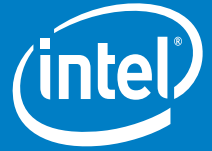


# Intel® Xeon® Processor 5500 Series plays a leading role in a MMOG gaming software by Kingsoft



Accelerating online gaming adoption with the help of Intel® Xeon® Processor 5500 Series

As leading game development software companies evolve from smaller dedicated servers to efficient data centers, they are using virtualized solutions to reduce time to market, increase their competitive advantage, and accelerate innovation. Kingsoft's product development and support operations are focused on enhancing the user experience of its customers. Kingsoft JX Online III is its new generation of Massively Multiplayer Online (MMOG) game that can support hundreds or thousands of players simultaneously. Kingsoft JX Online III Game Server is developed using C/C++.

Now Kingsoft JX Online III and Intel® Xeon® processor-based servers bring the full power, performance, and scale of online gaming to the mainstream, making the benefits of these applications more available and affordable than ever.

## Introduction

As online gaming enters the mainstream, system requirements are moving beyond pure performance. One of the key problems with regard to online gaming is to meet the growing demands of the online gaming membership. After 3 years development, Kingsoft released its JX Online Closed Alpha version in 2003. The game was created by the Season Studio based on traditional Chinese Kung Fu culture during the Southern Song Dynasty Period when China fought against the invaders from Jin. In 2005, Kingsoft released "JX Online II". The sequel presented martial arts culture using Dynamic Motion Capture to create life-like body movements. Since April 2006, "JX Online II" has been operating in Taiwan, Hong Kong, Singapore, Vietnam, Malaysia and other overseas regions. The coming sequel to the JX Series "JX Online III" is expected to be released soon and will benefit from the processing capabilities of the next generation Intel® Xeon® processor 5500 series.

## Product Overview

The key challenges that faced Kingsoft with its JX Online III included improving the response time of game servers, providing isolation and increasing the number of concurrent users within the virtual gaming world. Today's popular online games handle over 100,000 concurrent users. Because of extraordinarily high growth rates in its user base, Kingsoft needed robust and high performing systems that could scale accordingly while being watchful for the perils of server sprawl, power and cooling costs and system management complexity.

With the advent of the next generation Intel® Xeon® processor 5500 series based platforms and with Microsoft\* Hyper-V based virtualization solution, Kingsoft's online gaming challenges can be resolved.

## Key Challenge

To meet "high performance" demands, the Intel® Xeon® processor 5500 series maximizes performance, improves throughput, and adds new embedded technologies that give business, creative, and scientific professionals the tools to solve problems faster, process larger data sets, and meet bigger challenges.

With intelligent performance, a new high-bandwidth interconnect architecture, and greater memory capacity, platforms based on the Intel® Xeon® processor 5500 series deliver. Servers based on the Intel® Xeon® processor 5500 series have up to 8 computation engines, 16 threads per 2-socket platform with Intel® Hyper-Threading Technology, and more bandwidth than previous generations.

*"The new Intel® Xeon® processor 5500 series is really an important update in server platforms. Kingsoft JX Online III, the next generation online game, obtains a 1.98x performance speed up on a quad-core Intel® Xeon® processor 5500 series over a quad-core Intel® Xeon® processor 5440 series. The testing result indicates that Intel® Xeon® processor 5500 series is certainly one of the most preferable platforms for our online gaming."*

*Chen FeiZhou, VP of Kingsoft*

Dual-processor technical compute server platforms based on the Intel® Xeon® processor 5500 series feature Intel® QuickPath Technology, a new, scalable, shared memory architecture that integrates a memory controller into each microprocessor and connects processors and other components with a new high-speed interconnect, proving the data bandwidth to keep each core running at capacity. Intel® Turbo Boost Technology boosts performance even further for critical workloads by adapting core frequency to increase execution speed as needed (while Intel® Intelligent Power Technology conserves power on cores where there is less demand). For applications that lend themselves to parallel, multi-threaded execution, Intel® Hyper-Threading Technology reduces computational latency, making optimal use of every cycle.

In addition, Intel® Intelligent Power Technology delivered better performance with lower power consumption at all operating points, delivering as much as 1.89x<sup>2</sup> more performance in a similar power envelope.

Intel engineers worked closely with Kingsoft engineers to optimize the JX Online III software stack to take advantage of Intel® Xeon® processor 5500 series features like Intel® Turbo Boost Technology, Intel® Hyper-Threading Technology, and Intel® Virtualization Technology.

These results translate to Kingsoft JX Online III software being able to support more concurrent users within the response time window of less than 12 milliseconds.

Intel® Xeon® Processor 5500 Series	
Intelligent Performance	Intel® Turbo Boost Technology delivers performance on demand, letting processors operate above the rated frequency to speed specific workloads Greater bandwidth from Intel® QuickPath Technology with new inclusive L3 cache Intel® Hyper-Threading Technology benefits from larger caches and massive memory bandwidth, delivering greater throughput and responsiveness for multi-threaded applications Up to 78 lanes configurable PCIe (72 lanes PCIe gen 2) Larger memory support (up to 144 GB)
Extended Page Tables	Increased efficiency in translation between physical and virtual memory dramatically improves virtualized performance
Throughput enhancements	New microarchitecture and redesigned memory subsystem provide headroom
Next-generation Intel® Virtualization Technology	Expanded set of hardware features helps virtualization provide the basis for expanded efficiency and performance

### How Intel Benefited Kingsoft

The Intel® Xeon® processors with Intel® Virtualization Technology provided better performance per watt and performance per unit price options for Kingsoft. Intel® Microarchitecture, codenamed Core™ delivered better performance on multiple application types at substantially reduced power consumption levels, which helped Kingsoft to improve the data center density and lower power costs.

Using Windows\* Hyper-V™ and the Intel® Xeon® processor 5500 series, Kingsoft was able to achieve 1.98x<sup>1</sup> better performance when compared to the Intel® Xeon® processor E5540 series.

“Our benchmarks show that running our on-line gaming system in a Hyper-V virtualization environment on Intel® Xeon® processor 5500 series based servers virtually doubles performance. With their higher performance, consolidation headroom, and energy efficiency, these new Intel® Xeon® processors and Hyper-V will help us reduce our carbon footprint, save on power costs, and let us grow our business a lot further with our existing data centers.”

Chen FeiZhou, Vice President, Kingsoft

## Summary

Kingsoft benefitted in many ways:

- It allowed them to configure and size Kingsoft JX Online III Game Server in a virtualized environment
- Allowed them to compare different platforms
- Enabled Proof-of-concept scenarios
- Provide an outlook for future performance levels (new platforms, new servers, and many others)

Windows\* Hyper-V and the Intel® Xeon® processor 5500 series with Intel® Intelligent Power Technology delivered exceptional virtualization efficiency and flexibility, enabling Kingsoft to achieve maximum benefits.

The goal of the Kingsoft solution went beyond consolidation and having the ability to provide business continuity under unexpected spikes in customer demand. While the virtualization solution provided very comparable performance to native performance, it also helped Kingsoft achieve a higher responsiveness, greater flexibility in meeting all their virtualization goals, plus lower TCO through higher consolidation ratios and energy efficiency.

## Spotlight:

- Kingsoft is a leading online game and applications software developer and distributor in China.
- Kingsoft offers a portfolio of online games, information security software, including anti-virus, anti-spy and firewall software, utility products, including dictionary, translation and other consumer software, and office applications software, including word processing, spreadsheet and presentation software.
- Kingsoft leverages their comprehensive software development platform to offer a wide range of innovative entertainment and applications software.
- Kingsoft also utilizes the Internet as an efficient and relatively secure channel to market and distribute our existing and new software products.

To read more about virtualization solutions from Intel and Microsoft, visit [www.intellalliance.com/microsoft/virtualization](http://www.intellalliance.com/microsoft/virtualization)

To learn more about the Intel® Xeon® processor 5500 series, visit <http://www.intel.com/products/processor/xeon/>

To find out more about Microsoft\* Hyper-V, visit <http://www.microsoft.com/hyper-v/>

For more information about Intel® Microarchitecture Nehalem, visit [www.intel.com/technology/architecture-silicon/next-gen](http://www.intel.com/technology/architecture-silicon/next-gen)

1 Source: Intel and Customer measurements, February 2009. Intel Xeon Processor X5560, 2.8GHz; 12 GB, 6x2GB DDR3-1066 vs. Intel Xeon Processor E5440, 2.83GHz; 12GB, 6x2GB DDR2-667 FB

2 Source: Intel and Customer measurements, February 2009. Intel Xeon Processor X5500 series, 2.8GHz; 12 GB, 6x2GB DDR3-1066 vs. Intel Xeon Processor E5400 series, 2.83GHz; 12GB, 6x2GB DDR2-667 FB (PPW)

Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See [www.intel.com/products/processor\\_number](http://www.intel.com/products/processor_number) for details.

Intel may make changes to specifications and product descriptions at any time, without notice.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit <http://www.intel.com/performance/resources/limits.htm> or call (U.S.) 1-800-628-8686 or 1-916-356-3104.

Intel, processors, chipsets, and desktop boards may contain design defects or errors known as errata, which may cause the product to deviate from published specifications.

Current characterized errata are available on request.

Copyright © 2009 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel VTune and Intel Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Except as provided in Intel's Terms and Conditions of Sale such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Intel products are not intended for use in medical, life saving, life sustaining, critical control or safety systems, or in nuclear facility applications. Intel may make changes to specification and product descriptions at any time, without notice.

Information regarding third party products is provided solely for educational purposes. Intel is not responsible for the performance or support of third party products and does not make any representations or warranties whatsoever regarding quality, reliability, functionality, or compatibility of these devices or products.

Copyright © 2009, Intel Corporation. All rights reserved. Intel, the Intel logo, and Xeon are trademarks of Intel Corporation in the U.S. and other countries.

Copyright © 2009 Microsoft Corporation, One Microsoft Way, Redmond, Washington 98052-6399 U.S.A. All rights reserved

Kingsoft and Kingsoft logo are trademarks of Kingsoft Software CO, LTD.

\*Other names and brands may be claimed as the property of others.