Analyze SAP transactional business operations in real time

Introducing the IBM Systems solution for SAP In-Memory Appliance, SAP HANA

Highlights

- SAP In-Memory Appliance (SAP HANA™) running on IBM® eX5 enterprise servers enables faster access to SAP operational data and information with near real-time visibility into business operations
- Powerful and scalable IBM eX5 enterprise servers powered by the Intel® Xeon® processor E7 series speed in-memory processing, enabling the analysis of massive amounts of business and operational data
- Workload Optimized Solutions for SAP HANA deliver leading performance and scaling with faster deployment

In today's data-driven culture, tools for business analysis are quickly evolving. Organizations need new ways to leverage critical data on the fly to not only accelerate decision making, but also to gain insights into key trends. The ability to instantly explore, augment and analyze all data in near-real time could deliver the competitive edge your organization needs to make better decisions faster—as well as take advantage of favorable market conditions, customer trends, price fluctuations and other factors that directly influence the bottom line.

The SAP In-Memory Appliance (SAP HANA), delivered on IBM eX5 enterprise servers with fifth-generation IBM Enterprise X-Architecture® technology (eX5), helps transform the enterprise by addressing current needs while delivering the robust scalability and performance needed to accommodate growth. SAP HANA running on powerful IBM eX5 enterprise servers combines the speed and efficiency of in-memory processing with the ability to analyze massive amounts of business data—enabling companies to eliminate barriers between real-time events and real-time business decisions.

Innovative analytic appliance

To support today's information-critical business environment, SAP HANA gives companies the ability to process huge amounts of data faster than ever before. The appliance lets business users instantly access, model

and analyze all of a company's transactional and analytical data from virtually any data source in real time, in a single environment, without impacting existing applications or systems.

The result is accelerated business intelligence (BI), reporting and analysis capabilities with direct access to the in-memory data models residing in SAP In-Memory Database software. Advanced analytical workflows and planning functionality directly access operational data from SAP ERP or other sources. SAP HANA provides a high-speed data warehouse environment, with SAP In-Memory Database serving as a next-generation, in-memory acceleration engine.

Delivered on IBM eX5 enterprise servers that provide leading performance and scalability, SAP HANA efficiently processes and analyzes massive amounts of data by packaging SAP's use of in-memory technology, columnar database design, data compression and massive parallel processing together with essential tools and functionality such as data replication and analytic modeling.

Made possible through recent technology advances that combine large, scalable memory, multi-core processing, fast solid-state storage and data management, in-memory computing leverages these technology innovations to establish a continuous real-time link between insight, foresight and action to deliver significantly accelerated business performance and reduced total cost of ownership (TCO).

Delivered as an optimized hardware appliance based on IBM eX5 enterprise servers, SAP HANA includes:

- High-performance SAP In-Memory Database and a powerful data calculation engine
- Real-time replication service to access and replicate data from SAP ERP
- Data repository to persist views of business information
- Highly tuned integration with SAP BusinessObjects BI solutions for insight and analytics
- SQL and MDX interfaces for third-party application access
- Unified information-modeling design environment
- Data services to provide access to virtually any SAP and non-SAP data source

To explore, model and analyze data in real time without impacting existing applications or systems, SAP HANA can be leveraged as a high-performance "side-by-side" data mart to an existing data warehouse; it can also replace a data warehouse by adding in-memory acceleration features powered by IBM eX5 enterprise servers.

IBM DB2 enables advanced replication scenario

IBM and SAP have cooperated closely to enable the advanced replication scenario for IBM DB2® customers implementing SAP HANA. IBM DB2 is SAP HANA–ready and can efficiently replicate data into SAP HANA in near-real time using Sybase Replication Server. SAP ERP systems based on IBM DB2 can seamlessly support demanding business needs for real-time reporting based on the latest available data with unmatched administrative effort.

These components create an excellent environment for business analysis, letting organizations merge large volumes of SAP transactional and analytical information from across the enterprise, and instantly explore, augment and analyze it in near-real time.

IBM eX5 enterprise servers power SAP analytic innovation

IBM is the first to decouple memory and input/output (I/O) from the processor—moving processing power from what's theoretically possible to what's actually possible. IBM System x servers with fifth-generation IBM eX5 technology enable SAP HANA customers to benefit from a shared vision that delivers simplicity and automation designed to help organizations accelerate business outcomes while lowering TCO.

Leading performance

IBM eX5 enterprise servers offer extreme memory and performance scalability. With improved hardware economics and new technology offerings, IBM is helping SAP realize a real-time enterprise with in-memory business applications. IBM eX5 enterprise servers deliver a long history of leading SAP benchmark performance.[1, 2]

In addition, eX5 features such as eXFlash solid-state disk technology can yield significant performance improvements in storage access, helping deliver an optimized system solution for SAP HANA. Standard features in the solution such as the High IOPS MLC Duo Adapter for IBM System x can also provide fast access to storage.

Future-proof scalability

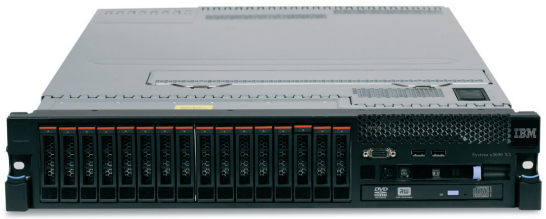
Based on scalable IBM eX5 technology included in IBM System x3690 X5, System x3850 X5 and System x3950 X5 servers, SAP HANA on eX5 enterprise servers offers solution that can help meet the need to analyze growing amounts of transactional data—delivering significant gains in both performance and scalability in a single, flexible appliance.

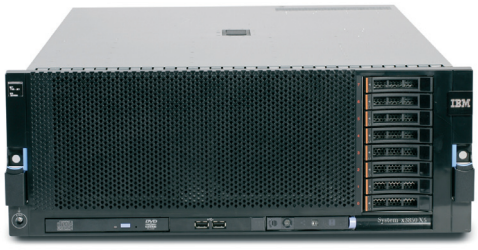
eX5 enterprise servers come equipped with the Intel Xeon processor E7 series. These processors deliver performance that is ideal for your most data-demanding SAP HANA workloads and offer improved scalability along with increased memory and I/O capacity, which is critical for SAP HANA. Advanced reliability and security features work to maintain data integrity, accelerate encrypted transactions and maximize the availability of SAP HANA applications. In addition, Machine Check Architecture Recovery, a reliability, availability, and serviceability (RAS) feature built into the Intel Xeon processor E7 series, enables the hardware platform to generate Machine Check Exceptions. In many cases, these notifications enable the system to take corrective action that allows the SAP HANA to keep running when an outage would otherwise occur.

The powerful and reliable Intel Xeon processor E7 series can enable extreme scaling for running demanding workloads such as SAP HANA.

Workload Optimized Solutions

IBM offers several Workload Optimized Solution models for SAP HANA. These models, based on the 2-socket x3690 X5 and 4-socket x3950 X5, are optimally designed and certified by SAP. They are delivered preconfigured with key software components preinstalled to help speed delivery and deployment of the solution. The x3690 X5–based configurations offer 256 GB of memory and the choice of only a solid-state disk or a combination of spinning disk and solid-state disk. The x3950 X5–based configurations leverage the scalability of eX5 and offer the capability to pay as you grow—starting with a 2-processor, 256 GB configuration and growing to a 8-processor, 1 TB configuration. The x3950 X5–based configurations integrate either the 320 GB High IOPS SD Class SSD PCIe adapter or the High IOPS MLC Duo Adapter. Note: an 8-socket configuration uses a scalability kit that combines the 7143-H2x with the 7143-H3x to create a single 8-socket, 1 TB system.





The following table gives a brief model summary.

Model	**x3690 X5:** Workload Optimized Solution for SAP In-Memory Appliance, SAP HANA		**x3850 X5:** Workload Optimized Solution for SAP In-Memory Appliance, SAP HANA		
	7147-H2X	**7147-H3X**	**7143-H1X**	**7143-H2X**	**7143-H3X Upgrade Option**
Intel Xeon Processor E7 Series	2	2	2	4	4
Memory	256 GB	256 GB	256 GB	512 GB	512 GB
Solid State Disk	IBM eXFlash 8x IBM 50 GB SATA 1.8" MLC SSD	IBM eXFlash 10x 200 GB 1.8" MLC SSD	IBM 320 GB High IOPS SD Class SSD PCIe Adapter	High IOPS MLC Duo Adapter for IBM System x	High IOPS MLC Duo Adapter for IBM System x
Hard Disk	8x 300 GB 10k SAS HDD		8x IBM 600 GB 10K 6 Gbps SAS 2.5" SFF Slim-HS HDD	8x IBM 600 GB 10K 6 Gbps SAS 2.5" SFF Slim-HS HDD	8x IBM 600 GB 10K 6 Gbps SAS 2.5" SFF Slim-HS HDD
Networking Ports	2x 10 GbE 6x 1 GigE	2x 10 GbE 6x 1 GigE	2x 10 GbE 6x 1 GigE	2x 10 GbE 6x 1 GigE	2x 10 GbE 6x 1 GigE
Software	Novell SUSE Linux for SAP IBM GPFS SAP HANA	Novell SUSE Linux for SAP IBM GPFS SAP HANA	Novell SUSE Linux for SAP IBM GPFS SAP HANA	Novell SUSE Linux for SAP IBM GPFS SAP HANA	

IBM and SAP accelerate value and performance

By implementing SAP HANA on eX5 enterprise servers, customers can realize:

- **Faster time-to-value** by bringing all the data in the enterprise to decision makers in seconds, not weeks or months—and presenting it in an easy-to-understand and usable format so your company can run smarter, react quicker and perform better.
- **Faster performance, less complexity and greater efficiency** from a powerful and proven converged infrastructure environment of integrated technologies that simplify operations, consolidate resources and dynamically migrate functionalities as business changes, while delivering the ability to quickly change the way users look at mass amounts of data without compromising data integrity or security. SAP HANA running on IBM eX5 enterprise servers has been proven to handle 10,000 queries per hour against 1.3 TB of data, returning results within seconds.[3]

SAP HANA can be deployed rapidly and offers low TCO by leveraging the latest server, processor, storage and memory technologies. Integrated solution components in the appliance help speed installation and deployment. Thanks to real-time replication of transaction data with near-zero latency, SAP HANA allows you to offload analytical reporting, easing the load on the transactional system.

Run bolder

SAP HANA takes advantage of SAP's intent to change enterprises, enable mixed workloads of analytics, operations and performance management in a single system, and roll out new business applications. Features include:

- In-memory computing for business applications with SAP In-Memory Appliance
- No disruption to existing SAP system landscapes
- Connectivity across both analytics and transactional systems in near-real time
- Optimization for speed, flexibility and scalability

Run simpler

SAP HANA helps organizations streamline the IT landscape without compromising power and functionality—plus, it is simple to deploy and does not disrupt existing landscapes. Highlights include:

- Significant rationalization of existing SAP ERP landscapes to help lower overall TCO
- Optimization as a "ready to deploy" software and hardware appliance
- In-memory computing that provides primary persistence model for the enterprise data warehouse
- "Side-by-side" deployment with existing SAP transactional and SAP business warehouse systems for analytic data mart scenarios

Run smarter

With SAP HANA, companies can make smarter business decisions supported by increased visibility into large volumes of operational data, and react faster to business events through real-time analysis and reporting of operational data. The benefits of being able to quickly analyze vast amounts of business information with no impact on transactional performance include:

- Optimized in-memory persistence of operational data with zero latency
- Readily available information for real-time, ad hoc analysis and reporting
- Integrated data modeling studio for design of in-memory analytic and reporting scenarios on operational systems
- Native access to SAP ERP data without traditional extract, transform and load processes

360-degree view of business operations

SAP HANA enables organizations to integrate and model data from virtually any data source for complete real-time insight into the entire business. In addition, it brings all the data in your enterprise within the reach of decision makers in seconds, enabling them to make time-critical business decisions based on instant access to information.

Greater organizational efficiency from this powerful and proven converged infrastructure environment simplifies operations, consolidates resources and dynamically migrates functionalities as business needs change—letting you quickly change the way users look at mass amounts of data without compromising data integrity or security. Now you can:

- Combine high-volume transactions with analytics to improve existing planning, forecasting, pricing optimization and other processes
- Access data directly from SAP ERP or combine it with other data sources for real-time analytics and business insight
- Accelerate business intelligence by leveraging SAP BusinessObjects BI, IBM Cognos®, and other third-party clients integrated directly on top of SAP HANA
- Roll out next-generation in-memory acceleration for current and future deployments

IBM General Parallel File System

Explosions of data, transactions and digitally-aware devices are straining IT infrastructure and operations, while storage costs and user expectations are increasing. The IBM General Parallel File System™ (GPFS™), with its high-performance enterprise file management, can help move beyond simply adding storage to optimizing data management for SAP HANA. High-performance enterprise file management using GPFS gives SAP HANA applications:

- Performance to satisfy the most demanding SAP HANA applications
- Seamless capacity expansion to handle the explosive growth of SAP HANA information
- High reliability and availability to help eliminate production outages and provide disruption-free maintenance and capacity upgrades

Seamless capacity and performance scaling—along with the proven reliability features and flexible architecture of GPFS—help your company foster innovation by simplifying your environment and streamlining data workflows for increased efficiency.

Services to speed deployment

To help speed deployment and simplify maintenance of your x3690 X5 and x3850 X5: Workload Optimized Solution for SAP HANA, IBM Lab Services and Global Technology Services offer quick-start services to help set up and configure the appliance and health-check services to ensure it continues to run optimally. In addition, IBM also offers skills and enablement services for administration and management of IBM eX5 enterprise servers.[4]

A trusted service partner

Many clients require more than software and hardware products. They need a partner to help them assess their current capabilities, identify areas for improvement and develop a strategy for moving forward. This is where IBM Global Business Services® provides immeasurable value with thousands of SAP consultants in 80 countries. The SAP Consulting Practice offers a broad range of services for SAP HANA such as:

- Discovery and assessment services to maximize business impact
- Architecture assessment and benchmark services
- Proof of concept services
- Express deployment offerings, including industry best practices

By drawing on these resources, we can help you take full advantage of SAP In-Memory Computing (SAP HANA) running on IBM eX5 enterprise servers.

IBM and SAP team for long-term business innovation

With a unique combination of expertise, experience and proven methodologies—and a history of shared innovation—IBM can help strengthen and optimize your information infrastructure to support your SAP applications.

IBM and SAP have worked together for nearly 40 years to deliver innovation to their shared customers. Since 2006, IBM has been the market leader for implementing SAP's original in-memory appliance, the SAP NetWeaver Business Warehouse Accelerator (BWA). Hundreds of BWA deployments have been successfully completed in multiple industries. These BWA appliances have been successfully deployed on many of SAP's largest business warehouse implementations, which are based on IBM hardware and DB2—optimized for SAP.

The IBM and SAP offer solutions that move business forward and anticipate organizational change by strengthening your business analytics information infrastructure for greater operational efficiency and offering a way to make smarter decisions faster.

For more information

To learn more about the IBM Systems solution for SAP In-Memory Appliance, SAP HANA on IBM eX5 Systems, please contact your IBM marketing representative or IBM Business Partner, or visit: www.ibm-sap.com/hana

[1] "IBM posts leadership 2-processor and 16-core result on two-tier SAP SD standard application benchmark," ftp://public.dhe.ibm.com/eserver/benchmarks/news/newsblurb_x3690X5_Windows_sap_101110.pdf.

[2] "IBM posts new results for two-tier SAP SD Standard Application Benchmark," http://www-03.ibm.com/systems/x/resources/benchmarks/intel/benchmark/index.html#SAP

[3] http://www.sap.com/about/newsroom/press.epx?pressid=14906

[4] Services offerings vary by geography. Please contact your IBM sales representation for available offerings.

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SAP Software Licensing
Please contact your local SAP sales representative for license information.

These IBM computer systems are pre-installed with a copy of the SAP High In-Memory Appliance (SAP HANA) software which includes SYBASE REPLICATION SERVER 15, SAP HOST AGENT 7.2, APACHE TOMCAT 5.5, PERL 5.8, SAP In-Memory Database which has been integrated or pre-installed as part of the IBM hardware system. You are not licensed to use the copy of SAP software contained in the IBM hardware system until you have purchased or licensed the use of the SAP software from SAP or its authorized distributors. Usage of the SAP software is subject to the applicable SAP end-user license agreement. Your purchase of the IBM hardware system does not include a license to use the SAP software to be pre-installed, or to any other SAP software. SAP is under no obligation to license the pre-loaded SAP software to you. Please contact your responsible SAP representative to obtain the appropriate license rights to use the SAP software.

General information about the SAP HANA can be found on SDN:
www.sdn.sap.com/irj/sdn/in-memory

The installation is described in the SAP OSS Note 1523337:
https://websmp206.sap-ag.de/~form/handler?_APP=01100107900000000342&_EVENT=DISPL_TXT&_NNUM=1523337&

XSS03062-USEN-00