

Telemetry in RPI for Rdk-V User manual

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.

RDKV Telemetry Components:

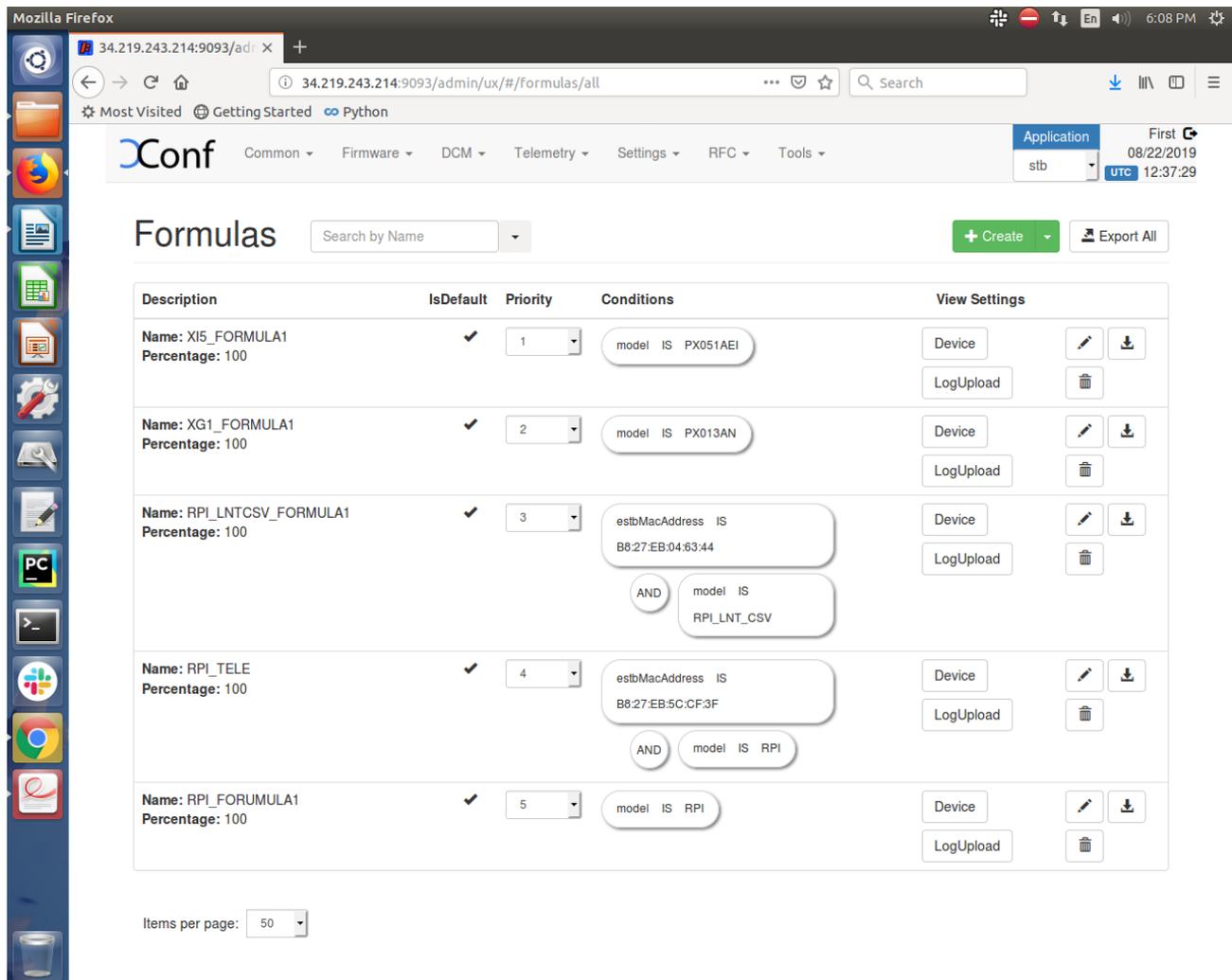
1. Xconf Server
2. Rpi Board with RDK Video image
3. HTTP Server

Processed Data (Metrics)

Rpi board will connect to Xconf Server to get the device configuration information, telemetry profile information and log upload repository (ip address of http 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 http server. This way all the critical data related to device health will be available on timely basis in the http 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



The screenshot shows the XConf web interface in a Mozilla Firefox browser. The page title is "Formulas" and it includes a search bar, a "+ Create" button, and an "Export All" button. The main content is a table with the following data:

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

At the bottom of the page, there is a "Items per page:" dropdown menu set to 50.

Mozilla Firefox

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

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:*
ecmMacAddress MATCH ??:?:?:?:?:AA:FF

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... Search

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Formulas

Search by Name + Create Export All

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

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Formulas

Search by Name + Create Export All

Description	IsDefault	Priority	Conditions	View Settings
Name: XI5_FORMULA1 Percentage: 100	<input checked="" type="checkbox"/>	1	model IS PX051AEI	Device LogUpload
Name: XG1_FORMULA1 Percentage: 100	<input checked="" type="checkbox"/>	2	model IS PX013AN	Device LogUpload
Name: RPI_LNTCSV_FORMULA1 Percentage: 100	<input checked="" type="checkbox"/>	3	estbMacAddress IS B8:27:EB:04:63:44 AND model IS RPI_LNT_CSV	Device LogUpload
Name: RPI_TELE Percentage: 100	<input checked="" type="checkbox"/>	4	estbMacAddress IS B8:27:EB:5C:CF:3F AND model IS RPI	Device LogUpload
Name: RPI_FORUMULA1 Percentage: 100	<input checked="" type="checkbox"/>	5	model IS RPI	Device LogUpload
Name: RPI_formula_22Aug Percentage: 100	<input checked="" type="checkbox"/>	6	estbMacAddress IN_LIST Mac_26July AND model IS RPI_BB	Device LogUpload Edit Formula

Items per page: 50

6. Edit formula page opens.

Mozilla Firefox

34.219.243.214:9093/ad... X

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

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

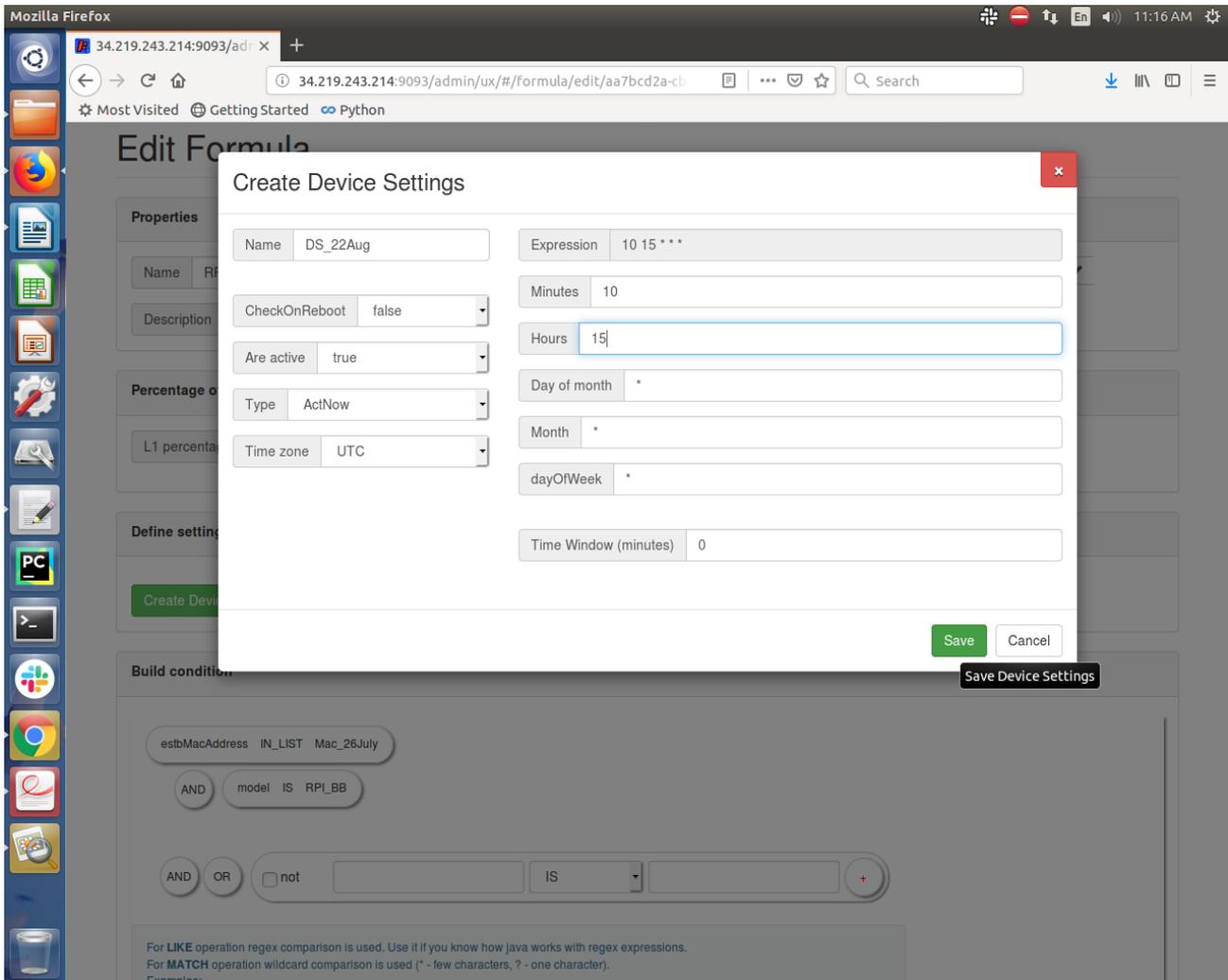
estbMacAddress IN_LIST Mac_26July

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: ...

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

Upload repositories

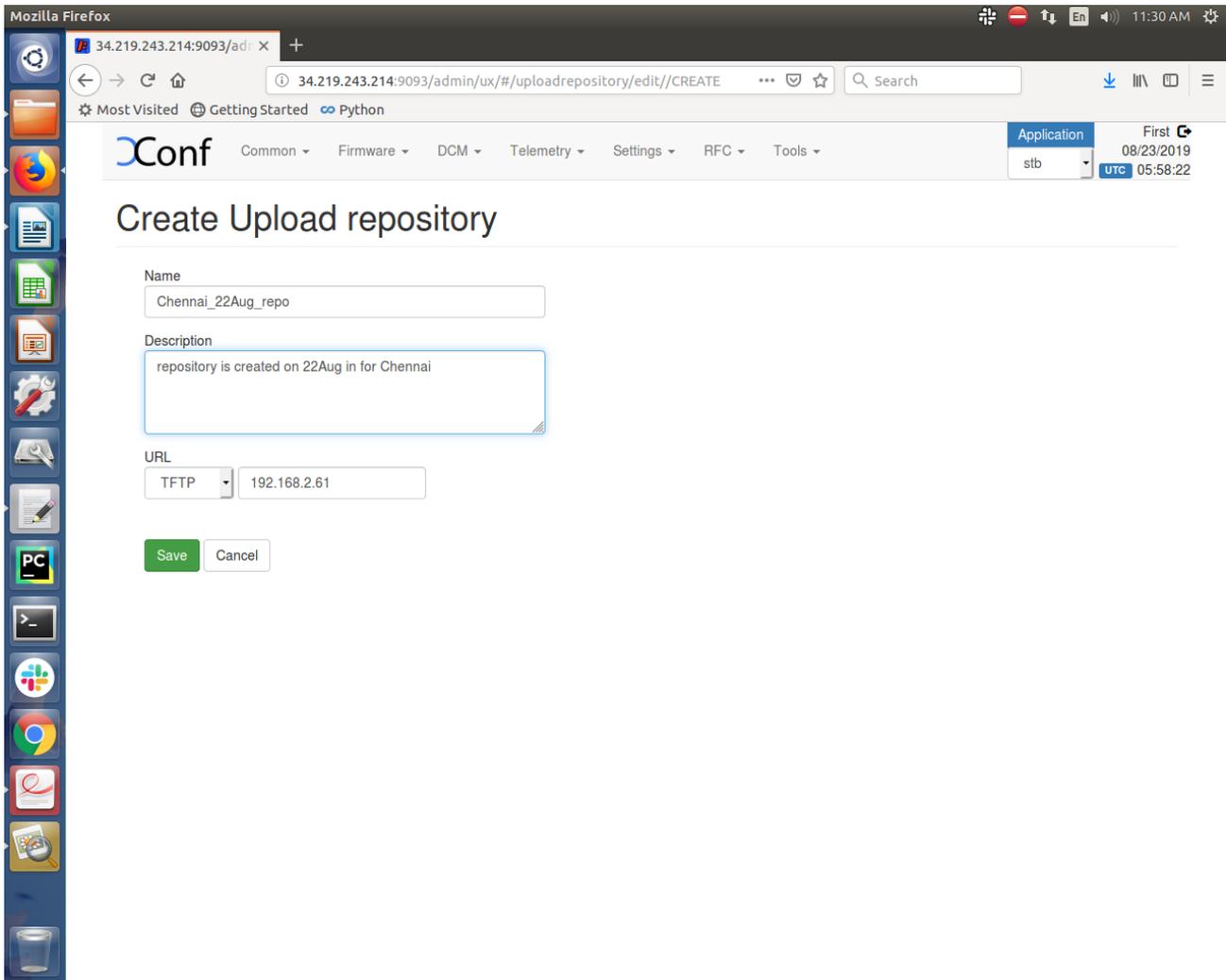
+ Create Export All

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

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/ad... X

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

Edit Formula

Create Log Upload Settings

Settings

Name Number Of Days

Upload On Reboot Are Settings Active

Upload repository

- Chennai_22Aug_repo
- Chennai_repo
- LNTCSV_REPO
- LOCAL_REPO
- RPL_TELE_REPO

Schedule

Type

Cron Expression Time zone

Minutes ExpressionL1

Hours ExpressionL2

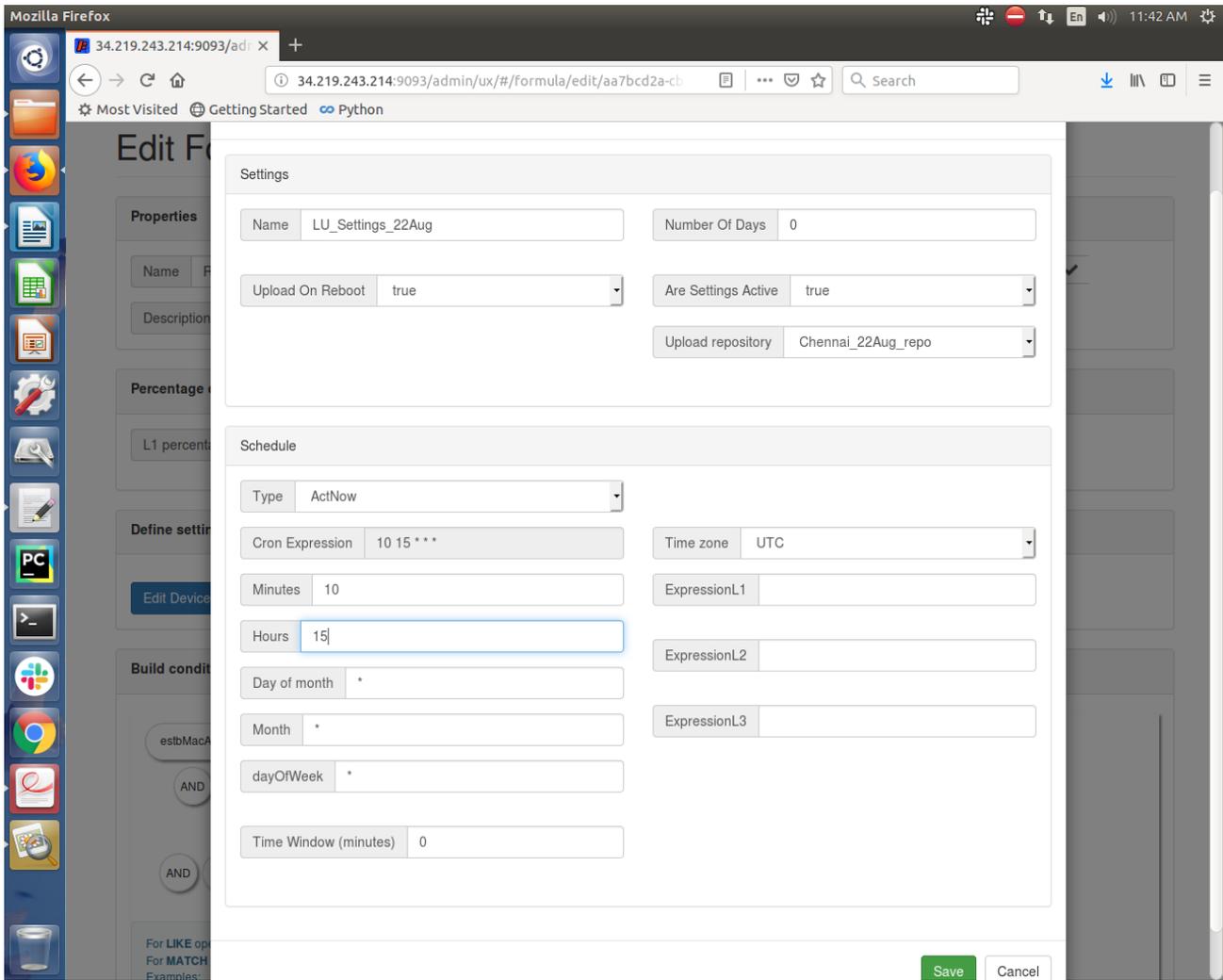
Day of month ExpressionL3

Month

dayOfWeek

Time Window (minutes)

11. Provide inputs as mentioned in the screen below:



12. Save the "Edit Formula" page

Mozilla Firefox

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

Percentage of responses with level one/two/three logs

L1 percentage 0 L2 percentage 0 L3 percentage 0

Define settings

Edit Device settings Edit 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:
firmwareVersion MATCH 13.14.*
estbMacAddress MATCH AA:AA:AA:AA:AA:*
ecmMacAddress MATCH ??:?:?:?:?:?:?:AA:FF

Save Cancel

Success
Saved RPI_formula_22Aug

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/#/formulas/all?pageNumber=1&p...

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	<input checked="" type="checkbox"/>	1	model IS PX051AEI	Device LogUpload
Name: XG1_FORMULA1 Percentage: 100	<input checked="" type="checkbox"/>	2	model IS PX013AN	Device LogUpload
Name: RPI_LNTCSV_FORMULA1 Percentage: 100	<input checked="" type="checkbox"/>	3	estbMacAddress IS B8:27:EB:04:63:44 AND model IS RPI_LNT_CSV	Device LogUpload
Name: RPI_TELE Percentage: 100	<input checked="" type="checkbox"/>	4	estbMacAddress IS B8:27:EB:5C:CF:3F AND model IS RPI	Device LogUpload
Name: RPI_FORUMULA1 Percentage: 100	<input checked="" type="checkbox"/>	5	model IS RPI	Device LogUpload
Name: RPI_formula_22Aug Percentage: 100	<input checked="" type="checkbox"/>	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"

The screenshot shows the xConf web interface. The main heading is "Permanent profiles". A dropdown menu is open under "Telemetry", showing "Permanent Profiles", "Targeting Rules", and "Test page". Below the heading is a table with the following data:

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

Below the table, there is a "Items per page:" dropdown set to "50".

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.

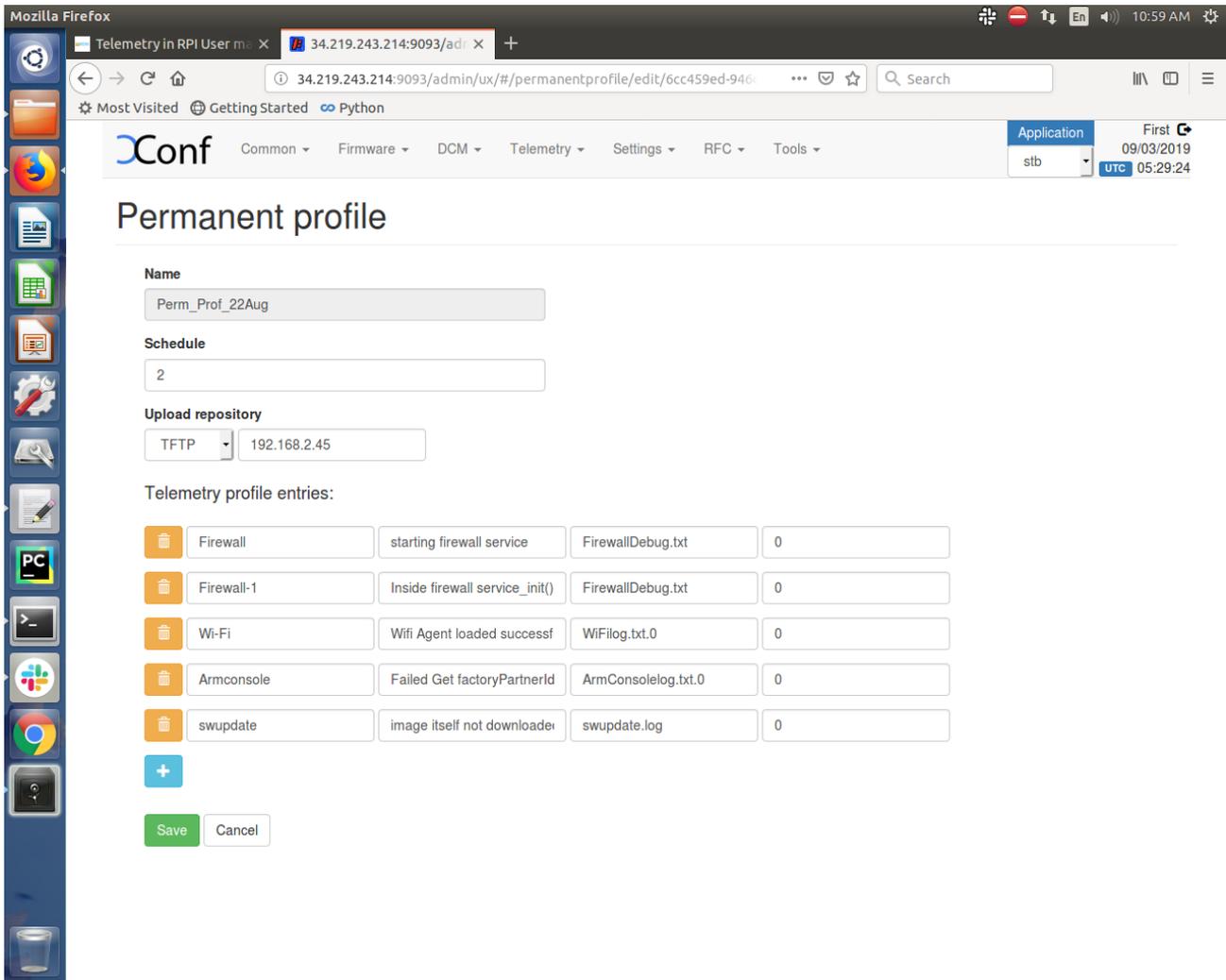
Third field is "**type**" - This is the name of the log file where the above log message string needs to be searched.

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:

Firewall	starting firewall service	FirewallDebug.txt
Firewall-1	Inside firewall service_init()	FirewallDebug.txt
Wi-Fi	Wifi Agent loaded successfully...	WiFiLog.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/ad... X Mail - Amrita Banik - Out... X

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

Search

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XConf Common Firmware DCM Telemetry Settings RFC Tools

Success
Saved Perm_Prof_22Aug

Permanent profiles

Search by Name

+ 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?pageNuml

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

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.

Mozilla Firefox

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

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

Application: stb, First: 08/23/2019, UTC: 09:04:21

Targeting rule

Rule name: Tele_Rule_22Aug

estbMacAddress IN_LIST Mac_26July

AND model IS RPI_BB

AND OR not IS

Bound profile: Perm_Prof_22Aug

Save Cancel

Save

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

The screenshot shows the XConf web interface for managing Targeting Rules. The page title is 'Targeting Rules' and it includes a search bar and buttons for '+ Create' and 'Export All'. A green success message 'Saved Tele_Rule_22Aug' is displayed in the top right corner. The main content is a table with three columns: Description, Rule, and Action.

Description	Rule	Action
Name: RPI_LNTCSV_RULE Profile: RPI_LNTCSV_PROFILE	model IS RPI_LNT_CSV AND estbMacAddress IN_LIST RPI_LNTCSV_MAC	[Edit] [Delete] [Download]
Name: RPI_TELE_RULE1 Profile: RPI_TELE_PERM_V1_PROFILE	estbMacAddress IS B827:EB5C:CF3F	[Edit] [Delete] [Download]
Name: Tele_Rule_22Aug Profile: Perm_Prof_22Aug	estbMacAddress IN_LIST Mac_26July AND model IS RPI_BB	[Edit] [Delete] [Download]
Name: XG1_TELE1 Profile: RPI_PROFILE1	model IS PX013AN	[Edit] [Delete] [Download]
Name: XI5_TELE_RULE1 Profile: RPI_PROFILE1	model IS PX051AEI	[Edit] [Delete] [Download]

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. In device.properties file:

ETHERNET_INTERFACE=eth0

4. In include.properties file:

TELEMETRY_JSON_RESPONSE=/opt/rtl_json.txt

5. Verify the image version: cat /version.txt

6. Perform reboot: reboot -f

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

1. Verify http 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 /opt/logs/telemetry.log`
3. 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>)