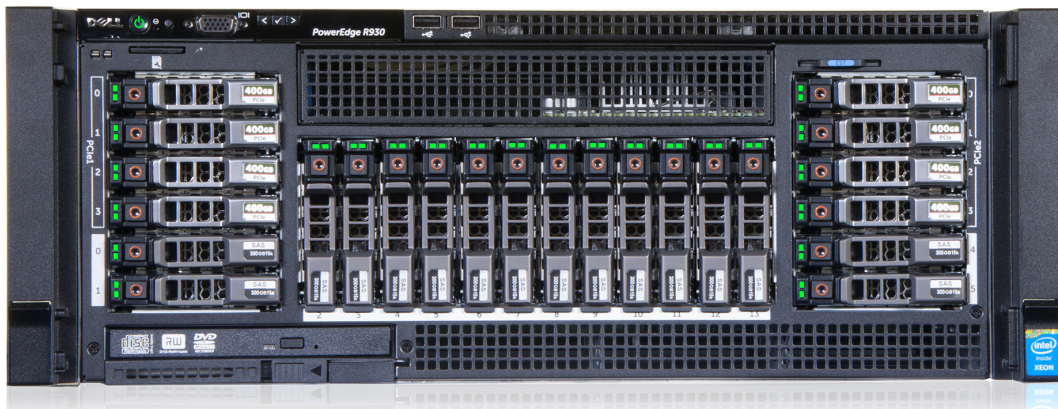# GAIN DATABASE PERFORMANCE AND ROOM FOR GROWTH

WITH DELL™ POWEREDGE™ R930 SERVERS
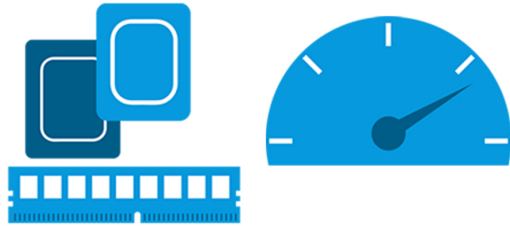
Latest-generation processors, expanded memory, and fast storage options give you ramped-up performance and plenty of room to grow.

The PowerEdge R930 boosted database performance, consolidated in-memory databases, and provided greater VM density in analytics workload tests.

POWERED BY THE INTEL® XEON® PROCESSOR E7-8800 V3 FAMILY

Today's datacenters need to be able to cope with complex, resource-intensive jobs on a daily basis. The workloads aren't getting any simpler, and the amount of data isn't getting any smaller. To stay competitive, your business needs servers capable of handling current demands and also be equipped with room to grow in the future.

The Dell PowerEdge R930, the latest four-socket 13th generation Dell server, is a robust solution featuring Intel latest-generation processors, expanded memory capacity, and fast storage configuration options. It is a customizable solution that can drive your business workloads to meet demands in a variety of resource-intensive IT scenarios, whether it's in-memory database, traditional database, or analytics workloads. What's more, it can provide savings to your business through consolidation compared to running the same workload on aging servers.

Principled Technologies has performed hands-on tests with the Dell PowerEdge R930 in many different configurations, testing the machine's capabilities with three representative resource-intensive workloads. We found that the PowerEdge R930 can deliver strong performance for enterprise applications, which can help upgrade, virtualize, and consolidate your datacenter.

ABOUT THE DELL POWEREDGE R930

The Dell PowerEdge R930 is a 4U, four-socket server that features the latest from the Intel Xeon processor E7 series. It is a versatile system designed to handle demanding workloads such as large-scale virtualization and massive databases— workloads that are becoming increasingly important for the day-to-day operations of enterprise organizations.

Under the hood, the R930 boasts a bevy of high-class specifications that make it a powerful tool for the modern datacenter. These specifications include:

- **96 DIMM slots**—The ample number of slots help leverage cost with performance and capacity needs. It accommodates a larger memory footprint which can be configured with smaller-capacity DIMMs for potential cost-efficiency, or can support up to 6 TB for more memory-intensive use cases.
- **24 Drive bays**, configurable with a mix of SAS/SATA HDDs and SSDs as well as optional NVMe PCIe® SSDs for expanded storage capabilities. Two chassis configurations—one with 24 HDD/SSD drive bays, and one with 16 HDD/SSD drive bays and 8 PCIe SSD drive bays—allow you to configure the PowerEdge R930 however your business needs.
- **Optional PCIe SSD NVMe drives** for data that requires the fastest-available I/O throughput. PCIe SSDs can also be used with caching solutions, such as SanDisk® DAS cache or Dell Fluid Cache™ For SAN, to accelerate your business workloads and deliver the added capacity of HDDs with the added throughput of flash-based drives.

STORAGE UPGRADE OPTIONS–ORACLE® DATABASE TESTING

Oracle database applications are particularly taxing on storage and require servers with a wide range of storage options. Principled Technologies tested a Dell PowerEdge R930 server running Oracle Database 12c with an online transaction processing (OLTP) workload in several different storage configurations available for the server.

While the PowerEdge R930 delivered strong performance with 22 HDDs, performance improved when we upgraded the drive configurations. To that end, we replaced the all-HDD configuration with a mix of HDDs and SSDs with SanDisk DAS Cache. Then, we upgraded to a chassis model with eight PCIe SSDs running SanDisk DAS Cache. The PCIe SSD configuration delivered 11.1 times the performance of the standard all-HDD configuration. Figure 1 compares the performance of the PowerEdge R930 with each storage configuration. By properly configuring the variety of storage options in your Dell PowerEdge R930, you can obtain the fast I/O throughput necessary to keep your customers happy when Oracle database is running at peak load.
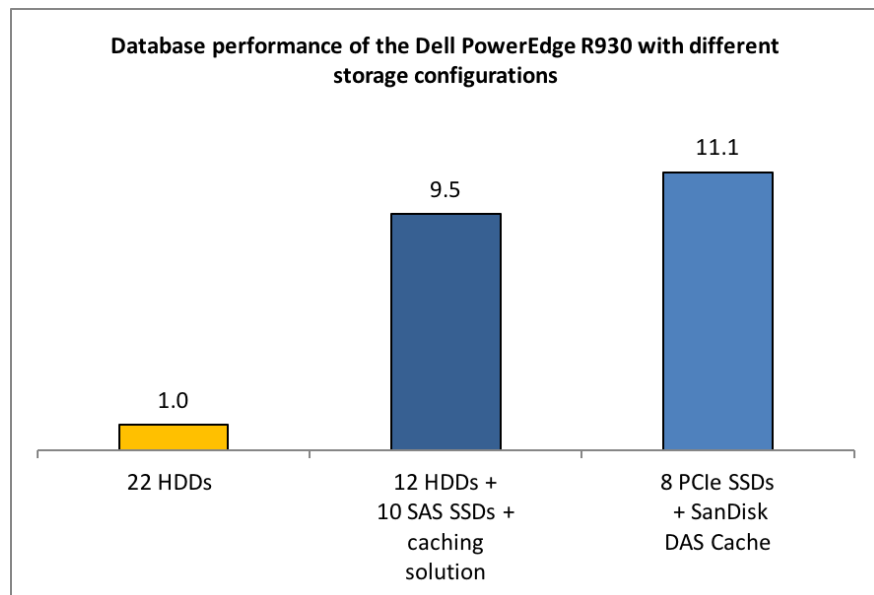
Figure 1: Versatile storage configurations can provide your business with the level of database performance your workloads require.

Database performance of the Dell PowerEdge R930 with different storage configurations

To learn more about this study, read the full report at www.principledtechnologies.com/Dell/PowerEdgeR930_Oracle_acceleration_SanDisk_DAS_Cache_0615.pdf.

IN-MEMORY OLTP DATABASE TESTING WITH SQL SERVER® 2014

With its upgraded hardware specifications, the Dell PowerEdge R930 can take full advantage of the latest features that come with Microsoft® SQL Server 2014. One feature—In-Memory Optimization—can accelerate your business' OLTP database workloads.

In-Memory Optimization is a technology integrated into the latest release of SQL Server that stores specified database tables directly in your server's memory. What this means for your business is the potential for lower latency and faster transaction processing by keeping data closer to compute. The Dell PowerEdge R930, with 96 available DIMM slots, faster DDR4 speeds, and greater overall memory potential, provides plenty of hardware resources to implement the In-Memory optimization feature.

PT tested the PowerEdge R930 an OLTP database workload to test SQL Server 2014 In-Memory Optimization features. We found the R930 provided up to 4.2 times the performance (in transactions per minute) of a Dell PowerEdge R910 legacy server solution (see Figure 2). Replacing multiple legacy servers with a single R930 can save your company rack space and space-related costs as your business grows.

Figure 2: The Dell PowerEdge R930 delivered 4.2x the database performance of a legacy server and software combination.
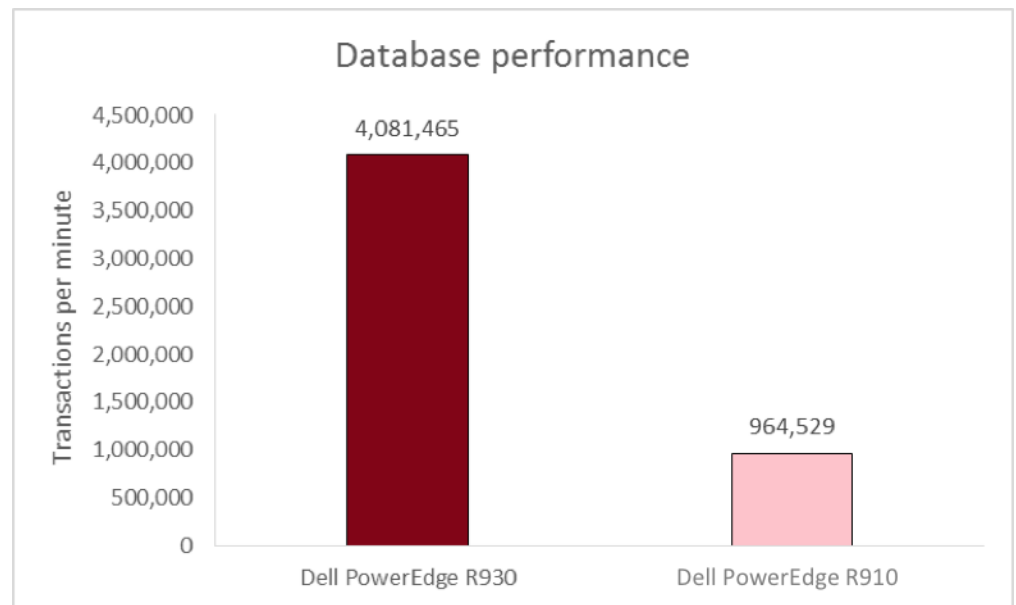
Database performance

To learn more about this study, read the full report at www.principledtechnologies.com/Dell/PowerEdge_R930_inmemory_0515.pdf.

FAST AND EFFICIENT ANALYTICS WORKLOADS

Analytics involves fewer user requests than OLTP, but the complex queries that are standard for analytics workloads come with a hefty resource price.

Imagine you own a bookstore that serves thousands of customers every day. Your store is very good at getting customers in and out with the book they came to purchase. Now imagine one day you have to serve only a single customer—but that customer wants to purchase *every* book published between 1926 and 2003 that contains characters named Steve or Stephanie. You have now entered the world of analytics.

Older, outdated machines can slow down your business analytics due to insufficient hardware resources. We found that the Dell PowerEdge R930 can handle the load of your legacy server and then some. We created a multiuser workload to simulate a typical SAS foundation environment consisting of 25 data analysis tasks.

Virtualizing the SAS loads increased the number of jobs the R930 could perform: While the Dell PowerEdge R720 we tested offered four times the performance of the four-year-old PowerEdge R710, the R930 provided nearly *14* times the performance of the legacy R710 solution across 12 virtual machines (see Figure 3)

Figure 3: More VMs and better performance with the PowerEdge R930.
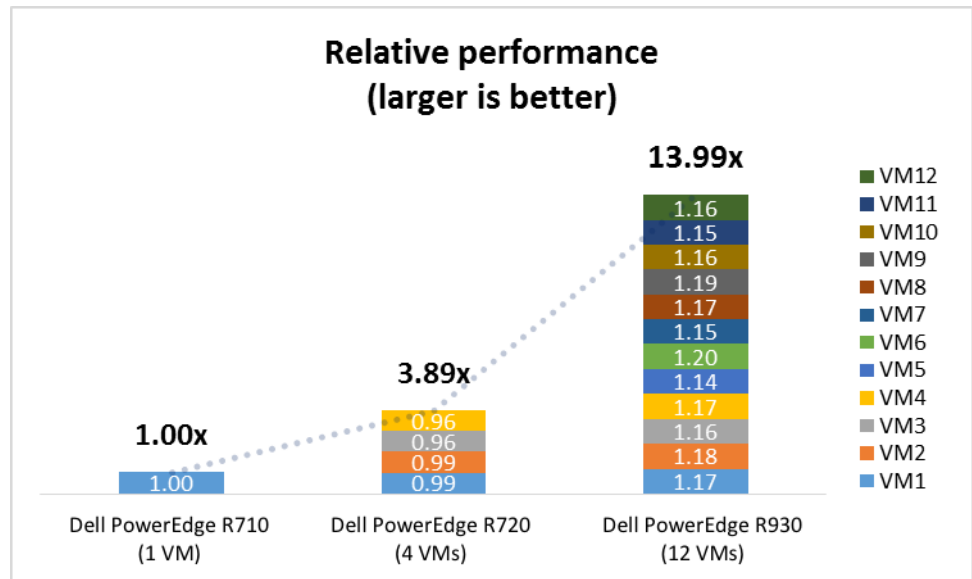
The ability to host more VMs on a single machine means your business could consolidate multiple older servers (in our tests, 12) with a single new one, saving your datacenter valuable real estate.

In addition to offering better performance, the PowerEdge R930 completed the SAS workload over 25 minutes faster than the legacy solution. The R930 averaged 118 jobs per hour compared to the legacy server's paltry 8.5—over 13 times the number of jobs per hour the legacy server was able to complete. And even though it was running

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12 VMs, the R930 still had headroom to spare, which could translate to an even greater number of possible virtual machines. To learn more about this study, read the full report at www.principledtechnologies.com/SAS/SAS_Intel_E5_E7v3_0415.pdf.

CONCLUSION

Your infrastructure may have served you well over the years, but newer systems like the Dell PowerEdge R930 will help your organization remain competitive in an increasingly challenging market. The PowerEdge R930 is available in a variety of hardware and software configurations to best fit your enterprise application demands—plus, up to 12x consolidation can mean a better return on investment compared to maintaining aging hardware.

The Dell PowerEdge R930 delivered better performance than each legacy machine in our hands-on comparison tests, and was able to excel at a variety of workflows, making it a truly versatile solution for large enterprise.

ABOUT PRINCIPLED TECHNOLOGIES

![Principled Technologies logo]

Principled Technologies, Inc.
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We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.