RED HAT ENTERPRISE VIRTUALIZATION: SCALING MICROSOFT EXCHANGE

EXECUTIVE SUMMARY

The goal

Determine the scalability and latency of a Microsoft Exchange Server 2007 workload running on Red Hat Enterprise Virtualization.

Why should I care?

Microsoft Exchange Server is a critical back office application in most organizations for email and groupware functionality. Good performance on this test means good performance for Microsoft Exchange and other groupware applications.

WHAT WAS TESTED?

LOADGEN WORKLOAD
MICROSOFT EXCHANGE SERVER 2007
MICROSOFT WINDOWS SERVER 2008 R2 RC
RED HAT ENTERPRISE LINUX 5.4 (WITH INTEGRATED KVM HYPERVISOR)
DELL POWEREDGE R710 (INTEL XEON W5540–NEHALEM)

Exchange LoadGen 2007 workload performance measured using the 16 logical CPUs of a two-socket, quad-core server with 72 GB of RAM. Tested scalability across multiple configurations of virtual guests.

What was the result?

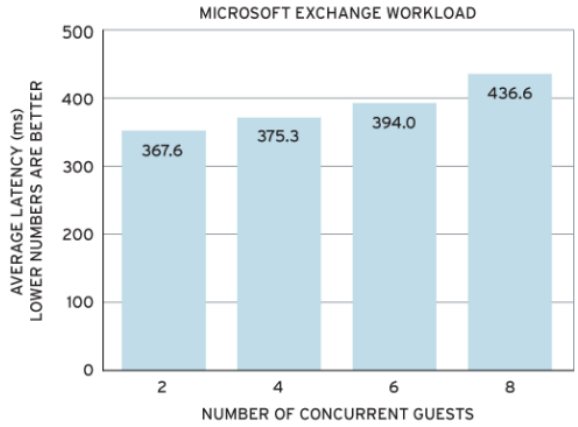
Red Hat Enterprise Virtualization scaled well with low overhead costs of virtualizing multiple hosts and multiple virtual CPUs. Red Hat Enterprise Virtualization exhibited low latency in all tested scenarios. Exchange effectively utilized all 16 vCPUs Red Hat Enterprise Virtualization presented to it by performing best in a scaled-out 8 x 2 vCPU virtual machine configuration.

MICROSOFT EXCHANGE LATENCIES UNDER 750MS ON A SINGLE SERVER HOSTING 16,000 USERS UNDER HIGH LOAD

The performance of the Microsoft Exchange Server 2007 was measured on the Red Hat Enterprise Virtualization hypervisor running on a two-socket Intel Nehalem server with 16 logical CPUs.

Scale-up of a single VM with 2, 4, or 8 vCPUs shows excellent latency under 750 ms in all instances and under 500 ms in most instances. Scaling up multiple VMs with multiple vCPUs on a single host also exhibits minimal loss of performance due to the extra workload and user count.

SCALING vCPUS GUESTS

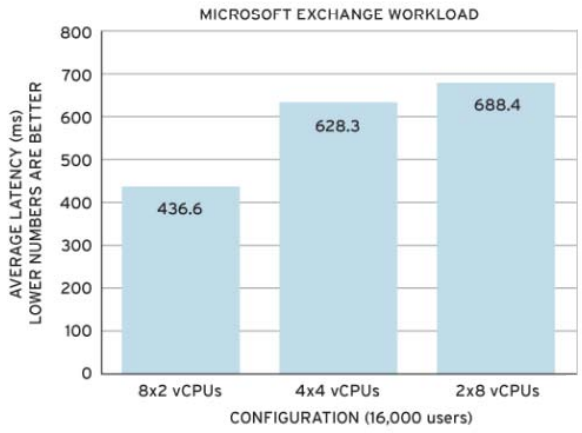


Scale-out of multiple virtual guests on a single host shows lower latency with 8 x 2 vCPU guests compared to 2 x 8 vCPU guests, suggesting Exchange performance benefits more from scale-out than scale-up.

WHAT WAS THE GOAL?

Red Hat tested the performance of the Microsoft Exchange Server 2007 application hosted on Red Hat Enterprise Virtualization to record response time with a defined user load. We used Microsoft Exchange LoadGen 2007 to generate load on the Exchange virtual machines. The results are an accurate snapshot of the overall performance capabilities of Red Hat Enterprise Virtualization for Exchange environments.

VIRTUALIZATION EFFICIENCY: CONSOLIDATION



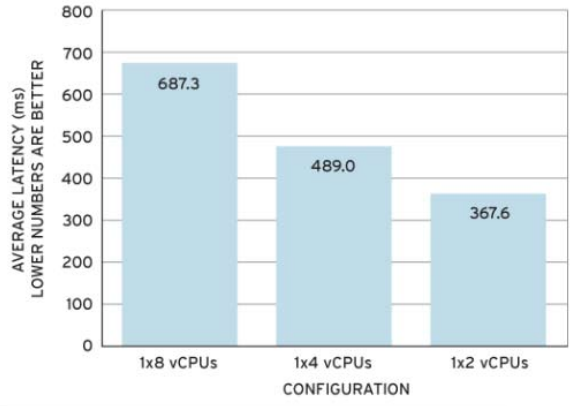
WHAT WAS TESTED?

The virtual machines were built on Windows Server 2008 R2 RC (Build 7100) running Microsoft Exchange Server 2007 SP1. To build the workload, Microsoft Exchange LoadGen 2007, an industry-standard tool for benchmarking an Exchange Server, was used. The MMB3 workload, the previous generation Exchange benchmark developed for Exchange 2003, was modified so it would work on the latest version of LoadGen 2007 by using the Custom feature of that tool. The workload was tuned in such a way as to stress CPU and memory.

Scaling up the VMs

First, the performance of the LoadGen workload was measured by loading a single VM on the server and assigning it 2, 4, or 8 vCPUs in the VM. As shown in the graph below, all configurations show acceptable latency.Oracle workloads show good consolidation efficiency and performance versus bare metal

SCALING UP WINDOWS GUEST AVERAGE LATENCY



Scaling out the VMs

A second series of tests involved scaling out multiple VMs of 2, 4 or 8 vCPUs to total the 16 cores in the server. As an example, Red Hat tested latency with 1, 2, 4, and 8 virtual machines with 2 vCPU each on a single server. The performance of the workload shows good latency in all scenarios.

Consolidation efficiency

The same number of users (16,000) were served using 2 x 8 vCPU, 4 x 4 vCPU, or 8 x 2 vCPU machines on a single server. The graph "Virtualization Efficiency: Consolidation" shows best performance under scale-out (high number of VMs) rather than scale-up (high number of vCPUs/VM).

WHAT NEXT?

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

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