

UM11567

Wi-Fi Alliance Certification Guide for NXP-based Wireless Modules on i.MX Platforms Running FreeRTOS

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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 FreeRTOS.



1 About this document

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 NXP-based wireless modules of 88W8987, IW416, IW610, AW611, IW611, and IW612 connected to an i.MX RT platform running FreeRTOS.

The users must be familiar with [ref.\[1\]](#), [ref.\[2\]](#), and [ref.\[3\]](#).

1.1 Considerations

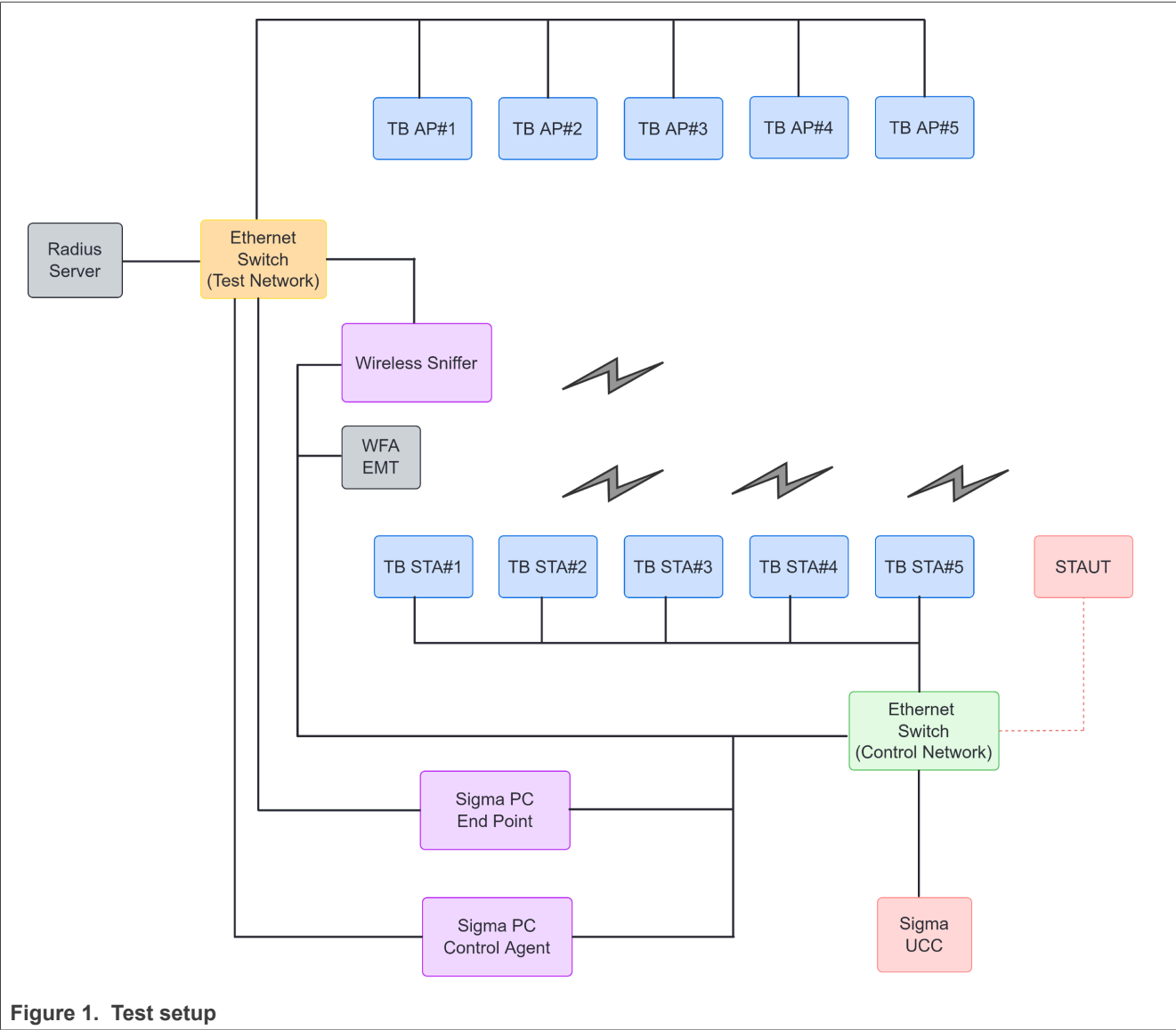
The readers should have some knowledge of Wi-Fi terminology and certification.

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.



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.
- 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 [UM11442](#).

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 : w9177o-V1, SDIO, FP99, 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 psk "passphrase"

Table 1. Command parameters

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"

Table 2. Command parameters

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 psk  
"wpa2wpa2" 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 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
```

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- 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 "abcdefghijkmnopqrstuvwxyzABCDEFGH"  
ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 psk "abcdefghijkmnopqrstuvwxyzABCDEFGH"  
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 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 Chariot for testbed sta, start at same time
- DT2: iperf on STAUT and Chariot for testbed sta, start at same time
- DT3: iperf on STAUT and Chariot 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 psk  
"OBEW23@?+" 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 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 psk  
"Multicast" 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 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 psk  
"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
```

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 psk "01234567890123456789012345678901"  
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
```

- 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 psk  
"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 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 psk  
"%@^98jhB" 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
```

- 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 psk  
"NONE0WPA2PSK" 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 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 psk  
"Association" 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 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 5.3.3.1

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 psk  
"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
```

3.2.2 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 psk  
"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
```

3.2.3 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 psk  
"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 5.3.3.5

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 psk  
"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 5.4.3.1

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 psk  
"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
```

3.2.6 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 psk  
"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 SAE (R3) 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.

WPA3 SAE (R3) command usage

Note: The default mode for WPA3 is set to *pwe 2*.

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 (disable WPA2-Personal = WPA-PSK and only allow SAE to be used)
```

3.3.1 WPA3 SAE test 5.2.1

Note: This test case also applicable for 5.2.1.1, 5.2.1.2, and 5.2.1.3.

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-5.2.1" 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

Note: This test case also applicable for 5.2.1.1, 5.2.1.2, and 5.2.1.3.

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-5.2.2"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 pwe 2 wpa2 psk 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
```


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- 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
```

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- 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 WPA3 Enterprise

Note: The commands in this section are generic for the WPA3 test cases in [Section 3.3.1](#) to [Section 3.3.5](#).

Server certificate validations (SCV)

```
wlan-add 1 ssid "<SSID>" eap-tls-sha256 id "rsa-user1" key_passwd wifi domain_match  
"testserver.wfatestorg.org" mfpc 1 mfpr 0
```

SuiteB

```
wlan-add 1 ssid "<SSID>" wpa3-sb-192 eap-tls id "Client Certificate IDL" key_passwd wifi  
mfpc 1 mfpr 1 gc 0x100 pc 0x100 gmc 0x1000
```

3.4 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.

Note: The SVD test cases are also applicable for Full Function Device (FFD) certification.

3.4.1 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 psk "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
```

Disconnect from the AP after every run and associate again

```
wlan-disconnect
```

3.5 Wi-Fi 5 (802.11ac) certification program

3.5.1 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 psk "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 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
```

3.5.2 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 psk "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 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
```

3.5.3 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
```

3.5.4 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 psk "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
```

- Check from SM bit in capability info from sniffer

3.5.5 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 psk "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 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
```


3.5.6 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 "01234567890123456789012345678901"  
ip:192.165.100.40,192.165.100.50,255.255.0.0 wpa2 psk "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
```

- 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
```

3.5.7 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 psk  
"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 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
```

3.5.8 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 psk  
"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 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
```

3.5.9 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 psk  
"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
```

- 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
```

3.5.10 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 psk  
"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
```

- 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
```

3.5.11 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 psk  
"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 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
```


3.5.12 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 psk  
"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 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
```

3.5.13 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
```

3.5.14 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
```

3.5.15 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
```

3.5.16 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 psk  
"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 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
```

3.5.17 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 psk  
"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 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
```

3.5.18 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 psk  
"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 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
```

3.5.19 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 psk  
"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 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
```


3.5.20 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 psk  
"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 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
```

3.5.21 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 psk  
"12345678" mfp 1 mfp 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 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
```

3.5.22 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 psk  
"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 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
```

3.5.23 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 psk  
"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 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
```

3.5.24 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 psk  
"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 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
```

3.5.25 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 psk  
"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 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
```

3.5.26 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 psk  
"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 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
```


3.6 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
```

This section describes the common or generic commands used for connection, disconnection, and data traffic.

3.6.1 Common commands

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 psk "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

Traffic between the AP and STAs:

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

```
iperf -s -u -B <DUT wireless ip>
```

- Run the command to run *iPerf* in client mode for the PC-Endpoint.

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

- Run the command to run *iPerf* in server mode for the PC-Endpoint.

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

Wi-Fi Alliance Certification Guide for NXP-based Wireless Modules on i.MX Platforms Running FreeRTOS

- Run the command to 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
```

3.6.2 Test case HE-5.27.1_5G

- LDPC supported DUT

```
wlan-llax-cfg set 5 04 53 72 49 0d 00 20 1e 11 3d 00  
wlan-llaxcfg done
```

3.6.3 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
```

3.6.4 Test case HE-5.32.1_5G

- 80 MHz DUT:

```
wlan-set-txratecfg sta 3 7 1 0x2228  
wlan-set-txratecfg sta 3 7 1 0x2248  
wlan-set-txratecfg sta 3 7 1 0x2268
```

- 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
```

3.6.5 Test case HE-5.61.1

```
wlan-set-mmsf 1 0x30 0x5
```

Note: Define `CONFIG_MMSF` macro in `wifi_config.h` file to enable this command.

3.6.6 Test case HE-5.63.1

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

3.6.7 Test case HE-5.64.1

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

3.6.8 Test case HE-5.71.1

```
wlan-set-forceRTS 1  
wlan-set-turbo-mode STA 0
```

Note: Define `CONFIG_WIFI_FORCE_RTS` macro in `wifi_config.h` file to enable this command.

3.6.9 Test case HE-5.72.1

- At the time of enabling *powersave* on the DUT:

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

3.6.10 Test case HE-5.74.1

- 80 MHz DUT:

```
wlan-set-debug-htc [fill the values for following as per UCC input]  
  <count>:1  
  <vht>:1  
  <he>:1  
  <rxNss>:1  
  <channelWidth>:1  
  <ulMuDisable>:1  
  <txNSTS>:1  
  <erSuDisable>:1  
  <dlResoundRecomm>:1  
  <ulMuDataDisable>:1
```

Note: Define `CONFIG_WIFI_HTC_DEBUG` macro in `wifi_config.h` file to enable this command.

4 Contact information

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

- Website homepage: www.nxp.com
- Web support: nxp.com/support
- NXP community: community.nxp.com

5 Abbreviations

Table 3. Abbreviations

Abbreviation	Definition
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

6 References

- [1] User manual – UM11441: Getting Started with NXP-based Wireless Modules on i.MX RT Platforms Running FreeRTOS ([link](#))
- [2] User manual – UM11442: Wi-Fi and Bluetooth Demo Applications for i.MX RT Platforms User Guide ([link](#))
- [3] User manual – UM11443: NXP Wi-Fi and Bluetooth Debug Feature Configuration Guide for i.MX Platforms Running FreeRTOS ([link](#))

7 Note about the source code in the document

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8 Revision history

Revision history

Document ID	Date	Description
UM11567 v.12.0	16 September 2025	<ul style="list-style-type: none"> Section 1 "About this document": added IW610 wireless product.
UM11567 v.11.0	9 June 2025	<ul style="list-style-type: none"> Section 1 "About this document": removed the reference to 88W8801. Section 2.3 "Most used commands": updated the code sample for <code>wlan-version</code> command. Section 3.6.2 "Test case HE-5.27.1_5G": updated the code sample. Section 3.6.5 "Test case HE-5.61.1": added a note. Section 3.6.8 "Test case HE-5.71.1": added a note. Section 3.6.10 "Test case HE-5.74.1": added a note.
UM11567 v.10.0	24 March 2025	<ul style="list-style-type: none"> Section 2.2 "Test procedure": updated. Removed the sections: <ul style="list-style-type: none"> <i>PMF test 5.1</i> <i>PMF test 5.2</i> <i>PMF test 5.3.3</i> Section 3.3.6 "WPA3 Enterprise": added. Removed the section <i>Security enhancement certification program</i>. Section 3.6.5 "Test case HE-5.61.1": updated. Section 3.6.8 "Test case HE-5.71.1": updated.
UM11567 v.9.0	24 September 2024	<ul style="list-style-type: none"> Section 1 "About this document": removed the footnote about AW611 module support. Section 2.3 "Most used commands": renamed wpa2 as wpa2 psk. Section 3 "Certification program execution": <ul style="list-style-type: none"> replaced all occurrences of wpa2 with wpa2 psk. Added <code>mfpc 1 mfpr 0</code> to commands with wpa2 psk. Section 3.3 "WPA3 SAE (R3) certification program": updated the section heading and moved the information about command usage to the beginning of the section. Section 3.3.1 "WPA3 SAE test 5.2.1": added a note. Section 3.3.2 "WPA3 SAE test 5.2.2": added a note. Section 3.3.4 "WPA3 SAE test 5.2.4": updated the command to add Wi-Fi profile with a static IP address.
UM11567 v.8.0	26 June 2024	<ul style="list-style-type: none"> Section 1 "About this document": extended the applicability to IW611 and AW611.
UM11567 v.7.0	09 January 2024	<ul style="list-style-type: none"> Section 1 "About this document": replaced IW612 with IW61x and removed the footnote about IW612 module support.
UM11567 v.6.0	13 October 2023	<ul style="list-style-type: none"> Section 1 "About this document": updated. Section <i>WPA3 SAE (R3) command usage</i>: added. Section 3.6 "Wi-Fi 6 (802.11ax) certification program": added.
UM11567 v.5.0	29 June 2023	<ul style="list-style-type: none"> Section 1 "About this document": added IW612 Section 3.3 "WPA3 SAE (R3) certification program": added a note about WPA3 SAE test cases Section 3.4 "Security vulnerability detection (SVD) certification": added a note about SVD test cases Section 7 "Note about the source code in the document": added
UM11567 v.4.0	15 September 2022	<ul style="list-style-type: none"> Section 1 "About this document": removed the reference to 88W8977 device

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Revision history...continued

Document ID	Date	Description
UM11567 v.3.0	14 March 2022	<ul style="list-style-type: none"> • Figure 1 "Test setup" updated (removed APUT) • Section 2.3 "Most used commands": <ul style="list-style-type: none"> – Added a note in the introduction – Section 2.3.1 "wlan-version command": added – Replaced <code>psk</code> parameter with <code>passphrase</code> • Section 3.1.3 "Test case N-5.2.11": updated the section <i>Start iPerf traffic</i> • Section 3.2 "Protected management frame (PMF) certification program": <ul style="list-style-type: none"> – Removed the <code>pmfcfg</code> command from the procedure and added <code>mfpcc</code> <code>mfprr</code> to <code>wlan-add</code> command – Added the Note about the use of QTT for some test cases • Section 3.3 "WPA3 SAE (R3) certification program": removed the <code>pmfcfg</code> command from the procedure and added <code>mfpcc</code> <code>mfprr</code> to <code>wlan-add</code> command • Section 3.4 "Security vulnerability detection (SVD) certification" modified a Wi-Fi profile by adding a static IP address • Section 5 "Abbreviations" added WTS and QTT acronyms
UM11567 v.2.0	10 January 2022	<ul style="list-style-type: none"> • Section 3.5 "Wi-Fi 5 (802.11ac) certification program": added
UM11567 v.1.0	14 April 2021	Initial version

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