

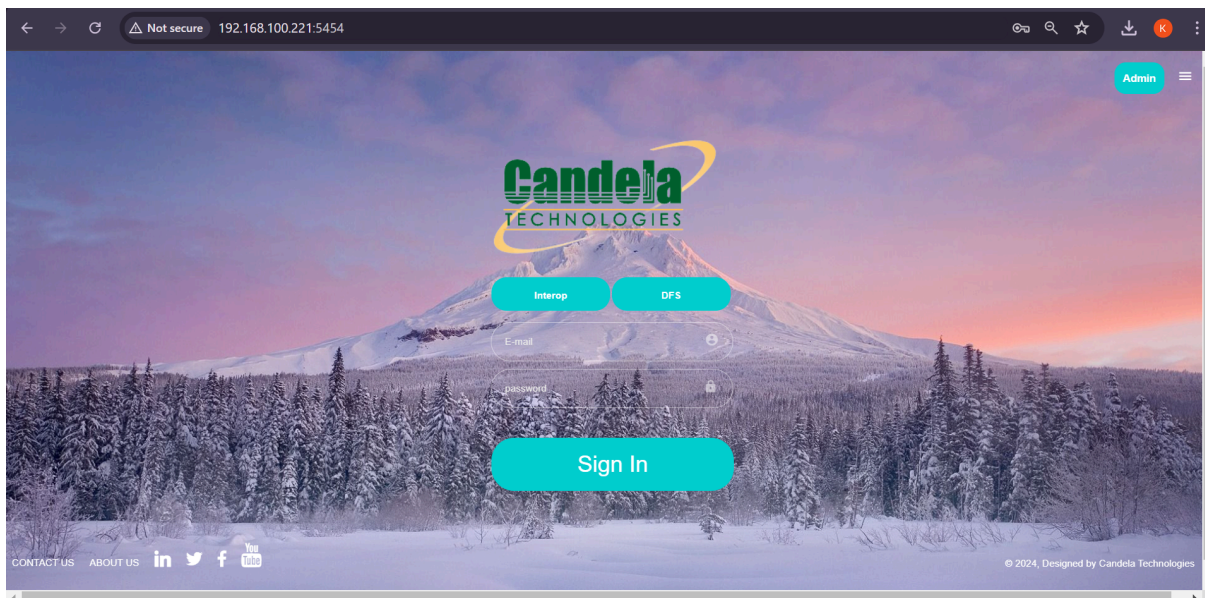
# DFS WebUI User Guide



- To open the WebUI in the Web Browser, enter the IP Address of the LANforge on which the WebUI is hosted.

Eg: 192.168.100.221:5454

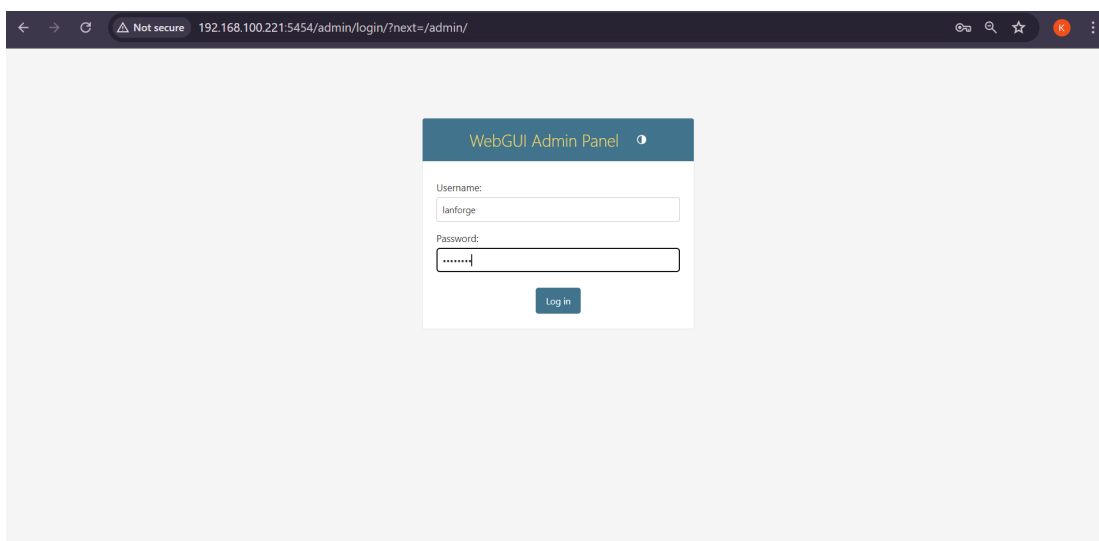
## The WebUI Sign In Page opens



The admin of WebUI creates a **Tester** with email and password credentials.

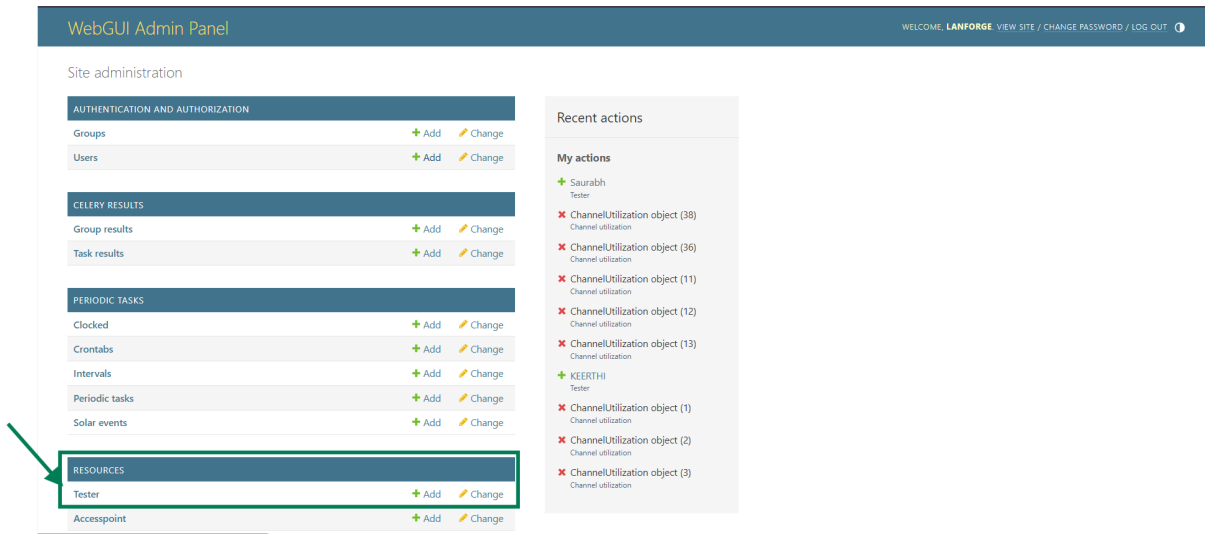
## Steps to create a Tester:

1. Click on the **ADMIN** button in the Sign in page. It directs to the WebUI Admin Panel shown below

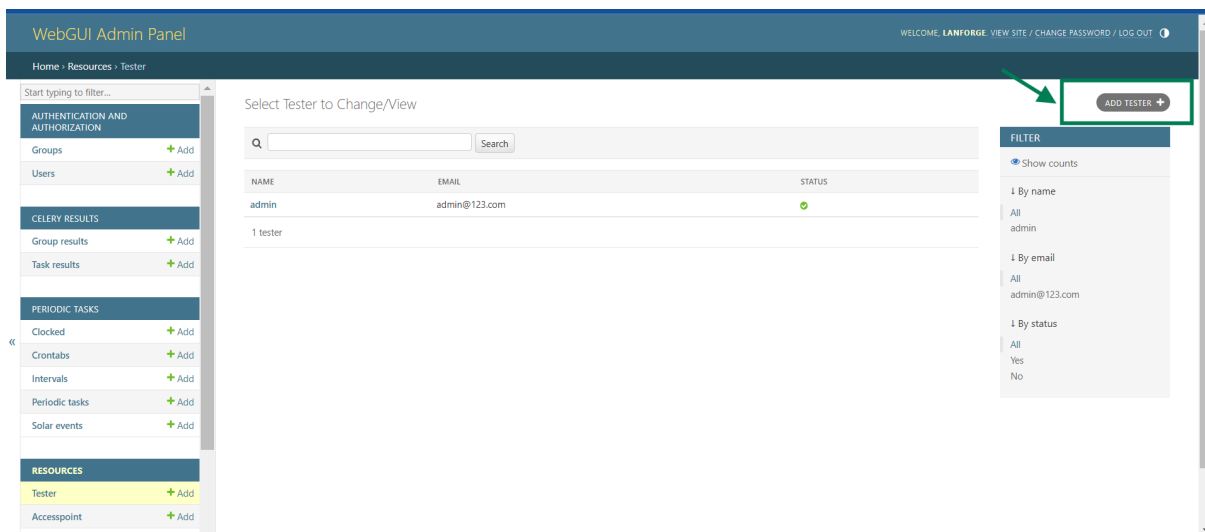


2. Enter the Username and Password credentials of the Admin Panel and click the Login Button. It directs to the window below.

3. To create a new Tester, Go to **Resources->Click on Tester**



4. Click on **Add Tester Button** on the left side of WebUI



5.It directs to the **Add Tester** Page as below. Fill the fields of Email, Password, Name and click on **SAVE** button

WebGUI Admin Panel

Home > Resources > Tester > Add tester

Start typing to filter...

AUTHENTICATION AND AUTHORIZATION

Groups + Add

Users + Add

CELERY RESULTS

Group results + Add

Task results + Add

PERIODIC TASKS

Clocked + Add

Crontabs + Add

Intervals + Add

Periodic tasks + Add

Solar events + Add

RESOURCES

Tester + Add

Accesspoint + Add

Add tester

Email: tester1@gmail.com

Password: tester

Name: Tester01

☒ Status

Chart: 0

SAVE Save and add another Save and continue editing

6.The Tester is successfully created and gets added to the Tester List as below

WebGUI Admin Panel

Home > Resources > Tester

Start typing to filter...

AUTHENTICATION AND AUTHORIZATION

Groups + Add

Users + Add

CELERY RESULTS

Group results + Add

Task results + Add

PERIODIC TASKS

Clocked + Add

Crontabs + Add

Intervals + Add

Periodic tasks + Add

Solar events + Add

RESOURCES

Tester + Add

Accesspoint + Add

The tester "Tester01" was added successfully.

Select Tester to Change/View

Q Search

NAME	EMAIL	STATUS
Tester01	tester1@gmail.com	Yes
admin	admin@123.com	Yes

2 Tester

ADD TESTER +

FILTER

Show counts

By name

All

Tester01

admin

By email

All

admin@123.com

tester1@gmail.com

By status

All

Yes

No

7.Click on **View Site** link on the Title Bar and it directs to the WebUI Sign In Page

WebGUI Admin Panel

Home > Resources > Tester

Start typing to filter...

AUTHENTICATION AND AUTHORIZATION

Groups + Add

Users + Add

CELERY RESULTS

Group results + Add

Task results + Add

PERIODIC TASKS

Clocked + Add

Crontabs + Add

Intervals + Add

Periodic tasks + Add

Solar events + Add

RESOURCES

Tester + Add

Accesspoint + Add

The tester "Tester01" was added successfully.

Select Tester to Change/View

Q Search

NAME	EMAIL	STATUS
Tester01	tester1@gmail.com	Yes
admin	admin@123.com	Yes

2 Tester

ADD TESTER +

FILTER

Show counts

By name

All

Tester01

admin

By email

All

admin@123.com

tester1@gmail.com

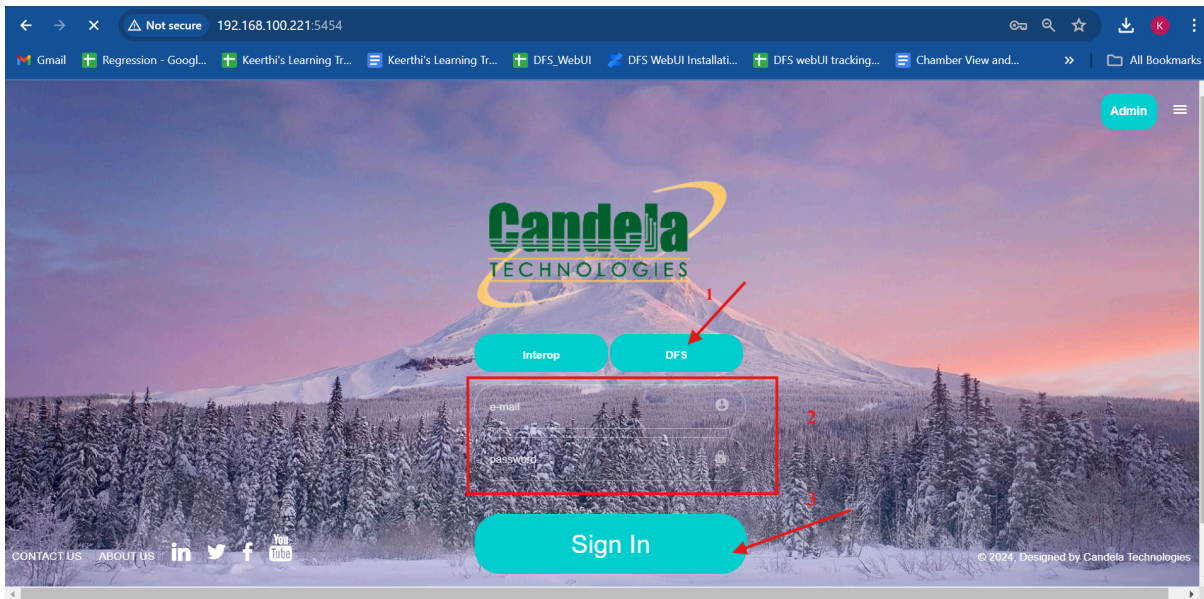
By status

All

Yes

No

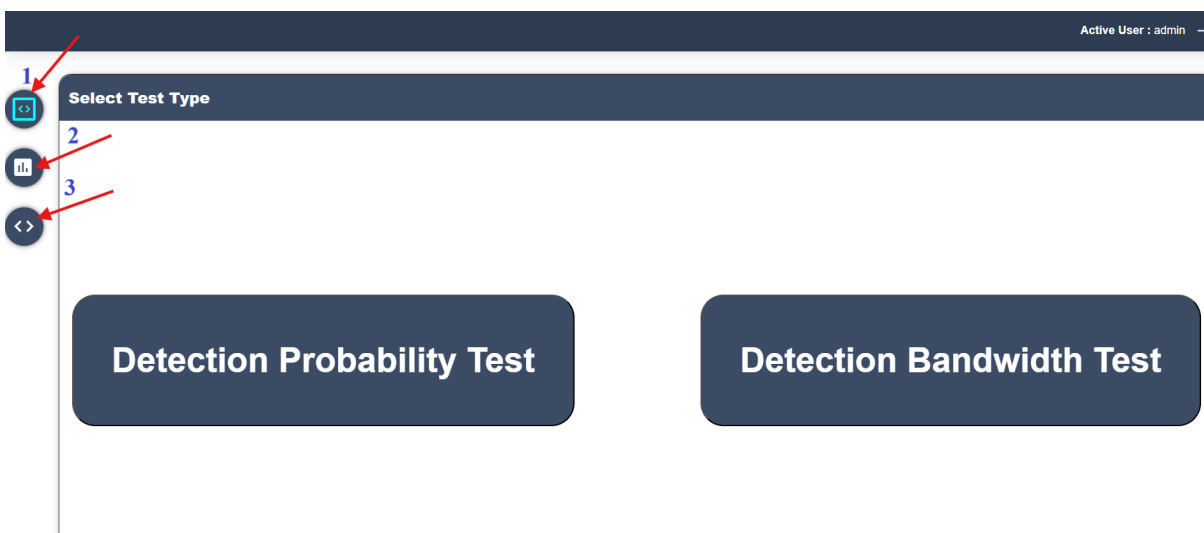
VIEW SITE



To sign in as a Tester into the DFS WebUI, follow the below steps.

1. Choose **DFS** application by clicking on the DFS button
2. Enter the Tester credentials (Email, Password)
3. Click on **Sign in button**

## • Select Test Type



### Left side Tabs:

1. **Traffic Generator Tab:** To configure the Test parameters
2. **Results Tab:** Shows the list of Test Reports generated from WebUI
3. **Runtime Logs tab:** To view the logs while running the Test.

## • TEST-1: DETECTION PROBABILITY TEST

The screenshot shows the 'Detection Probability Test' configuration page. It has a dark blue header with 'Active User : admin' on the right. Below the header, there are two main panels: 'Test Parameters' and 'Station Parameters'. The 'Test Parameters' panel contains fields for LANforge IP, Port, Upstream Port, HackRF S.No., HackRF Gain, DUT Name, Sniffer Radio, Sniff Duration, SSH Username, SSH Password, and Time Delay (in sec). The 'Station Parameters' panel contains fields for Create Station (checkbox), Type (Static/Dynamic), Station Radio, IP, Netmask, Gateway, SSID, Encryption (WPA2), Password, Channel, and Bandwidth (in MHz). At the bottom right, there are 'Previous' and 'Next' buttons.

### STEP1: TEST PARAMETERS:

**1.Lanforge IP-** The IP address of the management port (eth0) of LANforge on which WebUI is hosted.This field is automatically updated.

Eg: 192.168.200.122

**2.Port-** The Port number on which the LANforge is hosted.

Eg: 8080

**3.Upstream Port-** The ethernet port of LANforge to which the DUT is connected. All the traffic between the LANforge and DUT is passed through Upstream port.

Eg: eth1

**4.HackRF S.No-** HackRF is the **Radar signal generator**.In this field, enter the last 8 digits of the HackRF device.

Eg:25766ec3

**5.HackRF Gain-** The IF(Intermediate Frequency) gain of RF signal in db

Eg: 47

**6.DUT Name-** The user configurable name of the Device Under Test.The same name is printed on the Test Report.There should be no spaces in the DUT name

**7.Sniffer Radio-** Phy name of the LANforge Radio on which monitor interface is created and sniffing is done to check for CSA frames during Detection Probability Test.

\*Need to enter 1.1. before the Phy name.

Eg: 1.1.wiphy0

Here 1.1. Is the Resource ID of the Radio in the Port manager.

**Sniffer Radio has to be 5G Radio.**

**8.Sniff Duration:** The duration of sniffing for each trial in secs.

**Default Sniff Duration:** 10 secs

**Min Sniff Duration:** 2 sec

**Max Sniff Duration:** 12 secs

**9.SSH Username-** Username of the LANforge to SSH while running the Test.

**10.SSH Password-** Password of the LANforge to SSH while running the Test.

**11.Time Delay(in sec)-** The sleep time between each trial while running Detection Probability Test.

**\*\*\*Traffic Parameters are enabled only if user selects Create Station Checkbox in Station Parameters \*\*\***

Active User : admin →

**Detection Probability Test** Channel Utilization %

SSH Username: lanforge

SSH Password: lanforge

Time Delay (in sec): 0

Traffic Type: TCP

Traffic Direction: Bi-Directional

Upload Rates (in bps): 0 0

Download Rates (in bps): 0 0

Upstream Min PDU: 1250

Station Min PDU: 1250

**Station Parameters**

Create Station: ☒

Type: ☐ Static ☒ Dynamic

Station Radio: 1.1.wiphy1

IP:

Netmask:

Gateway:

SSID: candelatest

Encryption: WPA2

Password:

**12.Traffic Type-** Select the **TCP or UDP** traffic that has to run between the upstream port and virtual client created on the Station Radio.

**13.Traffic Direction-** Choose the traffic direction from below options

**-Download** (Station receives the data load from AP)

**-Upload** (Station sends data load to the AP)

**-Bidirectional** (Both Station and AP transfers data load to each other)

**14.Upload Rates(bps)-** The Minimum and Maximum Traffic rate sent by Station to the AP in Bits Per Second

**15.Download Rates(bps)-** The minimum and maximum Traffic rates received by Station from the AP in Bits Per Second

**16.Upstream Min PDU-** The minimum size of the Protocol Data Unit(PDU) of the Upstream port.

Eg: 1250 Bytes

**17.Station Min PDU-** The minimum size of Protocol Data Unit(PDU) of traffic running through the Station created from Automation.

Eg: 1250 Bytes

## STEP2: STATION PARAMETERS:

### Create Station:

**CASE-1:** Deselect the Create Station if we don't want to create a virtual station to run traffic while testing. If Create Station is disabled, the Traffic parameters and the Station Parameters get disabled.

The screenshot shows a web interface with two main sections: 'Test Parameters' and 'Station Parameters'. The 'Test Parameters' section includes fields for LANforge IP (192.168.100.221), Port (8080), Upstream Port (eth1), HackRF S.No. (25766ec3), HackRF Gain (47), DUT Name (Test\_AP), Sniffer Radio (1.1.wiphy3), Sniff Duration (1), SSH Username (lanforge), SSH Password (lanforge), and Time Delay (0). The 'Station Parameters' section has a 'Create Station' checkbox which is currently unchecked. Other fields in this section include SSID (candlatest), Channel (123), and Bandwidth (20 MHz).

**CASE-2:** Select the Create Station check box, to create a Station(Virtual Client) and run the UDP or TCP traffic between the Station and Upstream port, user need to enter the Station Parameters.

The screenshot shows the same web interface as before, but with the 'Create Station' checkbox checked. The 'Station Parameters' section is now active and contains fields for Type (Static/Dynamic), Station Radio (1.1.wiphy1), IP, Netmask, Gateway, SSID (candlatest), Encryption (WPA2), Password, and Channel (100). The 'Test Parameters' section also shows additional fields for Traffic Type (TCP), Traffic Direction (Bi-Directional), and Upload/Download Rates (Minimum/Maximum).

### 1.Type- Station IP Address type

**-Static:** User can assign a Static IP address to the Station.



**-Dynamic:** Station gets IP address from the DHCP server.

**2.Station Radio-** The Phy name of LANforge Radio on which a virtual station has to be created.

Eg: 1.1.wiphy2

Here 1.1. Is the Resource ID of the Radio in the Port manager.

**Station Radio has to be a 5G Radio.**

**3.IP-** Static IP Address of the Station.

Eg: 192.168.0.10

**4.Netmask-** Netmask of the Station static IP address

Eg: 255.255.255.0

**5.Gateway-** Station static IP address Gateway

Eg: 192.168.0.1

**6.SSID-** The DUT(AccessPoint) SSID to check for the CSA frames sent by the DUT.

**7.Encryption-** Encryption type of the DUT

-Open

-WPA

-WPA2

-WPA3

**8.Password-** Password of DUT (If encryption type is open, the Password field gets greyed out.)

**9.Channel-** DFS Channel number on which Radar has to be triggered.

**10.Bandwidth(in MHz)-** DFS Channel Bandwidth.



**STEP3:** Click on **Next Button** at the bottom of the page in order to move to the page where we can select the Radar Types for Detection Probability Test.

Test Parameters

LANforge IP: 192.168.200.196

Port: 8080

Upstream Port: eth1

HackRF S.No.: 246bc4c3

HackRF Gain: 47

DUT Name: Test\_AP

Sniffer Radio: 1.1.wiphy0

Sniff Duration: 2

SSH Username: lanforge

Station Parameters

Create Station: ☒

Type: ☐ Static ☒ Dynamic

Station Radio: 1.1.wiphy1

IP:

Netmask:

Gateway:

SSID: candelatest

Encryption: WPA2

Password:

Previous Next

**STEP4:** Choose the Radar types and enter additional Test parameters in the below page.

Detection Probability Test

Test Label: FCC\_test

Enable Traffic ☒

Desired Detection(%): 60

Trials: 30

Shift

Enter the Shift value

Centre Random

Clear

USA

Europe

Japan

Korea

Total Selected: 0

Country Type

Previous Run Test

- 1. Test Label:** The user configurable name given to the test which is displayed on the Test Report
- 2. Enable Traffic:** The Enable Traffic checkbox is automatically selected, if Create Station in Test Parameters is selected and vice versa. The purpose of Enable Traffic is to run the data load through the LANforge between the virtual station and DUT, while the Detection Probability Test is running.

**3. Desired Detection(%):** The percentage of detection probability against which the PASS/FAIL criteria is decided.

**Default value:** 60

**4. Trials:** The number of times each Radar type has to be tested.

**5. Radar Emulation Patterns:**

- **Shift:** User should enter the Frequency Step Value which is taken in MHz.

**If Shift Value is 5MHz,** say centre frequency is  $f_0$ , then radar is emulated at

$f_0$  for trial-1

$f_0+5\text{MHz}$  for trial-2

$f_0-5\text{MHz}$  for trial-3 and this sequence continues until all the trials are completed.

- **Centre:** Radar is emulated at the centre frequency( $f_0$ ) for all the trials.
- **Random:** Radar is emulated at random frequencies in the chosen Bandwidth.

**6. Select Radar Types:**

- **USA** - supports **FCC0 to FCC6**
- **ETSI**- supports **ETSI-0 to ETSI-6**
- **Japan**- supports **Japan-W53-1 to Japan-W53-8** and **Japan-W56-1 to Japan-W56-6**
- **Korea**- supports **Korea-1 to Korea-3**

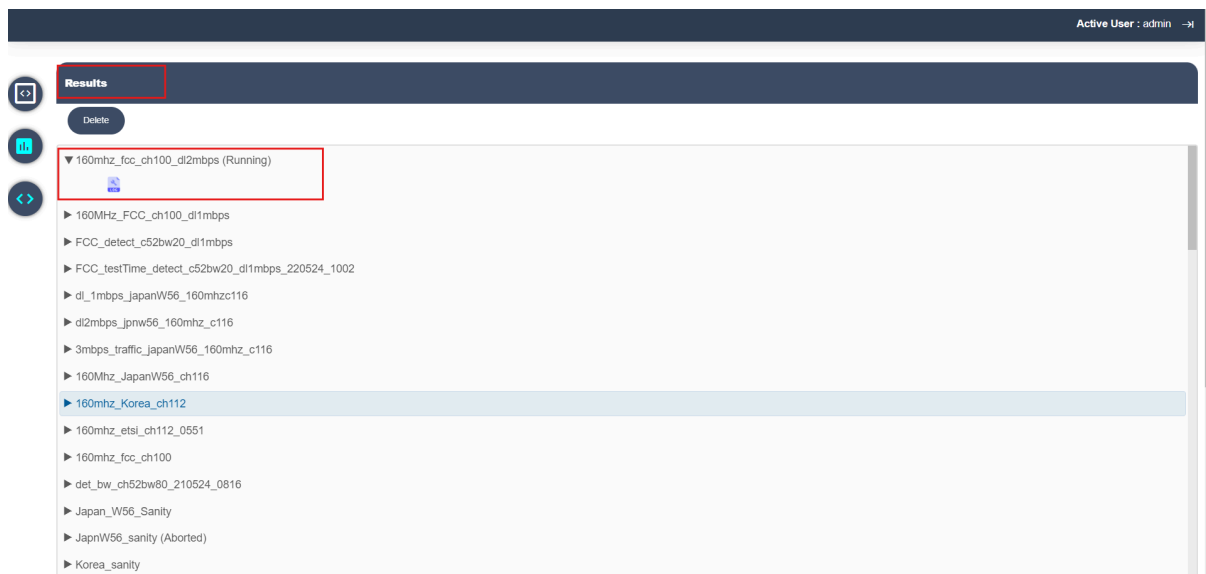
**7. Clear Button:** To clear all the previously selected Radar types.

**8. Total Selected:** This space shows the Country and Radar type of the selected Radar Signals.

**9. Previous Button:** Clicking on this button, navigates the user to the Station and Test Parameters Page of Detection Probability Test.

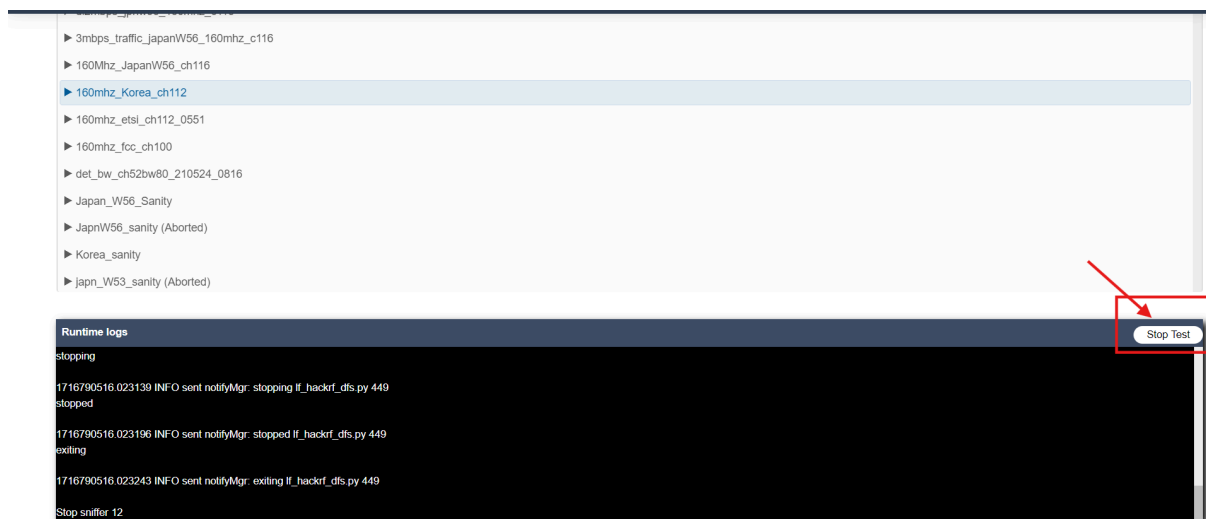
**10. Run Test Button:** Clicking on the Run Test button starts the Detection Probability Test for the selected Radar types and no. of trials.

**STEP 5:** After clicking on **RunTest button** we get navigated to **Results Window**.



- A test instance is created with the user chosen Test Label
- **Test status-** Running
- **Log File:** A text file is created which contains the runtime logs of the test.

**STEP 6:** Clicking on the **Runtime logs tab** on the left side panel navigates to the Runtime Logs Window at the bottom of the page.



- **Stop Test Button:** Clicking on Stop Test button aborts the currently running test.

## TEST-2: CHANNEL UTILIZATION TEST:

Active User: admin

Detection Probability Test Channel Utilization %

**Test Parameters**

LANforge IP: 192.168.100.221

Upstream Port: eth1

Sniffer Radio: 1.1.wiphy0

Traffic Type: TCP

Traffic Direction: Bi-Directional

Upload Rates (in bps): Minimum: 0 Maximum: 0

Download Rates (in bps): Minimum: 0 Maximum: 0

Upstream Min PDU: 1250

Station Min PDU: 1250

Sniff time (in seconds): 15

**Station Parameters**

Station Radio: 1.1.wiphy1

SSID:

Encryption: WPA2

Password:

Channel:

Bandwidth (in MHz): 20

Calculate

### TEST PARAMETERS:

**1.Lanforge IP-** IP address of the Management port of the LANforge(eth0) on which the WebUI is hosted.This field is automatically updated.

Eg:192.168.100.221

**2.Upstream Port-** The ethernet port of LANforge to which AP is connected.All the traffic between the LANforge and AP is passed through Upstream port.

Eg: eth1

**3.Sniffer Radio-** Phy name of the LANforge Radio on which monitor interface is created and sniffing is done .

Eg:1.1.wiphy0

Here, 1.1 is the Resource ID of the radio in the Port Manager

**Sniffer Radio has to be a 5G Radio.**

**4.Traffic Type-** Select the **TCP or UDP** traffic that has to run between the upstream port and the virtual client created on the Station Radio.

**5.Traffic Direction-** Choose the traffic direction from below options

-**Download** (Station receives data load from the AP)

-**Upload** (Station sends data load to the AP)

-**Bidirectional** (Both station and AP transfers data load to each other)

**6.Upload Rates(bps)-** The Minimum and Maximum Traffic rate sent by the Station to the AP in Bits Per Second(BPS)

**7.Download Rates(bps)-** The Minimum and Maximum Traffic rate received by the Station from the AP in Bits Per Second(BPS)

**8.Upstream Min PDU-** The minimum size of Packet Data Unit(PDU) ofcUpstream port

Eg: 1250 Bytes

**9.Station Min PDU-** The minimum size of Packet Data Unit(PDU) of traffic running through the Station created from Automation.

**10.Sniff Time(in seconds):** The duration of sniffing on the user specified sniffer radio.

**Min Sniff Time:** 1 sec

**Default Sniff Time:**15 secs

**Max Sniff Time:** 60 secs

#### **STATION PARAMETERS:**

**11.Station Radio-** The Phy name of LANforge Radio on which a virtual station has to be created.Eg: 1.1.wiphy2

Here, 1.1. Is the Resource ID of the Station radio in the Port Manager.

**Station Radio has to be a 5G Radio.**

**12.SSID-** The SSID of DUT(Access Point)

**13.Encryption-** Encryption type of the DUT

-Open

-WPA

-WPA2

-WPA3

**14.Password-** Password of DUT

**15.Channel-** DFS Channel Number to which the DUT is configured.

**16.Bandwidth(in MHz)-** DFS Channel bandwidth on which the DUT is operating.

**17.Calculate Button:** Clicking on this button checks if all the entered parameters are valid and starts calculating the % of Channel utilization.

#### **CHANNEL UTILIZATION RESULTS:**

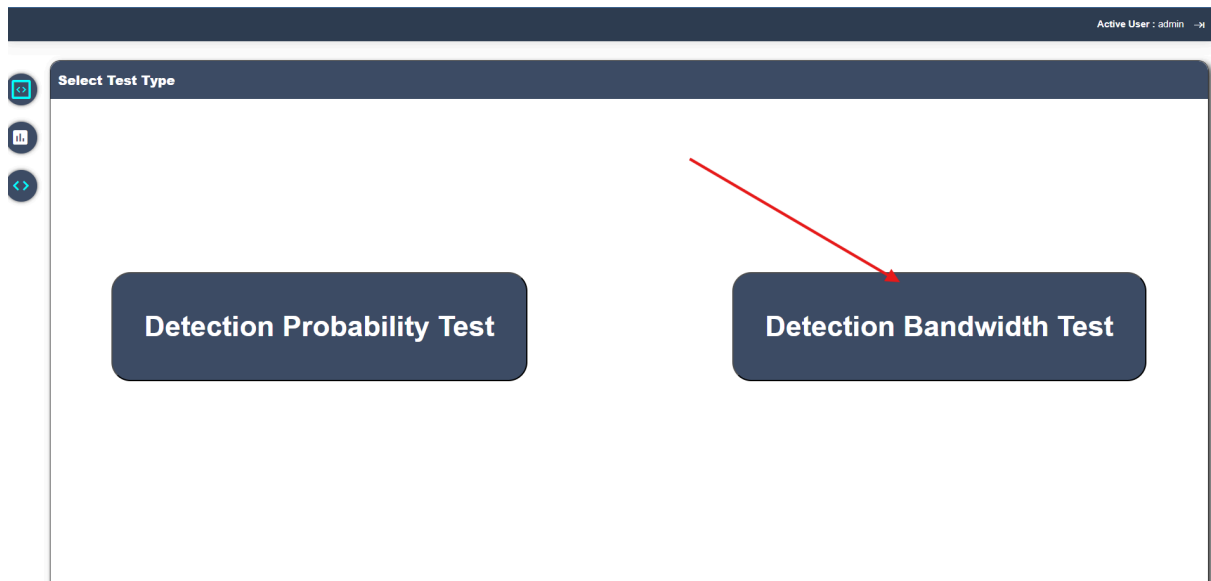
The details of the test and the Results are saved in the Channel Utilization Results table.

As per the FCC specifications, minimum of 17% channel utilization is required for Detection Probability Test.

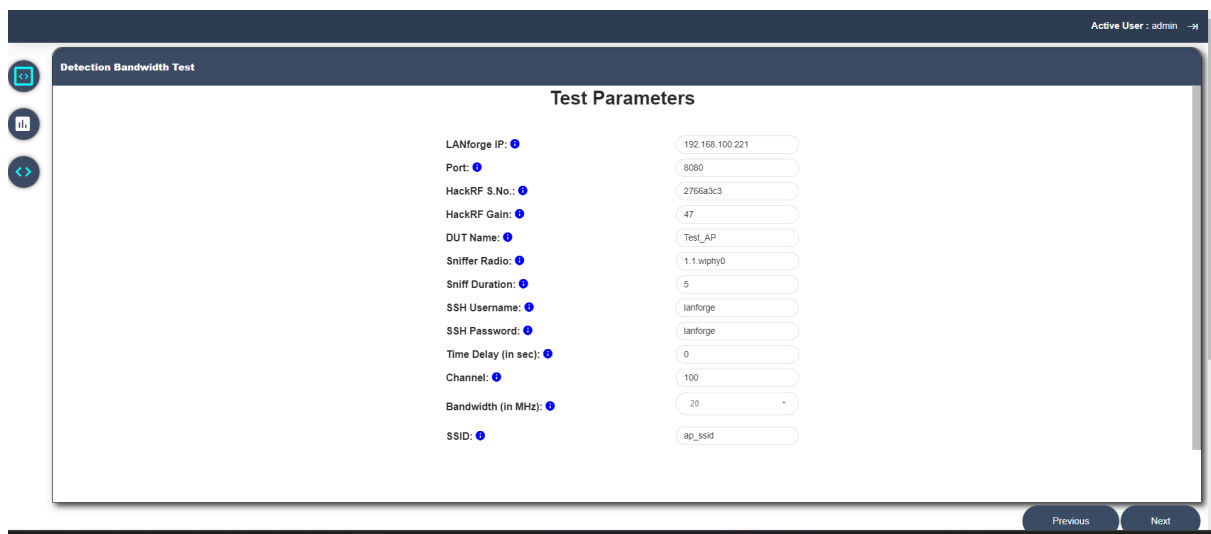
**Red-** If channel utilization % < 17%

Channel Utilization Results																
LANforge IP	Upstream Port	Traffic Type	Traffic Direction	Upload min rate (bps)	Upload max rate (bps)	Download min rate (bps)	Download max rate (bps)	Station Radio	Sniffer Radio	Sniff Time (s)	SSID	Encryption	Channel	Bandwidth	Test Status	Channel Utilization %
192.168.100.221	eth2	If_udp	If_download	0	0	50000000	50000000	1.1.wiphy3	1.1.wiphy3	10	MFG-SGTEST	open	100	40	Completed	0.5237467015857304
192.168.100.221	eth2	If_udp	If_download	0	0	100000000	100000000	1.1.wiphy6	1.1.wiphy6	5	MFG-SGTEST	open	100	160	Completed	0.5237467015857304
192.168.100.221	eth2	If_udp	If_download	0	0	100000000	100000000	1.1.wiphy4	1.1.wiphy4	5	MFG-SGTEST	open	100	160	Completed	0.598077073053000
192.168.100.221	eth1	If_tcp	If_download	0	0	0	0	1.1.wiphy3	1.1.wiphy3	5	MFG-SGTEST	open	100	160	Completed	0.6395259597106235
192.168.100.221	eth2	If_tcp	If_download	0	0	100000000	100000000	1.1.wiphy3	1.1.wiphy3	5	MFG-SGTEST	open	100	160	Completed	

## TEST-3: DETECTION BANDWIDTH TEST :



Step1: Clicking on Detection Bandwidth test button opens the below window



### TEST PARAMETERS:

**1.LANforge IP:** The IP address of the management port(eth0) of LANforge on which WebUI is hosted.This field is automatically updated from WebUI.

Eg: 192.168.100.221

**2.Port:** The port on which LANforge is hosted. By default, LANforge is hosted on 8080.

**3.HackRF S.No:**HackRF device is the **RF signal generator**. The user needs to enter the last 8 digits of HackRF Serial No.



Eg: 25766ec3

**4.HackRF Gain:**The IF(Intermediate Frequency) Gain of the HackRF device.

Eg:47

**5.DUT Name:** The user configurable name of the Device Under Test.The same name is printed on the Test Report.There should be no spaces in the DUT name.

**6.Sniffer Radio:** The Phy name of the LANforge radio on which monitor interface is created and sniffing is done to check for CSA frames during Detection BW Test.

Eg: 1.1.wiphy0

Here, 1.1 is the Resource ID of the Sniffer radio in the port manager.

**7.Sniff Duration:** The duration of sniffing for each trial in secs.

**Min Sniff Duration:** 2 secs

**Default Sniff Duration:** 5 secs

**Max Sniff Duration:** 12 secs

**8.SSH UserName:** Admin UserName of LANforge to SSH while running the Test.

**9.SSH Password:** Admin Password of the LANforge to SSH while running the Test..

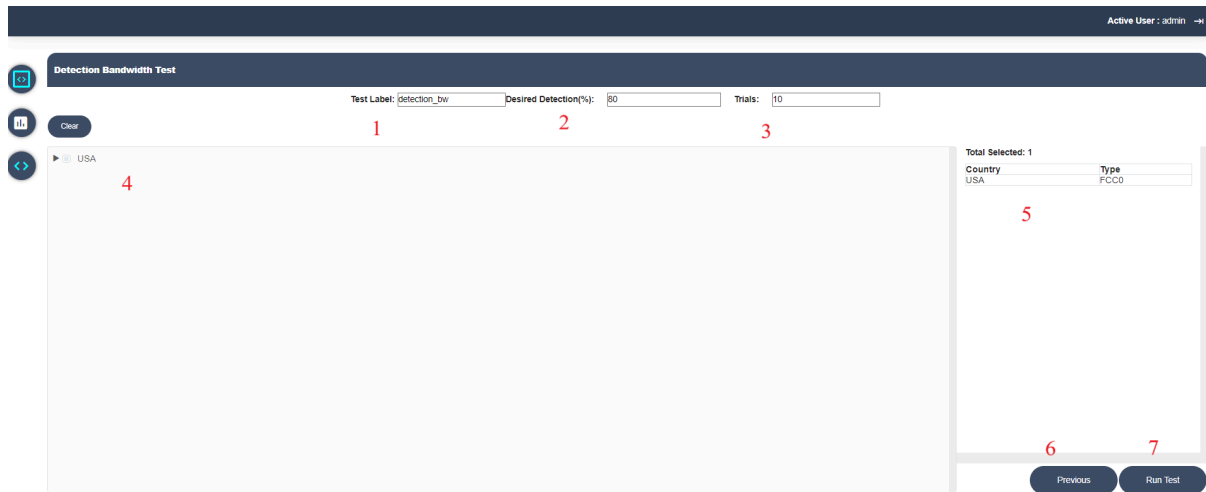
**10.Time Delay(in sec):** The delay to be provided between each trial of the test.

**11.Channel:** AP's operating Channel number to which the Sniffer Radio will be set.

**12.Bandwidth(in MHz):** The Bandwidth across which the Radar is triggered and Detection Bandwidth Test runs.

**13. SSID:** Enter the SSID of the DUT(Access Point).This is needed to check for the CSA frames broadcasted by the DUT while testing.

**Step2:Click on the NEXT button to select add the Test label, Number of trails and test cases.**



Active User : admin

Detection Bandwidth Test

Test Label:  Desired Detection(%):  Trials:

Clear

USA

Total Selected: 1

Country	Type
USA	FCC0

Previous Run Test

**1.Test Label:**The user configurable name given to the test which is displayed on the Test Report.Test Label should not have spaces in between.

**2.Desired Detection(%)**:The percentage of detection against which the PASS/FAIL criteria is decided.

Default value: 80

**3.Trials:** The number of trials the test has to run.

#### **4.USA - FCC0**

As per FCC standard, Detection Bandwidth test is tested only for radar type FCC0.

**5.Total Selected:** Displays country and type of selected Radar type.

**6.Previous Button:** Navigates the user to Test parameters Page of Detection Bandwidth test

**7.RunTest:** Click on RunTest button to run the Detection Bandwidth Test.