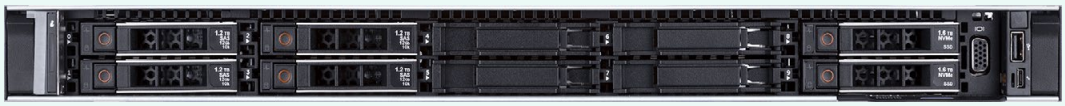


Server upgrade considerations for small- and medium-sized businesses

Performance differences your business may require to meet post-pandemic needs, and factors to consider before making an investment

If your organization is like many small- or medium-sized businesses (SMBs), you've had to make tough decisions due to the COVID-19 pandemic over the last year and a half. Perhaps you implemented a remote work policy, expanded to new markets, or moved more of your business online. Maybe you also opted to pause technology upgrades to make it to the next quarter. But now that your business has adapted, and as pandemic restrictions lift, you may be considering making a hardware purchase to better support your company in this altered landscape. It may suit your business interests to invest in a server solution that can better support employees working remotely, handle more ecommerce orders, or provide better web app performance. Throughout the upgrade process, you have a number of decisions to navigate.

General upgrade considerations

In addition to the complications of pandemic recovery, your business may face other obstacles when it comes to upgrading your servers. Like all SMBs, you have to balance your technology needs with investments in other areas. For example, timing and budgets may not allow for purchasing new servers and expanding your team at the same time. And when it comes to budget, TechTarget recommends not only considering the cost of the server, but also the costs of software licenses, housing the server, and IT resources.[1]

Your IT department may be smaller than its larger corporate counterparts, potentially comprising just a few people, or, if you choose a third party to handle your needs, non-existent. When it comes to researching data center solutions, deploying servers, and providing support once the new tech is up and running, saving IT time could mean either freeing up in-house IT admins to take care of other needs or keeping costs low for third-party IT.

When it is time to upgrade, matching your needs to a server solution can be a complex consideration. You don't want to overinvest in technologies with capabilities that don't match your workloads. On the other hand, upfront costs aren't everything—a suboptimal solution "might not be powerful or reliable enough to handle mission-critical workloads," and could deliver a poor experience to both customers and employees.[2] Such a solution may have a shorter lifecycle, which would mean investing in hardware and licensing costs, as well as IT resources, to upgrade again. Taking the time to assess your current and future needs—such as the types of workloads you run, the number of customers and employees you support, and the growth you anticipate—can help you select a hardware solution to suit your needs for years to come.

Any business must take a variety of concerns into account, but SMBs especially rise to meet a unique set of challenges: Timing, budgets, limited IT resources, and the search for suitable solutions may be just a fraction of the considerations your organization faces when it comes to upgrading.

About Dell EMC PowerEdge R6515 servers

As we note later in this paper, we are currently running performance tests on a cluster of Dell EMC™ PowerEdge™ R6515 servers. According to Dell Technologies, these single-socket 1U servers offer the following specifications:[3]

- Up to 64 high-performance 3rd Gen AMD EPYC cores
- Up to 16 DDR4 RDIMM/LRDIMM slots
- Support for PCIe Gen4 NVMe SSDs
- Integrated security features
- Embedded management tools

To learn more, visit https://www.dell.com/en-us/work/shop/povw/poweredge-R6515.

Additional considerations: Business after COVID-19

Besides the general challenges of upgrading, your organization may be considering a remote or hybrid work approach in the long term. According to a study by McKinsey Global Institute, up to 25 percent of workers in advanced economies could work remotely three to five days per week.[4] With younger workers more likely than older counterparts to give up future earnings for the opportunity to work remotely,[5] workplace flexibility is key for the future.

Your business may also be experiencing increased ecommerce demand, growing up to two to five times faster than before the pandemic.[6] And much of that growth is here to stay: 75 percent of consumers who used digital channels for the first time during the pandemic plan to continue to use them after it ends.[7] But increased ecommerce comes with its own challenges: You don't want to keep your customers waiting due to supply chain issues or slow shipping. Similarly, when it comes to more users navigating your website and making online purchases, customer satisfaction could wear thin if they experience delays.

As you move into this next phase of your business operations, it's important to consider the types of workloads you run in your data center, either simultaneously or on separate servers.

Why consider VDI performance?

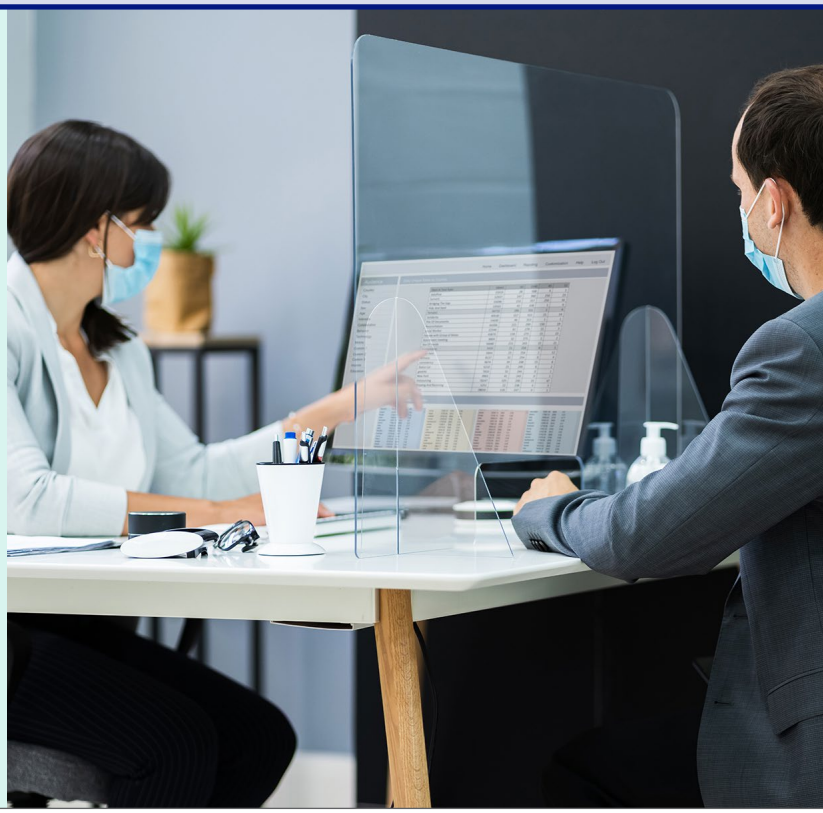
If your employees work in a remote or hybrid model, your business may use VDI, which provides virtual desktops to employees while keeping data securely in the data center. With VDI, organizations can provide each employee with a thin client rather than a workstation or fully featured laptop, potentially lowering IT costs. IT admins also don't have to dedicate time troubleshooting each employee's unique configurations, OS, and apps—each virtual desktop is equipped with exactly what the company specifies.

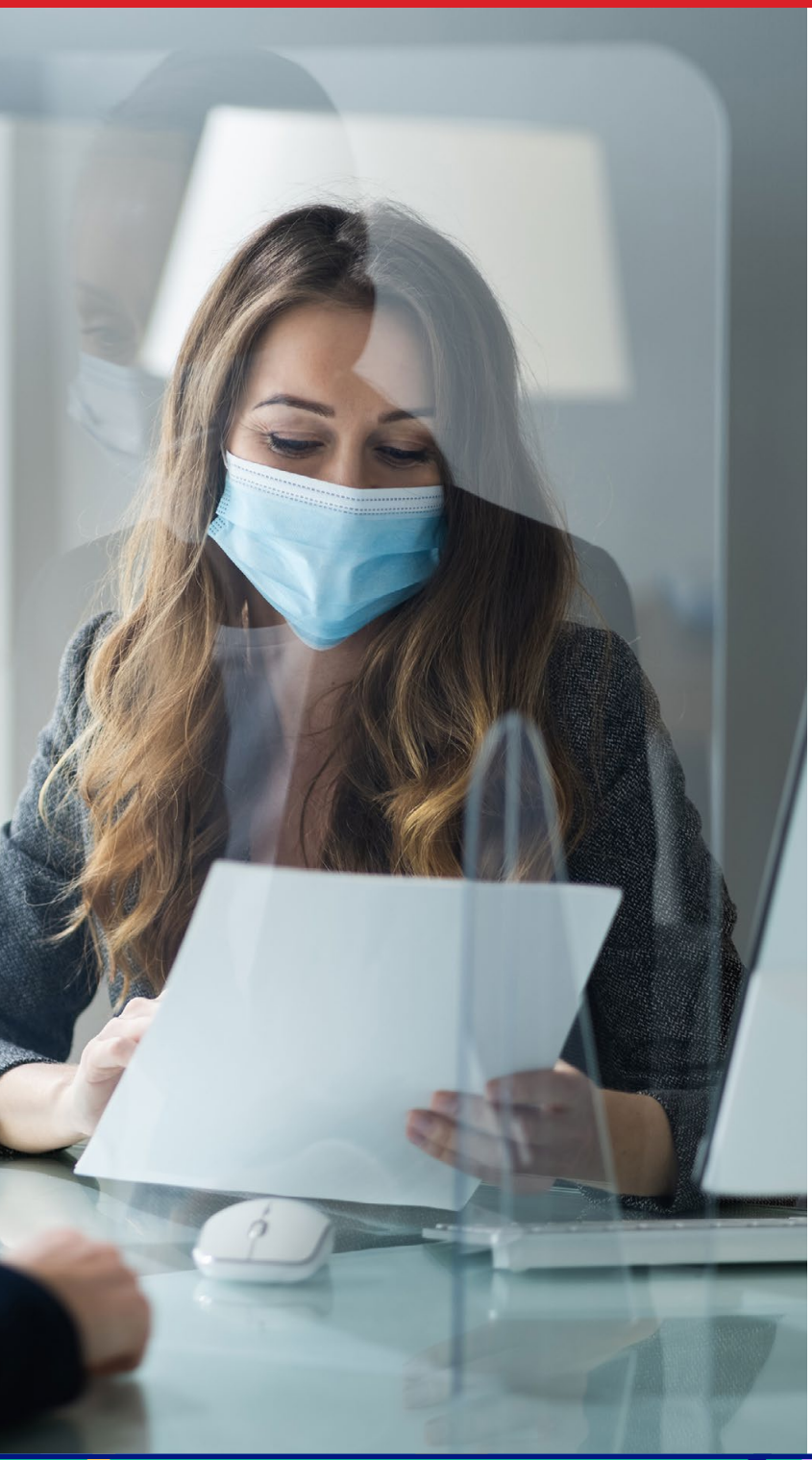
Why consider database performance?

A solution with the ability to support more OLTP database transactions could mean less waiting as customers add items to their cart or make purchases on your site. Even in a physical retail environment, point of sale (POS) terminals use transactional database systems to retrieve product descriptions or search customer records. Other sectors—such as healthcare, finance, and travel—also use database systems for updating patient records, tracking funds, and managing bookings. As the post-pandemic economy grows, each of these operations remains critical.

Why consider Kubernetes for multi-tier web apps?

Organizations may choose to deploy their apps in Kubernetes containers for scalability, flexibility, and the ability to burst to cloud—all from open-source software. Kubernetes containers are also more lightweight than VMs, which could allow you to get more out of your server hardware resources. While some legacy environments may not easily sustain Kubernetes, this technology has become more accessible in recent years, thanks to newer software.





What we're testing

Taking these considerations into account, in the PT data center, we are running a mixed workload that reflects some of the needs your organization may have as it moves past the pandemic. The workload includes virtual desktop infrastructure (VDI) and online transactional database (OLTP) components, running each simultaneously to simulate an organization using a single cluster of four servers to meet multiple needs. To understand the differences in performance you might expect between a newer solution and a solution you might be using today, we will run the workload on two different VMware® vSphere™ clusters with VMware vSAN™:

- four single-socket Dell EMC PowerEdge R6515 servers powered by 3rd Gen AMD EPYC™ 7543P processors
- four legacy Dell EMC PowerEdge R630 servers

We also plan to introduce a third component to the mixed workload on the newer server cluster: a multi-tier web app on Kubernetes. When testing concludes, our report will feature the results of the tests—the number of VDI users and orders per minute that each cluster supported simultaneously—along with the PowerEdge R6515 cluster's additional Kubernetes performance. The report will also include more information on our test environment, workloads, and configurations.

About AMD EPYC 7543P processors

These 32-core processors use AMD Infinity Architecture and are part of the AMD EPYC 7003 Series. The latest offering from AMD, 3rd Gen EPYC processors offer increased I/O with up to 32MB L3 cache per core, 7nm x86 hybrid die core, and new security features such as Secure Encrypted Virtualization - Secure Nested Paging (SEV-SNP) and Encrypted State (SEV-ES).[8] According to AMD, the EPYC 7543P model is well suited for workloads such as VDI, ERM/SCM/CRM apps, and value data management with NR/RDBMS.[9]

Learn more at https://www.amd.com/en/processors/epyc-7003-series.

Conclusion

As the economy grows in the wake of COVID-19, your organization has more tough decisions ahead. Fortunately, some of those decisions center on supporting a growing customer base and helping your employees adjust to a new normal. While there are still many considerations to balance when upgrading—including timing, budget, IT resources, and your current and anticipated needs—you may benefit from a server solution that can support workload requirements such as sustaining more VDI users and keeping digital transactions running smoothly. Plus, a solution that offers the capacity and software features to natively support Kubernetes containers could add value, helping your organization get more from your hardware. When our testing concludes with the mixed workload that reflects these needs, our forthcoming report will detail the performance you may be able to expect from a Dell EMC PowerEdge R6515 server cluster with AMD EPYC 7543P processors compared to a legacy Dell EMC PowerEdge R630 server cluster.

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1 Robert Sheldon, "How to purchase the best server hardware for small business," accessed July 14, 2021, https://searchdatacenter.techtarget.com/feature/How-to-purchase-the-best-server-hardware-for-small-business.

2 Robert Sheldon, "How to purchase the best server hardware for small business."

3 "PowerEdge R6515 Spec Sheet," accessed July 6, 2021, https://i.dell.com/sites/csdocuments/Product_Docs/en/poweredge-r6515-spec-sheet.pdf.

4 McKinsey Global Institute, "The future of work after COVID-19," accessed June 28, 2021, https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19.

5 PwC, "What's next for America's workforce post-COVID-19?" accessed June 28, 2021, https://www.pwc.com/us/en/services/consulting/workforce-of-the-future/library/workforce-pulse-survey.html.

6 McKinsey Global Institute, "The future of work after COVID-19," accessed June 25, 2021, https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19.

7 McKinsey Global Institute, "The future of work after COVID-19."

8 "AMD EPYC 7003 Series Processors," accessed July 6, 2021, https://www.amd.com/en/processors/epyc-7003-series.

9 "AMD EPYC 7543P," accessed July 6, 2021, https://www.amd.com/en/products/cpu/amd-epyc-7543p.

This project was commissioned by Dell Technologies.

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