Partner Milli Qualification Test Plan

Revision 2.4

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Revision/History

Revision	Reason	Date
1.0	Initial draft. Based on Partner Hardware Qualification Test Plan 3.0	1/12/2017
1.1	Removing some unnecessary requirements, remove power supply tests, RF immunity tests, add CoAP & bandwidth. Add pass/fail criteria.	7/24/2017
1.2	Additional detail for RF Testing	3/28/2018
1.3	RF test feedback from HWQA integrated	3/30/2018
1.4	Add test equipment and Milli power supply requirements	4/28/2018
1.5	Simplified RF tests Removed section 1.7 as there were no tests supporting it.	6/7/2018
1.6	Expanded instructions on setup	6/13/2-18
1.7	Itron template	6/21/2018
1.8	Improve CoAP test requirements and when to run each test.	3/25/2019
1.9	Actual results email, added country bands	3/26/2019
2.0	Updated with IoTR tool instructions	3/29/2019
2.1	Cleanup SSNI references, formatting, and improve description of how to run RF tests.	4/1/2019
2.2	Resolved RF frequency bands	4/14/2019
2.3	Update diagrams	5/20/2019
2.4	Updated clarification on testing details	10/29/2019

1 Introduction

The purpose of this document is to define the qualification tests for the host device that interfaces with the Itron Milli Module. These tests are intended to supplement the partner's tests; as such, the partner shall incorporate these tests into their test plan.

1.1 Partner Responsibility and Document Scope

The tests provided in this document were designed to ensure the partner's host device and the Itron Milli module are compatible and meet the required specifications.

Any tests that directly affect or apply to the host device and not mentioned in these test guidelines, are beyond the scope of this document; however the partner should execute their own testing to include verification of those product specific functions and features.

For example, for powered devices the host device might a have shutdown procedure in the event of a power failure. The partner should verify the host device doesn't become corrupted, latch up, or lose configuration information when power is lost and the Itron Milli module is allowed to draw power for receiving or transmitting data.

For host products powered via current harvesting or DC voltage vs. AC voltage, translate the voltage range requirements into the relevant input range requirements as seen by the host.

1.2 Reference Web Site

Itron developer portal provides documentation and tutorials help partners learn more about our technology: navigate to the "Itron Gen5 development resources" found at https://developer.itron.com/

There is a variety of information available; some without an account, more when signed in with an authenticated account, and some requiring explicit permission being granted by an Itron project representative. Sign up for an account and work with you Itron partner manager to get access to any necessary technical documentation. This test plan has links back to specific documentation on the website which can provide further assistance in understanding specific aspects of a given test.

1.3 Reference Test Labs

The tests must be conducted by one of these Itron approved test labs.

Table 1.3

Test Lab	Shipping Address	Contact
7Layers	15 Musick Irvine, CA 92618 USA	Shirley Cui Tarantino +1 (669) 600-5293 Shirley.Tarantino@7Layers.com

1.4 Terms and Acronyms

Table 1.4

Acronym/ Term	Definition/Description
FHSS	Frequency Hopping Spread Spectrum
IOTR	Internet of Things (IOT) Router – used for connecting devices to the Itron back office suite of software.
ITU	International Telecommunications Union
NIC	Network Interface Card (aka Communication Module)
PER	Packet Error Rate
sio_load	This is an Itron application used for configuring NICs and working with NIC firmware.
SMA	SMA Coax connector
TIS	Total Isotropic Sensitivity (aka RxPER)
TRP	Total Radiated Power
UUT	Unit Under Test

1.5 Test Requirements

1.5.1 Acceptance Test Criteria

The test acceptance criteria are defined for each test.

1.5.2 Test Equipment

All of the test equipment used in test procedures must be traceable to an accredited national standards body, such as the National Institute of Standards and Technology (NIST) or equivalent, with all the required documentation to support the claim of traceability to the accredited national standards body. Example equipment manufacturer and models are provided as a reference.

Table 1.5.2

Description	Manufacturer	Model/Part #	Remarks
Spectrum Analyzer (9KHz – 3GHz)	Agilent	N9320A	For measuring cable loss and setup calibration/baseline measurement
Dipole Antenna Operation Frequency – 698 – 960 MHz and 1710 – 2700 MHz Impedance - 50Ω	WPANT Pulse Laird	40021-C1B SPDA24700/2700 DBA6927C1-FSMAF	For UUT external antenna
Semi-rigid Coaxial (SMA) Cables			

Step/variable (SMA) Attenuators			
Cable USB-Serial TTL (or similar which matches UUT header for Milli debug port)	FTDI	TTL-232R-RPI	For USB connection to PC from milli UART.
Communications Tester			Software provided by Itron
Sio_load			Software application provided by Itron
IoTRDiagTool			Software application provided by Itron
Tera Term software			Software used for working with communications ports

1.6 Test Report Content Requirements

For each test, the test report shall contain the following:

1.6.1 Units Under Test (UUTs)

Provide a list of the host UUTs and the Milli modules used in the execution of this test as shown by the examples listed in the following table. This shall include the manufacturer, a unique identification, such as a model number or assembly part number, revision level, serial number or MAC address, and firmware (FW) revision number. The partner shall determine quantity of samples per test (minimum 1).

Table 1.6.1 DUTs tested

MFR	Model/ Assembly	Rev	Description	MAC/Serial Number	FW
XZY	ABCD	B	Host Device		
Itron	174-xxxx-xx	A0	Milli module		

1.6.2 Country RF Bands

The following countries are supported:

Table 1.6.2-1

BAND	CC*	IoTR HW	Milli HW	FREQUENCY BAND	POWER	COUNTRIES
AUS	36	2	1	915-928 MHz	350 mW (eirp)	AUS
USA	840	1	1	902-928 MHz	350 mW (eirp)	USA, CAN, JAM

BAND	CC*	IoTR HW	Milli HW	FREQUENCY BAND	POWER	COUNTRIES
SGP	702	2	1	920-925 MHz	350 mW (erp)	SGP
EU873	826	3	2	870-873 MHz	500 mW erp	CHE, EST, FIN, GBR, HUN, ISL, IRL, LUX, PRT, SWE
EU876	208	3	2	870-875.6 MHz	500 mW erp	ALB, DNK, MDA, NOR, SVN

* The CC is the "country code" that will be used to configure the device for the proper country frequency band.

Identify the countries for which your product must be certified. Milli hardware 1 and 2 are different Itron hardware parts and must be certified with different products. For each hardware type identify the Bands associated with the countries to be certified. Each identified Band will require separate Antenna Pattern and Receive Sensitivity testing by the test lab.

The following uplink/downlink channels are available for the devices:

Milli:

For MMESH we use 200KHz channel spacing running channels 0 through 127 (128 total).

FreqOut=902.2MHz + (200KHz*Ch#)

Table 1.6.2-2

Country	Nominal Band	MilliMesh				
		Channel Plan	1st chnl (Hz)	Last chnl (Hz)	bandwidth	# chnls
USA	902-928 MHz	1	902400000	926600000	200000	122
AUS	915-928 MHz	2	915200000	927800000	200000	64
SGP	920-925 MHz	8	920200000	924800000	200000	24
EU873	870-873 MHz	10	870200000	872800000	200000	14
EU876	870-876 MHz	10	870200000	875400000	200000	27

Table 1.6.2-3 – Channels required to be tested in accordance with Chapter 3.1.2:

Country	Nominal Band	MilliMesh frequency bands to be tested		
		Lowest (Hz)	Median (Hz)	Highest (Hz)
USA	902-928 MHz	**902400000**	**914400000**	**926600000**
AUS	915-928 MHz	**915200000**	-	**927800000**
SGP	920-925 MHz		**922400000**	
EU873	870-873 MHz		**871400000**	
EU876	870-876 MHz		**872600000**	

1.6.3 Results

Send the test results report to Itron Partner Certifications (**Partner-Certifications@itron.com**).

2 Initial setup

For the RF related tests (Chapter 3), the IoTR device shall be used.

The following prerequisites have to be met for successful test execution:

- Test lab has been provided all necessary information as specified in Itron Partner Milli Qualification Test Preparation.
- IoTR is provisioned and operational in WAN mode
- UUT configured with leaf node aggressive CoAP profile with Starfish Stage network ID (1711) and PanID of 0. Refer to Milli personalization page for instructions.
- UUT device has reached state 4 exchange condition under mesh and is UUT has route established with IoTR. This can be verified with the “Display Node Queue” command per the Milli Diagnostics and Testing Tool on IoTR document.
- Verify that MilliMesh is enabled for IoTR This can be verified with the “Get MAC state” command per the Milli Diagnostics and Testing Tool on IoTR document.
- Verify that country code is set to the required value for the country to be tested. Country code values can be found in section 1.6.2 for both IoTR and UUT. Refer to instructions on how to set country code for the Milli and IoTR.
- Must use the proper IoTR hardware version per section 1.6.2 for the country to be tested. These are specified as HW1 (SKU 385-001200), HW2 (SKU 385-002200), and HW3 (SKU 385-003200).
- UUT shall include all relevant derivative configurations and should be positioned during testing as it will normally be oriented in the field. Any mounting brackets / housing which may alter the antenna pattern shall be added to UUT to reflect as close to production/field installation.

Refer to the developer portal for additional details and documentation.

Also please refer to the following documents for more information on specific procedures: You must be logged in to the Developer Portal to access to access these documents.

Milli Diagnostics and Testing Tool on IoTR

Itron Partner Milli Qualification Test Preparation

3 RF Transmit / Receive

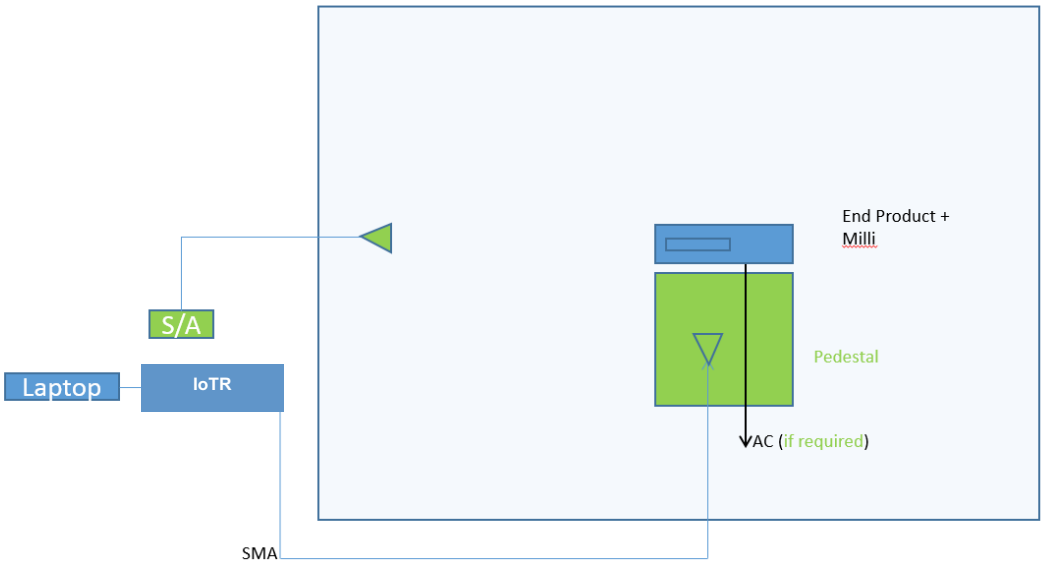
3.1 Antenna Pattern

3.1.1 Objective

Assess the impact of the host UUT on the NIC's Transmit antenna pattern and measure the average antenna gain.

3.1.2 Test Setup

1) Use the provided sio_load tool (can be downloaded from the Developer Portal) to switch the UUT device to HWTEST mode (connect to the Milli debug pins via the USB/TTL or other cable to the UUT). Refer to the "Optional Steps" section at Manually Update Milli Firmware for instructions on setting the firmware version.
2) Test samples shall include all relevant derivative configurations. **Position the UUT as it will normally be oriented in the field**. Position the IoTR antenna out of the receiving horn antenna line of sight. **Attach any mounting brackets / housing which may alter the antenna pattern**. Set up all equipment as shown below (grey box represents a fully anechoic chamber):



3) Execute following RF specific commands at each UUT orientation in 15 degree increments to perform the test when running the UUT in HWTEST mode:
   - **rf cf use_cw 1** (determines whether "rf cw on" will send a CW or continuously modulated signal, 0=continuously modulated, 1=un-modulated)
   - **rf cw on** (start transmission modulation per mode setting; The Milli module begins sending 20 byte packets every 200ms)
   - If the test equipment is not able to identify frequency channel with less than 200ms transmissions then may need to set the Milli to transmit on a continuous frequency as follows
     - For single channel selection use the command:
       - From the channel frequencies per table 1.6.2-3 choose the required bands and set the frequency to constant frequency. For example for the 902-928MHz lowest band set to 902.4MHz as follows:

- rf cf freq_hz 902400000 for 902.4 MHz

- when completed, do the following to turn off CW:
  - **rf tx on** (start packet data transmission)

4) Use the commands above to the UUT via the IoTR. The UUT will send a response. The Spectrum Analyzer will record the received signal strength. Record the position and signal level (adjusting for path loss, receiving antenna gain, cable losses, and conducted transmit power). Path loss should be measured using a reference antenna with known gain and a signal generator.
5) Rotate the table 15 degrees and repeat steps 3-4 above until you have complete 360° azimuth scans with the receiving antenna vertically and then horizontally polarized.
6) Adjust the UUT as required and repeat all above steps to obtain complete 360° elevation scans with the receiving antenna vertically and then horizontally polarized. If your chamber can only produce a 2D scan, then you will need to place the UUT on its side and rotate the turn table accordingly.
7) If there are more frequencies required to be tested (as per Table 1.6.2-3) repeat steps 3-6. (For example of the frequency band for the country of interest is USA, 902-928 MHz, the test will be run at 902.4, 914.4, and 926.6 MHz)

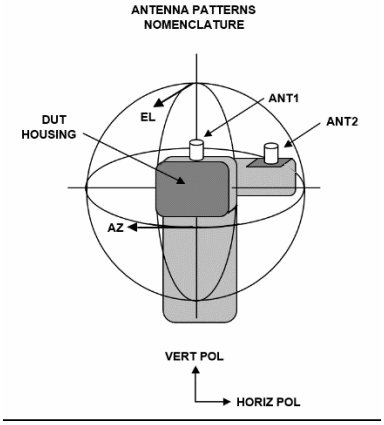
3.1.3 Test Results (Expected)

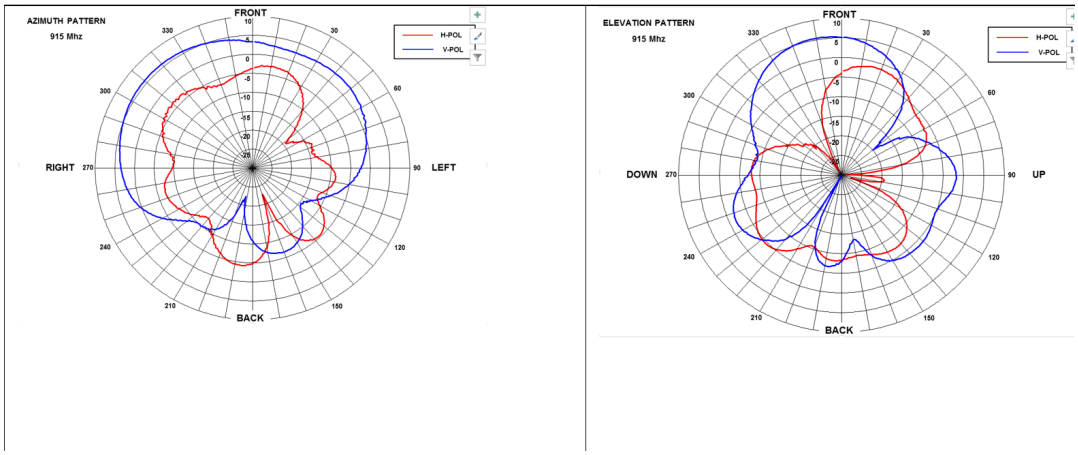
If the end product is typically installed against a wall, only the front facing radiation will be evaluated. If the end product is typically mounted on a light pole, only the bottom hemisphere will be evaluated. Sample Radiation Pattern report is provided below for reference. Actual pattern to be provided by the lab. The reports should designate orientation of the UUT superimposed upon the antenna pattern.

To compute average gain, decibels, which are logarithmic, must be converted to linear scale. Compute the average of all relevant values then convert back to log.

$$average = 10\log_{10}\left(\left\{\sum_{i=1}^{n} 10^{(Li/10)}\right\}/n\right)$$

Test Setup and Orientation





If the end product is typically installed against a wall, only the front facing radiation will be evaluated. If the end product is typically mounted on a pole, only the bottom hemisphere will be evaluated.

The radiation uplink performance classification as measured by the average antenna gain

Class A	Class B	Class C	Class D
>0dBi	>-3dBi	>-6dBi	<=-6dBi

Network performance is dependent on a combination of endpoint antenna gain, path loss, and receiver sensitivity as well as the performance of the rest of the network.

3.2 Receive Sensitivity (RxPER)

3.2.1 Objective

Ensure the host UUT meets the receive packet error rate (RxPER) target.

3.2.2 Test Conditions

Test Conditions

Temperatures +(°C)	Ambient (25)
Voltage	The host device's nominal specified voltage
Frequencies (Hz)	The host device's nominal specified frequency

3.2.3 Test Setup

Ensure the Milli is setup per the pre-requisites in section 2 above.

The Milli should be running the standard operating (aka PROD) firmware. If not, use the sio_load tool (can be downloaded from the Developer Portal) to switch the UUT device to PROD mode (connect to the Milli debug pins via the USB/TTL or other cable to the UUT). Refer to the "Optional Steps" section at Manually Update Milli Firmware for instructions on setting the firmware version.

Find the ipv6 address of the IoTR (using ifconfig, check tun6 ipv6 address, ***bold-italic*** below):

ssniotr:~$ ifconfig

…

tun6 Link encap:UNSPEC HWaddr 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00

inet6 addr: fe80::213:5005:45:d2d9/64 Scope:Link

inet6 addr: ***fdc8:1001:4a99:8086:213:***5005:45:d2d9/64 Scope:Global

inet6 addr: fe80::de0e:9d34:5b8f:76ca/64 Scope:Link

UP POINTOPOINT RUNNING NOARP MULTICAST MTU:1280 Metric:1

RX packets:2422 errors:0 dropped:0 overruns:0 frame:0

TX packets:264 errors:0 dropped:0 overruns:0 carrier:0

collisions:0 txqueuelen:500

RX bytes:319614 (319.6 KB) TX bytes:27818 (27.8 KB)

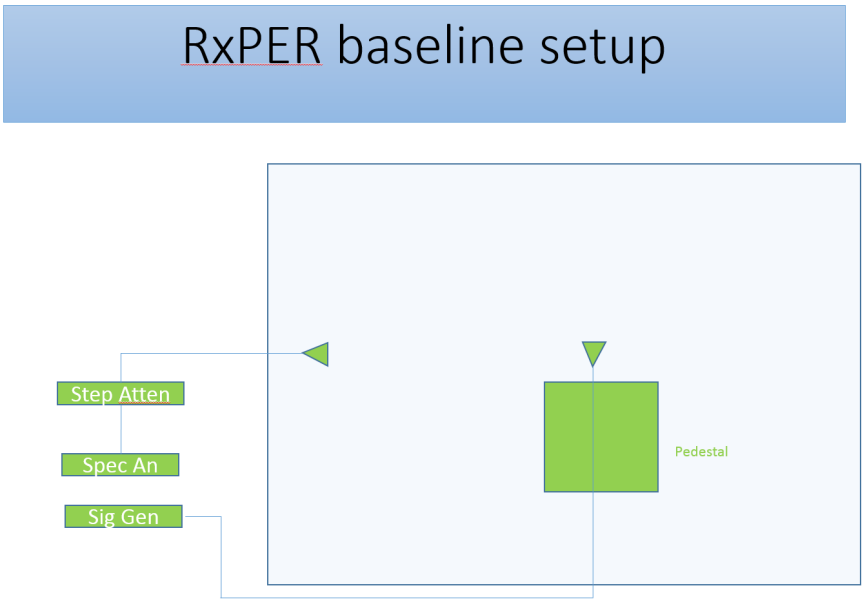
Use the ipv6 prefix from above (fdc8:1001:4a99:8086:213) and combine with your Milli mac address. If your Milli mac is:

00:13:50:05:00:47:dd:af

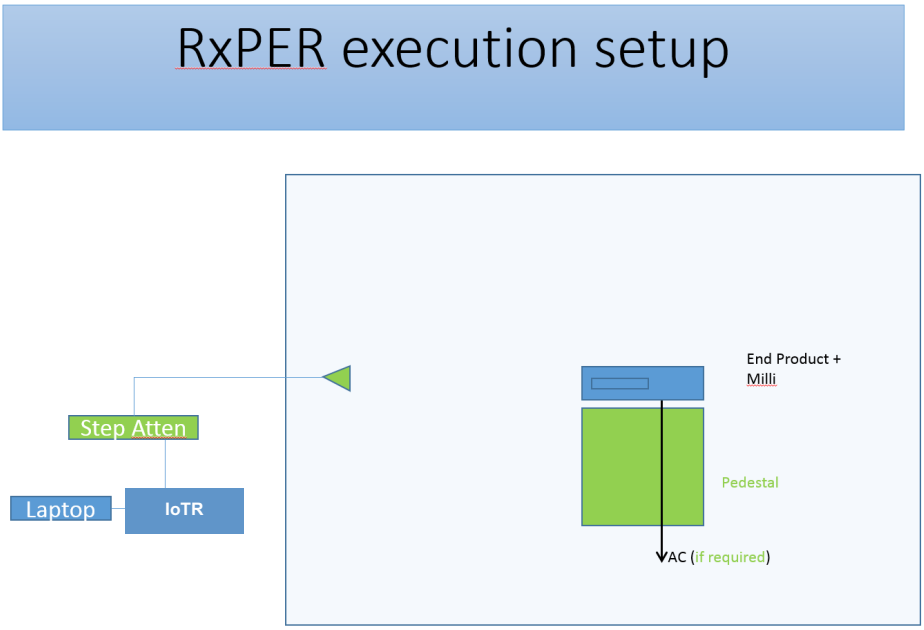
then based on the above the milli's ipv6 address is:

fdc8:1001:4a99:8086:213:5005:0047:ddaf

The following test shall be executed in a fully anechoic RF chamber. Calculate path loss as follows. Use a reference antenna with known gain (G) in place of the UUT. Use a signal generator to inject a signal of known strength at the UUT's transmit frequency. Use a power meter to measure the conducted power level at the point of entry into the reference antenna (P1). Note the power level as measured on the spectrum analyzer with the step attenuator set to 0 dB (P2). Path loss = P2-P1-G.



Now change the configuration to prepare for the actual test. First measure the conducted power out of the IoTR's external antenna port. The IoTR shall be placed inside of a shielded enclosure (e.g. Ramsey shield box).



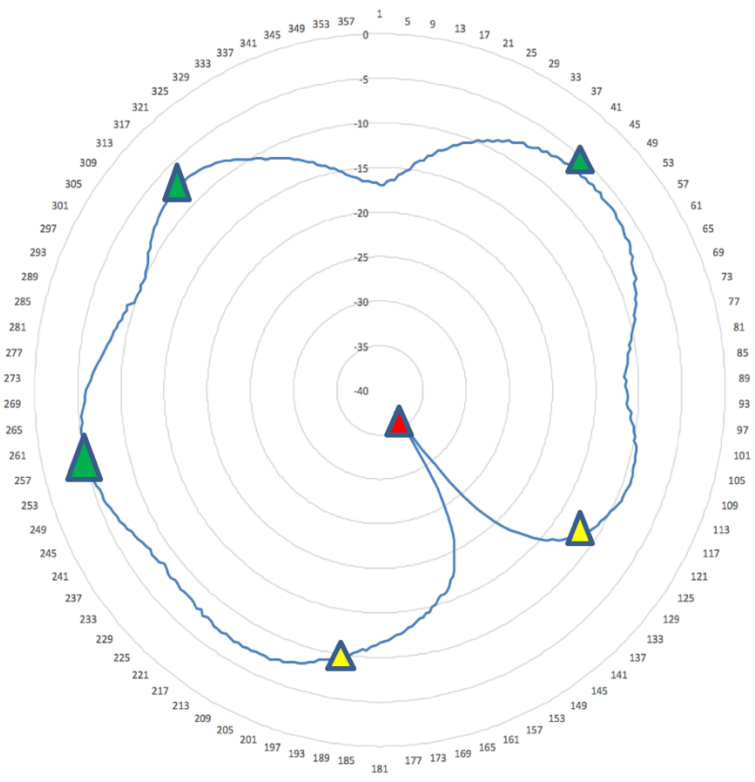
Positioning UUT

To determine the optimal test orientation of the UUT first obtain the antenna pattern. The end product radiation peak should be positioned towards the transmit antenna. Assume following is the 2D radiation pattern from antenna pattern test. The pattern shows a null and radiation peaks.

This is region of maximum gain. Good reference to point transmit antenna.

Null is near to this region. Good to avoid this region unless transmit antenna is pointed towards UUT with precision

There is a null in this region. Do not point transmit antenna here.



3.2.4 Test Procedure

Execute the ping6 command from the IoTR **100 times** with **5 seconds apart** and observe the response and the stats. As this is real time and depending on many different factor times will vary.

ssniotr:~$ ping6 -i 5 -c 100 fdc8:1001:4a99:8086:213:5005:0047:ddaf

The response should look something like:

PING fdc8:1001:4a99:8086:213:5005:0047:ddaf(fdc8:1001:4a99:8086:213:5005:47:ddaf) 56 data bytes

64 bytes from fdc8:1001:4a99:8086:213:5005:47:ddaf: icmp_seq=1 ttl=63 time=979 ms

…

64 bytes from fdc8:1001:4a99:8086:213:5005:47:ddaf: icmp_seq=20 ttl=63 time=916 ms

--- fdc8:1001:4a99:8086:213:5005:0047:ddaf ping statistics ---

100 packets transmitted, 100 received, 0% packet loss, time 95069ms

rtt min/avg/max/mdev = 916.806/946.782/979.916/18.557 ms

Repeat above step each time before you step up the attenuation (1 dB steps to identify break point). Increase until 10% of attempts fail. The receive sensitivity value = IoTR conducted power – path loss – attenuation.

3.2.5 Test Results Expected

The receive sensitivity shall be better than **-104 dBm**.

In case the UUT does not meet the Receive Sensitivity threshold the following test should be run:

Switch the device to HWTEST mode and run the continuous transmit on the lower, upper and median channel frequencies per section 1.6.2 to check and verify if the device fails under these tests or not (verify whether channel management noise affecting the previous results). For example of the frequency band for the country of interest is 902-928 MHz, the test will be run at 902.4, 914.4, and 926.6 MHz.

Enable the Milli to continuously (100% duty cycle) transmit on its lowest, middle and highest channel frequencies. The device needs to transmit modulated data. The device needs to operate at full power (default).

- For this mode, we need to run the following:
  - **rf cf use_cw 1** (modulation is turned off by using use_cw 0)
  - **rf cf use freq 915** (lowest channel – to set 902.4 use rf cf freq_hz 902400000, 926.6 use freq_hz 926600000, etc)
  - **rf cw on** (after this we will always be transmitting)
- To switch back use **rf cw off**

Continuously operate in receive mode on the lowest, middle and highest channel.

- For this mode, we need run the following:
  - **rf rx on** (turns on receive)
  - **rf tx off** (stop transmit)
- Channel selection is unnecessary, as we are receiving only.

4 CoAP Interoperability

The purpose of these tests is to verify interoperability of the CoAP implementation. The tests implement the ETSI plugtest organization (https://github.com/cabo/td-coap4/). The partner shall specify which CoAP methods are to be supported by the device and the appropriate tests shall be run to verify proper behavior.

4.1 Core CoAP Testing

4.1.1 Objective

Test CoAP GET, PUT, POST, DELETE in CON and NON modes.

4.1.2 Test Setup

Device configured and running as it would in the field connecting to the Starfish Stage network and Gateway using a miniAP or IoT Edge Router in WAN mode for backhaul to the Starfish back office. The tests will use the Itron CoAP API documented at https://developer.ssni.com/coap-apis.

4.1.3 Test Procedure

Perform all appropriate tests except the CoAP Ping in the Base CoAP test set found at https://github.com/cabo/td-coap4/ more specifically (https://rawgit.com/cabo/td-coap4/master/base.html). Partner choose which Core CoAP test cases need to be run marking them in the following table. For each test case to be run identify the resource URIs and other information as indicated.

Table 4.1.3 Core CoAP Test Cases

No	Base (aka Core) CoAP	Run	Resource Detail
1.	Perform GET transaction (CON mode). Run if any resource can be read or observed. Note any Observable resource should also support standard GET.		URIs
2.	Perform DELETE transaction (CON mode). Run if server offers a resource that handles DELETE.		URIs
3.	Perform PUT transaction (CON mode). Run if server offers already available resource or accepts creation of new resource that handles PUT.		URIs, content formats
4.	Perform POST transaction (CON mode). Run if Server accepts POST request on a resource.		URIs, content formats
5.	Perform GET transaction (NON mode). Run if any resource can be read or observed. Note any Observable resource should also support standard GET.		URIs

6.	Perform DELETE transaction (NON mode). Run if server offers a resource that handles DELETE.		URIs
7.	Perform PUT transaction (NON mode). Run if server offers already available resource or accepts creation of new resource that handles PUT.		URIs, content formats
8.	Perform POST transaction (NON mode). Run if server accepts POST request on a resource.		URIs, content formats
9.	Perform GET transaction with separate response (CON mode, no piggyback). Run if server offers a resource which is not served immediately and which therefore is not acknowledged in a piggybacked way.		URIs
10.	Perform GET transaction containing non-empty Token (CON mode). Run if server offers a resource with resource content not empty that handles GET.		URIs
11.	Perform GET transaction containing non-empty Token with a separate response (CON mode). Run if server offers a resource which is not served immediately and which therefore is not acknowledged in a piggybacked way.		URIs
12.	Perform GET transaction using empty Token (CON mode). Run if server offers a resource with resource content not empty that handles GET.		URIs
13.	Perform GET transaction containing several URI-Path options (CON mode). Run of server offers several resources with resource content is not empty.		URIs
14.	Perform GET transaction containing several URI-Query options (CON mode). Server offers a resource with query parameters and resource content is not empty		URIs, Query parameter details
15.	Perform GET transaction (CON mode, piggybacked response) in a lossy context. Run if any resource can be read or observed. Note any Observable resource should also support standard GET.		URIs
16.	Perform GET transaction (CON mode, delayed response) in a lossy context. Run if server offers a resource which is not served immediately and which therefore is not acknowledged in a piggybacked way.		URIs

17.	Perform GET transaction with a separate response (NON mode). Run if server offers a resource which is not served immediately and which therefore is not acknowledged in a piggybacked way.		URIs
18.	Perform POST transaction with responses containing several Location-Path options (CON mode). Run if server accepts creation of new resource and the created resource has multiple “Location-Path” options.		URIs, Location-Path option details
19.	Perform POST transaction with responses containing several Location-Query options (CON mode). Run if server accepts creation of new resource where the location of the created resource contains location-query parameters.		URIs, Location-query parameter details.
20.	Perform GET transaction containing the Accept option (CON mode). Run if server provides resources with multiple format options.		URIs, Format option details.
21.	Perform GET transaction containing the ETag option (CON mode). Run if server offers a resource with validate options which may be made to vary over time; and server supports ETag option.		URIs
22.	Perform GET transaction with responses containing the ETag option and requests containing the If-Match option (CON mode). Run if server offers a resource with validate options which may be made to vary over time; and server supports ETag and If-Match options.		URIs
23.	Perform PUT transaction containing the If-None-Match option (CON mode). Run if server offers a resource, which does not exist and can be created by the client; and server supports If-Non-Match option.		URIs

4.2 Link Format CoAP Testing

4.2.1 Objective

Test CoAP server supports CoRE Link Format (/.well-known/core) resource.

4.2.2 Test Setup

Device configured and running as it would in the field connecting to the Starfish Stage network and Gateway using a miniAP or IoT Edge Router in WAN mode for backhaul to the Starfish back office. The tests will use the Itron CoAP API documented at https://developer.ssni.com/coap-apis.

4.2.3 Test Procedure

Perform Link Format CoAP test set found at https://github.com/cabo/td-coap4/ (more specifically https://rawgit.com/cabo/td-coap4/master/link.html). Partner choose which Link format CoAP test cases need to be run marking them in the following table. Test 1 is mandatory and tests 4 and 5 do not need to be tested. For each test case to be run identify the resource URIs and other information as indicated. NOTE: tests 4 and 5 can be excluded.

Table 4.2.3 Link Format

No	Link Format CoAP	Run	Resource Detail
1.	Access to well-known interface for resource discovery (i.e. /.well-known/core)	Y	
2.	Use filtered requests for limiting discovery results. Run if device CoAP server offers different types of resources.		URIs, Type details
3.	Handle empty prefix value strings. Run if device CoAP server offers different types of resources and resources with no type.		URIs, Type details
4.	~~Filter discovery results in presence of multiple rt attributes~~	N	
5.	~~Filter discovery results using if attribute and prefix value strings~~	N	
6.	Filter discovery results using sz attribute and prefix value strings. Run if device CoAP server offers resources both with and without sz attribute.		URIs, sz attribute details
7.	Filter discovery results using href attribute and complete value strings. Run if server offers multiple URL resources.		URIs, href attribute details
8.	Filter discovery results using href attribute and prefix value strings. Get all resources with wildcarded link.		URIs, href attribute details
9.	Arrange link descriptions hierarchically. Run if server offers a resource with content type 40 (i.e. application/link-format) and sub-resources.		URIs, resource and sub-resource details

4.3 Observe CoAP Testing

4.3.1 Objective

Test CoAP Observe.

4.3.2 Test Setup

Device configured and running as it would in the field connecting to the Starfish Stage network and Gateway using a miniAP or IoT Edge Router in WAN mode for backhaul to the Starfish back office. The tests will use the Itron CoAP API documented at https://developer.ssni.com/coap-apis.

4.3.3 Test Procedure

Perform Observe (OBS) tests 1-2 and 4-12 in the Block and Observe CoAP test set found at https://github.com/cabo/td-coap4/ (more specifically https://rawgit.com/cabo/td-coap4/master/block.html). Partner choose which CoAP Observe methods and modes are supported in the following table. For each test case to be run identify the resource URIs and other information as indicated.

Table 4.3.3 CoAP Observe Test Cases

No	Observe CoAP	Run	Resource Detail
1.	Handle resource observation with CON messages		URIs
2.	Handle resource observation with NON messages		URIs
3.	NA		
4.	Client detection of deregistration (Max-Age). Run this test if test 1 is run.		URIs
5.	Server detection of deregistration (client OFF). Run this test if test 1 is run.		URIs
6.	Server detection of deregistration (explicit RST). Run this test if test 1 is run.		URIs
7.	Server cleans the observers list on DELETE. Run this test if test 1 is run.		URIs
8.	Server cleans the observers list when observed resource content-format changes. Run this test if test 1 is run.		URIs
9.	Update of the observed resource. Run this test if test 1 is run.		URIs

10.	GET does not cancel resource observation. Run this test if test 1 is run.		URIs
11.	Handle resource observation with CON messages (lossy case). Run this test if test 1 is run.		URIs
12.	GET with Observe=1 does cancel resource observation. Run this test if test 1 is run.		URIs