

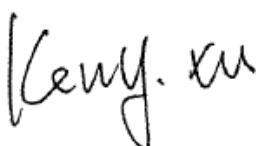
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TEST REPORT

Application No.: SZEM2006004502CR
Applicant: BTI Wireless
Address of Applicant: 6185 Phyllis Drive #D, Cypress, California 90630, United States
Manufacturer: Bravo Tech Inc
Address of Manufacturer: 14600 INDUSTRY CIRCLE LA MIRADA, CA 90638
Factory: Bravo Tech Inc
Address of Factory: 14600 INDUSTRY CIRCLE LA MIRADA, CA 90638
Equipment Under Test (EUT):
EUT Name: LTE Outdoor CPE
Model No.: CP880-B
FCC ID: WBKCP880-B
Standard(s) : CBRSA-TS-9001-V1.0.0
WINNF-19-IN-00033 V1.0
WINNF-TS-0122-V1.0.0
FCC 47 CFR Part 96
KDB 940660 D01
KDB 940660 D02
Date of Receipt: 2020-06-02
Date of Test: 2020-07-06 to 2020-07-13
Date of Issue: 2020-07-16

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



Keny Xu
EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-07-16		Original

Authorized for issue by:			
		 _____ Jacky Li /Project Engineer	
		 _____ Eric Fu /Reviewer	

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2 Test Summary

Item	Standard	Test Case ID	Result
Multi-Step registration	WINNF-TS-0122-V1.0.0	WINNF.FT.C.REG.1	Pass
Single-Step registration for CBSD with CPI signed data	WINNF-TS-0122-V1.0.0	WINNF.FT.C.REG.5	Pass
Missing Required parameters (responseCode 102)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.REG.8	Pass
Pending registration (responseCode 200)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.REG.10	Pass
Invalid parameter (responseCode 103)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.REG.12	Pass
Blacklisted CBSD (responseCode 101)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.REG.14	Pass
Unsupported SAS protocol version (responseCode 100)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.REG.16	Pass
Group Error (responseCode 201)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.REG.18	Pass
Unsuccessful Grant responseCode=400 (INTERFERENCE)	WINNF-TS-0122-V1.0.0	WINNF.FT.D.GRA.1	Pass
Unsuccessful Grant responseCode=401 (GRANT_CONFLICT)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.GRA.2	Pass
Heartbeat Success Case (first Heartbeat Response)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.HBT.1	Pass
Heartbeat responseCode=105 (DEREGISTER)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.HBT.3	Pass
Heartbeat responseCode=500 (TERMINATED_GRANT)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.HBT.4	Pass
Heartbeat responseCode=501 (SUSPENDED_GRANT) in First Heartbeat Response	WINNF-TS-0122-V1.0.0	WINNF.FT.C.HBT.5	Pass
Heartbeat responseCode=501 (SUSPENDED_GRANT) in Subsequent Heartbeat Response	WINNF-TS-0122-V1.0.0	WINNF.FT.C.HBT.6	Pass
Heartbeat responseCode=502 (UNSYNC_OP_PARAM)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.HBT.7	Pass
Heartbeat Response Absent (First Heartbeat)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.HBT.9	Pass
Heartbeat Response Absent (Subsequent Heartbeat)	WINNF-TS-0122-V1.0.0	WINNF.FT.C.HBT.10	Pass
Successful Grant Renewal in Heartbeat Test Case	WINNF-TS-0122-V1.0.0	WINNF.FT.C.HBT.11	Pass

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Item	Standard	Test Case ID	Result
Grant Response contains measReportConfig	WINNF-TS-0122-V1.0.0	WINNF.FT.C.MES.3	Pass
Heartbeat Response contains measReportConfig	WINNF-TS-0122-V1.0.0	WINNF.FT.C.MES.4	Pass
Successful Relinquishment	WINNF-TS-0122-V1.0.0	WINNF.FT.C.RLQ.1	Pass
Unsuccessful Relinquishment, responseCode=102	WINNF-TS-0122-V1.0.0	WINNF.FT.C.RLQ.3	Pass
Unsuccessful Relinquishment, responseCode=103	WINNF-TS-0122-V1.0.0	WINNF.FT.C.RLQ.5	Pass
Successful Deregistration	WINNF-TS-0122-V1.0.0	WINNF.FT.C.DRG.1	Pass
Deregistration responseCode=102	WINNF-TS-0122-V1.0.0	WINNF.FT.C.DRG.3	Pass
Deregistration responseCode=103	WINNF-TS-0122-V1.0.0	WINNF.FT.C.DRG.5	Pass
Successful TLS connection between UUT and SAS Test Harness	WINNF-TS-0122-V1.0.0	WINNF.FT.C.SCS.1	Pass
TLS failure due to revoked certificate	WINNF-TS-0122-V1.0.0	WINNF.FT.C.SCS.2	Pass
TLS failure due to expired server certificate	WINNF-TS-0122-V1.0.0	WINNF.FT.C.SCS.3	Pass
TLS failure when SAS Test Harness certificate is issued by unknown CA	WINNF-TS-0122-V1.0.0	WINNF.FT.C.SCS.4	Pass
TLS failure when certificate at the SAS Test Harness is corrupted	WINNF-TS-0122-V1.0.0	WINNF.FT.C.SCS.5	Pass
UUT RF Transmit Power Measurement	WINNF-TS-0122-V1.0.0	WINNF.PT.C.HBT	Pass
SAS Version: 1.0.0.3			

The UUT is a CPE-CBSD product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

CBRSA-TS-9001-V1.0.0

CBRS Alliance Certification Test Plan

WINNF-TS-0122-V1.0.0

Test and Certification for Citizens Broadband Radio Service (CBRS); Conformance and Performance Test Technical Specification; CBSD/DP as Unit Under Test (UUT)

WINNF-19-IN-00033 V1.0

CBRS CPE-CBSD as UUT Test Guidelines

KDB 940660 D01 Part 96 CBRS Eqpt v02

KDB 940660 D02 CPE-CBSD Handshake Procedures v02

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4 General Information

4.1 Details of E.U.T.

Power supply:	Adapter Model NO.: ASSA107A-240050 Input: 100-240V~50/60Hz, 0.45A Output: 24.0V, 0.5A POE Model NO.: GRT-HCQ-1000
Cable:	DC cable: 148cm unshielded
Sample Type:	Fixed device
CBSD Class:	B(Outdoor CPE)
Transmitter Frequency Band:	LTE Band 48
Transmitter Frequency Range:	3550~3700MHz
Hardware Version:	CW1202_V2.0
Software Version:	MG12_0.3.3.8_V1.0-CBSD-STD
Test sample:	1257019260400202(S/N)
Antenna Gain:	14 dBi

4.2 Description of CBSD/DP Support Features

Condition	Feature Description	Supported
C1	Mandatory for UUT which supports multi-step registration message.	Y
C2	Mandatory for UUT which supports single-step registration with no CPI-signed data in the registration message. By definition, this is a subset of Category A devices which determine all registration information, including location, without CPI intervention.	N
C3	Mandatory for UUT which supports single-step registration containing CPI-signed data in the registration message.	Y
C4	Mandatory for UUT which supports RECEIVED_POWER_WITHOUT_GRANT measurement report type.	N
C5	Mandatory for UUT which supports RECEIVED_POWER_WITH_GRANT measurement report type.	Y
C6	Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration.	N

Y: Supported

N: Not supported

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4.3 Summary of Test Results

WINNF-TS-0122			
Classes	Test Case Items	Pass Items	Pass Rate (%)
FT (CBSD, DP/CBSD)	32	32	100
PT (CBSD, DP/CBSD)	1	1	100
Total	33	33	100

Note:

1. Functional Test (FT): Test to validate the conformance of the Protocols and functionalities implemented in the CBSD/DP UUT to the requirements developed by WINNForum and supporting FCC/DoD requirements.
2. Field/Performance Test (PT): Test to check the capability of the CBSD/DP UUT to support various traffic models and actual operations in the field.

Duration and Duty Cycle		
Period	Limit	Test Result
10-second	1-second	Pass
300-second	10-second	Pass
3600-second	20-second	Pass

Note: Limited in duration and duty cycle to the minimum time necessary to get a grant from the SAS.

This time should not exceed 1 second within any 10-second period, 10seconds within any 300-second period, or 20 seconds within any 3600-second period.

4.4 Modification Record

1. The Pass/Fail criteria "UUT shall not transmit RF" is replaced by "CPE-CBSD UUT shall not transmit user traffic".
2. The Pass/Fail criteria "UUT shall stop transmission" is replaced by CPE-CBSD UUT shall stop transmitting user traffic"

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4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	RF conducted power	$\pm 0.75\text{dB}$
3	Temperature test	$\pm 1\text{ }^{\circ}\text{C}$
4	Humidity test	$\pm 3\%$
5	Supply voltages	$\pm 1.5\%$
6	Time	$\pm 3\%$

4.6 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
EPC	Lanner Electronics Inc.	LICA-1513A	LR202002004052
Router	TP-LINK	TL-R860+	1175379002425
Base station	Baicells	mBS105 (FCC ID: 2AG32MBS110596)	120200007219BSP0001

4.7 Test Location

All tests were performed at:

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No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

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5 Equipment List

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Laptop (With SAS Test harness)	Lenovo	Pro-13API 2019	REF. No.SEA1800	/	/
Spectrum Analyzer	R&S	FSP	SEM004-06	2019-09-24	2020-09-23
Spectrum Analyzer	Keysight	N9020A	SEM004-17	2020-05-21	2021-05-20
Shield Room	SAEMC	MSR433	SEM001-11	2018-03-13	2021-03-12
Coaxial Cable	SGS	N/A	SEM031-01	2019-07-11 2020-07-11	2020-07-10 2021-07-10
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2019-09-27	2020-09-26

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6 Test Method and Environment

6.1 CBSD/DP Conformance and Performance

Test Requirement: CBRS CBSD Test Specification WINNF-TS-0122-V1.0.0
Test Method: CBRS CBSD Test Specification WINNF-TS-0122-V1.0.0
WINNF-IN-0156_WInnForum_SAS_Test_Harness_CBSD_UUT_Tutorial_v1_0_0_1

6.2 CPE-CBSD Handshake Procedures

Test Requirement: KDB 940660 D02 CPE-CBSD Handshake Procedures v02
Test Method: WINNF-19-IN-00033 V1.0
KDB 940660 D02 CPE-CBSD Handshake Procedures v02

6.3 CBSD Test Procedure

- Connect the UUT to SAS Test Harness system and RF Test instruments via the CBSD interface and RF components. The highest level is set to test configuration.
- UUT shall be UTC time synchronized
- The frequency band is granted and set as UUT supported Modulation and Channels, transmitted power of the UUT according to it granted parameters from the SAS Test Harness.
- Each test case results was recorded and validated by SAS Test Harness system and RF instruments test cases was recorded test results from SAS Test Harness system.

6.4 Duration and Duty Cycle Measurement

The CPE-CBSD shall validate and ensure that limited in duration and duty cycle to the minimum time necessary to get a grant from the SAS.

6.5 Duration and Duty Cycle Test Procedure

- CPE-CBSD as UUT does not receive any RF signal from its "Compatible BTS-CBSD" (FCC ID: 2AG32MBS110596), so CPE-CBSD as UUT does not transmit. UUT shall be UTC time synchronized.
- Use the WinnForum SAS Harness #1 for CPE-CBSD as UUT and run test case WINNF.FT.C.GRA.1 for CPE-CBSD as UUT.
- CPE-CBSD as UUT starts to receive the RF signal from its "Compatible BTS-CBSD", so CPE-CBSD can start communicating with the WinnForum SAS Harness #1. Make note of the time when RF Test equipment logs the first transmission from CPE-CBSD which is above 23dBm/10MHz – this is the start time of the {X time out of Y time}.
- When the test case WINNF.FT.C.GRA.1 finishes and the questions appear on the WinnForum SAS Harness #1 console, do NOT answer the questions. Wait until Y time has passed from step #3. During this Y time, the RF test equipment is logging the amount of time CPE-CBSD as UUT transmitted EiRP above 23dBm/10MHz. The amount of time logged for transmitting EIRP above 23dBm/10MHz is the X time.
- Answer the questions on the WinnForum SAS Harness #1 console so the WinnForum SAS Harness #1 is ready for the next test.

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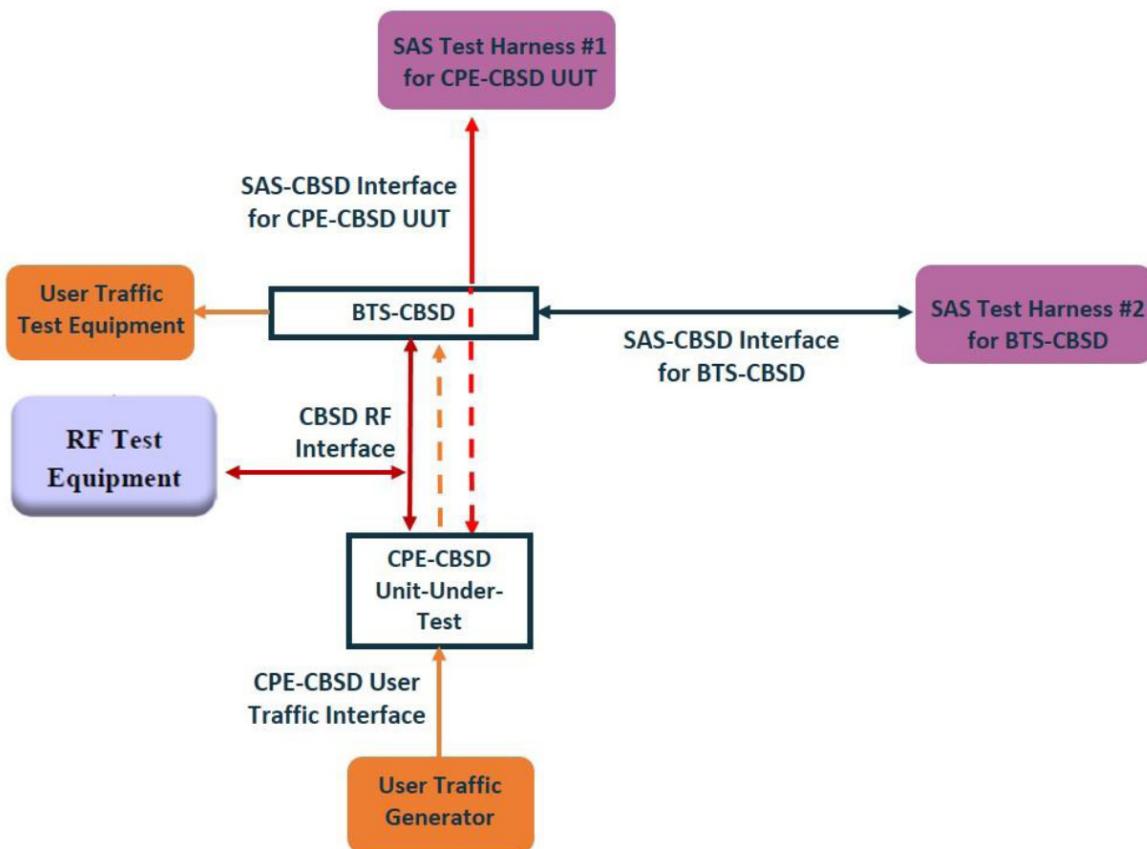


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6.6 Test Environment

Test Harness Version: V1.0.0.3
Operating System: Microsoft Windows 10
TLS Version: 1.2
Python Version: 2.7.13
Environmental Conditions: 25deg. C, 65%RH
Input Power: 120Vac, 60Hz

6.7 Test Setup



CPE-CBSD as UUT, BTS-CBSD direct communication without Domain Proxy

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7 Test Data

7.1 CBSD Registration Process

7.1.1 WINNF.FT.C.REG.1

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness● UUT is in the Unregistered state	--	--
2	CBSD sends correct Registration request information, as specified in [n.5], to the SAS Test Harness: <ul style="list-style-type: none">● The required userId, fcId and cbsdSerialNumber registration parameters shall be sent from the CBSD and conform to proper format and acceptable ranges.● Any REG-conditional or optional registration parameters that may be included in the message shall be verified that they conform to proper format and are within acceptable ranges. <p>Note: It is outside the scope of this document to test the Registration information that is supplied via another means.</p>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<ul style="list-style-type: none">● SAS Test Harness sends a CBSD Registration Response as follows:<ul style="list-style-type: none">- cbsdId = C- measReportConfig shall not be included- responseCode = 0	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none">● UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.1.2 WINNF.FT.C.REG.5

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT is in the Unregistered state● All of the required and REG-Conditional parameters shall be configured and CPI signature provided	--	--
2	CBSD sends Registration request to the SAS Test Harness: <ul style="list-style-type: none">● The required userId, fcId and cbidSerialNumber and REG-Conditional cbidCategory, airInterface, measCapability and cpiSignatureData registration parameters shall be sent from the CBSD and conform to proper format and acceptable ranges.● Any optional registration parameters that may be included in the message shall be verified that they conform to proper format and are within acceptable ranges.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<ul style="list-style-type: none">● SAS Test Harness sends a CBSD Registration Response as follows:<ul style="list-style-type: none">- cbidId = C- measReportConfig shall not be included.- responseCode = 0	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none">● UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.1.3 WINNF.FT.C.REG.8

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT is in the Unregistered state	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none">- SAS response does not include cbsdId- responseCode = R	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none">● UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.1.4 WINNF.FT.C.REG.10

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT is in the Unregistered state	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none">- SAS response does not include cbsdId- responseCode = R	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=200) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.1.5 WINNF.FT.C.REG.12

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT is in the Unregistered state	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none">- SAS response does not include cbsdId- responseCode = R	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=103) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.1.6 WINNF.FT.C.REG.14

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT is in the Unregistered state	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none">- SAS response does not include cbsdId- responseCode = R	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=101) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.1.7 WINNF.FT.C.REG.16

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT is in the Unregistered state	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none">- SAS response does not include cbsdId- responseCode = R	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=100) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.1.8 WINNF.FT.C.REG.18

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT is in the Unregistered state	--	--
2	CBSD sends a Registration request to SAS Test Harness.	--	--
3	SAS Test Harness rejects the request by sending a CBSD Registration Response as follows: <ul style="list-style-type: none">- SAS response does not include cbsdId- responseCode = R	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=201) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.2 CBSD Spectrum Grant Process**7.2.1 WINNF.FT.C.GRA.1**

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: ● UUT has registered successfully with SAS Test Harness, with cbsdId = C	--	--
2	UUT sends valid Grant Request.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	SAS Test Harness sends a Grant Response message, including ● cbsdId=C - responseCode = R	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: ● UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

7.2.2 WINNF.FT.C.GRA.2

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: ● UUT has registered successfully with SAS Test Harness, with cbsdId = C	--	--
2	UUT sends valid Grant Request.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	SAS Test Harness sends a Grant Response message, including - cbsdId=C - responseCode = R	--	--
4	After completion of step 3, SAS Test Harness will not provide any positive response (responseCode=401) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: ● UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.3 CBSD HeartBeat Process**7.3.1 WINNF.FT.C.HBT.1**

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: ● UUT has registered successfully with SAS Test Harness, with cbsdId = C	--	--
2	UUT sends a message: ● If message is type Spectrum Inquiry Request, go to step 3, or ● If message is type Grant Request, go to step 5	--	--
3	UUT sends Spectrum Inquiry Request. Validate: ● cbsdId = C ● List of frequencyRange objects sent by UUT are within the CBRS frequency range	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	SAS Test Harness sends a Spectrum Inquiry Response message, including the following parameters: ● cbsdId = C ● availableChannel is an array of availableChannel objects ● responseCode = 0	--	--
5	UUT sends Grant Request message. Validate: ● cbsdId = C ● maxEIRP is at or below the limit appropriate for CBSD category as defined by Part 96 ● operationFrequencyRange, F, sent by UUT is a valid range within the CBRS band	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
6	SAS Test Harness sends a Grant Response message, including the parameters: ● cbsdId = C ● grantId = G = a valid grant ID ● grantExpireTime = UTC time greater than duration of the test ● responseCode = 0	--	--
7	UUT sends a first Heartbeat Request message. Verify Heartbeat Request message is formatted correctly, including: ● cbsdId = C ● grantId = G ● operationState = "GRANTED"	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
8	SAS Test Harness sends a Heartbeat Response message, with the following parameters: ● cbsdId = C ● grantId = G ● transmitExpireTime = current UTC time + 200 seconds ● responseCode = 0	--	--

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	For further Heartbeat Request messages sent from UUT after completion of step 8, validate message is sent within latest specified heartbeatInterval, and: <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● operationState = "AUTHORIZED" 		
9	and SAS Test Harness responds with a Heartbeat Response message including the following parameters: <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● transmitExpireTime = current UTC time + 200 seconds ● responseCode = 0 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
10	Monitor the RF output of the UUT from start of test until UUT transmission commences. Verify: <ul style="list-style-type: none"> ● UUT does not transmit at any time prior to completion of the first heartbeat response ● UUT transmits after step 8 is complete, and its transmission is limited to within the bandwidth range F. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

7.3.2 WINNF.FT.C.HBT.3

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
2	UUT sends a Heartbeat Request message. Ensure Heartbeat Request message is sent within Heartbeat Interval specified in the latest Heartbeat Response, and formatted correctly, including: <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● operationState = "AUTHORIZED" 	--	--
3	SAS Test Harness sends a Heartbeat Response message, including the following parameters: <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● transmitExpireTime = T = Current UTC time ● responseCode = 105 (DEREGISTER) 	--	--
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	Monitor the RF output of the UUT. Verify: <ul style="list-style-type: none"> ● UUT shall stop transmission within (T + 60 seconds) of completion of step 3 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.3.3 WINNF.FT.C.HBT.4

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <p>Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● operationState = "AUTHORIZED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● transmitExpireTime = T = current UTC time ● responseCode = 500 (TERMINATED_GRANT) 	--	--
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	<p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> ● UUT shall stop transmission within (T + 60 seconds) of completion of step 3 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.3.4 WINNF.FT.C.HBT.5

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in GRANTED, but not AUTHORIZED state (i.e. has not performed its first Heartbeat Request) 	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <p>Verify Heartbeat Request message is formatted correctly, including:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "GRANTED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● transmitExpireTime = T = current UTC time ● ?responseCode = 501 (SUSPENDED_GRANT) 	--	--
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	<p>Monitor the SAS-CBSD interface. Verify either A OR B occurs:</p> <p>A. UUT sends a Heartbeat Request message. Ensure message is sent within latest specified heartbeatInterval, and is correctly formatted with parameters:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "GRANTED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
	<p>B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters:</p> <ul style="list-style-type: none"> ● cbdsId = C ● grantId = G <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> ● UUT does not transmit at any time 		

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7.3.5 WINNF.FT.C.HBT.6

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <p>Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> cbsdId = C grantId = G transmitExpireTime = T = current UTC time ● responseCode = 501 (SUSPENDED_GRANT) 	--	--
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	<p>Monitor the SAS-CBSD interface. Verify either A OR B occurs:</p> <p>A. UUT sends a Heartbeat Request message. Ensure message is sent within latest specified heartbeatInterval, and is correctly formatted with parameters:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "GRANTED" <p>B. UUT sends a Relinquishment request message. Ensure message is correctly formatted with parameters:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> ● UUT shall stop transmission within (T+60) seconds of completion of step 3 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.3.6 WINNF.FT.C.HBT.7

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsdId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <p>Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "AUTHORIZED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> cbsdId = C grantId = G transmitExpireTime = T = current UTC time ● responseCode = 502 (UNSYNC_OP_PARAM) 	--	--
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	<p>Monitor the SAS-CBSD interface. Verify:</p> <ul style="list-style-type: none"> ● UUT sends a Grant Relinquishment Request message. Verify message is correctly formatted with parameters: <ul style="list-style-type: none"> ○ cbsdId = C ○ grantId = G <p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> ● UUT shall stop transmission within (T+60) seconds of completion of step 3 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.3.7 WINNF.FT.C.HBT.9

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none">● UUT has registered successfully with SAS Test Harness● UUT has a valid single grant as follows:<ul style="list-style-type: none">○ valid cbsId = C○ valid grantId = G○ grant is for frequency range F, power P○ grantExpireTime = UTC time greater than duration of the test● UUT is in GRANTED, but not AUTHORIZED state(i.e. has not performed its first Heartbeat Request)	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <p>Ensure Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none">● cbsId = C● grantId = G● operationState = "GRANTED"	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>After completion of step 2, SAS Test Harness does not respond to any further</p> <ul style="list-style-type: none">● messages from UUT to simulate loss of network connection	--	--
4	<p>Monitor the RF output of the UUT from start of test to 60 seconds after step 3. Verify:</p> <ul style="list-style-type: none">At any time during the test, UUT shall not transmit on RF interface	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.3.8 WINNF.FT.C.HBT.10

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsId = C ○ valid grantId = G ○ grant is for frequency range F, power P ○ grantExpireTime = UTC time greater than duration of the test ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface 	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <p>Verify Heartbeat Request message is sent within latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● operationState = "AUTHORIZED" 	■ Pass	□ Fail
3	<p>SAS Test Harness sends a Heartbeat Response message, including the following parameters:</p> <ul style="list-style-type: none"> cbsId = C grantId = G transmitExpireTime = T = current UTC time + 200 seconds ● responseCode = 0 	--	--
4	After completion of step 3, SAS Test Harness shall not allow any further grants to the UUT.	--	--
5	<p>Monitor the RF output of the UUT. Verify:</p> <ul style="list-style-type: none"> ● UUT shall stop all transmission on RF interface within (transmitExpireTime + 60 seconds), using the transmitExpireTime sent in Step 3. 	■ Pass	□ Fail

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7.3.9 WINNF.FT.C.HBT.11

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has registered successfully with SAS Test Harness ● UUT has a valid single grant as follows: <ul style="list-style-type: none"> ○ valid cbsId = C ○ valid grantId = G ○ grant is for frequency range F, power P ● UUT is in AUTHORIZED state and is transmitting within the grant bandwidth F on RF interface. ● Grant has the following parameters at the start of the test: <ul style="list-style-type: none"> ○ grantExpireTime = UTC time equal to time at start of test + 300 seconds = Tgrant_expire ○ transmitExpireTime = UTC time equal to time at start of test + 200 seconds ○ heartbeatInterval = 60 seconds 	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <ul style="list-style-type: none"> ● If Heartbeat Request message contains grantRenew = TRUE, go to Step 6, else go to Step 3. 	--	--
3	<p>Verify Heartbeat Request message is sent within the latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● operationState = "AUTHORIZED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	<p>SAS Test Harness sends a Heartbeat Response message, with the following parameters:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● transmitExpireTime = current UTC + 200 seconds ● grantExpireTime = same as Step 1 ● responseCode = 0 	--	--
5	Go to Step 2	--	--
6	<p>Verify Heartbeat Request message is sent within the latest specified heartbeatInterval, and is formatted correctly, including:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● operationState = "AUTHORIZED" ● grantRenew = TRUE 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
7	<p>SAS Test Harness sends a Heartbeat Response message, with the following parameters:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● grantExpireTime = UTC time set far in the future ● transmitExpireTime = current UTC time + 200 seconds ● responseCode = 0 	--	--

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8	Continue to respond to any subsequent Heartbeat Request from CBSD with Heartbeat Response with the following parameters: ● cbsdId = C ● grantId = G ● transmitExpireTime = same as Step 7 ● responseCode = 0	--	--
9	Monitor RF transmission of UUT from start of test until Tgrant_expire + 60 seconds and ensure UUT continues to transmit throughout the time period.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.4 CBSD Measurement Report

7.4.1 WINNF.FT.C.MES.3

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT has successfully registered with SAS Test Harness, with cbsdId=C and measCapability = "RECEIVED_POWER_WITH_GRANT" 	--	--
2	<p>UUT sends a Grant Request message.</p> <p>Verify Grant Request message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> ● cbsdId = C ● operationParam is present and format is valid 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>SAS Test Harness sends a Grant Response message, with the following parameters:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G = valid grant ID ● grantExpireTime = UTC time in the future ● heartbeatInterval = 60 seconds ● measReportConfig= "RECEIVED_POWER_WITH_GRANT" ● operationParam is set to valid operating parameters ● channelType = "GAA" ● responseCode = 0 	--	--
4	<p>UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● operationState = "GRANTED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
5	<p>If Heartbeat Request message (step 4) contains measReport object, then:</p> <ul style="list-style-type: none"> ● verify measReport is properly formatted as object rcvdPowerMeasReport ● end test, with PASS result <p>else, if Heartbeat Request message (step 4) does not contain measReport object, then:</p> <ul style="list-style-type: none"> ● If number of Heartbeat Requests sent by UUT after Step 3 is = 5, then stop test with result of FAIL 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
6	<p>SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G ● transmitExpireTime = current UTC time + 200 seconds ● responseCode = 0 <p>Go to Step 4, above</p>	--	--

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7.4.2 WINNF.FT.C.MES.4

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT has successfully registered with SAS Test Harness, with cbsId=C and measCapability = "RECEIVED_POWER_WITH_GRANT" ● UUT has received a valid grant with grantId = G ● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. ● Grant has heartbeatInterval = 60 seconds 	--	--
2	<p>UUT sends a Heartbeat Request message.</p> <p>Verify Heartbeat Request message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● operationState = "AUTHORIZED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● measReportConfig= "RECEIVED_POWER_WITH_GRANT" ● responseCode = 0 	--	--
4	<p>UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● operationState = "AUTHORIZED" 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
5	<p>If Heartbeat Request message (step 4) contains measReport object, then:</p> <ul style="list-style-type: none"> ● verify measReport is properly formatted as object rcvdPowerMeasReport ● end test, with PASS result <p>else, if Heartbeat Request message (step 4) does not contain measReport object, then:</p> <ul style="list-style-type: none"> ● If number of Heartbeat Requests sent by UUT after Step 3 is = 5, then stop test with result of FAIL 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
6	<p>SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> ● cbsId = C ● grantId = G ● responseCode = 0 <p>Go to Step 4, above</p>	--	--

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7.5 CBSD Relinquishment Process

7.5.1 WINNF.FT.C.RLQ.1

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT has successfully registered with SAS Test Harness, with cbsdId=C● UUT has received a valid grant with grantId = G● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p>	--	--
2	<p>UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none">● cbsdId = C● grantId = G	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>SAS Test Harness shall approve the request with a Relinquishment Response message with parameters:</p> <ul style="list-style-type: none">- cbsdId = C- grantId = G● responseCode = 0	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT</p>	--	--
5	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none">● UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.5.2 WINNF.FT.C.RLQ.3

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT has successfully registered with SAS Test Harness, with cbsdId=C ● UUT has received a valid grant with grantId = G ● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p>	--	--
2	<p>UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none"> ● cbsdId = C ● grantId = G 	--	--
3	<p>SAS Test Harness shall approve the request with a Relinquishment Response message with parameters:</p> <ul style="list-style-type: none"> - cbsdId = C - No grantId - responseCode = R 	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any additional positive</p> <ul style="list-style-type: none"> ● response (responseCode=0) to further request messages from the UUT 	--	--
5	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> ● UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.5.3 WINNF.FT.C.RLQ.5

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT has successfully registered with SAS Test Harness, with cbsdId=C● UUT has received a valid grant with grantId = G● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <p>Invoke trigger to relinquish UUT Grant from the SAS Test Harness</p>	--	--
2	<p>UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically:</p> <ul style="list-style-type: none">● cbsdId = C● grantId = G	--	--
3	<p>SAS Test Harness shall approve the request with a Relinquishment Response message with parameters:</p> <ul style="list-style-type: none">- cbsdId = C- responseCode = 103- responseData = "grantId"	--	--
4	<p>After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT</p>	--	--
5	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none">● UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.6 CBSD Deregistration Process

7.6.1 WINNF.FT.C.DRG.1

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness● UUT has successfully registered with SAS Test Harness, with cbsdId=C● UUT has received a valid grant with grantId = G● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <p>Invoke trigger to deregister UUT from the SAS Test Harness</p>	--	--
2	<p>UUT sends a Relinquishment request and receives Relinquishment response with</p> <ul style="list-style-type: none">● responseCode=0	--	--
3	<p>● UUT sends Deregistration Request to SAS Test Harness with cbsdId = C.</p>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	<p>SAS Test Harness shall approve the request with a Deregistration Response message with parameters:</p> <ul style="list-style-type: none">● cbsdId = C● responseCode = 0	--	--
5	<p>After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT.</p>	--	--
6	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 4 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none">● UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs:<ol style="list-style-type: none">UUT sending a Registration Request message, as this is not mandatoryUUT sending a Deregistration Request message	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.6.2 WINNF.FT.C.DRG.3

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT has successfully registered with SAS Test Harness, with cbsdId=C ● UUT has received a valid grant with grantId = G ● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <p>Invoke trigger to deregister UUT from the SAS Test Harness</p>	--	--
2	<p>UUT sends a Relinquishment request and receives Relinquishment response with</p> <ul style="list-style-type: none"> ● responseCode=0 	--	--
3	<ul style="list-style-type: none"> ● UUT sends Deregistration Request to SAS Test Harness with cbsdId = C. 		
4	<p>SAS Test Harness shall approve the request with a Deregistration Response message with parameters:</p> <ul style="list-style-type: none"> ● No cbsdId ● responseCode = 102 	--	--
5	<p>After completion of step 3, SAS Test Harness will not provide any additional positive</p> <ul style="list-style-type: none"> ● response (responseCode=0) to further request messages from the UUT. 	--	--
6	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 4 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> ● UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: <p>A. UUT sending a Registration Request message, as this is not mandatory</p> <p>B. UUT sending a Deregistration Request message</p>	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.6.3 WINNF.FT.C.DRG.5

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> ● UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness ● UUT has successfully registered with SAS Test Harness, with cbsdId=C ● UUT has received a valid grant with grantId = G ● UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant. <p>Invoke trigger to deregister UUT from the SAS Test Harness</p>	--	--
2	<p>UUT sends a Relinquishment request and receives Relinquishment response with</p> <ul style="list-style-type: none"> ● responseCode=0 	--	--
3	<p>● UUT sends Deregistration Request to SAS Test Harness with cbsdId = C.</p>		
4	<p>SAS Test Harness shall approve the request with a Deregistration Response message with parameters:</p> <ul style="list-style-type: none"> ● responseCode = 103 ● responseData = "cbsdId" 	--	--
5	<p>After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT.</p>	--	--
6	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 4 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> ● UUT stopped RF transmission at any time between triggering the deregistration and either A OR B occurs: <ul style="list-style-type: none"> A. UUT sending a Registration Request message, as this is not mandatory B. UUT sending a Deregistration Request message 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.7 CBSD Security Validation**7.7.1 WINNF.FT.C.SCS.1**

#	Test Execution Steps	Results	
1	<ul style="list-style-type: none"> ● UUT shall start CBSD-SAS communication with the security procedure ● The UUT shall establish a TLS handshake with the SAS Test Harness using configured certificate. ● Configure the SAS Test Harness to accept the security procedure and establish the connection 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
2	<ul style="list-style-type: none"> ● Make sure that Mutual authentication happens between UUT and the SAS Test Harness. ● Make sure that UUT uses TLS v1.2 ● Make sure that cipher suites from one of the following is selected, <ul style="list-style-type: none"> ● TLS_RSA_WITH_AES_128_GCM_SHA256 ● TLS_RSA_WITH_AES_256_GCM_SHA384 ● TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 ● TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 ● TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<p>A successful registration is accomplished using one of the test cases described in section 6.1.4.1, depending on CBSD capability.</p> <ul style="list-style-type: none"> ● UUT sends a registration request to the SAS Test Harness and the SAS Test Harness sends a Registration Response with responseCode = 0 and cbsdId. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> ● UUT shall not transmit RF 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

7.7.2 WINNF.FT.C.SCS.2

#	Test Execution Steps	Results	
1	<ul style="list-style-type: none"> ● UUT shall start CBSD-SAS communication with the security procedures 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
2	<ul style="list-style-type: none"> ● Make sure that UUT uses TLS v1.2 for security establishment. ● Make sure UUT selects the correct cipher suite. ● UUT shall use CRL or OCSP to verify the validity of the server certificate. ● Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<ul style="list-style-type: none"> ● UUT may retry for the security procedure which shall fail. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	<ul style="list-style-type: none"> ● SAS Test-Harness shall not receive any Registration request or any application data. 	--	--
5	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> ● UUT shall not transmit RF 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.7.3 WINNF.FT.C.SCS.3

#	Test Execution Steps	Results	
1	<ul style="list-style-type: none"> ● UUT shall start CBSD-SAS communication with the security procedures 	■ Pass	□ Fail
2	<ul style="list-style-type: none"> ● Make sure that UUT uses TLS v1.2 for security establishment. ● Make sure UUT selects the correct cipher suite. ● UUT shall use CRL or OCSP to verify the validity of the server certificate. ● Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	■ Pass	□ Fail
3	<ul style="list-style-type: none"> ● UUT may retry for the security procedure which shall fail. 	■ Pass	□ Fail
4	<ul style="list-style-type: none"> ● SAS Test-Harness shall not receive any Registration request or any application data. 	--	--
5	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> ● UUT shall not transmit RF 	■ Pass	□ Fail

7.7.4 WINNF.FT.C.SCS.4

#	Test Execution Steps	Results	
1	<ul style="list-style-type: none"> ● UUT shall start CBSD-SAS communication with the security procedures 	■ Pass	□ Fail
2	<ul style="list-style-type: none"> ● Make sure that UUT uses TLS v1.2 for security establishment. ● Make sure UUT selects the correct cipher suite. ● UUT shall use CRL or OCSP to verify the validity of the server certificate ● Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness. 	■ Pass	□ Fail
3	<ul style="list-style-type: none"> ● UUT may retry for the security procedure which shall fail. 	■ Pass	□ Fail
4	<ul style="list-style-type: none"> ● SAS Test-Harness shall not receive any Registration request or any application data. 	--	--
5	<p>Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify:</p> <ul style="list-style-type: none"> ● UUT shall not transmit RF 	■ Pass	□ Fail

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7.7.5 WINNF.FT.C.SCS.5

#	Test Execution Steps	Results	
1	<ul style="list-style-type: none">● UUT shall start CBSD-SAS communication with the security procedures	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
2	<ul style="list-style-type: none">● Make sure that UUT uses TLS v1.2 for security establishment.● Make sure UUT selects the correct cipher suite.● UUT shall use CRL or OCSP to verify the validity of the server certificate● Make sure that Mutual authentication does not happen between UUT and the SAS Test Harness.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
3	<ul style="list-style-type: none">● UUT may retry for the security procedure which shall fail.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
4	<ul style="list-style-type: none">● SAS Test-Harness shall not receive any Registration request or any application data.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none">● UUT shall not transmit RF	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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7.8 CBSD RF Power Measurement**7.8.1 WINNF.PT.C.HBT.1**

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none">● UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness● UUT has registered with the SAS, with CBSD ID = C● UUT has a single valid grant G with parameters {lowFrequency = FL, highFrequency = FH, maxEirp = Pi}, with grant in AUTHORIZED state, and grantExpireTime set to a value far past the duration of this test case● Note: in order for the UUT to request a grant with the parameters {lowFrequency, highFrequency, maxEirp}, the SAS Test Harness may need to provide appropriate guidance in the availableChannel object of the spectrumInquiry response message, and the operationParam object of the grant response message. Alternately, the UUT vendor may provide the ability to set those parameters on the UUT so that the UUT will request a grant with those parameters	--	--
2	<p>UUT and SAS Test Harness perform a series of Heartbeat Request/Response cycles, which continues until the other test steps are complete. Messaging for each cycle is as follows:</p> <ul style="list-style-type: none">● UUT sends Heartbeat Request, including:<ul style="list-style-type: none">○ cbsdId = C○ grantId = G● SAS Test Harness responds with Heartbeat Response, including:<ul style="list-style-type: none">○ cbsdId = C○ grantId = G○ transmitExpireTime = current UTC time + 200 seconds● responseCode = 0	--	--
3	<p>Tester performs power measurement on RF interface(s) of UUT, and verifies it complies with the maxEirp setting, Pi. The RF measurement method is out of scope of this document, but may include additional configuration of the UUT, as required, to fulfill the requirements of the power measurement method.</p> <ul style="list-style-type: none">● Note: it may be required for the vendor to provide a method or configuration to bring the UUT to a mode which is required by the measurement methodology. Any such mode is vendor-specific and depends upon UUT behavior and the measurement methodology.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

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RF measurement plot for Test Case :

- Tester performs power measurement on RF interface(s) of UUT, and verifies it complies with the maxEirp setting, Pi. The RF measurement method is out of scope of this document, but may include additional configuration of the UUT, as required, to fulfill the requirements of the power measurement method.

Channel	Freq. (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
		Ant. 1		
Low	3560	22.58	23	Pass
Low	3560	34.43	37	Pass



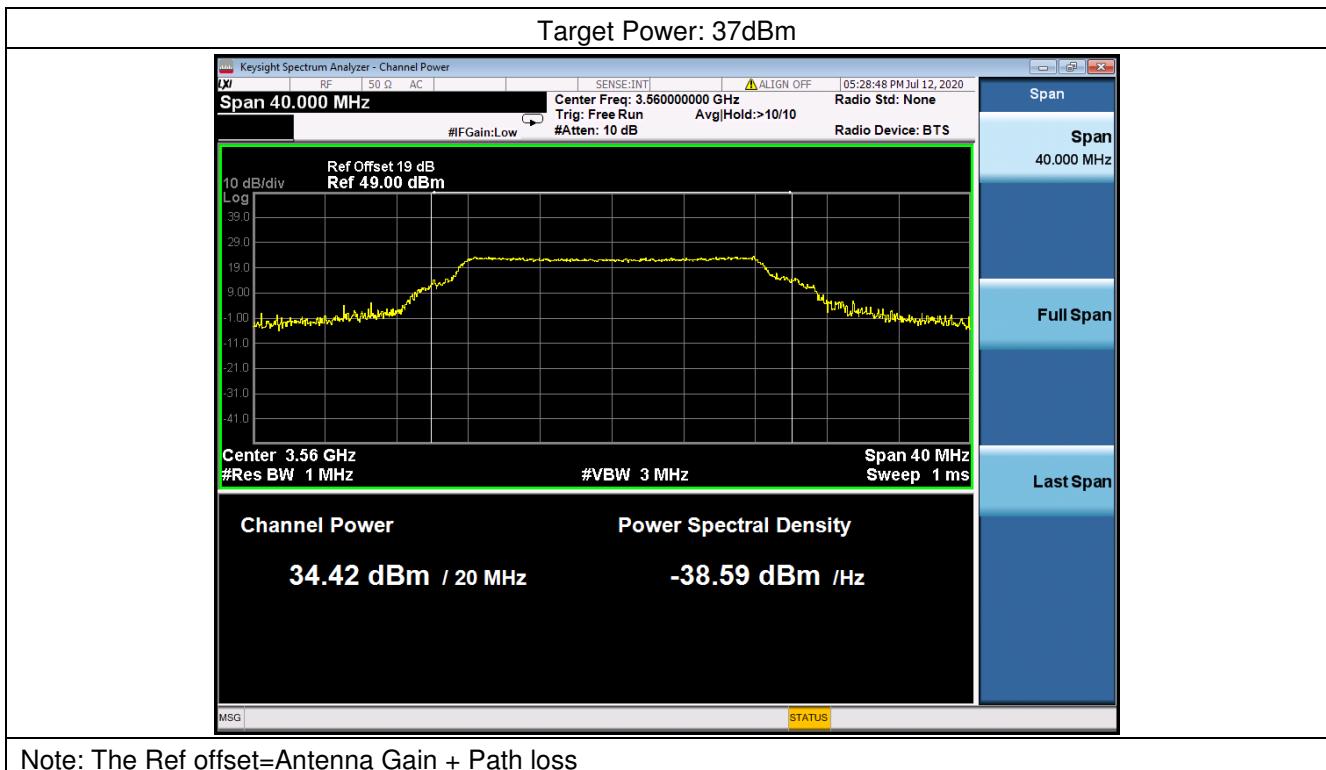
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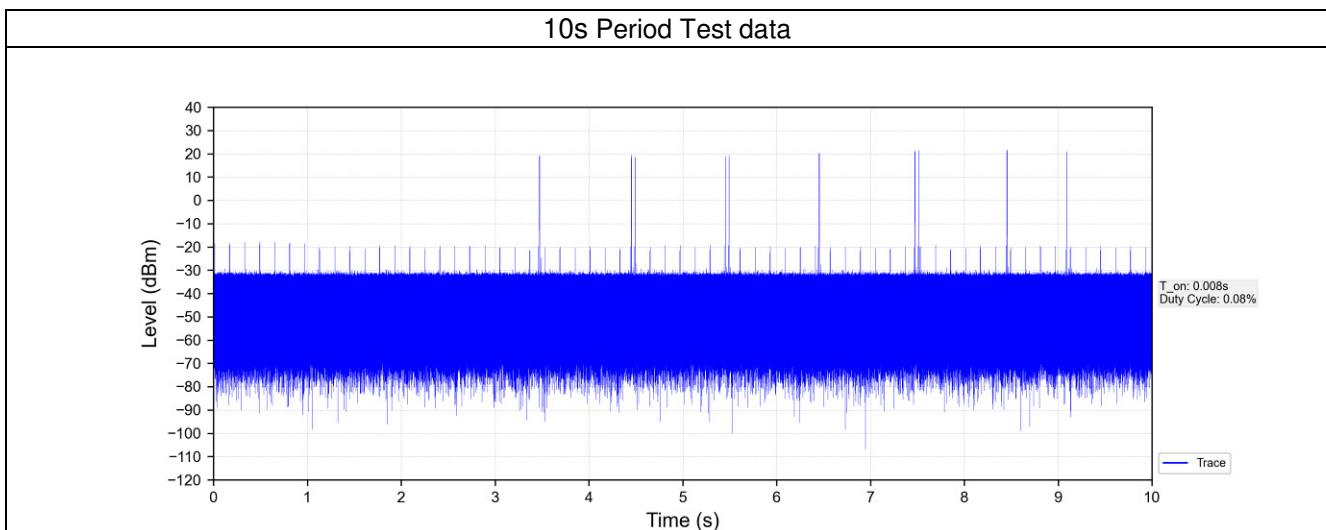
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7.9 Duration and Duty Cycle

Duration and Duty Cycle			
Period	Minimum Time (s)	Limit (s)	Pass / Fail
10-second	0.008	1-second	Pass
300-second	0.235	10-second	Pass
3600-second	0.844	20-second	Pass

Note:

1. Limited in duration and duty cycle to the minimum time necessary to get a grant from the SAS. This time should not exceed 1 second within any 10-second period, 10seconds within any 300-second period, or 20 seconds within any 3600-second period.
2. Pass = Minimum Time < Limit

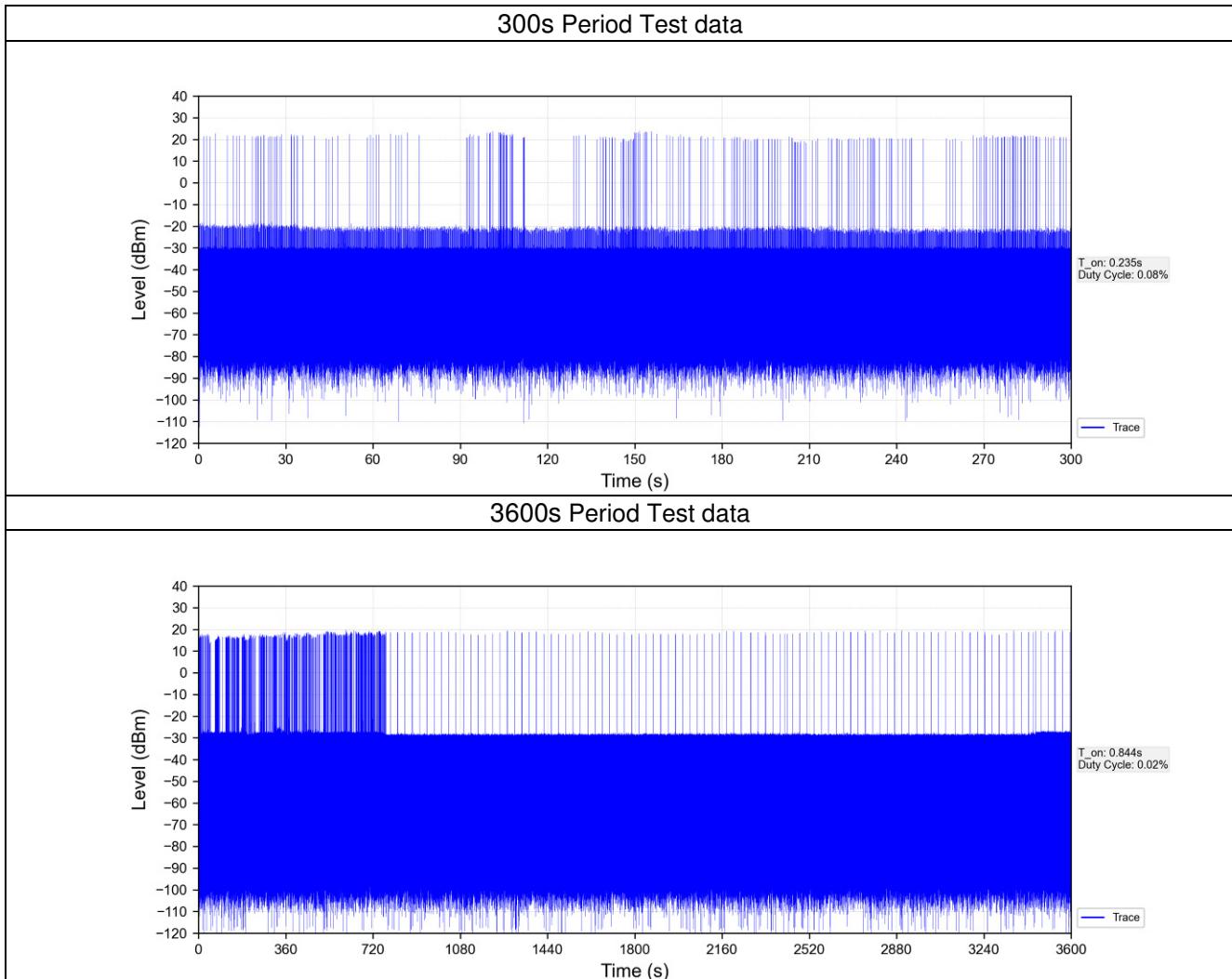


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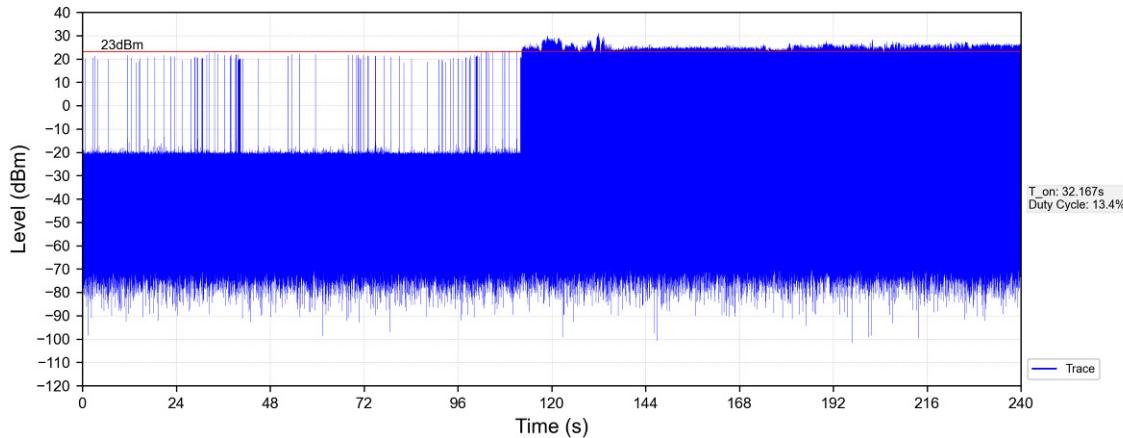


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7.10 Verify that the device will register with a SAS when operating below 23 dBm

Verified in test case WINNF.PT.C.HBT.1, the CPE-CBSD as UUT default EIRP is under 23 dBm and can register success with SAS. After granted, the CPE-CBSD UUT will adjust the EIRP by maxEirp.

**Note:**

1. Red color line in above plot represents the 23 dBm.
2. When Granted the product will transmit at power level above 23dBm.
3. Only when the product sends packets the product will work at max EIRP.

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8 Test Data Log

8.1 WINNF.FT.C.REG.1

```
"registrationRequest": [
  {
    "airInterface": {
      "radioTechnology": "E_UTRA"
    },
    "callSign": "callSign123",
    "cbsdCategory": "B",
    "cbsdSerialNumber": "1257019260400202",
    "cpiSignatureData": {
      "digitalSignature": "mE06LcEEExbM-jZKWny1CfA8LMahWsrMBziL__3g5iaVAwqi-y9PMSE33xXcDzc_g4rgcG3dAj4JcqZ_3OP0DEnV0pL6LZgC1nqQyfXDxn8m1paCPXKUAYY8hla6cL1b5AfM9MxsAfINzk5UJLEggT8wk_ykVH49Bsy-VH5x_MBX4dOAKiYlqitqDTXOI1f0w7iLdDU2fFCTP0GoDIC1kq0TnCwsAJNFrey0MgVVPvXIQ3tD4AR0BJSAk-jxgerPaLeUGOaV8yxhsnooogCje7Pzj-yLsxJdUtr9KsuvyivcA30i7DD8AknFPydAQX1UDLacA6QeyrYeixs8UA",
      "encodedCpiSignedData": "eyJyNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0lkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtIjp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWFTd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWInaHQiOjEwLCJoZWInaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCI6ZmFsc2UsImxhdGI0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEvVDE3OjE4OjA0Wi9fQ",
      "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"
    },
    "fccId": "WBKCP880-B",
    "groupingParam": [
      {
        "groupId": "123",
        "groupType": "INTERFERENCE_COORDINATION"
      }
    ],
    "measCapability": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "userId": "123"
  }
]
```



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2020-07-11T10:49:42.367Z - INFO - Registration message contains cpiSignatureData
2020-07-11T10:49:42.367Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}
2020-07-11T10:49:42.367Z - INFO - encodedCpiSignedData contents = {
 "installationParam": {
 "antennaAzimuth": 222,
 "heightType": "AGL",
 "longitude": 98.345,
 "height": 10,
 "indoorDeployment": false,
 "latitude": 58.8332,
 "antennaDowntilt": 45,
 "antennaBeamwidth": 333,
 "antennaGain": 14
 },
 "fcclId": "WBKCP880-B",
 "professionalInstallerData": {
 "cpiName": "123",
 "installCertificationTime": "2020-7-11T17:18:04Z",
 "cpId": "123"
 },
 "cbsdSerialNumber": "1257019260400202"
}
2020-07-11T10:49:42.403Z - INFO - verified signature on cpiSignatureData
2020-07-11T10:49:42.405Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-11T10:49:42.407Z - INFO - engine sent successfully, the response to CBRS :{
 "registrationResponse": [
 {
 "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
 "response": {
 "responseCode": 0
 }
 }
]
}

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8.2 WINNF.FT.C.REG.5

"registrationRequest": [

{

 "airInterface": {

 "radioTechnology": "E_UTRA"

 },

 "callSign": "callSign123",

 "cbsdCategory": "B",

 "cbsdSerialNumber": "1257019260400202",

 "cpiSignatureData": {

 "digitalSignature": "mE06LcEEXbM-jZKWny1CfA8LMahWsrMBziL__3g5iaVAwqi-y9PMSE33xXcDzc_g4rgcG3dAj4JcqZ_3OP0DEnV0pL6LZgC1nqQyfXDxn8m1paCPXKUAYY8hla6cL1b5AfM9MxsAflNzk5UJLEggT8wk_ykVH49Bsy-VH5x_MBX4dOAKiYILqitqDTXOI1f0w7iLdDU2fFCTP0GoDIC1kq0TnCwsAJNFrey0MgVVPvXIQ3tD4AR0BJSAk-jxgerPaLeUGOaV8yxhsnooogCjle7PzjJ-yLsxJdUtr9KsuvyivcA30i7DD8AknFPydAQX1UDLacA6QeyrYeixs8UA",

 "encodedCpiSignedData":

 "eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWInaHQiOjEwLCJoZWInaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUoJk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEvVDE3OjE4OjA0WiJ9fQ",

 "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"

 },

 "fcclId": "WBKCP880-B",

 "groupingParam": [

 {

 "groupId": "123",

 "groupType": "INTERFERENCE_COORDINATION"

 }

],

 "measCapability": [

 "RECEIVED_POWER_WITH_GRANT"

],

 "userId": "123"

}

]

}

2020-07-12T00:51:18.338Z - INFO - Registration message contains cpiSignatureData

2020-07-12T00:51:18.339Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T00:51:18.339Z - INFO - encodedCpiSignedData contents = {

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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-11T17:18:04Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T00:51:18.408Z - INFO - verified signature on cpiSignatureData
2020-07-12T00:51:18.415Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T00:51:18.417Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbid": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
```

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8.3 WINNF.FT.C.REG.8

"registrationRequest": [

{

"airInterface": {

"radioTechnology": "E_UTRA"

},

"callSign": "callSign123",

"cbsdCategory": "B",

"cbsdSerialNumber": "1257019260400202",

"cpiSignatureData": {

"digitalSignature":

"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",

"encodedCpiSignedData":

"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",

"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"

},

"fcclId": "WBKCP880-B",

"groupingParam": [

{

"groupId": "123",

"groupType": "INTERFERENCE_COORDINATION"

}

],

"measCapability": [

"RECEIVED_POWER_WITH_GRANT"

],

"userId": "123"

}

]

}

2020-07-12T01:15:13.789Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:15:13.789Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:15:13.789Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T01:15:13.826Z - INFO - verified signature on cpiSignatureData
2020-07-12T01:15:13.829Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T01:15:13.831Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "response": {
                "responseCode": 102
            }
        }
    ]
}
```

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8.4 WINNF.FT.C.REG.10**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-
 lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjU
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2020-07-12T01:18:51.983Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:18:51.983Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:18:51.983Z - INFO - encodedCpiSignedData contents = {



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"installationParam": {  
    "antennaAzimuth": 222,  
    "heightType": "AGL",  
    "longitude": 98.345,  
    "height": 10,  
    "indoorDeployment": false,  
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    "antennaBeamwidth": 333,  
    "antennaGain": 14  
},  
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"professionalInstallerData": {  
    "cpiName": "123",  
    "installCertificationTime": "2020-7-12T09:00:11Z",  

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8.5 WINNF.FT.C.REG.12

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"radioTechnology": "E_UTRA"

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"cbsdCategory": "B",

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"encodedCpiSignedData":

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"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"

},

"fcclId": "WBKCP880-B",

"groupingParam": [

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"groupType": "INTERFERENCE_COORDINATION"

}

],

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"RECEIVED_POWER_WITH_GRANT"

],

"userId": "123"

}

]

}

2020-07-12T01:20:15.348Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:20:15.348Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:20:15.348Z - INFO - encodedCpiSignedData contents = {



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    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
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    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T01:20:15.384Z - INFO - verified signature on cpiSignatureData
2020-07-12T01:20:15.388Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T01:20:15.390Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "response": {
                "responseCode": 103
            }
        }
    ]
}
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8.6 WINNF.FT.C.REG.14**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",****"encodedCpiSignedData":****"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",****"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"****},****"fcclId": "WBKCP880-B",****"groupingParam": [****{****"groupId": "123",****"groupType": "INTERFERENCE_COORDINATION"****}****],****"measCapability": [****"RECEIVED_POWER_WITH_GRANT"****],****"userId": "123"****}****]****}**

2020-07-12T01:21:25.565Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:21:25.565Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:21:25.565Z - INFO - encodedCpiSignedData contents = {



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"installationParam": {  
    "antennaAzimuth": 222,  
    "heightType": "AGL",  
    "longitude": 98.345,  
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    "antennaDowntilt": 45,  
    "antennaBeamwidth": 333,  
    "antennaGain": 14  
},  
"fcclId": "WBKCP880-B",  
"professionalInstallerData": {  
    "cpiName": "123",  
    "installCertificationTime": "2020-7-12T09:00:11Z",  

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8.7 WINNF.FT.C.REG.16**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-
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2020-07-12T01:27:54.519Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:27:54.519Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:27:54.520Z - INFO - encodedCpiSignedData contents = {



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    "antennaDowntilt": 45,
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"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T01:27:54.556Z - INFO - verified signature on cpiSignatureData
2020-07-12T01:27:54.559Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T01:27:54.562Z - INFO - engine sent successfully, the response to CBRS :{
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}
```

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8.8 WINNF.FT.C.REG.18**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",****"encodedCpiSignedData":****"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",****"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"****},****"fcclId": "WBKCP880-B",****"groupingParam": [****{****"groupId": "123",****"groupType": "INTERFERENCE_COORDINATION"****}****],****"measCapability": [****"RECEIVED_POWER_WITH_GRANT"****],****"userId": "123"****}****]****}**

2020-07-12T01:28:50.105Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:28:50.105Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:28:50.105Z - INFO - encodedCpiSignedData contents = {

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"installationParam": {  
    "antennaAzimuth": 222,  
    "heightType": "AGL",  
    "longitude": 98.345,  
    "height": 10,  
    "indoorDeployment": false,  
    "latitude": 58.8332,  
    "antennaDowntilt": 45,  
    "antennaBeamwidth": 333,  
    "antennaGain": 14  
},  
"fcclId": "WBKCP880-B",  
"professionalInstallerData": {  
    "cpiName": "123",  
    "installCertificationTime": "2020-7-12T09:00:11Z",  

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8.9 WINNF.FT.C.GRA.1

"registrationRequest": [

{

"airInterface": {

"radioTechnology": "E_UTRA"

},

"callSign": "callSign123",

"cbsdCategory": "B",

"cbsdSerialNumber": "1257019260400202",

"cpiSignatureData": {

"digitalSignature":

"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHivviq2XNcNz6_uABNTAEw",

"encodedCpiSignedData":

"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",

"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"

},

"fcclId": "WBKCP880-B",

"groupingParam": [

{

"groupId": "123",

"groupType": "INTERFERENCE_COORDINATION"

}

],

"measCapability": [

"RECEIVED_POWER_WITH_GRANT"

],

"userId": "123"

}

]

}

2020-07-12T01:32:24.823Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:32:24.823Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:32:24.823Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}

2020-07-12T01:32:24.869Z - INFO - verified signature on cpiSignatureData
2020-07-12T01:32:24.874Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T01:32:24.875Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}

2020-07-12T01:32:25.088Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T01:32:25.095Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T01:32:25.229Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T01:32:25.236Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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Report No.: SZEM200600450204
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"response": {  
    "responseCode": 400  
}  
}  
]  
}
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8.10 WINNF.FT.C.GRA.2

"registrationRequest": [
 {
 "airInterface": {
 "radioTechnology": "E_UTRA"
 },
 "callSign": "callSign123",
 "cbsdCategory": "B",
 "cbsdSerialNumber": "1257019260400202",
 "cpiSignatureData": {
 "digitalSignature": "Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",
 "encodedCpiSignedData": "eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDlwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",
 "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"
 },
 "fcclId": "WBKCP880-B",
 "groupingParam": [
 {
 "groupId": "123",
 "groupType": "INTERFERENCE_COORDINATION"
 }
],
 "measCapability": [
 "RECEIVED_POWER_WITH_GRANT"
],
 "userId": "123"
 }
]

2020-07-12T01:37:51.454Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:37:51.454Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:37:51.454Z - INFO - encodedCpiSignedData contents = {

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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T01:37:51.492Z - INFO - verified signature on cpiSignatureData
2020-07-12T01:37:51.494Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T01:37:51.496Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T01:37:51.746Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T01:37:51.755Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T01:37:51.927Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T01:37:51.937Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"response": {  
    "responseCode": 401  
}  
}  
]  
}
```

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8.11 WINNF.FT.C.HBT.1

```
"registrationRequest": [
  {
    "airInterface": {
      "radioTechnology": "E_UTRA"
    },
    "callSign": "callSign123",
    "cbsdCategory": "B",
    "cbsdSerialNumber": "1257019260400202",
    "cpiSignatureData": {
      "digitalSignature": "mE06LcEEXbM-jZKWny1CfA8LMahWsrMBziL__3g5iaVAwqi-y9PMSE33xXcDzc_g4rgcG3dAj4JcqZ_3OP0DEnV0pL6LZgC1nqQyfXDxn8m1paCPXKUAYY8hla6cL1b5AfM9MxsAflNzk5UJLEggT8wk_ykVH49Bsy-VH5x_MBX4dOAKiYILqitqDTXOI1f0w7iLdDU2fFCTP0GoDIC1kq0TnCwsAJNFrey0MgVVPvXIQ3tD4AR0BJSAk-jxgerPaLeUGOaV8yxhsnooogCjle7PzjJ-yLsxJdUtr9KsuvyivcA30i7DD8AknFPydAQX1UDLacA6QeyrYeixs8UA",
      "encodedCpiSignedData": "eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWInaHQiOjEwLCJoZWInaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUoJk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEvVDE3OjE4OjA0WiJ9fQ",
      "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"
    },
    "fcclId": "WBKCP880-B",
    "groupingParam": [
      {
        "groupId": "123",
        "groupType": "INTERFERENCE_COORDINATION"
      }
    ],
    "measCapability": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "userId": "123"
  }
]
```

2020-07-11T10:52:30.503Z - INFO - Registration message contains cpiSignatureData

2020-07-11T10:52:30.503Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-11T10:52:30.503Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-11T17:18:04Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-11T10:52:30.540Z - INFO - verified signature on cpiSignatureData
2020-07-11T10:52:30.545Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-11T10:52:30.546Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-11T10:52:30.765Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-11T10:52:30.782Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-11T10:52:30.930Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-11T10:52:30.937Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-18T10:52:30Z",
"grantId": "719619079",
"heartbeatInterval": 60,
"response": {
    "responseCode": 0
}
}
]
}

2020-07-11T10:53:01.134Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "719619079",
            "operationState": "GRANTED"
        }
    ]
}

2020-07-11T10:53:01.148Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "719619079",
            "response": {
                "responseCode": 0
            },
            "transmitExpireTime": "2020-07-11T10:56:21Z"
        }
    ]
}

2020-07-11T10:53:31.335Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "719619079",
            "operationState": "AUTHORIZED"
        }
    ]
}

2020-07-11T10:53:31.336Z - INFO - Time interval between two heartbeat request messages is: 30.2, limit is: 65.0
```

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2020-07-11T10:53:31.342Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "719619079",  
    "response": {  
      "responseCode": 0  
    },  
    "transmitExpireTime": "2020-07-11T10:56:51Z"  
  },  
]  
}
```

2020-07-11T10:54:01.533Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "719619079",  
    "operationState": "AUTHORIZED"  
  },  
]  
}
```

2020-07-11T10:54:01.536Z - INFO - Time interval between two heartbeat request messages is: 30.199, limit is: 65.0

2020-07-11T10:54:01.539Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "719619079",  
    "response": {  
      "responseCode": 0  
    },  
    "transmitExpireTime": "2020-07-11T10:57:21Z"  
  },  
]  
}
```

2020-07-11T10:54:31.733Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "719619079",  
    "operationState": "AUTHORIZED"  
  },  
]
```

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]
}
2020-07-11T10:54:31.734Z - INFO - Time interval between two heartbeat request messages is: 30.2, limit is: 65.0
2020-07-11T10:54:31.740Z - INFO - engine sent successfully, the response to CBRS : {
 "heartbeatResponse": [
 {
 "cbsId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "719619079",
 "response": {
 "responseCode": 0
 },
 "transmitExpireTime": "2020-07-11T10:57:51Z"
 },
]
}
2020-07-11T10:55:01.904Z - INFO - heartbeat request from CBRS : {
 "heartbeatRequest": [
 {
 "cbsId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "719619079",
 "operationState": "AUTHORIZED"
 },
]
}
2020-07-11T10:55:01.904Z - INFO - Time interval between two heartbeat request messages is: 30.17, limit is: 65.0
2020-07-11T10:55:01.911Z - INFO - engine sent successfully, the response to CBRS : {
 "heartbeatResponse": [
 {
 "cbsId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "719619079",
 "response": {
 "responseCode": 0
 },
 "transmitExpireTime": "2020-07-11T10:58:21Z"
 },
]
}
2020-07-11T10:55:32.095Z - INFO - heartbeat request from CBRS : {
 "heartbeatRequest": [
 {

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```
"cbsId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "719619079",
"operationState": "AUTHORIZED"
}
]
}
2020-07-11T10:55:32.098Z - INFO - Time interval between two heartbeat request messages is: 30.191, limit is: 65.0
2020-07-11T10:55:32.105Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "719619079",
      "response": {
        "responseCode": 0,
        "transmitExpireTime": "2020-07-11T10:58:52Z"
      }
    ]
  }
}
```

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8.12 WINNF.FT.C.HBT.3**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",****"encodedCpiSignedData":****"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",****"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"****},****"fcclId": "WBKCP880-B",****"groupingParam": [****{****"groupId": "123",****"groupType": "INTERFERENCE_COORDINATION"****}****],****"measCapability": [****"RECEIVED_POWER_WITH_GRANT"****],****"userId": "123"****}****]****}**

2020-07-12T01:45:48.805Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:45:48.805Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:45:48.805Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T01:45:48.845Z - INFO - verified signature on cpiSignatureData
2020-07-12T01:45:48.848Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T01:45:48.849Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T01:45:49.082Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T01:45:49.089Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T01:45:49.221Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T01:45:49.227Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T01:45:49Z",
"grantId": "373618039",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T01:46:19.433Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "373618039",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T01:46:19.444Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "373618039",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T01:49:39Z"
        }
    ]
}
2020-07-12T01:46:49.631Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "373618039",
            "operationState": "AUTHORIZED"
        }
    ]
}
}
2020-07-12T01:46:49.634Z - INFO - Time interval between two heartbeat request messages is: 30.198, limit is: 65.0
```

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2020-07-12T01:46:49.638Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "373618039",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T01:50:09Z"
  }
]
```

2020-07-12T01:47:19.792Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "373618039",
    "operationState": "AUTHORIZED"
  }
]
```

2020-07-12T01:47:19.793Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0

2020-07-12T01:47:19.798Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "373618039",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T01:50:39Z"
  }
]
```

2020-07-12T01:47:49.992Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "373618039",
    "operationState": "AUTHORIZED"
  }
]
```

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```
]
}
2020-07-12T01:47:49.993Z - INFO - Time interval between two heartbeat request messages is: 30.2, limit is: 65.0
2020-07-12T01:47:49.997Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "373618039",
      "response": {
        "responseCode": 105
      },
      "transmitExpireTime": "2020-07-12T01:47:49Z"
    }
  ]
}
```

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8.13 WINNF.FT.C.HBT.4

"registrationRequest": [

 {

 "airInterface": {

 "radioTechnology": "E_UTRA"

 },

 "callSign": "callSign123",

 "cbsdCategory": "B",

 "cbsdSerialNumber": "1257019260400202",

 "cpiSignatureData": {

 "digitalSignature": "Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",

 "encodedCpiSignedData": "eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDlwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",

 "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"

 },

 "fcclId": "WBKCP880-B",

 "groupingParam": [

 {

 "groupId": "123",

 "groupType": "INTERFERENCE_COORDINATION"

 }

],

 "measCapability": [

 "RECEIVED_POWER_WITH_GRANT"

],

 "userId": "123"

 }

]

]

2020-07-12T03:31:45.142Z - INFO - Registration message contains cpiSignatureData

2020-07-12T03:31:45.142Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T03:31:45.144Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T03:31:45.227Z - INFO - verified signature on cpiSignatureData
2020-07-12T03:31:45.233Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T03:31:45.236Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T03:31:45.552Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T03:31:45.566Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T03:31:45.750Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T03:31:45.775Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T03:31:45Z",
"grantId": "645572479",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T03:32:15.990Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "645572479",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T03:32:16.000Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "645572479",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T03:35:35Z"
        }
    ]
}
2020-07-12T03:32:46.151Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "645572479",
            "operationState": "AUTHORIZED"
        }
    ]
}
}
2020-07-12T03:32:46.154Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0
```

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2020-07-12T03:32:46.164Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "645572479",  
    "response": {  
      "responseCode": 0  
    },  
    "transmitExpireTime": "2020-07-12T03:36:06Z"  
  },  
]  
}
```

2020-07-12T03:33:16.311Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "645572479",  
    "operationState": "AUTHORIZED"  
  },  
]  
}
```

2020-07-12T03:33:16.313Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0

2020-07-12T03:33:16.325Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "645572479",  
    "response": {  
      "responseCode": 0  
    },  
    "transmitExpireTime": "2020-07-12T03:36:36Z"  
  },  
]  
}
```

2020-07-12T03:33:46.490Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "645572479",  
    "operationState": "AUTHORIZED"  
  },  
]
```

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]
}
2020-07-12T03:33:46.494Z - INFO - Time interval between two heartbeat request messages is: 30.18, limit is: 65.0
2020-07-12T03:33:46.506Z - INFO - engine sent successfully, the response to CBRS : {
 "heartbeatResponse": [
 {
 "cbsId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "645572479",
 "response": {
 "responseCode": 0
 },
 "transmitExpireTime": "2020-07-12T03:37:06Z"
 },
]
}
2020-07-12T03:34:16.701Z - INFO - heartbeat request from CBRS : {
 "heartbeatRequest": [
 {
 "cbsId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "645572479",
 "operationState": "AUTHORIZED"
 },
]
}
2020-07-12T03:34:16.704Z - INFO - Time interval between two heartbeat request messages is: 30.211, limit is: 65.0
2020-07-12T03:34:16.717Z - INFO - engine sent successfully, the response to CBRS : {
 "heartbeatResponse": [
 {
 "cbsId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "645572479",
 "response": {
 "responseCode": 0
 },
 "transmitExpireTime": "2020-07-12T03:37:36Z"
 },
]
}
2020-07-12T03:34:46.911Z - INFO - heartbeat request from CBRS : {
 "heartbeatRequest": [
 {

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```
"cbsId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "645572479",
"operationState": "AUTHORIZED"
}
]
}
2020-07-12T03:34:46.917Z - INFO - Time interval between two heartbeat request messages is: 30.209, limit is: 65.0
2020-07-12T03:34:46.924Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "645572479",
      "response": {
        "responseCode": 500
      },
      "transmitExpireTime": "2020-07-12T03:34:46Z"
    }
  ]
}
```

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8.14 WINNF.FT.C.HBT.5

"registrationRequest": [
 {
 "airInterface": {
 "radioTechnology": "E_UTRA"
 },
 "callSign": "callSign123",
 "cbsdCategory": "B",
 "cbsdSerialNumber": "1257019260400202",
 "cpiSignatureData": {
 "digitalSignature": "Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",
 "encodedCpiSignedData": "eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",
 "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"
 },
 "fcclId": "WBKCP880-B",
 "groupingParam": [
 {
 "groupId": "123",
 "groupType": "INTERFERENCE_COORDINATION"
 }
],
 "measCapability": [
 "RECEIVED_POWER_WITH_GRANT"
],
 "userId": "123"
 }
]

2020-07-12T01:51:48.798Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:51:48.798Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:51:48.798Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T01:51:48.835Z - INFO - verified signature on cpiSignatureData
2020-07-12T01:51:48.838Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T01:51:48.838Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T01:51:49.099Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T01:51:49.108Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T01:51:49.240Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T01:51:49.246Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T01:51:49Z",
"grantId": "936543302",
"heartbeatInterval": 60,
"response": {
    "responseCode": 0
}
}
]
```

2020-07-12T01:52:19.430Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
{
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "936543302",
    "operationState": "GRANTED"
}
]
}
```

2020-07-12T01:52:19.444Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
{
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "936543302",
    "response": {
        "responseCode": 501
    },
    "transmitExpireTime": "2020-07-12T01:52:19Z"
}
]
}
```

2020-07-12T01:52:49.710Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
{
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "936543302",
    "operationState": "GRANTED"
}
]
}
```

2020-07-12T01:52:49.711Z - INFO - Time interval between two heartbeat request messages is: 30.279, limit is: 65.0

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2020-07-12T01:52:49.720Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "936543302",  
    "response": {  
      "responseCode": 501  
    },  
    "transmitExpireTime": "2020-07-12T01:52:49Z"  
  },  
]  
}
```

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8.15 WINNF.FT.C.HBT.6**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",****"encodedCpiSignedData":****"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUoJk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",****"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"****},****"fcclId": "WBKCP880-B",****"groupingParam": [****{****"groupId": "123",****"groupType": "INTERFERENCE_COORDINATION"****}****],****"measCapability": [****"RECEIVED_POWER_WITH_GRANT"****],****"userId": "123"****}****]****}**

2020-07-12T01:56:00.461Z - INFO - Registration message contains cpiSignatureData

2020-07-12T01:56:00.461Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T01:56:00.461Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T01:56:00.497Z - INFO - verified signature on cpiSignatureData
2020-07-12T01:56:00.502Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T01:56:00.503Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T01:56:00.719Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T01:56:00.727Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T01:56:00.865Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T01:56:00.875Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```



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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T01:56:00Z",
"grantId": "543172560",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T01:56:31.068Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "543172560",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T01:56:31.075Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "543172560",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T01:59:51Z"
        }
    ]
}
2020-07-12T01:57:01.269Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "543172560",
            "operationState": "AUTHORIZED"
        }
    ]
}
2020-07-12T01:57:01.273Z - INFO - Time interval between two heartbeat request messages is: 30.202, limit is: 65.0
```

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2020-07-12T01:57:01.282Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "543172560",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T02:00:21Z"
  }
]
```

2020-07-12T01:57:31.469Z - INFO - heartbeat request from CBRS :{

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "543172560",
    "operationState": "AUTHORIZED"
  }
]
```

2020-07-12T01:57:31.470Z - INFO - Time interval between two heartbeat request messages is: 30.199, limit is: 65.0

2020-07-12T01:57:31.474Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "543172560",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T02:00:51Z"
  }
]
```

2020-07-12T01:58:01.628Z - INFO - heartbeat request from CBRS :{

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "543172560",
    "operationState": "AUTHORIZED"
  }
]
```

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```
]
}

2020-07-12T01:58:01.631Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0
2020-07-12T01:58:01.640Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "543172560",
      "response": {
        "responseCode": 501
      },
      "transmitExpireTime": "2020-07-12T01:58:01Z"
    }
  ]
}

2020-07-12T01:58:32.148Z - INFO - heartbeat request from CBRS : {
  "heartbeatRequest": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "543172560",
      "operationState": "GRANTED"
    }
  ]
}

2020-07-12T01:58:32.150Z - INFO - Time interval between two heartbeat request messages is: 30.519, limit is: 65.0
2020-07-12T01:58:32.155Z - INFO - engine sent successfully, the response to CBRS : {
  "heartbeatResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "543172560",
      "response": {
        "responseCode": 501
      },
      "transmitExpireTime": "2020-07-12T01:58:32Z"
    }
  ]
}
```



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8.16 WINNF.FT.C.HBT.7

"registrationRequest": [
 {
 "airInterface": {
 "radioTechnology": "E_UTRA"
 },
 "callSign": "callSign123",
 "cbsdCategory": "B",
 "cbsdSerialNumber": "1257019260400202",
 "cpiSignatureData": {
 "digitalSignature": "Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",
 "encodedCpiSignedData": "eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",
 "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"
 },
 "fcclId": "WBKCP880-B",
 "groupingParam": [
 {
 "groupId": "123",
 "groupType": "INTERFERENCE_COORDINATION"
 }
],
 "measCapability": [
 "RECEIVED_POWER_WITH_GRANT"
],
 "userId": "123"
 }
]

2020-07-12T02:03:22.180Z - INFO - Registration message contains cpiSignatureData

2020-07-12T02:03:22.180Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T02:03:22.180Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}

2020-07-12T02:03:22.223Z - INFO - verified signature on cpiSignatureData
2020-07-12T02:03:22.226Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T02:03:22.227Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}

2020-07-12T02:03:22.516Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T02:03:22.523Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T02:03:22.696Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T02:03:22.704Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T02:03:22Z",
"grantId": "493051373",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T02:03:52.946Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "493051373",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T02:03:52.956Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "493051373",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T02:07:12Z"
        }
    ]
}
2020-07-12T02:04:23.105Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "493051373",
            "operationState": "AUTHORIZED"
        }
    ]
}
}
2020-07-12T02:04:23.107Z - INFO - Time interval between two heartbeat request messages is: 30.159, limit is: 65.0
```

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2020-07-12T02:04:23.111Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "493051373",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T02:07:43Z"
  }
]
```

2020-07-12T02:04:53.305Z - INFO - heartbeat request from CBRS :{

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "493051373",
    "operationState": "AUTHORIZED"
  }
]
```

2020-07-12T02:04:53.309Z - INFO - Time interval between two heartbeat request messages is: 30.201, limit is: 65.0

2020-07-12T02:04:53.316Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "493051373",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T02:08:13Z"
  }
]
```

2020-07-12T02:05:23.545Z - INFO - heartbeat request from CBRS :{

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "493051373",
    "operationState": "AUTHORIZED"
  }
]
```

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```
]
}

2020-07-12T02:05:23.546Z - INFO - Time interval between two heartbeat request messages is: 30.239, limit is: 65.0
2020-07-12T02:05:23.552Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "493051373",
      "response": {
        "responseCode": 502
      },
      "transmitExpireTime": "2020-07-12T02:05:23Z"
    }
  ]
}

2020-07-12T02:05:24.035Z - INFO - relinquishment request from CBRS :{
  "relinquishmentRequest": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "493051373"
    }
  ]
}

2020-07-12T02:05:24.040Z - INFO - engine sent successfully, the response to CBRS :{
  "relinquishmentResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "493051373",
      "response": {
        "responseCode": 0
      }
    }
  ]
}
```



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8.17 WINNF.FT.C.HBT.9

"registrationRequest": [
 {
 "airInterface": {
 "radioTechnology": "E_UTRA"
 },
 "callSign": "callSign123",
 "cbsdCategory": "B",
 "cbsdSerialNumber": "1257019260400202",
 "cpiSignatureData": {
 "digitalSignature": "Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",
 "encodedCpiSignedData": "eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",
 "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"
 },
 "fcclId": "WBKCP880-B",
 "groupingParam": [
 {
 "groupId": "123",
 "groupType": "INTERFERENCE_COORDINATION"
 }
],
 "measCapability": [
 "RECEIVED_POWER_WITH_GRANT"
],
 "userId": "123"
 }
]

2020-07-12T02:10:15.328Z - INFO - Registration message contains cpiSignatureData

2020-07-12T02:10:15.328Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T02:10:15.328Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T02:10:15.364Z - INFO - verified signature on cpiSignatureData
2020-07-12T02:10:15.368Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T02:10:15.368Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbid": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T02:10:15.572Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbid": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T02:10:15.585Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T02:10:15.713Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T02:10:15.726Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T02:10:15Z",
"grantId": "195027392",
"heartbeatInterval": 60,
"response": {
    "responseCode": 0
}
}
]
```

2020-07-12T02:10:45.904Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
{
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "195027392",
    "operationState": "GRANTED"
}
]
}
```

2020-07-12T02:11:11.153Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
{
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "195027392",
    "operationState": "GRANTED"
}
]
}
```

2020-07-12T02:11:11.153Z - INFO - request message received while HBT is absent, sleep 179 sec before responding

2020-07-12T02:11:36.213Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
{
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "195027392",
    "operationState": "GRANTED"
}
]
}
```

2020-07-12T02:11:36.213Z - INFO - request message received while HBT is absent, sleep 154 sec before responding

2020-07-12T02:12:01.292Z - INFO - heartbeat request from CBRS : {

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```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "195027392",
    "operationState": "GRANTED"
  }
]
}
2020-07-12T02:12:01.293Z - INFO - request message received while HBT is absent, sleep 129 sec before responding
2020-07-12T02:12:26.411Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "195027392",
      "operationState": "GRANTED"
    }
  ]
}
2020-07-12T02:12:26.413Z - INFO - request message received while HBT is absent, sleep 104 sec before responding
2020-07-12T02:12:51.493Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "195027392",
      "operationState": "GRANTED"
    }
  ]
}
2020-07-12T02:12:51.493Z - INFO - request message received while HBT is absent, sleep 79 sec before responding
2020-07-12T02:13:16.572Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "195027392",
      "operationState": "GRANTED"
    }
  ]
}
}
```

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2020-07-12T02:13:16.572Z - INFO - request message received while HBT is absent, sleep 54 sec before responding

2020-07-12T02:13:41.651Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "195027392",  
    "operationState": "GRANTED"  
  }  
]
```

2020-07-12T02:13:41.651Z - INFO - request message received while HBT is absent, sleep 29 sec before responding

2020-07-12T02:14:05.915Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "195027392",  
    "response": {  
      "responseCode": 501  
    },  
    "transmitExpireTime": "2020-07-12T02:14:05Z"  
  }  
]
```



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8.18 WINNF.FT.C.HBT.10**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",****"encodedCpiSignedData":****"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",****"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"****},****"fcclId": "WBKCP880-B",****"groupingParam": [****{****"groupId": "123",****"groupType": "INTERFERENCE_COORDINATION"****}****],****"measCapability": [****"RECEIVED_POWER_WITH_GRANT"****],****"userId": "123"****}****]****}**

2020-07-12T02:18:42.898Z - INFO - Registration message contains cpiSignatureData

2020-07-12T02:18:42.898Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T02:18:42.900Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T02:18:42.937Z - INFO - verified signature on cpiSignatureData
2020-07-12T02:18:42.940Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T02:18:42.941Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T02:18:43.190Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T02:18:43.204Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T02:18:43.355Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T02:18:43.361Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```



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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T02:18:43Z",
"grantId": "479221579",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T02:19:13.539Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "479221579",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T02:19:13.545Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "479221579",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T02:22:33Z"
        }
    ]
}
2020-07-12T02:19:43.698Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "479221579",
            "operationState": "AUTHORIZED"
        }
    ]
}
}
2020-07-12T02:19:43.700Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0
```

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2020-07-12T02:19:43.706Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "479221579",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T02:23:03Z"
  }
]
```

2020-07-12T02:20:13.859Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "479221579",
    "operationState": "AUTHORIZED"
  }
]
```

2020-07-12T02:20:13.861Z - INFO - Time interval between two heartbeat request messages is: 30.161, limit is: 65.0

2020-07-12T02:20:13.865Z - INFO - LAST HBT RESPONSE THAT SET TRANSMIT_EXPIRE_TIME WAS AT: 2020-07-12 02:19:43.699000

2020-07-12T02:20:39.069Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "479221579",
    "operationState": "AUTHORIZED"
  }
]
```

2020-07-12T02:20:39.069Z - INFO - request message received while HBT is absent, sleep 179 sec before responding

2020-07-12T02:21:04.109Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "479221579",
    "operationState": "AUTHORIZED"
  }
]
```

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```
    }
  ]
}

2020-07-12T02:21:04.109Z - INFO - request message received while HBT is absent, sleep 154 sec before
responding
2020-07-12T02:21:29.148Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "479221579",
      "operationState": "AUTHORIZED"
    }
  ]
}

2020-07-12T02:21:29.148Z - INFO - request message received while HBT is absent, sleep 129 sec before
responding
2020-07-12T02:21:54.188Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "479221579",
      "operationState": "AUTHORIZED"
    }
  ]
}

2020-07-12T02:21:54.188Z - INFO - request message received while HBT is absent, sleep 104 sec before
responding
2020-07-12T02:22:19.187Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "479221579",
      "operationState": "AUTHORIZED"
    }
  ]
}

2020-07-12T02:22:19.187Z - INFO - request message received while HBT is absent, sleep 79 sec before
responding
2020-07-12T02:22:44.229Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"grantId": "479221579",
"operationState": "AUTHORIZED"
}
]
}
2020-07-12T02:22:44.229Z - INFO - request message received while HBT is absent, sleep 54 sec before
responding
2020-07-12T02:23:09.628Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "479221579",
      "operationState": "GRANTED"
    }
  ]
}
2020-07-12T02:23:09.628Z - INFO - request message received while HBT is absent, sleep 29 sec before
responding
2020-07-12T02:23:33.875Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "479221579",
      "response": {
        "responseCode": 501
      },
      "transmitExpireTime": "2020-07-12T02:23:33Z"
    }
  ]
}
```

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8.19 WINNF.FT.C.HBT.11**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",****"encodedCpiSignedData":****"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",****"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"****},****"fcclId": "WBKCP880-B",****"groupingParam": [****{****"groupId": "123",****"groupType": "INTERFERENCE_COORDINATION"****}****],****"measCapability": [****"RECEIVED_POWER_WITH_GRANT"****],****"userId": "123"****}****]****}**

2020-07-12T02:41:30.352Z - INFO - Registration message contains cpiSignatureData

2020-07-12T02:41:30.352Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T02:41:30.354Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}

2020-07-12T02:41:30.444Z - INFO - verified signature on cpiSignatureData
2020-07-12T02:41:30.451Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T02:41:30.454Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}

2020-07-12T02:41:30.661Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T02:41:30.673Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T02:41:30.801Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T02:41:30.815Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-12T02:47:30Z",
"grantId": "558747959",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T02:42:01.012Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "558747959",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T02:42:01.026Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "558747959",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T02:45:21Z"
        }
    ]
}
2020-07-12T02:42:31.210Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "558747959",
            "operationState": "AUTHORIZED"
        }
    ]
}
2020-07-12T02:42:31.214Z - INFO - Time interval between two heartbeat request messages is: 30.199, limit is: 65.0
```

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2020-07-12T02:42:31.226Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "558747959",  
    "response": {  
      "responseCode": 0  
    },  
    "transmitExpireTime": "2020-07-12T02:45:51Z"  
  },  
]  
}
```

2020-07-12T02:43:01.411Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "558747959",  
    "operationState": "AUTHORIZED"  
  },  
]  
}
```

2020-07-12T02:43:01.414Z - INFO - Time interval between two heartbeat request messages is: 30.2, limit is: 65.0

2020-07-12T02:43:01.426Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "558747959",  
    "response": {  
      "responseCode": 0  
    },  
    "transmitExpireTime": "2020-07-12T02:46:21Z"  
  },  
]  
}
```

2020-07-12T02:43:31.611Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [  
  {  
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "558747959",  
    "operationState": "AUTHORIZED"  
  },  
]
```

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]
}
2020-07-12T02:43:31.615Z - INFO - Time interval between two heartbeat request messages is: 30.2, limit is: 65.0
2020-07-12T02:43:31.625Z - INFO - engine sent successfully, the response to CBRS : {
 "heartbeatResponse": [
 {
 "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "558747959",
 "response": {
 "responseCode": 0
 },
 "transmitExpireTime": "2020-07-12T02:46:51Z"
 },
]
}
2020-07-12T02:44:01.811Z - INFO - heartbeat request from CBRS : {
 "heartbeatRequest": [
 {
 "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "558747959",
 "operationState": "AUTHORIZED"
 },
]
}
2020-07-12T02:44:01.813Z - INFO - Time interval between two heartbeat request messages is: 30.2, limit is: 65.0
2020-07-12T02:44:01.823Z - INFO - engine sent successfully, the response to CBRS : {
 "heartbeatResponse": [
 {
 "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "558747959",
 "response": {
 "responseCode": 0
 },
 "transmitExpireTime": "2020-07-12T02:47:21Z"
 },
]
}
2020-07-12T02:44:32.010Z - INFO - heartbeat request from CBRS : {
 "heartbeatRequest": [
 {

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```
"cbsId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "558747959",
"grantRenew": true,
"operationState": "AUTHORIZED"
}
]
}
2020-07-12T02:44:32.013Z - INFO - Time interval between two heartbeat request messages is: 30.2, limit is: 65.0
2020-07-12T02:44:32.026Z - INFO - grantRenew received in HBT request message
2020-07-12T02:44:32.026Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantExpireTime": "2020-07-12T02:50:32Z",
      "grantId": "558747959",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-07-12T02:47:52Z"
    }
  ]
}
2020-07-12T02:45:02.250Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "558747959",
      "operationState": "AUTHORIZED"
    }
  ]
}
2020-07-12T02:45:02.253Z - INFO - Time interval between two heartbeat request messages is: 30.239, limit is: 65.0
2020-07-12T02:45:02.266Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "558747959",
      "response": {
        "responseCode": 0
      },
    }
  ]
}
```

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"transmitExpireTime": "2020-07-12T02:48:22Z"

}

]

}

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8.20 WINNF.FT.C.MES.3

"registrationRequest": [
 {
 "airInterface": {
 "radioTechnology": "E_UTRA"
 },
 "callSign": "callSign123",
 "cbsdCategory": "B",
 "cbsdSerialNumber": "1257019260400202",
 "cpiSignatureData": {
 "digitalSignature": "Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",
 "encodedCpiSignedData": "eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbLBhcmFtljp7ImFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",
 "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"
 },
 "fcclId": "WBKCP880-B",
 "groupingParam": [
 {
 "groupId": "123",
 "groupType": "INTERFERENCE_COORDINATION"
 }
],
 "measCapability": [
 "RECEIVED_POWER_WITH_GRANT"
],
 "userId": "123"
 }
]

2020-07-12T03:13:40.065Z - INFO - Registration message contains cpiSignatureData

2020-07-12T03:13:40.065Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T03:13:40.066Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T03:13:40.157Z - INFO - verified signature on cpiSignatureData
2020-07-12T03:13:40.165Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T03:13:40.168Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T03:13:40.378Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T03:13:40.394Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T03:13:40.519Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T03:13:40.533Z - INFO - Response message contains measReportConfig
2020-07-12T03:13:40.535Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {

```



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```
"cbsId": "WBKCP880-BMock-SAS1257019260400202",
"channelType": "GAA",
"grantExpireTime": "2020-07-19T03:13:40Z",
"grantId": "565170955",
"heartbeatInterval": 60,
"measReportConfig": [
    "RECEIVED_POWER_WITH_GRANT"
],
"response": {
    "responseCode": 0
}
}
]
```

2020-07-12T03:14:10.709Z - INFO - heartbeat request from CBRS :{

```
"heartbeatRequest": [
{
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "565170955",
    "measReport": {
        "rcvdPowerMeasReports": [
            {
                "measBandwidth": 10000000,
                "measFrequency": 3550000000,
                "measRcvdPower": -60
            },
            {
                "measBandwidth": 10000000,
                "measFrequency": 3560000000,
                "measRcvdPower": -60
            }
        ]
    },
    "operationState": "GRANTED"
}
]
}
```

2020-07-12T03:14:10.716Z - INFO - measReport received in heartbeat message

2020-07-12T03:14:10.726Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [
{

```



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```
"cbsId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "565170955",
"response": {
    "responseCode": 0
},
"transmitExpireTime": "2020-07-12T03:17:30Z"
},
]
}
2020-07-12T03:14:40.898Z - INFO - heartbeat request from CBRS :{
"heartbeatRequest": [
{
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "565170955",
    "operationState": "AUTHORIZED"
}
]
}
2020-07-12T03:14:40.901Z - INFO - Time interval between two heartbeat request messages is: 30.189, limit is: 65.0
2020-07-12T03:14:40.914Z - INFO - engine sent successfully, the response to CBRS :{
"heartbeatResponse": [
{
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "565170955",
    "response": {
        "responseCode": 0
},
"transmitExpireTime": "2020-07-12T03:18:00Z"
}
]
}
2020-07-12T03:15:11.059Z - INFO - heartbeat request from CBRS :{
"heartbeatRequest": [
{
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "565170955",
    "operationState": "AUTHORIZED"
}
]
}
}
```



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2020-07-12T03:15:11.062Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0

2020-07-12T03:15:11.073Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "565170955",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T03:18:31Z"
  }
]
```

2020-07-12T03:15:41.217Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "565170955",
    "operationState": "AUTHORIZED"
  }
]
```

2020-07-12T03:15:41.221Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0

2020-07-12T03:15:41.237Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "565170955",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T03:19:01Z"
  }
]
```

2020-07-12T03:16:11.398Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "565170955",
  }
]
```

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```
        "operationState": "AUTHORIZED"
    }
]
}
2020-07-12T03:16:11.401Z - INFO - Time interval between two heartbeat request messages is: 30.179, limit
is: 65.0
2020-07-12T03:16:11.414Z - INFO - engine sent successfully, the response to CBRS :{
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "565170955",
            "response": {
                "responseCode": 0
            },
            "transmitExpireTime": "2020-07-12T03:19:31Z"
        }
    ]
}
```

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8.21 WINNF.FT.C.MES.4

"registrationRequest": [

{

"airInterface": {

"radioTechnology": "E_UTRA"

},

"callSign": "callSign123",

"cbsdCategory": "B",

"cbsdSerialNumber": "1257019260400202",

"cpiSignatureData": {

"digitalSignature":

"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",

"encodedCpiSignedData":

"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",

"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"

},

"fcclId": "WBKCP880-B",

"groupingParam": [

{

"groupId": "123",

"groupType": "INTERFERENCE_COORDINATION"

}

],

"measCapability": [

"RECEIVED_POWER_WITH_GRANT"

],

"userId": "123"

}

]

}

2020-07-12T03:20:03.209Z - INFO - Registration message contains cpiSignatureData

2020-07-12T03:20:03.210Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T03:20:03.210Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}

2020-07-12T03:20:03.325Z - INFO - verified signature on cpiSignatureData
2020-07-12T03:20:03.332Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T03:20:03.338Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}

2020-07-12T03:20:03.555Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T03:20:03.576Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T03:20:03.716Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T03:20:03.730Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```



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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T03:20:03Z",
"grantId": "884771487",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T03:20:33.936Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "884771487",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T03:20:33.948Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "884771487",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T03:23:53Z"
        }
    ]
}
2020-07-12T03:21:04.115Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "884771487",
            "operationState": "AUTHORIZED"
        }
    ]
}
}
2020-07-12T03:21:04.117Z - INFO - Time interval between two heartbeat request messages is: 30.179, limit is: 65.0
```

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2020-07-12T03:21:04.125Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "884771487",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T03:24:24Z"
  }
]
```

2020-07-12T03:21:34.275Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "884771487",
    "operationState": "AUTHORIZED"
  }
]
```

2020-07-12T03:21:34.279Z - INFO - Time interval between two heartbeat request messages is: 30.161, limit is: 65.0

2020-07-12T03:21:34.290Z - INFO - Response message contains measReportConfig

2020-07-12T03:21:34.290Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "884771487",
    "measReportConfig": [
      "RECEIVED_POWER_WITH_GRANT"
    ],
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T03:24:54Z"
  }
]
```

2020-07-12T03:22:04.456Z - INFO - heartbeat request from CBRS : {

```
"heartbeatRequest": [
  {
```

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"cbsId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "884771487",
"measReport": {
 "rcvdPowerMeasReports": [
 {
 "measBandwidth": 10000000,
 "measFrequency": 3550000000,
 "measRcvdPower": -60
 },
 {
 "measBandwidth": 10000000,
 "measFrequency": 3560000000,
 "measRcvdPower": -60
 }
],
 "operationState": "AUTHORIZED"
}
}
]
}
2020-07-12T03:22:04.459Z - INFO - Time interval between two heartbeat request messages is: 30.18, limit is: 65.0
2020-07-12T03:22:04.460Z - INFO - measReport received in heartbeat message
2020-07-12T03:22:04.469Z - INFO - engine sent successfully, the response to CBRS : {
 "heartbeatResponse": [
 {
 "cbsId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "884771487",
 "response": {
 "responseCode": 0
 },
 "transmitExpireTime": "2020-07-12T03:25:24Z"
 }
]
}
2020-07-12T03:22:34.615Z - INFO - heartbeat request from CBRS : {
 "heartbeatRequest": [
 {
 "cbsId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "884771487",
 "operationState": "AUTHORIZED"
 }
]
}

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]
}

2020-07-12T03:22:34.618Z - INFO - Time interval between two heartbeat request messages is: 30.159, limit is: 65.0

2020-07-12T03:22:34.634Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [{
"cbsId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "884771487",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-07-12T03:25:54Z"
}
]}
]
2020-07-12T03:23:04.835Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [{
"cbsId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "884771487",
"operationState": "AUTHORIZED"
}
]}
2020-07-12T03:23:04.838Z - INFO - Time interval between two heartbeat request messages is: 30.22, limit is: 65.0

2020-07-12T03:23:04.849Z - INFO - engine sent successfully, the response to CBRS : {

"heartbeatResponse": [
{
"cbsId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "884771487",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-07-12T03:26:24Z"
}
]}
]
2020-07-12T03:23:35.015Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{

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```
"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "884771487",
"operationState": "AUTHORIZED"
}
]
}
2020-07-12T03:23:35.019Z - INFO - Time interval between two heartbeat request messages is: 30.18, limit is: 65.0
2020-07-12T03:23:35.029Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "884771487",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-07-12T03:26:55Z"
    }
  ]
}
2020-07-12T03:24:05.174Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "884771487",
      "operationState": "AUTHORIZED"
    }
  ]
}
2020-07-12T03:24:05.177Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0
2020-07-12T03:24:05.190Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "884771487",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-07-12T03:27:25Z"
    }
  ]
}
```

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}

8.22 WINNF.FT.C.RLQ.1**"registrationRequest": [**

{

"airInterface": { **"radioTechnology": "E_UTRA"**

},

"callSign": "callSign123", **"cbsdCategory": "B",** **"cbsdSerialNumber": "1257019260400202",** **"cpiSignatureData": {** **"digitalSignature":****"Vgq2CNehdHgyIAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQULWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-****Ihs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sA1eIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",** **"encodedCpiSignedData":****"eyJyNkU2VyaWFsTnVtYmVlyjoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0lkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvblBhcmFtljp7lmFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2lkGgiOjMzMywiYW50ZW5uYURvd250aWx0j0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUDMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGI0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxckRhdGEiOnsiY3BpSWQiOilxMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",** **"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"**

},

"fcId": "WBKCP880-B", **"groupingParam": [**

{

"groupId": "123", **"groupType": "INTERFERENCE_COORDINATION"**

}

],

"measCapability": [**"RECEIVED_POWER_WITH_GRANT"**

],

"userId": "123"

}

]

}

2020-07-12T03:40:39.265Z - INFO - Registration message contains cpiSignatureData

2020-07-12T03:40:39.265Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T03:40:39.266Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T03:40:39.355Z - INFO - verified signature on cpiSignatureData
2020-07-12T03:40:39.369Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T03:40:39.372Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T03:40:39.588Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T03:40:39.602Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T03:40:39.747Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T03:40:39.763Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T03:40:39Z",
"grantId": "243152463",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T03:41:09.927Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "243152463",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T03:41:09.940Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "243152463",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T03:44:29Z"
        }
    ]
}
2020-07-12T03:41:40.108Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "243152463",
            "operationState": "AUTHORIZED"
        }
    ]
}
2020-07-12T03:41:40.111Z - INFO - Time interval between two heartbeat request messages is: 30.18, limit is: 65.0
```

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2020-07-12T03:41:40.122Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "243152463",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T03:45:00Z"
  }
]
```

2020-07-12T03:42:10.266Z - INFO - heartbeat request from CBRS :{

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "243152463",
    "operationState": "AUTHORIZED"
  }
]
```

2020-07-12T03:42:10.270Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0

2020-07-12T03:42:10.282Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "243152463",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T03:45:30Z"
  }
]
```

2020-07-12T03:42:40.427Z - INFO - heartbeat request from CBRS :{

```
"heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "243152463",
    "operationState": "AUTHORIZED"
  }
]
```

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]
}
2020-07-12T03:42:40.430Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0
2020-07-12T03:42:40.440Z - INFO - engine sent successfully, the response to CBRS : {
 "heartbeatResponse": [
 {
 "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "243152463",
 "response": {
 "responseCode": 0
 },
 "transmitExpireTime": "2020-07-12T03:46:00Z"
 },
]
}
2020-07-12T03:43:10.586Z - INFO - heartbeat request from CBRS : {
 "heartbeatRequest": [
 {
 "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "243152463",
 "operationState": "AUTHORIZED"
 },
]
}
2020-07-12T03:43:10.591Z - INFO - Time interval between two heartbeat request messages is: 30.159, limit is: 65.0
2020-07-12T03:43:10.599Z - INFO - engine sent successfully, the response to CBRS : {
 "heartbeatResponse": [
 {
 "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
 "grantId": "243152463",
 "response": {
 "responseCode": 0
 },
 "transmitExpireTime": "2020-07-12T03:46:30Z"
 },
]
}
2020-07-12T03:43:40.766Z - INFO - heartbeat request from CBRS : {
 "heartbeatRequest": [
 {

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"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "243152463",
"operationState": "AUTHORIZED"
}
]
}
2020-07-12T03:43:40.770Z - INFO - Time interval between two heartbeat request messages is: 30.18, limit is: 65.0
2020-07-12T03:43:40.780Z - INFO - engine sent successfully, the response to CBRS :{
"heartbeatResponse": [
{
"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "243152463",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-07-12T03:47:00Z"
}
]
}
2020-07-12T03:44:10.976Z - INFO - heartbeat request from CBRS :{
"heartbeatRequest": [
{
"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "243152463",
"operationState": "AUTHORIZED"
}
]
}
2020-07-12T03:44:10.982Z - INFO - Time interval between two heartbeat request messages is: 30.21, limit is: 65.0
2020-07-12T03:44:10.993Z - INFO - engine sent successfully, the response to CBRS :{
"heartbeatResponse": [
{
"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "243152463",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-07-12T03:47:30Z"
}
]
}

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}

2020-07-12T03:44:41.186Z - INFO - heartbeat request from CBRS : {

```
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "243152463",
      "operationState": "AUTHORIZED"
    }
  ]
```

2020-07-12T03:44:41.190Z - INFO - Time interval between two heartbeat request messages is: 30.21, limit is: 65.0

2020-07-12T03:44:41.200Z - INFO - engine sent successfully, the response to CBRS : {

```
  "heartbeatResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "243152463",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-07-12T03:48:01Z"
    }
  ]
```

2020-07-12T03:45:11.421Z - INFO - heartbeat request from CBRS : {

```
  "heartbeatRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "243152463",
      "operationState": "AUTHORIZED"
    }
  ]
```

2020-07-12T03:45:11.424Z - INFO - Time interval between two heartbeat request messages is: 30.234, limit is: 65.0

2020-07-12T03:45:11.436Z - INFO - engine sent successfully, the response to CBRS : {

```
  "heartbeatResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "243152463",
      "response": {
        "responseCode": 0
      }
    }
  ]
```

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```
 },
  "transmitExpireTime": "2020-07-12T03:48:31Z"
}
]
}
```

2020-07-12T03:45:41.635Z - INFO - heartbeat request from CBRS : {

```
 "heartbeatRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "243152463",
    "operationState": "AUTHORIZED"
  }
]
}
```

2020-07-12T03:45:41.640Z - INFO - Time interval between two heartbeat request messages is: 30.216, limit is: 65.0

2020-07-12T03:45:41.651Z - INFO - engine sent successfully, the response to CBRS : {

```
 "heartbeatResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "243152463",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T03:49:01Z"
  }
]
}
```

2020-07-12T03:46:00.946Z - INFO - relinquishment request from CBRS : {

```
 "relinquishmentRequest": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "243152463"
  }
]
}
```

2020-07-12T03:46:00.959Z - INFO - engine sent successfully, the response to CBRS : {

```
 "relinquishmentResponse": [
  {
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "243152463",
    "response": {

```

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```
    "responseCode": 0
  }
}
]
}
```

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8.23 WINNF.FT.C.RLQ.3

"registrationRequest": [

{

"airInterface": {

"radioTechnology": "E_UTRA"

},

"callSign": "callSign123",

"cbsdCategory": "B",

"cbsdSerialNumber": "1257019260400202",

"cpiSignatureData": {

"digitalSignature":

"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",

"encodedCpiSignedData":

"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ij0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",

"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"

},

"fcclId": "WBKCP880-B",

"groupingParam": [

{

"groupId": "123",

"groupType": "INTERFERENCE_COORDINATION"

}

],

"measCapability": [

"RECEIVED_POWER_WITH_GRANT"

],

"userId": "123"

}

]

}

2020-07-12T03:51:43.365Z - INFO - Registration message contains cpiSignatureData

2020-07-12T03:51:43.365Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T03:51:43.367Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T03:51:43.440Z - INFO - verified signature on cpiSignatureData
2020-07-12T03:51:43.446Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T03:51:43.447Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T03:51:43.703Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T03:51:43.720Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T03:52:09.365Z - INFO - spectrumInquiry request from CBRS :{
  "spectrumInquiryRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "inquiredSpectrum": [
        {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      ]
    }
  ]
}

2020-07-12T03:52:09.391Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {

```

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```
"channelType": "GAA",
"frequencyRange": {
    "highFrequency": 3570000000,
    "lowFrequency": 3550000000
},
"ruleApplied": "FCC_PART_96"
},
],
"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"response": {
    "responseCode": 0
}
}
]
}
```

2020-07-12T03:52:09.523Z - INFO - grant request from CBRS :{

```
"grantRequest": [
{
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
        }
    }
}
]
```

2020-07-12T03:52:09.539Z - INFO - engine sent successfully, the response to CBRS :{

```
"grantResponse": [
{
    "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    "channelType": "GAA",
    "grantExpireTime": "2020-07-19T03:52:09Z",
    "grantId": "908572740",
    "heartbeatInterval": 60,
    "response": {
        "responseCode": 0
    }
}
]
```

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]
}
2020-07-12T03:52:39.812Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "908572740",
"operationState": "GRANTED"
}
]
}
2020-07-12T03:52:39.821Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "908572740",
"response": {
"responseCode": 0
},
"transmitExpireTime": "2020-07-12T03:55:59Z"
}
]
}
2020-07-12T03:53:09.963Z - INFO - heartbeat request from CBRS : {
"heartbeatRequest": [
{
"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "908572740",
"operationState": "AUTHORIZED"
}
]
}
2020-07-12T03:53:09.967Z - INFO - Time interval between two heartbeat request messages is: 30.151, limit is: 65.0
2020-07-12T03:53:09.977Z - INFO - engine sent successfully, the response to CBRS : {
"heartbeatResponse": [
{
"cbsdId": "WBKCP880-BMock-SAS1257019260400202",
"grantId": "908572740",
"response": {
"responseCode": 0
}
},

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```
"transmitExpireTime": "2020-07-12T03:56:29Z"
    }
]
}
2020-07-12T03:53:40.148Z - INFO - heartbeat request from CBRS :{
  "heartbeatRequest": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "908572740",
      "operationState": "AUTHORIZED"
    }
  ]
}
2020-07-12T03:53:40.151Z - INFO - Time interval between two heartbeat request messages is: 30.184, limit is: 65.0
2020-07-12T03:53:40.161Z - INFO - engine sent successfully, the response to CBRS :{
  "heartbeatResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "908572740",
      "response": {
        "responseCode": 0
      },
      "transmitExpireTime": "2020-07-12T03:57:00Z"
    }
  ]
}
2020-07-12T03:53:47.923Z - INFO - relinquishment request from CBRS :{
  "relinquishmentRequest": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "grantId": "908572740"
    }
  ]
}
2020-07-12T03:53:47.936Z - INFO - engine sent successfully, the response to CBRS :{
  "relinquishmentResponse": [
    {
      "cbsId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 102,
        "responseData": [

```

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```
        "grantId"  
    ]  
}  
}  
]  
}
```

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8.24 WINNF.FT.C.RLQ.5

"registrationRequest": [
 {
 "airInterface": {
 "radioTechnology": "E_UTRA"
 },
 "callSign": "callSign123",
 "cbsdCategory": "B",
 "cbsdSerialNumber": "1257019260400202",
 "cpiSignatureData": {
 "digitalSignature": "Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",
 "encodedCpiSignedData": "eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",
 "protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"
 },
 "fcclId": "WBKCP880-B",
 "groupingParam": [
 {
 "groupId": "123",
 "groupType": "INTERFERENCE_COORDINATION"
 }
],
 "measCapability": [
 "RECEIVED_POWER_WITH_GRANT"
],
 "userId": "123"
 }
]

2020-07-12T06:11:52.858Z - INFO - Registration message contains cpiSignatureData

2020-07-12T06:11:52.858Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T06:11:52.859Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}

2020-07-12T06:11:52.948Z - INFO - verified signature on cpiSignatureData
2020-07-12T06:11:52.959Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T06:11:52.961Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}

2020-07-12T06:11:53.178Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T06:11:53.194Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T06:11:53.339Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T06:11:53.352Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T06:11:53Z",
"grantId": "149855650",
"heartbeatInterval": 60,
"response": {
    "responseCode": 0
}
}
]
}

2020-07-12T06:12:23.519Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "149855650",
            "operationState": "GRANTED"
        }
    ]
}
}

2020-07-12T06:12:23.526Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "149855650",
            "response": {
                "responseCode": 0
            },
            "transmitExpireTime": "2020-07-12T06:15:43Z"
        }
    ]
}
}

2020-07-12T06:12:53.680Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "149855650",
            "operationState": "AUTHORIZED"
        }
    ]
}
}

2020-07-12T06:12:53.686Z - INFO - Time interval between two heartbeat request messages is: 30.161, limit is: 65.0
```

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2020-07-12T06:12:53.700Z - INFO - engine sent successfully, the response to CBRS : {

```
"heartbeatResponse": [
  {
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "149855650",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T06:16:13Z"
  }
]
```

2020-07-12T06:13:04.997Z - INFO - relinquishment request from CBRS : {

```
"relinquishmentRequest": [
  {
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "149855650"
  }
]
```

2020-07-12T06:13:05.010Z - INFO - engine sent successfully, the response to CBRS : {

```
"relinquishmentResponse": [
  {
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "response": {
      "responseCode": 103,
      "responseData": [
        "grantId"
      ]
    }
  }
]
```

}



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8.25 WINNF.FT.C.DRG.1**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",****"encodedCpiSignedData":****"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUojk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",****"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCl6IkpxVCJ9"****},****"fcclId": "WBKCP880-B",****"groupingParam": [****{****"groupId": "123",****"groupType": "INTERFERENCE_COORDINATION"****}****],****"measCapability": [****"RECEIVED_POWER_WITH_GRANT"****],****"userId": "123"****}****]****}**

2020-07-12T07:04:44.959Z - INFO - Registration message contains cpiSignatureData

2020-07-12T07:04:44.960Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T07:04:44.960Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T07:04:45.052Z - INFO - verified signature on cpiSignatureData
2020-07-12T07:04:45.059Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T07:04:45.062Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T07:04:45.269Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T07:04:45.286Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T07:04:45.407Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T07:04:45.420Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T07:04:45Z",
"grantId": "757068407",
"heartbeatInterval": 60,
"response": {
    "responseCode": 0
}
}
]
}

2020-07-12T07:05:15.588Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "757068407",
            "operationState": "GRANTED"
        }
    ]
}
}

2020-07-12T07:05:15.602Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "757068407",
            "response": {
                "responseCode": 0
            },
            "transmitExpireTime": "2020-07-12T07:08:35Z"
        }
    ]
}
}

2020-07-12T07:05:45.818Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "757068407",
            "operationState": "AUTHORIZED"
        }
    ]
}
}

2020-07-12T07:05:45.821Z - INFO - Time interval between two heartbeat request messages is: 30.23, limit is: 65.0
```

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2020-07-12T07:05:45.832Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [
  {
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "757068407",
    "response": {
      "responseCode": 0
    },
    "transmitExpireTime": "2020-07-12T07:09:05Z"
  }
]
```

2020-07-12T07:05:48.528Z - INFO - relinquishment request from CBRS :{

```
"relinquishmentRequest": [
  {
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "757068407"
  }
]
```

2020-07-12T07:05:48.539Z - INFO - engine sent successfully, the response to CBRS :{

```
"relinquishmentResponse": [
  {
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "757068407",
    "response": {
      "responseCode": 0
    }
  }
]
```

2020-07-12T07:05:50.987Z - INFO - relinquishment request from CBRS :{

```
"relinquishmentRequest": [
  {
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",
    "grantId": "757068407"
  }
]
```

2020-07-12T07:05:51.000Z - INFO - engine sent successfully, the response to CBRS :{

```
"relinquishmentResponse": [
```



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```
{  
  "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
  "grantId": "757068407",  
  "response": {  
    "responseCode": 0  
  }  
}  
]  
}
```

2020-07-12T07:05:51.217Z - INFO - deregistration request from CBRS : {

```
"deregistrationRequest": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202"  
  }  
]  
}
```

2020-07-12T07:05:51.230Z - INFO - engine sent successfully, the response to CBRS : {

```
"deregistrationResponse": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "response": {  
      "responseCode": 0  
    }  
  }  
]  
}
```

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8.26 WINNF.FT.C.DRG.3**"registrationRequest": [****{****"airInterface": {****"radioTechnology": "E_UTRA"****},****"callSign": "callSign123",****"cbsdCategory": "B",****"cbsdSerialNumber": "1257019260400202",****"cpiSignatureData": {****"digitalSignature":****"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHiwiq2XNcNz6_uABNTAEw",****"encodedCpiSignedData":****"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkjoiV0JLQ1A4ODAtQilsImluc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemtdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0ljo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUoJk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxlcRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTlziwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",****"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"****},****"fcclId": "WBKCP880-B",****"groupingParam": [****{****"groupId": "123",****"groupType": "INTERFERENCE_COORDINATION"****}****],****"measCapability": [****"RECEIVED_POWER_WITH_GRANT"****],****"userId": "123"****}****]****}**

2020-07-12T07:11:00.132Z - INFO - Registration message contains cpiSignatureData

2020-07-12T07:11:00.132Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T07:11:00.134Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T07:11:00.230Z - INFO - verified signature on cpiSignatureData
2020-07-12T07:11:00.237Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T07:11:00.240Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T07:11:00.446Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T07:11:00.460Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T07:11:00.585Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T07:11:00.599Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```



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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T07:11:00Z",
"grantId": "629235087",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T07:11:30.744Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "629235087",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T07:11:30.757Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "629235087",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T07:14:50Z"
        }
    ]
}
2020-07-12T07:12:00.904Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "629235087",
            "operationState": "AUTHORIZED"
        }
    ]
}
2020-07-12T07:12:00.908Z - INFO - Time interval between two heartbeat request messages is: 30.16, limit is: 65.0
```

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2020-07-12T07:12:00.920Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "629235087",  
    "response": {  
      "responseCode": 0  
    },  
    "transmitExpireTime": "2020-07-12T07:15:20Z"  
  },  
]  
}
```

2020-07-12T07:12:02.785Z - INFO - relinquishment request from CBRS :{

```
"relinquishmentRequest": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "629235087"  
  },  
]  
}
```

2020-07-12T07:12:02.795Z - INFO - engine sent successfully, the response to CBRS :{

```
"relinquishmentResponse": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "629235087",  
    "response": {  
      "responseCode": 0  
    },  
  },  
]  
}
```

2020-07-12T07:12:04.694Z - INFO - relinquishment request from CBRS :{

```
"relinquishmentRequest": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "629235087"  
  },  
]  
}
```

2020-07-12T07:12:04.706Z - INFO - engine sent successfully, the response to CBRS :{

```
"relinquishmentResponse": [  
  {
```

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```
{  
  "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
  "grantId": "629235087",  
  "response": {  
    "responseCode": 0  
  }  
}  
]  
}
```

2020-07-12T07:12:04.884Z - INFO - deregistration request from CBRS :{

```
"deregistrationRequest": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202"  
  }  
]  
}
```

2020-07-12T07:12:04.895Z - INFO - engine sent successfully, the response to CBRS :{

```
"deregistrationResponse": [  
  {  
    "response": {  
      "responseCode": 102  
    }  
  }  
]  
}
```

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8.27 WINNF.FT.C.DRG.5

"registrationRequest": [

{

"airInterface": {

"radioTechnology": "E_UTRA"

},

"callSign": "callSign123",

"cbsdCategory": "B",

"cbsdSerialNumber": "1257019260400202",

"cpiSignatureData": {

"digitalSignature":

"Vgq2CNehdHgylAtIE6yM5WEokZUTfuwTjvGA7sfzukYbgF904TOsglnVk1nhm0sTy7i70qQbcFjvr5m_ydXvdAJSIYioISG2Bb1d4eMfYhJUQLWiqlJH0chxPGOE28pWTX3v9uuKmVJXyGrzze6knNuegWtThP-7pFWBsLvlEcs3d86AR-lhs34vXqtkAdx_uVMpbXQh33XSOpR6gOt5yiGvc4bCWEYKhdhzjcBOcuaWshsz1FexWHY7pzFjh34srMjUxJDmaZ-jbCdOagjuwCDpk5moe_1v9sAleIN1-Trgtx_mcTbF7Cpnkfr2WHivviq2XNcNz6_uABNTAEw",

"encodedCpiSignedData":

"eyJjYnNkU2VyaWFsTnVtYmVyljoiMTI1NzAxOTI2MDQwMDIwMilsImZjY0IkIjoiV0JLQ1A4ODAtQilsImIuc3RhbGxhdGlvbIBhcmFtljp7ImFudGVubmFBemItdXRoljoyMjlsImFudGVubmFCZWftd2IkGgiOjMzMywiYW50ZW5uYURvd250aWx0Ijo0NSwiYW50ZW5uYUdhaW4iOjE0LCJoZWlnaHQiOjEwLCJoZWlnaHRUeXBIIjoiQUdMliwiaW5kb29yRGVwbG95bWVudCl6ZmFsc2UsImxhdGl0dWRlljo1OC44MzMyLCJsb25naXR1ZGUiOjk4LjM0NX0sInByb2Zlc3Npb25hbEluc3RhbGxIckRhdGEiOnsiY3BpSWQiOixMjMiLCJjcGIOYW1lljoiMTIzliwiaW5zdGFsbENlcnRpZmljYXRpb25UaW1lljoiMjAyMC03LTEyVDA5OjAwOjExWiJ9fQ",

"protectedHeader": "eyJhbGciOiJSUzI1NilsInR5cCI6IkpxVCJ9"

},

"fcclId": "WBKCP880-B",

"groupingParam": [

{

"groupId": "123",

"groupType": "INTERFERENCE_COORDINATION"

}

],

"measCapability": [

"RECEIVED_POWER_WITH_GRANT"

],

"userId": "123"

}

]

}

2020-07-12T07:16:08.325Z - INFO - Registration message contains cpiSignatureData

2020-07-12T07:16:08.326Z - INFO - protectedHeader = {u'alg': u'RS256', u'typ': u'JWT'}

2020-07-12T07:16:08.326Z - INFO - encodedCpiSignedData contents = {



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```
"installationParam": {
    "antennaAzimuth": 222,
    "heightType": "AGL",
    "longitude": 98.345,
    "height": 10,
    "indoorDeployment": false,
    "latitude": 58.8332,
    "antennaDowntilt": 45,
    "antennaBeamwidth": 333,
    "antennaGain": 14
},
"fcclId": "WBKCP880-B",
"professionalInstallerData": {
    "cpiName": "123",
    "installCertificationTime": "2020-7-12T09:00:11Z",
    "cpId": "123"
},
"cbsdSerialNumber": "1257019260400202"
}
2020-07-12T07:16:08.391Z - INFO - verified signature on cpiSignatureData
2020-07-12T07:16:08.397Z - INFO - cpiSignatureData data successfully validated against jsonschema
2020-07-12T07:16:08.398Z - INFO - engine sent successfully, the response to CBRS :{
    "registrationResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "response": {
                "responseCode": 0
            }
        }
    ]
}
2020-07-12T07:16:08.604Z - INFO - spectrumInquiry request from CBRS :{
    "spectrumInquiryRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "inquiredSpectrum": [
                {
                    "highFrequency": 3570000000,
                    "lowFrequency": 3550000000
                }
            ]
        }
    ]
}
```

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```
    }
  ]
}

2020-07-12T07:16:08.618Z - INFO - engine sent successfully, the response to CBRS :{
  "spectrumInquiryResponse": [
    {
      "availableChannel": [
        {
          "channelType": "GAA",
          "frequencyRange": {
            "highFrequency": 3570000000,
            "lowFrequency": 3550000000
          },
          "ruleApplied": "FCC_PART_96"
        }
      ],
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "response": {
        "responseCode": 0
      }
    }
  ]
}

2020-07-12T07:16:08.769Z - INFO - grant request from CBRS :{
  "grantRequest": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
      "operationParam": {
        "maxEirp": 37,
        "operationFrequencyRange": {
          "highFrequency": 3570000000,
          "lowFrequency": 3550000000
        }
      }
    }
  ]
}

2020-07-12T07:16:08.782Z - INFO - engine sent successfully, the response to CBRS :{
  "grantResponse": [
    {
      "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
    }
  ]
}
```

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```
"channelType": "GAA",
"grantExpireTime": "2020-07-19T07:16:08Z",
"grantId": "694257217",
"heartbeatInterval": 60,
"response": [
    "responseCode": 0
]
}
]
}
2020-07-12T07:16:38.963Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "694257217",
            "operationState": "GRANTED"
        }
    ]
}
2020-07-12T07:16:38.976Z - INFO - engine sent successfully, the response to CBRS : {
    "heartbeatResponse": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "694257217",
            "response": [
                "responseCode": 0
            ],
            "transmitExpireTime": "2020-07-12T07:19:58Z"
        }
    ]
}
2020-07-12T07:17:09.142Z - INFO - heartbeat request from CBRS : {
    "heartbeatRequest": [
        {
            "cbsdId": "WBKCP880-BMock-SAS1257019260400202",
            "grantId": "694257217",
            "operationState": "AUTHORIZED"
        }
    ]
}
}
2020-07-12T07:17:09.145Z - INFO - Time interval between two heartbeat request messages is: 30.18, limit is: 65.0
```

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2020-07-12T07:17:09.157Z - INFO - engine sent successfully, the response to CBRS :{

```
"heartbeatResponse": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "694257217",  
    "response": {  
      "responseCode": 0  
    },  
    "transmitExpireTime": "2020-07-12T07:20:29Z"  
  },  
]  
}
```

2020-07-12T07:17:11.381Z - INFO - relinquishment request from CBRS :{

```
"relinquishmentRequest": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "694257217"  
  },  
]  
}
```

2020-07-12T07:17:11.395Z - INFO - engine sent successfully, the response to CBRS :{

```
"relinquishmentResponse": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "694257217",  
    "response": {  
      "responseCode": 0  
    },  
  },  
]  
}
```

2020-07-12T07:17:12.022Z - INFO - relinquishment request from CBRS :{

```
"relinquishmentRequest": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
    "grantId": "694257217"  
  },  
]  
}
```

2020-07-12T07:17:12.032Z - INFO - engine sent successfully, the response to CBRS :{

```
"relinquishmentResponse": [
```



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```
{  
  "cbsId": "WBKCP880-BMock-SAS1257019260400202",  
  "grantId": "694257217",  
  "response": {  
    "responseCode": 0  
  }  
}  
]  
}
```

2020-07-12T07:17:12.203Z - INFO - deregistration request from CBRS : {

```
"deregistrationRequest": [  
  {  
    "cbsId": "WBKCP880-BMock-SAS1257019260400202"  
  }  
]  
}
```

2020-07-12T07:17:12.213Z - INFO - engine sent successfully, the response to CBRS : {

```
"deregistrationResponse": [  
  {  
    "response": {  
      "responseCode": 103,  
      "responseData": [  
        "cbsId"  
      ]  
    }  
  }  
]  
}
```

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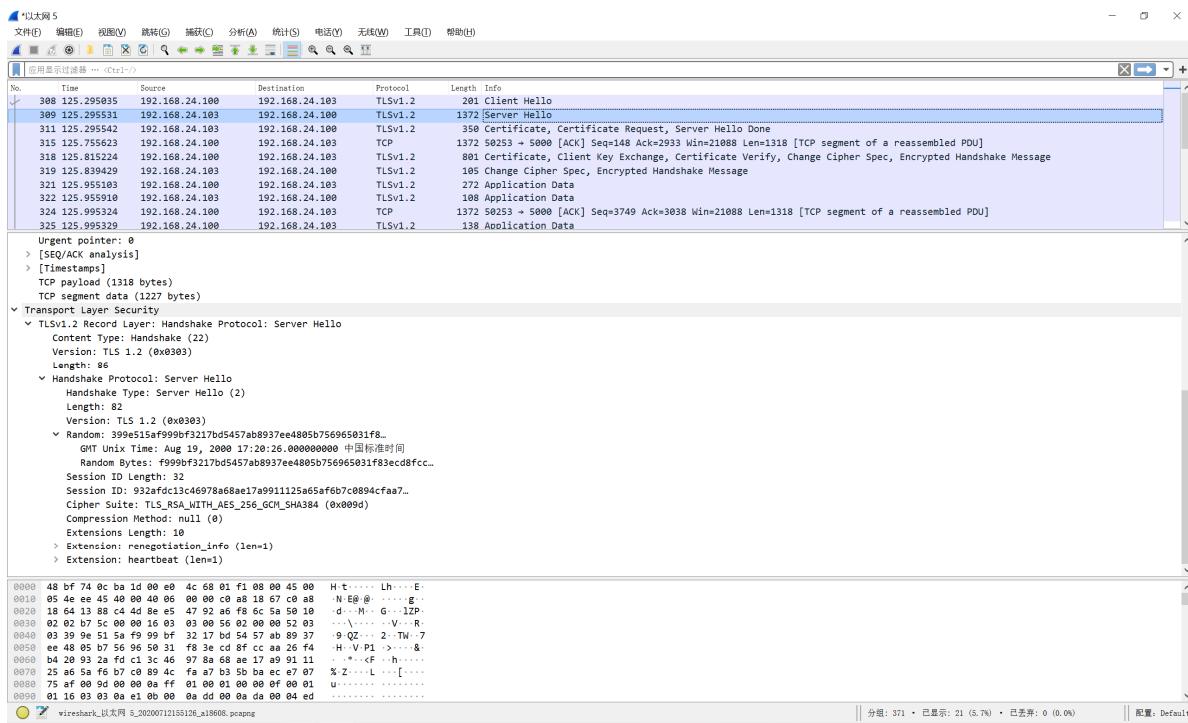
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8.28 WINNF.FT.C.SCS.1



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8.29 WINNF.FT.C.SCS.2

*以太网 5

文件(F) 编辑(E) 视图(V) 跟踪(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(I) 帮助(H)

捕获过滤器: t1s

列: No. Time Source Destination Protocol Length Info

No.	Time	Source	Destination	Protocol	Length	Info
36	25.549682	192.168.24.100	192.168.24.103	TLSv1.2	233	Client Hello
37	25.550125	192.168.24.103	192.168.24.100	TLSv1.2	1372	Server Hello
39	25.550143	192.168.24.103	192.168.24.100	TLSv1.2	485	Certificate, Certificate Request, Server Hello Done
55	25.839623	192.168.24.100	192.168.24.103	TLSv1.2	61	Alert (Level: Fatal, Description: Certificate Revoked)
66	31.409644	192.168.24.100	192.168.24.103	TLSv1.2	233	Client Hello
67	31.409977	192.168.24.103	192.168.24.100	TLSv1.2	1372	Server Hello
69	31.409993	192.168.24.103	192.168.24.100	TLSv1.2	485	Certificate, Certificate Request, Server Hello Done
84	31.659771	192.168.24.100	192.168.24.103	TLSv1.2	61	Alert (Level: Fatal, Description: Certificate Revoked)
93	37.249570	192.168.24.100	192.168.24.103	TLSv1.2	233	Client Hello
94	37.249929	192.168.24.103	192.168.24.100	TLSv1.2	1372	Server Hello

Urgent pointer: 0
> [SEQ/ACK analysis]
> [Timestamps]
> TCP payload (1318 bytes)
> TCP segment data (1227 bytes)

Transport Layer Security

> TLSv1.2 Record Layer: Handshake Protocol: Server Hello
Content Type: Handshake (22)
Version: TLS 1.2 (0x0303)
Length: 86

> Handshake Protocol: Server Hello
Handshake Type: Server Hello (2)
Length: 82
Version: TLS 1.2 (0x0303)
> Random: e1c2899f1357db4711df3789069ae6e843628bb7ab5cd3c..
GMT Unix Time: Jan 9, 2098 13:26:07.000000000 中国标准时间
Random Bytes: 1357db4711df3789069ae6e843628bb7ab5cd3c6b9863..
Session ID Length: 32
Session ID: 5a08705d4df075e7b4e2dd47366c51c1dd5f4e60c48f..
Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x090d)
Compression Method: null (0)
Extensions Length: 10
> Extension: renegotiation_info (len=1)
> Extension: heartbeat (len=1)
> Extension: ..

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
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0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
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0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

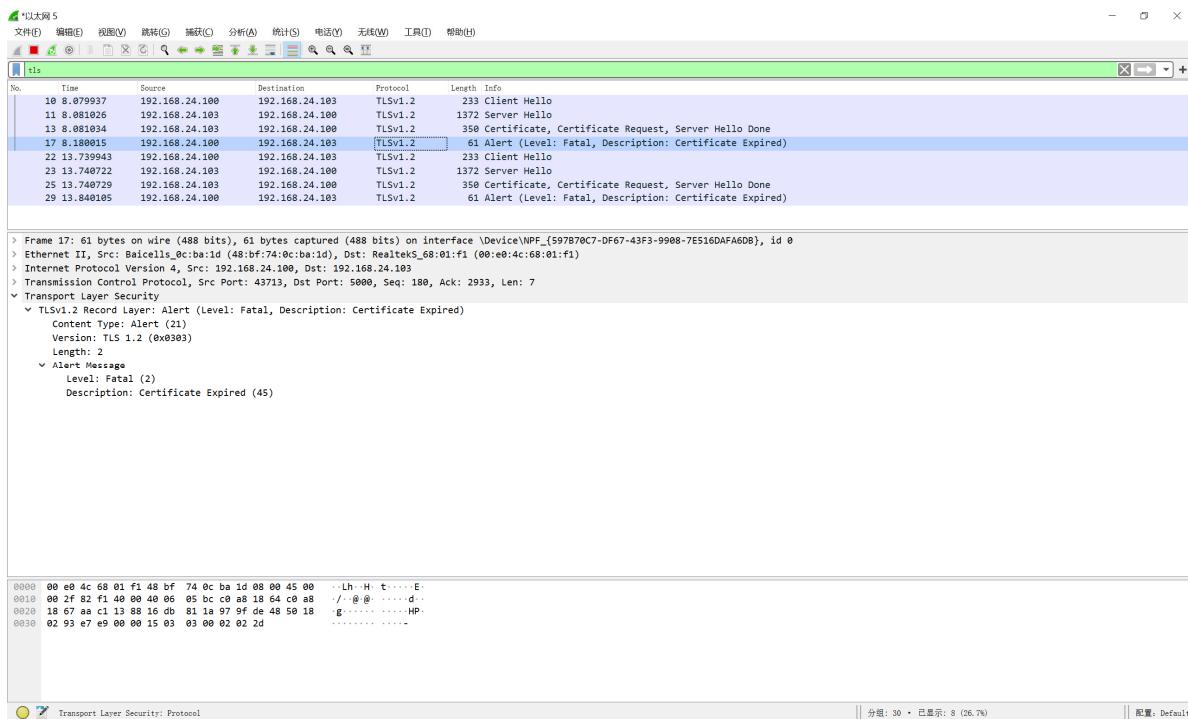
0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 00 00 00 00 00 00 Z P u ... s
0070 66 c5 c1 d8 0d 5f 4e 69 04 8f af 04 0d af e2 27 f ... _N v ... 1
0080 b4 00 80 9d 00 00 8a ff 01 00 01 00 00 00 00 00 01 f
0090 01 16 03 03 h 00 68 00 00 64 00 00 61 00 95 74 ... h ... d a t

0000 48 bf 74 0c ba 1d 00 e9 4c 68 01 f1 08 99 45 00 H t ... E
0010 05 4e ee f7 48 00 49 06 00 00 c9 a8 18 67 c9 a8 N @ @ ... g
0020 18 64 13 88 8a 35 2e a6 7a 9d 55 25 f3 ce 90 10 d ... z UK P
0030 02 02 b7 5c 00 00 16 03 03 00 56 02 00 00 52 03 ... \ ... V ... R
0040 03 e1 c2 89 6f 13 57 db 47 11 fd 37 89 86 9a 6e o W G ... 7 ... n
0050 69 43 62 8b 6b 7a b5 cd 3c 8c 6b 98 63 7c b7 36 H C Z ... < k c] 6
0060 c0 00 0e 00 00 00 00 00 00 00 0

8.30 WINNF.FT.C.SCS.3



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8.31 WINNF.FT.C.SCS.4

以太网 5

文件(F) 编辑(E) 视图(V) 跟踪(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(I) 帮助(H)

捕获

显示为: 108 • 已显示: 8 (7.4%) • 已丢弃: 0 (0.0%) | 配置: Default

捕获

No. Time Source Destination Protocol Length Info

88	21.152342	192.168.24.100	192.168.24.103	TLSv1.2	233 Client Hello
89	21.153277	192.168.24.103	192.168.24.100	TLSv1.2	1372 Server Hello
91	21.153284	192.168.24.103	192.168.24.100	TLSv1.2	349 Certificate, Certificate Request, Server Hello Done
95	21.192130	192.168.24.100	192.168.24.103	TLSv1.2	61 Alert (Level: Fatal, Description: Unknown CA)
100	26.792183	192.168.24.100	192.168.24.103	TLSv1.2	233 Client Hello
101	26.793083	192.168.24.103	192.168.24.100	TLSv1.2	1372 Server Hello
103	26.793095	192.168.24.103	192.168.24.100	TLSv1.2	349 Certificate, Certificate Request, Server Hello Done
107	26.832237	192.168.24.100	192.168.24.103	TLSv1.2	61 Alert (Level: Fatal, Description: Unknown CA)

Frame 107: 61 bytes on wire (488 bits), 61 bytes captured (488 bits) on interface \Device\NPF_{597870C7-DF67-43F3-9908-7E516DAFA60B}, id 0

> Ethernet II, Src: Baicells_0c:ba:1d (48:bf:74:0c:ba:1d), Dst: Realtek5_68:01:f1 (00:e0:4c:68:01:f1)

> Internet Protocol Version 4, Src: 192.168.24.100, Dst: 192.168.24.103

> Transmission Control Protocol, Src Port: 52735, Dst Port: 5000, Seq: 180, Ack: 2932, Len: 7

Transport Layer Security

 TLSv1.2 Record Layer: Alert (Level: Fatal, Description: Unknown CA)

 Content Type: Alert (21)

 Version: TLS 1.2 (0x0303)

 Length: 2

 Alert Message

 Level: Fatal (2)

 Description: Unknown CA (48)

0000 00 00 4c 68 01 f1 48 bf 74 0c ba 1d 08 00 45 00 :Lh.....E

0010 00 2f 39 47 48 00 40 06 4f 66 c9 a8 18 64 c9 a8 :/9Gb@.Of...d...

0020 18 67 cd ff 13 88 f1 29 67 e5 3d b1 9d 24 50 18 :g.....g=:\$P

0030 02 93 9b a4 00 00 15 03 03 00 02 02 300

捕获

以太网 5

文件(F) 编辑(E) 视图(V) 跟踪(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(I) 帮助(H)

显示为: 108 • 已显示: 8 (7.4%) • 已丢弃: 0 (0.0%) | 配置: Default

捕获

No. Time Source Destination Protocol Length Info

4	0.040035	192.168.24.100	192.168.24.103	TLSv1.2	233 Client Hello
5	0.041830	192.168.24.103	192.168.24.100	TLSv1.2	1372 Server Hello
7	0.041836	192.168.24.103	192.168.24.100	TLSv1.2	349 Certificate, Certificate Request, Server Hello Done
11	0.079976	192.168.24.100	192.168.24.103	TLSv1.2	61 Alert (Level: Fatal, Description: Unknown CA)
18	5.639993	192.168.24.100	192.168.24.103	TLSv1.2	233 Client Hello
19	5.640878	192.168.24.103	192.168.24.100	TLSv1.2	1372 Server Hello
21	5.640886	192.168.24.103	192.168.24.100	TLSv1.2	349 Certificate, Certificate Request, Server Hello Done
25	5.680008	192.168.24.100	192.168.24.103	TLSv1.2	61 Alert (Level: Fatal, Description: Unknown CA)

Frame 5: 1372 bytes on wire (10976 bits), 1372 bytes captured (10976 bits) on interface \Device\NPF_{597870C7-DF67-43F3-9908-7E516DAFA60B}, id 0

> Ethernet II, Src: Realtek5_68:01:f1 (00:e0:4c:68:01:f1), Dst: Baicells_0c:ba:1d (48:bf:74:0c:ba:1d)

> Internet Protocol Version 4, Src: 192.168.24.103, Dst: 192.168.24.100

> Transmission Control Protocol, Src Port: 5000, Dst Port: 49867, Seq: 1, Ack: 180, Len: 1318

Transport Layer Security

 TLSv1.2 Record Layer: Handshake Protocol: Server Hello

 Content Type: Handshake (22)

 Version: TLS 1.2 (0x0303)

 Length: 86

 Handshake Protocol: Server Hello

 Handshake Type: Server Hello (2)

 Length: 82

 Version: TLS 1.2 (0x0303)

 Random: 8894a0b3126e0c5bdc45da116c699dfcc303d52383fe827...

 GMT Unix Time: Aug 12, 2042 15:37:23.000000000 中国标准时间

 Random Bytes: 126e0c5b8c5d1a16c699dfcc303d52383fe827968cb99d...

 Session ID Length: 32

 Session ID: 414ade07f4b5d70cb659e33e8e776fbc4319d6a90684de...

 Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d)

 Compression Method: null (0)

 Extensions Length: 10

 Extension: renegotiation_info (len=1)

 Extension: heartbeat (len=1)

0000 48 bf 74 0c ba 1d 00 e0 4c 68 01 f1 08 00 45 00 :h.....E

0010 05 4e f1 f4 48 00 48 06 00 00 c0 a8 18 67 c0 a8 :N.....g...

0020 02 92 b7 88 00 00 00 00 00 00 00 00 00 00 00 00 :d.....j.....

0030 03 88 94 a0 b2 12 64 0c 5b 8c da 11 6c 69 8d :.....n.....Z...

0040 fc c3 03 d5 23 83 fe f8 27 96 8c bd 94 5a 00 62 :.....#.....Z...

0050 5c 28 41 4d e0 7f 4b 5d b7 0c b6 59 e3 3a 88 e7 :T AM-[K].....Y...

0060 76 fb e4 31 9d 6a e9 06 84 de b6 1f c6 7f ed d3 :v.....1.....

0070 28 0f 00 9d 00 00 ff 00 00 01 00 00 00 00 01 :.....

0080 01 16 03 03 00 00 00 00 00 00 00 00 00 00 00 01 :.....

0090 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :.....

捕获

以太网 5

文件(F) 编辑(E) 视图(V) 跟踪(G) 捕获(C) 分析(A) 统计(S) 电话(Y) 无线(W) 工具(I) 帮助(H)

显示为: 26 • 已显示: 8 (30.8%) • 已丢弃: 0 (0.0%) | 配置: Default

捕获

No. Time Source Destination Protocol Length Info

4	0.040035	192.168.24.100	192.168.24.103	TLSv1.2	233 Client Hello
5	0.041830	192.168.24.103	192.168.24.100	TLSv1.2	1372 Server Hello
7	0.041836	192.168.24.103	192.168.24.100	TLSv1.2	349 Certificate, Certificate Request, Server Hello Done
11	0.079976	192.168.24.100	192.168.24.103	TLSv1.2	61 Alert (Level: Fatal, Description: Unknown CA)
18	5.639993	192.168.24.100	192.168.24.103	TLSv1.2	233 Client Hello
19	5.640878	192.168.24.103	192.168.24.100	TLSv1.2	1372 Server Hello
21	5.640886	192.168.24.103	192.168.24.100	TLSv1.2	349 Certificate, Certificate Request, Server Hello Done
25	5.680008	192.168.24.100	192.168.24.103	TLSv1.2	61 Alert (Level: Fatal, Description: Unknown CA)

Frame 5: 1372 bytes on wire (10976 bits), 1372 bytes captured (10976 bits) on interface \Device\NPF_{597870C7-DF67-43F3-9908-7E516DAFA60B}, id 0

> Ethernet II, Src: Realtek5_68:01:f1 (00:e0:4c:68:01:f1), Dst: Baicells_0c:ba:1d (48:bf:74:0c:ba:1d)

> Internet Protocol Version 4, Src: 192.168.24.103, Dst: 192.168.24.100

> Transmission Control Protocol, Src Port: 5000, Dst Port: 49867, Seq: 1, Ack: 180, Len: 1318

Transport Layer Security

 TLSv1.2 Record Layer: Handshake Protocol: Server Hello

 Content Type: Handshake (22)

 Version: TLS 1.2 (0x0303)

 Length: 86

 Handshake Protocol: Server Hello

 Handshake Type: Server Hello (2)

 Length: 82

 Version: TLS 1.2 (0x0303)

 Random: 8894a0b3126e0c5bdc45da116c699dfcc303d52383fe827...

 GMT Unix Time: Aug 12, 2042 15:37:23.000000000 中国标准时间

 Random Bytes: 126e0c5b8c5d1a16c699dfcc303d52383fe827968cb99d...

 Session ID Length: 32

 Session ID: 414ade07f4b5d70cb659e33e8e776fbc4319d6a90684de...

 Cipher Suite: TLS_RSA_WITH_AES_256_GCM_SHA384 (0x009d)

 Compression Method: null (0)

 Extensions Length: 10

 Extension: renegotiation_info (len=1)

 Extension: heartbeat (len=1)

0000 48 bf 74 0c ba 1d 00 e0 4c 68 01 f1 08 00 45 00 :h.....E

0010 05 4e f1 f4 48 00 48 06 00 00 c0 a8 18 67 c0 a8 :N.....g...

0020 02 92 b7 88 00 00 00 00 00 00 00 00 00 00 00 00 :d.....j.....

0030 03 88 94 a0 b2 12 64 0c 5b 8c da 11 6c 69 8d :.....n.....Z...

0040 fc c3 03 d5 23 83 fe f8 27 96 8c bd 94 5a 00 62 :.....#.....Z...

0050 5c 28 41 4d e0 7f 4b 5d b7 0c b6 59 e3 3a 88 e7 :T AM-[K].....Y...

0060 76 fb e4 31 9d 6a e9 06 84 de b6 1f c6 7f ed d3 :v.....1.....

0070 28 0f 00 9d 00 00 ff 00 00 01 00 00 00 00 01 :.....

0080 01 16 03 03 00 00 00 00 00 00 00 00 00 00 00 01 :.....

0090 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 :.....

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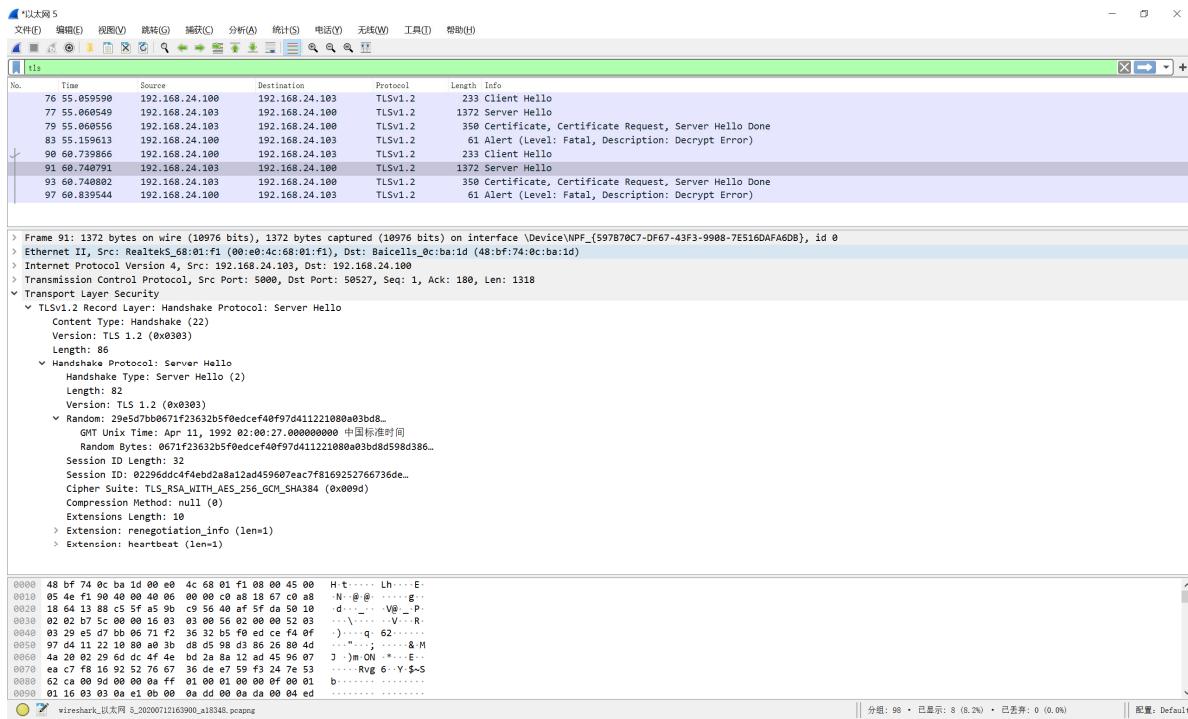
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8.32 WINNF.FT.C.SCS.5



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9 Photographs

9.1 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -



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