

## Next Generation PowerEdge Servers Implement Eco-Friendly Design Strategies

### Tech Note by

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### Summary

By increasing efficiencies, removing excess material, and standardizing design concepts, Dell EMC has continued to refine how to effectively contribute to the eco-friendly movement.

This tech note highlights a few of the design strategies that have been implemented for PowerEdge servers that preserve resources and reduce the overall footprint made when manufacturing products.

### Eco-Friendly Strategies

To continue leading the movement for more eco-friendly server designs, the Dell EMC Experience Design Group developed PowerEdge servers focusing on front-to-back efficiency and start-to-finish thoughtfulness. By leveraging collaborative resources and collective energies on following these two ideals, the following achievements were made in server resource preservation and footprint reduction.

### Efficient Design; From Front to Back

Efficient design focuses on maximizing the amount of work that can be done with the least amount of resources possible. Following this strategy ensures that no space, energy or opportunity is wasted in each box. Customers benefit from a solution that has been designed to output as much work as possible, therefore optimizing the total number of servers needed to meet their data center needs.

### PowerEdge Efficiency Achievements

1. Drive carrier rail structures now have thin folded metal edges that allow for increased airflow throughout the server chassis. Additionally, the motherboard design has been modified to a T-shape that better organizes airflow distribution throughout the server structure. These design modifications improve fan and power supply usage which reduces total power consumption.



Figure 1: HDD carrier design allows for additional airflow to circulate through the structure

2. Refined front-end perforation patterns more effectively prevent the buildup of dust around intake and exhaust vents as well as within the system. This improvement in airflow and fan performance reduces power consumption and enhances energy efficiency. Therefore, PowerEdge products can be further populated with valuable hardware as the efficiency of cool air has increased throughout the box.

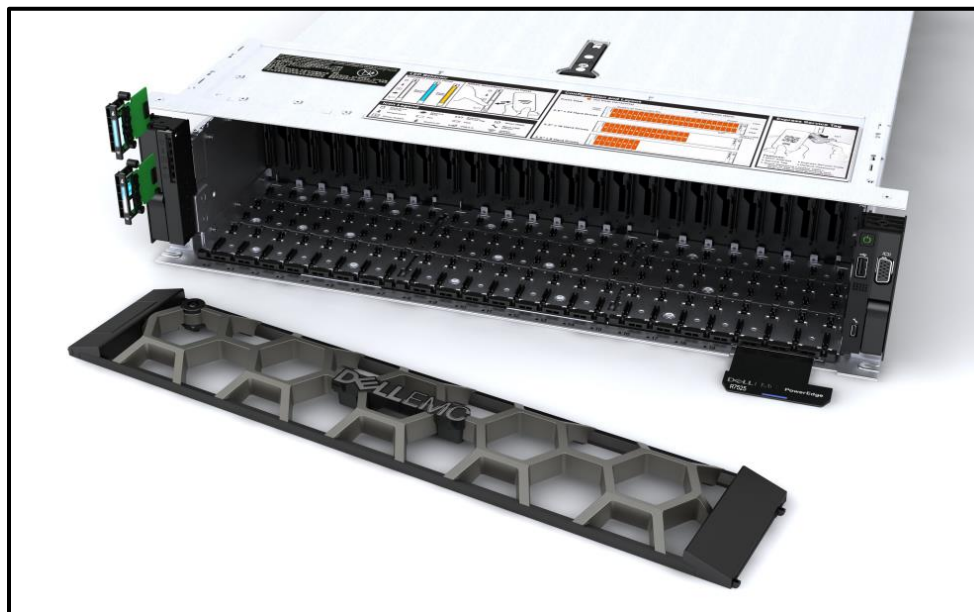


Figure 2: Front facing visual of the perforation patterns and IO port locations for the PowerEdge R740

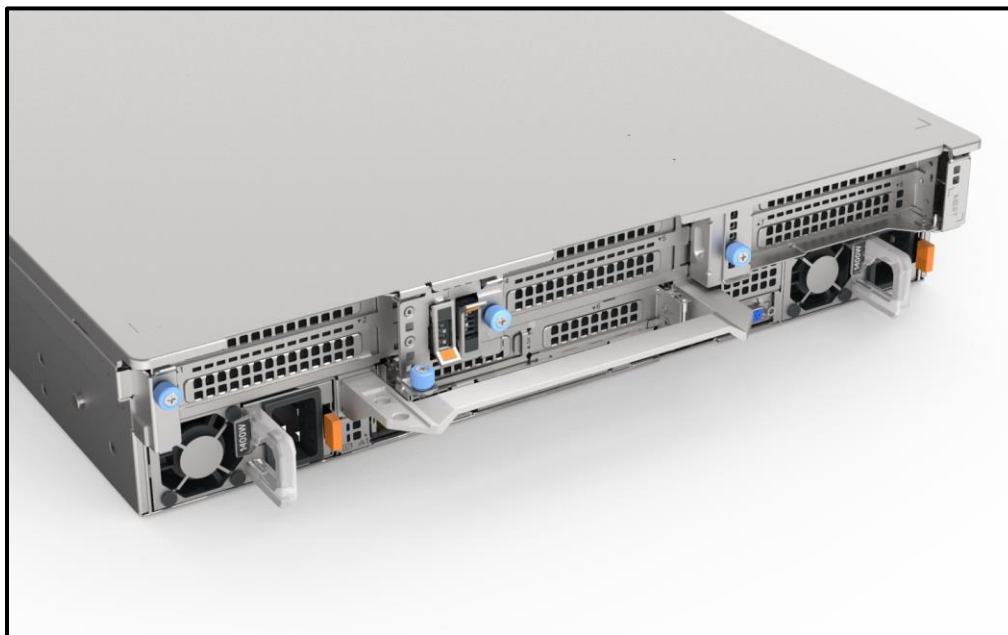
3. I/O ports were relocated from within the chassis to the rack ears. Implementing this design change enabled more drive space within the box that customers can utilize for additional capabilities.

## Thoughtful Design; From Start to Finish

Thoughtful design focuses on making conscious efforts to create positive environmental impacts, such as reusing resources to minimize the global footprint. PowerEdge servers prioritize thoughtfulness over inconsequential aesthetics to protect and preserve the environment and its future.

### PowerEdge Thoughtful Achievements

1. Paint was removed from the front end of the server, hard drive carriers and the rear handles. The front end of the server uses hemmed edges to conceal the metal edges, thereby eliminating any need for paint, enhancing the chassis structure, as well as enabling IO components to relocate to the rack ear. Hard drive carriers use a natural finish stainless steel, which reduces the volume of paint used on each server and improves signal integrity. Lastly, the rear handles utilize a die cast process with a bead blast finish as an alternative to using paint. These design changes allowed harmful paints to be removed from multiple processes, therefore producing less air pollutants.



*Figure 3: Rear handles are no longer painted, but rather leverage a bead blasted die cast to ensure handle quality remains superb over thousands of cycles.*

2. Black plastics contain up to 30% recycled resin. Internal components such as latches, air shrouds and casings now use recycled plastics to reduce the production of excess undesired plastics that pollute the oceans and harm our ecosystem.
3. Designs are being standardized across the PowerEdge portfolio. Standardizing primary components, such as the chassis, rails and guards, means less prototyping and tooling is required, which must use a small yet significant amount of toxic metal material that will eventually become waste. By moving forwards with a standardization approach, prototyping will be needed much less frequently, and tooling can be reused.

## In Conclusion

Dell EMC is committed to manufacturing servers with the future in mind and to make a positive impact on our surroundings. By efficiently and thoughtfully designing PowerEdge products, server technology can continue to advance while simultaneously helping preserve our environment.



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