DELL Technologies

Microsoft

Solution Brief

Giving Data Centers a Clear Roadmap to IT Sustainability

The latest Dell PowerEdge servers and Microsoft Azure Stack HCI combine to form an end-to-end solution that helps data centers control their total impact on sustainability (TIS).

Sustainability has become a top agenda item for data centers of all sizes, across all sectors. At the same time, these data centers face significant challenges when it comes to achieving sustainability. As organizations turn to data analytics and AI/ML to deliver valuable insights, these power-greedy workloads drive energy consumption up. The International Energy Agency (IEA) reports that energy consumption by data analytics and AI/ML workloads increases by between 10 and 30 percent annually.[1] It also estimates that data centers are responsible for one percent of the world's total electrical usage.[1]

In addition to meeting their environmental and social responsibilities, organizations also understand the total business value of sustainability. For example, infrastructure that is energy efficient can help lower carbon emissions and operating costs.

From reducing waste and carbon emissions to improving energy efficiency, the need for innovative technology and solutions is greater than ever. IDC foresees that sustainability-guided IT purchases will soon become *global* best practices:

- By 2023, **60 percent** of G2000 companies will have environmental sustainability parameters firmly embedded into their businesses' key performance indicators (KPIs).[2]
- **81 percent** of CEOs agree or strongly agree that digital investments are going to drive their ability to meet environmental, social and governance (ESG) goals.[3]
- By 2024, **75 percent** of G2000 digital infrastructure requests for proposal (RFPs) will require vendors to prove progress on ESG and sustainability initiatives with data, as CIOs rely on infrastructure to help meet ESG goals.[4]

The good news is that sustainable IT solutions from Dell Technologies and Microsoft are already available, giving organizations critical tools that can help them reduce their overall TIS. By working with trusted technology partners

such as Dell Technologies and Microsoft, which have sustainability deeply embedded into their core missions, businesses can find the products, services and data they need today.

End-to-End Sustainability Solutions from Dell Technologies and Microsoft

Dell Technologies and Microsoft have each advanced energy-efficient IT infrastructure solutions at the edge, on premises and in the cloud, at the hardware and software level. As industry-leading partners in delivering full-stack solutions, Dell Technologies and Microsoft offer enterprises an integrated platform that incorporates three key sustainability principles:

- Reducing energy consumption through modernized IT infrastructure
- Lowering carbon emissions through a consolidated data center footprint, workload analysis (accomplished by such tools as Dell Live Optics), increased hardware utilization and cloud adoption
- Integrating circular economy practices into production and packaging, such as the use of recycled materials

Reducing Energy Consumption

Next-generation Dell PowerEdge servers include platform power-management controls such as Integrated Dell Remote Access Controller (iDRAC). Through telemetry, iDRAC provides users with the ability to view power usage so they can manage and regulate power consumption. iDRAC allows system admins to view power status, history of power use, current averages and peaks. It also enables power capping, in which users can set minimum and maximum power-consumption levels, and it allows admins to power systems on/off, reset the systems and perform graceful shutdowns.

Dell OpenManage Enterprise Power Manager gives IT admins the option to intelligently throttle power during off-peak hours and set policy controls. It can also provide detailed historical reports for individual devices and racks/groups. The capabilities from OpenManage Enterprise Power Manager and iDRAC have made Dell Technologies the first tier-1 server vendor to provide customers with a view of server carbon emissions in real time.

Microsoft Azure hybrid cloud solutions on validated Dell servers, including the Azure cloud, Azure Arc and Azure Stack HCI, can help make IT operations even more sustainable. By running their workloads on Azure, cloud users can gain up to 98 percent more carbon efficiency and up to 93 percent more energy efficiency, compared to on-premises options.[5]

Azure Arc brings the efficiency of the cloud everywhere through a consistent multicloud and on-premises management platform. Hybrid and multicloud environments can be managed together when existing non-Azure and/or on-premises resources are projected into Azure Resource Manager. Users can manage virtual machines (VMs), Kubernetes clusters and databases as if they are running on Azure.

Lowering Carbon Emissions

With Azure Stack HCI, enterprises can take advantage of the latest hardware technologies to optimize resource utilization, allowing them to do more work on fewer servers that combine compute, network and storage functions. And because Azure Stack HCI uses less hardware than legacy server solutions, it results in less heat generation.

Dell Technologies constantly innovates to reduce the carbon footprint that comes from cooling in any environment where its servers are deployed. PowerEdge servers are designed with Dell Smart Cooling technology that incorporates air and direct liquid cooling to help reduce energy use. With direct liquid cooling, the CPU is cooled with warm liquid heat capacity instead of air, thereby reducing the burden on system server fans and data center HVAC systems. Dell Multi-Vector Cooling (MVC) technology helps minimize fan and system power consumption while maintaining component reliability using intelligent thermal algorithms. MVC not only increases system cooling capacity and power usage efficiency (PUE), it also allows for higher compute density and an improved return on investment (ROI).

Next-generation PowerEdge servers also feature several thermal design improvements that create more balanced and efficient airflows through the chassis.

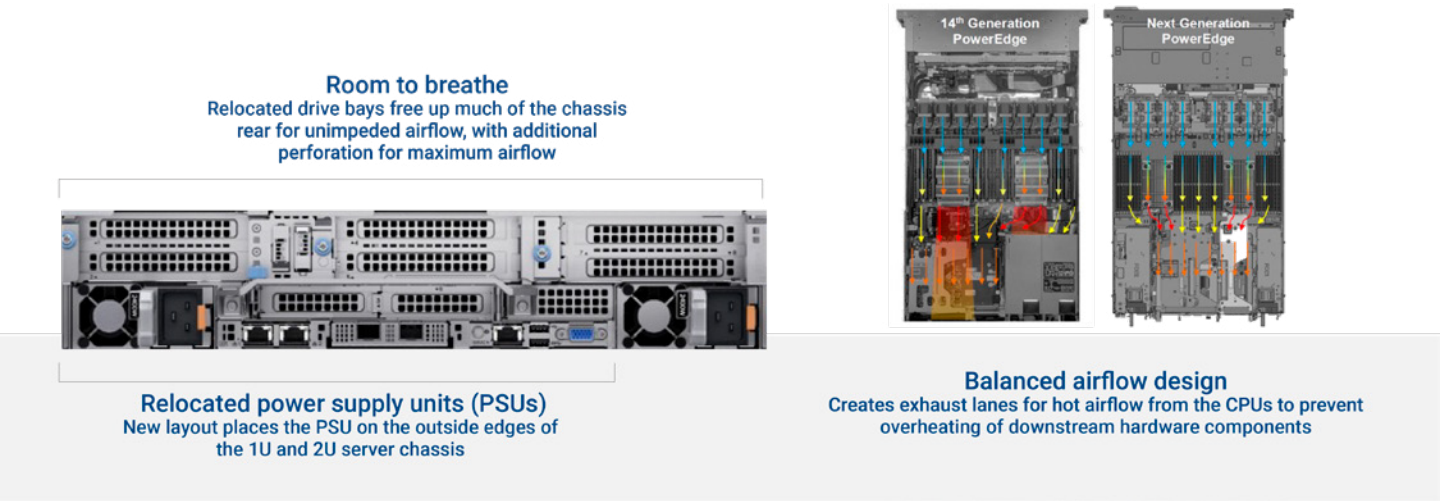

Figure 1. The reconfigured layout of the PowerEdge servers provides efficient cooling

Integrating Circular Economy Practices

Increasingly, companies are prioritizing vendors and suppliers that make sound environmental practices a part of their business. Both Dell Technologies and Microsoft are committed to reducing waste, increasing recycling and reusing materials throughout the product lifecycle. Dell Technologies uses a closed-loop recycling process to incorporate up to 35 percent recycled materials into PowerEdge servers. Dell's goal by 2030 is to increase the recycled materials composition in its servers up to 50 percent and to use 100 percent recycled packaging.

These practices have earned Dell Technologies 37 Electronic Product Environmental Assessment Tool (EPEAT)-registered products, among the highest in the industry.[6] Dell servers were the first to come to market with a Silver EPEAT rating, and many of the company's servers have earned an ENERGY STAR 3.0 rating from the US Department of Energy.

Microsoft has committed to following the United Nations' Brundtland Commission report's guidelines on sustainable IT practices, which include using carbon-negative energy, reducing cooling water usage, moving toward zero e-waste in operations, products and packaging by 2030, and protecting habitats through efficient resource usage. Microsoft is eliminating single-use plastics from packaging by 2025, including plastic film, primary product packaging and IT asset packaging in its data centers.[7]

Dell Technologies and Microsoft have also invested in renewable energy and reduced energy consumption. Both companies have set ambitious goals for carbon neutrality and renewable energy. Dell Technologies has set a goal of net-zero greenhouse gas emissions by 2050, while Microsoft plans to be carbon negative by 2030, with the additional goal to remove its historical carbon emissions from the atmosphere by 2050.[8]

Improving Enterprise IT with Joint Innovation

Dell Technologies and Microsoft are continuously collaborating to develop sustainable IT solutions. For instance, Dell platform-management tools integrate with Windows, Microsoft System Center and Windows Admin Center for management of PowerEdge and Microsoft environments. This integration means IT admins can manage servers to run as efficiently as possible while meeting workload performance needs.

Dell Integrated System for Azure Stack HCI allows enterprises to take advantage of the latest hardware technologies to optimize resource utilization, doing more work on fewer servers that combine compute, network and storage functions. Using less hardware than legacy server solutions means less overall heat generation and less energy use.

Together, Dell Technologies and Microsoft are helping customers measure and control their TIS, a new way of looking at hardware and software acquisitions that considers not only environmental impacts but also the business benefits of sustainability measures. To learn more about the concept of TIS and how Dell Technologies and Microsoft help customers lower their impacts, read the Prowess Consulting technical research study, "Grow and Innovate on an Energy-Efficient, Sustainable IT Infrastructure."

A More Sustainable IT Future Is Here

Find out why Dell Technologies believes advancing sustainability is critical to its core mission.

Learn how Microsoft can assist in your organization's journey to sustainability.

Microsoft Azure

Bring the cloud to your on-premises environment with Azure Stack HCI.

1 IEA. "Data Centres and Data Transmission Networks." September 2022. www.iea.org/reports/data-centres-and-data-transmission-networks. License: CC BY 4.0.
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