DYNAMIC FREQUENCY SELECTION TEST

PREPARED FOR

Netgear

PREPARED BY

Candela India Pvt Ltd

EXECUTIVE SUMMARY

The DFS Test is designed to test the Performance of the Netgear Access Point.Dynamic frequency selection is a technology that is designed to ensure that wireless devices operating in the unlicensed WLAN 5 GHz bands are able to detect when they may be interfering with military and weather radar systems and automatically switch over to another frequency where they will not cause any disturbance.

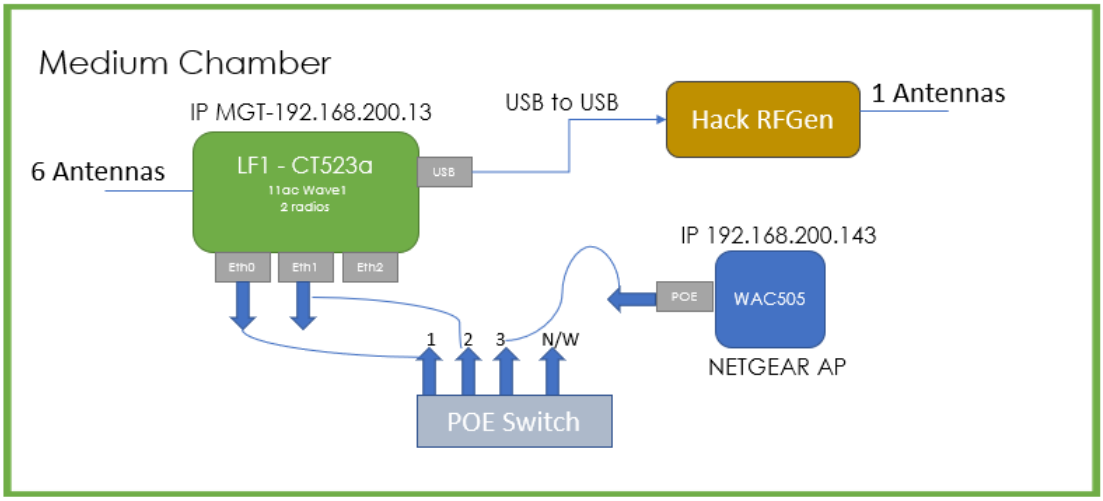
Netgear Scripting Project:

[07-03-2021]]

1. Project Overview

The DFS Test is designed to test the Performance of the Netgear Access Point.Dynamic frequency selection is a technology that is designed to ensure that wireless devices operating in the unlicensed WLAN 5 GHz bands are able to detect when they may be interfering with military and weather radar systems and automatically switch over to another frequency where they will not cause any disturbance.

2. Test Plan

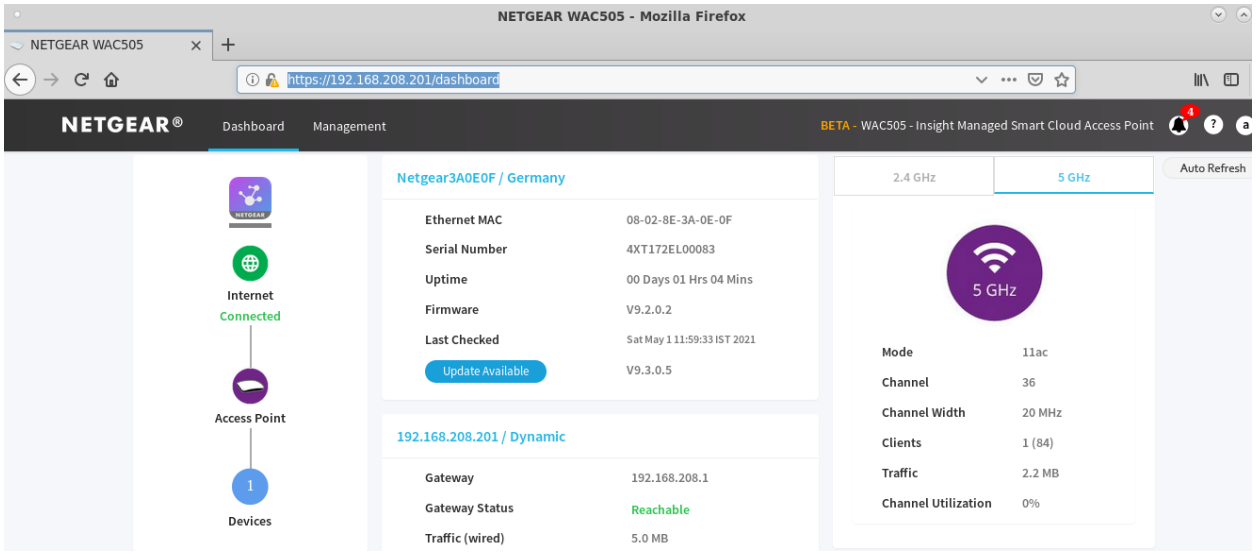


3. Settings Required

AP settings required are :-

1- ssh should be enabled in access point you can check it through following way :-

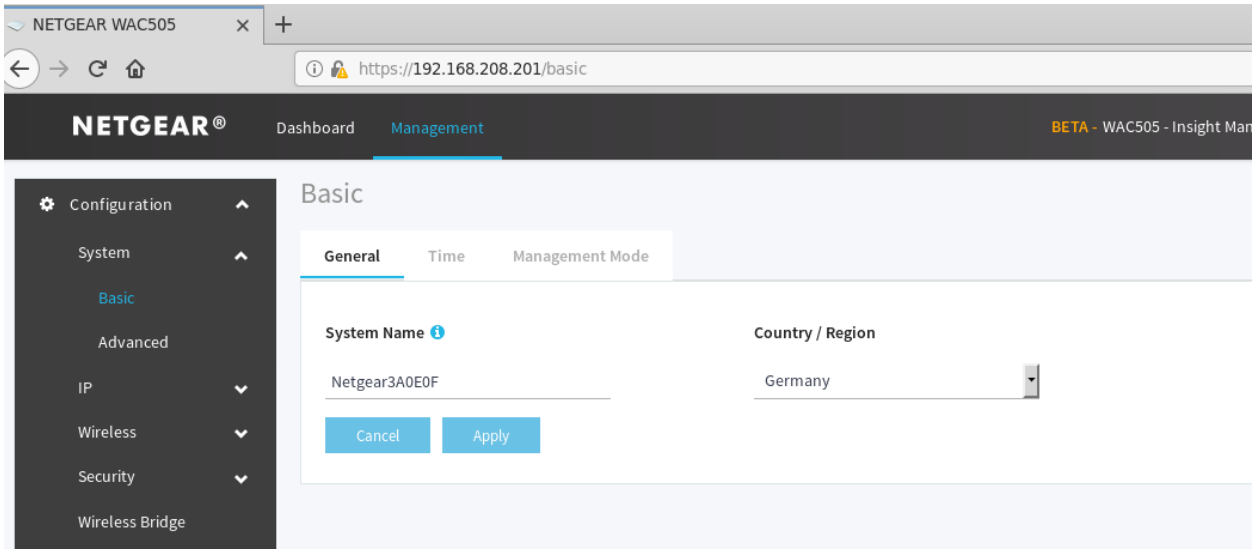
- Open AP cloud controller on firefox
- Eg - my AP ip is 192.168.208.201



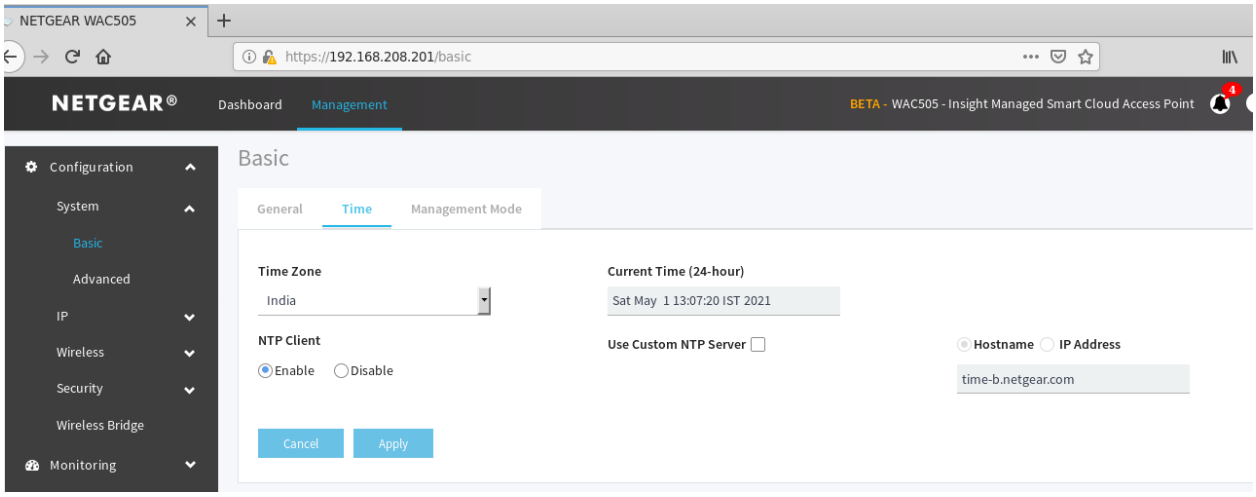
- Check for ap_ip/advanced_debugging.html then enable ssh for it

2- Go to Management → configuration → Basic and check for country region

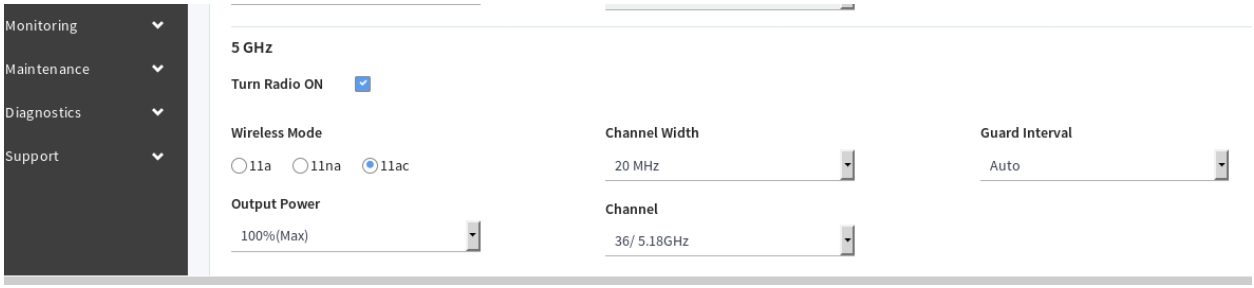
- Set it to Germany



3- Change the time zone to India

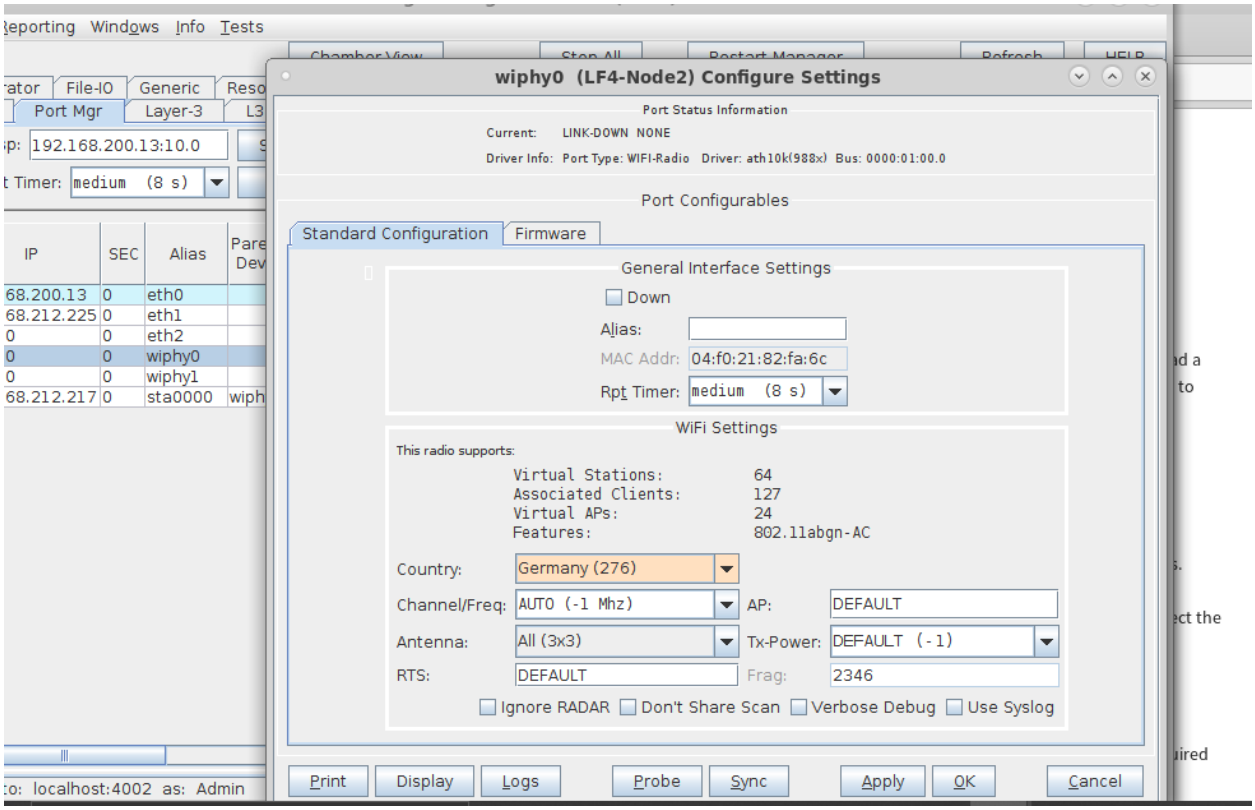


4- Make sure that the operating channel bandwidth is 20MHZ

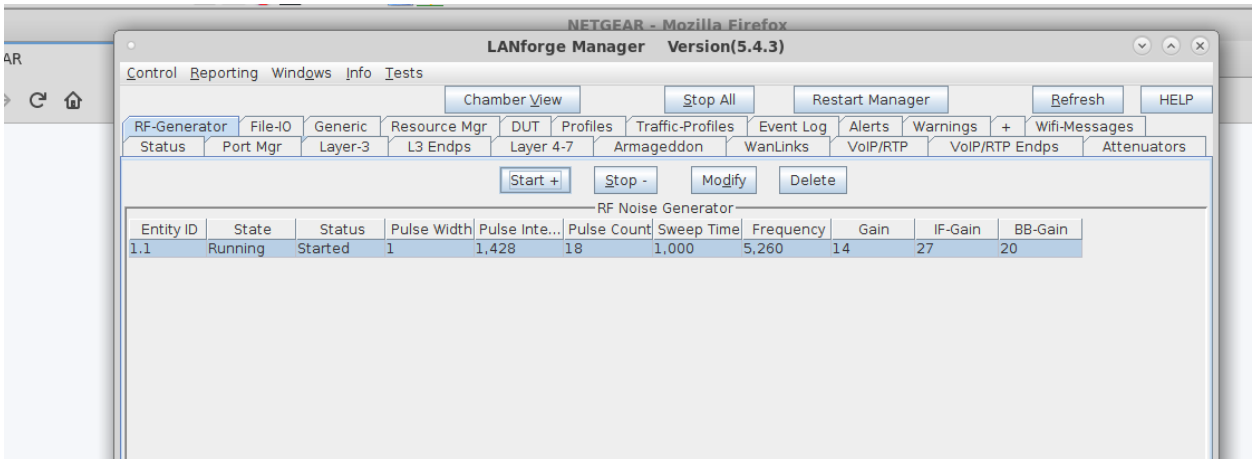


LANforge related settings required:

1- check if the LANforge machine you are working on is having IST time zone
2- make the radio Country region on LANforge Manager to Germany so that it can detect radar



3- make sure that the Hackrf unit connected to LANforge is working manually



4- All set to run the script.

3. How to use Script ?

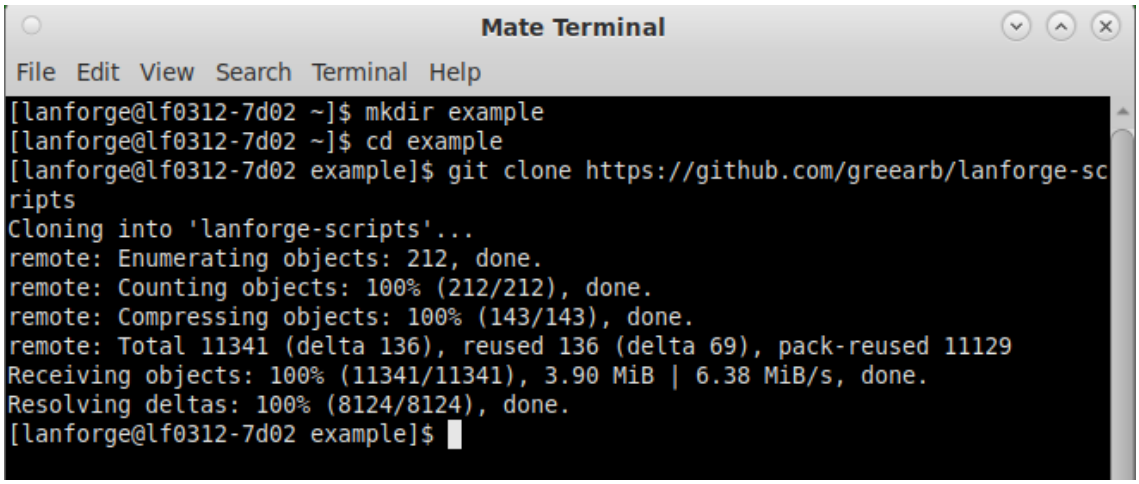
1. Create a directory to your LANforge

   Eg - mkdir example

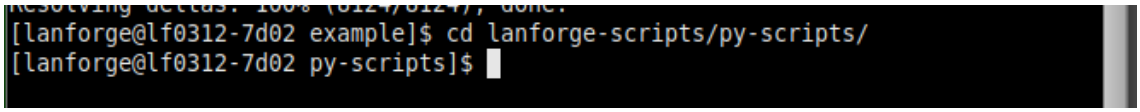
2. Change the directory

   ~ cd example

3. Git clone the LANforge scripts from - https://github.com/greearb/lanforge-scripts



4. Go to the directory where you need to execute your lf_dfs.py



5. If lf_dfs.py is not present in py-scripts you need to copy the file to the

   Directory - vim lf_dfs.py

   ~paste the code

   ~ then save and exit

6. If html_template.py not present in py-scripts you need to copy html_template.py there for report generation - follow same as above
7. If station_layer3 not present in py-scripts you need to copy station_layer3.py there for report generation - follow same as above
8. **Cli used to run script** :-

~ sudo python3 **lf_dfs.py** **-i** 192.168.208.28 **-u** root **-p** Password@123xzsawq@! **-mgr** localhost **-s** ssid **-pwd** [BLANK] **-sec** open **-rad** wiphy3 **-upstream** eth1 **-m** tri band **--fcctypes** FCC0 **--channel** 52

Here :-

-i - Ap ip address.

-u - username for ssh always uses root

-p - ssh password required.

-mgr - LANforge ip address usually localhost.

-s - ssid used to connect wireless clients.

-pwd - Passkey used for security.

-sec - security type.

-rad - radio on which you want wireless clients to be connected.

-upstream - upstream port like eth1/eth2.

-m - model type which AP model you want to perform a test on please mention in terms of two categories as "**dual"** or **"tri band"**.

--fcctypes - enter all the radar types you want to perform test on by default it will take

FCC0 FCC1 FCC2 FCC3 FCC4 FCC5 ETSI1 ETSI2 ETSI3 ETSI4 ETSI5 ETSI6

-channel - you can provide all the dfs channel you want to perform test on by default it will take all dfs channels as

52 56 60 64 100 104 112 116 120 124 128 132 136 140

9- After execution of script results can be seen on the html-reports directory

`~ /home/lanforge/html-reports

Log files can be seen in DFS_log folder as per execution time and date.

Pdf report and html reports can be found inside dfs folder as per execution date and time.

4. Results

Dynamic Frequency Selection

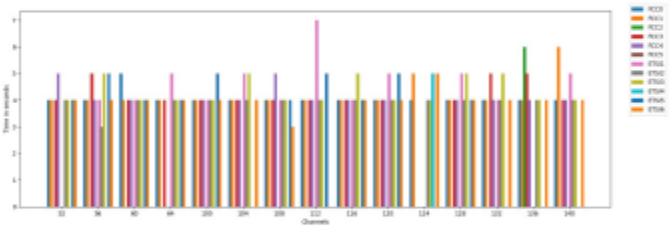
2021-02-18-10:26:13

Test Setup Information		
Device Under Test	AP Name	WAC505
	SSID	TestAP22
	Number of Stations	1
	Test Duration	17:14:08

Objective

The DFS Test is designed to test the Performance of the Netgear Access Point.Dynamic frequency selection is a technology that is designed to ensure that wireless devices operating in the unlicensed WLAN 5 GHz bands are able to detect when they may be interfering with military and weather radar systems and automatically switch over to another frequency where they will not cause any disturbance.

Detection Time Graph



Radar Detection Detail

This Table will give you results in YES or NO if the AP detects the Radar and 'N/A' - When channel never set in AP

Radar Detected															
	52	56	60	64	100	104	108	112	116	120	124	128	132	136	140
FCC0	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
FCC1	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
FCC2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
FCC3	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
FCC4	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
FCC5	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
ETSI1	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	NO	YES
ETSI2	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
ETSI3	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
ETSI4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
ETSI5	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	NO	YES	NO	NO	NO
ETSI6	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES

Client Connection Details

This Table will give you results in seconds which is measured value of the time taken by the client to connect and generate traffic after Radar detection 'N/A' - when you cannot set a channel in AP and connect time is not applicable '-' when radar is not detected 'X' - when radar detected but channel not switched

Client Connection Time (sec)																
	52	56	60	64	100	104	108	112	116	120	124	128	132	136	140
FCC0	65	65	66	0	621	0	614	614	0	66	619	65	0	66	0
FCC1	65	67	615	0	614	0	73	66	618	80	73	0	0	66	613
FCC2	-	-	-	-	-	-	-	-	-	-	-	-	-	66	-
FCC3	612	66	0	66	65	0	67	619	621	0	-	67	0	0	0
FCC4	73	0	623	-	0	74	0	0	66	65	-	74	73	0	73
FCC5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ETSI1	-	622	73	65	621	74	66	0	66	0	-	615	0	-	66
ETSI2	73	0	72	66	65	620	620	0	65	66	73	74	66	0	66
ETSI3	614	0	73	0	619	615	65	73	65	621	66	65	66	0	73
ETSI4	-	-	-	-	-	-	-	-	-	-	606	-	-	-	-
ETSI5	74	67	0	73	612	-	0	0	0	67	-	65	-	-	-
ETSI6	67	73	73	66	72	0	620	-	0	65	65	65	66	66	66

Detection Time Details

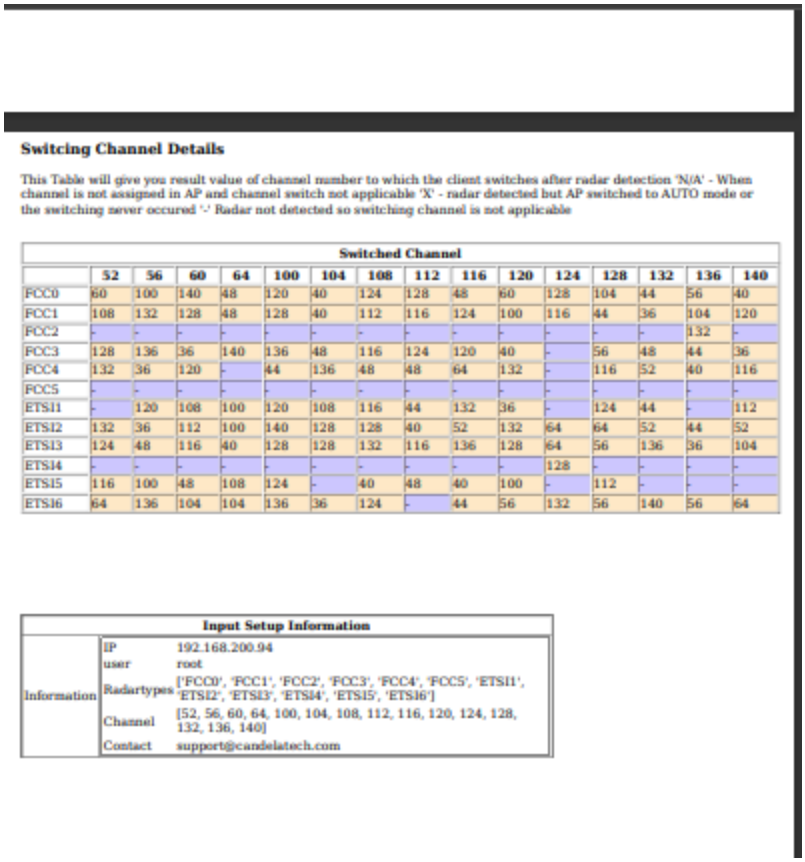
This Table will give you results in seconds which is measured value of the time difference when the radar was sent and detected

Detection Time (sec)															
	52	56	60	64	100	104	108	112	116	120	124	128	132	136	140
FCC0	4	4	5	4	4	4	4	4	4	4	4	4	4	4	4
FCC1	4	4	4	4	4	4	4	4	4	4	5	4	4	4	6
FCC2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
FCC3	4	5	4	4	4	4	4	4	4	4	0	4	5	5	4
FCC4	5	4	4	0	4	4	5	4	4	4	0	4	4	4	4
FCC5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ETSI1	0	4	4	5	4	5	4	7	4	5	0	5	4	0	5
ETSI2	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4
ETSI3	4	5	4	4	4	5	4	4	5	4	4	5	5	4	4
ETSI4	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0
ETSI5	4	5	4	4	5	0	4	5	4	5	0	4	0	0	0
ETSI6	4	4	4	4	4	4	3	0	4	4	5	4	4	4	4

Switcing Channel Details

This Table will give you result value of channel number to which the client switches after radar detection 'N/A' - When channel is not assigned in AP and channel switch not applicable 'X' - radar detected but AP switched to AUTO mode or the switching never occured '-' Radar not detected so switching channel is not applicable

Switched Channel															
	52	56	60	64	100	104	108	112	116	120	124	128	132	136	140
FCC0	60	100	140	48	120	40	124	128	48	60	128	104	44	56	40
FCC1	108	132	128	48	128	40	112	116	124	100	116	44	36	104	120



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FCC0	60	100	140	48	120	40	124	128	48	60	128	104	44	56	40
FCC1	108	132	128	48	128	40	112	116	124	100	116	44	36	104	120
FCC2	-	-	-	-	-	-	-	-	-	-	-	-	-	132	-
FCC3	128	136	36	140	136	48	116	124	120	40	-	56	48	44	36
FCC4	132	36	120	-	44	136	48	48	64	132	-	116	52	40	116
FCC5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ETSI1	-	120	108	100	120	108	116	44	132	36	-	124	44	-	112
ETSI2	132	36	112	100	140	128	128	40	52	132	64	64	52	44	52
ETSI3	124	48	116	40	128	128	132	116	136	128	64	56	136	36	104
ETSI4	-	-	-	-	-	-	-	-	-	-	128	-	-	-	-
ETSI5	116	100	48	108	124	-	40	48	40	100	-	112	-	-	-
ETSI6	64	136	104	104	136	36	124	-	44	56	132	56	140	56	64

Input Setup Information		
Information	IP	192.168.200.94
	user	root
	Radartypes	['FCC0', 'FCC1', 'FCC2', 'FCC3', 'FCC4', 'FCC5', 'ETSI1', 'ETSI2', 'ETSI3', 'ETSI4', 'ETSI5', 'ETSI6']
	Channel	[52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140]
	Contact	support@candelatech.com

5. Contact

Visit - https://www.candelatech.com/

For any support related help contact - support@candelatech.com