PROWESS

Meeting Cloud Service Provider Demands for Server Management and Performance

How do two leading cloud-scale server platforms stack up in satisfying the demanding infrastructure requirements of cloud service providers (CSPs)?

Managing data centers around the world poses unique challenges for cloud service providers (CSPs), requiring them to rely on high-quality products that offer serviceability, interoperability, and sustainability benefits. Prowess Consulting explored the infrastructure needs of CSPs, comparing two CSP platforms:

- Dell™ PowerEdge™ HS5610 (1U) and HS5620 (2U) with Broadcom® BRCM5720 network interface controllers (NICs)

- Supermicro® SuperServer® SYS-121C-TN10R (1U) and SYS-621C-TN12R (2U) with Supermicro® AOCA25G-I2SM NICs
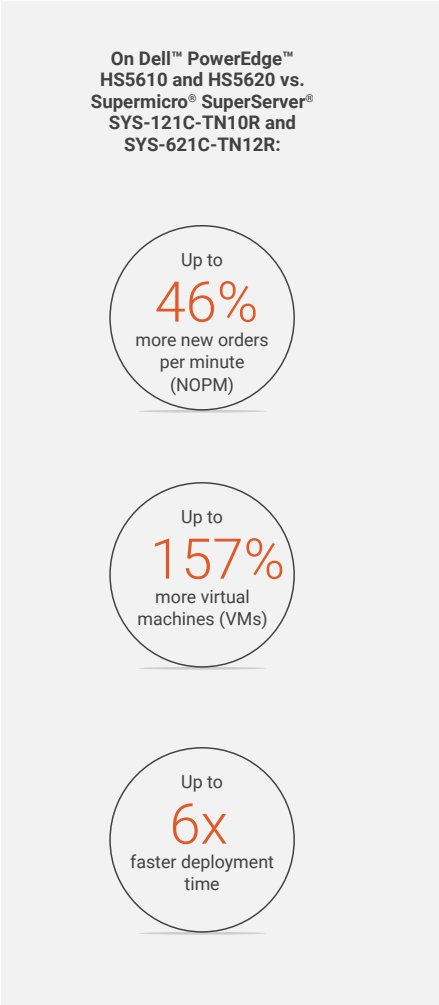
In our testing, the PowerEdge platform was better overall in quantitative comparisons made through performance testing and across all qualitative comparisons compared to the Supermicro SuperServer servers.

Quantitative Results

First, we evaluated the performance of each platform using the following parameters:

- New orders per minute (NOPM) and transactions per minute (TPM) on MySQL® using HammerDB benchmark testing

- Virtual machine (VM) capacity

Our engineers tested MySQL database performance on all four systems using HammerDB to simulate different numbers of virtual users in a 500 warehouse/e-store environment. The 1U Dell™ server performed 46% better than the 1U Supermicro® server with 50 virtual users (see Figure 1).
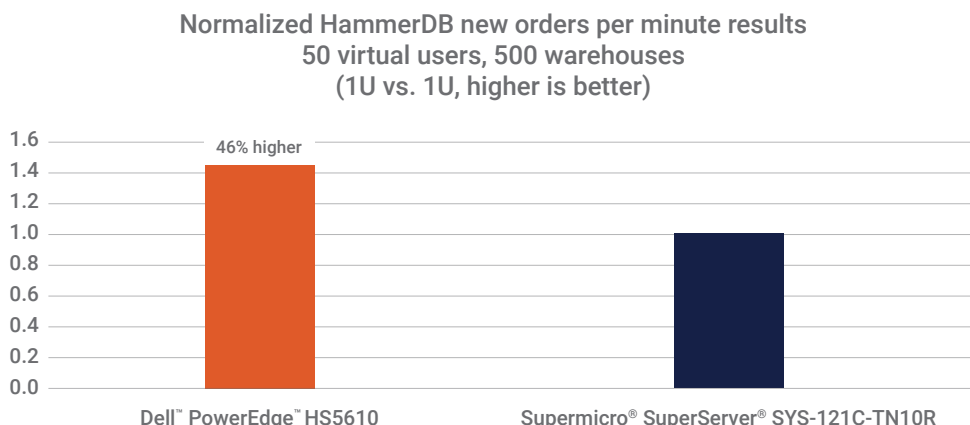
On Dell™ PowerEdge™ HS5610 and HS5620 vs. Supermicro® SuperServer® SYS-121C-TN10R and SYS-621C-TN12R:

Up to
46%
more new orders per minute (NOPM)

Up to
157%
more virtual machines (VMs)

Up to
6x
faster deployment time

Normalized HammerDB new orders per minute results
50 virtual users, 500 warehouses
(1U vs. 1U, higher is better)

Figure 1 | Comparison of MySQL® performance for 50 virtual users on 1U Dell™ and Supermicro® servers

The results were similar for the 2U comparison, with the Dell system performing 39% better than the Supermicro system in NOPM.

To test VM capacity and performance, our engineers created a few hundred VMs on each server. To simulate a virtual desktop infrastructure (VDI) workload typical for a CSP, each VM generated a small load every few minutes. Every five minutes, we spun up a new VM, until the system reported capacity.
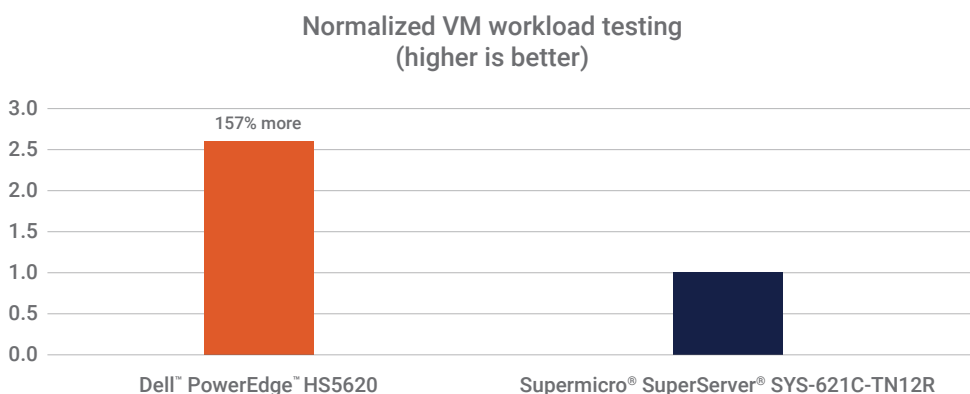
Normalized VM workload testing
(higher is better)

Figure 2 | Comparison of the 2U Dell™ server with 2U Supermicro® server in number of VMs that it could run at capacity

Qualitative Results

We then looked at how each platform compared using qualitative criteria that are crucial for CSPs, including ease of acquisition and deployment, ease of management and serviceability, and total cost of ownership (TCO).

Ease of Acquisition and Deployment

This metric is important to CSPs because they constantly upgrade and replace parts and servers in their data centers. We compared Dell Technologies and Supermicro in supply-chain robustness, order turnaround times, and equipment design, which all affect how quickly a server could be received, unboxed, and set running in the data center.

- It took up to 30 seconds to install the Dell servers into a rack with existing rails.

- Our engineers spent 45 and 1,943 seconds to perform the same task on the Supermicro SuperServer SYS-121C-TN10R and SYS 621C-TN12R servers, respectively.

Ease of Management and Serviceability

We compared management and serviceability features for both platforms, including management tools such as integrated Dell™ Remote Access Controller (iDRAC) and baseboard management controller (BMC) tools that track and monitor power.

- The iDRAC tool automatically updates firmware without requiring reboots. Supermicro servers require customers to manually download firmware updates from multiple sources.

- The iDRAC tool offers a rich display of information, while the Supermicro tool is less robust. For instance, iDRAC provides device information such as hardware and firmware version, firmware update, RAC time, IPMI version, number of possible sessions, and number of current sessions.

- The PowerEdge servers can be serviced without removing them from the rack for quick access to internal components. The Supermicro servers require that the unit be removed from the rack first, then moved to the servicing lab for internal component access.

- The PowerEdge HS5610 servers offer a front input/output (I/O) configuration for cold-aisle access, along with cold-aisle crash-cart access. In addition, Dell servers use "blind-mate" power rails that allow technicians to remove or service servers without requiring hot-aisle access. In contrast, the Supermicro servers are designed for only hot-aisle access.

These and other criteria were examined in our study on the Dell Technologies and Supermicro platforms for CSPs. For a closer look, read the technical research report, "Which Server Platform Can Better Support Massive Cloud Infrastructure Needs?"