



PERFORIC
performance is the key

WHITE PAPER

Comparing Native vs Virtualized performance

Comparing the performance of a simple web application between the Windows XP operating system and a Linux virtual machine running on the same Windows XP operating system

Windows native vs Linux VM performance

This whitepaper compares the performance of a simple web application running on the Smarty template engine for PHP between the Windows XP operating system and a Linux virtual machine running on the same Windows XP operating system. The Smarty template engine allows a clean separation of presentation from application code and is a free, open source engine. Our application writes some data to a MySQL table and then deletes it from the table. Each iteration of our test consists of writing a row of data and then deleting it. Each row consists of four fields: a numeric ID, two strings that are each 10 characters long written into varchar fields and a date time value. Smarty runs on EasyPHP 5.3.2i on Windows XP and on the Turnkey LAMP (Linux Apache MySQL PHP) stack on the Linux virtual machine. EasyPHP includes Apache, PHP and MySQL. LAMP includes Linux, Apache, PHP and MySQL. The versions of Apache, PHP and MySQL are the same on both Linux and Windows. The hardware is the same for both tests, an Intel Core 2 Duo T9550 @ 2.66 GHz with 3.45 GB of RAM. The purpose of the test is to compare the performance of a simple web application running on native Windows vs on a Linux virtual machine.

Setup

EasyPHP on Windows XP

We used EasyPHP 5.3.2i which can be downloaded from <http://www.easyphp.org/download.php>.

Use of standard packages
to set up the test

LAMP (Linux Apache MySQL PHP) on Windows XP

We downloaded the LAMP stack for Windows XP from <http://www.turnkeylinux.org/lampstack>. Specifically, download the VMDK zip file from <http://sourceforge.net/projects/turnkeylinux/files/turnkey-lamp/11.2-lucid-x86/turnkey-lamp-11.2-lucid-x86-vmk.zip/download> first and unzip it on your local disk. Then install Oracle VirtualBox as the virtualization platform, following the setup instructions at <http://www.turnkeylinux.org/docs/installation-appliances-virtualbox>. Where it says: “ Default build: it's a ZIP file containing a ready-to-run VMDK hard disk image which includes a virtualization optimized kernel and VMWare tools”, use the VMDK file that you unzipped earlier. Follow the steps until you have a new Linux Ubuntu Virtual Machine (VM) running on Windows XP. Your Linux VM will contain an installation of Apache, MySQL and PHP as its packaged as part of the Turnkey LAMP VMDK image.

Smarty

Install Smarty on both the EasyPHP platform on Windows and the LAMP stack by following the instructions at http://www.smarty.net/quick_install. Ensure the Smarty engine is working properly by invoking the “Hello Ned!” string. Next install the Smarty sample application called Guestbook from <http://www.smarty.net/sampleapp1>. The sample application out of the box only allows you to add entries to the guest book. We need to extend the application by adding a delete function in the index.php case statement that will delete all rows in the table. The following lines can be added to a new deleteEntries method in guestbook.lib.php to delete all rows in the guestbook table:

```
$rh = $this->pdo->prepare("delete from GUESTBOOK");  
$rh->execute();
```

Now our sample application is ready for performance testing.

Performance test

We used Jakarta JMeter 2.4 for running the load test. Our test did not have any think time and the load was 10 virtual users, each ramping up after 1 second. Here are the results:

Windows XP native

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	KB/sec	Avg. Bytes
Add Request	1000	69	12	225	28.86	0.00%	67.6/sec	46.76	708.8
Delete Req...	1000	67	12	313	29.21	0.00%	67.7/sec	26.62	402.6
TOTAL	2000	68	12	313	29.05	0.00%	134.9/sec	73.21	555.7

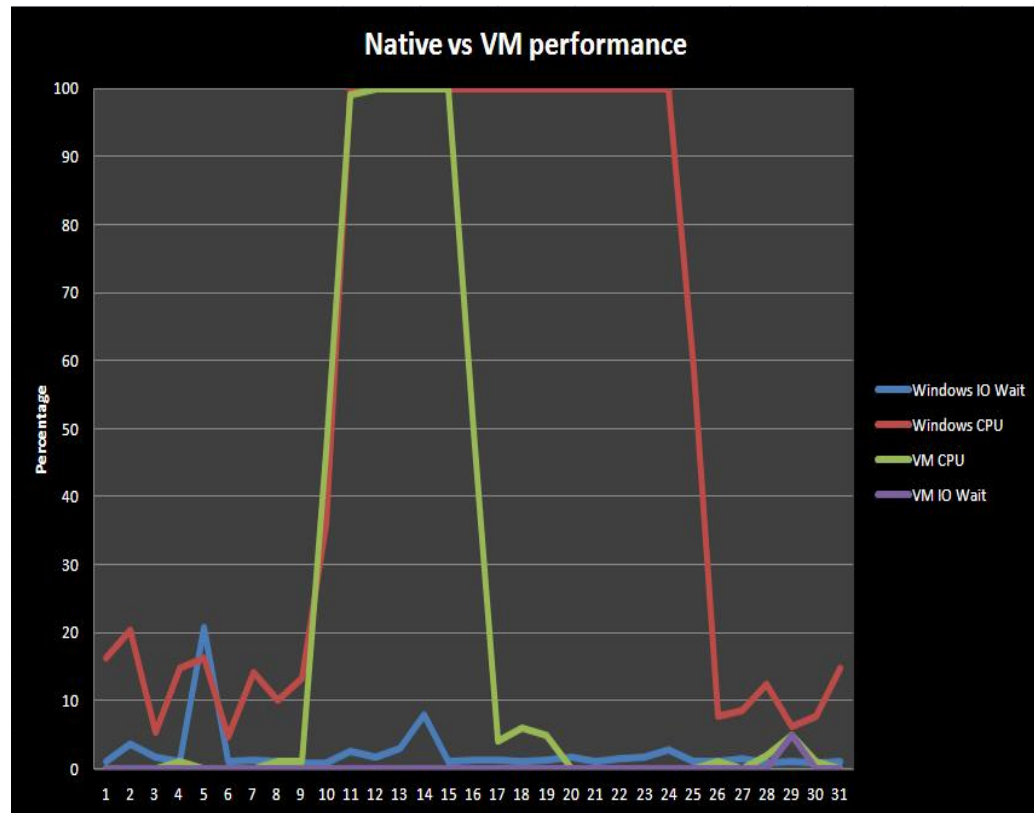
Linux VM on Windows XP

Label	# Samples	Average	Min	Max	Std. Dev.	Error %	Throughput	KB/sec	Avg. Bytes
Add request	1000	27	2	233	18.16	0.00%	171.8/sec	116.91	696.8
Delete request	1000	19	1	177	14.46	0.00%	172.0/sec	64.69	385.2
TOTAL	2000	23	1	233	16.82	0.00%	343.4/sec	181.44	541.0

Performance numbers for the Linux VM better than native Windows

CPU and IO Graph

A virtualized environment sometimes provides better performance than native



Observations

- Linux performance is markedly better than Windows native, both for response time and throughput
- CPU utilization peaks at a 100% for both Windows native and Linux VM
- IO Wait is negligible for both runs but slightly higher for Windows native

Conclusion

This test clearly shows that running a VM is not necessarily a performance impact and can sometimes provide better results. The technology used for this test, EasyPHP, is better optimized for Linux than Windows and it shows in the test above.

Perforic proposition

One of the biggest concerns for any business and IT organization is uptime. Application performance can impact revenues, customer satisfaction, employee productivity, data center efficiency and software and hardware licensing costs. There are several ways to manage application performance including performance testing, benchmarking, capacity planning and performance monitoring. These services are available both on-premise and as hosted service offerings and can help you ensure the health and the performance of your enterprise applications both before you launch and while in production. Organizations of all sizes should consider these services when application uptime is critical to business productivity.

About Perforic

Perforic provides flexible, high quality and cost-effective enterprise application porting and performance testing services for software product companies and internal development organizations. Our team consists of seasoned veterans with vast experience in performance and porting issues. We have worked with companies of all sizes – from startups to Fortune 500 companies - and have deep expertise in J2EE, .NET and database technologies in highly scalable, three-tier enterprise application environments. The company is based in Cambridge, MA and has 24 x 7 operations with locations and resources in the US and Asia. For more information, please visit <http://www.perforic.com/index.html>.



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