Bare-metal Wireless AP HW Function Test

**NTC STANDARD LIB**

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Introduction

Objective

The purpose of this document is to outline the Bare-Metal wireless AP HW function testing cases and Pass Criteria to ensure the Hardware functions properly when running with basic Network OS.

Scope

The test includes six parts:

1. LED verification
2. Ethernet ports Link status verification
3. Ethernet ports Auto negotiation Test
4. Wireless interface link status verification
5. Wireless Throughput Test
6. Serial Console Test

Reference

* Hardware specification

Terminology

* DUT Device Under Test
* IEEE Institute of Electrical and Electronic Engineers
* 10MbE 10 Megabit Ethernet
* 100MbE 100 Megabit Ethernet
* 1GbE 1 Gigabit Ethernet
* PPS Packet per second, as known as FPS- Frame per second
* CLI Command Line Interface
* ONIE Open Network Install Environment

DUT Information

|  |  |
| --- | --- |
| Model Name |  |
| Description |  |
| Diag. Version |  |
| HW Version |  |
| Tester |  |
| Date |  |

Test Equipment

Equipment & Tools

**Hardware:**

* DUT x 1
* PC x 1
* NB x 1 (Support dual band)

**Software:**

* ONIE
* DHCP Server
* IxChariot or Veriwave

Testing Topology

This section describes the setup and test procedure for the testing.



Test Items

LED Verification

Purpose:

1. To check if the System LED display correctly when the system is in different state, e.g. booting up, on or off.
2. To check if the Ethernet Port LED display correctly when it is in different state, e.g. link up, link down, PoE, or transmitting/receiving data.
3. To check if the Wireless interface LED display correctly when it is in different state, e.g. link up, link down, or transmitting/receiving data.

Resource Requirements:

NB x 1

PC x 1

Test Setup:

See 2.2 Testing Topology

Procedure/Expected Result:

|  |  |  |  |
| --- | --- | --- | --- |
| **LED** | **State** | **Expected Result** | **Test Result** |
| Power | Normal | Blue |  |
| Red | Fault |  |
| No Power | Off |  |
| Ethernet | Link up | Green for 10MbE and 100MbE  Blue for 1GbE |  |
| Transmitting/Receiving data | Flashing |  |
| Link down | Off |  |
| 5G | On | Blue |  |
| Transmitting/Receiving data | Flashing |  |
| Off | Off |  |
| 2.4G | On | Blue |  |
| Transmitting/Receiving data | Flashing |  |
| Off | Off |  |

Note: Different product may have different definitions of LED.

Ethernet ports Link status verification

Purpose:

To check if the DUT establishes the best possible link with a link partner

Resource Requirements:

PC x 1

Test Setup:

See 2.2 Testing Topology.

Procedure/Expected Result:

Case1: The DUT receives no signal from the link partner during initialization.

1. Power on the DUT and ensure that the device is initialized
2. Connect a cable between the DUT and PC.
3. Check local management information to verify that the link is established at the proper speed and that link　auto-negotiation, if supported, negotiated the optimal common values for the two devices.
4. Send the DUT a series of packets and observe whether the packets are forwarded or not.
5. To change the PC at different speed (10MbE, 100MbE and 1GbE), repeat step 1 to step4.

Case2: The DUT receives signal from the link partner during initialization.

1. Connect a cable between the DUT and PC.
2. Power on the DUT and ensure that the device is initialized.
3. Check local management information to verify that the link is established at the proper speed and that link　auto-negotiation, if supported, negotiated the optimal common values for the two devices.
4. Send the DUT a series of packets and observe whether the packets are forwarded or not.
5. To change the PC at different speed (10MbE, 100MbE and 1GbE), repeat step 1 to step4.

Case3: Plug/un-plug Cables

1. Connect a cable between the DUT and PC.
2. Power on the DUT and ensure that the device is initialized.
3. Remove and hold the cable for a few seconds, then reinsert. Repeat five times. Check local management information to verify that the link came up at the proper speed and that link auto-negotiation, if supported, negotiated the optimal common values for the two devices.
4. Send the DUT a series of packets and observe whether the packets are forwarded or not.
5. To change the PC at different speed (10MbE, 100MbE and 1GbE), repeat step 1 to step4.

2.4G wireless interface link status verification

Purpose:

To check 2.4G wireless client can be associated to the DUT.

Resource Requirements:

NB x 1

Test Setup:

See 2.2 Testing Topology.

Procedure/Expected Result:

Case1: The 2.4G radio is disabled in the DUT.

1. 2.4G radio is disabled in the DUT.
2. NB to scan wireless signal.

Expected Result: NB can’t scan the DUT’s wireless signal.

Case2: 802.11b wireless client associated to the DUT.

1. 2.4G radio is enabled and supports 802.11b/g/n in the DUT.
2. 802.11b wireless client associated to the DUT.
3. 802.11b wireless client send packets and observe whether the packets are forwarded or not

Expected Result: 802.11b wireless client can be associated to the DUT and forward packets success.

Case3: 802.11g wireless client associated to the DUT.

1. 2.4G radio is enabled and supports 802.11b/g/n in the DUT.
2. 802.11g wireless client associated to the DUT.
3. 802.11g wireless client send packets and observe whether the packets are forwarded or not

Expected Result: 802.11g wireless client can be associated to the DUT and forward packets success.

Case4: 802.11n wireless client associated to the DUT.

1. 2.4G radio is enabled and supports 802.11b/g/n in the DUT.
2. 802.11n wireless client associated to the DUT.
3. 802.11n wireless client send packets and observe whether the packets are forwarded or not

Expected Result: 802.11n wireless client can be associated to the DUT and forward packets success.

Case5: 802.11b/g/n wireless client associated to the DUT.

1. 2.4G radio is enabled and supports 802.11b/g/n in the DUT.
2. 802.11b/g/n wireless client associated to the DUT.
3. 802.11b/g/n wireless client send packets and observe whether the packets are forwarded or not

Expected Result: 802.11b/g/n wireless client can be associated to the DUT and forward packets success.

5G wireless interface link status verification

Purpose:

To check 2.4G wireless client can be associated to the DUT.

Resource Requirements:

NB x 1

Test Setup:

See 2.2 Testing Topology.

Procedure/Expected Result:

Case1: The 5G radio is disabled in the DUT.

1. 5G radio is disabled in the DUT.
2. NB to scan wireless signal.

Expected Result: NB can’t scan the DUT’s wireless signal.

Case2: 802.11a wireless client associated to the DUT.

1. 5G radio is enabled and supports 802.11a/n/ac in the DUT.
2. 802.11a wireless client associated to the DUT.
3. 802.11a wireless client send packets and observe whether the packets are forwarded or not

Expected Result: 802.11a wireless client can be associated to the DUT and forward packets success.

Case3: 802.11n wireless client associated to the DUT.

1. 5G radio is enabled and supports 802.11a/n/ac in the DUT.
2. 802.11n wireless client associated to the DUT.
3. 802.11n wireless client send packets and observe whether the packets are forwarded or not

Expected Result: 802.11n wireless client can be associated to the DUT and forward packets success.

Case4: 802.11ac wireless client associated to the DUT.

1. 5G radio is enabled and supports 802.11a/n/ac in the DUT.
2. 802.11ac wireless client associated to the DUT.
3. 802.11ac wireless client send packets and observe whether the packets are forwarded or not

Expected Result: 802.11ac wireless client can be associated to the DUT and forward packets success.

Case5: 802.11a/n/ac wireless client associated to the DUT.

1. 5G radio is enabled and supports 802.11a/n/ac in the DUT.
2. 802.11a/n/ac wireless client associated to the DUT.
3. 802.11a/n/ac wireless client send packets and observe whether the packets are forwarded or not

Expected Result: 802.11a/n/ac wireless client can be associated to the DUT and forward packets success.

Wireless Throughput Test

Purpose:

To verify the maximum wireless throughput.

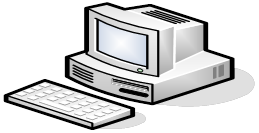
Resource Requirements:

NB x 1

PC x 1

IxChariot or Veriwave

Test Setup:



**Chariot console**

**Chariot endpoint**

**DUT**

**RRoomRoom**

Procedure/Expected Result:

**The following table illustrates the maximum throughput for each frame size.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Radio mode | Frame Size(Bytes) | (eSTA to wSTA) Downstream | (wSTA to eSTA) Upstream | (wSTA <-> eSTA) Bidirectional |
| 802.11b | 64 |  |  |  |
| 128 |  |  |  |
| 256 |  |  |  |
| 512 |  |  |  |
| 1024 |  |  |  |
| 1280 |  |  |  |
| 1518 |  |  |  |
| 802.11g | 64 |  |  |  |
| 128 |  |  |  |
| 256 |  |  |  |
| 512 |  |  |  |
| 1024 |  |  |  |
| 1280 |  |  |  |
| 1518 |  |  |  |
| 802.11n/g | 64 |  |  |  |
| 128 |  |  |  |
| 256 |  |  |  |
| 512 |  |  |  |
| 1024 |  |  |  |
| 1280 |  |  |  |
| 1518 |  |  |  |
| 802.11a | 64 |  |  |  |
| 128 |  |  |  |
| 256 |  |  |  |
| 512 |  |  |  |
| 1024 |  |  |  |
| 1280 |  |  |  |
| 1518 |  |  |  |
| 802.11n/a | 64 |  |  |  |
| 128 |  |  |  |
| 256 |  |  |  |
| 512 |  |  |  |
| 1024 |  |  |  |
| 1280 |  |  |  |
| 1518 |  |  |  |
| 802.11ac | 64 |  |  |  |
| 128 |  |  |  |
| 256 |  |  |  |
| 512 |  |  |  |
| 1024 |  |  |  |
| 1280 |  |  |  |
| 1518 |  |  |  |

Serial Console Test

Purpose:

To verify the serial console can access DUT with correct baud rate.

Resource Requirements:

PC x 1

Serial console cable

Terminal tool

Test Setup:

See 2.2 Testing Topology

Procedure/Expected Result:

Case1: Default Baud rate verification

1. Client uses a Tera Term or any terminal tools and sets the baud rate to 115200.
2. Client connects with the system via a serial console cable
3. Make sure the function is workable and displayed without error