UM11567

WFA Certification Guide for NXP-based Wireless Modules on i.MX RT Platform Running RTOS

Rev. 2 — 10 January 2022   **User manual**

Document information

Information	Content
Keywords	Wi-Fi Alliance (WFA), certification, NXP-based wireless modules, i.MX RT Platform
Abstract	Provides the step-by-step procedure of WFA certification for NXP-based wireless modules on i.MX RT platform running RTOS.

Revision history

Rev	Date	Description
v.1	20210414	Initial version
v.2	20220110	**Modifications** • Section 3.6 "Wi-Fi 5 (802.11ac) certification program": added

1 About this document

1.1 Purpose and scope

This document describes the test setup and procedure used for WFA certification of Wi- Fi features like 802.11n, protected management frames (PMF), WPA3, security enhancement, and security vulnerability detection of NXP wireless devices such as 88W8801, 88W8977, 88W8987, and IW416. This document applies to NXP-based wireless modules connected to i.MX RT platform running RTOS.

The users should be familiar with the user manuals reference UM11441, UM11442, and UM11443.

1.2 References

Table 1. Reference documents

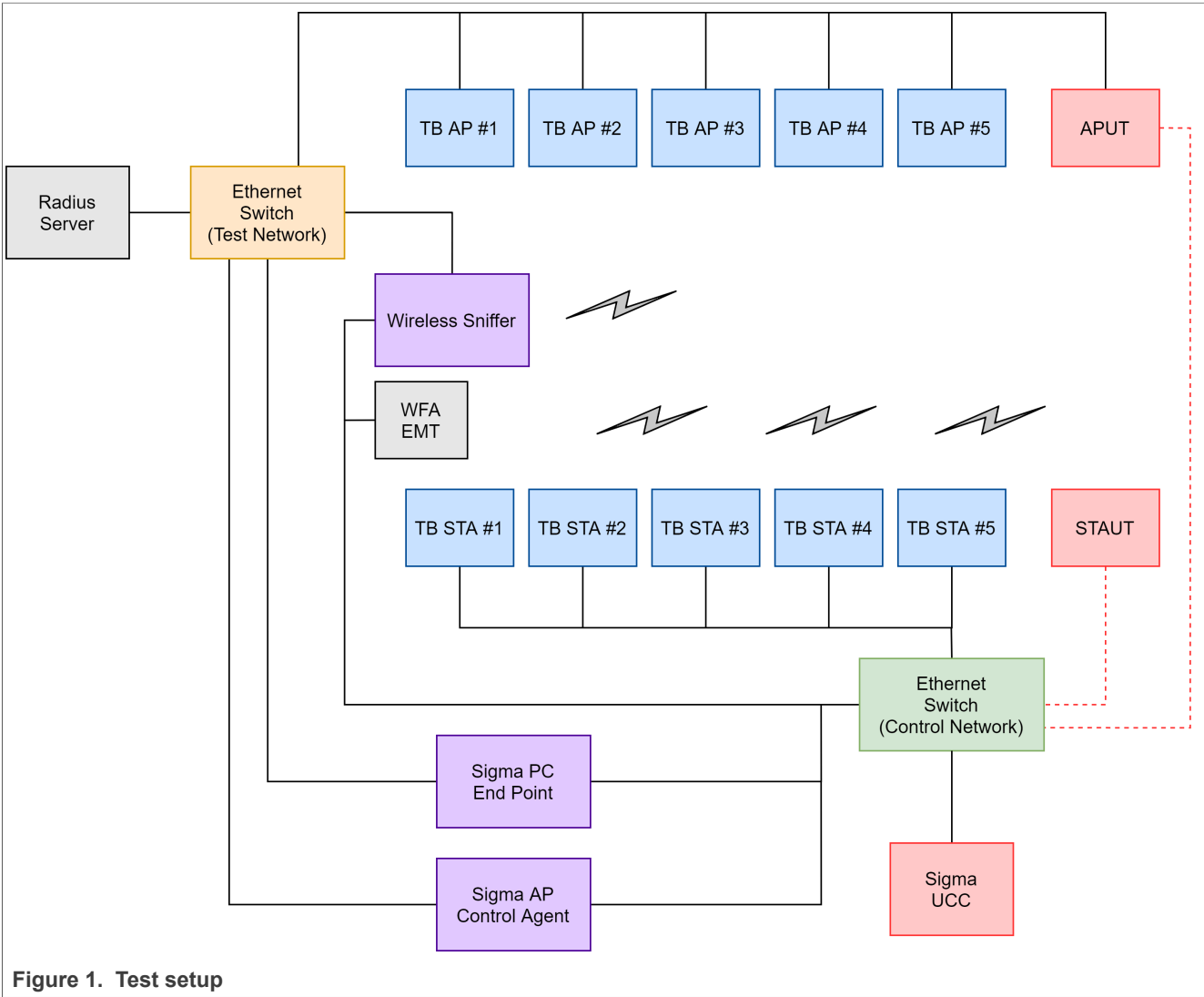| Document type	Document title
User manual	Getting Started with NXP-based Wireless Modules and i.MX RT Platform Running RTOS (UM11441)
User manual	Wi-Fi and Bluetooth Demo Applications for i.MX RT platforms (UM11442)
User manual	Wi-Fi Debug Feature Configuration Guide for MCUXpresso SDK (UM11443)

1.3 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

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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.

2.3.1 `wlan-scan` command

This command is used to scan the network.

Syntax: `wlan-scan`

2.3.2 `wlan-add` command

This command is used to add a network configuration.

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

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.*

2.3.3 `wlan-list` command

This command is used to list the profiles.

Syntax: `wlan-list`

2.3.4 `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

2.3.5 `wlan-disconnect` command

This command is used to disconnect.

Syntax: `wlan-disconnect`

2.3.6 `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 start iPerf on the server side:

```
iperf –s -u –n 7M
```

• Run the command to start iPerf on the client side:

```
iperf –c <server IP address> -d -u –n 7M
```

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
```

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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
```

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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
```

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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
```

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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 (v2.19) for the test procedure.

3.2.1 PMF test 5.1

Associate STAUT to AP

- Run the command to scan the network:

```
wlan-scan
```

- Run the command to configure PMF as enabled:

```
wlan-set-pmfcfg 1 0
```

- 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"
```

- 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
```

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3.2.2 PMF test 5.2

Associate STAUT to AP

• Run the command to scan the network:

```
wlan-scan
```

• Run the command to configure PMF as required:

```
wlan-set-pmfcfg 1 1
```

• 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"
```

• 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 configure PMF as enabled:

```
wlan-set-pmfcfg 1 0
```

• 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"
```

• 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 configure PMF as enabled:

```
wlan-set-pmfcfg 1 0
```

• 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"
```

• 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
```

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3.2.5 PMF test 5.3.3.3

Associate STAUT to AP

• Run the command to scan the network:

```
wlan-scan
```

• Run the command to configure PMF as enabled:

```
wlan-set-pmfcfg 1 0
```

• 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"
```

• 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 configure PMF as enabled:

```
wlan-set-pmfcfg 1 0
```

• 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"
```

• 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 configure PMF as enabled:

```
wlan-set-pmfcfg 1 0
```

• 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"
```

• 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 configure PMF as enabled:

```
wlan-set-pmfcfg 1 0
```

• 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"
```

• 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 configure PMF as enabled:

```
wlan-set-pmfcfg 1 0
```

• 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"
```

• 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.

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 configure PMF as required:

```
wlan-set-pmfcfg 1 1
```

- 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"
```

- 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

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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 configure PMF as required:

```
wlan-set-pmfcfg 1 1
```

• 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"
```

• 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 configure PMF as required:

```
wlan-set-pmfcfg 1 1
```

• 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"
```

• 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 configure PMF as enabled:

```
wlan-set-pmfcfg 1 0
```

• 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"
```

• 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

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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 configure PMF as required:

```
wlan-set-pmfcfg 1 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"
```

• 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"
```

• 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"
```

• 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"
```

• 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"
```

• 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*

3.4 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.

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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 without a static IP address:

```
wlan-add 1 ssid "<SSID>" 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
```

• Run the command to ping to the PC end-point or VDT agent

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

```
ping <vdt agent ip>
```

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
```

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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 "012345678901234567890012345678901"
 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
```

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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
```

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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
```

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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
```

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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
```

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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
```

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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
```

4 Contact information

Use the following links for more product details, queries and support.

- Home page: www.nxp.com
- Web support: nxp.com/support
- NXP community: community.nxp.com

5   Acronyms and abbreviations

Table 2. Abbreviations

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

6 Legal information

6.1 Definitions

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