channels are supported.

Peak Antenna Gain	Frequency Ranges	Available Channels	Channel Set
2.4GHz=2.4 dBi 5GHz=3.0 dBi	2.412 - 2.472 GHz 5.180 - 5.240 GHz 5.260 - 5.320 GHz 5.500 - 5.720 GHz 5.745 - 5.825 GHz	14 4 4 12 5	1-13 36, 40, 44, 48 52, 56, 60, 64 100-140 149, 153, 157, 161, 165

Table 1: WP820 Wi-Fi Frequency and Channel

WP820 WI-FI ROAMING

To adapt to different Wi-Fi deployment, WP820 has provided several roaming options for users to configure. Below options are available under LCD menu->Settings->Network settings->Wi-Fi roaming mode. They can also be found in WP820 Web GUI->Network Settings->Wi-Fi Settings->Wi-Fi Roaming page.





Table 2: WP820 Wi-Fi Roaming Options

Name	Description
Signal threshold	This is the RSSI threshold for WP820 to decide whether to switch during roaming. If the currently connected AP has RSSI lower than this threshold, WP820 will start looking for nearby AP with better RSSI. Default value is - 70 (dBm).
Good signal scan interval	If the currently connected AP has a higher RSSI than the threshold, WP820 will scan nearby APs at this interval. Default value is 1000 (seconds).
Poor signal scan interval	If the currently connected AP has a lower RSSI than the threshold and there is no nearby AP that has higher RSSI than the threshold, WP820 will scan nearby APs at this interval. Default value is 50 (seconds).

When the AP that WP820 is currently connected to has signal strength lower than the configured "*Signal threshold*" on WP820, the device will try to look for a nearby AP with better RSSI. To avoid switchover back and forth due to unstable RSSI, the WP820 will only switch over when the new AP's RSSI is at least 8 dB higher than the currently connected AP.

"Good signal scan interval" and "Bad signal scan interval" determine the scan interval for WP820 to find out whether there is a better AP nearby to switch to. Normally if the currently connected AP has a higher RSSI than the threshold, WP820 can scan at a longer interval, while a shorter value can be applied for "Poor signal scan interval" because the currently connected AP has lower RSSI than the threshold which means WP820 should look for a better AP in a more aggressive way.

DEPLOYMENT REQUIREMENTS

When deploying Wi-Fi network with multiple APs for WP820 to roam, please follow below guidelines:

- 1. Make sure the APs are properly powered up and connected to your network.
- 2. Connect your PC to the same network as the APs. This PC is used for configuring the APs and other necessary devices via web GUI.
- 3. Access the APs using the PC's web GUI. Configure the APs to set them up.
- 4. Set the same SSIDs for all the APs. SSID is case sensitive.
- 5. Make sure the IP addresses assigned by the APs belong to the same network segment and the same VLAN.





During deployment, the cell edge for each AP should be designed to -67dBm and there should be 20% - 30% overlap between adjacent APs at that signal level. Otherwise, WP820 might encounter packet loss or blind area at the cell edge and it cannot hold the signal long enough to complete seamless switchover. To ensure seamless roaming, it's recommended that WP820 can always receive RSSI -67dBm or higher from the access point.

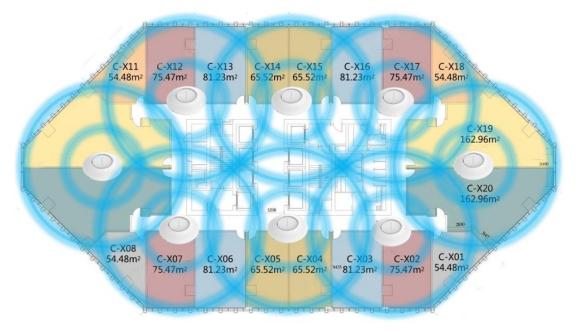


Figure 1: Wireless AP Deployment

IMPORTANT WI-FI PARAMETERS ON AP

There are several important parameters on AP for Wi-Fi configuration. Configuring them properly will enhance WP820 roaming performance.

Beacon Interval

Beacon interval defines how often the AP transmits the 802.11 beacon management frames. Usually the default value is **100ms**. It's recommended to keep it as default value on AP.

DTIM

This is the Delivery traffic indication message (DTIM) period in beacons. It's recommended to set it to 2.





Unicast Mode and Multicast Mode

In unicast mode, the controller unicasts every multicast packet to every access point associated to the controller. In multicast mode, the controller sends multicast packets to a CAPWAP multicast group. This method reduces overhead on the controller processor and shifts the work of packet replication to your network. It's recommended to use **unicast** mode to ensure call quality.

WMM (Wi-Fi Multimedia)

WMM is a wireless QoS protocol, a subset of the 802.11e protocol. It is used to ensure that packets with high priority can be sent first so that service quality for voice, video and other applications can be guaranteed.

On WP820, WMM related configurations can be found undero web UI->Network Settings->Advanced Network Settings.

• Layer 3 QoS for SIP

This defines the layer 3 packet's QoS parameter for SIP messages in decimal pattern. The value is used for IP Precedence, Diff-Serv or MPLS. The default setting is 26 which is equivalent to the DSCP name constant CS6.

• Layer 3 QoS for Audio

This defines the layer 3 packet's QoS parameter for RTP messages in decimal pattern. This value is used for IP Precedence, Diff-Serv or MPLS. The default setting is 46 which is equivalent to the DSCP name constant CS6.

WP820 will convert the QoS value to the corresponding WMM value/level so the packets can be differentiated and handled properly by other network devices.

Band Steering

Dual band operation with Band Steering detects clients capable of 5 GHz operation and steers them to that frequency which leaves the more crowded 2.4 GHz band available for legacy clients. This helps improve end user experience by reducing channel utilization, especially in high density environments. It's recommended to enable **band steering** on the APs, which means by default 5Ghz should be used (users can switch to 2.4Ghz if 5Ghz signal is poor.)

For above important parameters, the following sections provide the configuration methods on APs from different vendors for network administrator's quick reference. The following table shows whether the AP has the configurations related to these parameters. Click on the brand name to quickly locate relevant configuration instructions.





Product Model	Roam	Beacon Internal	DTIM	Multicast/Unicast	WMM	Band Steering
<u>GWN7600</u>	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
CISCO MERAKI	\checkmark			\checkmark	\checkmark	\checkmark
ARUBA CENTRAL	\checkmark	\checkmark	\checkmark	\checkmark		\checkmark
RUIJIE CLOUD	\checkmark					\checkmark
UBIQUITI UNIFI	\checkmark		\checkmark	\checkmark		\checkmark
MIST	\checkmark			\checkmark		\checkmark
HUAWEI CLOUD	\checkmark	\checkmark		\checkmark	\checkmark	\checkmark
EZMASTER	\checkmark					\checkmark
<u>CLOUDTRAX</u>	\checkmark				\checkmark	
TP-LINK	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark

Table 3: Important Wi-Fi Parameters





GWN7600

Wireless Configuration

- 1. Open a web browser on PC and enter the GWN web address to access the GWN7600/GWN7600LR web UI configuration page.
- 2. Connect to the GWN7600/GWN7600LR Web GUI as Master and navigate to page "Access Points".
- 3. Click on **Discover AP**.

S GWN7600	Firmware 1.0.7.5 Time 2018-08-17 16:42	⑦ │ Q │ 15s ♥ │ English ♥ admin [•
Overview	Access Points	
SSIDs	Device Type	Transfer network group Transfer AP Discover AP Failover
Access Points	③ Upgrade	\$
Clients 🔻	Device Type Name/MAC IP Address	Status Uptime Firmware Actions
Captive Portal 🔹	GWN7600 00:0B:82:AF:D3:1C 192.168.124.109	🚺 Master 17d 23h 16m 40s 1.0.7.5 🗹 🖄 🖶 🤱
System Settings 🔻	Showing 1-1 of 1 record(s).	Per Page: 10 •
Alert/Notification	© 2018 Grandstream Netw	orks, Inc. All Rights Reserved

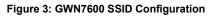
Figure 2: GWN7600 Access Points Configuration

4. When using GWN7600 as Master Access Point, users have the ability to create different SSIDs and adding GWN7600 Slave Access Points. The GWN7600 can support up to 16 SSIDs. Click on **Edit** to edit the SSID.





S GWN7600		Time 2018-08-15 1				0 Q			admin [→
Overview	+ Add								\$
SSIDs	Name	Wi-Fi	VLAN ID	Schedule	Security Mode	MAC Filtering	Captive Port	al RSSI	Actions
Access Points	GWNAFD31C	\checkmark	×	×	WEP 64-bit	Disabled	~	×	C
Clients •	TESTpwd	~	×	×	Open	Disabled	~	×	C
Captive Portal 🔹	ssid2	×	×	×	WPA2	Disabled	~	×	
Bandwidth Rules	ssid3	×	×	×	WPA2	Disabled	~	×	C
System Settings 🔹									
Alert/Notification				© 2018 Grandstr	eam Networks, Inc. Al	Rights Reserved			



S GWN7600		5 Time 2018-08-17 16:50	0 Q		English 🗸	admin [→
Overview	+ Add Name	Wi-Fi	Edit Device Membership	×	RSSI	Actions
SSIDs Access Points	GWNAFD31	Enable SSID	Ø		×	C D
Clients 👻 Captive Portal 👻	TESTpwd ssid2	SSID ③	GWNAFD31C		×	C 1
Bandwidth Rules	ssid3	SSID Hidden			×	Ľ
System Settings 🔻		VLAN Wireless Client Limit ⑦				
		Enable Captive Portal Captive Portal Policy	♥ simple v			
		Enable Schedule				
		Security Mode WFP Key (?)	WEP 64-bit •			
			Cancel			
Alert/Notification			© 2018 Grandstream Networks, Inc. All Rights Reserved			

Figure 4: GWN7600 Edit SSID

5. When editing or adding a new SSID, users will have to configure Wi-Fi. Please refer to below table for Wi-Fi tab options.





Table 4: GWN7000 Wi-Fi Parameters

Field	Description
Enable SSID	Check to enable Wi-Fi for the SSID.
SSID	Set or modify the SSID name.
SSID Band	Select the Wi-Fi band the GWN will use, three options are available: • Dual-Band • 2.4GHz • 5Ghz
SSID Hidden	Select to hide SSID. SSID will not be visible when scanning for Wi-Fi, to connect a device to hidden SSID, users need to specify SSID name and authentication password manually
VLAN	Enter the VLAN ID corresponding to the SSID.
Wireless Client Limit	Configure the limit for wireless client. If there's an SSID per-radio on a SSID, each SSID will have the same limit. So, setting a limit of 50 will limit each SSID to 50 users independently. If set to 0 the limit is disabled.
Enable Captive Portal	Click on the checkbox to enable the captive portal feature.
Captive Portal Policy	Select the captive portal policy already created on the "CAPTIVE PORTAL" web page to be used in the created SSID.
Enable Schedule	Check the box and choose a schedule to apply for the selected SSID.
Security Mode	Set the security mode for encryption, 5 options are available: • WEP 64-bit • WEP 128-bit • WPA/WPA2 • WPA2 • Open
WEP Key	Enter the password key for WEP protection mode.
Client Bridge Support	Configures the client bridge support to allow the access point to be configured as a client for bridging wired only clients wirelessly to the network. When an access point is configured in this way, it will share the Wi-Fi connection to the LAN ports transparently.
Client Time Policy	Select a time policy to be applied to all clients connected to this SSID.
Use MAC Filtering	Choose Blacklist/Whitelist to specify MAC addresses to be excluded/included





	from connecting to the zone's Wi-Fi. Default is Disabled.
	Client isolation feature blocks any TCP/IP connection between connected clients
	to GWN7600/GWN7600LR's Wi-Fi access point. Client isolation can be helpful
Client Isolation	to increase security for Guest networks/Public Wi-Fi. Three modes are available:
Chefter 130121011	Internet Mode
	•Gateway MAC Mode
	•Radio Mode
RSSI Enabled	Check to enable RSSI function, this will lead the AP to disconnect users below
	the configured threshold in Minimum RSSI (dBm).
	Enter the minimum RSSI value in dBm. If the signal value is lower than the
Minimum RSSI (dBm)	configured minimum value, the client will be disconnected.
Beacon Interval	Configure the beacon period, which decides the frequency the 802.11 beacon
Beacon interval	management frames AP transmits.
DTIM Period	Configure the delivery traffic indication message (DTIM) period in beacons.
	Once selected, AP will convert multicast streams into unicast streams over the
Multicast to Unicast	wireless link. Which helps to enhance the quality and reliability of video/audio
	stream and preserve the bandwidth available to the non-video/audio clients.
Enable 11K	Check to enable 802.11k
Enable 11V	Check to enable 802.11v
Upstream Rate	Set the maximum upstream rate
Downstream Rate	Set the maximum downstream rate

Band Steering

Band steering functions are divided into three items. Go to **Access Points->configure** to configure it.

- **2G in priority**, lead the dual client to the 2G band
- **5G in priority**, the dual client will be led to the 5G band with more abundant spectrum resources as far as possible
- **Balance**, access to the balance between these 2 bands according to the spectrum utilization rate of 2.4G and 5G.





S GWN7600	Firmware 1	.0.7.5 Time 20	018-08-15 11:31			0 Q	15s 🗸	English 🗸	admin [→
Overview	Access F	Points							
SSIDs	Device T	ype 🔻		Search		Transfer	network group	Transfer AP Discove	er AP Failover
Access Points	🕣 Upgi	rade 📿 🔿 Reboo	+ Add to SSIDs	🔀 Configure					•
Clients 🔻	V	Device Type	Name/MAC	IP Address	Status	Uptime	Firmware		Actions
Captive Portal 🔻	ø	GWN7600	00:0B:82:AF:D3:1C	192.168.124.109	🔊 Master	15d 18h 4m 43s	1.0.7.5	Ľ %	₽3 & # %
Bandwidth Rules	Showing	1-1 of 1 record(s).						Pe	r Page: 10 🔻
System Settings 🔻									
Alert/Notification				© 2018 Grandstream	ı Networks, Inc. All Rig	hts Reserved			

Figure 5: GWN7600 Band Steering - 1

S GWN7600) Firmware 1.0.7.	5 Time 2018-08-15 11:			@ Q		English 🗸	admin [→
Overview SSIDs Access Points Clients Captive Portal Bandwidth Rules System Settings	Access Po Device Typ C Upgra C Showing 1-	2.4GHz	Device : ings whose check box is checked Device Name ① Airtime Fairness Band Steering ① Mode ⑦ Channel Width ⑦ 40MHz Channel Location ⑦ Channel ⑦ Enable Short Guard Interval ⑦ Active Spatial Streams ⑦ Radio Power ⑦	Configuration		×		ver AP Failover Actions C Actions C Actions Point Page: 10 V
Alert/Notification				randstream Networks, Inc. All F	tights Reserved			

Figure 6: GWN7600 Band Steering - 2





CISCO MERAKI

Wireless Configuration

- 1. Find the Dashboard "network" to which you plan to add your APs, or create a new network.
- 2. Add your APs to your network.

Q Search Dashboard	📢 Announcements 👻	Help •	tianbopeng@163.com 👻
Access points			
There are no Meraki devices in this network. If you add some, we can help you configure them.			
		Cong	Make a wish
	Access points Tere are no Meraki devices in this network. If you add some, we can help you configure them. Add APs	Access points There are no Meraki devices in this network. If you add some, we can help you configure them. Add Are	Course obtained by the set of the set

Figure 7: Cisco Meraki – Add AP

3. Make any additional configuration changes under the Configure section of Dashboard network. Please make sure to review **SSIDs**, **Access Control**, **Firewall & Traffic Shaping** configuration pages.





disco Meraki	Q Search Dashboard	License problem Transouncements + Transouncements	*
NETWORK GWN -	Access control ssid: GWN WIFI	Υ	
Network-wide Wireless	Network access Association requirements	Open (no encryption) Any user can associate Pre-shared key with WEA2	
Organization		Visers must enter this key to associate:Show key MAC-based access control (no encryption) RADIUS server is queried at association time WPA2-Enterprise with Meraki authentication ▼ User credentials are validated with 802.1X at association time	
	WPA encryption mode 802.11r (9) 802.11w (9)	WPA2 only	
	Splash page	 None (direct access) Users can access the network as soon as they associate Click-through Users must view and acknowledge your splash page before being allowed on the network Sign-on with <u>Meraki authentication</u> Sign-on with <u>Meraki authentication</u> Users must enter a username and password before being allowed on the network Sign-on with SMS Authentication	-

Figure 8: Cisco Meraki – Additional Configurations

Band Steering

Go to Wireless->Access control->Wireless options.

ululu disco Meraki	Bridge mode and layer 3 roaming only		-
NETWORK	Content filtering O NAT mode only	Don't filter content	
GWN 👻	Bonjour forwarding Bridge mode and layer 3 roaming only	Disable Bonjour Forwarding V	
Network-wide	Wireless options		
Wireless		d minimum bitrate settings may be overridden by RF profiles. Go to RF Profiles	
Organization	Band selection Minimum bitrate (Mbps)	 Dual band operation (2.4 GHz and 5 GHz) 5 GHz band only 5 GHz band only 5 GHz has more capacity and less interference than 2.4 GHz, but legacy clients are not capable of using it. Dual band operation with Band Steering Band Steering detects clients capable of 5 GHz operation and steers them to that frequency, while leaving 2.4 GHz available for legacy clients. Lower Density Higher Density 1 2 5.5 6 9 11 12 18 24 36 48 54	
		802.11a/b/g/n/ac devices supported	
		Save Changes or <u>cancel</u> (Please allow 1-2 minutes for changes to take effect.)	
	© 2018 Cisco Systems, Inc. privacy - terms	Last login: translation missing; zh.datetime.distance in words.about x. hours ago from your current IP address Current session started: translation missing; zh.datetime.distance in words x. minutes ago Data for this organization is hosted in <u>Asia</u>	Ŧ

Figure 9: Cisco Meraki – Band Steering





Band selections are:

- **Dual band operation**: 2.4GHz and 5GHz
- **5GHz band only**: 5GHz has more capacity and less interference than 2.4GHz, but legacy clients are not capable of using it.
- **Dual band operation with Band Steering**: Band Steering detects clients capable of 5 GHz operation and steers them to that frequency, while leaving 2.4 GHz available for legacy clients.





ARUBA CENTRAL

Wireless Configuration

The app selector lists the apps available for the Managed Service Portal portal users. The Wireless Configuration app allows you to configure SSIDs, radio profiles, security and firewall settings, and enable services on Instant APs. It also allows you to configure Instant APs provisioned under template groups through configuration templates.

orubo Central	FILTER MONITORING & REPORTS default (3 Total Devices 1 Offline APs 0 Offline SWITCI	HES) 🔻		S HOURS	•
CURRENT APP MONITORING & REPORTS		APs 🔻	SWITCHES 🔻	SECURITY 🔻	
Q Search Current App Find devices, clients and networks	Monitoring & Wireless Reports Management Wired		Clients Count		
Network Overview View Aruba device performance and security Network Health View potential network issues	MA Maintenance Presence Analytics GA Guest Access		4		
Client Overview View detailed information on connected clients	(CL) (GS)		2		
AppRF™ View app usage and configure web policy enforcement	Clarity Global Settings	2:50:00			
VisualRF RF Heatmaps	100 120 10:00 10:30 11:00 11:30 12:00 12:30	13:00 13:30	0 10:00 10:30 11:00	11:30 12:00 12:30 13:00 13:30	
Alerts Set, edit and view alerts Reports	Top APs By Usage 2018-08-20 13:10		Top Clients By Usage 2018-08-20 13:10	38%) + 2.2K/s + 107K/s	
Schedule and generate reports	b4:5d:50:c2:a2:4c 12 KB 84:d4:7excb:5b:06 6 KB		20:47:da:89:82:5e	2 KB	
	Top IAP Clusters By Usage		Top IAP Clusters By Clients	Ви Алегаде 🗸 🗸	+
🖸 🖾 🤉 🖁	Need Help? A Copyright © 20	18 Aruba, a Hewlett Packa	rd Enterprise company. All Rights Reserve	ed.	

Figure 10: Aruba Central - App Selector

To configure WLAN settings, complete the following steps:

- 1. From the app selector, click **Wireless Management**.
- 2. From the group selector, select a group or a device.
- 3. On the left navigation pane, click Wireless Networks. The **Wireless Networks** page opens.
- 4. To create a new SSID profile, click the + icon. The Create a New Network pane opens.





Central	FILTER WIRELESS MANAGEME default (3 Total Devices	NT 1 Offline APs 0 Offline SWITCHES	1 🔻						
CURRENT APP WIRELESS MANAGEMENT	Networks								
Q Search Current App Find devices, clients and networks	Networks								
	NAME	TYPE	SECURITY	ACCESS TYPE					
Wireless Networks Add and edit wireless networks	aruba_tw	guest	wpa2-psk-aes	unrestricted					
Access Points	wired-SetMeUp	guest		network-based					
View APs and set device parameters	default_wired_port_profile	employee		unrestricted					
RF Set Aruba Adaptive Radio Management									
Wireless IDS/IPS Manage intrustion detection and prevention									
Security Set advanced security parameters	+								
VPN Manage controller VPN connections									
DHCP Manage DHCP scopes									
Services Enable additional Central services									
System Manage advanced system settings		Copyright © 2018 A	vruba, a Hewlett Packard Enterpr	ise company. All Rights Reserved.					
© ? Å	Need	Help? ^							

Figure 11: Aruba Central – Create New SSID

- 5. Configure Broadcast Filtering. Select any of the following values:
 - All. The Instant AP drops all broadcast and multicast frames except DHCP and ARP, IGMP group queries, and IPv6 neighbor discovery protocols.
 - **ARP**. The Instant AP drops broadcast and multicast frames except DHCP and ARP, IGMP group queries, and IPv6 neighbor discovery protocols. Additionally, it converts ARP requests to unicast and sends frames directly to the associated clients.
 - **Disabled**. All broadcast and multicast traffic is forwarded to the wireless interfaces.
- 6. Configure DTIM interval.

The **DTIM Interval** indicates the DTIM period in beacons, which can be configured for every WLAN SSID profile. The DTIM interval determines how often the Instant AP delivers the buffered broadcast and multicast frames to the associated clients in the power save mode. The default value is 1, which means the client checks for buffered data on the Instant AP at every beacon. You can also configure a higher DTIM value for power saving.





orubo Central	FILTER WIRELESS MANAGEMENT default (3 Total Devices 1 Offline APs 0 Offline SWITCHES)
CURRENT APP WIRELESS MANAGEMENT	Create a New Network
Q Search Current App Find devices, clients and networks	1 General (2) VLANs (3) Security (4) Access
	€ Basic Settings
Wireless Networks Add and edit wireless networks	Broadcast/Multicast
Access Points View APs and set device parameters	Broadcast Filtering:
RF Set Aruba Adaptive Radio Management	DTIM Interval: 1 beacon V
Wireless IDS/IPS Manage intrustion detection and prevention	Multicast Transmission Optimization:
Security Set advanced security parameters	Dynamic Multicast Optimization:
VPN Manage controller VPN connections	Dynamic Multicast Optimization Channel 90 %
DHCP Manage DHCP scopes	Utilization Threshold: 37x) + 0.20/5
Services Enable additional Central services	 Transmit Rates (Legacy Only)
System Manage advanced system settings	🕒 Bandwidth Limits
© ? Å	Need Help? Copyright © 2018 Aruba, a Hewlett Packard Enterprise company. All Rights Reserved.

Figure 12: Aruba Central – DTIM

7. Configuring Radio Parameters

To configure RF parameters for the 2.4 GHz and 5 GHz radio bands on an Instant AP, complete the following steps:

- a. From the app selector, click Wireless Management.
- b. From the group selector, select a group or a device.
- c. On the left navigation pane, click RF. The RF page opens.
- d. Click Radio.
- e. Under 2.4 GHz, 5 GHz, or both, configure the parameters.





aruba Central	FILTER WIRELESS MANAGEMENT default (3 Total Devices 1 Offline APs 0 Offline SWITCHES)	
CURRENT APP WIRELESS MANAGEMENT	NEW 2.4G RADIO PROFILE	
Q. Search Current App Find devices, clients and networks	> Name:	Ĩ
Wireless Networks	Zone:	
Access Points	Legacy Only:	
View APs and set device parameters	802.11d / 802.11h:	TX POWER ACTIONS
Set Aruba Adaptive Radio Management	Beacon Interval: 100 ms	127/127
Wireless IDS/IPS Manage Intrustion detection and prevention	Interference Immunity Level: 2 Y	
Security Set advanced security parameters	Channel Switch Announcement	
VPN Manage controller VPN connections	Count:	
DHCP Manage DHCP scopes	Background Spectrum Monitoring:	 40% + 0K/s 0.2K/s
Services Enable additional Central services	Save	
System Manage advanced system settings	Copyright © 2018 Aruba, a Hewlett Packard Enterprise company. All Rights Reserved.	
💬 ? A	Need Help? A	

Figure 13: Aruba Central – Radio Parameters

Band Steering

To configure ARM features such as band steering, and airtime fairness mode and Client Match, complete the following steps.

- 1. From the app selector, click Wireless Management.
- 2. From the group selector, select a group or a device.
- 3. On the left navigation pane, click RF. The RF page opens.
- 4. Under Adaptive Radio Management (ARM), click Client Control.
- 5. For Band Steering Mode, configure the parameters.





Central	FILTER WIRELESS MANAGEMENT default (3 Total Devices 1 Offline	e APs 0 Offline SWITCHES)
WIRELESS MANAGEMENT	RF	
Q Search Current App Find devices, clients and networks	✓ Adaptive Radio Management(AF	RM)
	Client Control	
Wireless Networks Add and edit wireless networks	Band Steering Mode:	Prefer 5GHz 🛛 🗠
Access Points View APs and set device parameters	Airtime Fairness Mode:	Disable Prefer 5GHz Force 5GHz
RF Set Aruba Adaptive Radio Management	ClientMatch:	Force SGHZ Balance Bands
Wireless IDS/IPS Manage intrustion detection and prevention	ClientMatch Calculating Interval:	3 seconds
Security Set advanced security parameters	ClientMatch Neighbor Matching:	60 %
VPN Manage controller VPN connections	ClientMatch Threshold:	5
DHCP Manage DHCP scopes	Spectrum Load Balancing Mode:	Channel 🗸
	🕀 Access Point Control	
Services Enable additional Central services	> Radio	
System Manage advanced system settings		
₽ ? Å	Need Help?	Copyright © 2018 Aruba, a Hewlett Packard Enterprise company. All Rights Reserved.

Figure 14: Aruba Central – Band Steering





RUIJIE CLOUD

Wireless Configuration

Create new network & add APs.

▲ 「 「 」 「 」 「 」 「 」 「 」 「 」 」 「 」 」 「 」 」 」 「 」 」 」 」 」 」 」 」	15068770629 监控	R 1	5	维护	♥ 业务组件	 ◆ 探索频道 • 				●添加 !!	098
 一概览 全局 网络 	·	5 网络个数		1/1 E线/总设备数	8	0/0 活跃/在线用户	4	严重 中等 一般	0 0 0	日 待接物	网络 0
告警 曰 设备	添加网络	网络名称	Q [≡列	表 ② 地图	选择网络类	裡 •					分组管理
AP 网关 交换机	🔁 hz	网络名称	: & C 🖻	告警 0	在线用户 0	AP	AC \$	同关 0/0	◆ 交換机 0/0	◆ ○ 无线配置	¥: 网络拓扑
AC □ 用户	5 44		: <u>A</u> C D	0	0	0/0	0/0	0/0	0/0		★ 网络拓扑
用户列表 用户体验	14444 👼 zij			0	0	0/0	0/0	0/0	0/0	6 无线配置	★ 网络拓扑
认证记录	궁 税捷	×	: 🖉 🖸 🗇	0	0	1/1	-	0/0	0/0	[○ 无线配置	
				重页	第	1 页/总数1	下一页 尾页				5 奈记录
											6 返 旧
			7.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4								

Figure 15: RuiJie Cloud – Create New Network







Figure 16: RuiJie Cloud – Create New AP

All AC device information under the current account can be viewed in the monitoring - device -AC to see whether the device is online and whether the configuration status of the device is **synchronized**.

於 法 法 🖂	5068770629 监控	配置	维护	♥ 业务组件 •	◇ 探索频道 -	The second	●添加 ! !	99
□ 概览	15068770629 ~					网络名称	Q £	相管理
全局 网络 告警	AP列表(点击"设备序列 添加AP 命令行助手		更多操作 🗸 1选口	a		自动刷新:	○ ○ ■ ○ ○ ■ ○ ○ ■ ○ ○ ○	 ₩ A A
□ 设备		息 🔿 型号版本						
AP 网关 交换机	 ✓ 在线状态 」 ✓ ● 在线 		記置状态 A 设备名 已同步 <u>Ruij</u>	e 5869.6ca8.d0f0	172.16.1.32 4	出口地址 用户数量 5.116.9.232 - ■	分组 15068770629 / 锐捷	-
AC □ 用户	_	首页	上一页	着 1 页/总数	1 页一页	尾页	10 -	1条记录
用户列表 用户体验 认证记录								
								し。返回

Figure 17: RuiJie Cloud – AP List





If the wireless configuration needs to be modified, the following steps can be followed: configuration -> wireless configuration.

- KJ1447	15068770629 🗸 —	説捷 ~				网络名称	Q	分组管理
 网络 无线配置 	The second states	10000			-			
元线配置 漫游配置	锐捷					从指定分组拷	贝配置(保存配置	更多操作・
认证配置								
	无线配置							^
〕射频	SSID 🕁							
布局规划	WLAN ID	SSID	加密模式	是否隐藏	转发类型	关联Radio	认证类型	操作
射频规划	1	ruijie	wpa2-psk	否	nat	1,2	未打开认证	CŪ
负载均衡	2	_333	wpa2-psk	否	bridge	1,2	未打开认证	ĭ ⊡
漫游网优	3	Ruijie-sms	wpa-psk	否	bridge	1,2	未打开认证	C d
〕其他		首页	上一页	第 1 页/总	数1 下一页	尾页	10	3条记录
配置任务		目风		# 1 W/8	<u>家」「下一页」</u>		10	
蓝牙配置	射频 ⊖							
自定义Cli集	Radio间用户数负	载均衡						
配置监控	负载均衡开关: 🕖							

Figure 18: Ruijie Cloud – Wireless Configuration

If the roaming function is turned on, users can achieve seamless roaming within the network scope.

▲● 流景 [15068770629 监控	
□ 网络	15068770629 ~ — 锐捷 ~ 网络名称	Q)分组管理
无线配置 漫游配置 认证配置	 ·	
日 射频 布局规划	若开启漫游功能,用户可在该网络范围内实现无缝漫游,实例如下:	
射频规划 负载均衡		
漫游网优 □ 其他	Network Once - O	
配置任务 蓝牙配置 自定义Cli集	Grand - Grand	帮助 文档
配置监控		企 返回 旧版

Figure 19: RuJjie Cloud – Roaming Configuration





Band Steering

5G priority: after 5G priority is turned on, AP will guide the wireless terminals supporting 5G to have priority access to 5G frequency band, reducing the pressure of 2.4g frequency band.

	客 15068770629	监控 配置	维护	♥业务组件	 	荷・ のため			8
	配置模板						×		
□ 网络	WLAN ID	1	•		是否隐藏	否	*	[理]	
无线配] 漫游配]	SSID	ruijie		中文编码 ②	转发模式 🛿		*	制作]	
漫研館: 认证配1		<i></i>				[点击这里配置NAT地址池]			H
- Strate and a	加密模式	WPA2-PSK	۲		射频	🛃 射频1 🗹 射频2			
日 射频	PPSK启用	□ 去管理PPSK账号>>				□ 射频3(仅raido3为接入模式时SSID生效)			
布局规 射频规	密码	1111111				「点这里配置第三频工作模式」			
负载均衡	5G优先	☑ 开启							
漫游网(单用户限速配置	□开启							
□ 其他	SSID总用户限速配置	□ 开启						录	
配置任: 蓝牙配:	认证配置	□ 开启							
自定义(确定	取消					
	负载均	適开关: 〇〇							6.0
									旧版
	安全							×.	

Figure 20: RuiJie Cloud – Band Steering





UBIQUITI UNIFI

Wireless Configuration

1. To add a new WLAN group, click + button.

U	ปก็โFi 5.8.28							CURRENT SITE Default 🗸	USERNAME admin ↓	:
89	SETTINGS				WLAN Group Default		Ø 🛙 🕇	3		₽
-∿		NAME 1	SECURITY	GUEST NETWORK	VLAN	ACTIONS				
即	Wireless Networks	qsding_portal	wpapsk	~		🖉 EDIT	DELETE			
\odot	Networks	ubnt-portal	wpapsk							
99	Routing & Firewall	Unifi_mesh	wpapsk							
	IPS BETA	wp800_unifi	wpapsk							
Q	DPI									
	Guest Control									
	Profiles									
	Services									
	Admins									
	User Groups									
	Controller									
	Notifications BETA									
	Cloud Access									
(i)	Elite Device									
	Maintenance									
\boxtimes	Auto Backup									
222										
0,										
9										
Ŷ										

Figure 21: UNIFI – Wireless Network Settings

2. Add or Edit a WLAN Group.

Name: Enter or edit a descriptive name for the WLAN group. Mobility: To enable seamless roaming (Zero Handoff), select the checkbox.





U	UniFi 5.8.28			CURRENT SITE Default 🗸	USERNAME admin 🗸	
63	SETTINGS					•
-∿		CREATE NEW WLAN GROUP				
即	Wireless Networks	Name				
\odot	Networks	Mobility	Enable seamless roaming (Zero-Handoff)			
ЯR	Routing & Firewall	Radio	5G (802.11n/a) 🗸			
Q	IPS BETA	Channel	36 ~ ~			
	Guest Control					
	Profiles	Duplicate WLANs	Duplicate WLANs from existing WLAN Group SG-2H (Zero-Handoff, radio ns, channel 36)			
	Services	PMF	Oisabled Optional Required			
	Admins					
	User Groups		Enabling PMF (Protected management frames) may cause a performance drop.			
	Controller		Disabled: APs will not use PMF for any stations. Optional: APs will use PMF for all capable stations, while allowing non-PMF capable stations			
	Notifications BETA		Optional: Ars will use PMP for all capable stations, while allowing non-PMP capable stations to join the WLAN.			
(j)	Cloud Access		Required: APs will use PMF for all stations. Stations without PMF capability will not be able to join the WLAN.			
\boxtimes	Elite Device		Note that PMF applies to Generation 3 UniFi APs only.			Ļ
22	Maintenance					
0,	Auto Backup					
Q		SAVE CANCEL				

Figure 22: UNIFI – Create New WLAN Group

- 3. Create or Edit a Wireless Network.
 - Name/SSID: Enter or edit the wireless network name or SSID.
 - Enabled: Select this option to make the network active.
 - Security: Select the type of security to use on your wireless network.

U	UniFi 5.8.28			CURRENT SITE Default 🗸	USERNAME admin 🗸	
69	SETTINGS					•
-∿-		EDIT WIRELESS NETWORK - Q	SDING_PORTAL			
即	Wireless Networks	Name/SSID	qsding_portal			
0	Networks	Enabled	Enable this wireless network			
яR	Routing & Firewall	Security	Open 💿 WEP 💿 WPA Personal 💿 WPA Enterprise			
Q	IPS BETA	Security Key	•••••••			
	DPI Guest Control	Guest Policy	Apply guest policies (captive portal, guest authentication, access)			
	Profiles					
	Services	Multicast and Broadcast Filtering	Block LAN to WLAN Multicast and Broadcast Data (2)			
	Admins	VLAN	Use VLAN (VLAN () (2:4009)			
	User Groups	Fast Roaming BETA	🗌 Enable fast roaming 📀			
	Controller	Hide SSID	Prevent this SSID from being broadcast			
(j)	Notifications BETA	WPA Mode	WPA2 Only V Encryption AES/CCMP Only V			1
\boxtimes	Cloud Access	Group Rekey Interval	Enable GTK rekeying every 3600 seconds			1
⊘	Elite Device Maintenance					
-	Auto Backup	User Group	Default ~			
00	Auto backup		Note that the configuration and rate limits of this user group will be ignored by any client that has a user group already			0
Ŷ			selected.			

Figure 23: UNIFI – Edit a Wireless Network





• DTIM Mode:

Select this option to use the default DTIM (Delivery Traffic Indication Message) values. Increasing the DTIM values allows devices to conserve power, at as light latency penalty. Deselect it to configure the values below.

- DTIM 2G Period: Enter the number of beacons between the 2.4 GHz DTIM beacons. The default is 1.
- DTIM 5G Period: Enter the number of beacons between the 5 GHz DTIM beacons. The default is 1.
- 2G Data Rate Control: Select this option to determine what bit rates your 2.4 GHz network will allow.
 Disabling lower bit rates can improve performance for higher density networks but will make some older devices in compatible with your network and limit the range of your wireless network.
- 5G Data Rate Control: Select this option to determine what bit rates your network will allow. Disabling lower bit rates can improve performance for higher density networks but will make some older devices incompatible with your network and limit the range of your wireless network.

U	ปก็โFi 5.8.28			CURRENT SITE Default 🗸	USERNAME admin 🗸	
69	SETTINGS	Group Rekey Interval	Enable GTK rekeying every 3600 seconds			9
-∿		User Group	Default			
囗	Wireless Networks		A Note that the configuration and rate limits of this user group			
0	Networks		will be ignored by any client that has a user group already selected.			
ЯR	Routing & Firewall	UAPSD	Enable Unscheduled Automatic Power Save Delivery			
Q	IPS BETA	Scheduled	Enable WLAN schedule			
	Guest Control	Multicast Enhancement	Enable multicast enhancement (IGMPv3)			
	Profiles	B02.11 RATE AND BEACON O	CONTROLS			
	Services	DTIM Mode	Vse default values			
	Admins	DTIM 2G Period				
	User Groups	DTIM 5G Period				
	Controller Notifications	2G Data Rate Control	Enable minimum data rate control 🕜			
()	Notifications BETA Cloud Access	5G Data Rate Control	🗌 Enable minimum data rate control 🕜			
\boxtimes	Elite Device	H MAC FILTER				
999	Maintenance		10N			
0,	Auto Backup					
Ŷ		SAVE CANCEL				

Figure 24: UNIFI – DTIM

Band Steering

The Devices screen displays a list of UniFi devices discovered by the UniFi Controller. You can click any of the column headers to change the list order.





ALL	(10) GATEWAY/SV	VITCHES (1) APS (9) OVERVIEW P	ERFORMANCE CONFI	G		Search or	select tag	0	PROPERTIES =
î	DEVICE NAME	IP ADDRESS	STATUS	MODEL	VERSION	CLIENTS	DOWN	UP	СНА	meshon10b5
	meshon10b5	192.168.1.247	CONNECTED	UniFi AP-AC-Mesh-Pro	3.9.42.9152	0	90.8 MB	3.68 MB	1 (ng)	
0	f0:9f:c2:3c:5b:6b	192.168.1.230	CONNECTED	UniFi AP-AC-Mesh	3.9.42.9152	0	908 KB	144 KB	11 (nį	☐ ● f0:9f:c2:d0:10:c3 ② ②
0	f0:9f:c2:3c:5c:7f	192.168.1.21	CONNECTED	UniFi AP-AC-Mesh	3.9.42.9152	0	6.76 MB	1.18 MB	11 (nį	
	f0:9f:c2:d0:10:c3	192,168,1.70	CONNECTED	UniFi AP-AC-Mesh-Pro	3.9.42.9152	0	0.8	0 B		8 11N/B/G (High, likely a problem) 76% Utiliz
0	acpro	192 168 1 212	DISCONNECTED	UniFi AP-AC-Pro	3.9.27.8537	0				42 (36,+1) 11N/A/AC (Acceptable) 20% Utiliz
0	44:d9:e7:f6:a0.ae	192.168.1.185	DISCONNECTED	UniFi AP-AC-Pro	3.9.27.8537	Ó				RX FRAMES TX FRAMES INTERFERENCE FRE
0	78:8a:20:ff:ba:08	192.168.1.104	DISCONNECTED	UniFi AP-SHD	3.9.42.9152	0				Details Clients Config Tools Stats
0	f0:9ftc2:65teatc7	192.168.1.66	DISCONNECTED	UniFi AP-HD	3.9.27.8537	0				
0	fciecida:48:e4:09	192.168.1.190	DISCONNECTED	UniFi AP-nanoHD	3.9.27.8537	0				E GENERAL
										NETWORK BAND STEERING
										Prefer 5G Balanced O Off
										E-manual and a second se
										QUEUE CHANGES CANCEL
										AIRTIME FAIRNESS

Figure 25: UNIFI – Band Steering





MIST

Wireless Configuration

1. Claim the AP.

Click on **Access Points** on the left-hand navigation bar. If you have a claim code for the AP, enter it by clicking **the Claim APs** button in the top right of the Access Points screen. Then, fill in the code and click the **Claim** button to add the AP. After that, click to select the new AP in the list and enter a name in the **Name** field.

Mist	SOF	10								TUE, C	18:59 PM 🙎 🤅	D
	O		ess Po	oints	site test_site2 💌				AP Inventory	Create Wireless Networks	Claim APs 🗮	φ
		8	Status	Name	MAC Address	IP Address	No. Clients	Uptime	Total Bytes	Capabilities	VBLE	
ACCESS POINTS							has no Acces					
						Claim your Acce	Claim APs	ling claim code	IS.			
NETWORK												

Figure 26: Mist – Claim APs

2. Setting up a WLAN

Click on **Networks** on the left-hand navigation bar, then select **WLANs**. Select appropriate options for WLAN Status.





SOHO		WE	D, 03:24 PM 2
SSID New WLAN Labels	Security WPA-2/PSK with passphrase Reveal WPA-2/EAP (802.1X) Open Access More Options	Apply to Access Points All APs AP Labels Specific APs	
WLAN Status Enabled Disabled Hide SSID No Static IP Devices Radio Band	Fast Roaming © Default © .11r VLAN © Untagged © Tagged © Pool © Dynamic	Isolation Ipohibit peer to peer communication Filtering (Wired to Wireless) ARP Broadcast/Multicast	
 e 2.4G and 5G 2.4G Band Steering Enable 	Guest Portal No portal (go directly to internet) Show guest portal <u>Configure Portal</u> Allowed Subnets	Custom Forwarding Custom Forwarding to Eth0 + PoE	
Data Rates Compatible (allow all connections) No Legacy (2.4G, no 11b) High Density (disable all lower rates) Custom Rates	Allowed Hostnames Hostname Exceptions Block access to these hostnames, even if the parent domain is allowed	SSID Scheduling © Enabled ® Disabled	

Figure 27: Mist - New WLAN

3. Filtering

By default Mist supports Proxy ARP.

- **ARP Filter:** When ARP filter is enabled, we block all ARP broadcast requests from going to the specified wireless Interface. When ARP filter Is disabled, Proxy ARP will try to resolve the Ethernet address of requests, and if not known, will flood the original request to any Interface not being ARP filtered.
- Broadcast / Multicast Filter: When Enabled, this filter will BLOCK ALL Broadcast and Multicast packets on a specified Interface, except:
 - a) ARP's (as handled above)
 - b) DHCP broadcast transactions.
 - c) IPv6 Neighbor discovery frames. (ICMPv6).

All other broadcasts will we blocked, including IPv6 Broadcasts/Multicasts, and ALL MDNS frames. (IPv4 & IPv6)

 Allow MDNS Checkbox: This option ONLY has any effect when #2 (the Broadcast / Multicast filter is ENABLED). When selected, this option will ALLOW mDNS packets to transmitted through the specified interface. This includes IPv4 and IPv6 mDNS. If Not selected, then the Broadcast/Multicast filter will treat mDNS frames just like any other broadcast/multicast frame, and block them.





Mist	SOHO Apply to Access Points	TUE, 09:17 PM	8	?	
	All APs AP Labels Specific APs				*
	Isolation prohibit peer to peer communication				
	Filtering (Wired to Wireless)				
	Broadcast/Multicast				
NETWORK	Custom Forwarding				
	SSID Scheduling Enabled Disabled				

Figure 28: Mist – Filtering

Band Steering

Enable Band steering under Network -> WLANs. Make sure both 2.4GHz and 5GHz radios are enabled on your WLAN to be able to use Band Steering mode.

Mist	SOHO		TUE, 09:17 PM 🙎 🕐
	< WLANS : New WLAN		Create
CLIENTS	SSID New WLAN	Security WPA-2/PSK with passphrase Reveal	
ACCESS POINTS	Labels +	WPA-2/EAP (802.1X) Open Access More Options	
		Fast Roaming Default	
	WLAN Status Enabled Disabled Hide SSID	• .11r	
NETWORK	No Static IP Devices	VLAN • Untagged • Tagged • Pool • Dynamic	
	Radio Band • 2.4G and 5G 2.4G 5G	Guest Portal	
	Band Steering	No portal (go directly to internet) Show guest portal <u>Configure Portal</u> Allowed Subnets	
	Data Rates	Allowed Hostnames	

Figure 29: Mist – Band Steering





HUAWEI CLOUD

Wireless Configuration

1. Configuring an SSID

Choose **AP>Configure>SSID**. Click **Create** to access the SSID configuration page.

				۵	🖪 To Do 🔍	🕐 English 🗸	547895483@qq.c	om =
	AP + Configure + SSID							
Site: HZ ≓	⊙ Create	Delete						
A Tenant	Name	Label	Status	Effective Radio	Authentication	Encryption Mo	WEP Default K	Netwo
- 🗊 Site				N	o records found.			
(g) AP								
💣 Recommend for you								
	4	ą	Copyright © 2015-2	018 Huawei Technologie	es Co., Ltd. All rights	reserved.		•

Figure 30: Huawei Cloud – Create SSID

Parameter		Description						
Basic settings	Name	SSID when a STA connects to a wireless network.						
	Working status	The default value is ON. If the value is set to OFF, the SSID is unavailable.						
	Effective radio	Dual frequency bands are used by default. The default value is recommended.						
	AP Tags	The label specifies the AP where the SSID is configured.						
	Network connection	Layer 2 forwarding.						
	mode	NAT						
	VLAN	This parameter is available only when the value of Network connection mode						
		is Layer 2 bridge forwarding. The VLANID of an AP is assigned to a STA that						
		is associated with an SSID based on the label.						
Advanced	SSID hiding	By default, this function is disabled. After this function is enabled, SSIDs are						
Configuration		invisible.						
	Band steering	By default, this function is enabled. The band steering function enables an AP						
	(5Gprioritized)	to steer STAs to the 5 GHz frequency band first, which reduces load and						
		interference on the 2.4 GHz frequency band. User experience is therefore						

Table 5: Huawei Cloud SSID Configuration Parameters





			increased at
			improved.
	Limi	it access of	By default, this function is disabled. After this function is enabled, 802.11a,
	Trad	ditional	802.11b, and 802.11g traditional terminals cannot be connected.
	term	ninals	
	Max	kimum	Maximum number of STAs connected to the SSID. The default value is 128.
	num	ber of	
	user	rs	
	Use	r isolation	By default, this function is enabled. After this function is enabled, STAs
			connected to the SSID are isolated from each other.
	Bonj	jour	By default, this function is disabled. Bonjour is a solution proposed by Apple
	trans	sparent	and applies to Layer 2 broadcast domains. It allows network devices in a
	trans	smission	Layer 2 broadcast domain to obtain IP addresses and discover services.
	U-AI	PSD	By default, this function is disabled. U-APSD is a new energy saving mode
			defined for WMM, which can improve the energy-saving capability of STAs.
			Some STAs may not well support U-APSD. In this case, you need to disable
			U-APSD.
1			

			۵	💽 To Do	0 Q	English - 54	7895483@qq.com	-
	AP > Configure > SSID							
Site: HZ ≓								^
	* Name:							8.1
A Tenant	Working status:							
- 🗊 Site	Scheduled switch-on:	—						
(g) AP	Effective radio:	Q 2.4G/5G ○ 2.4G ○ 5G						
	AP Tags:	· ·						
🗗 Recommend for you		Select the device to be configured	based on labels. If the l	label is empty, al	l devices are se	lected. To add	labels, choose AP >	M
	Network connection mode:	Switch	Interne					
		(1) AP	(I) AP					
	4	1. 1						•

Figure 31: Huawei Cloud – SSID Configuration

- 2. Configuring Radio Parameters
 - Choose **AP > Configure > Radio** and configure basic radio parameters on the Basic Settings area.
 - (Optional) Expand Advanced Settings and adjust radio calibration parameters as needed.
 - (Optional) On the **Channel Planning** area, find the target AP, click Edit for 2.4 GHz/5 GHz radio, and manually configure radio parameters.





	Q 💽 To Do 🗘 🖓 English - 547895483@qq.com -
	AP > Configure > Radio
Site: HZ ≓	Basic Settings A
	Area: China *
A Tenant	Schedule for enabling radio:
(v) AP	Calibration mode: Automatic • Optimal start time: - 03 : 00 : 00 + Time interval (minute): 1
ල් Recommend for you	Advanced Settings V Apply
	Channel Planning The configured antenna gain of an AP radio must be the same as the gain of the antenna installed on the AP, and is valid for outdoor APs only.
	🌺 Copyright © 2015-2018 Huawei Technologies Co., Ltd. All rights reserved.

Figure 32: Huawei Cloud – Radio Parameters





EZMASTER

Wireless Configuration

1. Adding devices to ezMaster Device Inventory.

Enter the MAC Address, Check Code and Description of the device you want to register.

↑ □ ↓		admin ~ EnGenius
Device Inventory		
Add Devke		Q
MAC Address	Description	4
88:DC:96:64:AE:D9	EAP1300_gwn	
50 Showing 1 to 1 of 1 Device(s)		Previous 1 Next

Figure 33: ezMaster – Add Device

2. Managing devices using ezMaster.

In order to start managing and monitoring Neutron devices, these devices must first be added to a project. Make sure that your Neutron device is connected to a network with a DHCP server and can access the Internet. Click on the **Project** icon to create a new project.





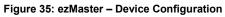
ŕ		\$	Ê				ĵ admin ∽	EnGeniius®
Γ.	lew Create New Proj	ect	Proje	ects				
	lanage		Q, S	Search		≔		
1	Recently Opened	d Projects		gwn_engen_test	1	0		
	Projects					Active 1		
				Last Opened: 2018-08-16 23:28:11 , Created:	2018-05-22 00:57:33	Offline		
								0

Figure 34: ezMaster – Create New Project

3. Device Configuration

Once the AP is online (green), to configure your AP, click on the **Device Name** link of your AP to bring up the configuration menu.

•	Â	P	₽		Î											0) admin ~ En	Genius®
	Device	e Manager	nent	Moni	toring	Visualiz	ation	Statistics	Hotspot Serv	ice Maintenance								
	Devic	e			g	wn en	gen	test > De	vice Config					1	managed	1 activ	ve O	offline
	Acces	ss Point		1					-									
	Switc			0		💼 Re	move	Reboot	1							Q		
	Pendi	ing Approv	al	0				Status ≑	Model Name	MAC Address	Device Name	WAN IP		Firmware Version	🖗 Uptime 🎈	Group [‡]	Operating Channel	:=
							•	Online	EAP1300	88:DC:96:64:AE:D9	EAP1300	192.168.1.184	192.168.1.184	v3.3.1-c1.8.59	6d 0h 14m		Ch6 (2.4G) / Ch36 (5G)	
						50 *	1 to 1	of 1 Device	(S)								Previous 1	Next







4. Set Wireless Radio Settings.

↑ □ ↓ i				
Device Management Monitoring	ng Visualization Statistics Hotspot Service Maintena	ince		
Device Access Point 1 Switch 0 Pending Approval 0	gwn_engen_test > Device Config	General Settings Wireless Radio Settings		
	Status + Model + MAC A	Country:	Please select a country code.	×
	Online EAP1300 88:DC:96 1 to 1 of 1 Device(s)	Wireless Mode: Channel HT Mode: Extension Channel: Channel: Operating Channel: Transmit Power: Client Limits: Data Rate: RTS/CTS Threshold: Aggregation:	2.4GHz 802.11 bigin Mixed ¥ 20MHz ¥ Upper Channel ¥ Auto ¥ 127 2346 (1~2346) © Enable © Disable 32 Frames (1~32) 50000 Bytes(Max) (2304~65535)	5GHz 802.11 ac/n Mixed • 40MHz • Upper Channel • Ch36 - 5.180GHz • Ch36 Auto • 127 Auto • 2348 (1~2346)

Figure 36: ezMaster – Wireless Radio Settings

Band Steering

When "Band steering" is enabled, when the wireless client first associates with the AP, the AP will detects whether or not the wireless client is dual-band capable, and if it is, it will force the client to connect to the less congested 5GHz network to relieve congestion and overcrowding on the mainstream 2.4GHz frequency. It does this by actively blocking the client's attempts to associate with the 2.4GHz network.

Note: For Band Steering to take effect, both 2.4GHz and 5GHz SSIDs must have the same SSID and security settings. Wireless clients must be in both 2.4GHz and 5GHz wireless coverage zone when authenticating with the AP for the Band Steering algorithm to take effect.





↑ □ ↓	● admin ~ EnGenius®
Device Management Monitoring Visualization Statistics Hotspot Service Mainte	
Device gwn_engen_test > Device Config	Advanced Settings
Switch 0 Pending Approval 0 Status Model Mame MAC A Online EAP1300 88:DC:96	LED Control Power: Enable Disable LAN: Enable Disable WLAN - 2.4GHz: Enable Disable WLAN - 5GHz: Enable Disable
50 T 1 to 1 of 1 Device(s)	Band Steering Band Steering: Disabled (NOTE: When enabled, band steering will be applied to first 2.4GHz/5GHz SSID profiles with the same SSID and security settings.) RSSI Threshold
	2.4GHz 5GHz Status: Enable © Disable Enable © Disable RSSI: -90 dBm (Range: -90 ~ -60) -90 dBm (Range: -90 ~ -60) (NOTE: Enabling RSSI Threshold disassociates wireless clients that fall below the configured RSSI threshold and may cause wireless clients to reconnect frequently. It is recommended to disable this feature unless you deem it absolutely necessary.)
	Management VLAN Status: Statu

Figure 37: ezMaster – Band Steering





CLOUDTRAX

Wireless Configuration

1. Create a new network. Fill in below information.

CLOUDTRAX ®	Network: num1	~				n mypdas	@qq.com 🗸
<							
🙎 All Networks	All Networks						
🗆 Manage 🔹 🕨	Anticeworks						
🗙 Configure 🕨 🕨	List Map View Option	к V)	Q	C	Create Network Gro	up + Create Network	0 ~
	> Network Group #1	Create a new network		×			
	> group2 (Networks: 1	Network name		0			
	> test (Networks: 0, AF	Network Group	Network Group #1				• V
	✓ li (Networks: 1, APs:	Location	Enter a location	0			• V
	i numt	Application Reporting			APs (Total)	Latest FW Version	Actions
	25 • records per page.	What type of network is this?	Select one •				
		Clone network?	No, use default settings 🔹 🕜				
		Create as legacy network	0	Cancel			
							8
F Language English Services Agreement Privacy Poli © 2007-2018 CloudTrex	ty Server Status Help			l wish	this page would		Send
② 帮助							

Figure 38: CloudTrax – Create New Network

- **Network name:** This is the name you want to give this specific network. You will use this name to make changes to the network, display reports, etc.
- **Network Group:** This determines which user accounts will administrate this network.
- Location: Enter a street address for the first access point. To add access points, you will be shown a map that you click on to place access points. By entering an address here, you will be centered on the correct location for your network.
- **Application Reporting:** This will set whether the Application Reporting function is enabled by default on this network, which will provide more in depth reporting on the sort of traffic on your network.
- Network Type: This gives us an idea how you are using CloudTrax so we can find more ways to improve.





- **Clone Network?:** If you wish to carry over your network settings from an already existing CloudTrax network under your same account, you can choose to clone that networks' settings here.
- 2. Add access points to your network

Navigate to the Manage->Access Points screen. There are three options to add access points to your network: click the "Add New" button to add access points one at a time by clicking on a map, or use the down arrow to the right of that to add access points in bulk.

CLOUDTRAX» N	etwork: num1		~									n mypdas	@qq.com 🗸
All Networks Manage	Access Pc Clients	oints all ssids	▼ Last	day ▼	C								Traffic
Network Overview Access Points Switches	2												4 bps 2 bps
Routers Clients Vouchers		Download 📕 Upload		02:00	04:00	06:0	00	08:00	10:0	0	Total: 0B (10B	8, †0B) / Clients	
Site Survey	List Map Status	View Options 🗸	@ Mac/IP	Clients	Usage	2.4G	5G	Last Checkin	Up time	Hops	Out	Add New V	Actions
🗙 Configure 🕨	•	gwn	ac:86:74:4d:5c:20 LAN IP / 192:168.1.67 Mesh IP / 5.77.92.32	o	OB ↓OB, ↑OB	1	40	10 minutes ago	28d 14h 11m	0	4PM 4A	M Nov	
	25 • records	s per page. 1 AP total.											
Language: English Services Agreement Privacy Policy © 2007-2018 CloudTrax	Server Status Hel	p							l wish this p	age would.			Send

Figure 39: CloudTrax – Add Access Point

3. Configure your network

Each CloudTrax device can broadcast four unique SSIDs that users can connect to. Each of these SSIDs are controlled independently in CloudTrax. Typically users have a mix of public SSIDs - with splash pages, bandwidth throttling, DNS filtering and client isolation - and private SSIDs, with WPA Enterprise authentication and access to LAN resources and other clients. When we created your network, we set the first SSID to be public and the second SSID to be private, but you can adjust these any way you wish.





CLOUDTRAX»	Network: num1	\checkmark		\Lambda mypdas@qq.com 🗸 🔒
<				
🙎 All Networks	SSID 1: openmesh+			Cancel Save Changes
🕗 Manage 🕨 🕨				
🗙 Configure 🔍 🔻	Common			
General	SSID name	openmesh+	0	
SSID 1		Use access point name 🕜		
SSID 2	Enable	0		
SSID 3	Visible			
SSID 4	Band	Both - Combined SSID V		
Vouchers		Both - Combined SSID Both - Unique SSIDs		
Radio	Authentication	2.4GHz only 5GHz only		
Maintenance	Authentication configuration			
Display	Authentication type	WPA Pre-shared key WPA Enterprise		
Advanced	WPA password		Show 🕐	
		WPA2-only 😰		
	Captive Portal			
	Learn more about the captive portal an	d splash pages in the CloudTrax Help Center. For Facebook WIF	i, visit the Facebook I	Help Center.
	Bandwidth throttling			Ŧ

Figure 40: CloudTrax – Edit SSID





TP-LINK

Wireless Configuration

1. Add Wireless Networks

Select a band frequency and click + to add a WLAN group.

tp-link					nnected Pending	Users Guests			Ç	\$ [→
Мар	Statistics	Access Po	oints Cli	ients	Insight	Log				
.11							All	Connected	Disconnecte	d Pending
Name, MAC Address	, IP Q Overview	Config Performa	ance							- Forget
+ AP Name	MAC Address	+ IP Address	\$ Status	\$ Model	+ Hardware Version	+ Firmware Version	Client Number	Download	\$ Upload	Action
AC-84-C6-3D-E2-44	AC-84-C6-3D-E2-44	172.16.0.201	Disconnected	EAP225	3.0	2.0.1 Build 20180105 Rel. 63471	0	3.16 G	4.30 M	1 € 0
AC-84-C6-17-BA-A6 age Size 10 🔻	AC-84-C6-17-BA-A6	172.16.1.13	Disconnected	EAP245	1.0	1.2.0 Build 20170828 Rel. 67350	0	2.93 G A total of 1 page	116.05 K	
	AC-84-C6-17-BA-A6							A total of 1 page		
	AC-84-C6-17-BA-A6	172.16.1.13 Wireless S		EAP245 Wireless C	Control System		<< < 1 > >>	A total of 1 page		
					Control System	n Admin	<< < 1 > >> ss Setting Band Steerl	A total of 1 page		√ [] C GC
		Wireless S			Control System	n Admin Vireless Setting Advanced Wirele	ss Setting Band Steer	A total of 1 page		
		Wireless S		Wireless C	Control Syster Basic V	n Admin Vireless Setting Advanced Wirele WLAN Group Default	ss Setting Band Steer	A total of 1 page		

Figure 41: TP-Link – Add Wireless Network

2. Add an SSID to the specific WLAN group, Configure the parameters in the following window.





Ptp-link Sites: Default	APs:	0 2 Connected Disconnected	0 Sta Pending		0 Jests			Ċ	¢ [→
Map Statistics	Access Points	Clients Insight	Log	1					
All	Add 2.4GHz SSID						Connected	Disconnected	I Pending
Name, MAC Address, IP Q Overview	Basic Info					*			G Forget All
AP Name AMAC Address	SSID Name:					-	Download	\$ Upload	Action
AC-84-C6-3D-E2-44 AC-84-C6-3D-E2-44	Wireless Vlan ID:	0	(0-	4094, 0 is used to disabl	e VLAN tagging.)		3.16 G	4.30 M	∀ ₿Ø
AC-84-C6-17-BA-A6 AC-84-C6-17-BA-A6	SSID Broadcast:	Imable					2.93 G	116.05 K	1 B B
Page Size 10 • 2.4Gf 1D 1	Security Mode: Version: Encryption: Wireless Password: Group Key Update Period: SSID Isolation: Access Control Rule: Rate Limit Apply tplink_test WPA-F	WPA-PSK Auto WPA-PSK Auto TKIP Auto TKIP Image: transfer in the second s	. se ▼	conds(30-8640000,0 me None < 1 > >> A tot	disable	× . 	A total of 1 page	(s) Page to [60

Figure 42: TP-Link – Add SSID

3. Configure Advanced Wireless Parameters

The advanced wireless parameters consist of Beacon Interval, DTIM Period, RTS Threshold, Fragmentation Threshold and Airtime Fairness. Go to Wireless Settings->Advanced Setting.

Мар	Statistics	Access Po	CI	ients	Insight	Log				
I							All	Connected	Disconnected	d Pendir
lame, MAC Address,	, IP Q Overview	Config Performa	ince							- Forge
AP Name	MAC Address	+ IP Address	\$ Status	Model	+ Hardware Version	Firmware Version	Client Number	Download	Upload	Action
AC-84-C6-3D-E2-44	AC-84-C6-3D-E2-44	172.16.0.201	Disconnected	EAP225	3.0	2.0.1 Build 20180105 Rel. 63471	0	3.16 G	4.30 M	⊲ 🖪
AC-84-C6-17-BA-A6	AC-84-C6-17-BA-A6	172.16.1.13	Disconnected	EAP245	1.0	1.2.0 Build 20170828 Rel. 67350	0	2.93 G	116.05 K	⊲ 🖪
	_	Wireless S	ettings	Wireless	s Control Syst	em Admin	<< < 1 > >>	A total of 1 page	e(s) Page to	(
	_	Wireless S	ettings	Wireless		em Admin Wireless Setting Advanced Wireless			e(s) Page to	
		Wireless S 2.4GHz 5GHz	_	Wireless					a(s) Page to	C
			_		Basic				a(s) Page to	
	В	2.4GHz 5GHz			Basic	Wireless Setting Advanced Wireless			a(s) Page to	C
	B	2.4GHz 5GHz eacon Interval:	10	10	Basic m. (1	Wireless Setting Advanced Wireless			e(s) Page to	G
	B D R	2.4GHz 5GHz eacon Interval: ITIM Period:	10	10	Basic m (1	Wireless Setting Advanced Wireless s(40-100) -255)			e(s) Page to	

Figure 43: TP-Link – Configure Advanced Wireless Parameters





Band Steering

A client device that is capable of communicating on both the 2.4GHz and 5GHz frequency bands will typically connect to the 2.4 GHz band. However, if too many client devices are connected to an EAP on the 2.4 GHz band, the efficiency of communication will be diminished. Band Steering can steer clients capable of communication on both bands to the 5GHz frequency band which supports higher transmission rates and more client devices, and thus to greatly improve the network quality. Go to Wireless Settings > Band Steering.

Мар					Insight	Log				
I							All	Connected	Disconnected	d Pending
ame, MAC Address,	, IP Q Overview	Config Performa	ince							G Forget A
AP Name	\$ MAC Address	♦ IP Address	\$ Status	Model	+ Hardware Version	+ Firmware Version	Client Number	Download	Upload	Action
AC-84-C6-3D-E2-44	AC-84-C6-3D-E2-44	172.16.0.201	Disconnected	EAP225	3.0	2.0.1 Build 20180105 Rel. 63471	0	3.16 G	4.30 M	1 B 0
C-84-C6-17-BA-A6	AC-84-C6-17-BA-A6	172.16.1.13	Disconnected	EAP245	1.0	1.2.0 Build 20170828 Rel. 67350	0	2.93 G	116.05 K	180
e Size 10 💌		Wireless S	ettings	Wireless			<< < 1 > >>			
e Size 10 💌		Wireless S	ettings		s Control Syste		<< 1 > >>	A total of 1 page		
ge Size 10 🔹	E	Wireless S and Steering;	ettings		s Control Syste	m Admin	<< 1 > >>	A total of 1 page		
ge Size 10 🔹				Wireless	s Control Syste	m Admin Wireless Setting Advanced Wireless	<< 1 > >>	A total of 1 page		
ge Size 10 🔻	c	and Steering:	d: 20	Wireless	s Control Syste Basic	m Admin Mireless Setting Advanced Wireless 40)	<< 1 > >>	A total of 1 page		GO
ge Size 10 🔹	C	and Steering:	d: 20	Wireless	s Control Syste Basic (2-	m Admin Mireless Setting Advanced Wireless 40)	<< 1 > >>	A total of 1 page		

Figure 44: TP-Link – Band Steering

