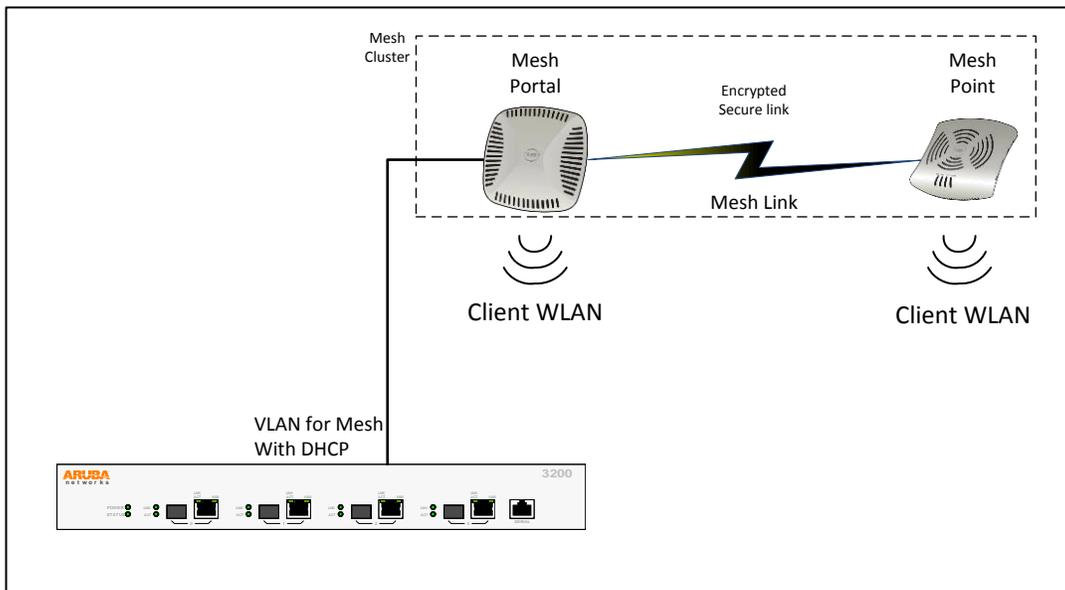


# Aruba Mesh AP Setup – Release 6.2.1.2

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### Representative Network



It is recommended to create a VLAN and DHCP server specifically for the Mesh and WLAN clients.

## 1) Create a VLAN

In this example VLAN 2 was created for use with the new Mesh network

Network > VLAN ID				
VLAN ID	VLAN Pool	Spanning-tree		
VLAN ID	IPv4 Address	IPv4 Net Mask	IPv6 Address	Associated Ports
1	172.16.0.3	255.255.255.0		GE1/0-3,Pc0-7
2	192.168.2.3	255.255.255.0		GE1/1

### 1a) Create a DHCP pool

Or enter a DHCP helper address in the VLAN for the Mesh VLAN AP's and clients to get IP addresses from

Enable DHCP Server			
IPv4 DHCP Server			<input checked="" type="checkbox"/>
Pool Configuration			
IP Version	Name	Default Router	Network
IPv4	vlan2-pool	192.168.2.3	192.168.2.0
<input type="button" value="Add"/>			

## 2) Create a new client VAP/SSID

This is the WLAN that will be broadcast over the Mesh points 2.4G Band (Employee, Guest, etc.) for client connectivity. For this example a Guest network was created using the Campus WLAN Wizard to create a Guest WLAN with Captive Portal and email authentication for guests call 'MyMesh-Guest'.

If not already assigned – open the Virtual AP profile for your WLAN and assign it to VLAN and DHCP created above.

When guests connect to this network they will receive an IP address from the DHCP pool assigned to VLAN 2.

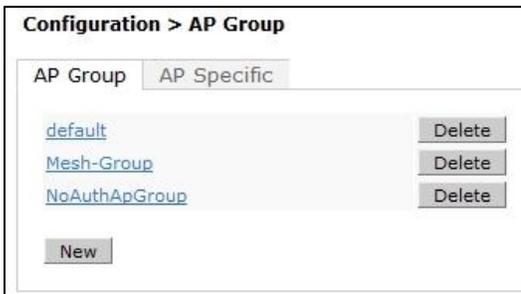
Virtual AP profile > MyMesh-Guest-vap_prof		Show Reference	Save As
Basic <input type="radio"/> Advanced <input type="radio"/>			
General			
Virtual AP enable	<input checked="" type="checkbox"/>		
VLAN	2	<--	2
Forward mode	tunnel		
RF			
Allowed band	all		
Band Steering	<input type="checkbox"/>		
Steering Mode	prefer-5ghz		
Broadcast/Multicast			
Dynamic Multicast Optimization (DMO)	<input type="checkbox"/>		
Drop Broadcast and Multicast	<input type="checkbox"/>		
Convert Broadcast ARP requests to unicast	<input checked="" type="checkbox"/>		

**Note** that the VAP /SSID is assigned to VLAN 2,

You need to use this same VLAN later in the doc, you should use this VLAN only for Mesh AP's and client traffic.

### 3) Create an AP Group for the Mesh AP's

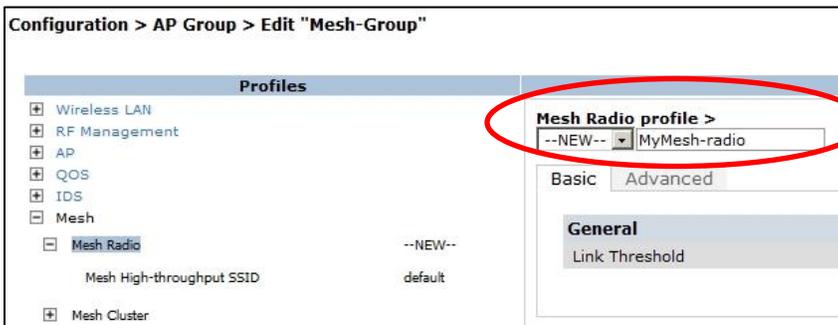
For the Mesh AP's and the "Wireless LAN" Virtual AP assignment to the AP's in the group  
This example "Mesh-Group"



### 4) Create a Mesh Radio Profile

From the Configuration > AP Configuration Tab

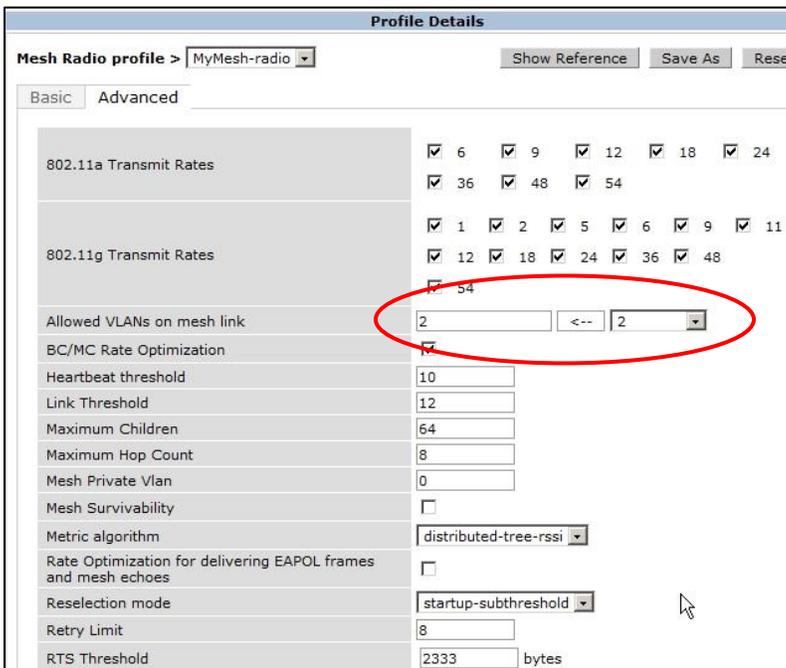
Enter the AP Group previously created (Mesh-Group) and expand the MESH section. Click on "Mesh Radio" and using the pull down select "--NEW--" and enter the name of your new Mesh Radio Profile. In this example "MyMesh-radio"



"Apply" the new Mesh Radio profile at the bottom of the page

Re-enter the MyMesh-radio profile you created and go to the Advanced Tab

Change the "Allowed VLANs on mesh link" to the VLAN created in Step 1. In this example VLAN 2.



"Apply" the change

## 5) Create a Mesh Cluster

Directly below the Mesh Radio Profile click on the Mesh Cluster

Select “Add a Profile” “—NEW—”

Enter a name for your Mesh Cluster profile (in this example “MyMesh-clus”)

Select **ADD** then

“**Apply**” at the bottom of the page

The screenshot shows the configuration page for a Mesh Group. The left sidebar contains a tree view with categories like Wireless LAN, RF Management, AP, QOS, IDS, Mesh, Mesh Radio, Mesh Cluster, and MyMesh-clus. The main area is divided into 'Profiles' and 'Profile Details'. Under 'Profile Details', there is a table for 'Mesh Cluster profiles' with columns for 'Name' and 'Priority'. The table shows one entry: 'MyMesh-clus' with a priority of '1'. Below the table, there is an 'Add a profile' section with a dropdown menu set to 'default', a 'using priority' dropdown set to '2', and an 'Add' button.

Select the new Mesh Cluster created (MyMesh-clus)

In this Mesh example we are using dual band radios (AP135 Mesh Portal and AP105 Mesh Point) so we want to select the “A” band radio as the RF band Mesh.

Enter a Cluster Name – in this example MyMesh1

In addition we are going to secure the Mesh Cluster with wpa2-psk-aes and a WPA Passphrase password

“**Apply**” at the bottom of the page

The screenshot shows the configuration page for a Mesh Cluster profile. The left sidebar is the same as in the previous screenshot. The main area is divided into 'Profiles' and 'Profile Details'. Under 'Profile Details', there is a section for 'Mesh Cluster profile > MyMesh-clus'. This section has two tabs: 'Basic' and 'Advanced'. The 'Basic' tab is selected. The 'Basic' tab contains several fields: 'Cluster Name' (text input with 'MyMesh1'), 'RF Band' (dropdown menu with 'a'), 'Encryption' (dropdown menu with 'wpa2-psk-aes'), 'WPA Hexkey' (text input), and 'WPA Passphrase' (text input). The 'WPA Passphrase' field has a 'Retype:' label and a password strength indicator. The 'WPA Hexkey' field has a 'Retype:' label and a password strength indicator. The 'WPA Passphrase' field has a 'Retype:' label and a password strength indicator. A red box highlights the 'Cluster Name', 'RF Band', 'Encryption', and 'WPA Passphrase' fields.

Proper use of the Mesh Cluster configuration allows you to expand the number of Mesh networks yet isolate and control AP’s in the clusters. The AP’s assigned (as Mesh Portals and Mesh Points) to a particular cluster will know which cluster to connect to and communicate with as well as the settings they operate with.

Aruba User Guide Release 6.1 “Mesh Clusters” page 253

You may not need to enable encryption in this tab depending on your application but given the opportunity to secure communications the default recommendation is to encrypt and secure.

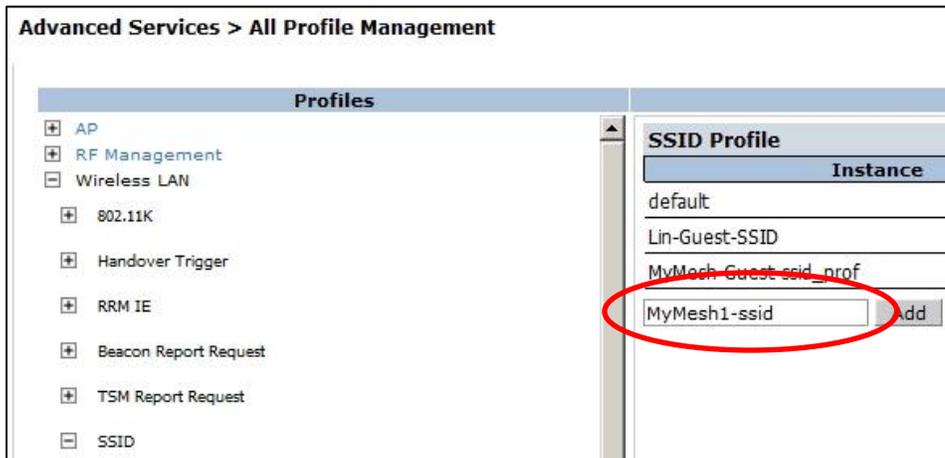
## 6) Create the Mesh Network SSID

**From the Configuration > All Profiles Tab** - This is the SSID used by the AP's to create and connect the Mesh network

Expand the Wireless LAN tab and click on the "SSID"

Enter the name of your Mesh SSID and click ADD

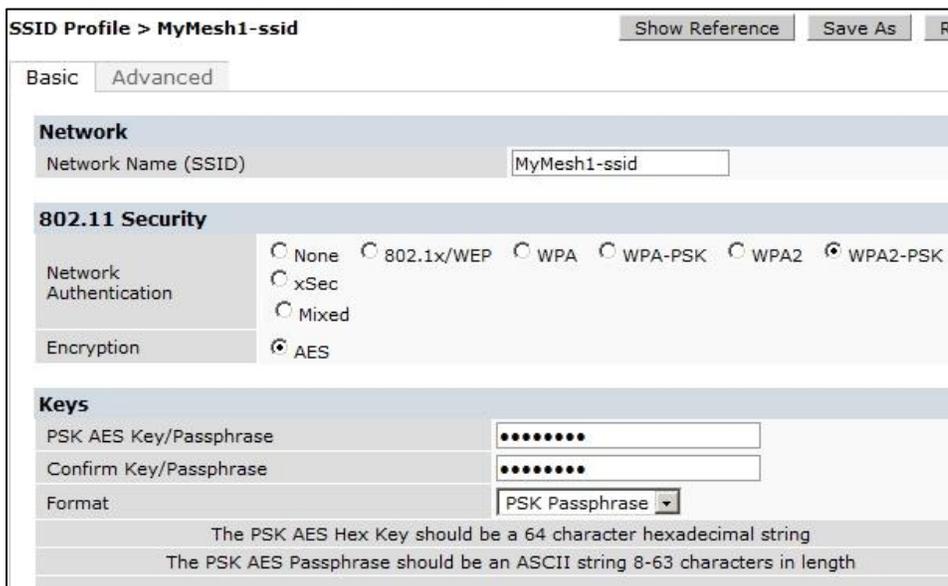
(in this example "MyMesh1-ssid")



Select the newly created Mesh SSID and set the following

Network Name – SSID

Security, in this example a wpa2-psk Passphrase



**"Apply"** at the bottom of the page

Depending on your application encryption on the Mesh Link may not be needed, in this example we are using the Mesh Link AP's to broadcast an open Guest network WLAN on the Mesh Point AP 2.4G band (the Guest WLAN is open encryption anyway). But should you use this for an employee WLAN Mesh Link encryption must be considered mandatory.

Stay in the SSID Profile and go to the **"Advanced"** tab

Find and set the following

- Max Associations = 0 (we do not want clients to associate to the Mesh SSID)
- Hide SSID – check ON (we do not want to Broadcast the Mesh SSID)
- Deny\_Broadcast Probes – check ON (we do not want the Mesh to reply to probe requests)

Profile Details	
RTS Threshold	2333 bytes
Short Preamble	<input checked="" type="checkbox"/>
Max Associations	0
Wireless Multimedia (WMM)	<input type="checkbox"/>
Wireless Multimedia U-APSD (WMM-UAPSD) Powersave	<input checked="" type="checkbox"/>
WMM TSPEC Min Inactivity Interval	0 msec
Override DSCP mappings for WMM clients	<input type="checkbox"/>
DSCP mapping for WMM voice AC	
DSCP mapping for WMM video AC	
DSCP mapping for WMM best-effort AC	
DSCP mapping for WMM background AC	
Multiple Tx Replay Counters	<input type="checkbox"/>
Hide SSID	<input checked="" type="checkbox"/>
Deny_Broadcast Probes	<input checked="" type="checkbox"/>

**“Apply”** at the bottom of the page

## 6) Create a Mesh Virtual AP

**From the Configuration > All Profiles Tab** - This is the Virtual AP that the Mesh Network SSID will be applied to

Create the Mesh Virtual AP profile

This example MyMesh-vir

Virtual AP profile > MyMesh-vir

Basic | Advanced

**General**

Virtual AP enable

VLAN: 2 <--> 2

Forward mode: split-tunnel

**RF**

Allowed band: all

Band Steering:

Steering Mode: prefer-5ghz

**Broadcast/Multicast**

Dynamic Multicast Optimization (DMO):

Drop Broadcast and Multicast:

Convert Broadcast ARP requests to unicast:

Click on the new Mesh Virtual AP profile and set the following

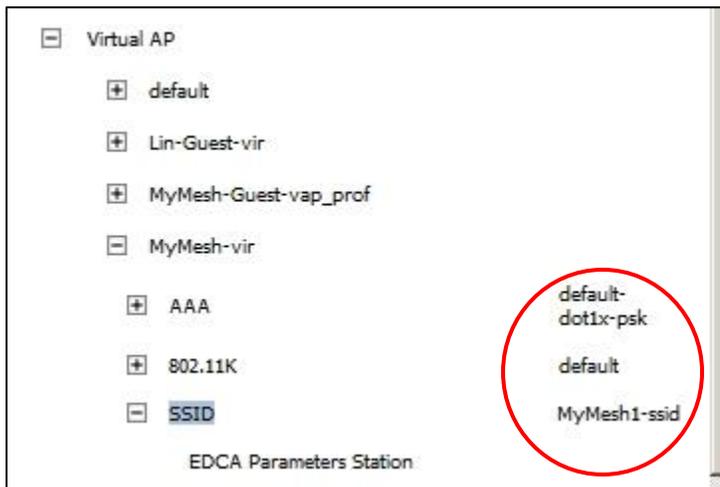
VLAN = vlan 2

Forward mode = split-tunnel

**“Apply”** at the bottom of the page

(Realize at this time you could assign different VLAN and DHCP scope to the AP's and the clients connecting to the Mesh 2.4 Band SSID but let's keep it simple – they will all use VLAN 2 in this exercise)

Now set the **Mesh Virtual AP profiles** (MyMesh-vir) necessary for **AAA** and **SSID** profiles



Select the AAA

Because we are using a WPA2-PSK Passphrase in the SSID you will need to select the “Default-dot1x-psk” profile for the AAA setting. If you had selected an “OPEN” network with no encryption between the Mesh AP’s you would not have to set this AAA profile (left as Default)

Select the SSID

Now select the SSID created for the Mesh AP’s link (MyMesh1-ssid) and add it to profile

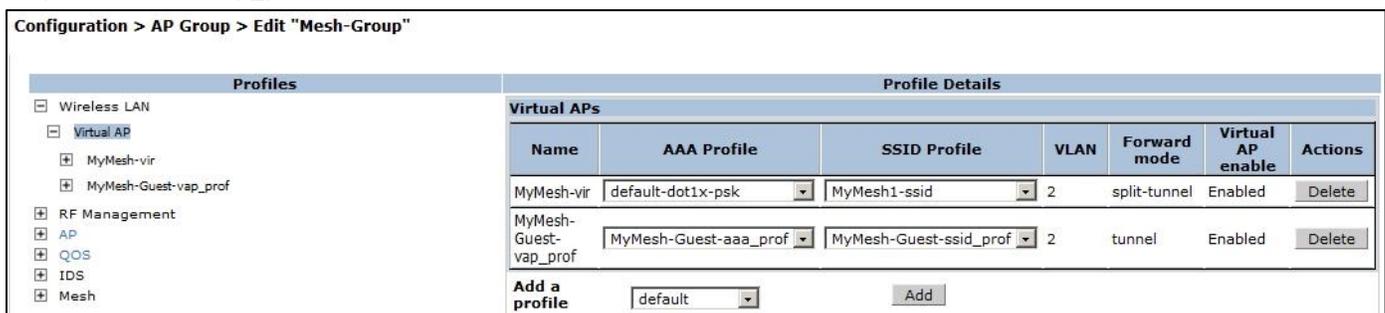
## 6) Add the Mesh SSID and Client SSID to the Mesh AP Group

**Configuration > AP Configuration > AP Group = Mesh-Group (created in Step 3)**

Click on and open the Wireless LAN within the Mesh-Group

Using the “Add a Profile” pull down on the right find and select the MyMesh-vir profile and click ADD

Using the “Add a Profile” pull down on the right find and select the client WLAN profile created in Step 2 (this example “MyMesh-Guest-vap\_prof”) and click ADD



**“Apply”** at the bottom of the page

At this time both the client WLAN and the WLAN used by the Mesh AP’s to connect and communicate with each other are in the Mesh-Group.

Time to assign an AP as a Mesh portal and a Mesh point to this AP Group

## 7) AP Provisioning

### Configuration > AP Installation

#### Mesh Portal

You configure Mesh AP's as you would any other AP's to an AP Group in addition to setting the **Mesh Role**.

Plug in the AP that will be the **Mesh Portal** and wait for it to be discovered by the controller in the AP Installation > Provisioning tab.

Once it is seen in this tab check on it to select it and hit "Provision"

Use the pull down to place it in the Mesh-Group

Select "Internal"

Scroll down to the bottom of the page

Enter an AP name

Under "Mesh Role" use the pull down to select "**Mesh Portal**"

Wireless > AP Installation > Provision

Provisioning Provisioning Profile Whitelist

**AP Parameters**

AP Group Mesh-Group

**AP Installation Mode**

Default  Indoor

AP IP Address	AP Name	AP Group	SNMP System Location	Mesh Role	AP Type	Serial Number
192.168.2.11	ap135-portal	Mesh-Group		Mesh Portal	135	AX0003361

Apply and Reboot Cancel

#### Apply and Reboot

After the AP finishes rebooting you should see in the AP Installation > Provisioning tab with the AP Name <your ap-name>, AP Group <Mesh-Group>, and the Flags should read "M" (for Mesh)

Search

AP Name	AP Group	AP IP	AP Type	AP MAC Address	AP Serial Number	Flags	Status
ap135-portal	Mesh-Group	192.168.2.11	135	d8:c7:c8:c0:1a:42	AX0003361	M	Up 15m:33s

1 | 1-2 of 2 | 10

### Configuration > AP Installation

#### Mesh Point

You can now add a Mesh Port to the Mesh network but you have to configure the AP by connecting it to and provisioning it from the controller first! After provisioning you can relocate it to the area it will provide the Mesh back to the controller.

Plug in the AP that will be the **Mesh Point** and wait for it to be discovered by the controller in the AP Installation tab.

Once it is seen in this tab check on it to select it and hit "Provision"

Use the pull down to place it in the Mesh-Group

Select "Internal"

Scroll down to the bottom of the page

Enter an AP name

Under "Mesh Role" use the pull down to select "**Mesh Point**"

**Wireless > AP Installation > Provision**

Provisioning | Provisioning Profile | Whitelist

**AP Parameters**  
 AP Group: Mesh-Group

**AP Installation Mode**  
 Default  Indoor

AP IP Address	AP Name	AP Group	SNMP System Location	Mesh Role	AP Type	Serial Number
192.168.2.12	ap105-point	Mesh-Group		Mesh Point	105	BE0110744

Apply and Reboot | Cancel

### Apply and Reboot

After the AP finishes rebooting you should see in the AP Installation > Provisioning tab with the AP Name <your ap-name>, AP Group <Mesh-Group>, and the Flags should read "M" (for Mesh)

AP Name	AP Group	AP IP	AP Type	AP MAC Address	AP Serial Number	Flags	Status
ap105-point	Mesh-Group	192.168.2.12	105	d8:c7:c8:c9:70:97	BE0110744	M	Up 23m:59s

Once the AP has its Mesh Point configuration and is rebooting you can disconnect it from the controller, place it in the remote area, power it up (you can use POE without need for a network connection or use a 12vdc external power supply) and the AP will start and connect to the Mesh Portal.

## 8) Checks

After relocating the Mesh Point ensure that it is up and communicating with the controller through the Mesh Portal

**Wireless > AP Installation > Provisioning**

Provisioning | Provisioning Profile | Whitelist

**Search**

AP Name	AP Group	AP IP	AP Type	AP MAC Address	AP Serial Number	Flags	Status
ap105-point	Mesh-Group	192.168.2.12	105	d8:c7:c8:c9:70:97	BE0110744	M	Up 3m:37s
ap135-portal	Mesh-Group	192.168.2.11	135	d8:c7:c8:c0:1a:42	AX0003361	M	Up 4m:13s

1 | 1-2 of 2 | 10

Flags: U = Unprovisioned; N = Duplicate name; G = No such group; L = Unlicensed; I = Inactive; D = Dirty or no config; E = Regulatory Domain Mismatch; X = Maintenance Mode; P = PPPoE AP; B = Built-in AP; R = Remote AP; R- = Remote AP requires Auth; C = Cellular RAP; c = CERT-based RAP; 1 = 802.1x authenticated AP; 2 = Using IKE version 2; u = Custom-Cert RAP; M = Mesh node; Y = Mesh Recovery; ; Port information is available only on 6xx controller;

Provision

Ensure that the WLAN SSID (for client access) that you had assigned to the Mesh AP Group is broadcasting – this example "MyMesh-Guest"

Connect a Client device to the WLAN SSID at the Mesh Point and check connectivity, IP address assignment and connection to the network.

```
(Aruba3200) #show user
Users
-----
IP          MAC          Name   Role   Age(d:h:m)  Auth  VPN link  AP name  Roaming  Essid/Bssid/Phy  Profile
-----
192.168.2.13 5c:96:9d:08:f4:63 m@m.com guest 00:00:13  Web        ap105-point Wireless MyMesh-Guest/d8:c7:c8:17:09:7a/a-HT MyMesh-G
uest-aaa_prof tunnel iPad
User Entries: 1/1
(Aruba3200) #
```

## Mesh Network checks

### Show ap mesh topology

```
(Aruba3200) #show ap mesh topology
Mesh Cluster Name: MyMesh1
-----
Name           Mesh Role   Parent           Path Cost  Node Cost  Link Cost  Hop Count  RSSI  Rate Tx/Rx  Last Update  Uplink Age  #Children
-----
ap105-point    Point (N)   ap135-portal    1          0          0          1          34   300/6       7m:0s       43m:44s    0
ap135-portal   Portal (N)  -               0          1          0          0          0    -           4m:15s      46m:38s    1
Total APs :2
```

Useful for showing the portal and points of a particular Mesh Cluster name

### Show ap mesh debug counters ap-name <ap-name>

```
(Aruba3200) #show ap mesh debug counters ap-name ap135-portal
Mesh Packet Counters
-----
Interface  Echo Sent  Echo Recv  Probe Req  Probe Resp  Assoc Req  Assoc Resp  Assoc Fail  Link up/down  Resel.  Switch  Other Mgmt
-----
Parent     2904      2884      1          1(1 HT)    1(1 HT)    1(1 HT)    0           0              -       -       0
Received Packet Statistics: Total 33900, Mgmt 28117 (dropped non-mesh 0), Data 5783 (dropped unassociated 0)HT: pns=1 ans=1 pnr=0 ars=0 arr=1 anr=0
Recovery Profile Usage Counters
-----
Item                               Value
-----
Enter recovery mode                 0
Exit recovery mode                  0
Total connections to switch         0
Mesh loop-prevention Sequence No.:3055
Mesh timer ticks:3054
```

Useful to display link up/down and Association Failures for a particular AP in the Mesh

Remember to run the command against ALL AP's in the Mesh