Firmware Upgrade using RDKM XCONF Server

- Pre-requisites
- Overview
- Configure the device in XConf Server
- How to perform the Firmware upgrade in STB

Pre-requisites

- The user must configure a local TFTP (Trivial File Transfer Protocol) or HTTP (Hypertext Transfer Protocol) server.
- Ensure that both the local HTTP/TFTP server and the device are on the same network

Overview

This page details how to perform firmware upgrade using RDKM XConf Server.

RDKM offers a reference XConf server that is publicly accessible at the URL XConf.rdkcentral.com. Users have the option either use this XConf server or can create their own.

If you are interested in setting up a custom XConf server, please visit the page https://wiki.rdkcentral.com/display/RDK/XConf+Server+-+User+guide+for+configuration+and+feature+validation for detailed instructions on installation and a usage guide.

The primary focus of this page is to guide you through the process of firmware upgrade using the RDKM XConf server XConf.rdkcentral.com.

User would be able to see two options in the landing page

- 1. XConf Admin UI
- 2. XConf Data service

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XCONF Reference Setup

!!! Reference Xconf Server for RDK (access available on request) !!!

- Xconf is a device management service for RDK. Xconf consists of 2 web applications Xconf dataservice and Xconf admin.
- Both the applications along with the Cassandra DB is setup in this server instance. Reference Log upload server and Telemetry upload servers are also setup here

Configuration document on how to setup and verify Xconf server is available here : https://wiki.rdkcentral.com/display/RDK/Xconf+Server+++User+guide+for+configuration+and+feature+validation

Applications available in this server are :

 $\mathbf{Xconf}\,\mathbf{Admin}\,\mathbf{UI}:\underline{\mathrm{Available}}\,\mathrm{Here}$

Xconf Data Service : <u>Available Here</u>

User can configure firmware rules, configurations, Telemetry settings, RFC settings etc in the admin UI. While dataservice, currently tells the XConf version information - Which version is used, when was it updated lastly and the commit informations etc.

Configure the device in XConf Server

In order to configure the device information user needs to login to XConf admin UI. For getting the access details, refer this page XConf Reference Setup Credentials and fill the information in admin UI and press login button.

Please enter your NT credentials	
Username:	
admin	
Password:	
•••••	
	Login

Once logged in, Users need to do basic configuration like setting up the environment, Creating the model information, Saves the mac Lists, IP Lists. These configurations are required for all device management features like RFC, Firmware upgrade, Telemetry etc.

Common Configurations

Create Environment

- Select Environments option within Common list to enter Environment page.
- After entered Environments page press create button to add your device environment detail.
 Give ID and Description to setup Environment for your device and save those details in XConf server

Conf	Common +	Firmware 👻	DCM +	Telemetry 👻	Settings +	RFC +	Tools +	Changes 👻	
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Environment

ld	RPI_X0	CONF_UPGRADE
Des	cription	RPI_FIRMWARE_UPGRADE_VERIFY
Sav	e Car	ncel

Create Model

• Select Models option within Common list to enter Model page.

- After entered Models page press create button to add your device model detail.
- Give ID and Description to setup Model for your device and save those details in XConf server.

Conf	Common +	Firmware 👻	DCM -	Telemetry 👻	Settings +	RFC +	Tools 👻	Changes 🗸
Model								
Id RPI_XC	ONF_UPGRADE							
Description Save Can	RPI firmware up	ograde						

Create Mac List

- Select MAC Lists option within Common list to enter MAC Lists page.
 After entered MAC Lists page press create button to add your device MAC detail.
 Give Name and Data to set MAC detail for your device and save those details in XConf server.

Common - Firmware - DCM - Telemetry - Settings - RFC - Tools -	Changes - Application admin - 11/29/2023 UTC 10:45:51
Editing MAC List	Choose File Browse
Name	
RPI_XCONF_UPRAGE	
Data	
Please enter item	+
B8:27:EB:BB:D9:5E X B8:27:EB:EE:8C:0B X	
Save Cancel	

User also has the option to choose multiple mac address from a file. User can use a browse button on the right side of the UI to select the files which holds the mac addresses.

Note: All formats are not accepted here. each line holds only a single mac address



- Press the Add '+' button
- Then press save

- Select IP Lists option within Common list to enter IP Lists page.
- After entering IP Lists page press create button to add your device IP detail.
- Give Name and Data to set IP detail for your device and save those details in XConf server.

xconf.rdkcentr	tral.com:19093/admin/ux/#/namespacedlist/edit//CREATE/IP_LIST	کر او Application admin E 11/29/2023
	Add IP List	Browse
	Name	
	Please enter Name	
	Data	
	Please enter item	+
	Save Cancel	

As our requirement is to perform firmware upgrade, User need to configure the information like which Firmware version, From where to download the image and how(protocol) to download.

There are 3 significant steps involved in the XConf firmware upgrade configuration:

1. Firmware Config – The firmware details can be configured here.

Where : Go to Firmware - > Firmware Configs -> Create.

How : Add your firmware details - File name (Upgrading image name), Version(Upgrading image version) and select your model name and save the details in XConf server.

Create Firmware Config

Before configuring Firmware essentials, Ensure application type is stb.

- ° Select Firmware Config option within Firmware list to enter Firmware Configs page.
- After entered Firmware Configs page press create button to add your device firmware configuration detail.
- Give Description, File name (Upgrading image name), Version(Upgrading image name) and select your model name and save the details in XConf server.

Firmware config

Description RPI scont teeting
Pleasant
Heriname Idegeneto-(p-db-client_rde-next_20200110141605.roofs.adc
Visition de-garacio-sth-client rdi-read 2020/101/1025
Machelie:
1219 REALTEK REFERENCE DEVICE A_FRAWARE_UPGRADE A+212 A+212
W212_AMLOGICREF1_MODEL W212_FW_MODEL W212_FW_UPGRADE W212_PREMILMWPPS
AMLOGIC AMLOGIC_RDHM_CI AP233 ARHORSHNAN_AH212 ARM/7 ARRS AT321
AT201-TV AUSA-TEST AUTOMATICS_AMLOGIC AUTOMATICS_REALTER
AUTOMATICS_SKYWORTH_AMLOGIC AXXEARI BALAU_TELEMETRY BLADE CERT_RP_MODEL
CMF_MODEL_SERCOM COGMMTION_BB COGMMTION_BW DEMOT2 DEMO_SEC DEV
DRV_FIAD_TEST DRV_TEST DRV222 DRESH EMJERNY EMJEATOR EMJEATOR
ENURORY ENVIO FSSS FAGTOMENS FAGTSOTO TAPL FRUPS DONO HARESHARP
HPICK HPICACEY HPINH HPROX HOWH HOW TEST HITEST JITHAHPINHACEEL
JITHA, AND SCHOOL [LIGN/REALTER/SCHO] (MIKARHIETEST/2022] [NEWTEST [PLG]
PP MODEL PRIVINKAA RPI PROD QA QAENVI QAMODEL RID RA RASPERRY PH
ROLL ROKE TO ROKE TEST ROKE TEST ROKE TEST ROKE TEST ROKET
ROW TOTI ROW TOTI ROW & HEN ROW BROADLAND ROW BR WINE TOTING
TOTAL SOL DATA DOT
ROM(RADI, DEVICES ROMERVICE, RPI, TEST ROMARD ROMARD
RDKV/SERCOMMALADE RDKV-TEST RDKV-TEST RDKV_PSTB RDKV_RPI_DEV
ROWA REALTER REFERENCE BOARD REALTER, ROLL (ROWL), CLIPREMUMAPPS
REALTER, REF, ROND, CI REALTER, SDR. 1 REALTER, TEST, MODEL REALTER, MANK
REALTERMANK, PREMILINAPPS_CI REALTERMANK, RISH, SERCOMM REALTERMANK, TOK
REALTERWAR, VA, OHRE REALTERING REALTERWARK REALTERWARK REALTERWARK REALTERWARK
RPI RPI-220 RPI-3 RPI-FWAUG22 RPI-RDIA-DEV-TEST RPI-RDIAD-73 RPI-TEST
RPHTESTING-REKER RPG_BALAU RPH RPH-HILT RPH-ANTONY RPH-FRAMMARE
REW ADALACONE REW, REWARDSTRUCTURE REVAIL TO TAKE TO TAKE TO TAKE A TAKE
RPLDEEPIKK RPLDINFELL RPLFRMWARE_UPDATE RPLMPROVSE RPLMAK
RPLINDEL * RPLINDER REV REPORT TELEMETRY RPLINDEL TEST RPLINDE TEST (RPLINDE
TRE ROOM RELEASE RELEASE RTK HANK SAGECOM TELEMETRIZO TEST
SARDIVA-TEL2/0 SARDIVA-TEL2/0 SAMPLE ROMA SECTION RETAININGARES TRACI
SECTION IS ADD DV SECTION FORM C1 SECTION FORM C1 PREMI AMERS SECTION TOX
SKARAVES SAVARETH AN OOK SAVARETH DOW TOX STANK OF SECOND
TDC/088-721020-578_TEST_MODEL TDC/P_TEST_MODEL TDC/REALTEC/TEST_MODEL
TDK_REALTROOMNK_TEST_MODEL TDK_RPL_TEST_MODEL TDK_XONE_TEST_MODEL
TEMPTEST TEST-12 TEST_MODEL TEST_XCONF_AMALOGIC_SEX_1_MODEL
TEST,XCONF,REALTER, SDK,2,MODEL TESTAUTOH TESTAUTO2 TESTAUTO2 TESTAUTO2
TESTAUTOR TESTAUTOR TESTAUTOR TESTAUTOR TESTAUTOR
TESTAUTORI TESTAUTORI TESTAUTORI TESTAUTORI TESTAUTORI
TESTALTORE TESTALTORE TESTORE TESTOREFOR1212 TESTENV TESTEN/FOR2222
TESTEN/FOR222 TESTRI TURRE TURREFULCIO-MODEL TV_MODEL_TELEMETRY_DHVMA
VA-7022 VIPT022 XCONF_RELEASE_TESTING_MODEL_3.30 X07/223 YS4000
ZSURESH_TELEMETRY ZXXX4012 ZZZ-44012
Properties:



Where : Go to Firmware -> FirmwareRule - > Create.

How : Select one of the default template like MAC_RULE.

Enter name of the rule, build condition (you can add estbMacAddress i.e.)

select the firmware config from the drop down list to map it with the rule

Create Firmware Rules

Sava Canoli

- Select Firmware Rules option within Firmware list to enter Firmware Rule page.
- After entered Firmware Rule page press create button to add your device firmware Rule detail.
- After entered firmware Rule page you can see list of default templates(ENV_MODEL_RULE, IP_RULE, MAC_RULE etc.) Note: If we need to create new custom template, go to Firmware Firmware templates. Enter the ID name. Select priority from the 'Priority' drop down menu. Add conditions. Once saved select the new template to create firmware rule
- Choose MAC_RULE(any required template) in this list of Template to add your device MAC list in Firmware Configuration.
- After we select the required template, 'Add firmware Rule' page will be displayed. Here the build conditions will be present from the 'template' that we added and in addition to that we can add additional Build Conditions also.
- Add your device specific eStbMac under build condition option.

° Select your firmware config under Action option and save your Firmware rule in XConf server.

~ 0111	stb	✓ UTC 13:13
Edit Firmware Rule		
PROPERTIES		
Name RPI_XCONF_TESTING Type MAC_RULE		
BUILD CONDITIONS		
eStbMac IN_LIST RPI_XCONF_UPRAGE		
Please provide value for each condition in the rule: click condition, enter fixedArg value, then click Plus button to save that condition. Note: <u>Key</u> value in condition <u>can't</u> be modified. It's not allowed to add new conditions.		
ACTION		
Action Type RULE		
NoOp false		
Firmware Config RPI xconf testing		
Save Cancel		

3. Download Location Filter - Here we can specify the download location URL and it's protocol.

There is a by default location available in Download Round Robin location filter', but admin can set up an alternative download location for hosting the firmware image using any local file server. To add alternative location for the device, we need to override it from firmware rules.

- Go to Firmware -> Firmware Rules -> Define Properties -> Create
- A page will be displayed with options to select the template. Select 'DOWNLOAD_LOCATION_FILTER' from the list In this 'firmware rule' page with type 'DOWNLOAD_LOCATION_FILTER', we can specify the firmwareDownloadProtocol and firmware location. ٠ This property will override the default value set from 'Download Round Robin location filter'.
- · Add the firmwareDownloadProtocol and the local http/tfp location as the firmwareLocation in XConf server. (Make sure local server and STB are in same network)

				stb 🗙 🔽 🗤 11:59:
dd Firm	ware Rule			
PROPERTIE 8				
Name		Туре	DOWNLOAD LOCATION FILTER	
BUILD CONDITION	8			
bAddress IN LIST	0			
OH esta	Mare IN LIST			
	Mac IS			
	4 B			
	not	IS 🗸		
<u> </u>				
Please provide value				
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click condition, enlar Note: Key value in c	e for each condition in the rule: fittedAig value, then click Plus button to serve it condition <u>can't</u> be modified. It's not allowed to ad	hal condition. dd new conditiona.		
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By default, rebootImmediately flag will be false. If we need to perform reboot immediately after writing the image to other partition, User can configure REBOOT_IMMEDIATELY_FILTER

- Go to *Firmware -> Firmware Rules -> Define Properties -> Create*A page will be displayed with options to select the template. Select 'REBOOT_IMMEDIATELY_FILTER' from the list
 In this 'firmware rule' page with type 'REBOOT_IMMEDIATELY_FILTER', we can specify the 'rebootImmediately' as true.

dd Firm	nware Rule			
PROPERTIE 8				
Name			Type REBOOT IMMEDIATELY FILTER	R
BUILD CONDITION	N 8			
OR USZ	52:168.162.198	15 🗸	\odot	
Please provide valu click condition, ente Note: <u>Key</u> value in	ue for each condition in the rule: er foxedArg value, then click Plux button to se condition <u>can1</u> be modified. The not allowed t	we that condition. to add new conditions.		
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Now we have everything configured in the XCONF server side. we can validate in the XConf Firmware test page to see the configurations set.

Verification using XConf firmware Test page

After creating the Firmware configs and Firmware rules, go to Firmware->Test page and give a parameter that will match the one of the rules that you have created. Then matched rule will be displayed like below.

Firmware Test page

Parameters

Enter context parameters like est parameters' button to see results	bMac or env/model. Use toggle near plus sign to add predefined capabilities (RCDL, rebootDecoupled, supportsFullHttpUrl). Hit 'Test with i.
eStbMac	B8:27:EB:EE:8C:0B
+ +	
Context	
{"eStbMac":"B8:27:EB:EE:8C:0B	","applicationType":"stb","time":"2023-01-19T13:16:00.000","ipAddress":"1.1.1.1","timeZone":"UTC"}
Matched Rule	
type:	MAC_RULE
name:	RPI_XCONF_TESTING
id:	5f507f02-f464-4cf8-9b6c-26e653f5f2e9
blocked:	false
eStbMac IN_LIST RPI_XCONF_U	PRAGE
Firmware Config	
description:	RPI xconf testing
id:	d263fd35-5893-4f3f-8a4a-c24301d55ec0
firmwareDownloadProtocol:	http
firmwaraFilenama	rdk generic in eth client, rdk next, 20230116141625 rooffs wic

inniwarernename:	rak-generic-ip-sib-client_rak-next_20250116141625.100tis.wid
firmwareVersion:	rdk-generic-ip-stb-client_rdk-next_20230116141625
rebootImmediately:	false
supportedModelIds:	["RPI_XCONF_UPGRADE"]

Applied Filters

How to perform the Firmware upgrade in STB

RDKUI provides the option to perform the firmware upgrade. User can go to Settings->Other Settings->Advanced Settings-> Device -> Firmware Update

٩	ERDK	\$ 9:24 am
	Settings / Other Settings / Advanced Settings / Device	
	Info	>
\wedge	Time Zone	>
	Check for Firmware Update	\rangle
	Reboot	
\bigcirc	Factory Reset	>

Select Check for Update

٩	ERDK	\$ 7:47 am
	Settings / Other Settings / Advanced Settings / Device / Firmware Update	
	Firmware State: Uninitialized Firmware Versions: lib32-skyworth-generic-mediaclient-image_FBT_6.0.0-rc3_20231010150713	
\triangle	Downloaded Firmware Version: Check for Update	

As this being the reference UI, Current implementation is using only the API calls not the Events of plugin and API is invoked only when a page transition is done. So we may need to go to the previous screen's in order to see the transitions

• State indicates validation is completed

۲	ERDK	ŝ	7:55 am
	Settings / Other Settings / Advanced Settings / Device / Firmware Update		
	Firmware State: Validation Complete		
	Firmware Versions: lib32-skyworth-generic-mediaclient-image_FBT_6.0.0-rc3_20231010150713		
\triangle	Downloaded Firmware Version: NA Check for Update		
\bigcirc			

• State indicates when preparing for reboot

	ERDK	3	7:56 am
	Settings / Other Settings / Advanced Settings / Device / Firmware Update		
	Firmware State: Preparing to Reboot		
	Firmware Versions: lib32-skyworth-generic-mediaclient-image_FBT_6.0.0-rc3_20231010150713		
\triangle	Downloaded Firmware Version: NA Check for Update		
\bigtriangleup			

STB will check for upgrade and downloads to the other partition and next time boots up with this image. If reboot immediately filter is set to true in the XConf server, STB will go for immediate reboot once the image write is successful in the other partition.