Scaling Real-Time Analytics across the Enterprise—and into the Cloud

With the Intel and SAP Petascale Cloud Lab, real-time analytics at massive scale has become a reality—and it’s just the beginning.

“We think HANA has the potential to let us completely rethink the architecture of our transactional systems.”
— Jim Fortner, VP of IT, Procter & Gamble

What if decision makers throughout your business could access and analyze enterprise data a hundred times faster, a thousand times faster, or even ten thousand times faster? They would be able to make faster, smarter decisions to improve productivity and profitability. They would also be able to condense hour-long analytical queries into just seconds to gain deeper and more timely insight into critical business issues and to support real-time strategies and tactics that have not been possible until now.

SAP HANA* running on Intel® Xeon® processor E7 family-based servers is helping businesses achieve this goal today. According to Dr. Vishal Sikka, member of the Executive Board of SAP AG and head of technology and innovation, SAP HANA is delivering massive performance improvements for hundreds of customers: “We continue to see unmatched transactional and analytical performance—an average of 7,976 times performance improvement over previous systems across all project implementations.”

The unprecedented analytics performance provided by SAP HANA running on the Intel Xeon processor E7 family offers transformative business capability today, and there’s much more to come from the Intel and SAP collaboration. The two companies recently deployed the initial 100 TB RAM cluster of the Petascale Cloud Lab, which they are using to further optimize their combined platform, to support customer proof-of-concept testing, and to explore ways to simplify and accelerate future implementations. Ultimately, the impact of this collaboration is likely to provide even more far-reaching benefits.
Fast and Simple—a New Paradigm for Enterprise Analytics

SAP HANA running on the Intel Xeon processor E7 family-based servers doesn’t just accelerate analytics. It also simplifies the underlying infrastructure and operational framework. Data from transactional systems is replicated in near-real time, eliminating the complexity and delays of traditional data warehouse loading processes. Operational data can be combined with other data sources (both SAP and non-SAP) and analyzed almost instantly. There is no need to create and maintain the complex data structures that are often required to enable sufficient performance in more traditional data warehouses.

It took close collaboration between Intel and SAP to deliver these transformative capabilities (see the sidebar Breakthrough Innovation through Close Collaboration). The SAP HANA in-memory database is optimized specifically for the advanced features of the Intel Xeon processor E7 family. The combined solution is available in pre-configured appliances from leading hardware vendors and can be quickly integrated with key SAP applications to simplify and accelerate data access and analytics.

Proven Scalability for the Challenges Ahead

“Working together, Intel and SAP engineering teams have optimized the SAP HANA in-memory database to take full advantage of advanced features of the Intel Xeon processor E7 family. By efficiently using massive amounts of memory, the combined solution delivers game-changing levels of performance and scalability for mission-critical databases.”

— Diane Bryant, Vice President and General Manager, Datacenter and Connected Systems Group, Intel Corporation

SAP HANA and the Intel Xeon processor E7 family—in Action

Charité Universitätsmedizin Berlin

The researchers and clinical staff at Charité Universitätsmedizin Berlin can combine and analyze up to 20 TB of patient data in just seconds to fundamentally improve the quality of care they provide to people with cancer. Analyses that used to take two days are now performed almost instantly, and physicians have secure mobile access to information using specialized tablets based on Intel® architecture.

• Read the full case study at: www.intel.com/content/www/us/en/healthcare-it/healthcare-xeon-sap-charite-universitatsmedizin-berlin-study.html

Businesses need faster, simpler ways to expand their IT capability. Production-ready appliances and cloud-based, on-demand delivery models provide flexible answers to this challenge. However, extending these approaches to address the extreme demands of mission-critical enterprise applications requires innovation on many levels.

Intel and SAP have extended their decade-long collaboration to bring their combined hardware and software expertise to bear on this challenge. The results of their joint engineering efforts are helping both companies accelerate innovation and deliver better value to their customers.

• SAP has been able to bring the SAP HANA in-memory database to market and is developing new delivery models that will greatly simplify the experience for SAP customers across the complete application lifecycle. SAP is working with Intel to establish a unified and consistent architecture that can be used across all deployment models, while continuing to provide SAP customers with a broad choice of industry-leading hardware and software partners.

• Intel has been able to optimize its processors and platforms to better meet the demands of mission-critical computing for both on-premise and cloud-based deployments. The ability to test emerging technologies at scale using SAP customer data is helping Intel solve real-world customer challenges and deliver higher value with each new product generation.

Scaling Real-Time Analytics across the Enterprise—and into the Cloud
Breaking Down the Barriers to Petascale Analytics

The Intel and SAP Petascale Cloud Lab

The performance and scalability of SAP HANA running on the Intel Xeon processor E7 family offer transformative business capabilities today, yet there is much higher value to come. Intel and SAP engineering teams have deployed SAP HANA in a new Petabyte Cloud Lab that provides 8000 threads, 4000 cores, and 100 TB of RAM in a server farm consisting of 100 four-socket Intel Xeon processor E7 family-based servers. The cluster currently hosts a single instance of SAP HANA and engineers continue to see near-linear scalability operating across a petabyte of data.

Mission-Critical Computing in the Cloud

The Petascale Cloud Lab provides Intel and SAP engineering teams with a large-scale research and development environment they can use to further optimize their products and technologies for cloud-based deployment of mission-critical applications. The lab can also be used as a test environment for customers who want to perform large-scale proof-of-concept testing before deploying SAP HANA in their production environments.

- Mission-Critical Resilience. SAP HANA already takes advantage of the advanced reliability, availability, and serviceability (RAS) features in the Intel Xeon processor E7 family. Data errors are automatically detected, corrected, and contained, and self-healing I/O and memory channels help to maintain high per-server uptime across a wide range of scenarios. Clustering with automated failover extends these advantages to provide a truly mission-critical computing platform. Intel and SAP are working to drive down recovery times to a few seconds and, ultimately, to microseconds.

- Manageability, Security, Compliance, and Control. The systems in the Petascale Cloud Lab are designed to provide end-to-end transparency and control. A key goal is to optimize the environment for efficient resource sharing, with levels of manageability, security, and visibility that address the needs of mission-critical enterprise deployments in a large-scale cloud environment. Ultimately, SAP wants to be able to provide each customer with full control over their infrastructure using the customer’s preferred tools and frameworks—whether the infrastructure resides in the customer’s own data center, in an SAP or partner-based cloud facility, or across multiple environments.

- Enhanced Mobility. To deliver full value to the business, information and insight have to be securely available to front-line employees, no matter where they happen to be. This requires a combination of flexible user access and strong security and compliance models. It also requires increasing levels of scalability to support complex queries from growing numbers of users. Intel and SAP are working to address these issues from client to cloud. The solutions they are developing will help businesses make better use of their data, while also helping them manage associated costs and risks.

- Scalability and Efficiency. The Petascale Cloud Lab is designed to be a fluid environment that can be continually optimized and upgraded. One near-term goal is to create a smarter, faster, and more flexible network using a combination of Intel® Ethernet Gigabit, Intel® Ethernet 10 Gigabit, and Intel® Ethernet 40 Gigabit technologies. Another goal is to integrate and test the latest Intel® flash memory technologies to accelerate data flow between storage disks and the in-memory HANA database. Intel® Data Center Manager is also part of the R&D environment, providing the foundation needed to monitor and optimize heat generation and power consumption at a granular level throughout the cloud infrastructure.

SAP HANA and the Intel Xeon processor E7 family—in Action

Hilti Corporation

The engineering and sales staff at Hilti Corporation can now search and analyze more than 53 million customer data records in just two to three seconds, giving them almost instant access to customer information during every engagement. Analytics and reports run up to a thousand times faster on the company’s new SAP HANA® and Intel® Xeon® processor E7 family-based appliance—and the data warehouse environment is greatly simplified.

- View the customer testimonial video at: www.experiencesaphana.com/community/customer-stories
Building “Cloud Frames” to Simplify SAP Deployments

IT organizations are looking for ways to reduce the complexity of deploying, integrating, and managing their mission-critical applications. Many would like to combine on-premise and on-demand resources to scale their SAP landscapes while maintaining end-to-end visibility and control. Intel and SAP engineers are using the Petascale Cloud Lab to explore the use of hardware and software reference architectures to help solve this challenge by providing a more uniform building block, or “cloud frame,” for SAP HANA deployments.

A unified cloud frame could potentially provide substantial benefits, both for customers and for the SAP vendor ecosystem.

• **Consistency across private and public clouds.** Independent hardware vendors could deliver highly optimized platforms that could be used for SAP deployments in both customer data centers and public clouds. This would help to establish a more unified environment across all deployment models with better support for flexible, hybrid cloud computing models. One vision for the cloud frame architecture is to use it as the foundation for a 10 petabyte cloud that would have the capacity to host all existing enterprise resource planning implementations throughout the world.

• **Accelerated software innovation.** Both SAP and third-party software vendors would be able to target a single, unified hardware and software environment based on Intel architecture. The resources currently devoted to porting and optimizing software for multiple platforms could be redirected toward delivering new functionality and higher performance on a faster time line.

• **Simpler Implementation and higher overall value.** Today’s often complex software deployment processes could potentially be replaced with drag-and-drop deployment models that enable customers to implement new capabilities more quickly and reliably. Customers would be able to focus on higher-value initiatives, such as optimizing information flow, information provisioning, and business processes.

As Intel and SAP continue their joint efforts to optimize the combined platform, a strong focus is being placed on ensuring that tomorrow’s solutions interoperate smoothly with existing customer implementations and with current and future SAP HANA appliances. This is accomplished by providing standards-based interfaces that help to simplify integration at all levels, including the data, application, presentation, management, and security layers. With this foundation, customers can begin integrating real-time analytics into their mission-critical application environment today, knowing they are laying a scalable and adaptable foundation for growth and innovation.

SAP HANA and the Intel Xeon processor E7 family—in Action

Nomura Research Institute, Ltd.

The engineers at Nomura Research Institute, Ltd. can now analyze 336-million items of data from 13,000 taxis across Japan in just over one second. The company is transforming traffic management by providing navigational guidance based on an accurate, real-time knowledge of traffic patterns and congestion.

Real-time analytics is poised to transform the competitive landscape across many industries. SAP HANA running on Intel Xeon processor E7 family-based servers offers industry-leading capabilities today, enabling companies to speed access to data and insight by up to thousands of times. The value of this platform will continue to increase as SAP integrates SAP HANA across its product line and works with Intel to develop solutions that are not only increasingly powerful, but also far easier to deploy, integrate, and manage.

LEARN MORE TODAY

SAP Resources
SAP HANA web site:
SAP HANA Performance white paper: “Efficient Speed and Scale-out for Real-Time Business Intelligence”

Intel Resources
Intel Xeon processor E7 family:

Intel and SAP Joint white paper: “Analyzing Business as it Happens”
6. Intel® Ethernet 40 Gigabit products and technologies are in development and are not available for purchase at this time.
7. For more information about Intel® Data Center Manager, visit the Intel Web site at: http://software.intel.com/sites/datacentermanager/

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