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Defensive Publications Series

December 2019

TYPE C FUNCTION EXPLORER FOR USB-C DEVICE

HP INC

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Type C Function Explorer for USB-C Device

Abstract: An App assists a user with identifying and resolving connection problems between a host and a USB Type C device by conducting a VDM session with the device.

This disclosure relates to the field of computer device interconnection.

A technique is disclosed that assists a user with identifying and resolving connection problems between a host and a USB Type C device.

There are many kinds of Type C devices which can be connected to a USB Type C port, including cell phones, docking stations, dongles, and mass storage devices. Currently, a user can determine only whether the Type C device is working or not working. They don't have a way to determine why the device is not working, the device's status and performance, or how to get the device to work properly. This causes the user frustration and a loss of productivity.

According to the present disclosure, and as understood with reference to the Figure, an App 10 obtains the USB type-C device's support information. The App 10 provides Type C device information including the USBC Cable capability, TBT/DP Alt Mode support information, USBC charging capability, and USB support type. Thus the App enables a user to understand the devices capability and status, and provides guidance on how to resolve the problem of a non-working device.

The Host PD (Power Delivery) subsystem of the Host EC/PD module 20 communicates and the Device PD 30 via Vendor Defined Messages (VDM), a standard in power delivery protocol, on the USB-C interface. The Host PD detects the device status by conducting a VDM session with the Device PD 30. The Host EC subsystem of the Host EC/PD 20 can get USBC device status from the Host PD 20 via an I2C interface. The App 10 shows the related device information and messages on the screen of the device which runs the App 10.

In operation, the user plugs the USB Type C device into the Host ED/PC 20 at 40. At 45, the Host EC/PD 20 detects the USB Type C device to which it is connected. At 50, the Host EC/PD 20 sends a VDM to the Device PD 30 to get USB, cable, device, and DP information. At 55, the Device PD 30 replies the USB, cable, device, and DP information to the Host EC/PD 20. At 60, the Host EC/PD 20 detects the charging mode via a USB 2 signal. At 65, the EC collects Type C support status from the Host, cable, and Device. At 70, the App 10 receives, processes, and compares all the Type C device information which has been acquired by the Host EC/PD 20. At 75, the App 10 reports Host, cable, and Device support status on the display, along with information about what is not working, why, and suggestions for fixing the problem.

The disclosed technique advantageously provides a way for a user to easy determine detailed support information about their Type C device. VDM implements the docking detection and docking device control without any additional hardware components. As a result, users can easily resolve Type C device problems on their own.

Disclosed by Yi-Fan Hsia, Bebe Lai, and Patrick Chen, HPInc.

User

User plug-in USB
type-C device.

40

Host EC/PD

Detect the USB
type-C device.

20

45

Send VDM to device
PD to get USB/
Cable/Device/DP
information

50

30 Device PD

Reply the Type C
USB/Cable/
Device/DP info by
VDM

55

PD Detect Charging
Mode by
USB2 signal

60

App   10

Process and
compare the type C
device information

75   70

Show
Host/Cable/Device
support status and
provide wrong
message to end
customer if have

EC to collect Type C
support status from
Host ,Cable and
Device

65