zeus

Zeus Extensible Traffic Manager

ZXTM Performance on Blade Servers

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Executive Summary

ZXTM software was benchmarked on two sets of dual processor IBM blade servers (AMD Opteron based LS20 blades and Intel Xeon based HS20 blades) and its performance compared with that obtained on the ZXTM 7000 appliance (a dual processor Opteron server).

It was found that ZXTM ran as efficiently on blades as on conventional hardware, and that performance scaled linearly as additional blades were added to the ZXTM cluster.

This makes ZXTM the ideal traffic management solution for a blade based environment, since it can be deployed on the same blades as the application and database servers themselves, saving space and power in the datacenter by avoiding the need to deploy bulky appliances in addition to blade cabinets, and ensuring that the best possible efficiencies can be obtained from the blades purchased. When traffic loads increase, spare blades can be configured as necessary to resolve the bottleneck, whether by installing additional application servers, database servers or copies of ZXTM itself.

Additionally, when an installed blade based system is upgraded, all components of the application stack, including ZXTM, will benefit from the increased performance of the new blades; datacenter managers will not have to write off their investment in expensive dedicated traffic management appliances that are no longer able to keep up with the servers whose traffic they manage.

ZXTM is easily integrated with blade provisioning and management systems using its SOAP/XML API and comprehensive SNMP monitoring capability, giving the administrator complete visibility of, and control over, his blade based application server stack.

Acknowledgements

Zeus Technology thanks IBM for providing access to the IBM BladeCenters used for the benchmarks described in this paper, and the staff of the IBM Innovation Centre, Hursley for their assistance and advice.

Introduction

The Zeus Extensible Traffic Manager (ZXTM) is a high performance, software based traffic manager that makes network and web-enabled applications faster, more reliable, more secure and easier to manage.

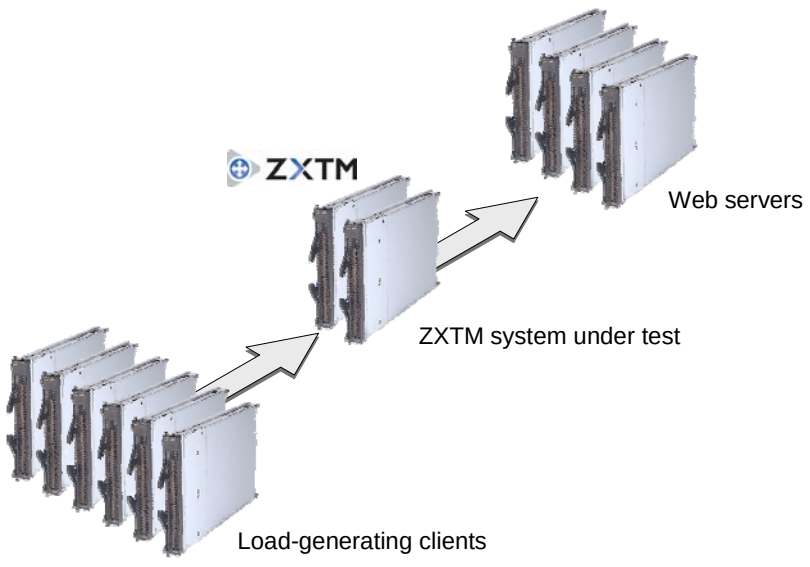
Unlike its competitors, which are typically available only as appliances, ZXTM is flexible whatever your deployment needs allowing you to choose a platform to run it on that has the performance and form factor most appropriate. So, when you have invested in blade systems to run your applications, you can deploy ZXTM directly on to your chosen blades, rather than having to install additional servers or appliances in your data centre.

ZXTM also benefits from the same manageability and scalability advantages of blade based systems as your applications. ZXTM scales horizontally, allowing you to cope with increasing traffic simply by installing additional copies of ZXTM on spare blades in your blade center, instead of throwing away your existing traffic management hardware and replacing it with a more expensive model.

This document describes performance and scalability benchmarks conducted against ZXTM running on IBM blade servers, compares the results with those obtained on the ZXTM 7000 appliance, and then moves on to look at some of the features of ZXTM that are particularly useful in a typical blade deployment.

Benchmark Environment

Tests were conducted using blades from both IBM LS20 (Opteron) and IBM HS20 (Intel) blade centers. Six of the Intel blades were used to generate load with between 1 and 4 blades (either Intel or AMD) running ZXTM as the system under test. Back end nodes were provided by additional blades running the Zeus Web Server (ZWS). The diagram below illustrates the benchmarking architecture.



Please note that whilst the Zeus Web Server was used for these tests, similar results will be obtained using other web servers in conjunction with ZXTM, since care was taken to ensure that the bottleneck was always the ZXTM server or servers under test.

Hardware Specifications

The table below describes the specification of the blades tested, and that of the ZXTM 7000 appliance with which the benchmark results are compared.

System	**IBM Opteron LS20 Blade**	**IBM Intel HS20 Blade**	**ZXTM 7000**
CPU	2 x 2.4 GHz Opteron 250	2 x 3.8 GHz Xeon	2 x 2.4 GHz Opteron 250
RAM	4 GB	4GB	4 GB
Network Interfaces	2 x 1 Gb	2 x 1 Gb	4 x 1 Gb

Software Specifications

The following versions of software were used in the tests:

Traffic Manager	ZXTM 4.1 - Linux x86_64
Web Server	ZWS 4.3r3 – Linux x86_64

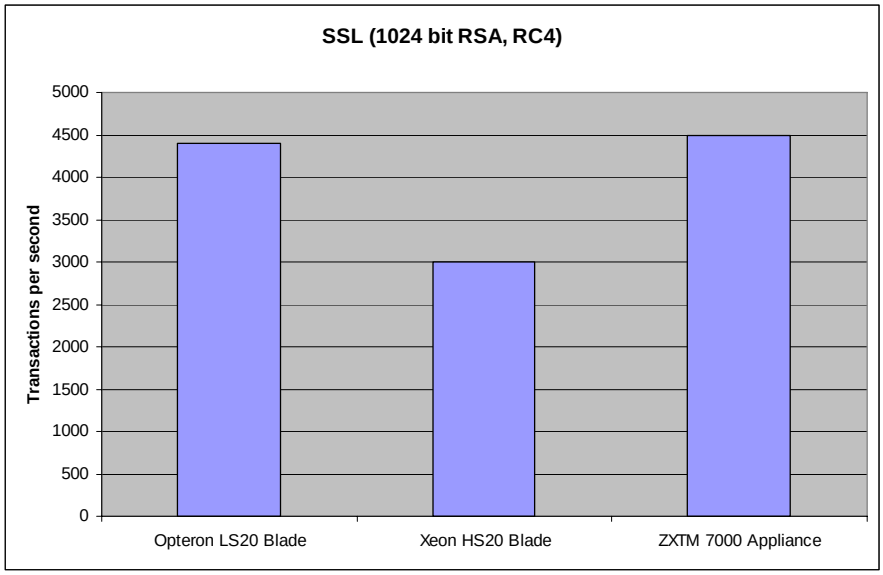
Benchmarks

Using the above infrastructure, benchmarks were conducted against both blade systems. The results are presented below including the ZXTM 7000 appliance figures for comparison.

Note that some variation between the figures for the ZXTM 7000 and LS20 blades is expected, since although they use the same chips (Opteron 250s) , the ZXTM 7000 figures were obtained in a previous benchmarking session using the Spirent Avalanche product as the load generator instead of Zeusbench.

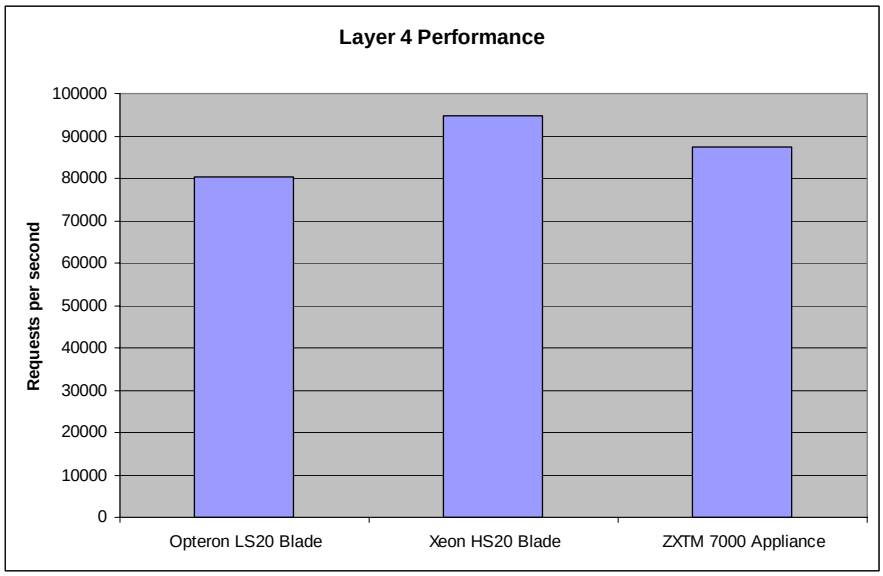
SSL Transactions

A standard maximum SSL transactions per second test was conducted against both the HS20 and LS20 blades. The performance of the Opteron based blades was within 2% of the 7000 appliance.



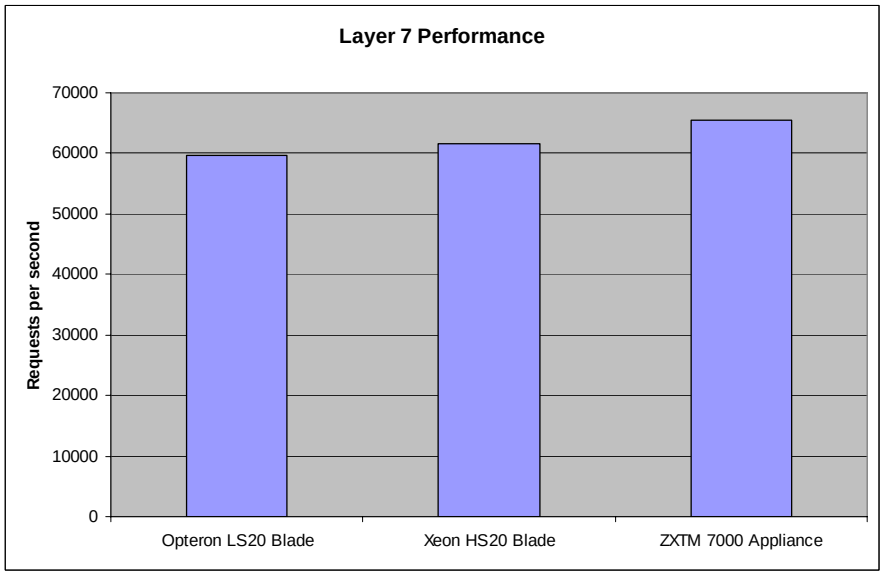
Layer 4 Performance

The layer 4 performance test measures the number of HTTP requests per second, with HTTP keepalives enabled, that can be sustained with all HTTP protocol parsing disabled in ZXTM. As can be seen, both the Intel and AMD blades performed well.



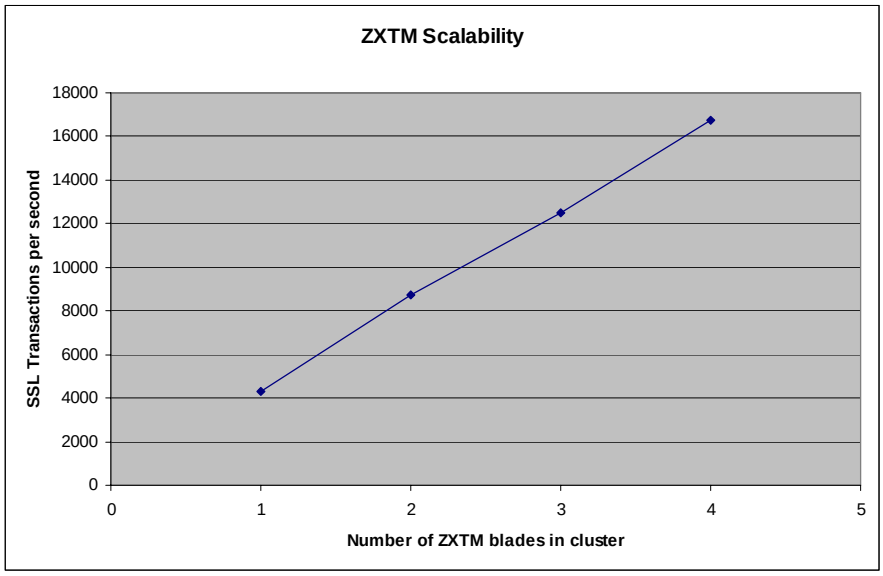
Layer 7 Performance

This test measures the maximum number of HTTP requests per second that can be sustained when ZXTM is parsing HTTP. Very similar results were obtained for both the AMD and Intel based blades, within 9% of the ZXTM 7000 appliance performance.



Horizontal Scalability

ZXTM was installed on four of the LS20 blades. The SSL transactions per second benchmark was then run several times, each time adding a new blade to the ZXTM cluster under test, in order to determine how well the blades scaled horizontally. Previous independent benchmarks conducted by Broadband Testing[1] had shown that the performance of a ZXTM cluster scales linearly with the number of ZXTM appliances in a cluster. As can be seen from the graph below, the same results were obtained for the blades.



[1] "Broadband Testing: ZXTM 3.1 with v4 Highlights". See the Useful Links section below.

ZXTM software features complementary to blades

This section examines those features of ZXTM that are particularly useful or advantageous when it is being deployed on blade servers.

Ease of integration with provisioning and management systems

ZXTM has a SOAP/XML API that permits it be configured and controlled by external programs. This makes it possible to integrate ZXTM with blade provisioning and management systems, so that when, for example, a new application server is provisioned, it is added automatically to a load balancing pool in ZXTM.

ZXTM's comprehensive SNMP output gives the administrator complete visibility of the performance of both the ZXTM cluster and the pools of servers to which it is managing traffic. Its Service Level Monitoring capability raises alerts when the response times of services exceed the configured thresholds, allowing you time to take effective action before users begin to experience delays or outages.

ZXTM's traffic shaping and prioritization features provide a powerful set of tools to ensure the availability and responsiveness of your business critical applications. Read the Zeus white paper "Traffic Valuation and Prioritization with ZXTM" for further details.

Deploy natively or in virtualized environments

Blade servers are ideal platforms for virtualization using tools such as VMware and Xen. Not only can ZXTM be run directly on a blade, it can also be run inside a virtual machine and is available as a virtual appliance for VMware (ZXTM VA, see Useful Links section below) allowing you to extend the ease of management and control that virtualization gives your applications to your traffic management solution as well.

Conclusion

ZXTM performance is as high and as scalable when running on blade servers as it on conventional hardware, and it is therefore ideally suited for managing traffic in a blade environment. ZXTM's SNMP capability and SOAP API allow it to be integrated with blade management systems and provisioning systems.

Useful Links

Zeus White Papers:
www.zeus.com/news/white_papers

Traffic Valuation and Prioritization with ZXTM Paper:
www.zeus.com/news/pdf/white_papers/traffic_valuation_prioritization.pdf

ZXTM Virtual Appliance (ZXTM VA):
www.zeus.com/products/zxtmva/

Broadband-Testing: ZXTM 3.1 with v4 Highlights
www.zeus.com/news/pdf/white_papers/broadband-testing_zxtm31_scalability.pdf

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Our web site contains a wealth of information on our products, services and solutions, as well as customer case studies and press information. For more information, please visit http://www.zeus.com/.

knowledgehub.zeus.com

The ZXTM KnowledgeHub is a key resource for developers and system administrators wishing to learn about ZXTM and Zeus' Traffic Management solutions. It is located at http://knowledgehub.zeus.com/.