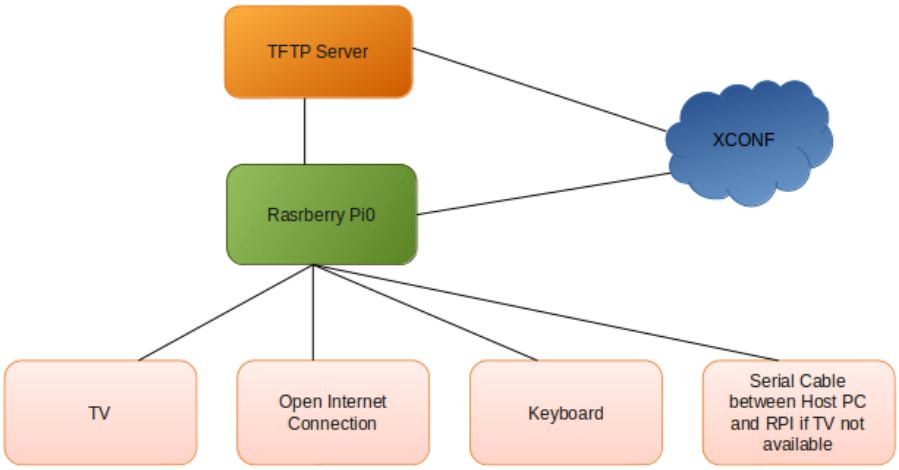
RDK-C : Firmware Upgrade

- Introduction
- Architecture
- Design Considerations
- Sequence Diagram

Introduction

This document covers the design approach used for upgrading firmware for RPI RDK Camera devices using XCONF server & TFTP protocol.

Architecture



Design Considerations

Initially we need to do firmware configuration in XCONF server i.e we need to create firmware config ,firmware rule,download filter info(protocol(TFTP),IP address) etc corresponding to RPI MAC address

Next we need to have TFTP server in public network,so that it can be accessed by the device

In RPI we have to create a script which will be called by the systemd service file on boot up,When the device boots the script will read the cloud firmware version using a curl request and it will check with the local FW version,If the device FW version and cloud FW version are different then it will go with further processing as below

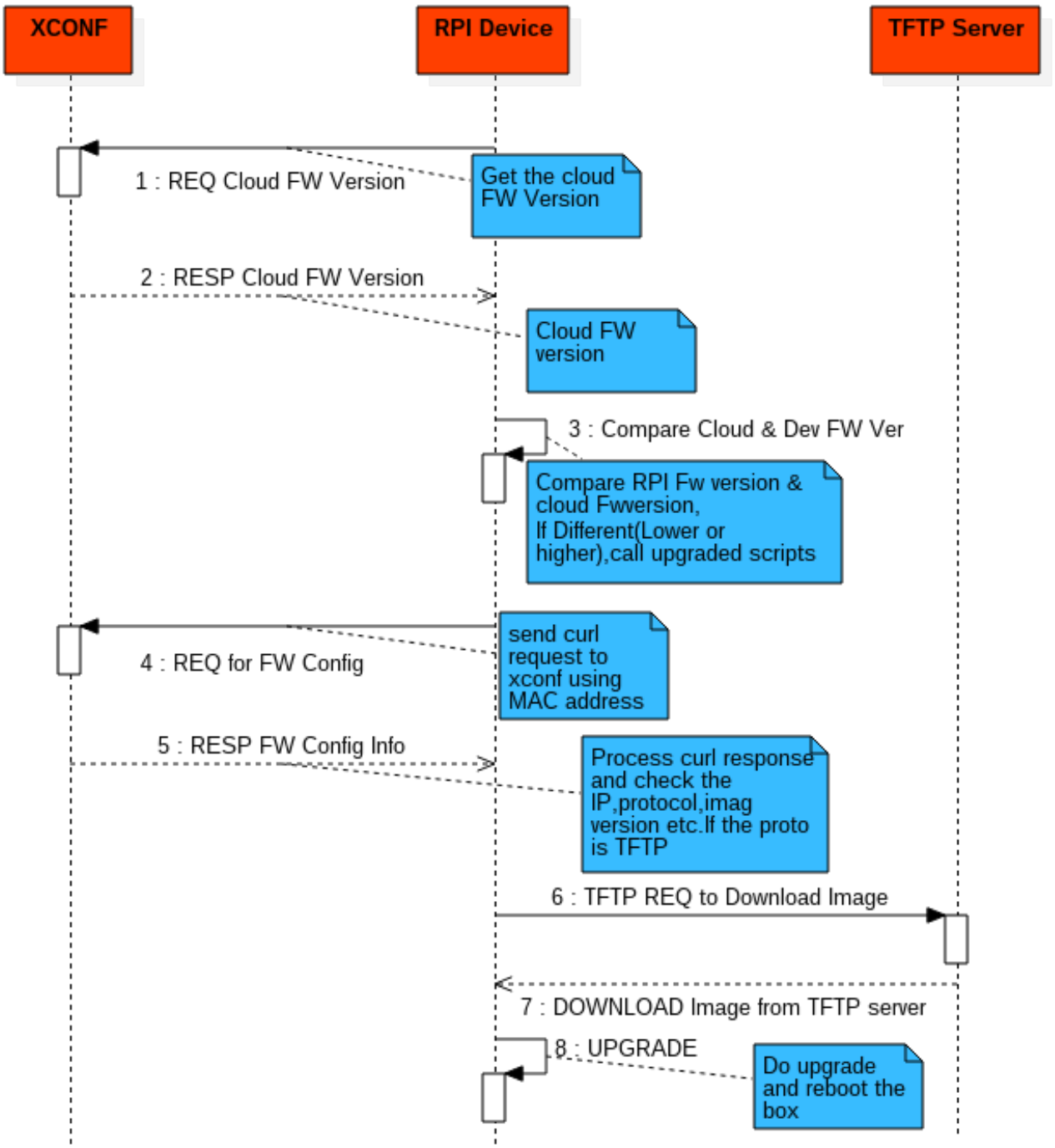
RPI will send curl request to XCONF and XCONF will send firmware config info(protocol,firmware location,firmware version,etc..) to RPi & it will process the response and based on the protocol it will download from TFTP server and proceeds with partition creation & flashing

By default RPI is having only SD card support for flashing OS and boot,right now we have only two partitions,one for Kernel(FAT32) ~40MB & other for rootfs(ext3) ~ 360 MB(mmcblk0p1,mmcblk0p2)

As part of our approach,during run time we are creating two more partitions using fdisk and mkfs.ext3 (mmcblk0p3,mmcblk0p4) will be doing reboot to take this partitions into effect

After booting we will be upgrading the new image

Sequence Diagram


XCONF
RPI Device
TFTP Server
1 : REQ Cloud FW Version
Get the cloud FW Version
2 : RESP Cloud FW Version
Cloud FW version
3 : Compare Cloud & Dev FW Ver
Compare RPI Fw version & cloud Fwversion, If Different(Lower or higher),call upgraded scripts
4 : REQ for FW Config
send curl request to xconf using MAC address
5 : RESP FW Config Info
Process curl response and check the IP,protocol,imag version etc.If the proto is TFTP
6 : TFTP REQ to Download Image
7 : DOWNLOAD Image from TFTP server
8 : UPGRADE
Do upgrade and reboot the box