

VUP Client Driver and Test Application on Linux subsystem

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# Abstract

Undertanding of USB, V4L2, and PCIe based subsystem and Develop a different client drivers and test application. Linux based diagnostics tool to capture device specific configurations and link states information.

The initial drop of the driver and application is targeted to have functionality to configuration data on BB/Rpi/Host board.

# Disclaimer

The information presented in this proposal can only be used by client for the sole purpose of considering this proposal and raising a purchase order for the requirement. It is deemed to be confidential and should therefore only be distributed to employees and authorized advisors / consultants.

# References

[1] https://www.kernel.org/

[2] https://docs.kernel.org/subsystem-apis.html

[3] https://linuxhint.com/pci-linux

[4] https://www.oreilly.com/library/view/linux-device-drivers/0596005903/ch12.html

# Scope of work

Moschip’ s scope of work shall include understanding of core subsystem, and application development on BB/Rpi/Host board.

# System Description

Developing a VULP based diagnostics tool to capture device specific configurations and link states information, where need to understand all VULP core subsystems(Root complex, Endpoints ,Switch, USB, V4L2, PCIE to PCI/PCI-x bridge) and communication via protocol.

# High Level Solution Block Diagram

V4L2 Video Rendering test application

USB Client Driver

USB Controller

PCIe Client Driver

PCIe Stack

PCIe Controller

USB Stack

V4L2 Client Driver

V4L2 Core

USB Camera

Unit test for USB/PCIe

SysCall Interface

**Def:** Develop a VULP client Driver and test application on user space on BB/Rpi/Host development board.

**Inputs:**

* Need to understand VULP protocol.
* Need to understand VULP driver stack layer in kernel space.
* App/driver should be compiled only once and should work on
* BB/Rpi/Host board

**What is the advantage to the BU:**

No Advantages to BU

**Advantage to the engineer :**

* Kernel Debugging skills
* Driver development exposure in PCIe, USB, V4L2 Subsystem in Linux Platform
* USB, PCIe, and V4L2 Subsystem exposure in Linux kernel.

**Tools to be used:**

* BB/Rpi/Host board
* GIT, Gerrit

**Targeted Objective & Tool Exposure**

**Targeted Objectives:**

* Unit test cases and Utility implementation
* USB / PCIe Client Driver and V4L2 Utility development

**Tool Exposure:**

* gdb – For debugging
* Git – Storage
* Gerrit – Code Review
* Redmine – Bug/ Project Tracking
* FTrace – Kernel trace
* KProbes – Kernel probes

**Device Dependencies:**

* Beagle Board, Raspberry Pi3
* USB to UART dongles (FTDI/7720/7820)
* SD Cards