

Investigating Network Performance on Edge Servers from Dell Technologies

Prowess Consulting benchmarking tests on Dell™ PowerEdge™ servers demonstrate the servers' performance for network workloads at the edge and for telecommunications.

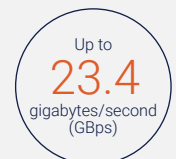
Moving networks to the edge—that is, as close to the point of request as possible—can provide many benefits to organizations in retail, manufacturing, healthcare, telecommunications (telco), and other industries. When these businesses offer apps and services at the edge, they can reduce application latency, improve operations, and enhance the customer experience.

Choosing the right servers for edge networking is a key decision for IT administrators. For this reason, Prowess engineers looked at two rugged rack-mount servers built for edge deployments: Dell™ PowerEdge™ XR11 (1U) and Dell PowerEdge XR12 (2U) servers. The Dell PowerEdge XR11 and Dell PowerEdge XR12 servers are nearly identical, but the Dell PowerEdge XR12 offers more PCIe® and NVMe Express® (NVMe®) slots, providing more performance if needed.

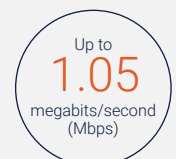
We tested these servers, powered by 3rd Gen Intel® Xeon® Gold processors, first using iPerf®, an open-source, cross-platform tool that can produce standardized performance measurements for any network. Then we tested the performance of a database workload on a Dell PowerEdge XR11 VMware vSAN™ cluster of three nodes and a Dell PowerEdge XR12 vSAN cluster of three nodes.

We ran a Microsoft® SQL Server® workload on multiple virtual machines (VMs) to measure input/output operations per second (IOPS) using HammerDB, a leading benchmarking and load-testing software solution for popular databases. In addition, to see how enterprises might improve network performance using remote direct memory access (RDMA), we ran SQL Server workloads with RDMA both on and off and captured the results. Enabling RDMA allows systems to bypass the CPU and move data with lower latency and compute overhead.

Through benchmark testing, Prowess found that Dell™ PowerEdge™ XR11 and Dell PowerEdge XR12 server clusters were able to deliver:



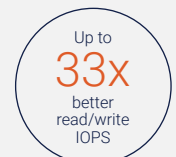
of data over Transmission Control Protocol (TCP) using the iPerf® network benchmarking tool on the Dell PowerEdge XR11 server



of data over User Datagram Protocol (UDP) with **low packet loss** (up to 0.012) for 5,432 data packets per second on both the Dell PowerEdge XR11 and Dell PowerEdge XR12 servers¹



for Microsoft® SQL Server® workloads with RDMA enabled on both the Dell PowerEdge XR11 and Dell PowerEdge XR12 servers¹



with RDMA enabled on both the Dell PowerEdge XR11 and Dell PowerEdge XR12 servers¹

Highlights of Test Results

Prowess benchmarked Dell PowerEdge XR11 and Dell PowerEdge XR12 servers and found they provided fast network performance using iPerf, which measures the maximum achievable bandwidth on IP networks.

Prowess also benchmarked the performance of SQL Server workloads using HammerDB with RDMA enabled and disabled on VMware vSAN clusters on the Dell PowerEdge XR11 server.

Table 1 | iPerf® network benchmarking results¹

Dell™ PowerEdge™ XR11 and Dell PowerEdge XR12 server network performance	
TCP test	
Bandwidth	25 GB
Interval	10 seconds
TCP transfer (GB)	27.3
TCP bitrate (GBps)	23.5
UDP test	
Datagrams	5,432
Interval	60 seconds
UDP transfer (KB)	7.5
UDP bitrate (Mbps)	1.05
Jitter (lost packets)	0.012

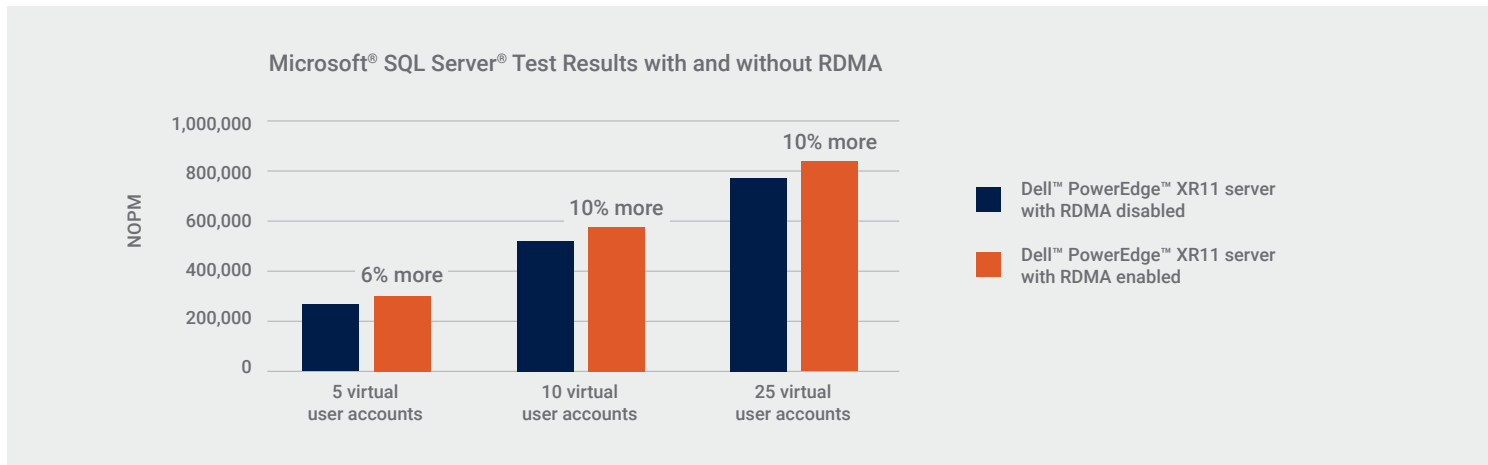


Figure 1 | Microsoft® SQL Server® database workload results on Dell™ PowerEdge™ XR11 server nodes

Edge networking will continue to evolve, especially as industries such as manufacturing and telco push to innovate with 5G and other edge computing use cases. Prowess’s testing demonstrates that Dell PowerEdge XR11 and Dell PowerEdge XR12 servers can perform well in such edge networking scenarios.

Learn more

Get the full story by reading our paper, [“How Do Dell™ PowerEdge™ Servers Perform for Networking Workloads at the Edge and Telecommunications?”](#)

¹ Both the Dell™ PowerEdge™ XR11 and Dell PowerEdge XR12 servers delivered nearly identical results.



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