Create a Spectrum Analysis (and Air Monitor) AP Group

Enter the Controller from the CLI

Configure a new AP-Group from CLI (clone the default ap group settings)

(Aruba3200) #configure t Enter Configuration commands, one per line. End with CNTL/Z (Aruba3200) (config) # ap-group *spect (name)* (Aruba3200) (AP group "spect") #clone default (clones the configuration of the current default AP group)

Exit the configuration mode - "wr mem" to save the configuration

Enter the Controller from the GUI

Go to

"Configuration" > "Wireless" > "AP Configuration" Edit the new AP Group created (this example "spect")

Monitoring Configurat	ion Dagnostics Maintenance Plan Save Configuration	
WIZARDS	Configuration > AP Group	
AP Wizard Controller Wizard	AP Group AP Specific	
WLAN/LAN Wizard	Name	
License Wizard	default	Edit Delete
WIP Wizard	NoAuthApGroup	Edit Delete
NETWORK	spect	Edit Delete
Controller		
VLANs	New	
Ports		
Cellular Profile		
IP		
SECURITY		
Authentication		
WINELSES		
> AP Configuration		
AP Installation		

Go to and open

"RF Management" and open "802.11a radio profile"

Profiles				Profile Detail	S
 Wireless LAN RF Management 		802.11a radio pr	ofile > default 💽		Show Reference
802.11a radio profile	default	Radio enable	V	Mode	ap-mode 💽
Adaptive Hodo Management (ARM) Profile High-throughput Radio Profile	derault default-a	High throughput enable (radio)	V	Channel	Seconda © None
Spectrum Profile	default-a	Beacon Period	100 msec	Beacon Regulate	Π
AM Scanning Profile	default	·		Advertise 802.11d and	-
802.11g radio profile	default		15	802.11h Capabilities	
RF Event Thresholds profile	default	TPC Power	15	Spectrum load balancing	
E AP € QOS € TDS		Spectrum Load balancing mode	channel 💌	Spectrum load balancing update interval (sec)	30
€ Mesh		Advertized regulatory max EIRP	0	Spectrum Load Balancing domain	

Find and pull down the "MODE" and select "spectrum-mode"

Profiles					Profile Detail	s
Wireless LAN RF Management		802.11a radio pro	o <mark>file ></mark> def	ault 💌		Show Reference
 802.11a radio profile 	default	Radio enable			Mode	ap-mode 🔹
Adaptive Radio Management (ARM) Profile High-throughput Radio Profile	default-a	High throughput enable (radio)		(Channel	am-mode ap-mode spectrum-mode one
Spectrum Profile	default-a	Beacon Period	100	msec	Beacon Regulate	E
AM Scanning Profile	default				Advertise	2.2
+ 802.11g radio profile	default	Transmit EIRP	15		802.11d and 802.11h	

Select the "SAVE AS" button and enter the name of the new mode(in this example "spect").

Profiles					Profile Details	6
Wireless LAN RF Management		802.11a radio pro	ofile >)	Show Reference
802.11a radio profile	default	inchpeet				
Adaptive Radio Management (ARM) Profile	default	Radio enable	M		Mode	spectrum-mode 💌
High-throughput Radio Profile	default-a	High throughput enable (radio)	N		Channel	Secondary Channe None C Above
Spectrum Profile	default-a	Beacon Period	100	msec	Beacon Regulate	
AM Scanning Profile	default		1		Advertise	

When completed select the "APPLY" button at the bottom of the page

"Save Configuration"

Repeat these steps for the "802.11g radio profile"

When the changes have taken at the AP go to the "Monitoring" tab and select "Spectrum Analysis"



You will be presented with a new browser window

Click 'here' to add the AP and begin the Spectrum Analysis

ARURA MOB	LITY CONTROLLE	R Aruba3200 > Spectrum Analysis
Spectrum Dashboards	Spectrum Monitors	
View 1 * <u>View 2</u>	Record/Playba	<u>:k</u>
There are no curr	ently connected Spectr	um Monitors.
Click <u>here</u> to conn	ect to at least one Spe	ctrum Monitor.

Select "ADD"

Spectrum Dashboards	Spectrum Monitors	
Spectrum Monitors		
Currently Connected	1	

You will be presented with the names of the AP's that have been placed in the AP Group 'spect'.

bectrum Dashboards	Spectrum M	lonitors				
Spectrum Monitors						
Currently Connected	I					
Add						
Select AP/Radio to	connect to (voi	ı can have up	o to 4 simulta	neous Spectrum Mon	itor connections):	
APs (2)						
APs (2) AP	Band Sta	tus Model	AP Group	Mode	Availability for Connection	
APs (2) AP <u>00:24:6c:c9</u>	Band Sta 2.4 GHz Up	tus Model 105	AP Group mycomp	Mode Spectrum Monitor	Availability for Connection Available, 2.4 GHz	
APs (2) AP <u>00:24:6c:c9</u> <u>00:24:6c:c9</u>	Band Sta 2.4 GHz Up 5 GHz Up	tus Model 105 105	AP Group mycomp mycomp	Mode Spectrum Monitor Spectrum Monitor	Availability for Connection Available, 2.4 GHz Available, 5 GHz	
APs (2) AP @ 00:24:6c:c9 @ 00:24:6c:c9	Band Sta 2.4 GHz Up 5 GHz Up	tus Model 105 105	AP Group mycomp mycomp	Mode Spectrum Monitor Spectrum Monitor	Availability for Connection Available, 2.4 GHz Available, 5 GHz	
APs (2) AP M <u>00:24:6c:c9</u> M <u>00:24:6c:c9</u>	Band Sta 2.4 GHz Up 5 GHz Up	tus Model 105 105	AP Group mycomp mycomp	Mode Spectrum Monitor Spectrum Monitor	Availability for Connection Available, 2.4 GHz Available, 5 GHz	
APs (2) AP ^(k) <u>00:24:6c:c9</u> ^(k) <u>00:24:6c:c9</u>	Band Sta 2.4 GHz Up 5 GHz Up	tus Model 105 105	AP Group mycomp mycomp	Mode Spectrum Monitor Spectrum Monitor	Availability for Connection Available, 2.4 GHz Available, 5 GHz	
APs (2) AP ^(k) <u>00:24:6c:c9</u> ^(k) <u>00:24:6c:c9</u>	Band 2.4 GHz Up 5 GHz Up	tus Model 105 105	AP Group mycomp mycomp	Mode Spectrum Monitor Spectrum Monitor	Availability for Connection Available, 2.4 GHz Available, 5 GHz	
APs (2) AP © <u>00:24:6c:c9</u> © <u>00:24:6c:c9</u>	Band 2.4 GHz Up 5 GHz Up	tus Model 105 105	AP Group mycomp mycomp	Mode Spectrum Monitor Spectrum Monitor	Availability for Connection Available, 2.4 GHz Available, 5 GHz	

Click on and highlight the AP name for the 2.4 GHz band and select 'Connect'

NP	Band	Status	Model	AP Group	Mode	Availability for Connection
00:24:6c:c9	. 2.4 GHz	Ľρ	105	mycomp	Spectrum Monitor	Available, 2.4 GHz

You should now see the Spectrum Monitor now currently connected to the AP select.

tly Connected		
0:24:6c:c9:2d:c3 2.4GHz	Connected Apr 18 10:29:58 AM	Disconnect
(tly Connected 0:24:6c:c9:2d:c3 2.4GHz	0:24:6c:c9:2d:c3 2.4GHz Connected Apr 18 10:29:58 AM

Select "ADD" on the current screen to select and connect an AP for the 5GHz band Spectrum Monitor.

Currently Connected							
00:24:6c:c9:2d	:c3 2.4G⊦	Iz Con	nected Ap	or 18 10:29:5	8 AM <u>Disconnect</u>		
Add							
Select AP/Radio to APs (1)	connect t	o (you ca	n have up	o to 4 simulta	neous Spectrum Mon	itor connections):	
AP	Band	Status	Model	AP Group	Mode	Availability for Connection	
00:24:6c:c9	5 GHz	Up	105	mycomp	Spectrum Monitor	Available, 5 GHz	

Select a 5GHz channel range to monitor and select "Connect"

Add	
Connect to 00:24:6c:c9:2d:c3	
Select the desired band below: • 5 GHz Lower (Channels 36-64)	
5 GHz Middle (Channels 100-140) 5 GHz Upper (Channels 149-165)	
	Back Connect Cancel

There is now one AP with the 2.4 GHz and 5 GHz radio band that is connected as a Spectrum Analyzer

Spectrum Dashboards	Spectrum Mo	nitors	
Spectrum Monitors			
Currently Connected			
00:24:6c:c9:2d	:c3 2.4GHz	Connected Apr 18 10:29:58 AM	Disconnect

You can place and add additional AP's to/ from your 'spectrum' AP Group as necessary depending on the spectrum coverage needed within the environment.

Now select the "Spectrum Dashboards" tab to display the spectrum windows

Spectrum Dashboards Spectrum Mo	nitors	
Spectrum Monitors		
Currently Connected		
Currently Connected	Connected Apr 18 10:29:58 AM	Disconnec

Spectrum Window Display

Once the spectrum window is opened it is **required** to select a specific spectrum analyzer for display in each window before actually seeing the spectrum display.



Once the spectrum window is opened it is **required** to select a specific spectrum analyzer for display in each window. Use the pull down next to the "Please select a spectrum monitor" to assign an existing spectrum AP to that particular display.

pectrum Dashboards	Spectrum Monitors	
View 1 View 2	<u>Record/Playback</u>	
Swept Spectrogram (F	T Max) -Please select a spectrum monitor 🔹	🗧 👻 Quality Spectro
-237s	-50 dBm \	Select Spectrum Monitor

Here the pull down was used to select the AP set as the spectrum analyzer. In this example AP name 00:24:6c:c9:2d:c3 is selected to display the 2.4GHz band.



Note that other menu options are available to change the spectrum display. The display selected below is showing "Real Time FFT" per 2.4GHz band channel.



Menu Options are available, selected and set per individual display window. Go through the menu options to display the variety of display examples available.

Display Examples

Use the HELP menu for descriptions of each windows display function.



Real-time FFT

The Real-time FFT chart displays the instantaneous Fast Fourier Transform (FFT) signature of the RF signal seen by the radio. The Fast Fourier Transform (FFT) converts a RF signal from time domain to frequency domain. The frequency domain representation divides RF signals into discrete frequency bins; small frequency ranges whose width depends on the resolution bandwidth of the spectrum monitor (i.e., how many Hz are represented by a single signal strength value). Each frequency bin has a corresponding signal strength value. Since there may be a large number of FFT signatures received by the radio every second, an algorithm selects one FFT sample to display in the Real-time FFT chart every second.

Good for showing 802.11 and non-802.11 noise and noise floor Additional Real-time FFT information is displayed and available under the HELP section.



Swept Spectrogram

A spectrogram is a chart that shows how the density of the quantity being plotted varies with time. The spectrum analysis Swept Spectrogram chart plots real-time FFT Maximums, real-time FFT Averages or the FFT Duty Cycle. In this swept spectrogram, the x-axis represents frequency or channel and the y-axis represents time. Each line in the swept spectrogram corresponds to the data displayed in the Real-Time FFT or FFT Duty Cycle chart.

Additional Swept Spectrogram information is displayed and available under the HELP section.

FFT Duty Cycle

The amount of time the channel is in use Below 20% - normal 20 – 40% - lower edge of possible issues (maybe affect throughput tests, large transfers?)

AIR MONITOR

You can use the same steps to create an AP group for air monitor in the same way – when in the RF Management > Radio Profiles just select the MODE pull down to "am-mode" and SAVE AS "airmon" (or whatever name you choose). You now have an AP group for spectrum analysis and air monitor to put AP's in.

Profiles		Profile Details					
€ Wireless LAN ∃ RF Management		802.11a radio profile > spect 💌				Show Reference	
802.11a radio profile	spect	Radio enable			Mode	am-mode 🔹	
Adaptive Radio Management (ARM) Profile High-throughput Radio Profile	default default-a	High throughput enable (radio)	2		Channel	Seconda None	
Spectrum Profile	default-a	Beacon Period	100	msec	Beacon Regulate		
AM Scanning Profile	default	Transmit 5100	15		Advertise 802.11d and	-	