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TYPE-C PORT THAT INCLUDES ALTERNATE MODES INCLUDING VIRTUALLINK AND COEXISTS WITH THUNDERBOLT

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Type-C port that includes alternate modes including VirtualLink and coexists with Thunderbolt

Abstract: A single Type-C port allows the coexistence of both Thunderbolt and VirtualLink modes.

This disclosure relates to the field of computer I/O.

A technique is disclosed that allows the coexistence of Thunderbolt and VirtualLink on the same Type-C port

A new standard is emerging that allows for high speed USB 3.x and four lanes of DisplayPort to be routed via the Type-C connector. This mode is called VirtualLink. It targets VR users who require both full display performance, and full USB bandwidth. Up to now, only either half the display performance, or reduced USB performance, were possible via this one port.

In addition, once the VirtualLink mode is enabled, there is no easy way to enable Thunderbolt (a high-speed I/O technology that enables connection of as many as six devices through a single connector) via this same port, due to the difficulty of managing all these high speed signals via this one Type-C port.

According to the present disclosure, all these modes can coexist on this single port.

The technique utilizes the existing Thunderbolt controller from Intel to manage the left and right high speed lanes. A USB high speed switch is added to manage the center lanes that VirtualLink employs. The power delivery (PD) controller that sits behind the Type-C port manages what gets enabled in the Thunderbolt controller and the USB high speed switch. In this manner, all five alternate modes can be implemented on the Type-C controller.

The disclosed technique advantageously solves the coexistence of Thunderbolt and VirtualLink on the same Type-C port. It resolves the mixed messaging around Type-C ports and what they're capable of. A Type-C port that only supports USB, or only supports Thunderbolt, appear identical, and the user may not know until he plugs in a device and discovers that it's not supported. With the disclosed technique there is no confusion over the functionality of the Type-C port since all functions are supported, in addition to enabling the new VirtualLink mode that allows VR connections via single attach cable.

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