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 two and a half years. Perhaps you expanded to new markets or moved more of your business online. Maybe you also opted to delay technology upgrades due to the general uncertainty of the times. But now that your business has adapted and conditions have stabilized, you may be considering making a hardware purchase to better support your company. It may suit your business interests to invest in a server solution that can handle more ecommerce orders, provide better support for Kubernetes clusters, or deliver stronger web app performance. Throughout the upgrade process, you have a number of decisions to navigate.

General upgrade considerations

Your business might face obstacles when preparing to upgrade 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 simultaneously. 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 use a third party to handle your needs—non-existent. Researching data center solutions, deploying servers, and providing support once the new tech is up and running can be time-consuming; solutions that minimize these IT burdens could either allow in-house admins to take care of other needs or help keep costs for third-party IT low.

When it is time to upgrade, selecting a server solution can be complicated. 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 could have a shorter lifecycle, which would require additional investments in hardware and licensing costs, as well as IT resources, when it's necessary 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 that will suit your needs for years to come.

Any business must take a variety of concerns into account, but SMBs face a unique set of challenges: Timing, budgets, limited IT resources, and the search for suitable solutions are some of the many factors your organization must consider when upgrading.

Additional considerations: Business after COVID-19

Alongside the perennial challenges of upgrading hardware, it's important to look at the trends affecting business as the pandemic focus recedes. One of these is digital transformation. According to an *Inc.* magazine article on pandemic business trends that are here to stay, "[s]o many companies are digital by default—at least in terms of working remote, using digital tools to communicate, and selling products and services digitally…. Companies understand that their entire organizations can be streamlined through the adoption of digital methods, from communication and transactions to deeper business functions."[3] In one survey of small business owners, close to half reported that "they embraced more digital practices in response to COVID-19 which will contribute to 52% of all small businesses getting more than half of their revenues digitally by 2022, up from 42% in 2019."[4]

With this emphasis on digital engagement, your company's website—the primary way that customers and clients interact with your business—takes on more importance than ever. Your business may also be experiencing increased ecommerce demand, growing up to two to five times faster than before the pandemic.[5] 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.[6] While this growth may be welcome, it can create challenges. Supply chain issues and slow shipping can frustrate your customers and servers that fail to accommodate the increasing volume of users can create delays that erode customer satisfaction.

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 together or on separate servers.

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.

Why consider database performance?

A solution with the ability to support more OLTP database work could mean less waiting as customers add items to their carts 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, all of these operations remain critical.

Why consider WordPress performance?

Regardless of your field, a business website is vital. In addition to giving customers and clients a way to find you and learn what you have to offer, business websites can include ecommerce and blog components. According to WordPress, "More bloggers, small businesses, and Fortune 500 companies use WordPress than all other options combined."[7]

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 post-pandemic requirements your organization might be experiencing. The workload includes an online transactional database (OLTP) component, a multi-tier web app on Kubernetes, and a WordPress component, each running simultaneously to simulate an organization using a single cluster of four servers to meet multiple needs. To understand the performance improvements you could expect a newer solution to deliver over the solution you're using today, we will run the workload on two different Microsoft Windows Server 2022 clusters with Hyper-V and Storage Spaces Direct:

• four latest-gen 16G Dell PowerEdge servers powered by 4th Gen AMD EPYC processors

• four previous-generation 15G Dell PowerEdge servers

When testing concludes, we will publish the number of OLTP orders per minute and Wordpress requests per second that each cluster supported simultaneously. We will also publish Weathervane test results for the 16G Dell PowerEdge sever cluster's Kubernetes performance in WvUsers, a metric that represents "the maximum number of simulated users that could interact with the application instances without violating the QoS requirement."[8] The report will include complete information on our test environment, workloads, and configurations.

Conclusion

As the post-pandemic economy grows, your organization faces both opportunities, such as supporting a growing customer base, and challenges, such as helping your employees thrive in the 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 keeping digital transactions running smoothly and sustaining the websites for your business. Plus, a solution that offers the capacity and software features to natively support Kubernetes containers could add value by 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 cluster of 16G Dell PowerEdge single-socket servers powered by 4th Gen AMD EPYC processors compared to a cluster of legacy 15G Dell PowerEdge servers.

1. Robert Sheldon, "How to purchase the best server hardware for small business," accessed October 14, 2022, 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. Inc., "These Are the Pandemic Business Trends That Are Here to Stay," accessed October 14, 2022, https://www.inc.com/shama-hyder/these-are-pandemic-business-trends-that-are-here-to-stay.html.

4. Los Angeles Business Journal, "Post-Pandemic Business Trends are Digital-First, Female-Owned and Optimistic," accessed October 14, 2022, https://labusinessjournal.com/business-journal-events/post-pandemic-business-trends-are-digital-first-female-owned-and-optimistic/.

5. McKinsey Global Institute, "The future of work after COVID-19," accessed October 14, 2022, https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19.

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

7. WordPress, "Welcome to the world's most popular website builder," accessed October 14, 2022, https://wordpress.com.

8. VMware VROOM! Performance Blog, "Weathervane 2.0: An Application-Level Performance Benchmark for Kubernetes," accessed October 14, 2022, https://blogs.vmware.com/performance/2020/02/weathervane2-kubernetes.html.

Principled Technologies®

Facts matter.®