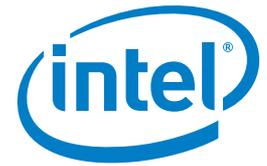


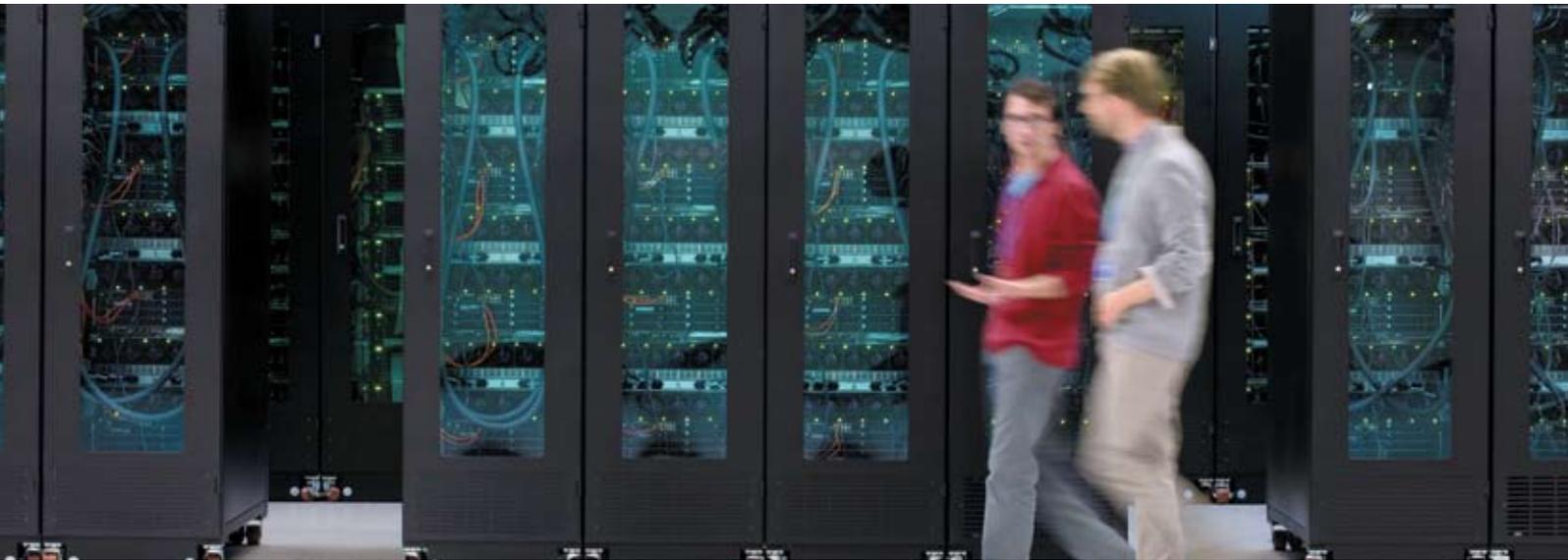
SOLUTION PROFILE

Intel® Xeon® Processor E7 Family

SUSE* Linux Enterprise Server 11



Mission-Critical Platform Innovation from Intel and SUSE



Build a highly reliable, scalable, and efficient infrastructure for your mission-critical applications with SUSE* Linux Enterprise Server 11 and industry-standard hardware featuring the Intel® Xeon® processor E7 family. Meet today's challenges with headroom to spare for future needs. Protect your business with state-of-the-art security, while also protecting your bottom line with excellent energy efficiency.

Solution provided by:



For nearly 20 years, Intel and SUSE have been delivering open-standards-based solutions that provide outstanding performance, reliability, and efficiency for both virtualized and non-virtualized server workloads. The latest engineering collaboration between Intel and SUSE introduces breakthroughs in innovation, value, and optimization of SUSE Linux Enterprise Server 11 for the Intel Xeon processor E7 family:

- **SUSE Linux Enterprise Server** is a highly reliable, scalable, and secure server OS, built to power mission-critical workloads in physical, virtual, and cloud environments. With this affordable, interoperable, and manageable open source foundation, you can cost effectively deliver core business services, enable secure networks, and easily manage your heterogeneous IT infrastructure, maximizing efficiency and value. Optional extensions deliver advanced capabilities and allow customers to deploy just what they need, keeping costs low and value high. SUSE Linux Enterprise Server 11 exposes the latest mission-critical hardware capabilities in the Intel Xeon processor E7 family.
- **The Intel Xeon processor E7 family** provides an excellent hardware platform for mission-critical computing. With up to 10 cores (20 threads), support for up to 2 TB RAM per four-socket system,¹ and 30 MB last-level cache, it breaks new ground in scalable performance. Features such as Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI), Double Device Data Correction (DDDC), and Partial Memory Mirroring provide excellent reliability and security, while Intel® Intelligent Power Technology² and low-voltage DIMM support³ deliver very high energy efficiency. These features are enabled in SUSE Linux Enterprise Server 11.

Scalable Performance for the Next Generation of Enterprise Computing

Demanding enterprise applications thrive on the scalable performance delivered by SUSE Linux Enterprise Server and the Intel Xeon processor E7 family. This latest large-scale SUSE and Intel solution stack helps drive up the number of transactions that can be handled per server, which in turn may allow you to buy fewer servers and lower both capital and operating expenses.

SUSE Linux Enterprise Server 11 and the latest Intel Xeon processors take advantage of the extensive contributions to the Linux kernel made by both Intel and SUSE. The result is a highly optimized set of hardware and software technologies that deliver excellent results for customers, with high throughput, low latency, and the ability to dynamically adapt to changing workload conditions.

SCALABLE PERFORMANCE FROM INTEL AND SUSE	
Hardware Performance Features: Intel® Xeon® Processor E7 Family	Software Performance Features: SUSE® Linux Enterprise Server 11
<ul style="list-style-type: none">▪ Increased parallelism. Enhances multi-threaded performance with 10 cores (20 threads), 30 MB of shared cache per processor, and Intel® Hyper-Threading Technology.▪ Four improved Intel® QuickPath Interconnect. Increase processor-processor and processor-memory data-transfer frequency compared to predecessors.▪ Intel® Turbo Boost Technology. Lets cores briefly operate above the Thermal Design Point to help handle peak demands.▪ Intel® Advanced Vector Extensions. Improve performance for demanding workloads such as business intelligence and real-time analysis.	<ul style="list-style-type: none">▪ Designed for scalability. Support for up to 4,096 CPUs, 16 TB of RAM, and 8 EB file sizes.▪ Large file systems. Commercial support for highly scalable XFS and clustered OCFS2, in addition to EXT3 and ReiserFS.▪ High-speed interconnects and fabrics. Enables open interconnect technologies such as InfiniBand* and 10 GbE for throughput- and latency-sensitive workloads.▪ Remote Direct Memory Architecture (RDMA) and Fibre Channel over Ethernet (FCoE) support. Delivers cost-effective data sharing among networked devices.▪ Enhanced tracing, tuning, and debugging tools. Significantly improves platform control to increase performance.

The Intel Xeon processor E7 family delivers world record four-way and eight-way processor performance that enables more transactions per server for scalable, data-demanding enterprise applications. SUSE Linux Enterprise Server 11 builds on Linux's reputation as a high-performance, reliable OS with advanced memory management, multi-pathing, and I/O capabilities, coupled with support for high-speed interconnects and multi-threaded file systems.

Using an enhanced and tuned 2.6.32-based Linux kernel for optimal performance, the latest service pack for SUSE Linux Enterprise Server 11 supports more than 16 TB of RAM on certified systems and implements NUMA (non-uniform memory access) to augment memory throughput and enhance scalability.

Advanced Reliability and Security for Mission-Critical Applications

The Intel Xeon processor E7 family and SUSE Linux Enterprise Server 11 are an excellent platform for reducing the capital and operating costs associated with mission-critical applications. Taking advantage of large-volume manufacturing and open source software, this platform is now a better alternative than ever to higher-cost proprietary architectures such as UNIX* on RISC.

A broad spectrum of reliability, availability, and serviceability (RAS) features provides the basis for mission-critical reliability, including Machine Check Architecture Recovery, which enables the OS to handle machine check exceptions raised by the hardware, keeping the system online in the presence of otherwise uncorrectable errors. The combination of hardware and software capabilities can automatically monitor, report, and recover from many hardware errors to maintain data integrity and keep services online.





ADVANCED RELIABILITY AND SECURITY FROM INTEL AND SUSE

Hardware Energy-Efficiency Features: Intel® Xeon® Processor E7 Family	Software Energy-Efficiency Features: SUSE* Linux Enterprise Server 11
<ul style="list-style-type: none"> ▪ Machine Check Architecture Recovery. Works with the OS to recover from otherwise-unrecoverable memory errors. ▪ Double Data Device Correction (DDDC). Enables recovery from two simultaneous DRAM device failures, helping maximize uptime. ▪ Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI). Increases security by significantly reducing the performance penalties often associated with pervasive encryption. ▪ Intel® Trusted Execution Technology. Verifies the integrity of software components, for a trusted execution environment. 	<ul style="list-style-type: none"> ▪ SUSE Linux Enterprise High Availability Extension. Simplifies cluster configuration, deployment, and management. ▪ Swap-over NFS. Supports using NFS (network file system) over IP to enable the use of centralized network-based storage. ▪ Device Mapper MPIO. Enables redundant connections of systems to SANs, improving reliability. ▪ Control groups. Management of CPU, memory, storage, and networking resources for more fine-grained control over the environment. ▪ RAID 6 and 10 support. Extends software striping and mirroring RAID capabilities.

SUSE Linux Enterprise High Availability Extension extends mission-critical capabilities even further. This integrated suite of open source clustering technologies helps customers maintain business continuity, protect data integrity, and reduce unplanned downtime. The solution includes a policy-driven cluster resource manager, DRBD (distributed replicated block device) data replication, a highly scalable clustered logical volume manager, and a cluster-aware file system (OCFS2).

Automated Energy Efficiency to Help Contain Operating Costs

SUSE Linux Enterprise Server 11 and the Intel Xeon processor E7 family work together to automatically regulate power consumption, delivering dramatically better performance per watt compared to that of previous generations. Intel® Intelligent Power Technology lowers energy costs by automatically putting processor cores and memory into the lowest available power state that can meet the performance requirements of the current workload.

SUSE Linux Enterprise Server 11 is highly optimized for Intel Intelligent Power Technology, dynamically reducing platform power in response to workloads, and it provides a broad array of other software-based, power-saving features. Together, these capabilities reduce energy use in the data center through lower server power consumption and decreased cooling requirements, which combine to aid the bottom line.

The energy efficiency of solution stacks based on SUSE Linux Enterprise Server 11 and the Intel Xeon processor E7 family helps companies save money on energy costs, even as they meet their green IT goals. Optimized for the latest energy-saving hardware and software technologies, these solutions help you save money now, as well as in the future.

AUTOMATED ENERGY EFFICIENCY FROM INTEL AND SUSE	
Hardware Energy-Efficiency Features: Intel® Xeon® Processor E7 Family	Software Energy-Efficiency Features: SUSE* Linux Enterprise Server 11
<ul style="list-style-type: none"> ▪ New 32-nanometer process technology. Enables higher performance at a given thermal design point, relative to predecessor platforms. ▪ Automated low-power states. Allows the platform to change automatically among operating power states with very low latency. ▪ Integrated power gates. Allows processor cores to power down individually and consume nearly zero power when idle. ▪ Power-efficient memory subsystem. Includes support for low-power memory and the option for new low-voltage memory buffers. 	<ul style="list-style-type: none"> ▪ Improved utilization of low power states. Support for Linux* kernel tickless idle to eliminate unnecessary timer events and help reduce exits from low power states. ▪ Granular file-based power profiles. Helps IT administrators more efficiently administer enterprise-wide power management. ▪ Built-in virtualization. Increases server utilization and reduces your data center footprint with commercially supported open source Xen* and KVM virtualization hypervisor technologies.

Plan Now for Your Next Generation of Business Success

SUSE Linux Enterprise Server 11 and the Intel Xeon processor E7 family drive synergies that can take your IT to the next level of scalable performance and advanced reliability, security, and energy efficiency. Decades of collaboration deliver a robust infrastructure that helps you prepare your business for a successful future.

Learn More:

Intel® Xeon® processors: www.intel.com/xeon

SUSE* Linux Enterprise 11: www.suse.com

Open Source at Intel: www.intel.com/opensource

¹ Up to 64 slots per standard 4 socket system x 32 GB/DIMM = 2 TB.

² Uses similar core and package C6 power states enabled on Intel® Xeon® processor 5500 and 5600 series. Requires OS support.

³ Savings dependent on workload and configuration. Example: At 100-percent SPECpower* load it can save ~0.8W for 4-GB DIMM DRx8 based on early Intel internal estimates.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR 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.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark* and MobileMark*, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>.

Intel products are not intended for use in medical, life saving, life sustaining, critical control or safety systems, or in nuclear facility applications. Performance will vary depending on the specific hardware and software used. All plans, dates, features, pricing, and information are subject to change without notice. Intel internal testing and estimate. Power consumption will vary depending on the specific hardware and software used. Individual service times and prices may vary depending on the specific hardware and software used.

Intel, the Intel logo, Xeon, and Xeon inside are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds.

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

Copyright © 2011 Intel Corporation. All rights reserved. 0811/NKR/MESH/PDF 325241-002US

