

Grandstream Networks, Inc.

WP820 Wi-Fi Roaming Application Note







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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 quality.

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	Sets the Wi-Fi signal threshold. When the Wi-Fi signal strength of the device drops below this configured value, the device will scan for a hotspot above the threshold value and connect to it. The default setting is -70 and the valid range is [-100, -30].
Good signal scan interval	Sets the time interval for signal scanning when the Wi-Fi signal strength is higher than the signal threshold. Default is 600s, and valid range is from 5to 600.
Poor signal scan interval	Sets the time interval for signal scanning when the Wi-Fi signal strength is lower than the signal threshold and there is no hotspot which is higher than the current signal strength. Default is 5s, and valid range is from 5 to 600.

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	s, the following sections	provide the configuration	methods on APs from different
--------------------------------	---------------------------	---------------------------	-------------------------------

Product Model	Roam	Beacon Internal	DTIM	Multicast/Unicast	WMM	Band Steering
GWN76XX	\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
CLOUDTRAX	\checkmark				\checkmark	
TP-LINK	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark

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.

Table 3: Important Wi-Fi Parameters

Note:

The GWN76xx series supporting these features are: GWN7600, GWN7600LR, GWN7610, GWN7630, GWN7630LR, GWN7615, GWN7602, GWN7605 and GWN7605LR. This below configurations are applicable on all our models. **[GWN76XX]**





GWN76XX

Wireless Configuration

- 1. Open a web browser on PC and enter the GWN web address to access the GWN76XX web UI configuration page.
- 2. Connect to the GWN76XX 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 v Search	Transfer network group Transfer AP Discover AP Failover
Access Points	🕞 Upgrade 🛛 🗘 Reboot 🕇 Add to SSIDs 🕅 🗶 Configure	•
Clients 🔻	Device Type Name/MAC IP Address S	tatus Uptime Firmware Actions
Captive Portal 🔻	GWN7600 00:0B:82:AF:D3:1C 192.168.124.109	o Master 17d 23h 16m 40s 1.0.7.5 🗹 况 記 🗴
Bandwidth Rules	Showing 1-1 of 1 record(s).	Per Page: 10 V
Alert/Notification	© 2018 Grandstream Networks	Inc. All Rights Reserved

Figure 2: GWN76XX Access Points Configuration

4. When using GWN76XX as Master Access Point, users have the ability to create different SSIDs and adding GWN76XX Slave Access Points. Click on **Edit** to edit the SSID.

Note:

GWN7610/GWN7600/GWN7600LR/GWN7630LR/GWN7615/GWN7630 can support up to 16 SSIDs and GWN7605GWN7605LR support 16 SSIDs (when deployed as Master can only be added to 8 SSIDs) while GWN7602 supports 4 SSIDs.





S GWN7600		Time 2018-08-15 11				0 Q			admin [→
Overview	bbA +								\$
SSIDs	Name	Wi-Fi	VLAN ID	Schedule	Security Mode	MAC Filtering	Captive Portal	RSSI	Actions
Access Points	GWNAFD31C	\checkmark	×	×	WEP 64-bit	Disabled	~	×	C
Clients •	TESTpwd	~	×	×	Open	Disabled	~	×	C
Captive Portal 🔻	ssid2	×	×	×	WPA2	Disabled	~	×	C
Bandwidth Rules	ssid3	×	×	×	WPA2	Disabled	~	×	C 🗊
System Settings 🔹									
Alert/Notification				© 2018 Grandstr	eam Networks, Inc. Al	l Rights Reserved			



S GWN7600	Firmware 1.0.7	7.5 Time 2018-08-17 16:50	ଡ			admin [- >
Overview	+ Add Name	Wi-Fi	Edit Device Membership	×	RSSI	Actions
SSIDs Access Points	GWNAFD31	Enable SSID			×	C (
Clients 🔹	TESTpwd	SSID (?)	GWNAFD31C		×	C
Captive Portal 🔻	ssid2	SSID Band 🕐	Dual-Band	T	×	1
Bandwidth Rules	ssid3	SSID Hidden			×	C
System Settings 🔻		VLAN				
		Wireless Client Limit (?)				
		Enable Captive Portal				
		Captive Portal Policy	simple	•		
		Enable Schedule				
		Security Mode	WEP 64-bit	•		
		WFP Kev (୭)				
			Save Cancel			
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Figure 4: GWN76XX 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.		
Client Inactivity Timeout(s)	AP will remove the client's entry if the client generates no traffic at all for the specified time period. The client inactivity timeout is set to 300 seconds by default. Range from 60-3600 seconds.		
Captive Portal Policy	Select the captive portal policy already created on the Policy List 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: Using a static WEP key. The characters can only be 0-9 or A-F with a length of 10, or printable ASCII characters with a length of 5. WEP 128-bit: Using a static WEP key. The characters can only be 0-9 or A-F with a length of 26, or printable ASCII characters with a length of 13. WPA/WPA2: Using "PSK" or "802.1x" as WPA Key Mode, with "AES" or "AES/TKIP" Encryption Type. WPA2: Using "PSK" or "802.1x" as WPA Key Mode, with "AES" or "GCMP-128" Encryption Type. WPA2: Using "SAE-PSK" or "802.1x" as WPA Key Mode, with "AES" or "AES/TKIP" Encryption Type. WPA3: Using "SAE" or "802.1x" as WPA Key Mode, with "AES" or "AES/TKIP" Encryption Type. WPA3: Using "SAE" or "802.1x" as WPA Key Mode, with "AES" or "AES/TKIP" Encryption Type. WPA3: Using "SAE" or "802.1x" as WPA Key Mode, with "AES" or "AES/TKIP" Encryption Type. WPA3: Using "SAE" or "802.1x" as WPA Key Mode, with "AES" or "AES/TKIP" Encryption Type. WPA3: Using "SAE" or "802.1x" as WPA Key Mode, with "AES" or "AES/TKIP" Encryption Type. WPA3: Open: No password is required. Users will be connected without authentication. Not recommended for security reasons. Note: GWN products support for 802.1x (PEAP-MSCHAPv2 and EAP-TLS) requires external AAA server to permit authentication and centralized access management. 		
WEP Key	Enter the password key for WEP protection mode. This field is available only when "Security Mode" is set to "WEP 64-bit" or "WEP 128-bit".		





WPA Key Mode	 Two modes are available: PSK: Use a pre-shared key to authenticate to the Wi-Fi. 802.1X: Use a RADIUS server to authenticate to the Wi-Fi. This field is available only when "Security Mode" is set to "WPA/WPA2" or "WPA2". 					
WPA Encryption Type	 Two modes are available: AES: This method changes dynamically the encryption keys making them nearly impossible to circumvent. AES/TKIP: use both Temporal Key Integrity Protocol and Advanced Encryption Standard for encryption, this provides the most reliable security. This field is available only when "Security Mode" is set to "WPA/WPA2" or "WPA2". 					
WPA Pre-Shared Key	Set the access key for the clients, and the input range should be: 8-63 ASCII characters or 8-64 hex characters. <i>This field is available only when "Security Mode" is set to "WPA/WPA2" of</i> <i>"WPA2"</i> .					
RADIUS Sever Address	Configures RADIUS authentication server address. This field is available only when "WPA Key Mode" is set to "802.1x".					
RADIUS Server Port	Configures RADIUS Server Listening port. Default is: 1812. This field is available only when "WPA Key Mode" is set to "802.1x".					
RADIUS Server Secret	Enter the secret password for client authentication with RADIUS server. <i>This field is available only when "WPA Key Mode" is set to "802.1x".</i>					
RADIUS Accounting Server Configures the address for the RADIUS accounting server. <i>This field is available only when "WPA Key Mode" is set to "802.1x".</i>						
RADIUS Accounting Server Port	Configures RADIUS accounting server listening port. Defaults to 1813. <i>This field is available only when "WPA Key Mode" is set to "802.1x".</i>					
RADIUS Accounting Server Secret	Enter the secret password for client authentication with RADIUS accounting server. This field is available only when "WPA Key Mode" is set to "802.1x".					
RADIUS NAS ID	Enter the RADIUS NAS ID. This field is available only when "WPA Key Mode" is set to "802.1x".					
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. Once a SSID has a Client Bridge Support enabled, the AP adopted in this SSID can be turned in to Bridge Client mode by click the Bridge button. Note: This feature isn't supported on GWN7602.					
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.					
Enable Dynamic VLAN	When enabled, clients will be assigned IP address from corresponding VLAN configured on the RADIUS user profile.					





	This field is available only when "WPA Key Mode" is set to "802.1x".			
Client Isolation	 Client isolation feature blocks any TCP/IP connection between connected clients to GWN76XX's Wi-Fi access point. Client isolation can be helpful to increase security for Guest networks/Public Wi-Fi. Three modes are available: Radio Mode: Wireless clients can access to the internet services, GWN7xxx router and the access points GWN76XX but they cannot communicate with each other. Internet Mode: Wireless clients will be allowed to access only the internet services and they cannot access any of the management services, either on the router nor the access points GWN76XX. Gateway MAC Mode: Wireless clients can only communicate with the gateway, the communication between clients is blocked and they cannot access any of the management services on the GWN76XX access points. 			
Minimum Access Rate Limit	Specify whether to limit the minimum access rate for clients. When enabled, it will help to eliminate the legacy connection which slow the total performance of the Wi-Fi network. Range from 1 to 54 Mbps.			
Gateway MAC Address	This field is required when using Client Isolation , so users will not lose access to the Network (usually Internet). Type in the default LAN Gateway's MAC address (router's MAC address for instance) in hexadecimal separated by ":". Example: 00:0B:82:8B:4D:D8			
RSSI Enabled	Check to enable RSSI function, this will lead the AP to disconnect users below the configured threshold in Minimum RSSI (dBm).			
Minimum RSSI (dBm)	Enter the minimum RSSI value in dBm. If the signal value is lower than the configured minimum value, the client will be disconnected. The input range is from "-94" or "-1".			
Beacon Interval	 Configures interval between beacon transmissions/broadcasts. The Beacon signals help to keep the network synchronized and provide main information about the network such as SSID, Timestamp Using High Beacon Interval: AP will be sending beacon broadcast less frequently. This will help to get better throughput, thus better speed/performance. It also helps to save Wi-Fi clients energy consumption. Using Low Beacon Interval: AP will be sending beacon broadcast more frequently. This can help in environments with weak signal areas; sending more frequently beacons will increase chances to be received by Wi-Fi clients with weak signal. Notes: 1. When AP enables several SSIDs with different interval values, the max value will take effect. 2. When AP enables less than 3 SSIDs, the interval value which will be effective are the values from 40 to 500. 3. When AP enables more than 2 but less than 9 SSIDs, the interval value which will be effective are the values from 100 to 500. 4. When AP enables more than 8 SSIDs, the interval value which will be effective are the values from 200 to 500. 			





5. Mesh feature will take up a share when it is enabled.

Default value is 100ms. Valid range: 40 - 500 ms.

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 2	018-08-15 11:31			0 Q	15s 🗸	English 🗸 a	dmin [→
Overview	Access P	oints							
SSIDs	Device Ty	vpe 🔻		Search		Transfer r	network group	ansfer AP Discover AP	Failover
Access Points	🕣 Upgr	ade 💽 🖓 Rebo	ot + Add to SSIDs	🔀 Configure					٥
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	15d 18h 4m 43s	1.0.7.5	🗹 🖓 🖽 🖉	4 A 3
Bandwidth Rules System Settings 🔻	Showing :	L-1 of 1 record(s).						Per Page:	10 •
Alert/Notification				© 2018 Grandstream	Networks, Inc. All Righ	nts Reserved			

Figure 5: GWN76XX Band Steering - 1





S GWN7600	Firmware 1.0.7	.5 Time 2018-08-15 1	11:31		⑦ Q 15s	~	English 🗸	admin [→
Overview SSIDs Access Points Clients Captive Portal Bandwidth Rules System Settings	Firmware 1.0.7	_		Disable Band Steering Disable Band Steering Disable Band Steering 20 in priority Balance 802.11b 20MHz Auto Auto Auto Low	Q 158 Q Q 158	×	Transfer AP Discove	
			Save	Cancel				
Alert/Notification			© 2018 Gra	ndstream Networks, Inc. All R	lights Reserved			

Figure 6: GWN76XX 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.

cisco Meraki	Q Search Dashboard	📢 Announcements 👻	⑦ Help ▾	tianbopeng@163.com 👻
NETWORK	Access points			
HZ-TEST -	There are no Meraki devices in this network. If you add some, we can help you configure them.			
	Add APs			
Network-wide				
Wireless				
Organization				
	2018 Cisco Systems, Inc. Last login: <u>translation missing: zh datetime distance. in words x days ago</u> from 45. <u>privacy</u> - <u>terms</u> Current session started: <u>translation missing: zh datetime distance in words</u> Data for this organization is hosted in <u>Asia</u>		Kong	Make a wish

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.





uluulu cisco Meraki	Q Search Dashboard	License problem ₹3 Announcements + ③ Help + 15068770629@163.com +	
NETWORK GWN -	Access control	v	
Network-wide Wireless	Network access Association requirements	Open (no encryption) Any user can associate Pre-shared key with [WPA2 •]	
Organization		Users must enter this key to associate:	
	WPA encryption mode 802.11r (9) 802.11w (9)	WPA2 only Disabled Disabled	
	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 Meraki authentication Sign-on with Meraki authentication Sign-on with SMS Authentication	Ŧ

Figure 8: Cisco Meraki – Additional Configurations

Band Steering

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

disco Meraki	Bridge mode and layer 3 roaming only		-
	Content filtering (1) NAT mode only	Don't filter content	
GWN -	Bonjour forwarding Bridge mode and layer 3 roaming only	Disable Bonjour Forwarding	
Network-wide	Wireless options		
Wireless		d minimum bitrate settings may be overridden by RF profiles. Go to RF Profiles	
Organization	Band selection	Dual band operation (2.4 GHz and 5 GHz)	
		 Dual band operation (2.4 GHz and 3 GHz) 5 GHz band only 5 GHz band only 5 GHz bas 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. 	
	Minimum bitrate (Mbps)	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. <u>privacy</u> - <u>terms</u>	Last login: <u>translation missing: zh_datetime.distance in words.about x_hours ago</u> from your current IP address Current session started: <u>translation missing: zh_datetime.distance in words.x_minutes ago</u> Data for this organization is hosted in <u>Asia</u>	

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.

aruba Central	FILTER MONITORING & REPORTS default (3 Total Devices 1 Offline APs 0 Offline SWITCHES))		€ TEMPORAL FILTER 3 HOURS ▼
CURRENT APP MONITORING & REPORTS		SWITCHES V	SECURITY V
Q Search Current App Find devices, clients and networks	Monitoring & Wireless Management Management	Clients Count	
Network Overview View Aruba device performance and security Network Health	MA PA GA Maintenance Presence Guest Access	4	
View potential network issues Client Overview View detailed information on connected clients AppRF™	CL GS GS Global Settings	2	
View app usage and configure web policy enforcement VisualRF RF Heatmaps	100 2018-08-20 12:50:00 120 0.000 10:30 11:00 11:30 12:00 12:30 13:00 13:30	0 10:30 11:00	11:30 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	38x + 2.2k/s
Schedule and generate reports	b4:5d:50:c2:a2:4c 12 KB 84:d4:7e:cb:5b:06 6 KB	20:47:da:89:82:5e	2 KB
	Top IAP Clusters By Usage	Top IAP Clusters By Clients	Rv Average 🗸 🔻
D 💬 ? A	Need Help? A Copyright © 2018 Aruba, a Hewlett Par	kard Enterprise company. All Rights Reserve	d.

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.





aruba Central	PILTER WIRELESS MANAGEMENT default (3 Total Devices 1 Offline APs 0 Offline SWITCHES)						
CURRENT APP WIRELESS MANAGEMENT	Networks	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 Art	uba, a Hewlett Packard Enterprise compa	ny. All Rights Reserved.			
💬 ? ሕ	Need H	lelp?					

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	Ceneral O VLANs Security Access
Wireless Networks	Basic Settings
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 %
	Utilization Threshold:
DHCP Manage DHCP scopes	3/%/÷ 0.2%/
Services	(+) Transmit Rates (Legacy Only)
Enable additional Central services	😌 Zone
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.





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:	
Wireless Networks Add and edit wireless networks	Zone:	
Access Points	Legacy Only:	
View APs and set device parameters	802.11d / 802.11h:	TX POWER ACTIONS
RF Set Aruba Adaptive Radio Management	Beacon Interval: 100 ms	127/127
Wireless IDS/IPS Manage intrustion detection and prevention	Interference Immunity Level: 2 💙	
Security Set advanced security parameters	Channel Switch Announcement 0 V	
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.	
œ ? 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	FILTER WIRELESS MANAGEMENT default (3 Total Devices 1 Offline APs 0 Offline SWITCHES)				
CURRENT APP WIRELESS MANAGEMENT	RF					
Q Search Current App Find devices, clients and networks	✓ Adaptive Radio Management(AR	✓ Adaptive Radio Management(ARM)				
	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:	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						
💬 ? A	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.

活発 活加原格 回 三列東 急地風 送採网络类型 分別管理 AP 分別管理 分別管理 AP <th> 一概览 全局 网络 </th> <th>ch.</th> <th>5 网络个数</th> <th>-</th> <th>1/1 在线/总设备数</th> <th>8</th> <th>0/0 活跃/在线用户</th> <th>4</th> <th>严重 中等 一般</th> <th>0 0 0</th> <th>日 待接收网络 0</th>	 一概览 全局 网络 	ch.	5 网络个数	-	1/1 在线/总设备数	8	0/0 活跃/在线用户	4	严重 中等 一般	0 0 0	日 待接收网络 0
AP RE CLUE AP AP AC PR P	告警	添加网络	网络名称	۹) 🔳	列表 心地图	选择网络类	型 ▼				分组管理
文技机 AC C C 0 0 0/0 - 0/0			网络名称		告罄	在线用户	AP 🛔	AC 👙	同关 🗍	交换机(2
AC		👼 hz		< @ C 0	0	0	0/0		0/0	0/0	○ 无线配置 ¥ 网络拓扑
用户列表 用户列表 ● 4444 < 色 ビ 凹 0 0 0/0 0/0 0/0 ※ 网络括针 用户体验 2ij < 色 ビ 凹 0		(11) 44		« @ C D	0	0	0/0	0/0	0/0	0/0	🗶 网络拓扑
		(11) 44444		< & C i	0	0	0/0	0/0	0/0	0/0	★ 网络拓扑
	用户体验	👼 zij		* @ C Ö	0	0	0/0		0/0	0/0	□ 无线配置 ¥ 网络拓扑
	认证记录	궁 税連		< @ C D	0	0	1/1	-	0/0	0/0	◎ 无线配置 🗶 网络拓扑
						第	1 页/总数1	下一页 尾页			5 余记

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**.

《 诺 密 [15068770629 监控 配置 维护 ♥业务组件・ ☆ 探索频道・
□ 概览	15068770629 ~ 図格容称 Q 分相管理
全局 网络 告警	AP列表 (点击 "设备序列号"可以查看设备详情) 自动刷新: ○ ♀ 詳 ▼ ☆ 添加AP 命令行助手 开极 更多操作 ▼ 1 选中 设备序列号、设备名称、Q
□ 设备	 ✓ 基本信息 ○ 射频信息 ○ 型号版本
AP 网关 交换机	ご在线状态」设备序列号 配置状态」设备名称 ◆ MAC 管理地址 ◆ 出口地址 用户数量 分組 ● 在线 G1KD901007440 已同步 Ruijie 5869.6ca8.d0f0 172.16.1.32 45.116.9.232 - 15068770629 / 锐雄 AP_RGOS 1
AC	首页 上一页 第 1 页/总数 1 下一页 尾页 10 ▲ 1 条记录
 日用户 用户列表 用户体验 认证记录 	

Figure 17: RuiJie Cloud – AP List





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

□ 网络	15068770629 ~	説捷 ~				网络名称	Q	分组管理
C M 年 天线配置	and the second states	1000	100		-			
浸游配置	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							~
	一元线配直							^
□ 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	⊠
漫游网优	3	Ruijie-sms	wpa-psk	否	bridge	1,2	未打开认证	ت ک
□ 其他		(autor		第 1 页/总	104 1 [im] im]		10	3条记录
配置任务		首页	[上一页]	第 1 页/总	数1 下一页	尾页		
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.

不受 流音 [15068770629 监控 配置 维护 ♥业务组件 ◆ 探索频道 - ●添加	000
□ 网络 无线配置	15068770629 × 一 税雄 × 岡塔名歌 Q	分粗管理
漫游配置	 税捷 漫游设置 网络漫游功能: 	
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 配置任务	Network	
蓝牙配置 自定义Cli集	Orasl O Orasl-2 Orasl-	な世
配置监控		运。 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.

A tike tike tike tike tike tike tike tike	客 15068770629	监控 配置	维护	♥ 业务组件	- ☆ 探索版	而道 •		9 8
	配置模板						×	
□ 网络	WLAN ID	1	٣]	是否隐藏	否	•	
无线配	SSID	ruijie		中文编码 🕖	转发模式 🛛	nat	•	曩作▼
漫游配: 认证配:						「点击这里配置NAT地址池」		
	加密模式	WPA2-PSK	•]	射频	🖌 射频1 🖌 射频2		^
□ 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	密码	1111111				「点这里配置第三频工作模式」		
射频规划								
负载均衡	5G优先	☑ 开启						
漫游网位	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	认证配置	□ 开启						
蓝牙配: 自定义(确定	取消				帮助 文档
配置监控	合载均	· 例开关: 〇〇			_			G
								返回
	1	31-7 059						旧版
	● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	eci						ř

Figure 20: RuiJie Cloud – Band Steering





UBIQUITI UNIFI

Wireless Configuration

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

U	ປກໍ່ເFi 5.8.28							CURRENT SITE Default 🗸	USERNAME admin ∨	:
63	SETTINGS				WLAN Group Default		_ / • +			0
-∿			SECURITY	GUEST NETWORK	VLAN	ACTIONS				
囗	Wireless Networks	qsding_portal	wpapsk	~		🖉 EDIT	DELETE			
0	Networks	ubnt-portal	wpapsk							
- AR	Routing & Firewall	Unifi_mesh	wpapsk							
	IPS BETA	wp800_unifi	wpapsk							
Ŷ	DPI									
	Guest Control									
	Profiles									
	Services									
	Admins									
	User Groups									
	Controller									
	Notifications BETA									
	Cloud Access									
(j)	Elite Device									
1000	Maintenance									
	Auto Backup									
?										
0,										
Q										
×										

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

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	ปก็โFi 5.8.28			CURRENT SITE Default 🗸	USERNAME admin ✓
69	SETTINGS				e
-∿-		EDIT WIRELESS NETWORK - Q	SDING_PORTAL		
囗	Wireless Networks	Name/SSID	qsding_portal		
\odot	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 📀		
	Admins	VLAN	Use VLAN (2-4009)		
	User Groups	Fast Roaming BETA	Enable fast roaming (2)		
	Controller	Hide SSID	Prevent this SSID from being broadcast		
(j)	Notifications BETA	WPA Mode	WPA2 Only V Encryption AES/CCMP Only V		
	Cloud Access	Group Rekey Interval	Enable GTK rekeying every 3600 seconds		
	Elite Device				•
2	Maintenance	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		
Ŷ			selected.		D

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	មក៏គែ 5.8.28			CURRENT SITE Default 🗸	USERNAME admin 🗸	
69	SETTINGS	Group Rekey Interval	Z Enable GTK rekeying every 3600 seconds			0
-M		User Group	Default.			
	Wireless Networks		▲ Note that the configuration and rate limits of this user group			
\odot	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 Fable WLAN schedule			
	DPI					
	Guest Control	Multicast Enhancement	Enable multicast enhancement (IGMPv3)			
	Profiles	B02.11 RATE AND BEACON	CONTROLS			
	Services	DTIM Mode	Se default values			
	Admins	DTIM 2G Period				
	User Groups	DTIM 5G Period				
	Controller	D'HM 5G Period				
~	Notifications BETA	2G Data Rate Control	Enable minimum data rate control 🕜			
<u>(</u>)	Cloud Access	5G Data Rate Control	Enable minimum data rate control 🕜			
\square	Elite Device	H MAC FILTER				
92	Maintenance		TION			
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.





_	5.8.28									CURRENT SITE Default V	USERNAME admin 🗸
ALL	(10) GATEWAY/SV	VITCHES (1) APS ((9) OVERVIEW P	ERFORMANCE CONFI	G		Search or	select tag	۹	PROPERTIES	= =
Ť	DEVICE NAME	IP ADDRESS	STATUS	MODEL	VERSION	CLIENTS	DOWN	UP	CHA	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)	Content of the second secon	0021
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 (nş	f0:9f:c2:d0:10:c3	OVEIK
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 (ng		-) 7(9/1000
	f0:9f:c2:d0:10:c3	192.168.1.70	CONNECTED	UniFi AP-AC-Mesh-Pro	3.9.42.9152	0	0 B	0 B		8 11N/B/G (High, likely a proble	m) 76% Utilized
0	acpro	192.168.1.212	DISCONNECTED	UniFi AP-AC-Pro	3.9.27.8537	0				42 (36,+1) 11N/A/AC (Acceptab	le) 20% Utilized
0	44:d9:e7:f6:a0:ae	192.168.1.185	DISCONNECTED	UniFi AP-AC-Pro	3.9.27.8537	0				RX FRAMES TX FRAMES INTERFE	
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	f0:9f:c2:65:ea:c7	192.168.1.66	DISCONNECTED	UniFi AP-HD	3.9.27.8537	0					
0	fc:ec:da:48:e4:09	192.168.1.190	DISCONNECTED	UniFi AP-nanoHD	3.9.27.8537	0				GENERAL	
Showi	ing 1-9 of 9 records.	Items per page: 5	0 ~							RADIOS WLANS	
										I NETWORK	
										BAND STEERING	
										Prefer 5G Balanced Off	
										QUEUE CHANGES CANCEL	
										🗄 AIRTIME FAIRNESS	
										∃ WIRELESS UPLINKS	
										MANAGE DEVICE	

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	SOHC)							TUE,	08:59 PM 🖉 🕐	
			Points	site test_site2 💌				AP Inventory	Create Wireless Networks	Claim APs 🛱 🗘	
CLIENTS	Filter	Status	Name	MAC Address	IP Address	No. Clients	Uptime	Total Bytes	Capabilities	VBLE	
						has no Acce					
					Claim your Acces	Claim APs	ling claim code	15			
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.





Mist	SOHO		WED	0, 03:24 PM 🖉 🕐
	< WLANS : New WLAN			Create Cancel
CLIENTS ACCESS POINTS	SSID New WLAN Labels	Security WPA-2/PSK with passphrase WPA-2/PSK with passphrase WPA-2/EAP (802.1X) Open Access More Options	Apply to Access Points All APs AP Labels Specific APs	
	WLAN Status	Fast Roaming © Default 0.11r VLAN © Untagged © Tagged © Pool © Dynamic	Isolation prohibit peer to peer communication Filtering (Wired to Wireless) ARP Broadcast/Multicast	
	Radio Band • 2.4G and 5G • 2.4G • 5G Band Steering • Enable Data Rates	Guest Portal No portal (go directly to internet) Show guest portal <u>Configure Portal</u> Allowed Subnets	Custom Forwarding Custom Forwarding to Eth0 + PoE SSID Scheduling	
	Data Kates © Compatible (allow all connections) © No Legacy (2.4G, no 11b) © High Density (disable all lower rates) © Custom Rates	Allowed Hostnames	Enabled Enabled	•

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	TUE, 09:17 PM	2	?	
	Apply to Access Points All APs AP Labels Specific APs				•
CLIENTS					
	Isolation prohibit peer to peer communication				
	Filtering (Wired to Wireless)				
	Broadcast/Multicast				
	Custom Forwarding Custom Forwarding to Eth0 + PoE				I
	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 Cancel
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 Opfault	
	WLAN Status Enabled Disabled Hide SSID	.11r	
	No Static IP Devices	VLAN • Untagged Tagged Pool Dynamic	
	Radio Band 2.4G and 5G 2.4G 5G	Guest Portal	
OR SAUNZATION	Band Steering Enable	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 🗘	② English -	547895483@qq.com -
	AP > Configure > SSID					
Site: HZ ≓	• Create					
A Tenant	Name Label	Status	Effective Radio	Authentication	Encryption Mo	WEP Default K Netwo
- 🗊 Site			Ν	o records found.		
(g) AP						
🖒 Recommend for you						
	٢	W Copyright © 2015-201	18 Huawei Technologi	es Co., Ltd. All rights	reserved.	•

Figure 30: Huawei Cloud – Create SSID

		ja and a second s										
Parameter		Description										
Basic	Name	SSID when a STA connects to a wireless network.										
settings	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	Layer 2 forwarding.										
	connection 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										
Configuratio		invisible.										
n	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.										

Table 5: Huawei Cloud SSID Configuration Parameters





	User experience is therefore improved.
Limit access of	By default, this function is disabled. After this function is enabled, 802.11a,
Traditional	802.11b, and 802.11g traditional terminals cannot be connected.
terminals	
Maximum	Maximum number of STAs connected to the SSID. The default value is 128.
number of	
users	
User isolation	By default, this function is enabled. After this function is enabled, STAs
	connected to the SSID are isolated from each other.
Bonjour	By default, this function is disabled. Bonjour is a solution proposed by Apple
transparent	and applies to Layer 2 broadcast domains. It allows network devices in a
transmission	Layer 2 broadcast domain to obtain IP addresses and discover services.
U-APSD	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.

			c	Q 🖪 T	• D• 🗘 🤇	🕽 English -	547895483@qq.com	ι ν
	AP + Configure + SSID							
Site: HZ ≓								•
	* Name:							11
A Tenant	Working status:							
- 🗈 Site	Scheduled switch-on:	—						
(v) AP	Effective radio:	• 2.4G/5G • 2.4G • 5G						
🖒 Recommend for you	AP Tags:	¥						
		Select the device to be configured	based on labels. If t	the label is er	mpty, all devices	are selected. To	add labels, choose AP	> M.
	Network connection mode:	Switch	in In	nternet				
		(2) AP	((<u>1</u>))	P				÷
	4							•

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 -	
A	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): 14	Ι.
	Advanced Settings 🗸	
🗗 Recommend for you	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.	Ţ

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.

â 🛱 🌣 📋		
Device Inventory		
Add Device Generate List		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.





1	P	\$	Ê				admin ~ EnGeniu	s®
Γ.	New Create New Proje	ect	Pro	ojects				
	Manage		٩	Search				
	Recently Openeo	d Projects		gwn_engen_test	× 🕅	0		
	Projects					Active 1		
				Last Opened: 2018-08-16 23:28:11 , Created: 2018	-05-22 00:57:33	Offline		
								1
								J

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	\$	Û											Q) admin ~ En(Geniius®
Device	e Manageme	ent Mor	nitoring	Visualiza	ation	Statistics	Hotspot Servi	ice Maintenance								
Devic	e			awn end	aen t	test > Dev	/ice Config					1	managed	1 acti	ve O	offline
Acces	ss Point	1	Ĭ				ş									
Switc		0		💼 Rei	nove	Reboot	ן							Q		
Pendi	ing Approval	0				Status [‡]	Model Name	MAC Address	Device Name	WAN IP		Firmware Version	Uptime [‡]	Group [‡]	Operating Channel	i
					•	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.

^ ▣ ♀ ਛੇ			admin ~ EnGenius						
Device Management Monitoring Visualization Statistics Hotspot Service Mainten	ance								
Device gwn_engen_test > Device Config Access Point 1	General Settings								
Switch	Wireless Radio Settings								
Pending Approval 0 Model Status Name MAC A	Country:	Please select a country code.	T						
Online EAP1300 88:DC:96	Wireless Mode:	2.4GHz 802.11 b/g/n Mixed •	5GHz 802.11 ac/n Mixed 🔻						
50 • 1 to 1 of 1 Device(s)	Channel HT Mode:	20MHz •	40MHz v						
	Extension Channel:	Upper Channel 🔻	Upper Channel 🔹						
	Channel:	Auto 🔻	Ch36 - 5.180GHz 🔻						
	Operating Channel:	Ch6	Ch36						
	Transmit Power:	Auto	Auto						
	Client Limits:	127 2	127 🔞						
	Data Rate:	Auto 🔻	Auto 🔻						
	RTS/CTS Threshold:	2346 (1~2346)	2346 (1~2346)						
	Aggregation:	Enable Disable							
		32 Frames (1~32)							
		50000 Bytes(Max) (2304~65535)							
	WLAN Settings - 2.4GHz								
			• • •						

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.







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	AITNELWOTKS						_
🗙 Configure 🕨 🕨	List Map View Option	ns 🗸	0		Create Network Grou	p + Create Network	* ~
	> Network Group #1	Create a new network		×			* ~
	> group2 (Networks: 1	Network name		0			*
	> test (Networks: 0, AF	Network Group	Network Group #1				* ~
	✓ li (Networks: 1, APs:	Location	Enter a location	0			* ~
	0 num1	Application Reporting	0		APs (Total)	6.4.11	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 Create			
							0
f 🎐 Language: English	.			l wish	this page would		Send
Services Agreement Privacy Poli © 2007-2018 CloudTrax	icy Server Status Help						
(? 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	Network: num1		\checkmark									\Lambda myp	odas@qq.com 🗸
<													
All Networks	Access P	oints all SSIDs	▼ Last	day 🔻	e								
🕗 Manage 🛛 🔻	Clients	Clients											
Network Overview	4												4 bps
Access Points	2												2 bps
Switches													
Routers	0		2:00 Aug 15	02:00	04:00	06:0	00	08:00	10:0	0		14:00	0 bps
Clients	Clients	Download Upload									I OTAI: UB (1	.0B, †0B) / Clie	ents: U
Vouchers	List Map	View Options \vee	0									+ Add New	▼ * ∨
Site Survey	Status 4	Name	Mac/IP	Clients	Usage	2.4G	56	Last	Up time	Hops		utages	Actions
🗙 Configure 🕨 🕨	- Suites	Harre	ac:86:74:4d:5c:20	circito	-	2.110	50	Checkin		nops		duges	
		gwn	LAN IP / 192.168.1.67 Mesh IP / 5.77.92.32	0	0B ↓0B, †0B	1	40	10 minutes ago	28d 14h 11m	0	4PM	4AM	Now 🌣 🗸
	25 • record	ds per page. 1 AP total.											
f 🎐 Language: English	•								l wish this p	age would			Send
Services Agreement Privacy Polic © 2007-2018 CloudTrax	cy Server Status H	elp											
⑦ 帮助													

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		nypdas@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	0		
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 Faceboo	k WiFi, visit the Facebook H	elp Center.
	Bandwidth throttling			•

Figure 40: CloudTrax – Edit SSID





TP-LINK

Wireless Configuration

1. Add Wireless Networks

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

Мар	Statistics	Access Po	inte Cli	ents	Insight	Log				
Ш							All	Connected	Disconnected	d Pending
Name, MAC Address	IP Q Overview	Config Performa	nce							- 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	17 🖪 🖸
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	1 ₿0
							<< < 1 > >>			
		Wireless S						A total of 1 page		
		Wireless S		Wireless C	Control System		<< < 1 > >>	A total of 1 page		
	2.4				Control System	m Admin	<< < 1 > >> s Setting I Band Steer	A total of 1 page		
					Control System	n Admin Vireless Setting Advanced Wireles	s Setting Band Steeri	A total of 1 page		
				Wireless C	Control Syster Basic V	m Admin Vireless Setting Advanced Wireles WLAN Group Default	s Setting Band Steeri	A total of 1 page		GO

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 0 Connected Disconnected Pending	Stations: 0 0 Users Guests		Ŭ ✿ [→
Мар	Statistics	Access Points	Clients Insight	Log®		
All		Add 2.4GHz SSID			All Connected	I Disconnected Pending
Name, MAC Address,	IP Q Overview (Basic Info			*	😑 Forget All
AP Name	MAC Address	SSID Name:			÷ ⇒ Downloa	d \$ Upload Action
AC-84-C6-3D-E2-44	AC-84-C6-3D-E2-44	Wireless Vlan ID:	0	(0-4094, 0 is used to disable VLAN tagging.)	3.16 G	4.30 M 💙 📑 🗹
AC-84-C6-17-BA-A6	AC-84-C6-17-BA-A6	SSID Broadcast:	Inable		2.93 G	116.05 К 💙 📑 🖸
Page Size 10 🔻		Security Mode:			>> A total of 1	page(s) Page to GO
		Version: Encryption:	 Auto WPA-PSK WPA2-PSK Auto TKIP AES 			
		Wireless Password:	Auto Thir C ALS			
		Group Key Update	0	seconds(30-8640000,0 means no upgrade).		
		Period: SSID Isolation:	Enable	occonde os robbo, o modifio no apgradoj.		
		Access Control Rule:	None 🔻		ering	
	2.4GF	Rate Limit				
	2.401					
		Apply			+ Add	
	ID				ction	
	1	tplink_test WPA-I	PSK disable enable	e None disable	🖸 💼	
				<< < 1 > >> A total of 1 page(s) Page to	GO	

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	oints Cl	ients	Insight	Log				
I							All	Connected	Disconnected	d Pendin
ame, 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	⊲ B
	40.04.05.47.04.46	172.16.1.13	Disconnected	EAP245	1.0		0	0.00.0	116.05 K	10
	AC-84-C6-17-BA-A6					1.2.0 Build 20170828 Rel. 67350	< < 1 > >>	_		
ge Size 10 ▼	AL-84-UD-17-DA-AD	Wireless S		Wireless	s Control Syste		<< 1 > >>	A total of 1 page		
			ettings		s Control Syste	em Admin	<< 1 > >>	A total of 1 page		7 3
		Wireless S	ettings	Wireless	s Control Syst Basic	em Admin	<< 1 > >>	A total of 1 page		
	В	Wireless S 2.4GHz 5GHz	ettings	Wireless	s Control Syste Basic	em Admin Wireless Setting Advanced Wireless	<< 1 > >>	A total of 1 page		
	B	Wireless S 2.4GHz 5GHz eacon Interval:	ettings	Wireless 0	s Control Syste Basic ma	em Admin Wireless Setting Advanced Wireless 9(40-100)	<< 1 > >>	A total of 1 page		
	B D R	Wireless S 2.4GHz 5GHz eacon Interval: TIIM Period:	ettings	Wireless 0	s Control Syste Basic ma (1.	em Admin Wireless Setting Advanced Wireless s(40-100) 255)	<< 1 > >>	A total of 1 page		

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.

			_				All	Connected	Disconnecter	d Pending
		Out Dutient						- oomeeted -	5150011100000	_
ame, MAC Address	, IP Q Overview	Config Performa	ince							Forget /
AP Name	MAC Address	IP Address	Status	Model	Hardware Version	Firmware Version	Client Number	Download	Upload	Action
C-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	I C C
	AC-84-C6-17-BA-A6	172.16.1.13	Disconnected	EAP245	1.0	1.2.0 Build 20170828 Rel. 67350	0		116.05 K	
C-84-C6-17-BA-A6	AC-84-C6-17-BA-A6	172.16.1.13 Wireless S			s Control Syste	m Admin	<< 1 > >>	A total of 1 page		
	AC-84-C6-17-BA-A6				s Control Syste		<< 1 > >>	A total of 1 page		
			ettings	Wireles	s Control Syste	m Admin	<< 1 > >>	A total of 1 page		
	E	Wireless S	ettings	Wireles	s Control Syste	m Admin Wireless Setting Advanced Wireless	<< 1 > >>	A total of 1 page		√ [] [] (co
	E	Wireless S Band Steering:	ettings d: 20	Wireless	s Control Syste Basic 1 (2-	m Admin Wireless Setting Advanced Wireless 40)	<< 1 > >>	A total of 1 page		

Figure 44: TP-Link – Band Steering

