

SAP Solution Brief
SAP HANA

SAP HANA®: The In-Memory Platform for Digital Transformation





Accelerate innovation and simplify IT

Digital transformation is a top priority. IT systems must adapt quickly to technologies and business models that arise at a dizzying pace. Let the SAP HANA® platform replace complex systems and isolated applications to help you transform IT. It supports modern applications that help you **reimagine business processes and deliver real-time insights** from data that's always fresh.

Accelerate innovation and simplify IT

SAP HANA is one of the first data management platforms to handle both transactions and analytics in memory on a single data copy. It converges a state-of-the-art database with advanced analytical processing, application development capabilities, data integration, and data quality. You gain a single secure environment for all your mission-critical data assets, so you can manage large volumes of structured and unstructured data efficiently to improve total cost of ownership. At the same time, you can simplify your IT landscape and reduce

administrative effort by consolidating multiple workloads onto SAP HANA. Being able to Run Simple helps you deliver insight into ongoing transactions, so your organization can respond in real time to market change, seizing new opportunities more quickly than your competitors. And you can develop innovative applications on SAP HANA that combine transactions and analytics and deliver engaging personalized experiences over any device.



Reimagine your database

SAP HANA is built on an in-memory columnar store that optimizes the benefits of multicore processing and the single-instruction, multiple-data instruction set. It's fully compliant with requirements for the atomicity, consistency, isolation, and durability (ACID) standards.

Intuitive modeling tools and preconfigured function libraries let you run complex business logic directly inside the database. And that means you avoid latencies from moving data between the database and the application servers. Stored procedures take advantage of optimized in-memory calculation engines to run faster.

When you set up multitenant database containers, you can manage several databases as one while maintaining their isolation from one another. You can perform administrative tasks such as backup and patching on all tenants at once and optionally allocate resources to each tenant separately to protect performance. You can meet service-level requirements handily while lowering capital and operating costs.

With multistore tables in SAP HANA dynamic tiering software, you can keep frequently accessed data in memory while moving rarely accessed data to disk, managing Big Data economically without the constraints of memory size. Applications can access data independently of storage location, and you can modify storage preferences whenever demand changes.

Reimagine your database

Accelerate analytics exponentially

Create and manage innovative applications

Optimize data access, integration, and quality management



Accelerate analytics exponentially

With in-memory processing, you can run on-the-fly aggregation, eliminating the need for pre-aggregates, materialized views, analytic indexes, or database accelerators. Business users can retrieve high-level summaries quickly and also drill down to granular details.

SAP HANA includes native high-performance predictive and machine learning algorithms and integration with TensorFlow and R Server to reveal meaningful patterns in data and build applications


that can learn and automate some of the manual business processes. Text search and text analysis extract meaning from semistructured text and transform it into a data model for analysis. SAP HANA provides native support for spatial data – points, lines, and polygons – and spatial functions. Base maps in SAP HANA – with political boundaries and points of interest – help accelerate development of location-aware business applications.

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You can also process and analyze streaming data from sensors, plant equipment, the Internet of Things, or financial transactions with SAP HANA. Series data processing helps you store and query time-series data like price fluctuations, seasonal trends, and information on machine efficiency and network flow. Finally, SAP HANA can store highly interconnected graph data in a dynamic data model.

SAP HANA is a single platform for building applications that combine text analysis, spatial analysis, predictive analysis, and graph data processing on the same live transactional data, streaming data, series data, and data from external sources. A wealth of new possibilities helps you reimagine business models, design new services, and expand into new markets.



Prescient uses SAP HANA to build **innovative applications** that help keep travelers safe through advanced sentiment and geospatial analysis.

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Create and manage innovative applications

SAP HANA connects with existing applications using open standards and offers a choice of ways to build Web-based applications and applications based on microservices. SAP® Web IDE for SAP HANA offers a comprehensive lightweight tool set for data modeling and application development. You also can use the edition of the SAP Enterprise Architecture Designer Web application that works with SAP HANA to model data for building enter-

prise architecture. ABAP® programming language programmers and users of SAP PowerDesigner® software can exploit the power of SAP HANA with their preferred tools as well. Integrated lifecycle management features help you define application structure, track object changes, and assemble applications and deploy them to the production system.

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SAP HANA supports a variety of programming languages, including Java, JavaScript, Python, Go, Node.js, and JSON, so you can use a familiar language for development. It contains several preconfigured business functions, discounted cash flow, and interest rate management, to further accelerate development. These run inside the database for optimal performance and can be called directly from SQLScript. SAP HANA also includes a framework that lets you create your own data processing algorithms to run inside the database.



Running on premise or in the cloud, SAP HANA is built to be **the one platform** for everything you do.

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Optimize data access, integration, and quality management

SAP HANA offers functionality to manage data virtualization, quality, and synchronization, so you can retrieve and use data inside and outside your organization with unprecedented ease.

With smart data access, you can federate queries to external data sources such as other databases, Apache Hadoop, and Apache Spark to perform queries without costly data movement. When you need to move data across SAP HANA and multiple data sources, smart data integration can help you do so to support informed decision making with

complete visibility. With smart data quality, you can validate and match entities such as names, phone numbers, and addresses to help ensure accuracy. Finally, features for remote data synchronization help you synchronize data bidirectionally among databases in SAP HANA and the SAP SQL Anywhere® suite that are embedded in devices located beyond the reach of high-bandwidth connections. That means you can synchronize devices at distant locations and shorten response times across the enterprise.

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An SAP HANA project at the National Center for Tumor Diseases in Heidelberg used data from diverse sources to **inform surprising new medical insights.**



Maximize availability and reduce administration

SAP HANA protects your business against a broad range of outages, from software error to natural disaster. Full data-at-rest encryption support secures your data. To help you maintain agility, the platform scales up and out to support many deployment scenarios and is available for use in public and private cloud environments. And remember that, with database multitenancy, you can perform administrative chores once for multiple tenant databases. (See [figure](#) on the next page.)

You can minimize downtime and shorten recovery times using multitier secondary systems and one of several high-availability and disaster-recovery solutions delivered with SAP HANA. Offload read-intensive workloads to secondary systems with SAP HANA active/active read-enabled option software for additional load balancing and hardware utilization.

Several tools help you monitor infrastructure health:

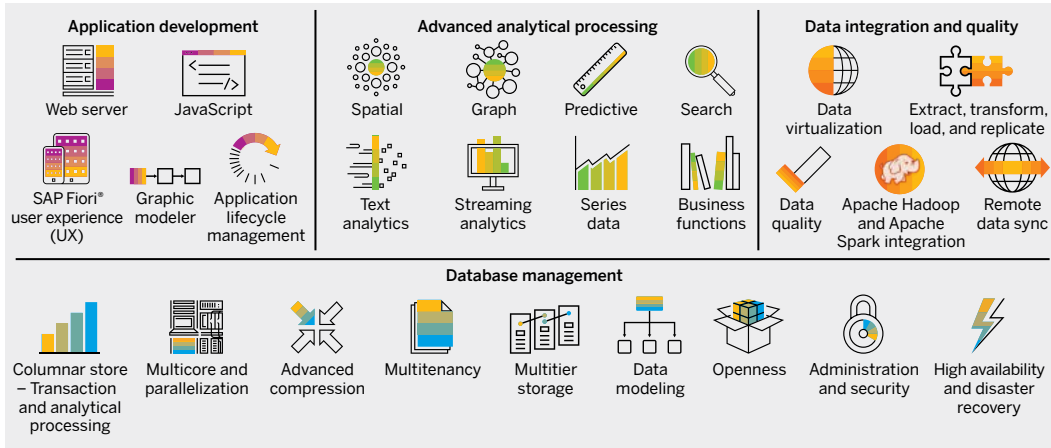
- The SAP HANA cockpit platform provides a Web-based tool that lets you administer and monitor multiple SAP HANA instances. A security dashboard in SAP HANA cockpit helps you meet compliance requirements with confidence and operate applications running on SAP HANA on the same solid security foundation.
- SAP Solution Manager supports holistic monitoring of SAP applications running on SAP HANA.
- A modern tool set for performance and workload analysis provides in-depth insights on query execution plans and resource utilization.

Maximize availability and reduce administration

Tally the benefits of deploying
SAP HANA



SAP HANA® Platform On premise | Cloud



Maximize availability and reduce administration

Tally the benefits of deploying SAP HANA

Figure: SAP HANA – In-Memory Platform to Build Next-Generation Applications



Tally the benefits of deploying SAP HANA

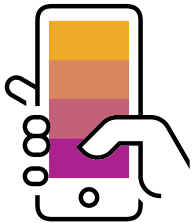
Companies worldwide use SAP HANA – one of today’s most advanced data-processing platforms – to transform business and create value. SAP HANA can process both transactions and analytics on a single data copy. You can uncover new opportunities from data anywhere and analyze fresh transactions to support real-time decision making. Since you can process multiple workloads on a single system, key business processes like period-end closing take far less time. And you can simplify IT operations, making room for more strategic work.

The in-memory database lets you process large data volumes at high speed with less administrative effort. You do not need indexes, preaggregates, or materialized views to speed up analytics. To help you improve performance, special tools let you visualize query execution plans and monitor CPU and memory usage.

SAP HANA also includes a number of predictive algorithms, some self-improving. Many run on streaming data as well as structured, text, spatial, and time-series data, so you can build next-generation applications that enrich insight exponentially.

Maximize availability and reduce administration

Tally the benefits of deploying SAP HANA



Vodafone Group saved an entire day in its month-end close process using SAP HANA.



Summary

The SAP HANA® platform helps you reimagine business by combining a robust database with services for creating innovative applications. It enables real-time business by converging transactions and analytics on one in-memory platform. Running on premise or in the cloud, SAP HANA untangles IT complexity, bringing huge savings in data management and empowering decision makers everywhere with new insight and predictive power.

Objectives

- Speed response and analysis while simplifying IT
- Acquire and integrate data from a wide range of sources to boost visibility
- Uncover new insights to help stakeholders work smarter
- Ride the next wave of change with innovative new applications
- Maintain security and business continuity

Solution

- Advanced in-memory processing to eliminate latency
- Real-time insight from Big Data and the Internet of Things
- Integrated data management that increases scalability and lowers complexity
- Support for modern applications that use geospatial and streaming data
- Tools to keep business secure and minimize downtime

Benefits

- Accelerate data processing for real-time insight and action
- Draw insight from complex data sets and ongoing transactions
- Reimagine business processes and create innovative applications
- Achieve business agility and streamline IT

Learn more

For more on using SAP HANA, visit hana.sap.com, and sap.com/sap-hana-express (free SAP HANA, express edition).



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