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TECHNICAL VALIDATION

HPE ProLiant Compute Gen11 Servers With AMD EPYC Processors

Optimize Performance, Security, and Flexibility for the Most Demanding VDI Workloads With HPE and AMD

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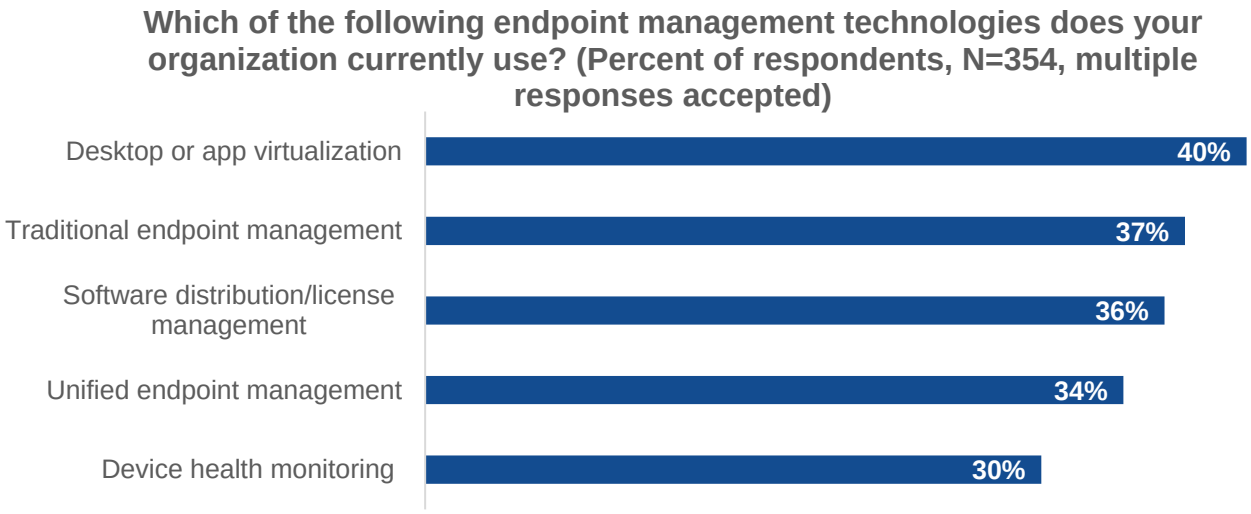
Introduction

TechTarget's Enterprise Strategy Group validated HPE ProLiant Compute Gen11 servers with AMD EPYC processors, with a focus on compute efficiency, performance, security features, and manageability in support of virtualization and virtual desktop infrastructure (VDI) workloads.

Background

Given the wide variety of work arrangements—whether on-premises, in the field, or in a remote or hybrid manner—organizations face the daunting task of managing the numerous types of end-user devices. According to Enterprise Strategy Group research, desktop or app virtualization ranked as the top endpoint management technology amongst respondents (40%).[1] In fact, 24% of respondents stated that their organizations would be significantly investing in virtual desktop infrastructure over the next 12 months.[2]

Figure 1. Top 5 Most Prevalent Endpoint Technologies Used



Source: Enterprise Strategy Group, a division of TechTarget, Inc.

At the same time, organizations continue to deploy new applications. Although there has been much discussion about migrating applications to the cloud, having a cloud-first policy has yet to become the norm. When considering how to deploy new applications, more than half of organizations (53%) have either an on-premises-first policy (26%) or consider both on-premises resources and cloud services (27%).[3]

Given the continuing investments to support VDI workloads and application deployment, organizations must still purchase servers. Yet, the push to adhere to environmental, social, and governance (ESG) standards has affected how server hardware is evaluated and purchased. In fact, the majority (59%) of organizations with established ESG programs agree that ESG has had a *significant* impact on their strategic planning. While 57% of respondents believe that IT is the functional area most impacted by ESG initiatives, nearly two-thirds (64%) believe that infrastructure and operations have been the IT areas most impacted by their organization's ESG's goals.[4]

[1] Source: Enterprise Strategy Group Research Report, *Endpoint Device Trends*, February 2024.
[2] Source: Enterprise Strategy Group Complete Survey Results, *2024 Technology Spending Intentions Survey*, February 2024.
[3] Source: Enterprise Strategy Group Research Report, *Multi-cloud Application Deployment and Delivery Decision Making*, June 2023.
[4] Source: Enterprise Strategy Group Research Report, *The Role of ESG Programs in IT Decision Making*, September 2022.

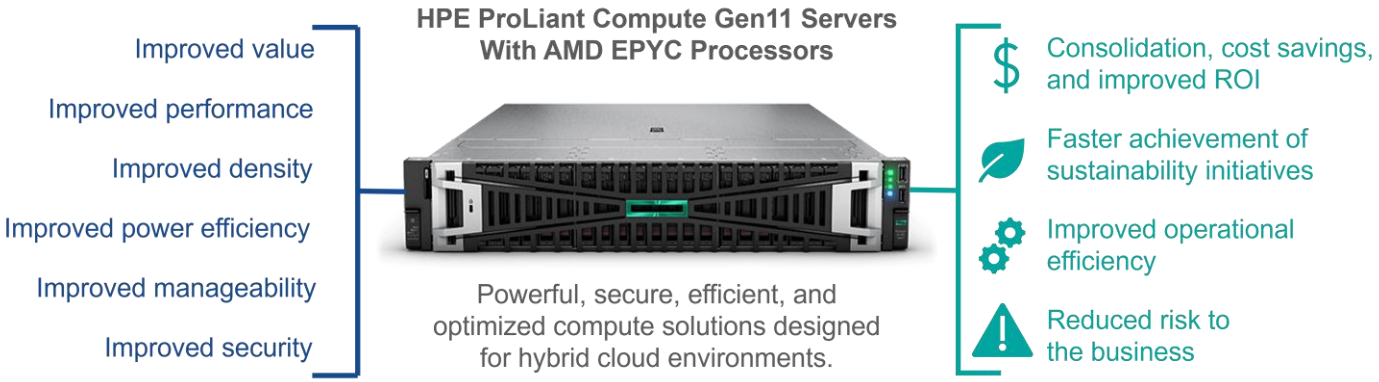
The bottom line is that organizations must closely consider the environmental impact of their server infrastructure, without sacrificing the performance required to support workloads such as VDI and business-critical applications.

HPE ProLiant Compute Gen11 Servers With AMD EPYC Processors

HPE ProLiant Compute Gen11 rack and tower servers are the latest generation of powerful, secure, efficient, and optimized computing solutions designed for hybrid cloud environments (see Figure 2). Organizations can deploy these servers in private clouds, multiple data centers, and at the edge. They also can be configured to meet the needs of any workload, with the benefit of embedded security and manageability.

HPE ProLiant Compute Gen11 servers offer intuitive, cloud-based management, through HPE GreenLake for Compute Ops Management, that provides visibility and consistent control across the entire lifecycle. Servers can be managed remotely in organized groups, which helps to reduce time and manual effort in keeping the environment up to date and secure.

Figure 2. HPE ProLiant Compute Gen11 Servers With AMD EPYC Processors



Source: Enterprise Strategy Group, a division of TechTarget, Inc.

HPE ProLiant Compute Gen11 servers are available across the HPE ProLiant Compute ML, DL, and RL product families. This server line is part of HPE's comprehensive portfolio of compute infrastructure. HPE ProLiant Compute covers three processor families: AMD, Intel, and Arm-based Ampere. All of these processor families are designed to enable and support sustainable IT. Enterprise Strategy Group validated that HPE ProLiant Compute Gen11 servers with AMD EPYC processors provide numerous benefits when compared with previous-generation servers across the industry, including:

Improved performance:

- HPE ProLiant Compute Gen11 servers with AMD EPYC processors deliver 110% higher compute-intensive throughput versus Gen10 servers.
- HPE ProLiant Compute Gen11 servers with AMD EPYC processors service up to 54% more virtual desktop users and provide 445% higher virtualization performance versus Gen10 servers.

Improved efficiency:

- As of this writing, servers powered by AMD EPYC processors—including the HPE ProLiant Compute DL325 Gen11 server—hold the top three highest SERT Active State Efficiency Scores listed on the Energy Star website.[5]
- HPE ProLiant Compute Gen11 servers with AMD EPYC processors provide up to 43% more performance per watt versus Gen10 servers.

Improved sustainability:

- When consolidating a multigenerational environment including Gen10+, Gen9, and Gen8 servers, HPE ProLiant Compute Gen11 servers with AMD EPYC processors required 64% fewer servers and 49% less power than previous-generation servers to service the same workloads.

Improved serviceability:

- HPE ProLiant Compute Gen11 servers deploy firmware updates up to 5x faster than Gen10 servers.

Enterprise Strategy Group Technical Validation

Enterprise Strategy Group evaluated the latest HPE ProLiant Compute Gen11 servers with AMD EPYC processors. Our goal was to validate and model the overall business impact of running VDI workloads on Gen11 servers with AMD EPYC processors, as compared with previous-generation technologies. Areas of focus included performance efficiency, desktop virtualization performance, and the ability of the platforms to support sustainable IT initiatives, which in turn support organizations' overall sustainability strategies.

Performance Efficiency

To validate the performance efficiency of HPE ProLiant Compute DL385 Gen11 servers as compared with previous-generation servers, we used published SPECpower_ssj 2008 benchmark results to calculate the performance advantage of Gen11, how much rack space could be reclaimed, and the performance per watt of each system.

The Standard Performance Evaluation Corporation (SPEC) power benchmark is an industry-standard benchmark that enables hardware vendors and the wider IT industry to evaluate the power and performance characteristics of single server and multi-node servers and compare these characteristics among different servers and server models. SPECpower_ssj 2008 is the first release of this benchmark.

Enterprise Strategy Group Analysis

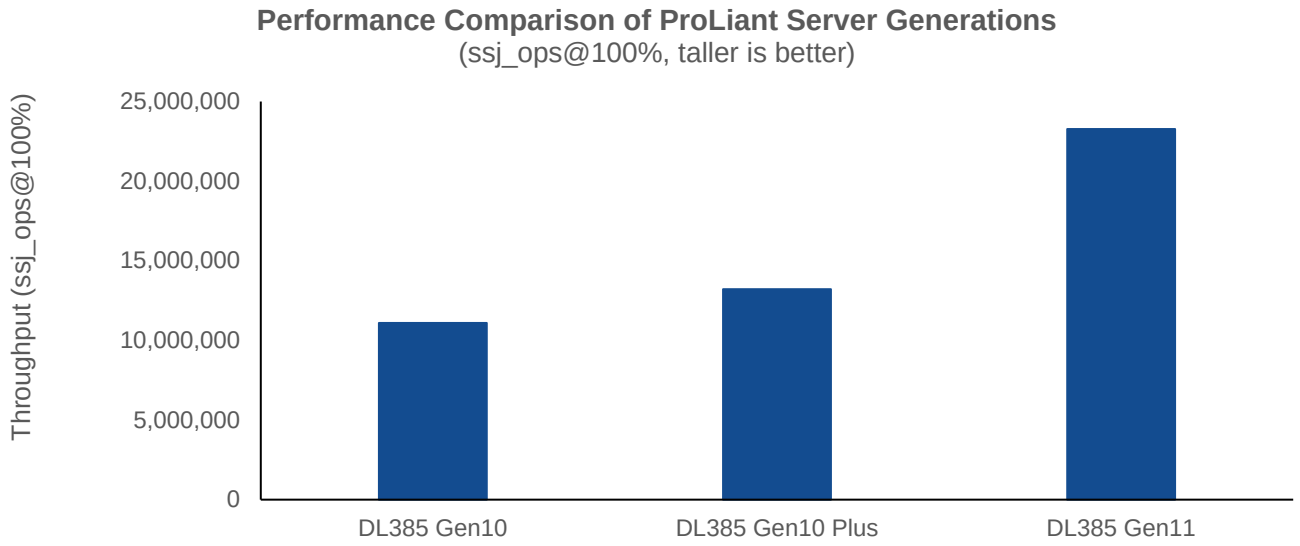
Enterprise Strategy Group first evaluated the performance of the ProLiant Gen11 servers compared with previous ProLiant server generations, specifically the ProLiant Gen10 and Gen 10+ models, using results from SPECpower-ssj testing (see Figure 3). All server models were equipped with AMD EPYC processors.

Based on SPECpower_ssj throughput results:

- Gen11's performance increased by 76% compared to Gen10+.
- Gen11's performance increased by 110% compared to Gen10.

[5] Source: Energy Star, *Energy Star Certified Enterprise Servers*.

Figure 3. Generation-to-generation Performance

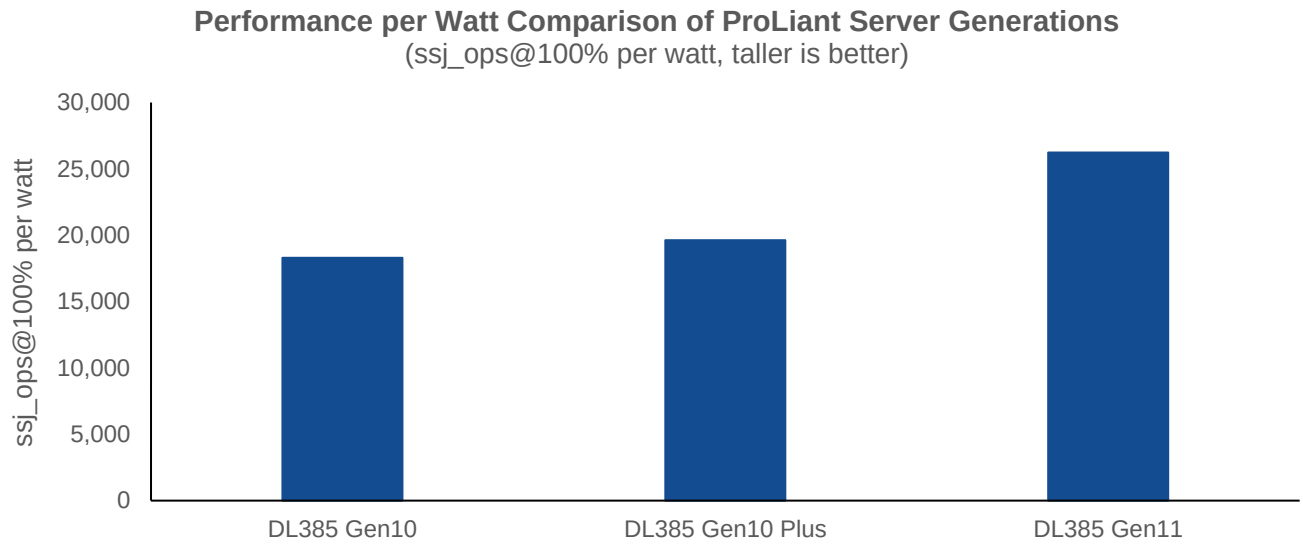


Source: SPEC.org and Enterprise Strategy Group, a division of TechTarget, Inc.

We then compared performance per watt between Gen11, Gen10+, and Gen10 using results from SPECpower-ssj testing (see Figure 4). Based on the results, we observed that:

- Gen11's performance per watt increased by 33% compared to Gen10+.
- Gen11's performance per watt increased by 43% compared to Gen10.

Figure 4. Generation-to-generation Performance per Watt



Source: SPEC.org and Enterprise Strategy Group, a division of TechTarget, Inc.

Based on these results, Enterprise Strategy Group noted how the higher performance-per-watt ratio can enable organizations to consolidate more workloads on fewer servers without sacrificing performance. Based on these numbers, we estimate that at 100% power, workloads supported by 25 ProLiant Gen10 servers can be consolidated onto 11 ProLiant Gen11 servers. Subsequently, organizations can decrease their capital costs from both a hardware and power consumption perspective.

Why This Matters

Organizations that are committed to following ESG guidelines must consider the environmental impact of the number and types of servers purchased and deployed. Yet, such a purchase should not sacrifice performance.

Enterprise Strategy Group validated that the HPE ProLiant Compute Gen11 servers, powered by AMD EPYC processors, have improved both performance and performance per watt, as compared with the ProLiant Gen10 and Gen 10+ servers. Using SPECpower_ssj results, we found that performance (or throughput) increased by 76%. We also found that the ProLiant Gen11 servers are more power efficient when supporting higher throughput. This power efficiency can help organizations purchase a lower number of Gen11 servers without sacrificing performance, while saving on power consumption and related hardware and operational costs.

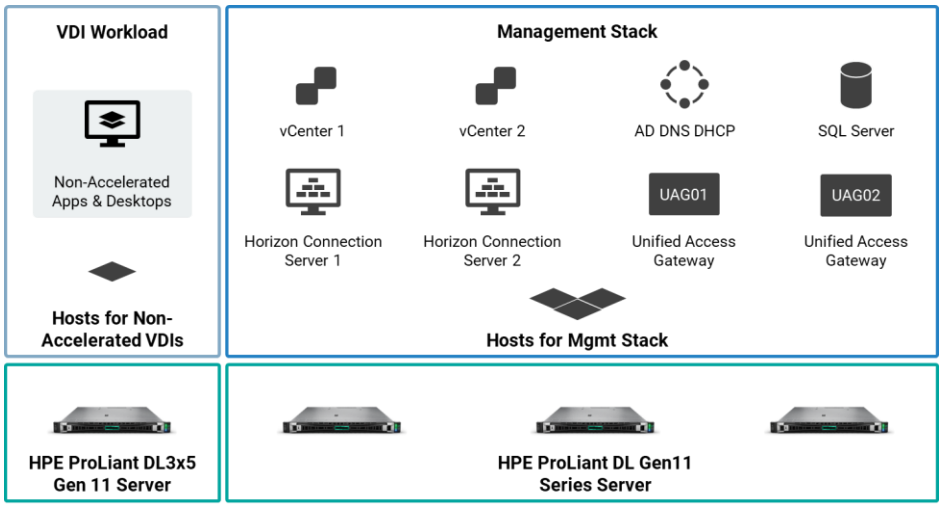
Desktop Virtualization

The modern workplace is a hybrid environment. Employees and managers need a robust, secure, and manageable environment to drive productivity and engagement. VDI solutions built on HPE ProLiant Compute Gen11 servers, powered by the latest AMD EPYC processors, are optimized for the hybrid workplace, enabling teams to work remotely with improved productivity and performance while organizations retain control of data and applications across the edge, data center, and the cloud.

Enterprise Strategy Group Analysis

To analyze the impact on both performance and power consumption when using HPE ProLiant Compute Gen11 servers for VDI workloads, Enterprise Strategy Group used the reference architecture shown in Figure 5.

Figure 5. Solution Architecture Diagram



Source: HPE and Enterprise Strategy Group, a division of TechTarget, Inc.

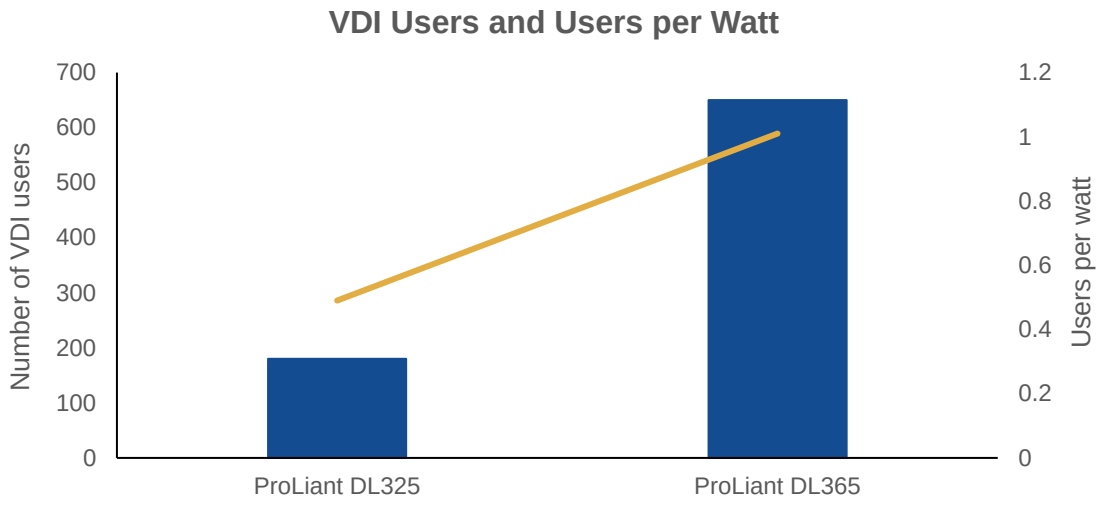
In this reference architecture, VDI desktops are deployed on HPE ProLiant Compute DL325 Gen11 and HPE ProLiant Compute DL365 Gen11 servers, each equipped with AMD EPYC processors. Both servers are installed with VMware vSphere ESXi 8.0. VMware vCenter 8.0 is deployed for centralized management of hosts and clusters.

VMware Horizon 8 is deployed on the management stack consisting of Connection Servers (primary and secondary) and Unified Access Gateway (primary and secondary). The IT infrastructure stack consisted of MSSQL Server, Active Directory, DNS, and DHCP Server. VDI Desktop pools were created via the Horizon Connection Server by cloning a Windows 10 Golden Image.

Testing was conducted using the industry-standard VDI benchmarking tool Login Enterprise. Login Enterprise validates application performance and response times for various predefined VDI workloads to show desktop density potential for a given set of hardware and software components.

To characterize VDI performance, Enterprise Strategy Group first examined the Login Enterprise Knowledge Worker workload. This workload simulates user behavior, simultaneously using up to seven well-known desktop applications like Microsoft Office, Internet Explorer, and Adobe Acrobat Reader, plus video. VSImax (i.e., the maximum number of user sessions supported with satisfactory performance) were obtained. These numbers were used to estimate the number of users per watt for each ProLiant Gen11 server in our reference architecture. We assumed that the maximum number of end-user sessions operated at 80% of CPU capacity (see Figure 6).

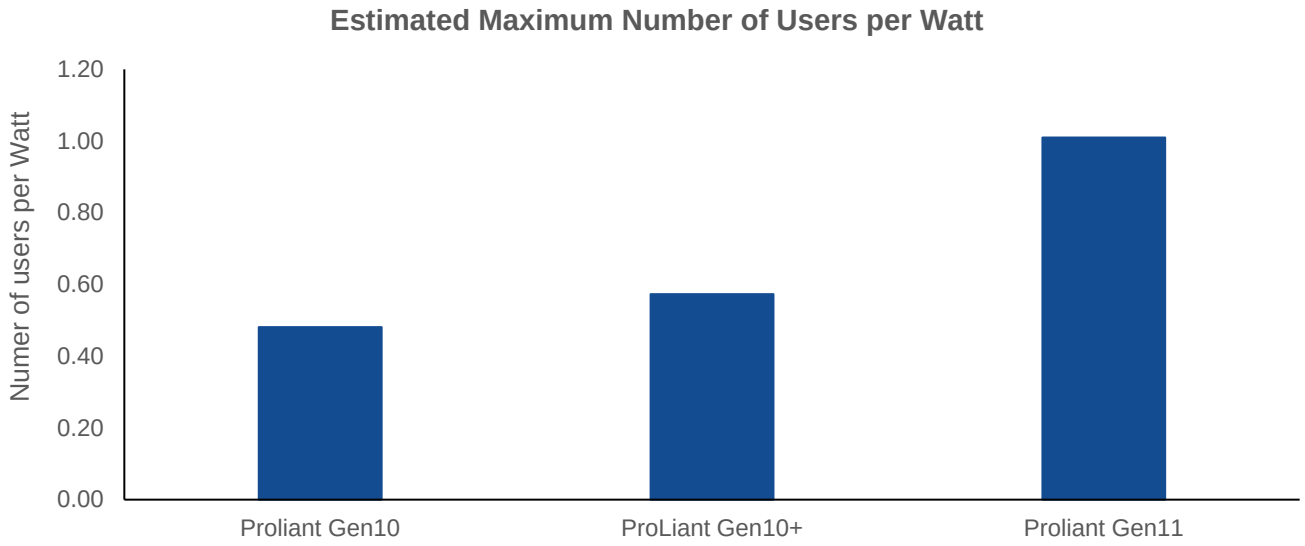
Figure 6. VDI Users and Users per Watt for Gen11



Source: Enterprise Strategy Group, a division of TechTarget, Inc.

We then extrapolated the maximum number of user sessions and users per watt that could be supported by ProLiant Gen10 and Gen10+ servers (see Figure 7). Our comparison considered similar configurations to the HPE ProLiant Compute DL365 Gen11.

Figure 7. Gen11's Improvement Over Gen10 and Gen10+



Source: Enterprise Strategy Group, a division of TechTarget, Inc.

Based on SPECpower_ssj results (at 80% CPU load), Enterprise Strategy Group extrapolated that the number of knowledge workers that can be supported per watt dramatically improved over the Gen10 and Gen10+ servers. The more VDI sessions that can be supported, the higher the server consolidation ratios that can be achieved with ProLiant Gen11 servers, while consuming less power as the server footprint drastically reduces.

Why This Matters

Delivering highly performant user sessions via a VDI infrastructure is becoming more challenging with the plethora of applications that organizations need to continually enhance productivity in light of more demanding business needs. Yet, supporting a VDI infrastructure can become more expensive to manage if more servers are required to deliver the performance end users expect, especially when spending on additional hardware and related power consumption.

Enterprise Strategy Group validated that HPE ProLiant Compute Gen11 servers, powered by AMD EPYC processors, maximize the number of end-user sessions per watt when compared with Gen10 and Gen10+ servers. Using results from Login Enterprise and SPECpower_ssj, we found that the ProLiant DL385 Gen 11 server maximizes the number of user sessions supported per watt, enabling organizations to consolidate servers with little performance impact.

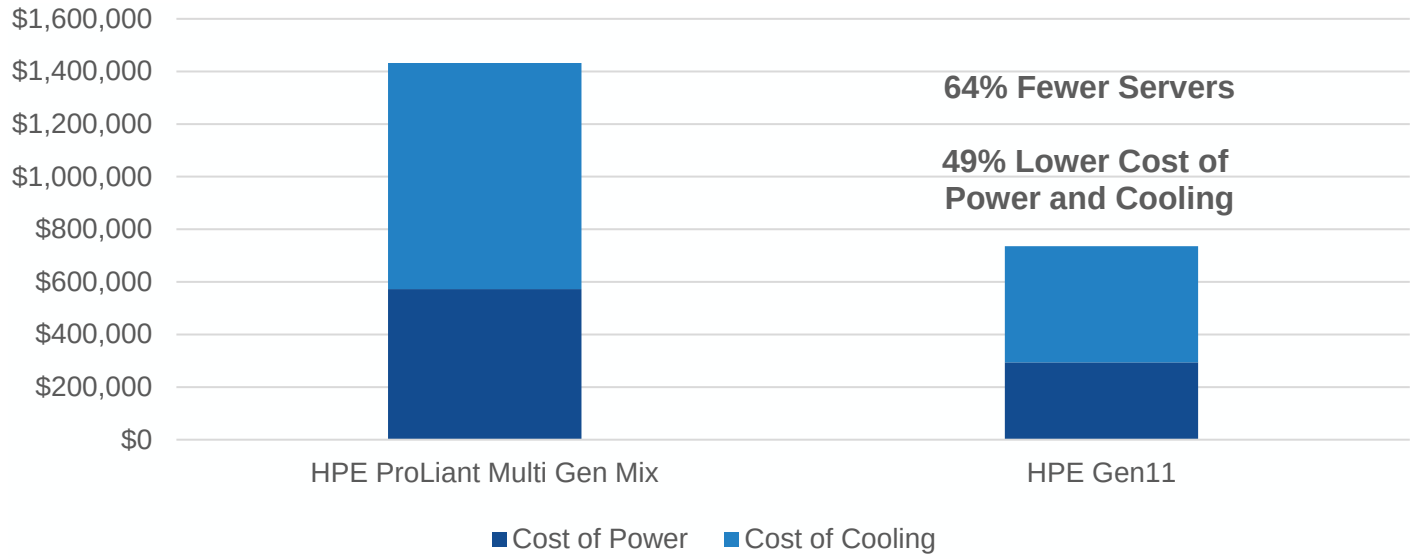
Sustainable Advantages

When considering how to minimize the environmental impact of IT infrastructure, organizations can also expect tangible business benefits, such as reduced capital and operational costs. With the power efficiency offered by HPE ProLiant Compute Gen11 servers with AMD EPYC processors, organizations can consolidate workloads into a smaller server footprint and allow for lower power consumption, resulting in reduced expenses.

Enterprise Strategy Group Analysis

Enterprise Strategy Group considered the case of consolidating workloads onto HPE ProLiant Compute Gen11 servers with AMD EPYC processors. Figure 8 shows the estimated space, power, and cooling savings when consolidating from a server infrastructure consisting of multiple server models from previous ProLiant generations.

Figure 8. Mixed-generation Server Consolidation Savings



Source: Enterprise Strategy Group, a division of TechTarget, Inc.

In this analysis, our modeled organization has a multigenerational mix of HPE servers, hosting 1,000 servers in total. We assumed 70% of the servers were Gen10+, 20% were Gen9, and 10% were Gen8. We calculated that this environment with this server mix would consume approximately 4,317 megawatt hours (MWh) annually, running at a constant 80% utilization. Consolidating with Gen11 would reduce the number of total servers required to 355 and the total annual power consumption to 2,218 MWh—a savings of 2,099 MWh per year, or about $696,000 in power and cooling costs in the U.S.

Why This Matters

Sustainability has real and tangible business benefits. Reducing the rack space of server infrastructure can directly affect the bottom line by reducing both capital and operational expenses.

Enterprise Strategy Group validated that the HPE ProLiant Compute Gen11 servers, powered by AMD EPYC processors, can help organizations consolidate workloads onto a smaller number of servers. Based on our analysis, HPE ProLiant Compute Gen11 servers can help reduce carbon footprints, leading to lower hardware, power consumption, and management costs.

Conclusion

While organizations continue to purchase servers to support VDI and business-critical applications for their hybrid clouds, sustainability has emerged as a serious issue that businesses need to address. Addressing a server's impact on the environment can actually help increase profitability, without affecting the performance that organizations require to support their workloads.

HPE and AMD deliver workload-optimized, high-performance compute, engineered for hybrid environments. Powered by AMD EPYC processors, HPE ProLiant Compute Gen11 servers can deliver the performance required for demanding workloads and applications within smaller footprints. This latest generation of server offers the server density and power efficiency that organizations concerned about sustainability need.

Throughout our analysis, Enterprise Strategy Group validated that:

- HPE ProLiant Compute Gen11 Servers with AMD EPYC processors provide both higher performance and higher efficiency when compared with previous generations.
- VDI powered by HPE ProLiant Compute Gen11 servers with AMD EPYC processors can maximize user density, with consistent performance for the most demanding VDI workloads.
- HPE ProLiant Compute Gen11 servers with AMD EPYC processors can provide significant sustainability improvements, reducing server footprint by 64% and cutting power and cooling costs by 49% when consolidating a multigenerational server environment.
- HPE ProLiant Compute Gen11 servers with AMD EPYC processors allow customers easy scalability of their infrastructure as the demand for additional VDI instances arise.

Sustainability has a major influence on most organizations' strategic planning. Enterprise Strategy Group believes that modernizing IT by using better performing, more energy-efficient servers that result in reduced carbon footprints like HPE ProLiant Compute Gen11 servers with AMD EPYC processors can have a significant impact. If your organization is looking for a solution that can support more workloads and users, more sustainably, in a smaller footprint, you should be talking to HPE.

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