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Executive summary

Upgrade your cloud infrastructure with Dell PowerEdge R760 servers and VMware Cloud Foundation 5.1 to handle more database workload activity

Compared to a cluster of PowerEdge R750 servers running VMware Cloud Foundation 4.5

Many organizations need to support more database work year over year, and newer on-premises cloud solutions can cater to these requirements effectively. Upgrades to the hardware and software of cloud infrastructure can deliver improved database workload performance, enabling organizations to handle increasing volumes of data. Additionally, upgrades can streamline management and automation, potentially reducing operational costs. For organizations running clusters of moderately configured, older Dell™ PowerEdge™ servers with a previous version of VMware® Cloud Foundation™ (VCF), upgrading to better-configured modern servers can provide a significant performance boost and more.

For the better-configured modern cloud solution, we deployed VCF 5.1 virtual infrastructure (VI) workload domain on three 16th Generation Dell PowerEdge R760 servers equipped with four NVMe® drives and 20 SAS SSDs for VMware vSAN™ storage. For the moderately configured and older cloud solution, we deployed VCF 4.5 VI workload domain on three 15th Generation R750 servers equipped with six NVMe drives. When we ran transaction processing (OLTP) workloads on each cloud solution, we saw that the modern PowerEdge R760 server cluster running VCF 5.1 handled substantially more transactions per minute and delivered lower vSAN average latencies than the older solution. These superior performance metrics could translate to more online ordering activity or support for a larger user base.

In addition to these performance gains, the PowerEdge R760 and VMware Cloud Foundation 5.1 solution offered simpler management through the VMware Aria Operations Management Pack for Dell EMC PowerEdge integration. Adding this embedded adapter to your toolbox can unlock both predictive analysis and timely information about cloud infrastructure problems.

Improve MySQL database performance

78.8% more TPM*

79.0% more NOPM*

Reduce vSAN latencies

Lower and more consistent read and write response times*

*Dell PowerEdge R760 server cluster running VCF 5.1 vs. Dell PowerEdge R750 server cluster running VCF 4.5

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Upgrade and process more transactions

Speedy transaction processing isn't just for retail, web applications, and inventory management scenarios—although these are worthwhile use cases. Many industries, including marketing, finance, HR/recruiting, education, healthcare, and agriculture rely on MySQL® workloads to leverage data from many sources to inform business decisions.[1]

78.8% more TPM with the Dell PowerEdge R760 cluster

Higher is better

PowerEdge R760 cluster with VCF 5.1

1,042,535

PowerEdge R750 cluster with VCF 4.5

582,836

Figure 1: HammerDB benchmark results, in transactions per minute, with 500 warehouses, 64 virtual users, and 36 MySQL VMs with 10 vCPUs each. Higher is better. Source: Principled Technologies.

79.0% more NOPM with the Dell PowerEdge R760 cluster

Higher is better

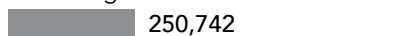PowerEdge R760 cluster with VCF 5.1

449,072

PowerEdge R750 cluster with VCF 4.5

250,742

Figure 2: HammerDB benchmark results, in new orders per minute, with 500 warehouses, 64 virtual users, and 36 MySQL VMs with 10 vCPUs each. Higher is better. Source: Principled Technologies.

Upgrade and get lower vSAN average latencies

We found that the older Dell PowerEdge R750 cluster bottlenecked on vSAN storage, with max write latency at 8.9ms versus 3.8ms on the newer Dell PowerEdge R760 cluster. We believe this higher latency is due in part to the moderate drive configuration of the older solution, which was limited to a single disk group. The better-configured newer solution with more drives could support four disk groups, enabling it to deliver lower latency.

1. Packt, "Use cases of MySQL," accessed April 8, 2024, https://subscription.packtpub.com/book/data/9781788395199/1/ch01lvl1sec07/use-cases-of-mysql.

Lower vSAN average latencies can translate to faster order processing and improved database experience.

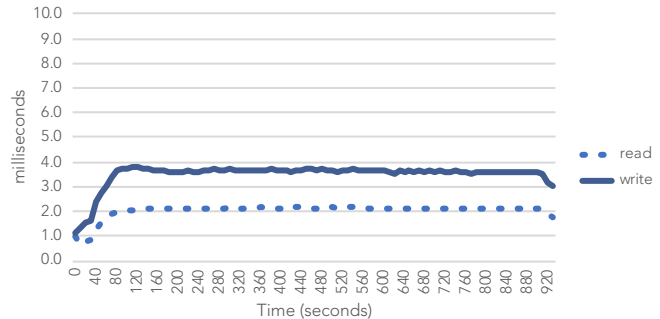**vSAN average latencies on the Dell PowerEdge R760 cluster**

Figure 3: Average vSAN latencies over time in milliseconds for the Dell PowerEdge R760 cluster during testing. Lower is better. Source: Principled Technologies.

vSAN average latencies on on the Dell PowerEdge R750 cluster
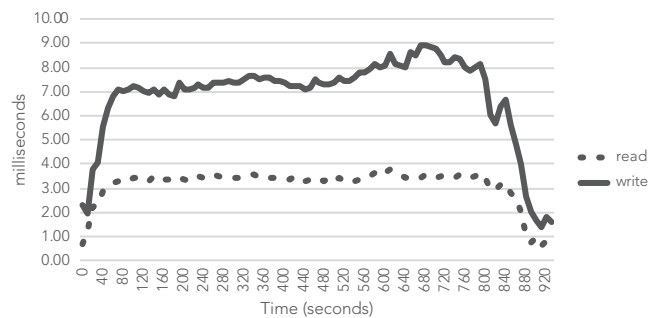

Figure 4: Average vSAN latencies over time in milliseconds for the Dell PowerEdge R750 cluster during testing. Lower is better. Source: Principled Technologies.

If your company is struggling with underperforming infrastructure, upgrading to 16th Generation Dell PowerEdge servers running VCF 5.1 could be just what you need to handle more database throughput and reduce vSAN latencies. As an additional benefit to IT admins, we also found that the embedded VMware Aria Operation adapter provided useful infrastructure insights.

Read the report at https://facts.pt/1pJ4Dpb ▶

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