Mesh Application

For a mesh network topology to be successfully set up, the following conditions must be met.

- Minimum of 2 mesh points is required for a simple mesh network topology.
- All configurations must be completed individually on each mesh point through the web UI

by accessing their unique IP address.

- To make sure the mesh points to be interconnected successfully, the following specific settings must be identical for all mesh points on their interfaces.
  - ✓ Channel
  - ✓ Mesh ID
- 1 DHCP server must be provided and configured in advance for setting up a mesh network topology.
- For the consistent service of the mesh network topology, the mesh points must be positioned where their basic service areas are overlapped.

Users should access Basic Settings to switch wireless operation mode as AP+MESH first. Operation mode, MESH, is for users which need to configure a mesh node without Wireless Access Point capability.

Here are two cases on application.

Case1: #3 AP+MESH. Wire/Wireless can surf Internet at three locations without extra setting.

Case 2: #1 AP+MESH, #2 MESH. Wire client can surf Internet at three locations without extra setting. Wireless client only works on AP+MESH location.

Case 1: #3 AP+MESH

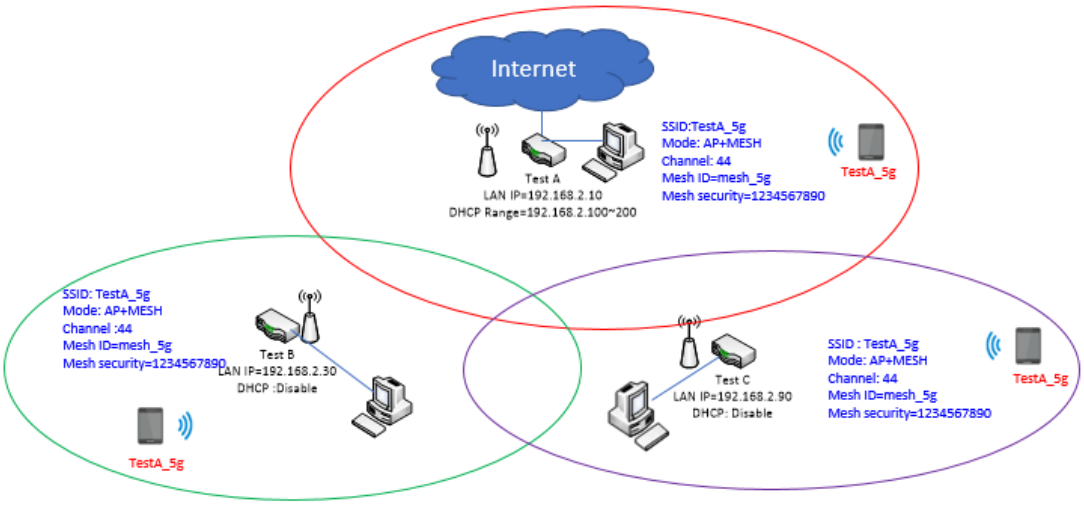
Scenario: Under Case1 Mesh topology, Wire/Wireless user can surf Internet without doing any extra setting at 3 different locations.

Location-Test A: Support Wire/Wireless client for surfing Internet.

Location-Test B: Support for Wire/Wireless client for surfing Internet.

Location-Test C: Support Wire/Wireless client for surfing Internet.

Network topology: (Take Wireless 5g for example)



Test A (Router): LAN IP=192.168.2.10, DHCP Range=192.168.2.100~192.168.2.200, WAN=PPPoE.

Test B (Router): LAN IP=192.168.2.30, DHCP server=None (Disable)

Test C (Router): LAN IP=192.168.2.90, DHCP server=None (Disable)

Note: Under the above Mesh Topology, the **Wireless channel/channel width/security and Mesh ID/Mesh Security** must be the same on Test A/Test B/Test C.

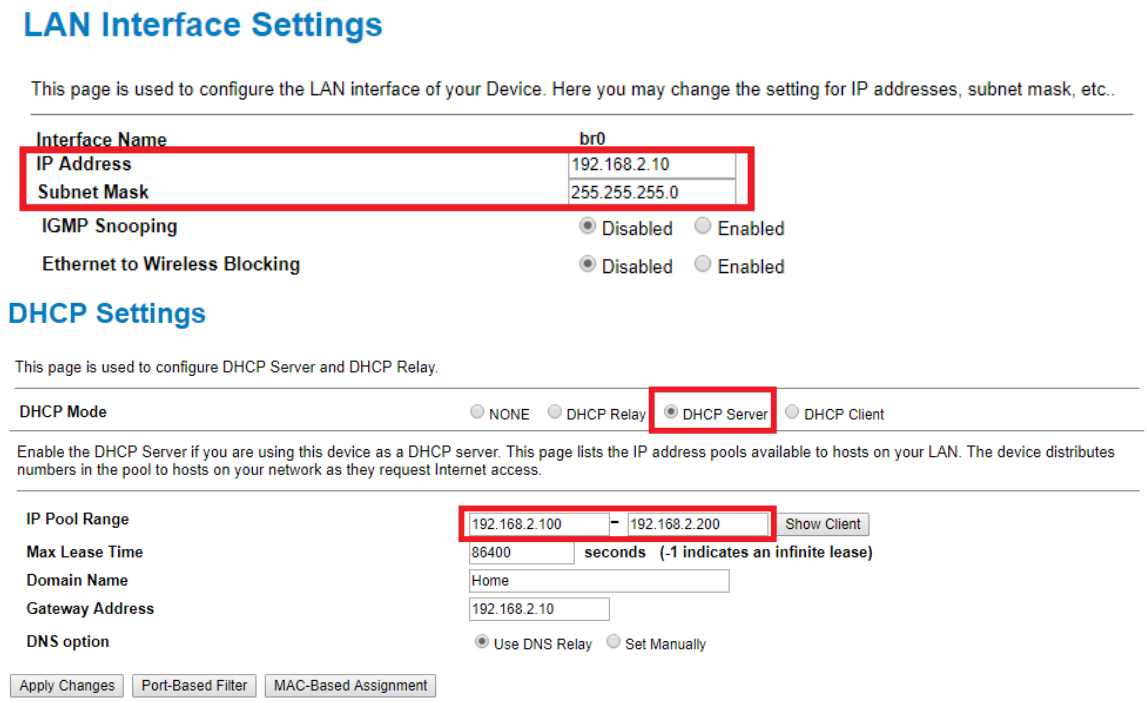
Test A Setting:

1. Setup WAN connection on Test A.

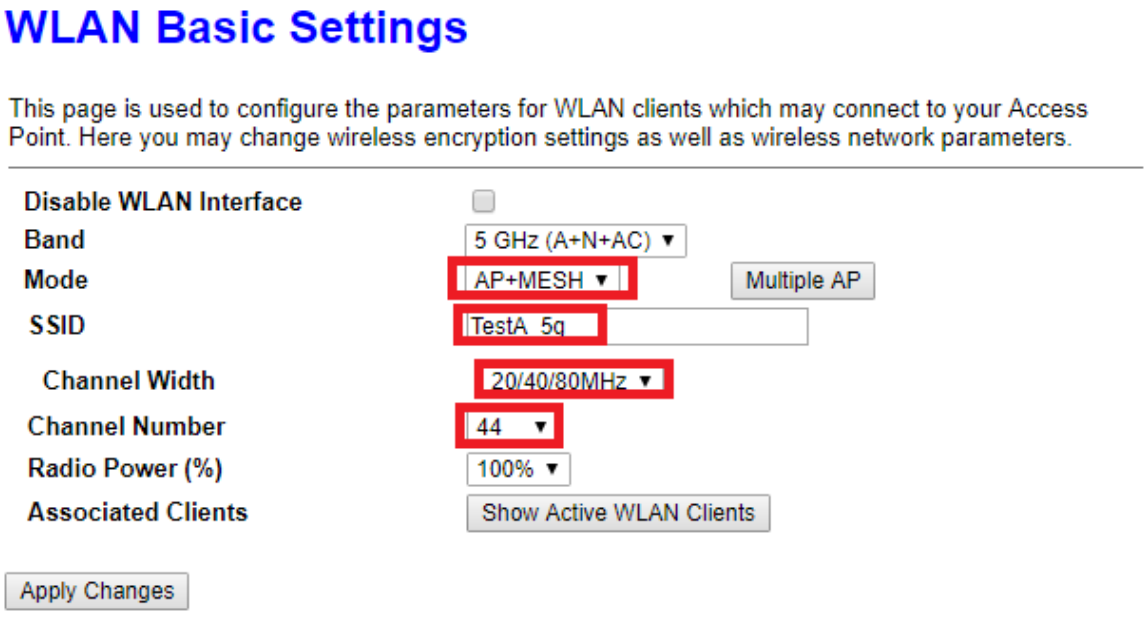
WAN Configuration

Interface	VPI/VCI	Encapsulation	Protocol	IP Address	Gateway	Status
ppp0_vc0	0/33	LLC	PPPoE	118.166.180.208	168.95.98.254	up 00:00:55 Disconnect

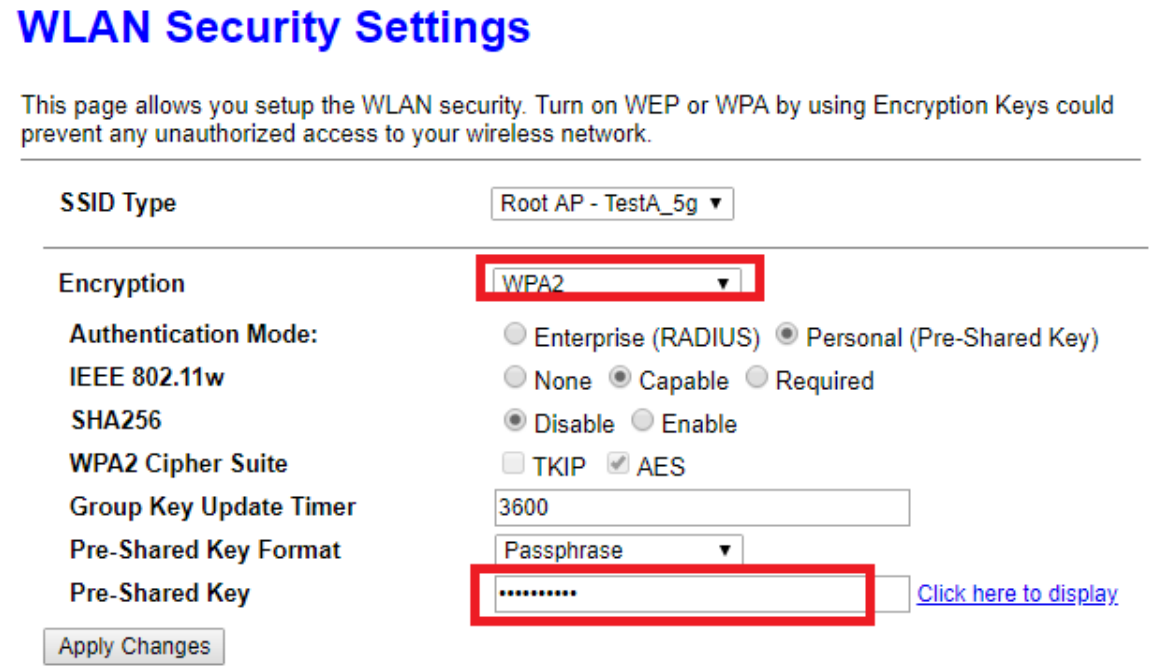
2. On Site contents>LAN: Set to LAN IP=192.168.2.10 and DHCP server range to 192.168.2.100~200.



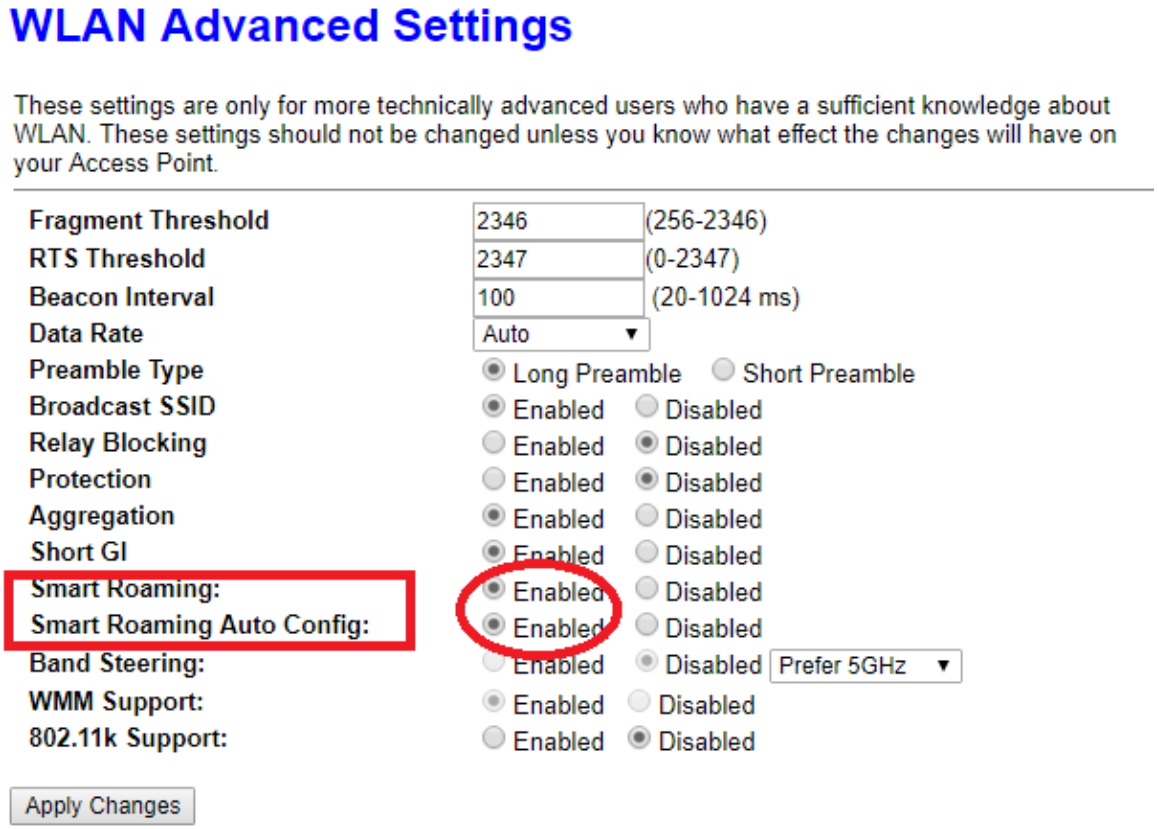
3. On Site contents>WLAN>5GHz Wifi>Basic Settings: Set SSID=TestA_5g, Mode=AP+MESH and channel number =44, others are default.



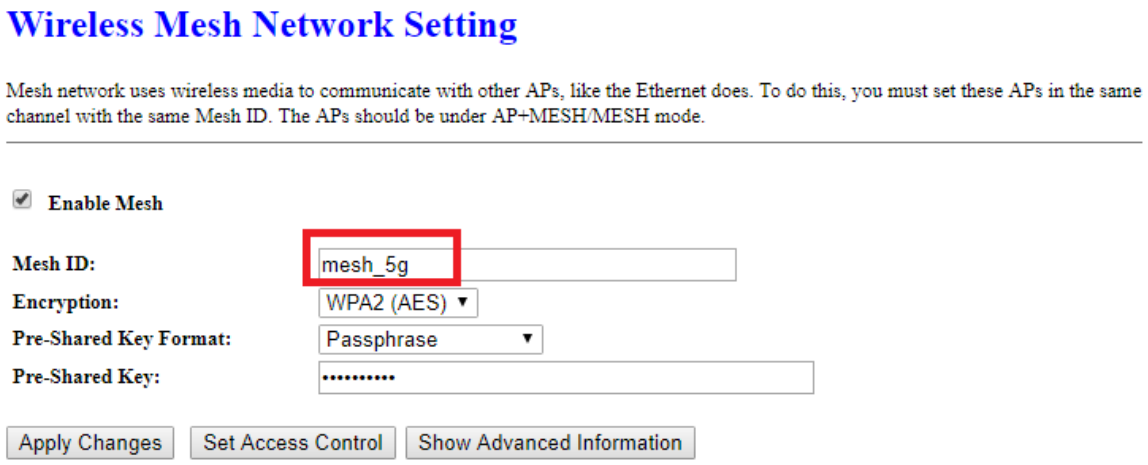
4. On Site contents>WLAN>5GHz Wifi>Security, set WPA2 on Encryption and 1234567890 on Pre-Share Key.



5. On Site contents>WLAN>5GHz Wifi>Advanced Setting. Enable Smart Roaming and Smart Roaming Auto Config. [Note: Only Test A Router need to enable Smart Roaming Auto Config, others keep using Disabled.]



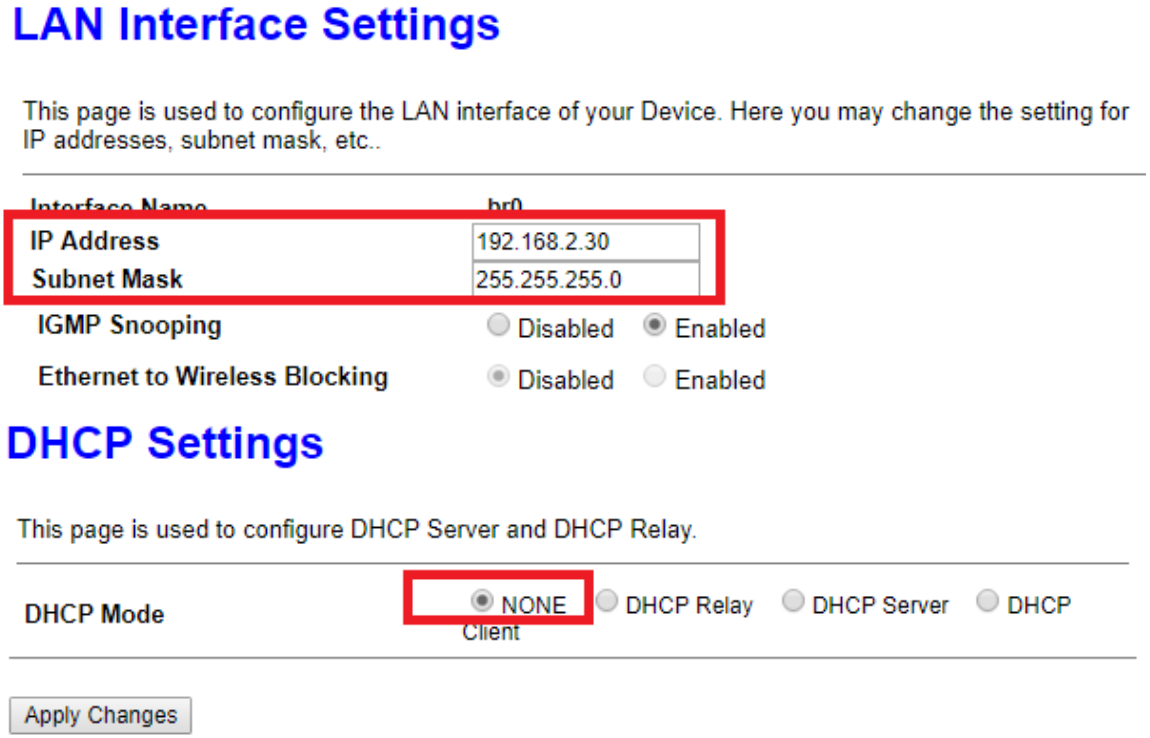
6. On Site contents>WLAN>5GHz Wifi>MESH : Set Mesh ID to mesh_5g and 1234567890 on Pre-shared Key. [Note: This setting must same on **Test A/Test B/Test C** locations.]



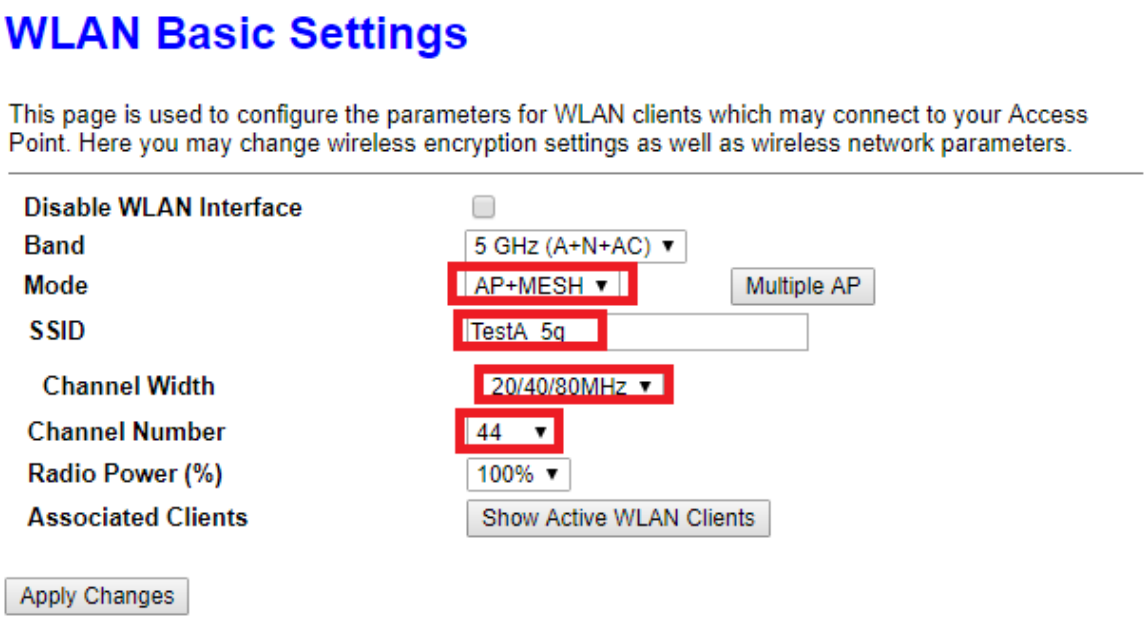
7. Done.

Test B Setting:

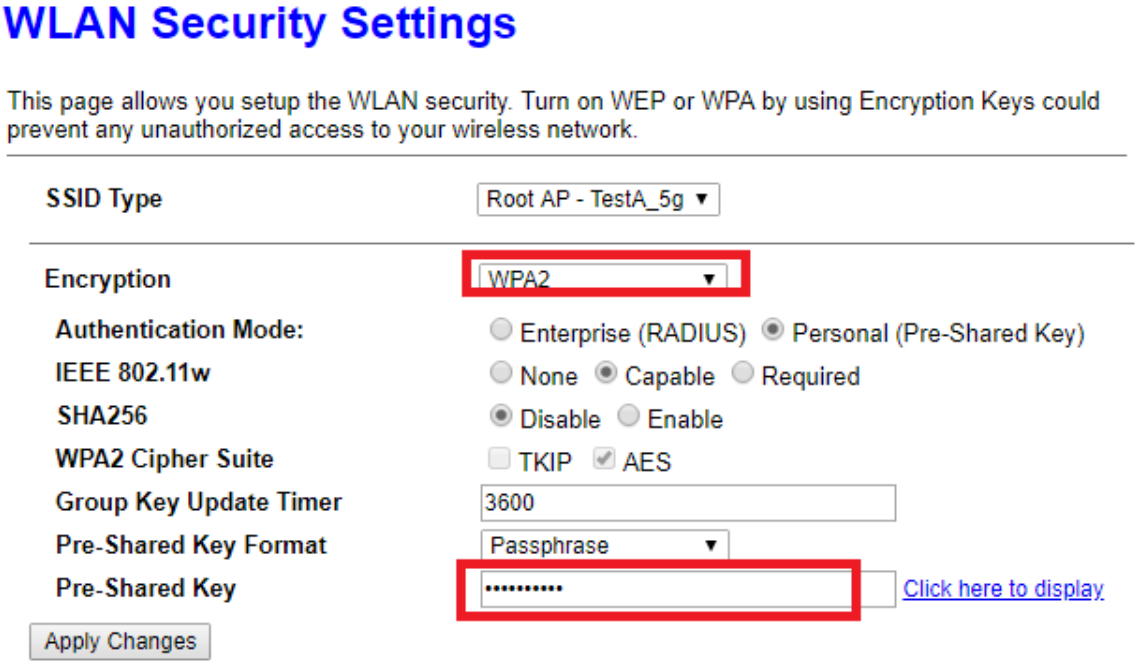
1. On Site contents>LAN: Set to LAN IP=192.168.2.30 and DHCP mode to NONE.



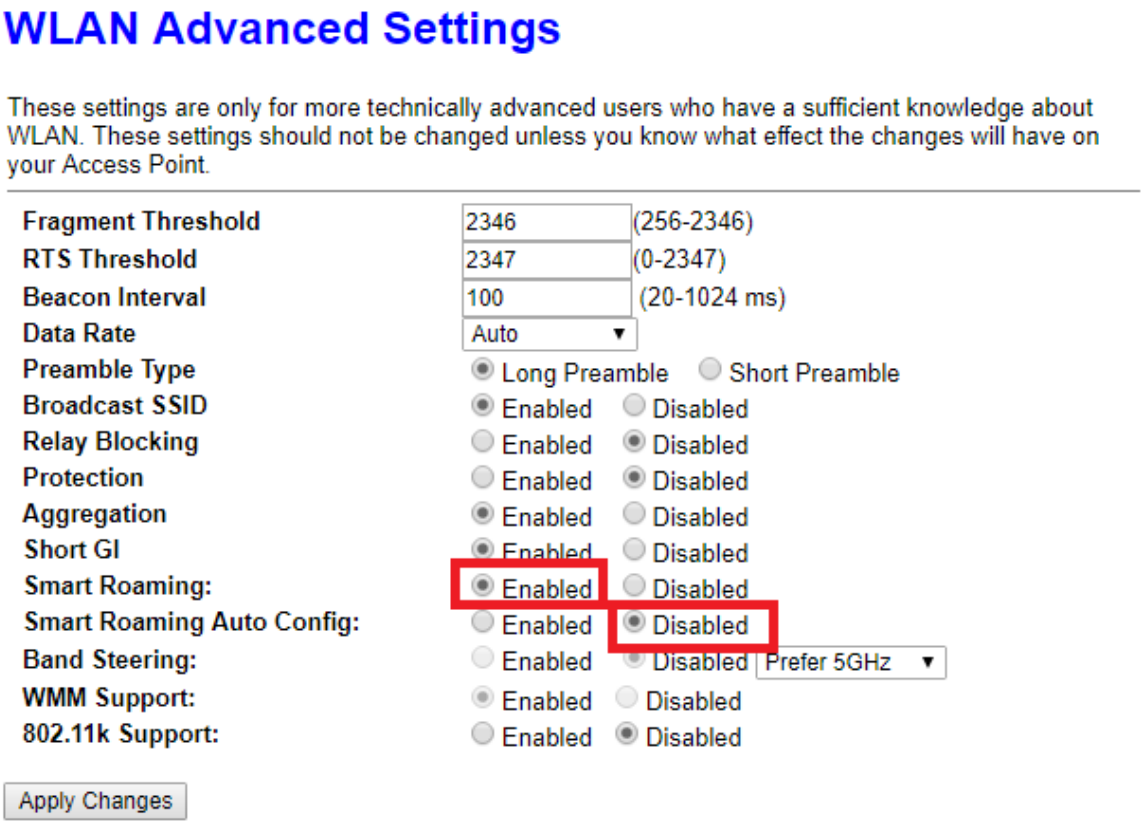
2. On Site contents>WLAN>5GHz Wifi>Basic Settings: Set SSID=TestA_5g, Mode=AP+MESH and channel number =44, others are default.



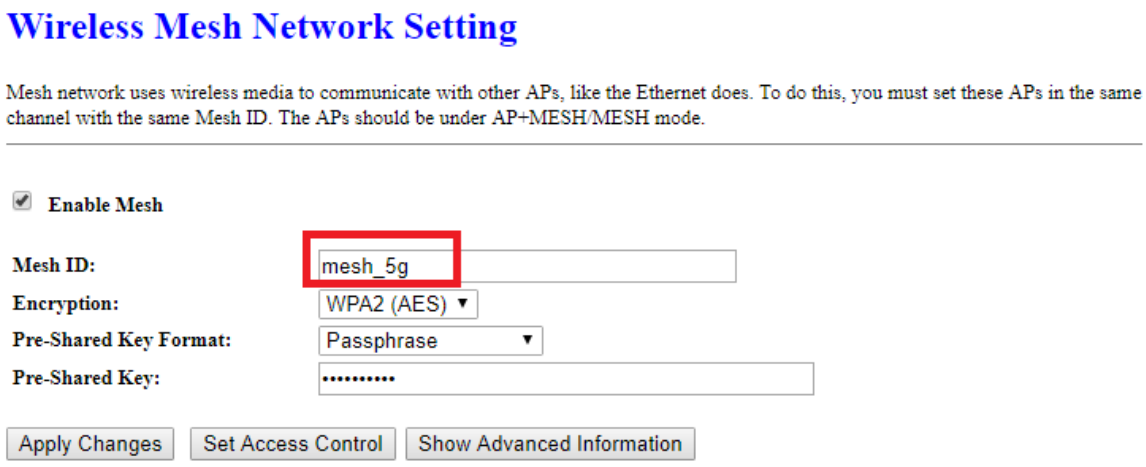
3. On Site contents>WLAN>5GHz Wifi>Security. Set WPA2 on Encryption and 1234567890 on Pre-Shared Key.



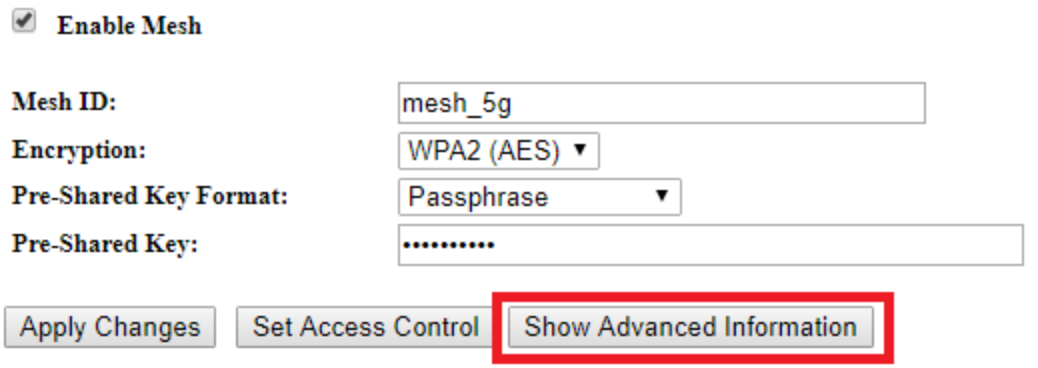
4. On Site contents>WLAN>5GHz Wifi>Advanced Setting. Make sure Smart Roaming is Enabled and Smart Roaming Auto Config is Disable. [Note: Only Test A Router need to enable Smart Roaming Auto Config, others keep using Disabled.]



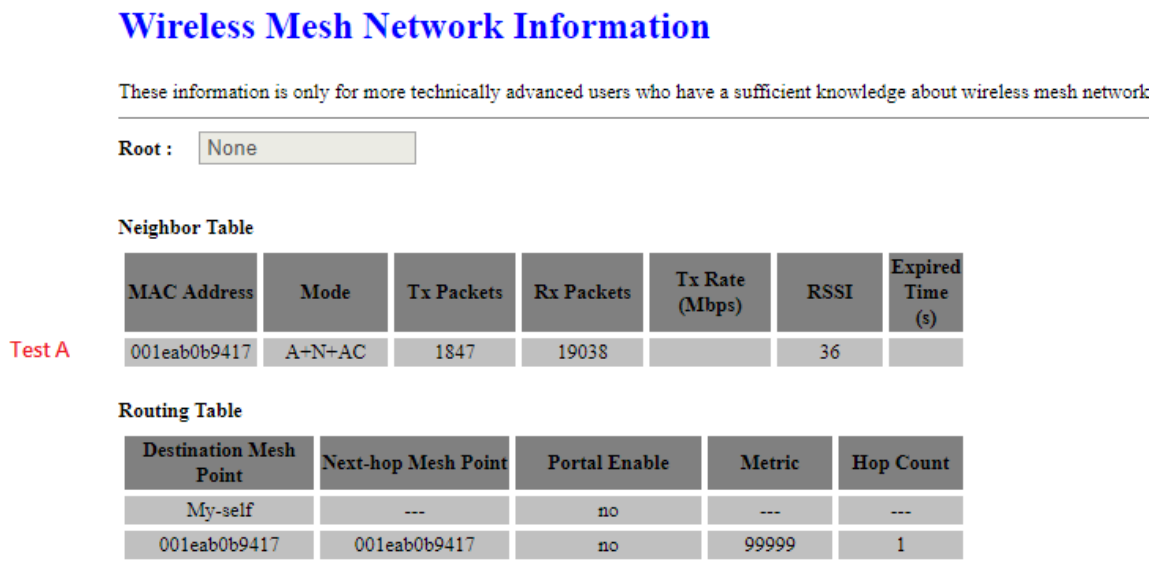
5. On Site contents>WLAN>5GHz Wifi>MESH : Set Mesh ID to mesh_5g and 1234567890 on Pre-shared Key. [Note: This setting must same on **Test A/Test B/Test C** locations.]



6. Done. Check MESH connection on Site contents>WLAN>5GHz Wifi>MESH>Show Advanced Information.

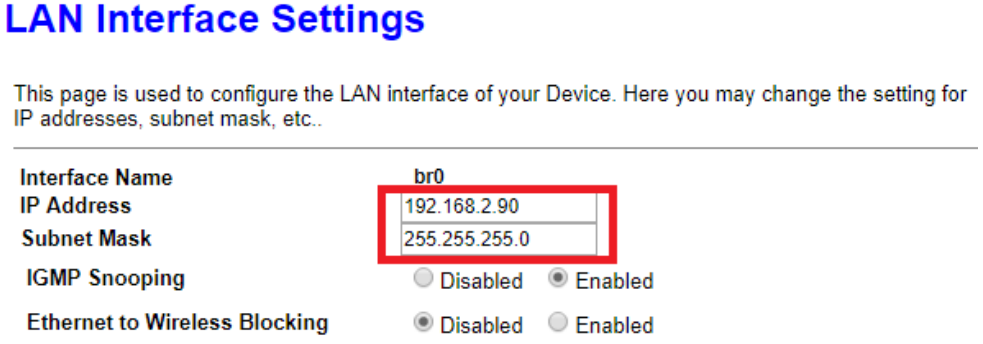


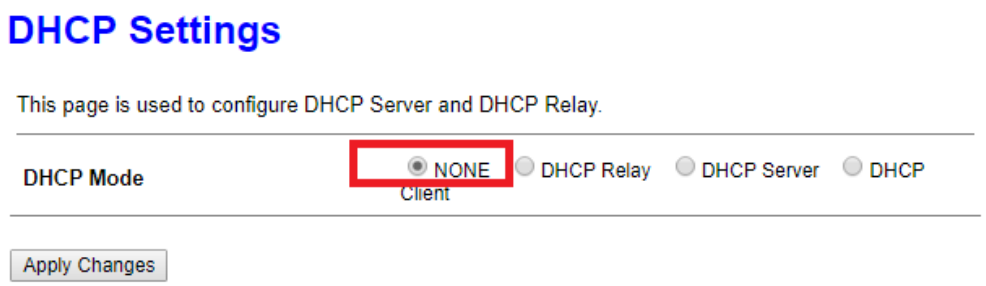
When MESH connection is done, it will show Test A Router.



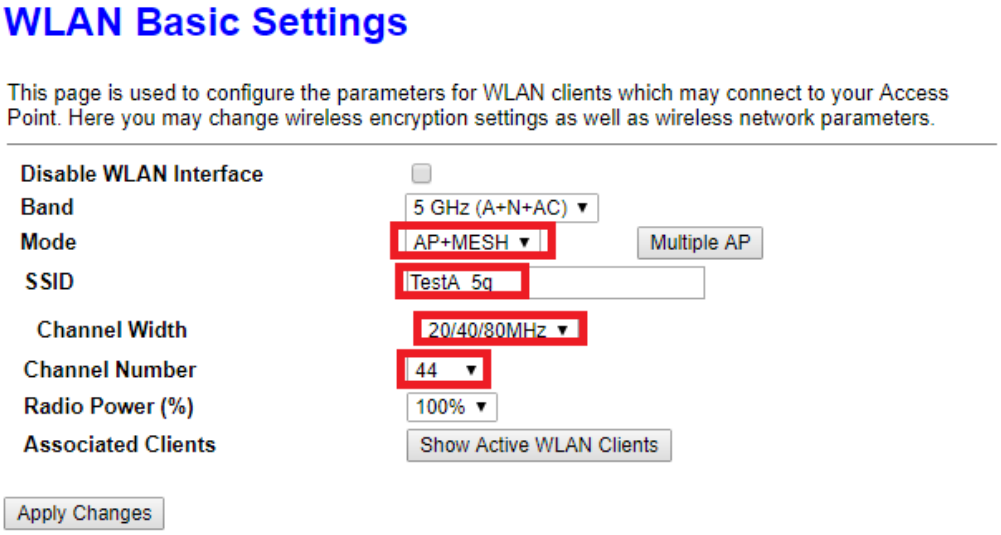
Test C Setting:

1. On Site contents>LAN: Set to LAN IP=192.168.2.90 and DHCP Mode to NONE.

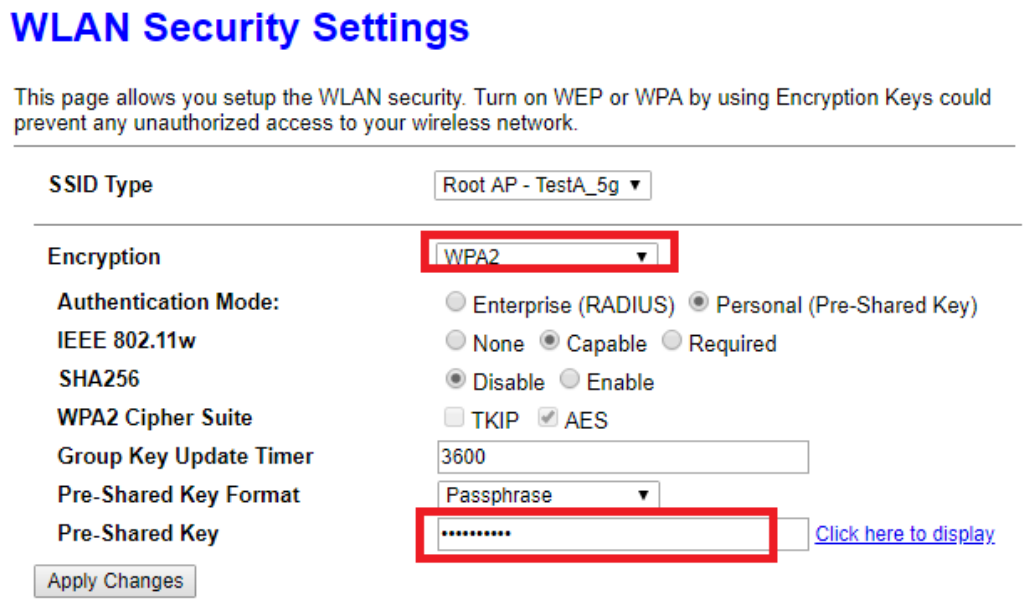




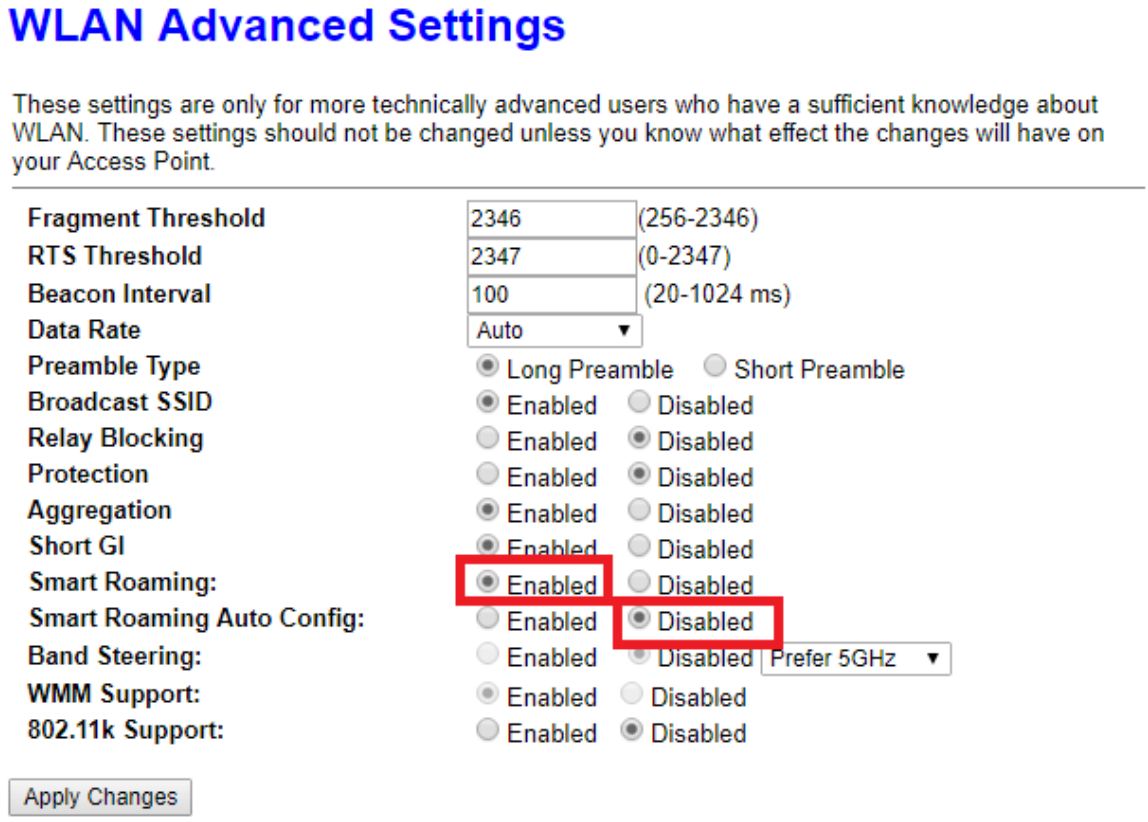
2. On Site contents>WLAN>5GHz Wifi>Basic Settings: Set SSID=TestA_5g, Mode=AP+MESH and channel number =44, others are default.



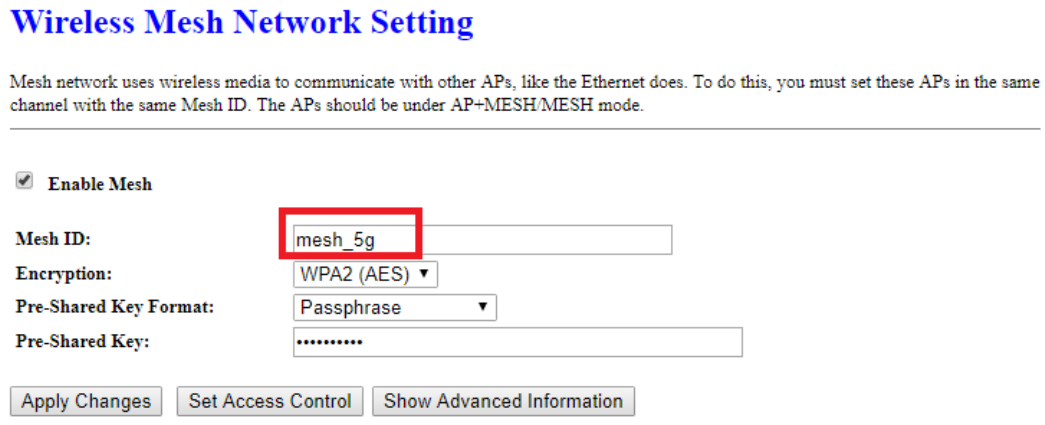
3. On Site contents>WLAN>5GHz Wifi>Security. Set WPA2 on Encryption and 1234567890 on Pre-Shared Key.



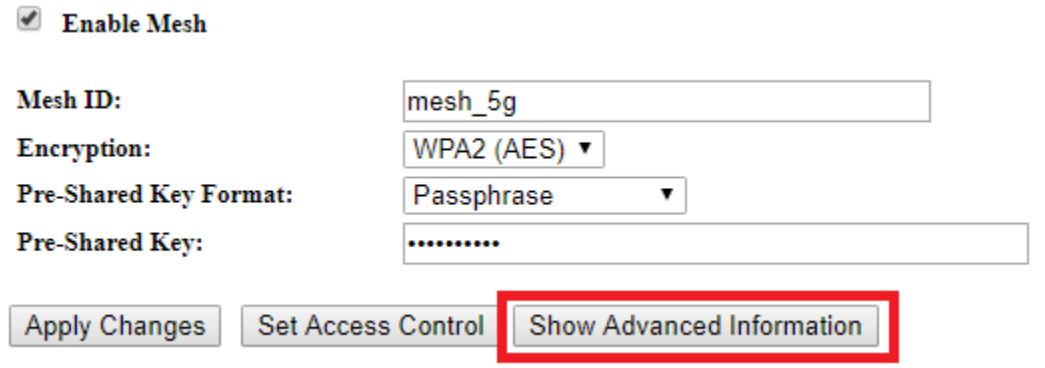
4. On Site contents>WLAN>5GHz Wifi>Advanced Setting . Make sure Smart Roaming is Enabled and Smart Roaming Auto Config is Disable. [Note: Only Test A Router need to enable Smart Roaming Auto Config, others keep using Disabled.]



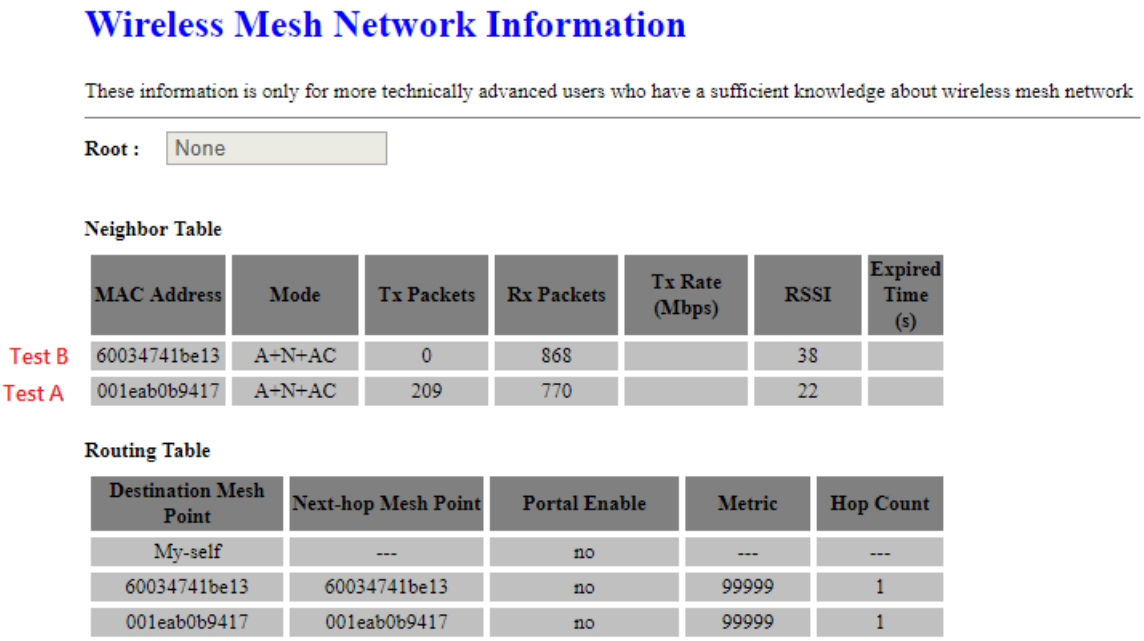
5. On Site contents>WLAN>5GHz Wifi>MESH : Set Mesh ID to mesh_5g and 1234567890 on Pre-shared Key. [Note: This setting must same on Test A/Test B/Test C locations.]



6. Done. Check MESH connection on Site contents>WLAN>5GHz Wifi>MESH>Show Advanced Information.



When MESH connection is done, it will show Test A and Test B Routers.



Wireless Mesh Network Information

These information is only for more technically advanced users who have a sufficient knowledge about wireless mesh network

Root : None

Neighbor Table

	MAC Address	Mode	Tx Packets	Rx Packets	Tx Rate (Mbps)	RSSI	Expired Time (s)
Test B	60034741be13	A+N+AC	0	868		38	
Test A	001eab0b9417	A+N+AC	209	770		22	

Routing Table

Destination Mesh Point	Next-hop Mesh Point	Portal Enable	Metric	Hop Count
My-self	---	no	---	---
60034741be13	60034741be13	no	99999	1
001eab0b9417	001eab0b9417	no	99999	1

Test Result Check:

1. User (WiFi client- SSID=TestA_5g) at Location A can surf Internet.
   Test A Router will show Wireless MAC address on Site contents>WLAN>5GHz Wifi>MESH>Show Advanced Information as below:

Test A :192.168.2.10

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
c8:1e:e7:68:b4:82	3567	1936	433	yes	299

Test B : 192.168.2.30

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
None	---	---	---	---	---

Test C : 192.168.2.90

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
None	---	---	---	---	---

User (Wire connection via LAN port) can surf Internet also.

2. User (WiFi client SSID=TestA_5g) at Location B can surf Internet.
   Test B Router will show Wireless MAC address on Site contents>WLAN>5GHz Wifi>MESH>Show Advanced Information.

Test A :192.168.2.10

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
None	---	---	---	---	---

Test B : 192.168.2.30

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
c8:1e:e7:68:b4:82	3567	1936	433	yes	299

Test C : 192.168.2.90

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
None	---	---	---	---	---

User (Wire connection via LAN port) can surf Internet also.

3. User (WiFi client SSID=TestA_5g) at Location C can surf Internet.
   Test C Router will show Wireless MAC address on Site contents>WLAN>5GHz Wifi>MESH>Show Advanced Information.

Test A :192.168.2.10

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
None	---	---	---	---	---

Test B : 192.168.2.30

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
None	---	---	---	---	---

Test C : 192.168.2.90

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
c8:1e:e7:68:b4:82	3567	1936	433	yes	299

User (Wire connection via LAN port) can surf Internet also.

Case 2: #1 AP+ MESH, #2 MESH

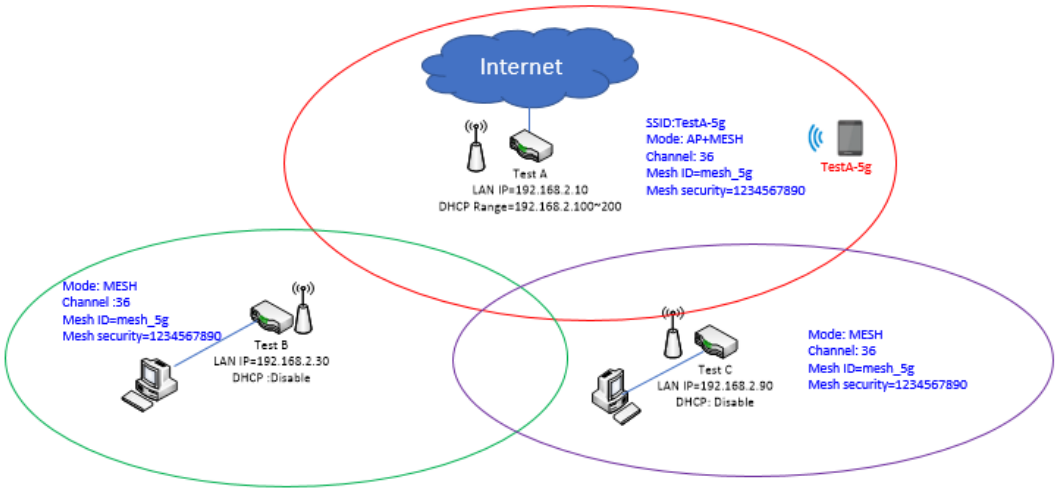
Scenario: Under Case 2 Mesh topology,

Location-Test A: Support Wire/Wireless client for surfing Internet.

Location-Test B: Support Wire client for surfing Internet.

Location-Test C: Support Wire client for surfing Internet.

Network topology: (Take Wireless 5g for example)



Test A (Router): LAN IP=192.168.2.10, DHCP Range=192.168.2.100~192.168.2.200, WAN=PPPoE.

Test B (Router): LAN IP=192.168.2.30, DHCP server=None (Disable)

Test C (Router): LAN IP=192.168.2.90, DHCP server=None (Disable)

Note: Under the above Mesh Topology, the **Wireless channel/channel width/security and Mesh ID/Mesh Security** must be the same on Test A/Test B/Test C.

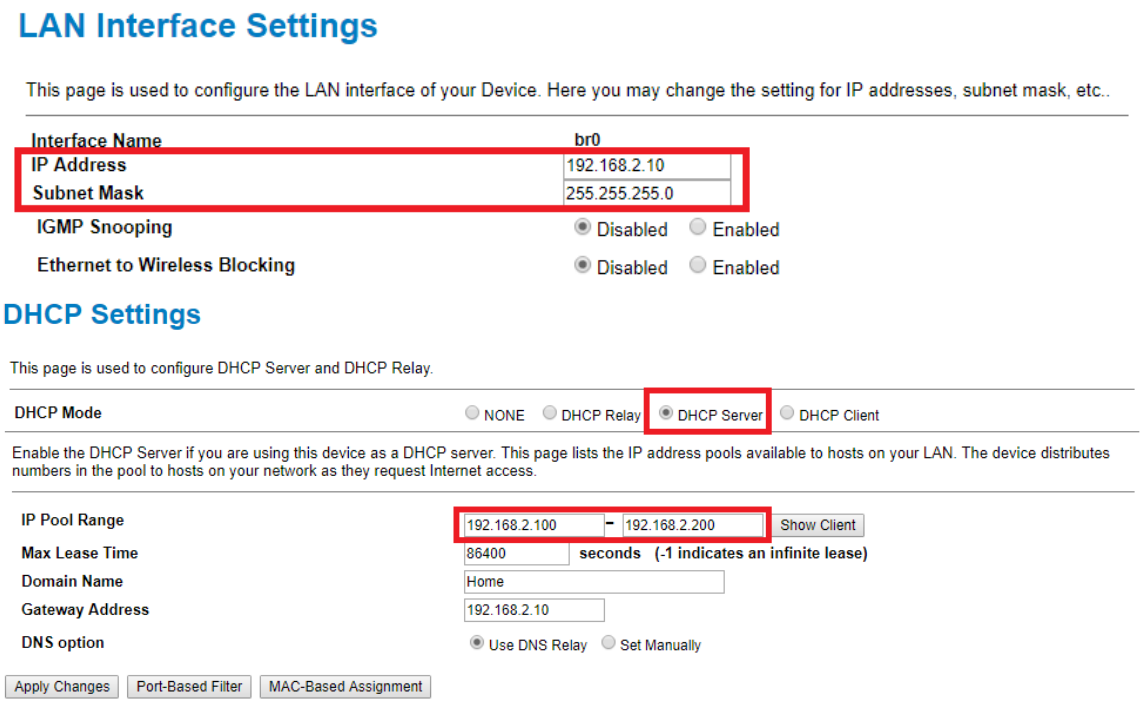
Test A Setting:

1. Setup WAN connection on Test A.

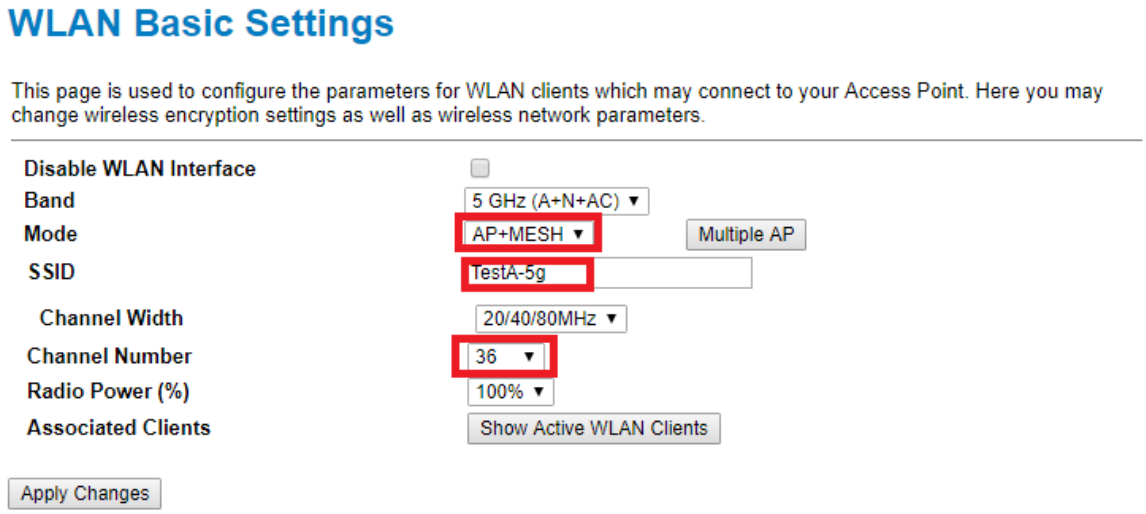
WAN Configuration

Interface	VPI/VCI	Encapsulation	Protocol	IP Address	Gateway	Status
ppp0_vc0	0/33	LLC	PPPoE	118.166.180.208	168.95.98.254	up 00:00:55 Disconnect

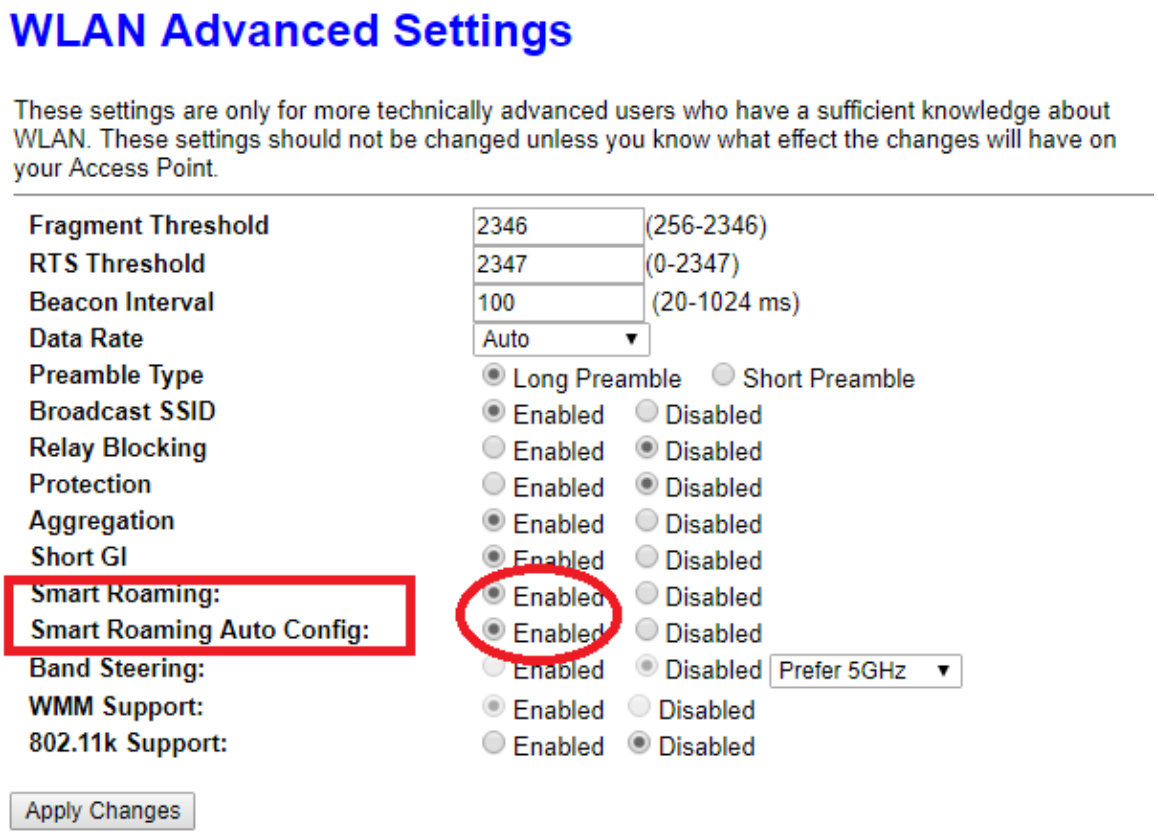
2. On Site contents>LAN: Set to LAN IP=192.168.2.10 and DHCP server range to 192.168.2.100~200.



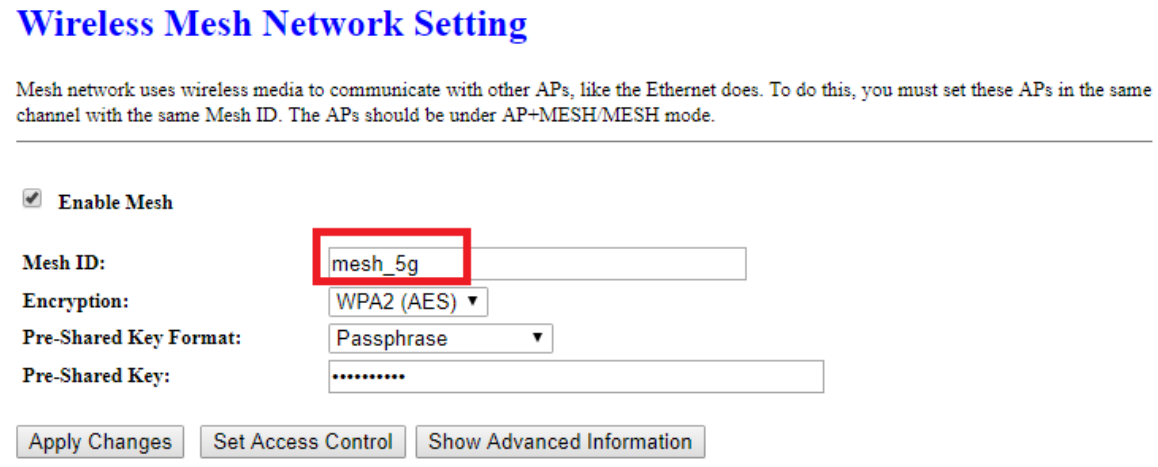
3. On Site contents>WLAN>5GHz Wifi>Basic Settings: Set SSID=TestA-5g, Mode=AP+MESH and channel number =36, others are default.



4. On Site contents>WLAN>5GHz Wifi>Advanced Settings. Enable Smart Roaming and Smart Roaming Auto Config. [Note: Only Test A Router need to enable Smart Roaming Auto Config, others keep using Disabled.]



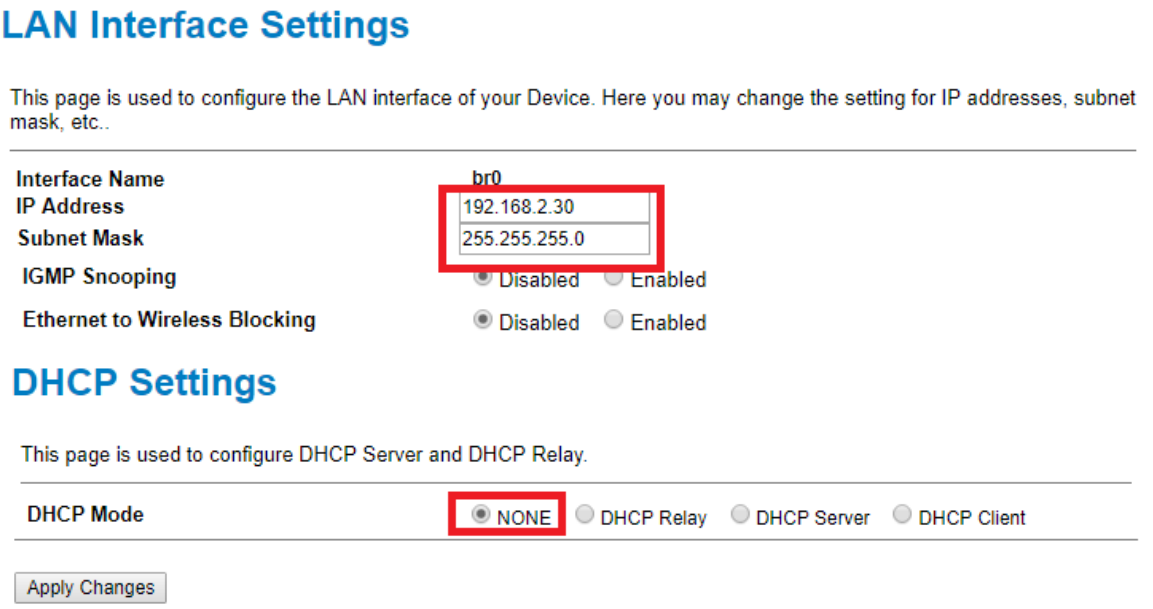
5. On Site contents>WLAN>5GHz Wifi>MESH : Set Mesh ID to mesh_5g and 1234567890 on Pre-shared Key.[Note: This setting must same on Test A/Test B/Test C locations.]



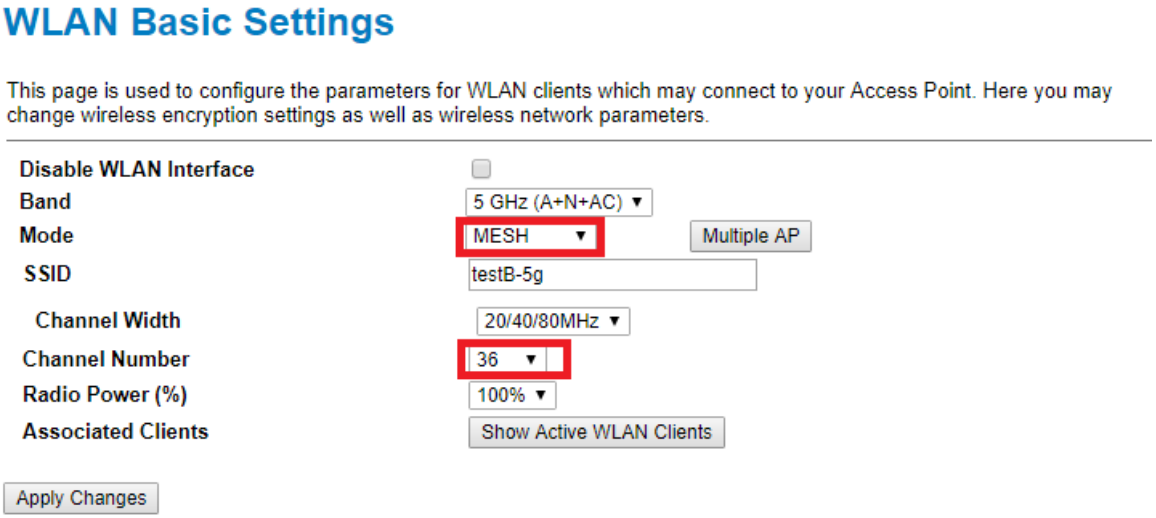
6. Done.

Test B Setting:

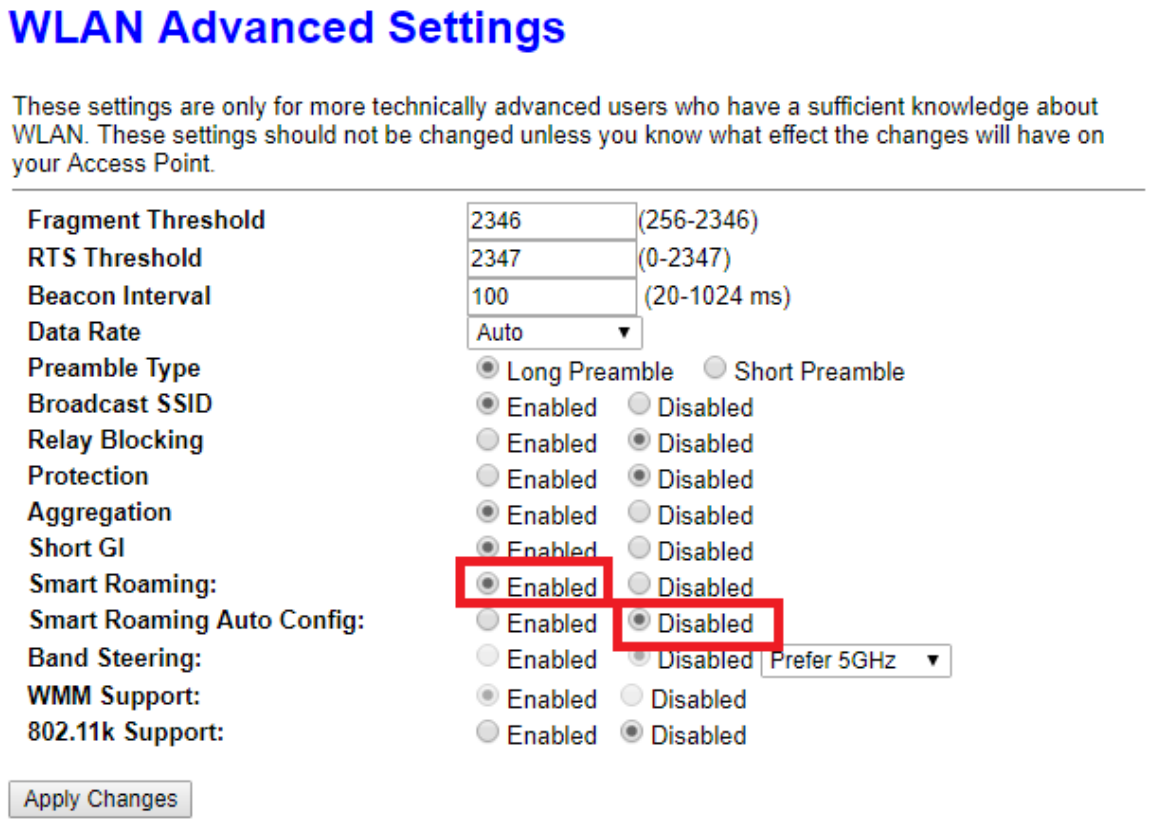
1. On Site contents>LAN: Set to LAN IP=192.168.2.30 and DHCP Mode to NONE.



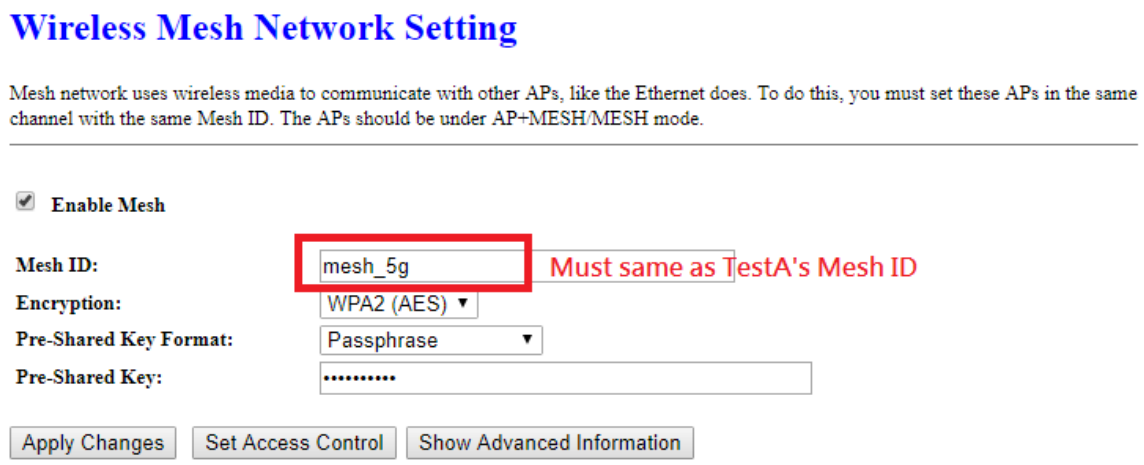
2. On Site contents>WLAN>5GHz Wifi>Basic Settings: Set SSID=testB-5g, Mode=MESH and channel number =36, others are default.



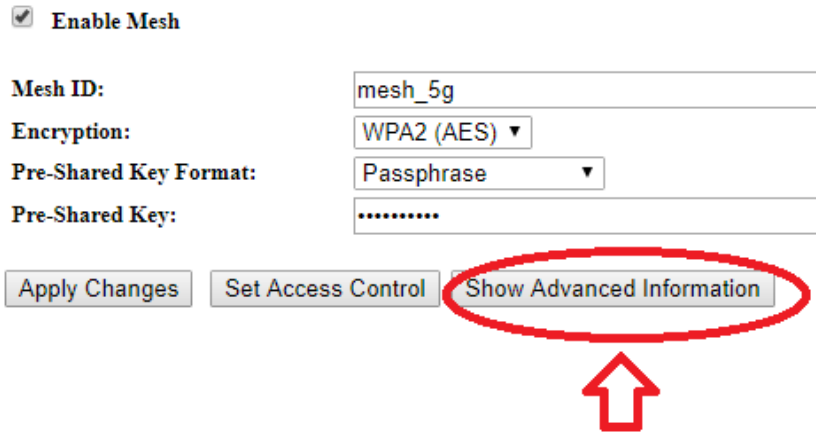
3. On Site contents>WLAN>5GHz Wifi>Advanced Settings. Make sure Smart Roaming is Enabled and Smart Roaming Auto Config is Disable. [Note: Only Test A Router need to enable Smart Roaming Auto Config, others keep using Disabled.]



4. On Site contents>WLAN>5GHz Wifi>MESH:
Set Mesh ID to mesh_5g and 1234567890 on Pre-shared Key.[Note: This setting must same on Test A/Test B/Test C locations.]



5. Setting is done on Test B. Then check “Show Advanced Information” on Site contents>WLAN>5GHz Wifi>MESH.
   The MESH connection is done if Test A is shown as below.



Wireless Mesh Network Information

These information is only for more technically advanced users who have a sufficient knowledge about wireless mesh network

Root : None

Neighbor Table

MAC Address	Mode	Tx Packets	Rx Packets	Tx Rate (Mbps)	RSSI	Expired Time (s)
001eab0b9417	A+N+AC	14360	139142		30	

Routing Table

	Destination Mesh Point	Next-hop Mesh Point	Portal Enable	Metric	Hop Count
Test B	My-self	---	no	---	---
Test A	001eab0b9417	001eab0b9417	no	99999	1

6. At the same time, Test A will also show Test B as below on Site contents>WLAN>5GHz Wifi>MESH>Show Advanced Information:

Wireless Mesh Network Information

These information is only for more technically advanced users who have a sufficient knowledge about wireless mesh network

Root : None

Neighbor Table

MAC Address	Mode	Tx Packets	Rx Packets	Tx Rate (Mbps)	RSSI	Expired Time (s)
60034741be13	A+N+AC	29428	141645		29	

Routing Table

	Destination Mesh Point	Next-hop Mesh Point	Portal Enable	Metric	Hop Count
Test A	My-self	---	no	---	---
Test B	60034741be13	60034741be13	no	99999	1

Portal Table

PortalMAC
None

Test C Setting:

1. On Site contents>LAN: Set to LAN IP=192.168.2.90 and DHCP Mode to NONE.

LAN Interface Settings

This page is used to configure the LAN interface of your Device. Here you may change the setting for IP addresses, subnet mask, etc..

Interface Name	br0
IP Address	192.168.2.90
Subnet Mask	255.255.255.0
IGMP Snooping	(•) Disabled ( ) Enabled
Ethernet to Wireless Blocking	(•) Disabled ( ) Enabled

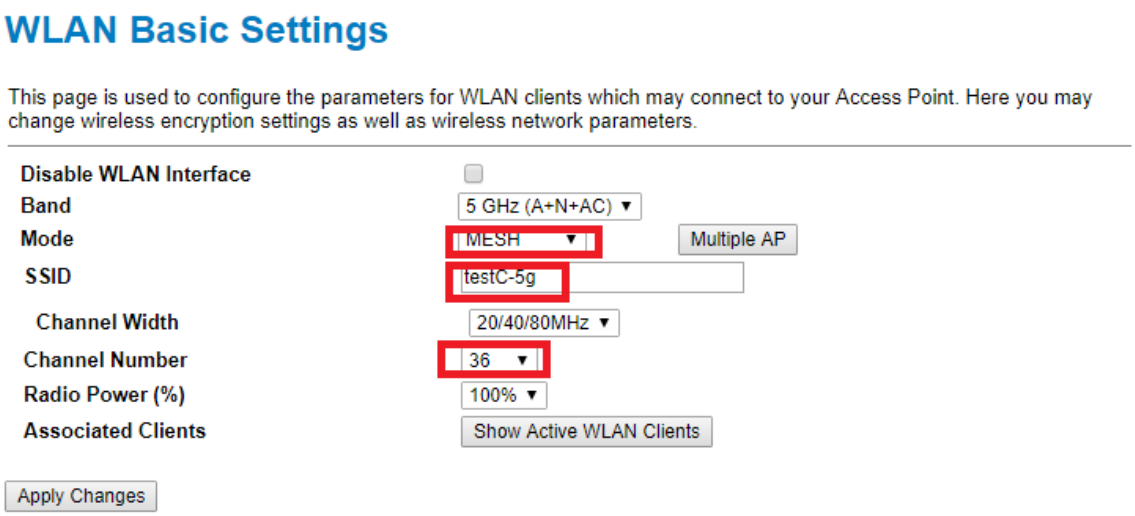
DHCP Settings

This page is used to configure DHCP Server and DHCP Relay.

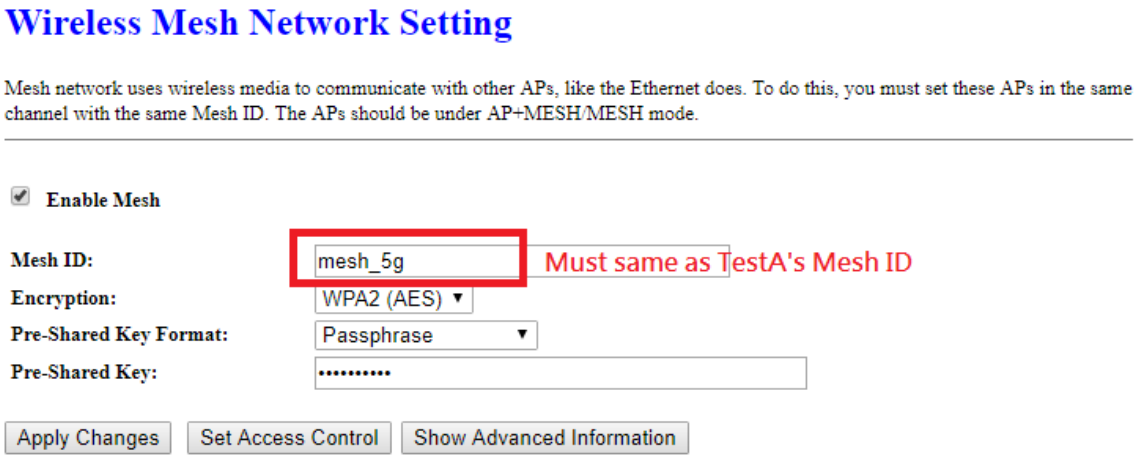
DHCP Mode	(•) NONE ( ) DHCP Relay ( ) DHCP Server ( ) DHCP Client

Apply Changes

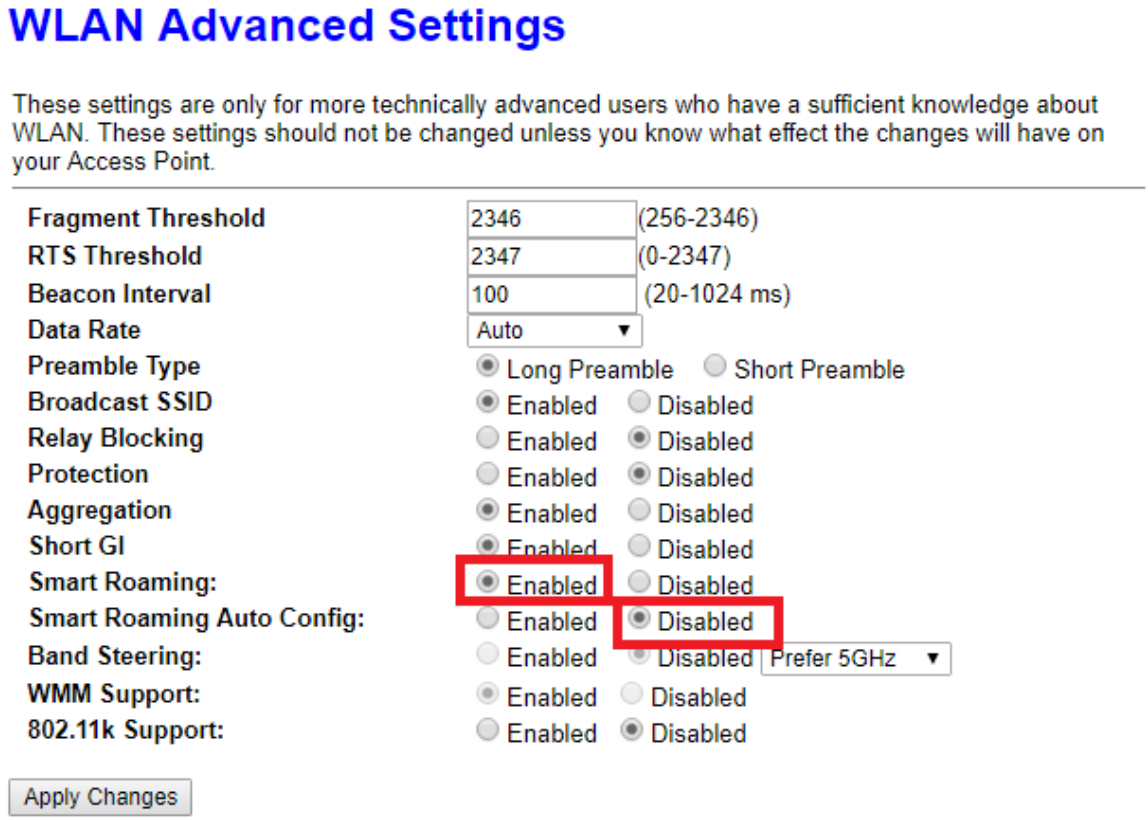
2. On Site contents>WLAN>5GHz Wifi>Basic Settings: Set SSID=testC-5g, Mode=MESH and channel number =36, others are default.



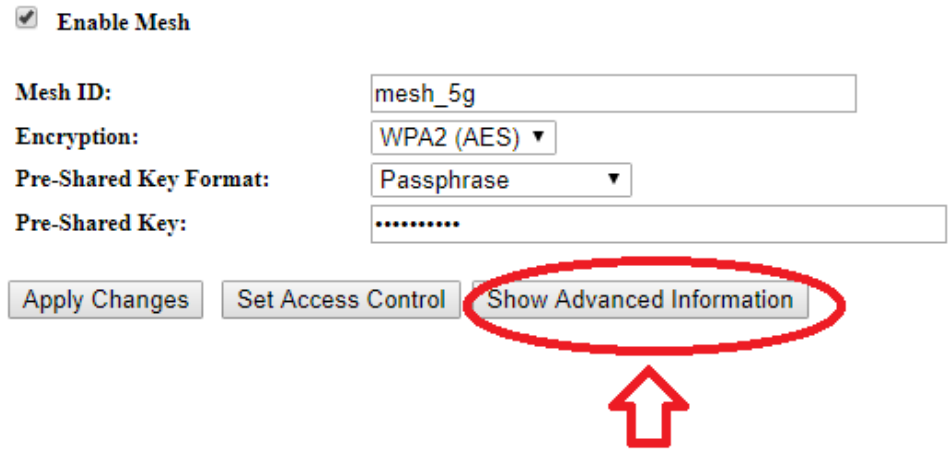
3. On Site contents>WLAN>5GHz Wifi>MESH:
   Set Mesh ID to mesh_5g and 1234567890 on Pre-shared Key. [Note: This setting must same on Test A/Test B/Test C locations.]



4. On Site contents>WLAN>5GHz Wifi>Advanced Settings. Make sure Smart Roaming is Enabled and Smart Roaming Auto Config is Disable. [Note: Only Test A Router need to enable Smart Roaming Auto Config, others keep using Disabled.]



5. Setting is done on Test C. Then check “Show Advanced Information”, the Test A and Test B are all shown.



Wireless Mesh Network Information

These information is only for more technically advanced users who have a sufficient knowledge about wireless mesh network

Root : None

Neighbor Table

	MAC Address	Mode	Tx Packets	Rx Packets	Tx Rate (Mbps)	RSSI	Expired Time (s)
Test A	001eab0b9417	A+N+AC	0	5563		18	
Test B	60034741be13	A+N+AC	600	5660		17	

Routing Table

	Destination Mesh Point	Next-hop Mesh Point	Portal Enable	Metric	Hop Count
Test C	My-self	---	no	---	---
Test B	60034741be13	60034741be13	no	99999	1
Test A	001eab0b9417	001eab0b9417	no	99999	1

6. At the same time, Test A will show as below on Site contents>WLAN>5GHz Wifi>MESH>Show Advanced Information.

Wireless Mesh Network Information

These information is only for more technically advanced users who have a sufficient knowledge about wireless mesh network

Root : None

Neighbor Table

	MAC Address	Mode	Tx Packets	Rx Packets	Tx Rate (Mbps)	RSSI	Expired Time (s)
Test B	60034741be13	A+N+AC	31086	151528		32	
Test C	0004ed1282aa	A+N+AC	1416	7925		26	

Routing Table

	Destination Mesh Point	Next-hop Mesh Point	Portal Enable	Metric	Hop Count
Test A	My-self	---	no	---	---
Test C	0004ed1282aa	0004ed1282aa	no	99999	1
Test B	60034741be13	60034741be13	no	99999	1

7. Finish.

Test Result Check:

1. User (WiFi client- SSID=TestA-5g) at Location A can surf Internet
   Test A Router will show Wireless MAC address on Site contents>WLAN>5GHz Wifi>MESH>Show Advanced Information.

Test A :192.168.2.10

Wireless Station List

MAC Address	Tx Packet	Rx Packet	Tx Rate (Mbps)	Power Saving	Expired Time (s)
c8:1e:e7:68:b4:82	3567	1936	433	yes	299

   User (Wire connection) can surf Internet and ping 8.8.8.8.

```
C:\Users\FAE>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=160ms TTL=52
Reply from 8.8.8.8: bytes=32 time=20ms TTL=52
Reply from 8.8.8.8: bytes=32 time=22ms TTL=52
Reply from 8.8.8.8: bytes=32 time=31ms TTL=52

Ping statistics for 8.8.8.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 160ms, Average = 58ms
```

2. User (Wire connection) at Location B can surf Internet and ping 8.8.8.8.

```
C:\Users\FAE>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=160ms TTL=52
Reply from 8.8.8.8: bytes=32 time=20ms TTL=52
Reply from 8.8.8.8: bytes=32 time=22ms TTL=52
Reply from 8.8.8.8: bytes=32 time=31ms TTL=52

Ping statistics for 8.8.8.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 160ms, Average = 58ms
```

3. User (Wire connection) at Location C can surf Internet and ping 8.8.8.8.

```
C:\Users\FAE>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=160ms TTL=52
Reply from 8.8.8.8: bytes=32 time=20ms TTL=52
Reply from 8.8.8.8: bytes=32 time=22ms TTL=52
Reply from 8.8.8.8: bytes=32 time=31ms TTL=52

Ping statistics for 8.8.8.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 160ms, Average = 58ms
```