



Solution Brief  
Intel® Xeon® Processor 5600  
Parallels Server 4 Bare Metal\*

# Breakthrough Security Capabilities and Energy-Efficient Performance for Cloud Computing Infrastructures

## Parallels Server 4 Bare Metal\* and Intel® Xeon® processor 5600 series-based servers

Cloud service providers are on the cutting edge of IT service delivery, which provides both tremendous opportunity and significant challenges. The Intel® Cloud Builder Program can help. This program brings Intel scientists and engineers together with leading cloud researchers, service providers and independent software vendors (ISVs) to identify needs, develop new technologies and solutions, and deliver optimized reference architectures and documented best practices. Service providers can take advantage of these resources to expand their cloud infrastructures more quickly and with less effort.

As part of this program, Intel and Parallels have been working together to deliver better infrastructure building blocks and to simplify the deployment of Parallels Server 4 Bare Metal\* virtualization software on the latest Intel® Xeon® processor 5600<sup>A</sup> series-based servers. This cloud-optimized virtualization platform offers:

- **Significant gains in energy-efficient performance** versus previous-generation servers so you can support more customers and heavier workloads with lower operating costs.
- **Policy-based power management** at the server, rack and data center levels to help you reduce power consumption and improve rack densities without sacrificing performance.
- **Highly flexible virtualization**, with support for Linux\* containers and hypervisor-based virtual machines running simultaneously on the same physical server, so you can optimize your hardware and software environments without limiting OS flexibility.
- **Fundamental security improvements** for multi-tenant cloud environments with Intel® Trusted Execution Technology<sup>1</sup> (Intel® TXT) and a forthcoming update to Parallels Server 4 Bare Metal.

### Multi-Level Improvements in Energy-Efficient Performance

The Intel Xeon processor 5600 series provides up to 45 percent<sup>1</sup> higher performance per watt than the previous-generation Intel Xeon processor 5500 series to help you support more customers and heavier workloads, while maintaining or even reducing associated power consumption. With up to 12 processor cores and 24 execution threads per two-socket server, you can also allocate processing resources more flexibly, which may allow you to support significantly more containers or virtual machines per server, depending on workloads and policies.

These new processors also provide integrated support for the Intel® Intelligent Power Node Manager, which enables dynamic power and thermal monitoring and policy-based power management for individual servers, for racks of servers and for whole data centers. It can help you right-size your power and cooling infrastructure and increase density without compromising application performance and service delivery. In proof-of-concept implementations, it has helped Intel customers reduce power consumption per server by up to 70 watts and improve rack densities by as much as 40 to 60 percent<sup>2</sup>

## Flexible Virtualization Helps You Extend Your Service Offerings

Parallels Server 4 Bare Metal supports both OS virtualization (Linux containers) and hypervisor-based virtualization (virtual machines) on the same physical server, and lets you manage both with a single, integrated management environment. This provides the most flexible virtualization platform available today, as you can run a highly dense set of Linux containers for a specific workload, such as a LAMP<sup>3</sup> stack, and also deploy Linux and Windows\* virtual machines for applications that need kernel-level access.

- **OS virtualization** lets you host multiple applications in isolated containers running on a single OS version. It typically provides significantly better performance than a dedicated physical server for applications that are not multi-threaded, which can help maximize consolidation ratios across the larger number of cores now available per server. It also simplifies the software environment to reduce maintenance costs.
- **Hypervisor virtualization** lets you host multiple Linux and Windows OSs on the same physical server, with up to 12 virtual CPUs and 64 GB of memory per virtual machine. In tandem with Intel® Virtualization Technology<sup>4</sup> (Intel® VT), it delivers near-native performance, even for I/O-intensive applications. It also supports dynamic resource allocation and virtual machine migration.

## A Better Foundation for Multi-Tenant Security

Strong security safeguards are imperative for cloud service providers seeking to attract new customers and workloads. The Intel Xeon processor 5600 series offers enhanced protections with integrated support for Intel TXT. With a forthcoming version of Parallels Server 4 Bare Metal, this new technology will provide cryptographic verification that your core virtualization platform – from the BIOS to the host OS or hypervisor – always launches into a known good state, free from “rootkits” or other malicious or inadvertent tampering. It fills a critical hole in cloud security to help you establish a more trusted pool of virtualized resources. By restricting critical workloads to Intel TXT-enabled servers (during both deployments and live migrations), you will be able to provide stronger security assurances for your customers.

The Intel Xeon processor 5600 series also supports Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI), which includes new instructions that help to accelerate the processing of AES encryption algorithms. As software support emerges, service providers will be able to implement encryption to protect customer data on hard drives and during transmission with far less performance impact. This will help eliminate the historical dilemma of having to choose between security and performance for high-volume data processing.

With Parallels Server 4 Bare Metal running on Intel Xeon processor 5600 series-based servers, you get today’s most flexible virtualization platform, along with exceptional performance and energy-efficiency. You also lay a hardware foundation for more secure processing. There is simply no better platform available today for building out a flexible, high-performance and cost-effective cloud infrastructure.

## Learn More

Intel® Cloud Builder Program: [www.intel.com/software/cloudbuilder](http://www.intel.com/software/cloudbuilder)

Parallels Server 4 Bare Metal: [www.parallels.com/products/server/baremetal](http://www.parallels.com/products/server/baremetal)

Intel® Xeon® processor 5600 series: [www.intel.com/itcenter/products/xeon/5600/index.htm](http://www.intel.com/itcenter/products/xeon/5600/index.htm)

<sup>1</sup> Source: Internal Intel measurements on the Intel® Xeon® processor X5670 versus the Intel Xeon processor X5570 on the industry-standard SPECpower benchmark, which measures server side java performance in conjunction with power consumption across a load line.

<sup>2</sup> For details, see the Intel white papers: Preserving Performance While Saving Power Using Intel® Intelligent Power Node Manager and Intel® Data Center Manager ([http://software.intel.com/sites/datacentermanager/node\\_manager\\_white\\_paper\\_bmw.pdf](http://software.intel.com/sites/datacentermanager/node_manager_white_paper_bmw.pdf)) and Intelligent Power Optimization for Higher Server Density Racks ([http://software.intel.com/sites/datacentermanager/intel\\_node\\_manager\\_v2e.pdf](http://software.intel.com/sites/datacentermanager/intel_node_manager_v2e.pdf)).

<sup>3</sup> LAMP is a common acronym for an open-source software solution stack based on Linux, Apache, MySQL and a scripting language, such as PHP (PHP: Hypertext Preprocessor), Python or Perl.

<sup>4</sup> 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.

<sup>5</sup> No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology is a security technology under development by Intel and requires for operation a computer system with Intel® Virtualization Technology, an Intel Trusted Execution Technology-enabled processor, chipset, BIOS, Authenticated Code Modules, and an Intel or other compatible measured virtual machine monitor. In addition, Intel Trusted Execution Technology requires the system to contain a TPMv1.2 as defined by the Trusted Computing Group and specific software for some uses. See <http://www.intel.com/technology/security/> for more information.

<sup>6</sup> Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain platform software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

This document and the information given are for the convenience of Intel’s customer base and are provided “AS IS” WITH NO WARRANTIES WHATSOEVER, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. Receipt or possession of this document does not grant any license to any of the intellectual property described, displayed, or contained herein. 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 specifications, product descriptions and plans at any time, without notice.

Copyright © 2010 Intel Corporation. All rights reserved. Intel, the Intel logo, and Xeon are trademarks of Intel Corporation in the U.S. and other countries.

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

