UM11822

Wi-Fi Alliance Certification Guide for RW61x Running RTOS

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User manual
CONFIDENTIAL

Document information

Information	Content
Keywords	Wi-Fi Alliance (WFA), certification, RW61x
Abstract	Provides the step-by-step procedure of Wi-Fi Alliance certification for RW61x running RTOS.

1 About this document

1.1 Purpose and scope

This manual describes the test setup and procedure of Wi-Fi certification programs including 802.11n, 802.11ac, 802.11ax, protected management frames (PMF), WPA3, security enhancement, and security vulnerability detection.

The document applies to RW61x platform running RTOS.

The users should be familiar with the user manuals [1], [2], and [3].

1.2 Considerations

The readers should have some knowledge of Wi-Fi terminologies and certification.

2 Pre-certification test procedure

The pre-certification test procedure is done for the purposes of the development, quality assurance and preparation for WFA certification test. The test procedure increases the probability and confidence for passing the tests successfully in the Wi-Fi Alliance certification lab.

2.1 Test setup

Figure 1 illustrates the test setup.

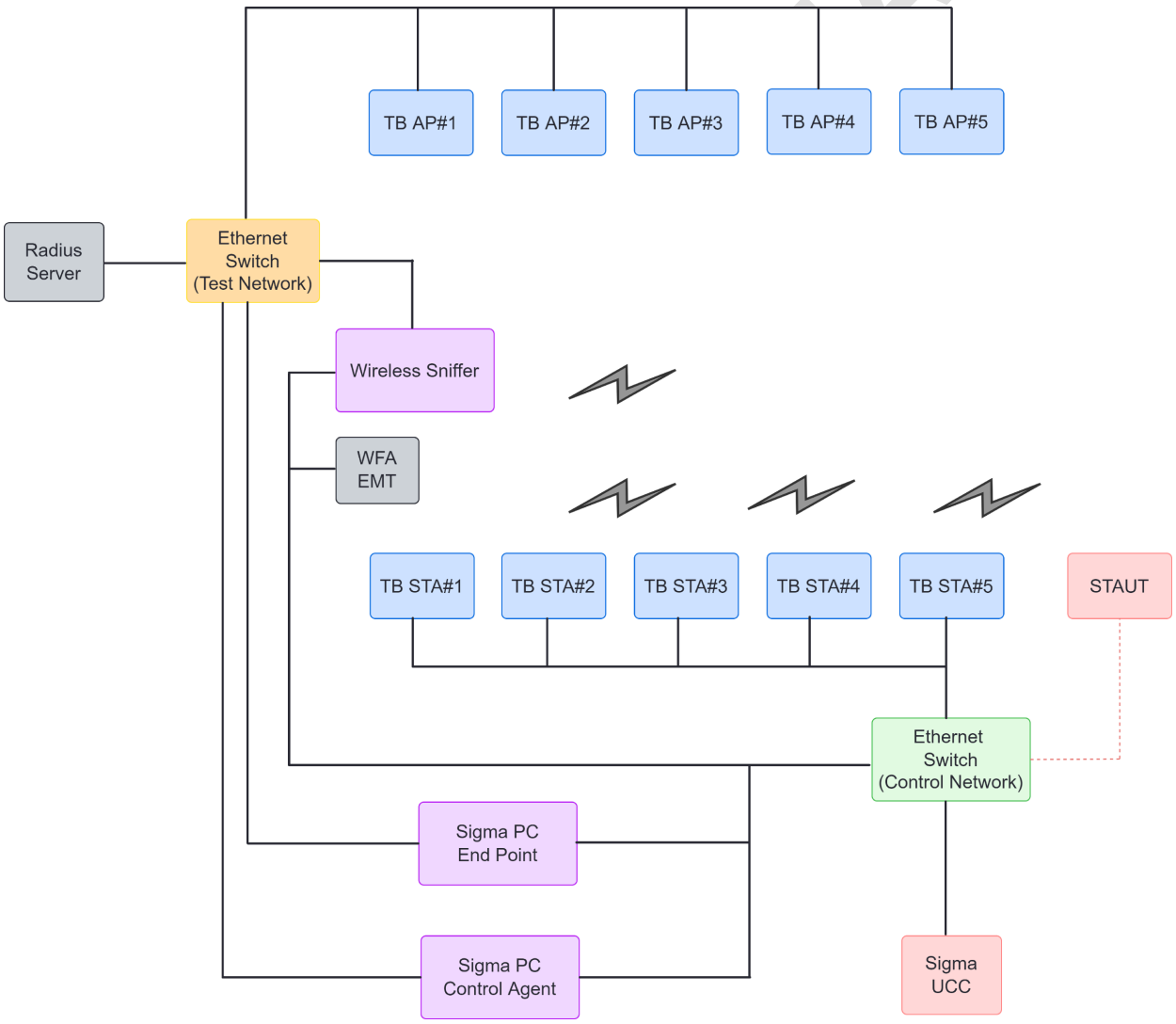

Figure 1. Test setup

2.2 Test procedure

The test procedure requires the setup based on the setup diagram and ensure that the test network and control network are up and running.

- Connect the DUT
  - Connect the DUT to the control network. The control network is the Ethernet switch, and the DUT will connect to it via Ethernet.
  - Assign the control network IP to the wired interface
- Configure the device
  - Open the device serial console
  - Configure the device as per the test case

2.3 Most used commands

This section describes the commands most used in the test programs.

Note: *For more details on the commands, refer to wifi_cert sample application in [2].*

2.3.1 `wlan-version` command

This command is used to get Wi-Fi firmware and driver version.

Syntax: `wlan-version`

Example:

```
wlan-version
WLAN Version : rw610-x, IMU, FP91, X.X.X
```

2.3.2 `wlan-scan` command

This command is used to scan the network.

Syntax: `wlan-scan`

2.3.3 `wlan-add` command

This command is used to add a network configuration.

Syntax: `wlan-add "profilename" ssid "ssid" ip:ipaddr,gateway,netmask wpa2 "passphrase"`

Where:

Command parameter	Description
`profilename`	Network profile name, with values of 0, 1,or 2
`ssid`	Service set identifier
`psk`	Password for the AP network

Note: *If DHCP IP is required in the test case, don't add the static IP address in the `wlan-add` command.*

2.3.4 `wlan-list` command

This command is used to list the profiles.

Syntax: `wlan-list`

2.3.5 `wlan-remove` command

This command is used to remove profiles.

Syntax: `wlan-remove "profilename"`

Where:

Command parameter	Description
`profilename`	Network profile name, with values of 0, 1,or 2

2.3.6 `wlan-disconnect` command

This command is used to disconnect.

Syntax: `wlan-disconnect`

2.3.7 `help` command

This command is used to for any command help.

Syntax: `help`

3 Certification program execution

This section shows how to execute the certification programs for the set of Wi-Fi features.

3.1 Wi-Fi 4 (802.11n) certification program

3.1.1 Test case N-5.2.3

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "WKV(*+8210" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "wpa2wpa2"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the PC end-point to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STAs

- Run the command to run *iPerf* in server mode for STAUT:

```
iperf -s
```

- Run the command to run *iPerf* in client mode for the AP back-end:

```
iperf -c <STAUT IP address> -t <number of seconds to transmit for>
```

- Run the command to run *iPerf* in server mode for the AP back-end:

```
iperf -s
```

- Run the command to run *iPerf* in client mode for STAUT:

```
iperf -c <AP backend IP address> -t <number of seconds to transmit for>
```

- Run the command to run *iPerf* in server mode for STAUT:

```
iperf -s
```

- Run the command to run *iPerf* in client mode and dual test mode for AP back-end during 30 seconds:

```
iperf -c <STAUT IP address> -d -t 30
```

- Run the command to run *iPerf* in server mode for the AP back-end:

```
iperf -s
```

- Run the command to run *iPerf* in client mode for STAUT:

```
iperf -c <AP backend IP address> -t <number of seconds to transmit for>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.2 Test case N-5.2.5

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "abcedfghijklmnopqrstuvwxyzABCDEF"
 ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "abcedfghijklmnopqrstuvwxyzABCDEF"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the PC end-point to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STAs

Traffic between the AP and STAs:

- DT1: iperf on STAUT and chriot for testbed sta, start at same time
- DT2: iperf on STAUT and chriot for testbed sta, start at same time
- DT3: iperf on STAUT and chriot for testbed sta, start at same time

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.3 Test case N-5.2.11

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "OBEW23@?+" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "OBEW23@?+"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the PC end-point to the STAUT

```
ping <STAUT IP address>
```

Start iPerf traffic

- Run the command to run iPerf in server mode for the STAUT:

```
iperf –s -u
```

- Run the command to run iPerf in client mode for AP back-end:

```
iperf –c <server IP address> -d –u
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.4 Test case N-5.2.14

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Multicast" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "Multicast"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the PC end-point to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STAs

STAUT Tx of multicast traffic

- AP back-end:

```
iperf –s -u -B 224.0.0.5 -i 1
```

- STA1:

```
iperf –s -B 224.0.0.5 -u -i 1
```

- STAUT:

```
iperf -c 224.0.0.5 -u -t <number of seconds to transmit for>
```

STAUT Rx of multicast traffic

- AP back-end:

```
iperf -c 224.0.0.5 -u -i 1 -t <number of seconds to transmit for>
```

- STA1:

```
iperf –s -B 224.0.0.5 -u -i 1
```

- STAUT:

```
iperf -s -B 224.0.0.5 -u
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.5 Test case N-5.2.19

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Negative" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.6 Test case N-5.2.26

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "01234567890123456789012345678901"
 ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "01234567890123456789012345678901"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Start a continuous ping from STAUT to the AP back-end:

```
ping -s 1000 <ip address of backend>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.7 Test case N-5.2.28

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "12345678" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

Use the script stored in *5.2.28* directory

- AP back-end:

```
iperf -s
```

- STAUT:

```
iperf -c <server IP> -t 30
```

- Start chariot traffic from STA1 to AP back-end

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.8 Test case N-5.2.29

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "5.2.29" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

Use the script stored in *5.2.29* directory

- AP back-end:

```
iperf -s
```

- STAUT:

```
iperf -c <server IP> -t 30
```

- Start chariot traffic from STA1 to AP back-end

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.9 Test case N-5.2.35

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "%@^98jhB" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "%@^98jhB"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Start a continuous ping from STAUT to the AP:

```
ping -s 10000 <IP address of AP back-end>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.10 Test case N-5.2.36

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "5.2.36" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.11 Test case N-5.2.37

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "NONE0WPA2PSK" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 "NONE0WPA2PSK"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

- STAUT:

```
iperf –s -u
```

- AP back-end:

```
iperf –c <STAUT IP> -u –b 60M -t 30
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.12 Test case N-5.2.38

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "5.2.38" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

- STAUT:

```
iperf –s -u
```

- AP back-end:

```
iperf –c <server IP> -u –b 60M -t 90
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.13 Test case N-5.2.39

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "AP1-5.2.39" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

- AP back-end:

```
iperf –s
```

- STAUT:

```
iperf –c <server IP> -t 60
```

- Start the traffic between STA1 and AP2 using chariot

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.14 Test case N-5.2.40

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "AP1-5.2.40" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

Use the chariot script stored in 5.2.40 directory

- AP back-end:

```
iperf -s
```

- STAUT:

```
iperf -c <server IP> -t 60
```

- Start the traffic between STA1 and AP2 using chariot

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.15 Test case N-5.2.42

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "h0rtG7" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.16 Test case N-5.2.43

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "AP1-5.2.43" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

Use the chariot script stored in 5.2.43 directory

- AP back-end:

```
iperf -s
```

- STAUT:

```
iperf -c <server IP> -t 60
```

- Start the traffic between STA1 and AP2 using chariot

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.17 Test case N-5.2.44

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "5.2.44" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.18 Test case N-5.2.46

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "5T8CRx%" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.19 Test case N-5.2.47

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "5.2.47" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the AP of 1000 bytes

```
ping -s 1000 <IP address of AP back-end>
```

Start the traffic between the AP and STA

- AP back-end:

```
iperf –s -u
```

- STAUT:

```
iperf –c <server IP> -u –b 60M -t <sec>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.20 Test case N-5.2.50

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "5.2.50" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the AP

```
ping -c 100 -s 10000 <IP address of AP back-end>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.1.21 Test case N-5.2.55

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Association" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 "Association"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to STAUT

```
ping <IP address of STAUT>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.2 Protected management frame (PMF) certification program

This section includes the test configuration to be used on the DUT when running WFA Protected Management Frames (PMF) test plan.

Refer to the test plan (v1.8) for the test procedure using WTS tool and WFA documents for the test procedure using QTT tool.

Note: *QTT was used for some test cases. QTT guides the user to execute the test commands with different parameters such as* `ssid` *and* `password`*.*

3.2.1 PMF test 5.1

See Note .

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "PMF-5.1" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
 mfpc 1 mfpr 0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping to the PC end point

```
ping <PC-end point ip> -t 20
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Repeat the above steps for all three APs

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.2.2 PMF test 5.2

See Note.

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "PMF-5.2" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
 mfpc 1 mfpr 1
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping to the PC end point

```
ping <PC-end point ip>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Repeat the above steps for all three APs

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.2.3 PMF test 5.3.3.1

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "PMF-5.3.3.1" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 "12345678" mfpc 1 mfpr 0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping continuously from the AP back-end to STAUT

```
ping <ip address of STAUT>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.2.4 PMF test 5.3.3.2

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "PMF-5.3.3.2" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 "12345678" mfpc 1 mfpr 0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping continuously from the AP back-end to STAUT

```
ping <ip address of STAUT>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.2.5 PMF test 5.3.3.3

See Note.

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "PMF-5.3.3.3" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 "12345678" mfpc 1 mfpr 0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping continuously from the AP back-end to STAUT

```
ping <ip address of STAUT>
```

Send unicast de-auth to test the AP

Send a unicast de-auth./disassoc. frame to the AP:

```
wlan-disconnect <BSSID>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.2.6 PMF test 5.3.3.4

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "PMF-5.3.3.4" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 "12345678" mfpc 1 mfpr 0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping continuously from the AP back-end to STAUT

```
ping <ip address of STAUT>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.2.7 PMF test 5.3.3.5

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "PMF-5.3.3.5" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 "12345678" mfpc 1 mfpr 0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping continuously from the AP back-end to STAUT

```
ping <ip address of STAUT>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.2.8 PMF test 5.4.3.1

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "PMF-5.4.3.1" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 "12345678" mfpc 1 mfpr 0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping continuously from the AP back-end to STAUT

```
ping <ip address of STAUT>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.2.9 PMF test 5.4.3.2

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "PMF-5.4.3.2" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 "12345678" mfpc 1 mfpr 0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping continuously from the AP back-end to STAUT

```
ping <ip address of STAUT>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.3 WPA3 (WPA3 SAE) certification program

This section includes the test configuration to be used on the DUT when running WFA WPA3-SAE test plan. Refer to the test plan (v2.19) for the test procedure.

Note: *The WPA3 SAE test cases also apply for WPA3 SAE (R3) certification.*

3.3.1 WPA3 SAE test 5.2.1

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Wi-Fi-5.2.1" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa3 sae
 "0123456789abcdef0123456789abcdef" mfpc 1 mfpr 1
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping to the PC end point IP

```
ping <PC end-point ip>
```

Re-association using PMK caching

Disconnect from the AP

```
wlan-disconnect
```

Re-associate to the AP

```
wlan-connect 1
```

Disconnect from the AP when the test case is finished

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

Note: *Reset the STAUT after every test case*

3.3.2 WPA3 SAE test 5.2.2

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Wi-Fi-5.2.2"ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa3 sae
 "12345678" mfpc 1 mfpr 1
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping to the PC end point IP

```
ping <PC end-point ip>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

Note: *Reset the STAUT after every test case*

3.3.3 WPA3 SAE test 5.2.3

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Wi-Fi-5.2.3" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa3 sae
 "12345678" mfpc 1 mfpr 1
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping to the PC end point IP

```
ping <PC end-point ip>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

Note: *Reset the STAUT after every test case*

3.3.4 WPA3 SAE test 5.2.4

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Wi-Fi-5.2.4" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa3 sae
 "12345678123456781234567812345678" mfpc 1 mfpr 0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping to the PC end point IP

```
ping <PC end-point ip>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

Note: *Reset the STAUT after every test case*

3.3.5 WPA3 SAE test 5.2.6

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Wi-Fi-5.2.6" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa3 sae
 "12345678" mfpc 1 mfpr 1
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP. If associated then fail, otherwise pass.

```
wlan-connect 1
```

Disconnect from the AP

```
wlan-disconnect
```

Delete the profile

```
wlan-remove 1
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Wi-Fi-5.2.6" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa3 sae
 "12345678" mfpc 1 mfpr 1
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP. If associated then fail, otherwise pass.

```
wlan-connect 1
```

Disconnect from the AP

```
wlan-disconnect
```

Delete the profile

```
wlan-remove 1
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Wi-Fi-5.2.6" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa3 sae
 "12345678" mfpc 1 mfpr 1
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP. If associated then fail, otherwise pass.

```
wlan-connect 1
```

Disconnect from the AP

```
wlan-disconnect
```

Delete the profile

```
wlan-remove 1
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Wi-Fi-5.2.6" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa3 sae
 "12345678" mfpc 1 mfpr 1
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP. If associated then fail, otherwise pass.

```
wlan-connect 1
```

Disconnect from the AP

```
wlan-disconnect
```

Delete the profile

```
wlan-remove 1
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "Wi-Fi-5.2.6" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa3 sae
 "12345678" mfpc 1 mfpr 1
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP. If associated then fail, otherwise pass.

```
wlan-connect 1
```

Disconnect from the AP

```
wlan-disconnect
```

Delete the profile

```
wlan-remove 1
```

Note: *Reset the STAUT after every test case*

3.3.6 PA3 SAE (R3) command usage

Syntax: `wpa3 sae <secret> [pwe <0/1/2> tr <0/1>>`

SAE mechanism for PWE derivation:

```
# 0 = hunting-and-pecking loop only (default without password identifier)
# 1 = hash-to-element only (default with password identifier)
# 2 = both hunting-and-pecking loop and hash-to-element enabled
```

Transition disable indication:

```
# 0 = transition mode (allow to connect WPA2-Personal)
# 1 = disable transition mode ((i.e., disable WPA2-Personal = WPA-PSK and only allow SAE
 to be used))
```

3.4 Security enhancement certification program

This section includes the test configuration to be used on the DUT when running WFA Security Enhancement test plan. Refer to the test plan (v2.19) for the test procedure.

3.4.1 Security enhancement test 5.2.2

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "WiFi-5.2.2" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping the PC end-point

```
ping <PC end-point IP>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

Note: *Repeat the above steps for each scenario.*

3.4.2 Security enhancement test 5.2.3

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "WiFi-5.2.3" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping the PC end-point

```
ping <PC end-point IP>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

Note: *Repeat the above steps for each scenario.*

3.4.3 Security enhancement test 5.2.4

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "WiFi-5.2.4" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping the PC end-point

```
ping <PC end-point IP>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

Note: *Repeat the above steps for each scenario.*

3.5 Security vulnerability detection (SVD) certification

This section includes the test configuration to be used on the DUT when running WFA Security Vulnerability Detection (SVD) test plan. Refer to the test plan (v2.19) for the test procedure.

3.5.1 SVD all test cases

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "<SSID>" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

Disconnect from the AP after every run and associate again

```
wlan-disconnect
```

3.6 Wi-Fi 5 (802.11ac) certification program

3.6.1 Test case AC-5.2.2

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "wi-fi" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the PC end-point to the STAUT

```
ping <STAUT IP address>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.2 Test case AC-5.2.9

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "wpa2" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the PC end-point to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STAs

- Run the command to run *iPerf* in server mode for STAUT:

```
iperf -s -u
```

- Run the command to run *iPerf* in client mode for the AP back-end:

```
iperf -c <STAUT IP address> -t <number of seconds to transmit for>
```

- Run the command to run *iPerf* in server mode for the PC end-point:

```
iperf -s -u -i1
```

- Run the command to run *iPerf* in client mode for STAUT:

```
iperf -c <IP of PCE> -u -t 60
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.3 Test case AC-5.2.9A

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "wpa2" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the PC end-point to the STAUT

```
ping <STAUT IP address>
```

Start iPerf traffic

- Run the command to run *iPerf* in server mode for STAUT:

```
iperf -s -u
```

- Run the command to run *iPerf* in client mode for the PC end-point:

```
iperf -c <STAUT IP address> -u -i 1 -b 60M -t 60
```

- Run the command to run *iPerf* in server mode for the PC end-point:

```
iperf -s -u -i1
```

- Run the command to run *iPerf* in client mode for STAUT:

```
iperf -c <IP of PCE> -u -t 60
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.4 Test case AC-5.2.22

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "80211h" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Check from SM bit in capability info from sniffer

3.6.5 Test case AC-5.2.23

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "80211h" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the PC end-point to the STAUT

```
ping <STAUT IP address>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.6 Test case AC-5.2.26

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "012345678901234567890123456789O1"
 ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Start a continuous ping from the STAUT to the AP back-end

```
ping -s 1000 -c 300 <IP address of back-end>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.7 Test case AC-5.2.28

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.28" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

Step 5

The pre-requisite for STAUT is Tx UDP AP back-end.

- PC end-point:

```
iperf –s
```

- STAUT:

```
iperf -c 192.165.100.99 -B 192.165.100.40 -u -t 60
```

Step 6

The pre-requisite for STA1 is to use WTS to send traffic.

Step 7

STAUT: Tx of AC_BE

- PC end-point:

```
iperf –s -u -i1
```

- STAUT:

```
iperf -c 192.165.100.99 -B 192.165.100.40 -S 0 -u -t 30
```

Step 8

STAUT: Tx of AC_VI

- PC end-point:

```
iperf –s -u -i1
```

- STAUT:

```
iperf -c 192.165.100.99 -B 192.165.100.40 -S 160 -u -t 30
```

Step 9

STAUT: Tx of AC_BK

- PC end-point:

```
iperf –s -u -i1
```

- STAUT:

```
iperf -c 192.165.100.99 -B 192.165.100.40 -S 70 -u -t 30
```

Step 10

STAUT: Tx of AC_VI

- PC end-point:

```
iperf –s -u -i1
```

- STAUT:

```
iperf -c 192.165.100.99 -B 192.165.100.40 -S 160 -u -t 30
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.8 Test case AC-5.2.33

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.33" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

Step 4

The pre-requisite for STAUT is Tx UDP.

- PC end-point:

```
iperf –s -u -i1
```

- STAUT:

```
iperf -c 192.165.100.99 -B 192.165.100.40 -u -t 60
```

Step 5

STAUT: Tx of AC_VI

- PC end-point:

```
iperf –s -u -i1
```

- STAUT:

```
iperf -c 192.165.100.99 -B 192.165.100.40 -S 160 -u -t 30
```

Step 7 and step 9

Same as step 5

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.9 Test case AC-5.2.34

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.34" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Start a continuous ping from the STAUT to the AP

```
ping -s 10000 -c 90 <IP address of PC end-point>
```

Start the traffic between the AP and STA

Step 5

STAUT: Tx of AC_VI

- STAUT:

```
iperf -s -u -B 192.165.100.40
```

- PC end-point:

```
iperf -c 192.165.100.40 -u -S 160 -b 70M -t 30 -i1
```

Step 7

Same as step 5

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.10 Test case AC-5.2.35

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid “VHT-5.2.35-AP1" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2
 “12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Start a continuous ping from the STAUT to the AP

```
ping -s 10000 -c 300 <IP address of back-end>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.11 Test case AC-5.2.36

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.36" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 “12345678”
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.12 Test case AC-5.2.37

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.37" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

Step 4

- STAUT:

```
iperf -s -u -B 192.165.100.40
```

- PC end-point:

```
iperf -c 192.165.100.40 -u -S 160 -b 60M -t 30 -i1
```

Step 9

Same as step 4.

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.13 Test case AC-5.2.38

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.38" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

Step 4

- STAUT:

```
iperf -s -u -B 192.165.100.40
```

- PC end-point:

```
iperf -c <IP of STAUT> -u -i 1 -b 60M -t 60
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.14 Test case AC-5.2.40

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.40-AP1" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Start the traffic between the AP and STA

Step 4

Tx from STAUT and STA1 to PC end-point

- PC end-point:

```
iperf -s -u -i1
```

- STAUT:

```
iperf -c <IP address of PC end-point> -u -t 60
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.15 Test case AC-5.2.42

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.42" ip:192.165.100.40,192.165.100.50,255.255.0.0
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.16 Test case AC-5.2.46

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.46" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 “12345678”
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the AP to the STAUT

```
ping <STAUT IP address>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.17 Test case AC-5.2.47

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.47" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 “12345678”
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the AP of 1000 bytes

```
ping -s 1000 <IP address of AP back-end>
```

Start the traffic between the AP and STA

Step 5

Tx of AC_BE from STAUT to PC end-point

- PC end-point:

```
iperf –s –u –i1
```

- STAUT:

```
iperf -c <IP of PCE>  -B <IP of wlan interface> -u -S 0  -t 60
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.18 Test case AC-5.2.50

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.50" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 “12345678”
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the AP

```
ping -c 100 –s 10000 <IP address of AP>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.19 Test case AC-5.2.54

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.54" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the PC end-point

```
ping -c 100 -s 10000 <IP address of PC end-point>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.20 Test case AC-5.2.55

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.55" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the PC end-point

```
ping <IP address of PC end-point>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.21 Test case AC-5.2.57

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.57" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the PC end-point

```
ping <IP address of PC end-point>
```

Start the traffic between the AP and STA

- STAUT:

```
iperf -s -u
```

- PC end-point:

```
iperf -c <IP of STAUT> -u -i 1 -b 60M -t 60
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.22 Test case AC-5.2.58

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.58" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the PC end-point

```
ping -s 1000 -c 90 <IP address of PC end-point>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.23 Test case AC-5.2.59

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.59" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the PC end-point

```
ping -s 1000 -c 90 <IP address of PC end-point>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.24 Test case AC-5.2.60

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.60" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the PC end-point

```
ping -s 1000 -c 90 <IP address of PC end-point>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.25 Test case AC-5.2.61

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.61" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the PC end-point

```
ping -s 1000 -c 90 <IP address of PC end-point>
```

Start the traffic between the AP and STA

Step 3

Make this value as X

- PC end-point:

```
iperf –s -u -i1
```

- STAUT:

```
iperf -c <IP of PC end-point> -u -t 60
```

Step 7

Make this value as X' which should be 23% > X

- PC end-point:

```
iperf –s -u -i1
```

- STAUT:

```
iperf -c <IP of PC end-point> -u -t 60
```

Step 11

Make this value as X which should be 6% > X

- PC end-point:

```
iperf –s -u -i1
```

- STAUT:

```
iperf -c <IP of PC end-point> -u -t 60
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.6.26 Test case AC-5.2.62

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to add a Wi-Fi profile with a static IP address:

```
wlan-add 1 ssid "VHT-5.2.62" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Run the command to check the added profile:

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Run the command to ping from the STAUT to the PC end-point (WTS should take care)

```
ping -s 1000 -c 90 <IP address of PC end-point>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.7 Wi-Fi 6 (802.11ax) certification program

11AX certification program is used to test the compliance of 802.11ax Wi-Fi feature.

Note:

1. *Use txratecfg commands on the DUT after association for a specific LTF/GI combinations.*
2. *Send OMI command at a specific step as per the test plan.*
3. *Run the rest of the 11axcfg and other commands before the association.*
4. *For Intel AP cases with RT-FC, use the following commands before the association:*

```
HE-5.72.1_5G/HE-5.26.1_24G/HE-5.30.1: wlan-11axcfg
set 6 fc ff fc ff wlan-11axcfg done
```

3.7.1 Common commands

This section lists the commands used for connection, disconnection, and data traffic.

Associate STAUT to AP

- Scan the network.

```
wlan-scan
```

- Add a Wi-Fi profile with a static IP address.

```
wlan-add 1 ssid "wi-fi" ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 "12345678"
```

- Check the added profile.

```
wlan-list
```

- Run the command to associate the STAUT to the AP

```
wlan-connect 1
```

- Ping from the PC end-point to the STAUT.

```
ping <STAUT IP address>
```

Start the traffic between the AP and STAs

- Run *iPerf* in server mode for STAUT.

```
iperf -s -u <DUT wireless IP>
```

- Run *iPerf* in client mode for the AP back-end:

```
iperf -c <DUT wireless IP> -u -t <duration> - p <port> -b <bandwidth>
```

- Run *iPerf* in server mode for the PC end-point.

```
iperf -s -u - p <port>
```

- Run *iPerf* in client mode for STAUT.

```
iperf -c <IP of PCE> -u -t <duration> - B <DUT wireless IP>
```

Disconnect from the AP

Disconnect from the AP when the test case is finished.

```
wlan-disconnect
```

Delete the profile

Delete the profile when the test case is finished.

```
wlan-remove 1
```

3.7.2 Test case HE-5.27.1_5G

LDPC supported DUT.

```
wlan-11axcfg set 5 04 53 72 49 0d 00 20 1e 11 3d 00
```

Output:

```
wlan-11axcfg done
```

3.7.3 Test case HE-5.32.1_24G

```
wlan-set-txratecfg sta 3 7 1 0x2020
wlan-set-txratecfg sta 3 7 1 0x2040
wlan-set-txratecfg sta 3 7 1 0x2060
```

3.7.4 Test case HE-5.32.1_5G

20 MHz DUT:

```
wlan-set-txratecfg sta 3 7 1 0x2020
wlan-set-txratecfg sta 3 7 1 0x2040
wlan-set-txratecfg sta 3 7 1 0x2060
```

3.7.5 Test case HE-5.61.1

```
wlan-set-su 1 before traffic
```

3.7.6 Test case HE-5.63.1

```
wlan-set-toltime 8
```

3.7.7 Test case HE-5.64.1

```
wlan-set-turbo-mode STA 0
```

3.7.8 Test case HE-5.71.1

```
wlan-set-forceRTS 1
```

3.7.9 Test case HE-5.72.1

```
wlan-ieee-ps 1
```

4 Acronyms and abbreviations

Table 1. Abbreviations

Acronym	Description
AP	Access point
PMF	Protected management frame
QTT	Quick track tool
SAE	Simultaneous authentication of equals
STAUT	Station under test
SVD	Security vulnerability detection
WFA	Wi-Fi alliance
WTS	Wi-Fi test suite

5 References

5.1 User manuals

[1] UM11798-Getting Started with Wireless on RW61x-Evaluation Board Running RTOS (link)
[2] UM11799-NXP Wi-Fi and Bluetooth Demo Applications for RW61x (link)
[3] UM11797-NXP Wi-Fi and Bluetooth Debug Feature Configuration for RW61x Evaluation Board (link)

6 Revision history

Table 2. Revision history

Document ID	Release date	Description
UM11822 v.1	12 December 2023	• Initial version

Legal information

Definitions

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