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Low Profile Air Duct for Double Width Slot

Abstract

Components within a computer server are generally laid out with a balance of electrical, mechanical, power, and thermal requirements. In most cases, the thermal limit of every downstream component is affected by the preheat of components in its direct upstream airflow path. Supporting different form factor components also requires compromises in one or more of the facets listed above. The disclosed invention, an air duct assembly and a supporting bulkhead bracket, addresses the problem of supporting low profile (LP) GPU PCIe cards in full length full height (FLFH) double wide GPU card slots laid out in series of each other.

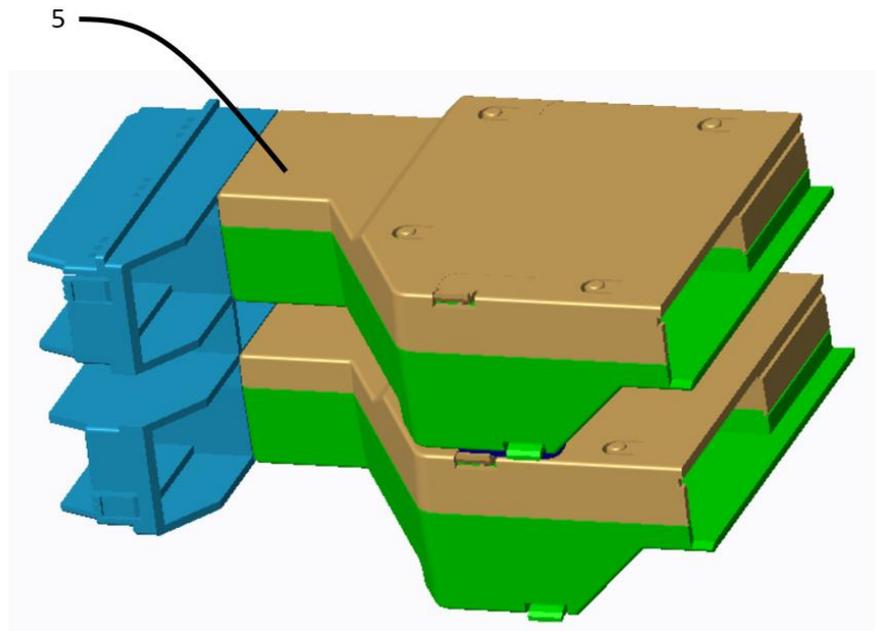
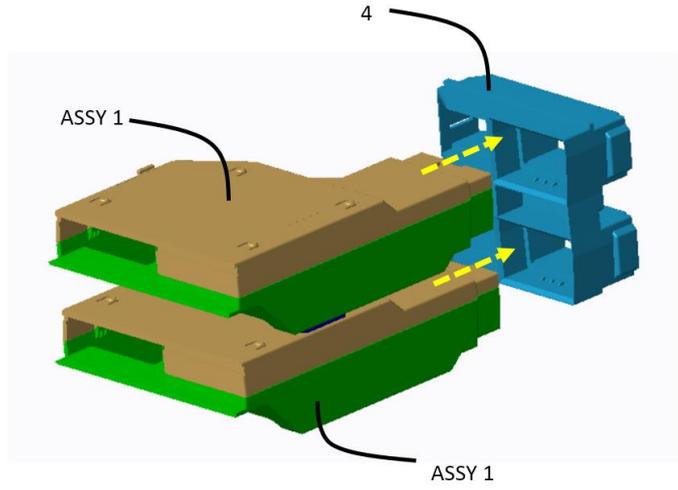
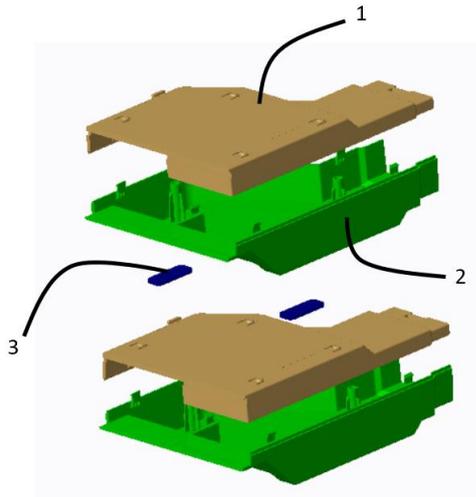
Description

Prior solutions consist of individual foam blocks adhered to surfaces within the server, lower server inlet ambient temperature requirement, and higher fan speeds to cool the serial GPU PCIe cards. Limited structural support on the rear end of the LP PCIe card due to limited mounting points within the FHFL double wide GPU PCIe card slots hinders proper low profile GPU card installation.

The invention does the following:

- Support LP GPU PCIe cards in FHFL double-wide GPU slots.
- Provide fresh air to each LP GPU PCIe cards, especially for those cards arranged directly downstream of another LP GPU PCIe card. The air duct creates a bypass for the incoming preheated air.
- Reduce fan power consumption.
- Raise the upper temperature limit for the server, which will allow the server to be supported in environments with higher temperature thresholds.
- Allows the same air duct design to be used on either or both sides of the server.

The air duct assembly consists of four different parts, labeled as Part 1, 2, 3, and 4 in the pictures below. Part 1 and Part 2 are assembled together via internal snap features into a subassembly. Two of these subassemblies are joined with two pieces of Part 4, a rubber piece with adhesives on both flat sides, and then are subsequently inserted and secured into Part 4 via its internal snap features. This final air duct assembly, noted as Part 5, is rotated into the server chassis and snapped in place via its external snap features, as shown in Figure 1. Figure 2 displays two of these air duct assemblies within the server, one on either side. The designed bulkhead bracket is then mounted to the LP GPU card to allow it to interface with and be mounted to the double wide GPU FLFH card slot's bulkhead within the server, as shown in Figure 2.



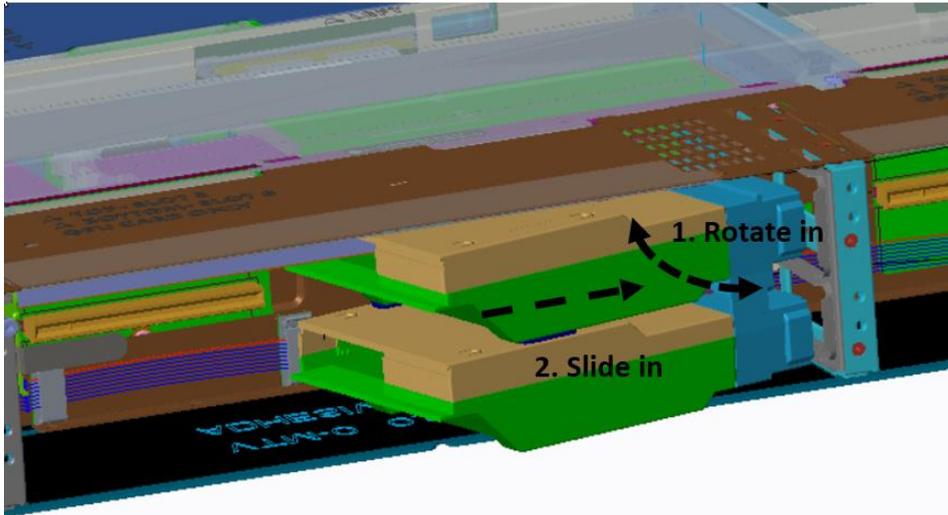


Figure1

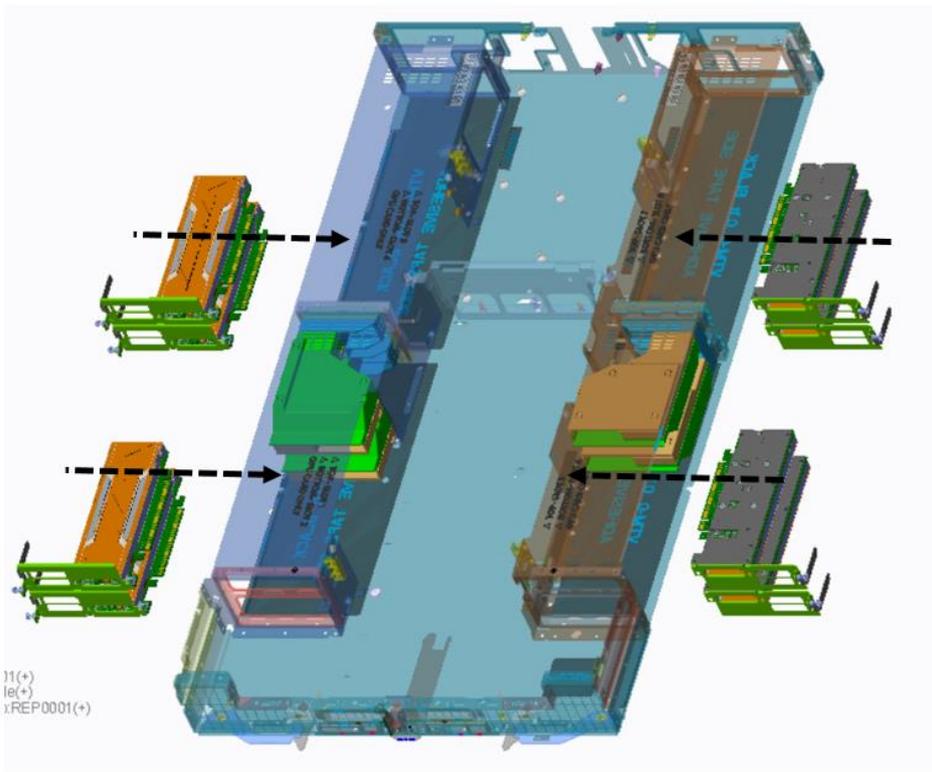


Figure2

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