

Telemetry(1.0) in RPI User manual Broadband - 2019 M9

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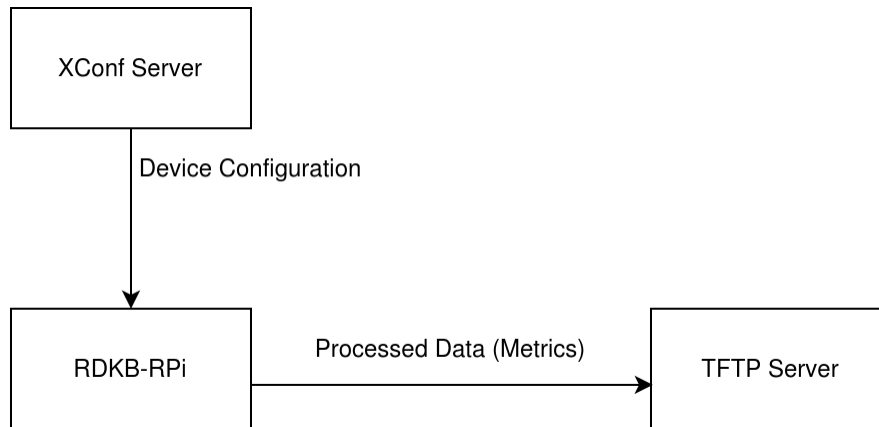
Telemetry Introduction:

Telemetry is the automatic recording and transmission of data from remote or inaccessible sources to an IT system in a different location for monitoring and analysis.

RDKB Telemetry Components:

1. Xconf Server
2. Rpi Board with RDK Broadband image
3. Tftp Server

RDKB Telemetry Architecture:



Rpi board will connect to Xconf Server to get the device configuration information, telemetry profile information and log upload repository (ip address of tftp server). It will search for the markers (contents mentioned in the permanent profile) in the mentioned log file. If it is found in the log file, it will process those information and create a text file and upload that file in the tftp server. This way all the critical data related to device health will be available on timely basis in the tftp server for further analysis.

XConf Server Configuration procedure:

1. Login to Xconf Server and go to DCM menu item and click on "Formulas" sub menu

Mozilla Firefox

34.219.243.214:9093/admin/ux/#/formulas/all

34.219.243.214:9093/admin/ux/#/formulas/all

Search

Most Visited Getting Started Python

Application: stb First: 08/22/2019 UTC 12:37:29

Formulas

Search by Name

+ Create Export All

Description	IsDefault	Priority	Conditions	View Settings
Name: XI5_FORMULA1 Percentage: 100	✓	1	model IS PX051AEI	Device LogUpload
Name: XG1_FORMULA1 Percentage: 100	✓	2	model IS PX013AN	Device LogUpload
Name: RPI_LNTCSV_FORMULA1 Percentage: 100	✓	3	estbMacAddress IS B8:27:EB:04:63:44 AND model IS RPI_LNT_CSV	Device LogUpload
Name: RPI_TELE Percentage: 100	✓	4	estbMacAddress IS B8:27:EB:5C:CF:3F AND model IS RPI	Device LogUpload
Name: RPI_FORMULA1 Percentage: 100	✓	5	model IS RPI	Device LogUpload

Items per page: 50

2. Click on Create button

34.219.243.214:9093/admin/ux/#/formula/edit/?formulasSize

Common Firmware DCM Telemetry Settings RFC Tools

Application: stb First: 08/22/2019 UTC 12:41:44

Create Formula

Properties

Name: Percentage: Default formula: ☒

Description: Priority:

Percentage of responses with level one/two/three logs

L1 percentage: L2 percentage: L3 percentage:

Build condition

☐ not IS

For **LIKE** operation regex comparison is used. Use it if you know how java works with regex expressions.
 For **MATCH** operation wildcard comparison is used (* - few characters, ? - one character).
 Examples:
 firmwareVersion MATCH 13.14.*
 estbMacAddress MATCH AA:AA:AA:AA:AA*
 ecmMacAddress MATCH ????:??:AA:FF

3. i) Provide "Name", "Description", and build conditions and save the formula.
- ii) Verify Percentage and Priority field (normally it displays the sequence number of formula, can be changed to make the formula higher/lower priority) is auto field up with their respective values
- iii) Go to "Build condition" section and click on the first empty field to get all the available field displayed there
- iv) Select estbMacAddress and provide the MAC address of Rpi board

Mozilla Firefox

34.219.243.214:9093/admin/ux/... X

34.219.243.214:9093/admin/ux/#/formula/edit/?formulasSize

Search

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Create Formula

Properties

Name	RPI_formula_22Aug	Percentage	100	Default formula: ✓
Description	Telemetry formula	Priority	6	

Percentage of responses with level one/two/three logs

L1 percentage	0	L2 percentage	0	L3 percentage	0
---------------	---	---------------	---	---------------	---

Build condition

estbMacAddress IN_LIST Mac_26July

AND model IS RPI_BB

AND OR ☐ not IS +

For **LIKE** operation regex comparison is used. Use it if you know how java works with regex expressions.
For **MATCH** operation wildcard comparison is used (* - few characters, ? - one character).
Examples:
firmwareVersion MATCH 13.14.*
estbMacAddress MATCH AA:AA:AA:AA:AA:AA.*
ecmMacAddress MATCH ??:?:?:?:?:?:?:?:?:?:AA:FF

Save Cancel

4. Verify the created formula (ex. RPI_formula22Aug) displayed in the formula list.

Mozilla Firefox 34.219.243.214:9093/admin/ux/#/formulas/all?pageNumber=1&p...

34.219.243.214:9093/admin/ux/#/formulas/all?pageNumber=1&p...

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Formulas

Search by Name

+ Create Export All

Description	IsDefault	Priority	Conditions	View Settings
Name: XI5_FORMULA1 Percentage: 100	✓	1	model IS PX051AEI	Device LogUpload
Name: XG1_FORMULA1 Percentage: 100	✓	2	model IS PX013AN	Device LogUpload
Name: RPI_LNTCSV_FORMULA1 Percentage: 100	✓	3	estbMacAddress IS B8:27:EB:04:63:44 AND model IS RPI_LNT_CSV	Device LogUpload
Name: RPI_TELE Percentage: 100	✓	4	estbMacAddress IS B8:27:EB:5C:CF:3F AND model IS RPI	Device LogUpload
Name: RPI_FORUMULA1 Percentage: 100	✓	5	model IS RPI	Device LogUpload
Name: RPI_formula_22Aug Percentage: 100	✓	6	estbMacAddress IN_LIST Mac_26July AND model IS RPI_BB	Device LogUpload

Items per page: 50

5. Click on Edit formula for the created formula (ex. RPI_formula_22Aug).

Mozilla Firefox

34.219.243.214:9093/admin/ux/#/formulas/all?pageNumber=1&p...

34.219.243.214:9093/admin/ux/#/formulas/all?pageNumber=1&p...

Search

Most Visited Getting Started Python

Formulas

Search by Name

+ Create Export All

Description	IsDefault	Priority	Conditions	View Settings
Name: XI5_FORMULA1 Percentage: 100	✓	1	model IS PX051AEI	Device LogUpload
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Name: RPI_LNTCSV_FORMULA1 Percentage: 100	✓	3	estbMacAddress IS B8:27:EB:04:63:44 AND model IS RPI_LNT_CSV	Device LogUpload
Name: RPI_TELE Percentage: 100	✓	4	estbMacAddress IS B8:27:EB:5C:CF:3F AND model IS RPI	Device LogUpload
Name: RPI_FORUMULA1 Percentage: 100	✓	5	model IS RPI	Device LogUpload
Name: RPI_formula_22Aug Percentage: 100	✓	6	estbMacAddress IN_LIST Mac_26July AND model IS RPI_BB	Edit Formula

Items per page: 50

6. Edit formula page opens.

Mozilla Firefox

34.219.243.214:9093/admin/ux/... X

34.219.243.214:9093/admin/ux/#/formula/edit/aa7bcd2a-cb

Search

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Edit Formula

Properties

Name

RPI_formula_22Aug

Percentage

100

Default formula:

✓

Description

Telemetry formula

Priority

6

Percentage of responses with level one/two/three logs

L1 percentage

0

L2 percentage

0

L3 percentage

0

Define settings

Create Device settings

Create Log Upload settings

Create VOD settings

Build condition

estbMacAddress IN_LIST Mac_26July

AND model IS RPI_BB

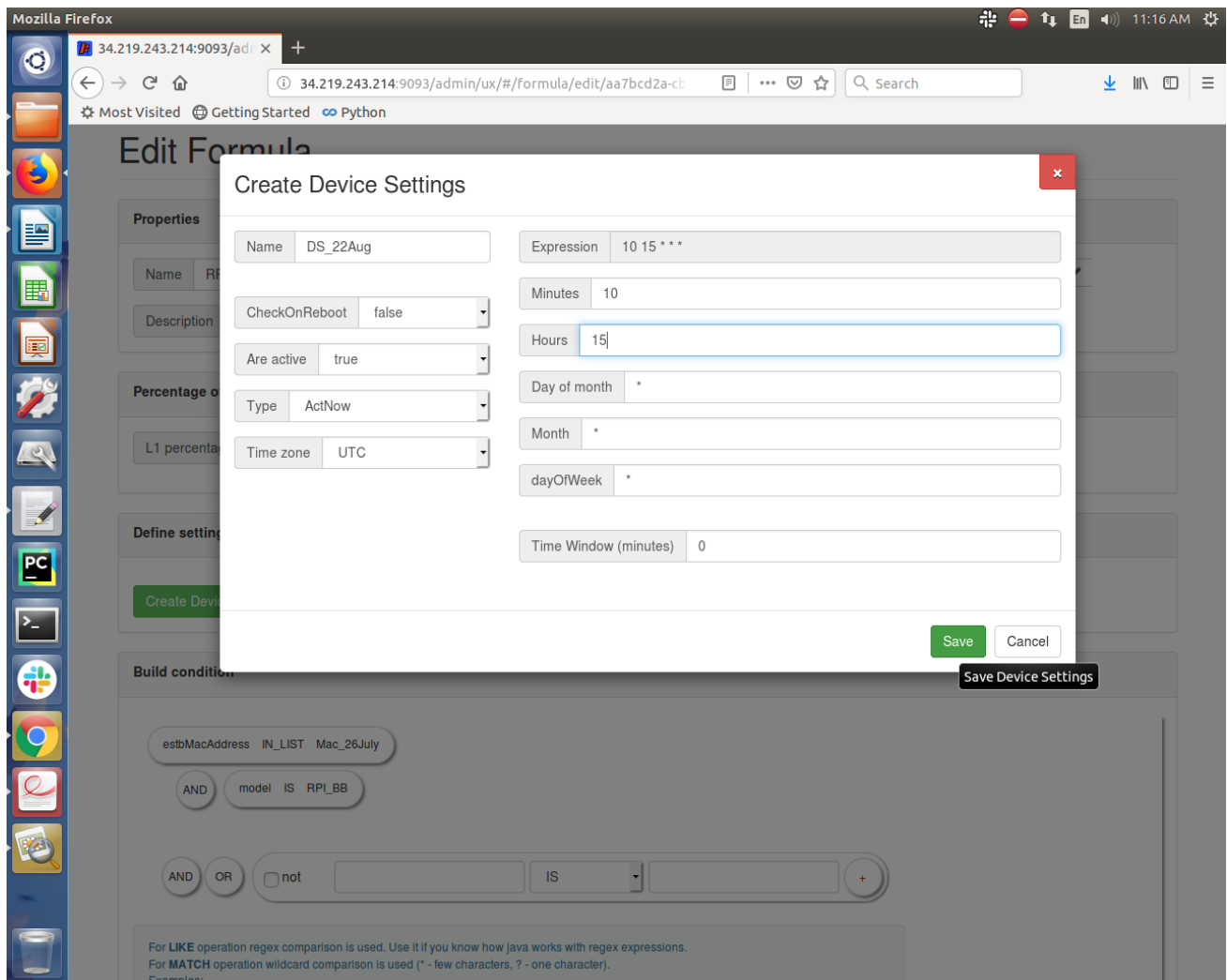
AND OR ☐ not IS

For **LIKE** operation regex comparison is used. Use it if you know how java works with regex expressions.

For **MATCH** operation wildcard comparison is used (* - few characters, ? - one character).

Examples:

7. Click on "Create Device Settings" and fill up the fields as displayed in the screen below and click on save button:



8. Click on DCM menu then "Upload repository" submenu and click on "Create" button

Mozilla Firefox

34.219.243.214:9093/admin/ux/#/uploadrepository/all?pageNum: ... Search

Most Visited Getting Started Python

XConf Common Firmware DCM Telemetry Settings RFC Tools

Application: stb First: 08/23/2019 UTC 05:55:56

Upload repositories

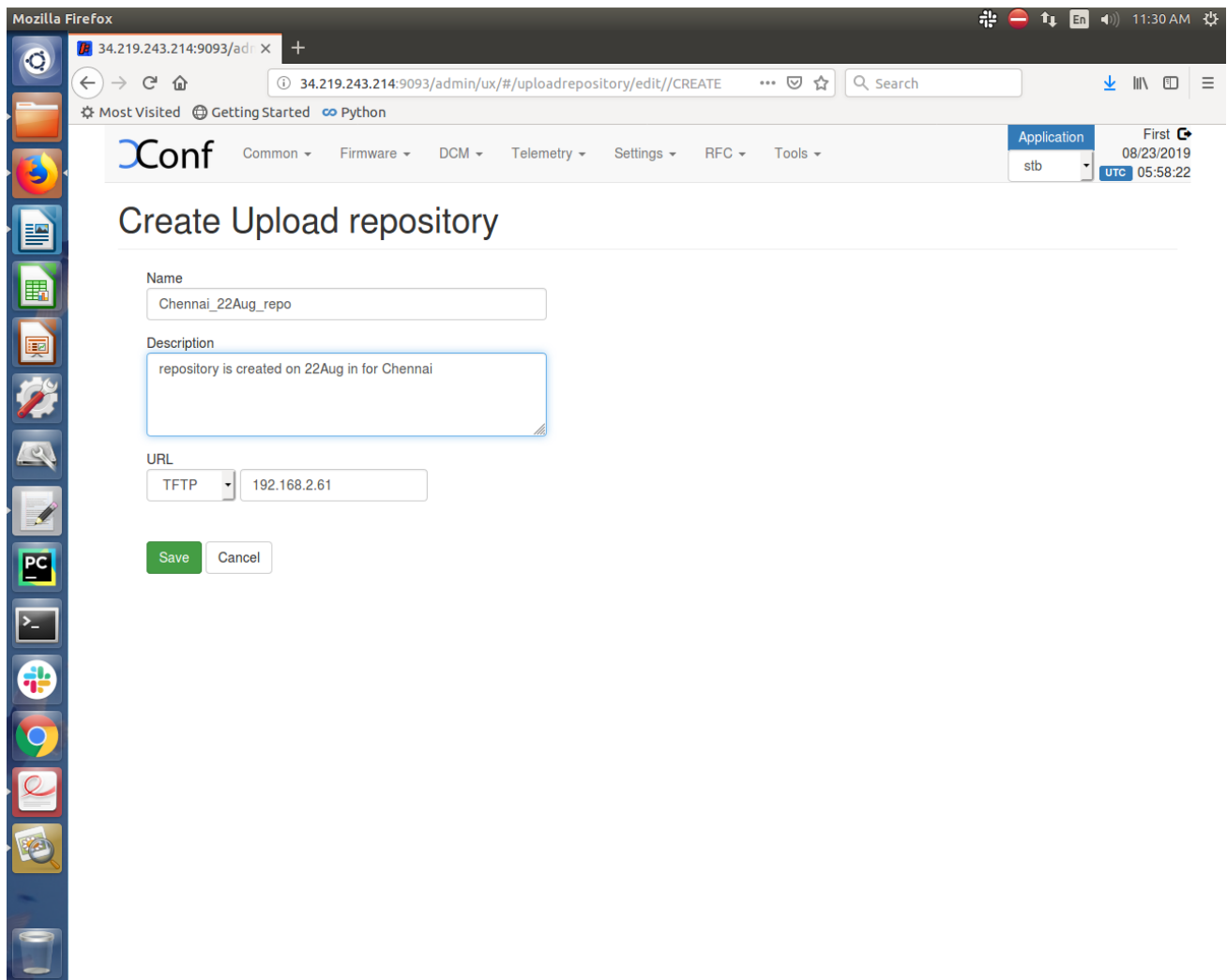
+ Create Export All

Name	Description	Protocol	URL	Action
Chennai_repo	Local database		http://192.168.2.30:81/xconf/logupload.php	  
LNTCSV_REPO	LNT CSV REPO		10.172.52.80/tmp/RPI_Upload	  
LOCAL_REPO	Local HTTP Repository	HTTP	http://192.168.30.172:81/xconf/logupload.php	  
RPI_TELE_REPO	Local Repo Chandra Bangalore	TFTP	192.168.60.181	  

Items per page: 50

34.219.243.214:9093/admin/ux/#/uploadrepository/all

9. Provide inputs as mentioned below screen and save the upload repository.



10. Click on Formula and go back to the Edit formula page of the created formula (ex. RPI_formula_22Aug) and click on "Create Log Upload settings" button. Upload repository drop down menu field will show all the upload repositories including the created one (ex. Chennai_22Aug_repo)

Mozilla Firefox

34.219.243.214:9093/admin/ux/#/formula/edit/aa7bcd2a-cb

34.219.243.214:9093/admin/ux/#/formula/edit/aa7bcd2a-cb

Search

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Edit Formula

Properties

Name

Description

Percentage

L1 percent

Define settings

Edit Device

Build condition

estbMacA

AND

AND

For LIKE op

For MATCH

Examples

Create Log Upload Settings

Settings

Name

Number Of Days

0

Upload On Reboot

false

Are Settings Active

false

Upload repository

Chennai_22Aug_repo

Chennai_22Aug_repo

Chennai_repo

LNTCSV_REPO

LOCAL_REPO

RPI_TELE_REPO

Schedule

Type

ActNow

Cron Expression

Time zone

UTC

Minutes

Hours

Day of month

*

Month

*

dayOfWeek

*

ExpressionL1

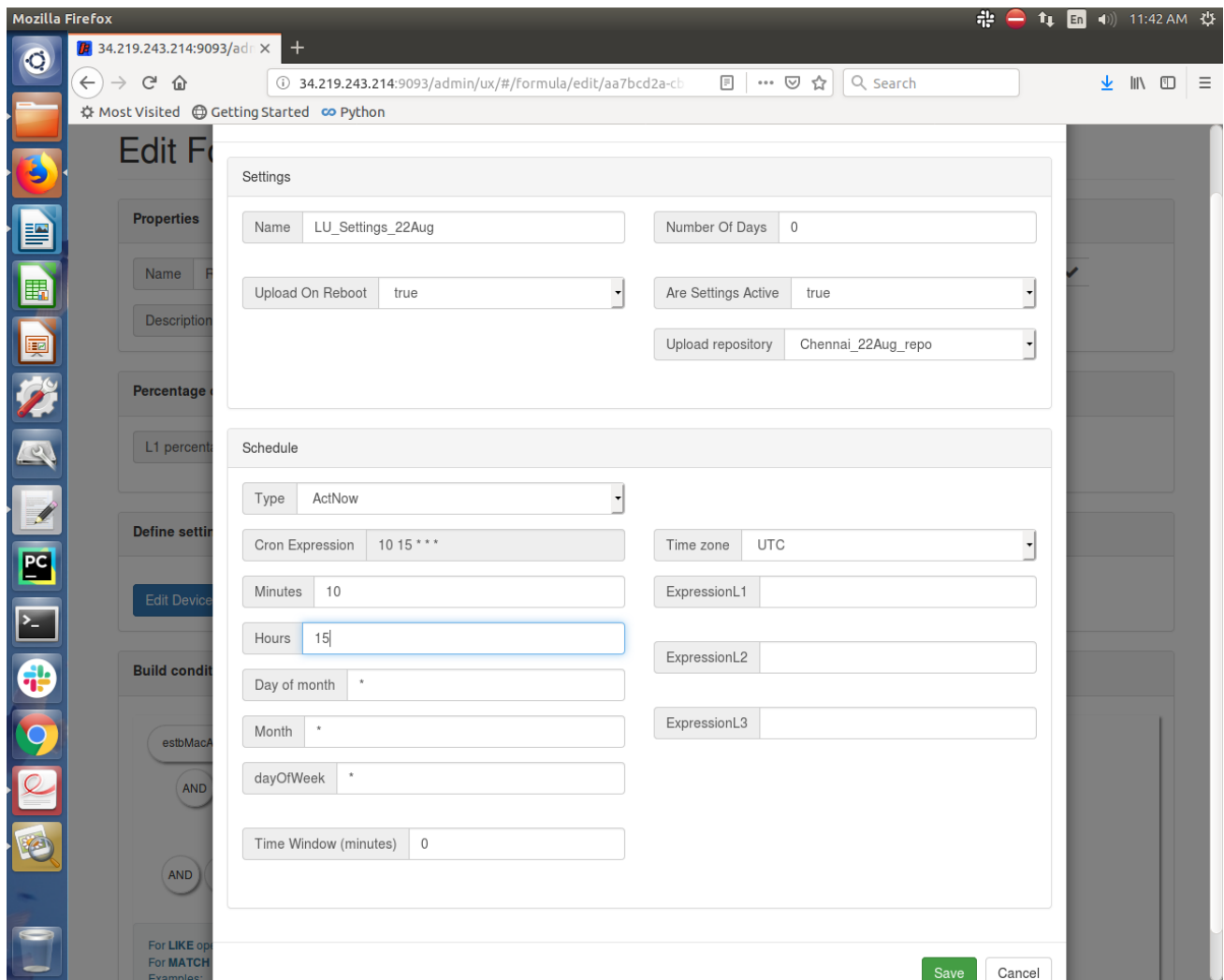
ExpressionL2

ExpressionL3

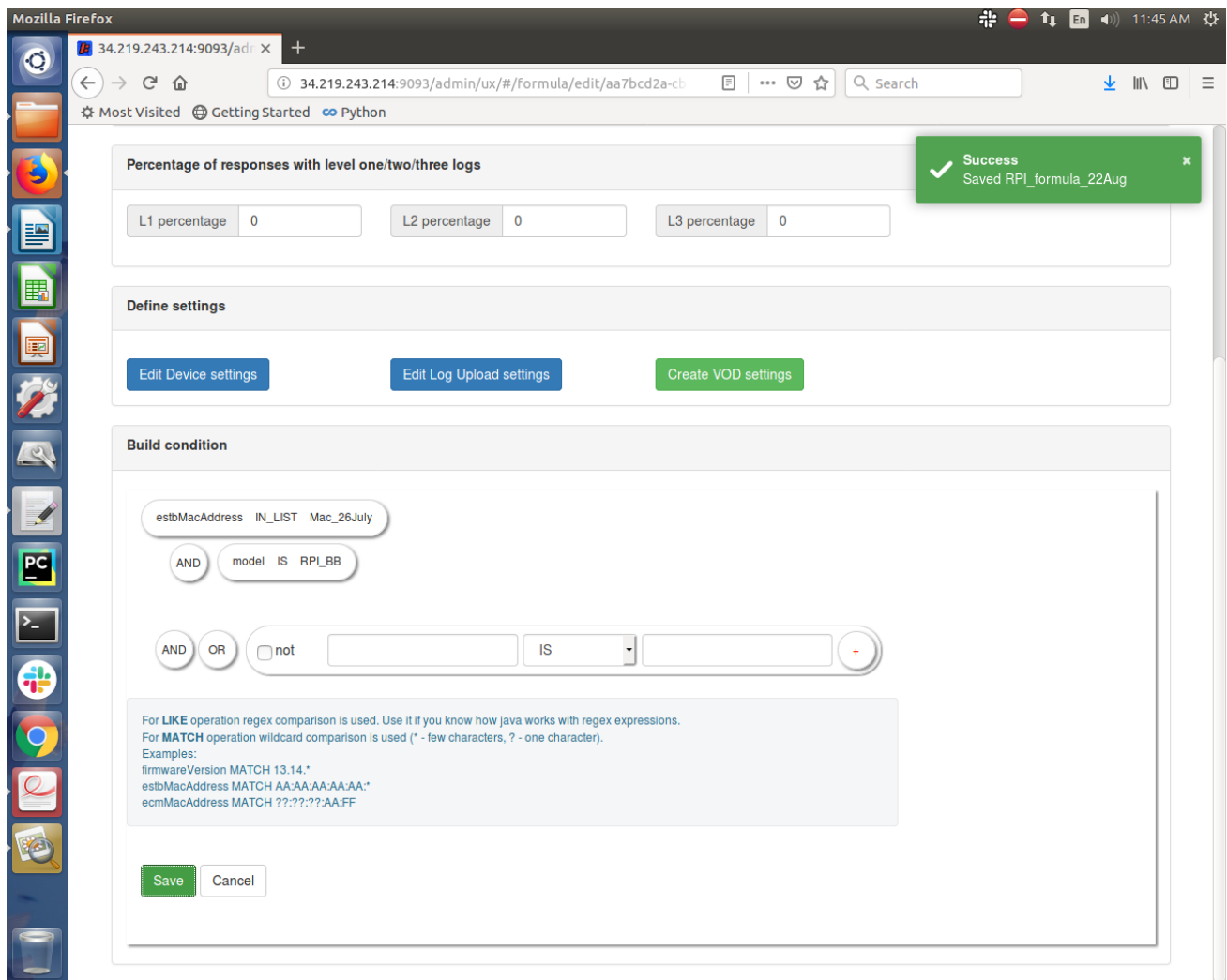
Time Window (minutes)

0

11. Provide inputs as mentioned in the screen below:



12. Save the "Edit Formula" page



13. Verify the Formula page for the created formula (ex. RPI_formula_22Aug) where View Settings column displays the “Device” and “LogUpload”

Mozilla Firefox

34.219.243.214:9093/admin/ux/... 34.219.243.214:9093/admin/ux/#/formulas/all?pageNumber=1&p... Search

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Formulas

Search by Name

+ Create Export All

Description	IsDefault	Priority	Conditions	View Settings
Name: XI5_FORMULA1 Percentage: 100	✓	1	model IS PX051AEI	Device LogUpload
Name: XG1_FORMULA1 Percentage: 100	✓	2	model IS PX013AN	Device LogUpload
Name: RPI_LNTCSV_FORMULA1 Percentage: 100	✓	3	estbMacAddress IS B8:27:EB:04:63:44 AND model IS RPI_LNT_CSV	Device LogUpload
Name: RPI_TELE Percentage: 100	✓	4	estbMacAddress IS B8:27:EB:5C:CF:3F AND model IS RPI	Device LogUpload
Name: RPI_FORUMULA1 Percentage: 100	✓	5	model IS RPI	Device LogUpload
Name: RPI_formula_22Aug Percentage: 100	✓	6	estbMacAddress IN_LIST Mac_26July AND model IS RPI_BB	Device LogUpload

Items per page: 50

14. Go to Telemetry menu and click on "Permanent Profile"

Permanent profiles

+ Create Export All

Name	Schedule	Upload repository	Action
RPI_LNTCSV_PROFILE	2	10.172.52.80/tmp/RPI_Upload	
RPI_PROFILE1	5	http://192.168.30.172:81/xconf/telemetry_upload.php	
RPI_PROFILE2	5	192.168.30.172:81/xconf/telemetry_upload.php	
RPI_TELE_PERM_V1_PROFILE	2	192.168.60.181	
RPI_Test	2	http://192.168.2.30:81/xconf/logupload.php	

Items per page: 50

34.219.243.214:9093/admin/ux/#/permanentprofile/all

15. Click on "Create" button to create permanent profile with different markers.

Telemetry profile entries -

First field is "**Header**" - This is the name for the particular logs collection. This is a custom name and can be decided based on the use case or error condition or any other scenario.

Second field is "**Content**" - This is the "log message string" that appears in the RDK logs.

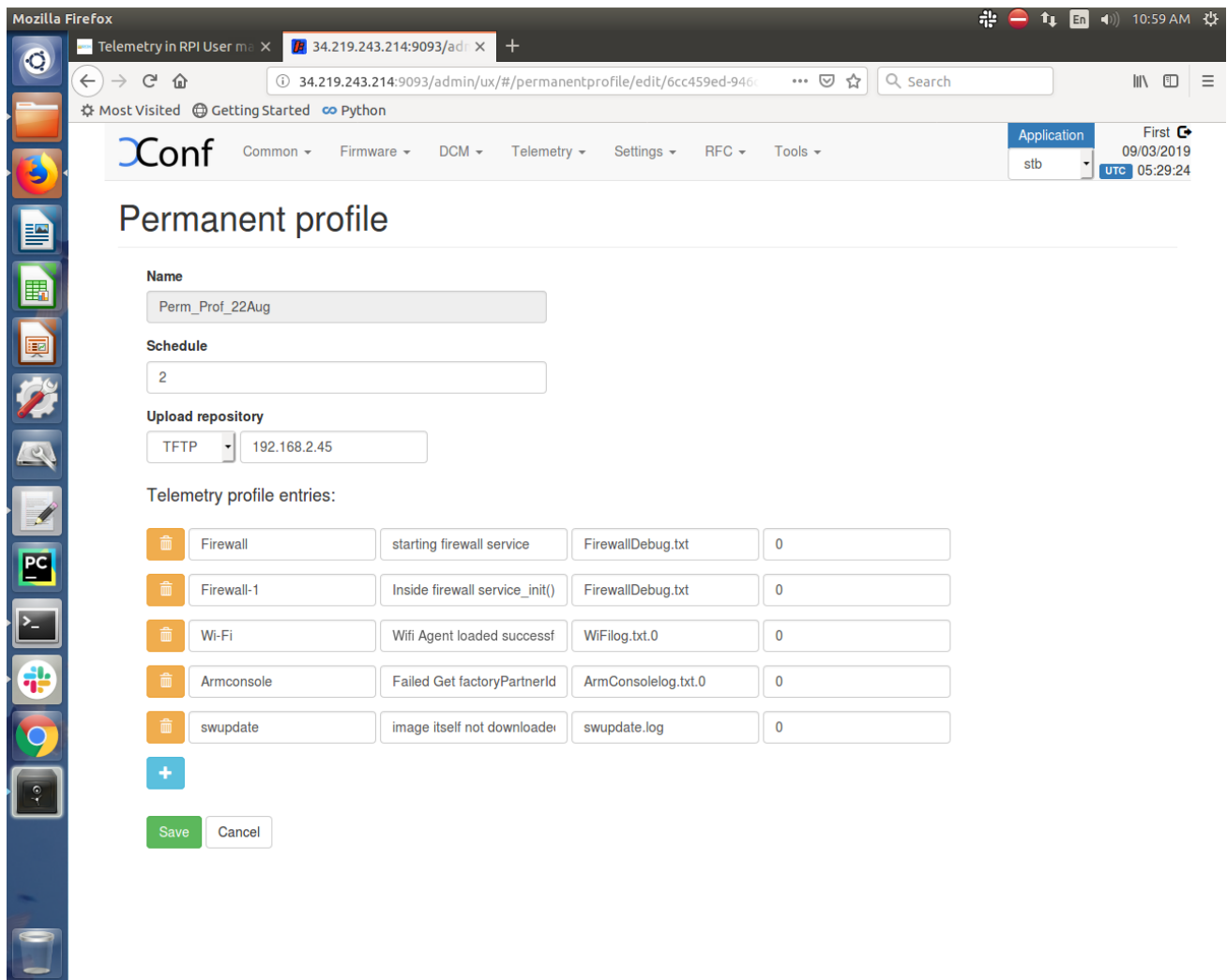
Third field is "**type**" - This is the name of the log file where the above log message string needs to be searched.

Fourth field is "**Skip frequency**" - This is a skip frequency. It can have values like 0, 1, 2 etc.

0 - This particular log message is never skipped.

1 - Skip every alternate occurrence of this log message.

2 - Skip 2 consecutive log message occurrences and then collect 1 occurrence and then again skip 2 occurrences.



Based on the R-Pi board supported markers available, we have selected few of them as mentioned below:

Header	Content	Type
Firewall	starting firewall service	FirewallDebug.txt
Firewall-1	Inside firewall service_init()	FirewallDebug.txt
Wi-Fi	Wifi Agent loaded successfully...	WiFilelog.txt.0
Armconsole	get_PartnerID - Failed Get factoryPartnerId so set it PartnerID as: comcast	ArmConsolelog.txt.0
swupdate	image itself not downloaded from TFTP, pls check tftp connection!!	swupdate.log

16. Save Permanent profile (ex. Perm_Prof_22Aug) and it will display in the Permanent profiles page

Mozilla Firefox

34.219.243.214:9093/admin/ux/... Mail - Amrita Banik - Outl... +

34.219.243.214:9093/admin/ux/#/permanentprofile/all?pageNuml... Search

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XConf Common Firmware DCM Telemetry Settings RFC Tools

Permanent profiles Search by Name

Success Saved Perm_Prof_22Aug

+ Create Export All

Name	Schedule	Upload repository	Action
Perm_Prof_22Aug	2	192.168.2.61	  
RPI_LNTCSV_PROFILE	2	10.172.52.80/tmp/RPI_Upload	  
RPI_PROFILE1	5	http://192.168.30.172:81/xconf/telemetry_upload.php	  
RPI_PROFILE2	5	192.168.30.172:81/xconf/telemetry_upload.php	  
RPI_TELE_PERM_V1_PROFILE	2	192.168.60.181	  
RPI_Test	2	http://192.168.2.30:81/xconf/logupload.php	  

Items per page: 50

17. Click on "Telemetry" and then click on "Targeting Rules"

Mozilla Firefox

34.219.243.214:9093/admin/ux/#/permanentprofile/all?pageNum:

34.219.243.214:9093/admin/ux/#/permanentprofile/all?pageNum:

Search

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XConf Common Firmware DCM Telemetry Settings RFC Tools

Application stb First 08/23/2019 UTC 07:40:26

Permanent profiles

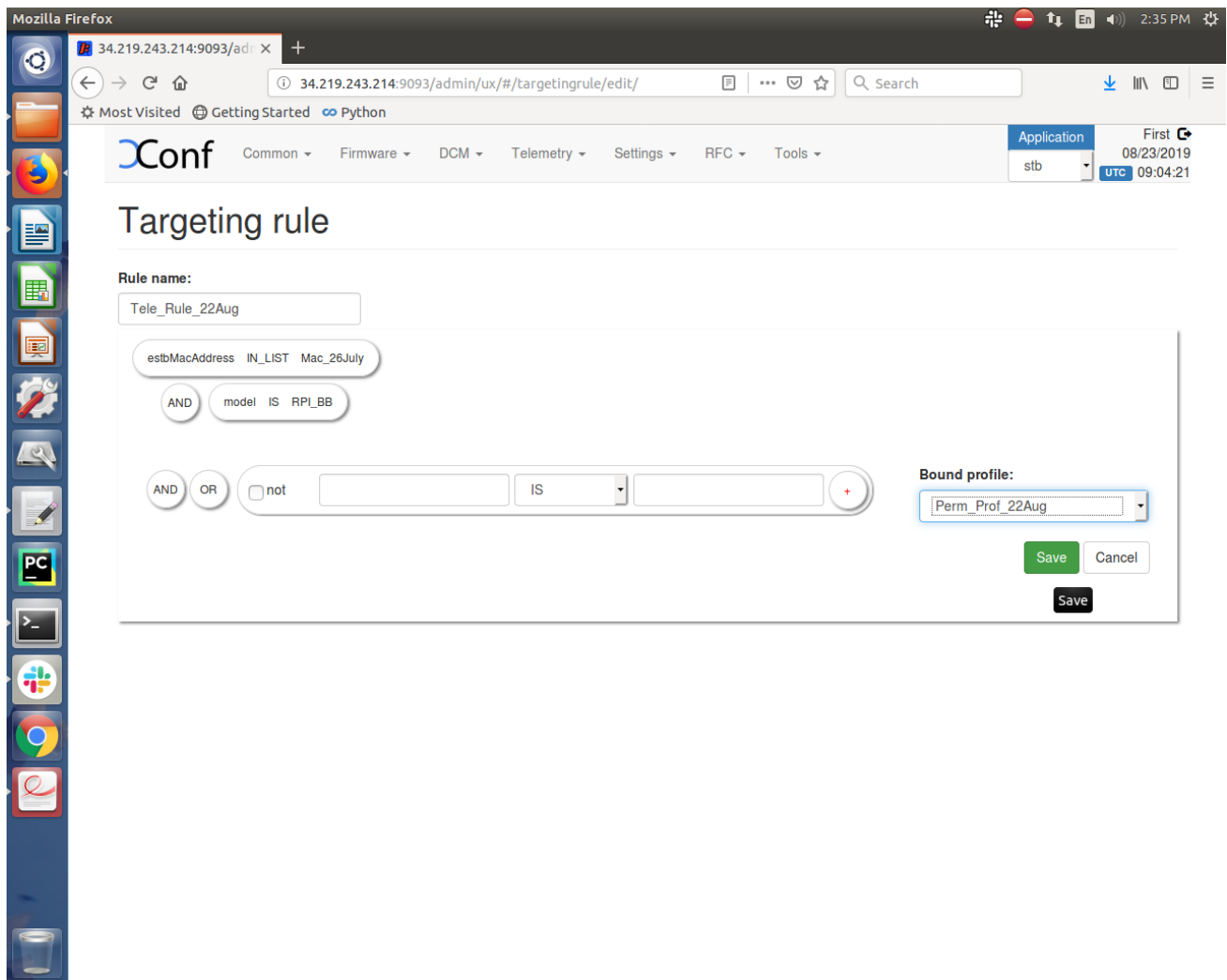
+ Create Export All

Name	Schedule	Upload repository	Action
Perm_Prof_22Aug	2	192.168.2.61	
RPI_LNTCSV_PROFILE	2	10.172.52.80/tmp/RPI_Upload	
RPI_PROFILE1	5	http://192.168.30.172:81/xconf/telemetry_upload.php	
RPI_PROFILE2	5	192.168.30.172:81/xconf/telemetry_upload.php	
RPI_TELE_PERM_V1_PROFILE	2	192.168.60.181	
RPI_Test	2	http://192.168.2.30:81/xconf/logupload.php	

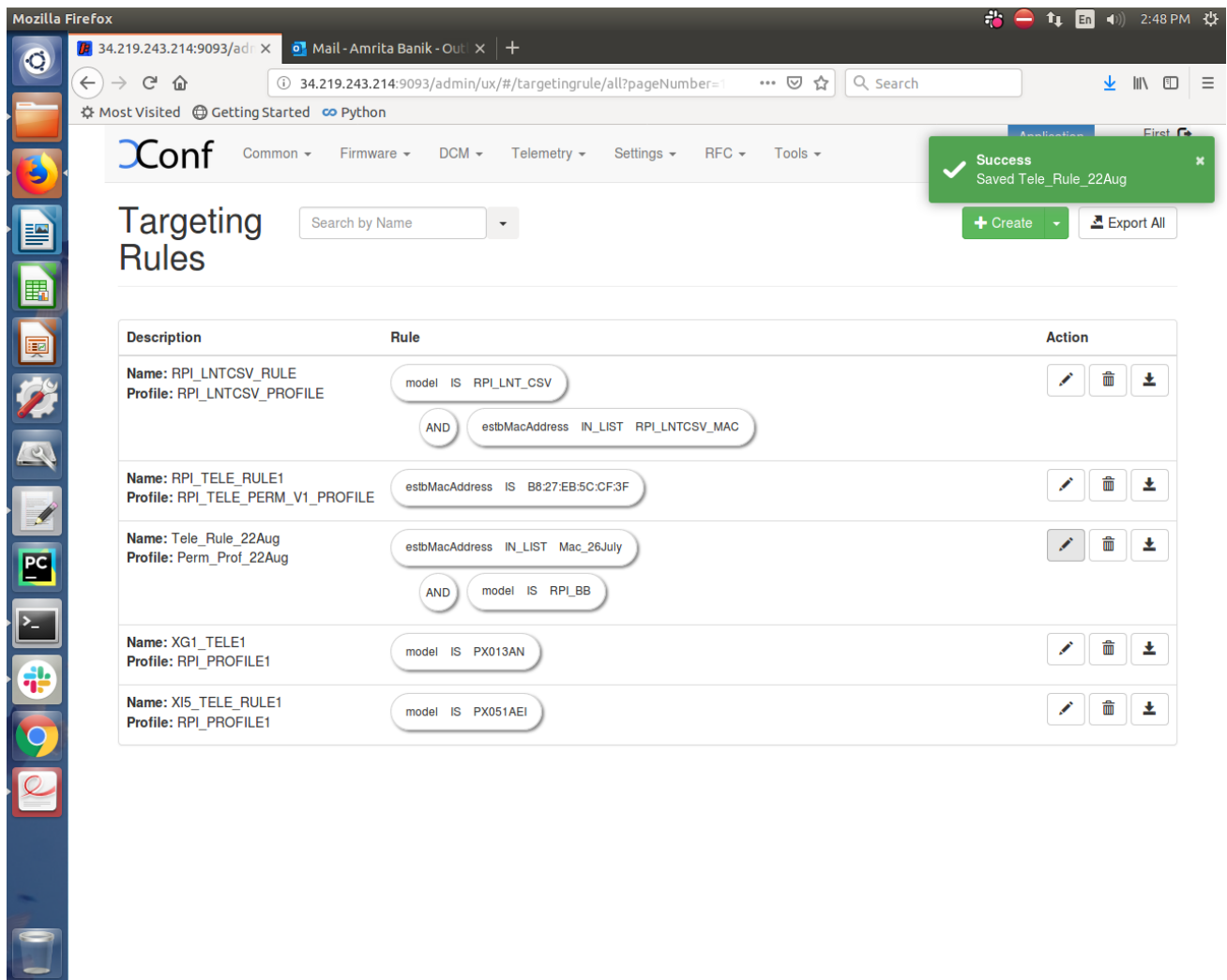
Items per page: 50

34.219.243.214:9093/admin/ux/#/targetingrule/all

18. Click on "Create" button, provide Rule name and select different rule parameters and map the Permanent profile with this rule by selecting "Bound profile" drop down menu. Save the Targeting rule.



19. Verify the created Targeting rule displayed on the Targeting rule page



RPi device side configuration and testing process:

Below steps needed after flashing for the first time:

1. Flash the Telemetry image and load it on RPi board
2. Configure the CLOUDURL parameter and Log Server/Http Server parameter by providing IP address of XConf server in the two mentioned files /etc/include.properties and /etc/dcm.properties respectively.

For ex. In include.properties file:

CLOUDURL=<http://35.155.171.121:9092/xconf/swu/stb?eStbMac=>

In dcm.properties file:

DCM_LOG_SERVER_URL=<http://35.155.171.121:9092/loguploader/getSettings>
 DCM_HTTP_SERVER_URL=http://35.155.171.121/xconf/telemetry_upload.php
 DCM_LA_SERVER_URL=<http://35.155.171.121/xconf/logupload.php>

3. After board boot up, disable log rotation by using the command:

Log Monitor Disable

```
systemctl disable rdkbLogMonitor
```

4. Verify the image version: `cat /version.txt`
5. Perform reboot: `reboot -f`

Important Note:

Disabling log monitor is required because log rotation feature will wipe out logs when threshold reached, due to which telemetry feature can't able to identify the event count.

Telemetry functionality requires rdk logs.

To bring both log rotation and telemetry feature at same time, user needs to increase the threshold size of max size which is used by log rotation feature . Please follow [Log Rotation Support in RPI User manual - Broadband - 2019 M8](#) to change threshold size of log rotation.

Below steps are to check telemetry log whenever box boots up (after first time boot) :

1. Verify tftp server is running and XConf DCM and Telemetry Permanent profile is configured properly (see Telemetry User manual for XConf side configuration for Telemetry)
2. After reboot, verify Telemetry log: cat /rdklogs/logs/telemetry.log
3. Verify that rtl_json.txt and zipped log files for all other logs displayed in tftp server
4. Verify that rtl_json file and zipped log files for all other logs displayed in AWS(http) server(<http://35.155.171.121/xconf/upload>)

Future Enhancement:

1. We are not considering the cron job time setting for log collection and upload.
2. We are not considering the polling frequency parameter in Telemetry profile entries section of Permanent profile page under Telemetry menu. As of now polling frequency value is considered as 0.

These things are under future development.