Executive Summary

There's an old saying: “Don’t work harder; work smarter.” The SAP HANA real-time business platform helps companies work smarter at almost every decision point. They can process all their data—both historical and fresh operational—with the speed needed to support real-time business processes. Companies are using SAP HANA to deliver data-driven insights throughout their business and are improving outcomes for processes as diverse as online sales, deep sea drilling, television ad placement, and genomic analysis.

Optimized specifically to run on the Intel® Xeon® processor E7 family, this innovative platform delivers more than breakthrough performance and scalability for enterprise data processing. It also provides the advanced reliability and data integrity needed to support mission-critical business processes. Add McAfee security applications and it delivers on another critical enterprise need: It provides the advanced security and compliance protection needed when processing sensitive data in today's threat-filled world.

A recent proof of concept (PoC) for the McAfee IT organization demonstrated decisively that a full complement of McAfee security applications could run on the SAP HANA platform with negligible impact on performance. Based on the successful PoC, McAfee is taking the next steps in evaluating SAP HANA for a potential production deployment. More importantly for other businesses, SAP now supports SAP HANA when running in combination with McAfee security applications.

Real-Time Business Requires Real-Time Security

The ability to analyze massive data sets in real time offers transformative business capability. Businesses can move beyond static reports and historical data mining to perform complex predictive and prescriptive analytics on all of their data. With near-instant query results, they can drive better outcomes in their most important processes, including customer engagements, financial decision making, supply chain optimization, and more.

SAP HANA is leading the way into this brave new world of real-time business, by providing an efficient, blazingly fast database platform that can support core business applications and also ingest and analyze all available data. With transactional and analytical applications running on the same platform, businesses can streamline their infrastructure to reduce costs, even as they move toward real-time, data-driven business models.
To maximize the value of the platform, businesses will want to integrate data from diverse sources into this scalable, high-speed analytics environment. For most companies, this will include potentially sensitive data, such as intellectual property (IP) and personally identifiable information (PII). The more data companies pour into their SAP HANA platform, the more value they can derive from real-time analytics. Yet increasing the types and amount of data also increases the potential impact of a data breach.

Digital threats are frequent and sophisticated in today’s massively connected world, and research shows that the largest data breaches, representing 75 percent of compromised records, come from databases. Such breaches can result in lost customers, impaired credibility, high clean-up costs, and potentially disastrous legal and regulatory repercussions. Strong security is essential to protect the business.

**Robust Security Policy with SAP HANA**

SAP HANA supports enterprise-class security policy. It includes built-in tools and functionality to implement access controls and authorizations, and reporting mechanisms to simplify compliance audits. IT organizations can also apply encryption at a granular level to protect sensitive data both at rest and in motion. Since SAP HANA software is optimized for Intel® Advanced Encryption Standard New Instructions² (Intel® AES-NI), encryption can be used pervasively without the performance penalties typically associated with encrypting and decrypting data.

SAP offers best-practice guidance for implementing and using these capabilities and for securing the broader environment. Users should encrypt communications between external components and the database, segment and secure the network, and deploy SAP HANA in a secure data center environment. Details can be found in the SAP HANA Security Guide and the SAP HANA Security white paper.

Businesses that take advantage of these SAP features and recommendations will have an excellent foundation for securing their real-time business environment. However, SAP HANA is not designed to offer the kind of platform-level security technologies delivered by McAfee security applications—technologies that provide comprehensive, non-stop, continuously updated protection against today’s increasingly sophisticated digital attacks.

**Extended Security Protection with McAfee Security Applications**

Running McAfee security applications in SAP HANA environments addresses the need for malware and hacker protection, and for guarding against known and unknown vulnerabilities that could potentially compromise the business. McAfee security technologies complement SAP HANA security policies to establish a fundamentally more secure computing environment—one that can run more reliably, with less risk, and with less need for disruptive maintenance.

When adding third-party applications to an SAP HANA platform, it is vital to verify that performance is not compromised. The unprecedented performance of the platform is critical to its unique value proposition, and that performance is based on exceptionally tight integration and optimization between SAP HANA and the underlying hardware platform.
SAP worked closely with Intel to develop an in-memory platform with a unique level of hardware and software optimization (see the sidebar, Intel and SAP). To ensure customers enjoy the full performance benefits of the platform, SAP HANA software is:

- Certified only for the Intel® Xeon® processor E7 family, which is Intel’s top-of-the-line processor designed for the most data-intensive, mission-critical workloads in enterprise environments.
- Available as an SAP-certified, pre-integrated appliance.

SAP had concerns that running third-party applications on this finely tuned platform—especially security applications that run continuously in the background—could detract from its high-speed query performance.

Those concerns were put to rest in a recent proof-of-concept (PoC) performed for the McAfee IT organization by SAP’s Consulting Group. As demonstrated in the PoC, an SAP HANA platform protected by a full complement of McAfee security applications can deliver the same blazingly fast performance as it does when running without those security applications.

### A Recommended Security Configuration

McAfee’s four-month SAP HANA PoC started in late 2012. It was designed to test the business value of the platform under real-world conditions, using real McAfee data and serving a pilot group of McAfee employees (Figure 1). At McAfee’s request, the SAP team agreed to load and run McAfee security applications during the PoC in a configuration designed to meet McAfee’s strict security requirements for mission-critical production applications.

According to Ron McCutchen, vice president of IT Solutions Delivery for McAfee, “We’ll be exploring the value of SAP HANA for our core transactional applications as well as for analytics, which means it would be storing and manipulating our most sensitive customer and competitive data. Anything short of world-class security would be a show stopper for us.”

Three McAfee security applications were loaded and run during the PoC.

- **McAfee Security Scanner for Databases** is a sophisticated vulnerability assessment solution designed specifically for databases. It identifies, evaluates, and prioritizes risks from virtually all known threat vectors, and includes tools for penetration testing so IT staff can proactively identify and address vulnerabilities. McAfee Security Scanner for Databases goes beyond known threats. By detecting changed objects, it protects against the insertion of unknown malware, including advanced stealth attacks, such as rootkits.

  Database administrators and security teams receive alerts and detailed information about each threat, including fix scripts and suggested changes to remediate discovered issues.

- **McAfee Application Control** is a centrally managed whitelisting solution that prevents access to the system by unauthorized applications. It is based on a dynamic trust model and innovative security features that block advanced

![Figure 1](image-url) Four McAfee security applications—McAfee Security Scanner for Databases, McAfee Application Control, McAfee Virus Scan for Enterprise Linux, and McAfee ePolicy Orchestrator—provide efficient, centrally managed security and compliance for the SAP HANA real-time business platform.
persistent threats (APTs), including zero-day threats, without requiring signature updates or the labor-intensive management associated with other whitelisting technologies. Every application attempting to access the database is classified as well-known, unknown, or known bad. A powerful suggestion engine helps IT staff quickly pinpoint and address vulnerabilities based on the latest information available from McAfee Global Threat Intelligence.

- **McAfee Virus Scan for Enterprise**
  Linux provides real-time, always-on antivirus protection for Linux* environments, to proactively protect against viruses, worms, and other malicious code. This application was named a Virus Bulletin VB100 award winner for 100 percent detection of “in the wild” test samples, plus zero false positives. Automated updates from McAfee Labs protect systems, data, and applications without requiring a system reboot. To provide strong protection against zero-day threats, McAfee Virus Scan for Enterprise Linux includes heuristic scanning, which identifies new viruses before a patch is available. It also includes archive scanning and blocks Windows* malware so malicious code entering a Linux environment is not transmitted to other systems running Windows.

The PoC team used McAfee ePolicy Orchestrator (McAfee ePO) to monitor and manage the security environment. McAfee ePO provides centralized security management on an open platform that connects with enterprise infrastructure and third-party security and compliance applications. It simplifies and improves security responses by providing IT staff with a unified, real-time view of the security posture across the entire infrastructure, from the data center to mobile client systems. It also supports automated workflows, so security issues can be resolved within seconds, instead of hours or days, to dramatically reduce risk exposure.

**Intel and SAP**

**Breaking Down the Barriers to Real-time Business**

Intel and SAP have been working together for more than a decade to transform cost and capability for mission-critical computing. Initial efforts focused on optimizing hardware and software to deliver better performance and higher availability on a more flexible and cost-effective platform.

They have since expanded their work together, and SAP HANA is a direct result—an in-memory database that can scale to support massive, enterprise data sets. SAP HANA software is highly optimized for the Intel® Xeon® processor E7 family, which provides the high level of parallelism (large core and thread counts) and memory capacity (up to 4 TB per 8-socket server) needed to support real-time business on an enterprise scale. These servers also provide the advanced reliability, availability, and serviceability (RAS) needed for mission-critical computing.

**Intel and SAP continue to drive innovation in key areas.**

- **Mission-critical Cloud Computing.** SAP is rolling out the SAP HANA Enterprise Cloud worldwide, beginning with multiple data centers in the United States and Europe. These solutions are based on jointly developed reference architectures specifically designed for enterprise needs.

- **Advanced Mobility.** The two companies are optimizing SAP software for next-generation mobility across the full range of Intel® architecture-based client systems, from Ultrabook™ devices to smart phones.

The goal is to provide businesses with end-to-end support for real-time business on a uniquely cost-effective and flexible computing platform that extends all the way from client to cloud. For more information, read the Intel and SAP solution brief, *Infuse Your Business with Real-Time, Data-Driven Intelligence*. 

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Intel and SAP continue to drive innovation in key areas.
Testing the Security Configuration under Real-World Conditions

During the PoC, SAP HANA ran in a side-by-side configuration with McAfee’s existing SAP NetWeaver Business Warehouse (BW) (Figure 2). The team loaded 33 months of data onto the SAP HANA platform from McAfee’s SAP ERP system, a third-party customer relationship management (CRM) application, and a number of other key business applications.

All users had mobile access to data and business intelligence (BI) tools through SAP BusinessObjects. Three user groups participated in the pilot program.

- **Business users** viewed and interacted with reports and dashboards. For the first time, executives and managers were able to track key performance indicators in real time and drill down instantly to relevant data.

- **Business analysts** performed complex “slice-and-dice” queries to generate deeper insights by exploring, combining, and analyzing data from a wide variety of sources. Previously, this group had relied on developers to provide data and reports. Now they were able to explore data interactively and run their own analyses using tools that are optimized for business users.

- **Super users and BI developers** ran more advanced queries, such as predictive and prescriptive analytics. These teams had an opportunity for hands-on evaluation of SAP HANA Studio, which provides a complete development environment for SAP HANA. Developers created reports, dashboards, and custom applications to deliver data and insights to people and processes, including executives and sales teams.

Blazingly Fast Analytics with Reduced Risk

The PoC was successful from all viewpoints. Users found the BI tools to be powerful and easy to use and were excited by the speed of query execution. A key criterion for success was that queries would complete within one second. This was achieved readily throughout the PoC, even for the most complex queries.

User feedback was uniformly positive, with comments such as:

- “Able to complete a customer search in seconds rather than 20 minutes.”
- “This means I can concentrate on supporting the business rather than data processing.”
- “So much simpler to use than what we have now.”
- “I would use this every day.”
- “When can we have it?!”

McAfee engineers monitored the SAP HANA solution both before and after installation of the McAfee Security Solutions and found that the security applications had negligible impact on overall system performance. The SAP Consulting team, as well as users of the system, also detected no performance impact. The SAP HANA appliance delivered the same high-speed query response times before and after the McAfee security applications were installed.

McAfee IT tested the security applications to ensure they were functioning properly and actively protecting against digital attacks. They tried to gain access to the platform using scripts to simulate escalation of privilege attacks and other sophisticated digital threats. All attempts were successfully blocked and reported by the security applications.
McAfee and SAP HANA

McAfee is not the only SAP customer to gain from this successful PoC. Because of the PoC, SAP now supports the SAP HANA platform when McAfee security applications are running on the same system. As a result, SAP customers can implement SAP HANA in configurations that include:

- **Access, authorization, and accounting (AAA) security and compliance** policies supported by the tools and capabilities built into SAP HANA and other SAP applications
- **Security best practices** outlined in the SAP HANA Security Guide
- **Robust, always-on protection against digital threats** using McAfee Security Scanner for Databases, McAfee Application Control, McAfee Virus Protection for Enterprise Linux, and McAfee ePO for unified security management

With world-class security protections and SAP service and support, businesses can move with greater confidence to implement data-driven, real-time business models knowing that their mission-critical systems and sensitive data are well protected against today's sophisticated and pervasive digital threats.

### Conclusion

The SAP HANA real-time business platform is transforming the way businesses store, manage, and use their data. IT organizations no longer need to deploy and maintain separate databases for their transactional and analytical applications. Instead, they can support all their applications on a single database and perform complex queries in fractions of a second to inject data-driven insights into real-time processes.

Now IT organizations can also configure SAP HANA to support enterprise-class security and compliance demands. They can start by taking advantage of the built-in support for AAA security and high-performance data encryption. Then they can add McAfee security applications to provide comprehensive, always-on protection against today's sophisticated and pervasive digital attacks. The combined platform has been extensively tested by SAP and McAfee—and SAP now supports SAP HANA when running in combination with McAfee security applications.

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2 No computer system can provide absolute security. Requires an enabled Intel® processor and software optimized for use of the technology. Consult your system manufacturer and/or software vendor for more information.

3 SAP HANA appliances typically include all required hardware and software. However, with certain stipulations, SAP HANA can also be run using a customer's preferred storage solution. For details, read 'SAP HANA tailored data center integration_FAQ' at http://www.saphana.com/servlet/JiveServlet/downloadBody/3634-102-7-8178/SAP%20HANA%20tailed%20data%20center%20integration_FAQ.pdf.

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