A Powerful Foundation for the Data–Driven Enterprise

SQL Server* 2014 and Intel® architecture deliver a fully-integrated data platform for in-memory computing and real-time business intelligence.

Today’s growing flood of business data represents one of the most potent business opportunities of our time. With the emergence of in-memory computing, distributed big data analytics and self-service business intelligence, companies have powerful new tools for storing and analyzing massive amounts of diverse data, and for injecting deep insight into real-time business processes.

Many businesses are trying to capitalize on this opportunity by deploying multiple point solutions to address specific needs. Microsoft SQL Server* 2014 running on Intel® Xeon® processor-based servers offers an alternative: a modern, fully-integrated data platform optimized for in-memory performance, big data integration, self-service analytics, comprehensive data management, and cloud extensibility.

This comprehensive, mission-critical data platform delivers the next-generation capabilities you need in a platform you can trust. Just as importantly, it provides cost models and IT efficiencies that can free your organization to focus on what matters most—delivering the data and insights you need to drive better outcomes for your most important processes.
Deliver Dramatic Performance Gains with In-Memory Computing

SQL Server 2014 is optimized for in-memory computing across all workloads. In combination with servers powered by Intel Xeon processors, these technologies have demonstrated up to 30x performance gains for online transaction processing (OLTP) workloads and average gains of 10x for data analytics workloads (with gains as high as 100x in some analytics environments). An In-Memory OLTP engine is fully-integrated into SQL Server 2014. By moving performance-critical data tables into memory-optimized structures, you can provide targeted performance where you need it most. You can achieve still higher gains by recompiling stored procedures into machine code to take better advantage of the advanced hardware capabilities of the latest Intel Xeon processors.

The In-Memory Column Store Index in SQL Server 2014 provides dramatic performance gains for analytic workloads. Columnar data tables are more efficient for analytics than traditional row-based tables. They provide faster access to large data sets and enable much higher data compression ratios—up to 15x higher in Microsoft SQL Server Parallel Data Warehouse. This reduces storage requirements and improves performance and scalability even more by retaining more data in main memory.

Scale Easily to Support Your Most Demanding Workloads

Information excellence begins with mission-critical database systems. The Intel Xeon processor E7 v2 family delivers breakthrough capability for in-memory computing in SQL Server environments, with up to 60 cores, 120 threads, and 4 terabytes (TB) of memory per four-socket server. These processors also provide up to four times the I/O performance of prior generation processors. Intel tests have shown that these advances deliver roughly 2x higher performance across a wide range of traditional applications compared with prior-generation servers, so you can expect significant performance gains for all your database workloads, whether you run them in memory or from disk (see the sidebar, World-Record Database Performance). These servers also provide up to 80 percent higher performance than comparable RISC-based solutions, with up to 80 percent lower total cost of ownership.

You can use solid state drives to help unleash the full potential of these processors. SQL Server 2014 lets you use one or more SSDs as a “buffer pool extension.” Your most frequently used data is automatically moved onto these high-bandwidth, low-latency drives, yet you can still scale storage capacity using low-cost mechanical drives. The Intel® Solid State Drive S3700 Series provides an

A Comprehensive, Next–Generation Data Platform

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- Mission-critical support with the Intel® Xeon® processor E7 v2 family
- Efficient and flexible performance with the Intel® Xeon® processor E5 v2 family
- Low-latency storage with Intel® Solid State Drives
- High-performance, unified networking with 10 Gigabit Intel® Ethernet Converged Network Adapters

SQL Server 2014 running on Intel architecture provide a fully-integrated, enterprise-class data platform with comprehensive support for next-generation capabilities, such as in-memory computing, self-service BI, and hybrid-cloud extensibility.
ideal way to take advantage of this new capability, providing exceptional performance and reliability, with end-to-end protection against data loss and corruption.

Keep Your Data Flowing—and Your Business Running
Mission-critical data must be available at all times. SQL Server, Windows Server® and the Intel Xeon processor E7 family help you meet this need without the exorbitant costs of traditional tier-1 solutions. For several years now, this platform has been delivering uptime levels equivalent to those of best-in-class RISC/UNIX platforms. The Intel Xeon processor E7 v2 family takes reliability to new heights with Intel® Run Sure Technology®, which includes more than 40 reliability features to improve data integrity and system uptime. Intel and Microsoft have worked together to provide optimized support for these features throughout the solution stack. SQL Server also supports fast, automated failover across multiple sites using AlwaysOn Availability Groups. You can configure up to eight secondary databases, and all secondaries can be used for read-only workloads, such as queries and backups. For more information, see the Intel white paper, “Mission-Critical Reliability at Mainstream Prices,” at intel.com/content/www/xa/en/mission-critical/misson-critical-xeon-e7-microsoft-sql-server-brief.html.

Optimize Capability versus Cost throughout Your Infrastructure
Not all databases require the mission-critical capability of the Intel Xeon processor E7 v2 family. Smaller servers based on the Intel Xeon processor E5 v2 family offer similar benefits throughout your information infrastructure, with excellent performance, availability, and energy-efficiency tailored to the needs of smaller databases. Altogether, the breadth and depth of available server configurations on Intel architecture gives you the flexibility to tailor your infrastructure to match your performance and availability needs at every point, while maintaining a unified hardware and software infrastructure.

The Intel and Microsoft Data Platform in Action

World Record Database Performance

SQL Server 2014 and the Intel Xeon processor E7 v2 family offer industry-leading performance for demanding enterprise workloads, even if you choose not to run them using in-memory acceleration. The combined platform has achieved the best results published to date for the industry standard TPC-E benchmark running on both four-socket and eight-socket server configurations. It has also achieved the best results to date for the 3 TB and 10 TB TPC-H benchmarks.

The Intel and Microsoft Data Platform in Action

Faster Insights from Any Data
A software vendor for the energy and utilities industry is helping its customers capture, store, and analyze massive, smart–meter data flows in real time to create innovative new business opportunities.

Read the Microsoft Case Study at microsoft.com/casestudies/Microsoft-SQL-Server-2012/Ferranti-Computer-Systems/Utilities-ISV-Scales-to-Meet-Customer-Needs-for-Storage-and-Analysis-of-Big-Data/710000003000

Strengthen Security and Compliance to Reduce Your Risk
Data security has become more challenging—and more critical—than ever before. SQL Server has been named the least vulnerable database for each of the last five years. It provides transparent data encryption and granular access controls that are tightly integrated with Windows Server®, Active Directory®, and Microsoft SharePoint®. SQL Server 2014 also provides consistent security and compliance functionality across all versions to help you provide better coverage with less effort.

Intel architecture complements and strengthens these protections with hardware-assisted security functionality in both servers and client systems. You can use Intel® Data Protection Technology with AES-NI and Secure Key to accelerate and strengthen encryption, so you can protect your data without slowing performance. You can also implement two-factor authentication for your client systems, and automatic lock-downs for lost or stolen devices. With these protections, you can share and use data more widely and with less risk.

Integrate All Your Data—Big and Small—for Enterprise-Wide Analytics
SQL Server 2014 is designed to support all data types and data sources, including both traditional structured data and unstructured big data, such as web logs, blogs, social networking posts, sensor data, and more. All data types are treated as first-class citizens that can be managed, processed, and protected using the enterprise-class tools that are built into SQL Server.
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massive scalability for aggregating and analyzing data using cost-effective, two-socket servers based on the Intel Xeon processor E5 family. You can start small and scale up to 6 petabytes of data. Alternatively, you can build a powerful and compact data warehouse using SQL Server 2012 running on four-socket, eight-socket or larger servers based on the Intel Xeon processor E7 v2 family.

In either case, features such as external BLOB storage and StreamInsight allow you to integrate unstructured and fast-moving data to achieve additional insights. You can also connect SQL Server directly to HDInsight®, Microsoft’s optimized distribution of Apache Hadoop®. HDInsight running on clustered two-socket servers based on the Intel Xeon processor E5 v2 family gives you almost unlimited big data capacity at a remarkably low cost per terabyte. If you are using SQL Server Parallel Data Warehouse, you can use a new feature called PolyBase to run standard T-SQL queries simultaneously across both SQL Server and HDInsight, so you can achieve deeper and more complete query results.

Generate Powerful Business Intelligence Using Familiar Tools

Intel processor-based laptops, 2 in 1s, and Ultrabook™ devices running Microsoft Office® or linking to Microsoft Office 365® can help you extend powerful BI and analytics to all your users. With SQL Server at the backend and either Excel® or Power BI for Office 365 at the front-end, you can combine corporate-quality analytics with easy-to-use, self-service BI tools. Innovations such as PowerPivot, Power View, Power Map, Power Query, and Data Mining Add-ins for Excel allow users to access, aggregate, analyze, visualize and share data from almost any source. The rich toolset combines with powerful hardware platforms and in-memory technologies to deliver speed-of-thought analytics optimized for all user groups, from business users to professional data analysts.

Manager Your Data for Higher Value

A key advantage of SQL Server is that it comes complete with enterprise-class tools for end-to-end data management, including Data Quality Services, Master Data Services, Analysis Services, and Integration Services. It also provides a consistent BI Semantic Model across all analytic needs, which makes it easier to integrate self-service BI with centralized BI development efforts (see the Intel white paper, “Implementing Self-Service BI to Improve Business Decision Making,” at intel.com/content/www/us/en/business-intelligence/business-intelligence-xeon-e5-whitepaper.html).

Grow into the Cloud for Unlimited Potential

The agility and cost efficiencies of cloud computing will play an increasing role as companies build out their big data analytics capability. SQL Server 2014 is designed for simple extension into the cloud for backup, disaster recovery, burst capacity, application development and many other usage models. Servers powered by Intel Xeon processors help to simplify this transition by providing near-native performance for enterprise-scale databases running in Windows Server 2012 Hyper-V® virtual machines. You can move or extend these virtual machines into Microsoft Azure with low risk and very little effort. Microsoft also offers SQL Server as a managed cloud service. In all cases, customers maintain control of their data and applications and benefit from consistent management and security frameworks across all their deployment models—native, virtualized, private cloud, and public cloud.

The Intel and Microsoft Data Platform in Action

Real-Time Insight and Self-Service BI

A leading provider of data solutions for retailers and manufacturers is preparing and delivering high-volume product data in real-time to improve customer satisfaction and support new, self-service BI capabilities.

Read the Microsoft Case Study at microsoft.com/casestudies/Windows-Server-2012-R2/Edgenet/Data-Services-Provider-Upgrades-Operating-System-to-Boost-IT-Management-Efficiency/710000003302

Get Started Today

Microsoft SQL Server running on Intel architecture provides a premier platform for next-generation database and analytics requirements—in a fully-integrated solution that helps you achieve higher value with lower cost and risk. Visit the following links for more information.

• Microsoft SQL Server 2014: microsoft.com/en-us/server-cloud/products/sql-server/#fbid=6D7KF2WeWmf
• Intel® IT Center: intel.com/itcenter/

To learn more about the Intel Xeon processor product families, visit intel.com/products/server/processor/xeonE7/index.htm.

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