



RED HAT ENTERPRISE VIRTUALIZATION: SCALING IBM DB2

EXECUTIVE SUMMARY

The goal

Determine the scalability of IBM DB2 database workloads running on the Red Hat® Enterprise Virtualization platform by running an online transaction processing (OLTP) workload across different scenarios.

Why should I care?

OLTP is a common database implementation exercising both the memory and I/O subsystems of virtual machines. Good performance on this test means good performance for your database applications running on Red Hat Enterprise Virtualization.

What was tested?

OLTP WORKLOAD
DB2 9.7
RED HAT ENTERPRISE LINUX 5.4
RED HAT ENTERPRISE LINUX 5.4 (WITH INTEGRATED KVM HYPERVISOR)
HP PROLIANT DL370 G6 (INTEL XEON W5580-NEHALEM)

What was the result?

Red Hat Enterprise Virtualization scaled nearly linearly in all configurations tested, with low overhead costs of virtualizing multiple hosts and multiple virtual CPUs. IBM DB2 workload performance on Red Hat Enterprise Virtualization scaled equally well in increasing numbers of virtual machines/hosts and numbers of vCPUs/guests.

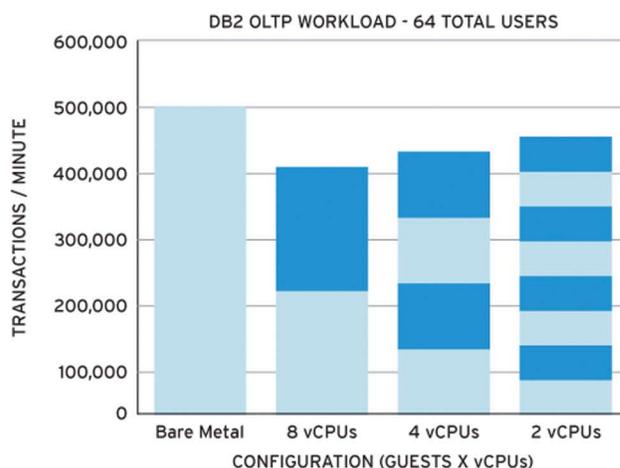
IBM DB2 DATABASE AT UP TO 92% OF BARE METAL PERFORMANCE, GOOD SCALABILITY

The performance of IBM DB2 database workloads was measured on Red Hat Enterprise Virtualization running on a two-socket Intel Xeon W5580 server. Red Hat Enterprise Virtualization exhibited excellent scaling and performance across multiple configurations.

Scale-up of a VM with 2, 4, 6, or 8 vCPUs yields good scaling. As vCPUs are added, throughput per vCPU decreases slightly due to I/O contention, lock management, and virtualization overhead. Scaling up multiple VMs with multiple vCPUs on a single host also exhibits good scaling.

Scale-out of multiple virtual guests on a single host shows 82-92% of bare metal performance on the same host and almost no difference between scaled-up and scaled-out virtual machines, reflecting IBM DB2's suitability for either architectural strategy.

VIRTUALIZATION EFFICIENCY: CONSOLIDATION



WHAT WAS THE GOAL?

Red Hat tested the performance of IBM DB2 database workloads on Red Hat Enterprise Virtualization. We chose an online transaction processing (OLTP) workload, a popular type of workload for database servers, as the target for our performance testing. The results are scalability and performance measurements that are relevant for IBM DB2 database workloads that provide insights into sizing and configuration of infrastructure for relational database virtual hosting.

WHAT WAS TESTED?

The OLTP workload emulates a common database workload that typically taxes both the memory and the I/O subsystems of database servers.

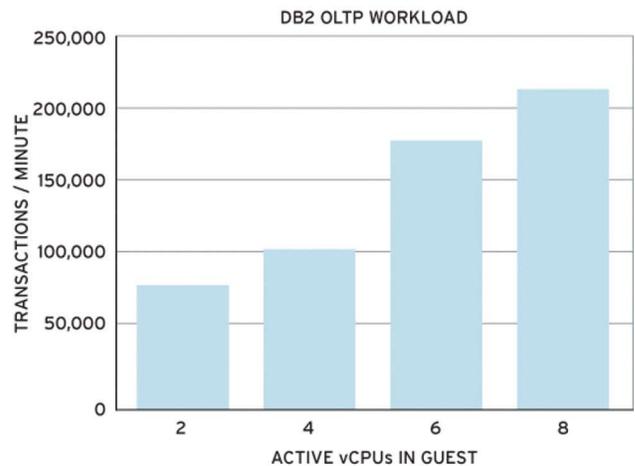
Scaling up the VMs

First, the performance of the OLTP workload was measured by loading a single VM on the server and assigning it 2, 4, 6, or 8 vCPUs in the VM. As shown in the graph “Scaling vCPUs and Memory on a Single Guest,” the total throughput increases although the throughput per vCPU decreases slightly as vCPUs are added, as a result of IO contention, distributed lock management, and virtualization overhead.

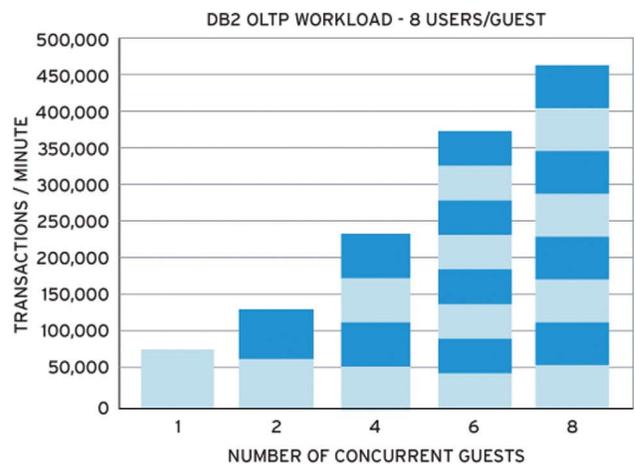
Scaling out the VMs

A second series of tests involved scaling out multiple VMs of 2, 4, or 8 vCPUs. The performance of the OLTP workload shows good scalability as shown in the graph below.

SCALING vCPUs AND MEMORY ON A SINGLE GUEST



SCALING MULTIPLE 2-vCPU GUESTS





IBM DB2 workloads show good consolidation efficiency and performance versus bare metal

As shown in the graph “Virtualization Efficiency: Consolidation,” the IBM DB2 workload scales up (high number of vCPUs per guest) and out (high number of guests with same number of vCPUs) equally well on Red Hat Enterprise Virtualization, giving users added architectural flexibility.

WHAT NEXT?

For more information, visit redhat.com/rhev/server or contact your local Red Hat Enterprise Virtualization reseller.



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00800 7334 2835
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europe@redhat.com

LATIN AMERICA

+54 11 4341 6200
www.latam.redhat.com
info-latam@redhat.com