

Unleash the power of your SAP HANA platform

Give your business world-record performance with
HPE Superdome Flex and Intel Xeon Platinum processors

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Unleash the power of your SAP HANA platform

Nearly three billion connected IoT devices.¹

More than six billion connected mobile devices.²

Mobile data generated at a rate of 6 terabytes per second and increasing at a rate of 47% per year.³

These figures hint at the challenges businesses face today. Enterprise infrastructures now extend to a nearly unfathomable number of mobile and Internet of Things (IoT) endpoints at their periphery, and they face a deluge of data pouring back from those endpoints in real time.

For corporations to survive in this new business environment, it is no longer an option to simply offer core services. Competitors are now deriving more data-driven insights and they are doing so more quickly than ever before. They are using these insights to offer better services to customers, faster, and at a lower cost.

To thrive, businesses today need real-time analytics

An enterprise today can effectively handle this onslaught of real-time data only by transforming the heart of its business into a dynamic digital core. Such a core needs to transform the massive incoming information streams pouring in from every segment of the business process—suppliers, factory floors, distributors, and customers—into instant analytics and then use that analytics to improve competitiveness. For example, wherever updates originate, they need to be communicated immediately to other parts of the business to improve organizational efficiency and agility. To meet the level of service that customers expect, real-time data also needs to be fed into prediction engines that help these customers find what they need as effortlessly as possible. And finally, to remain competitive, this data needs to lead to actionable insights for quick and smart decision-making.

For many large organizations, the in-memory database capabilities of the SAP HANA® platform provide the core software functionality needed to run high-speed transactions and advanced analytics in real time. But many of these same organizations are losing their competitive advantage because they are held back by the limiting performance of their existing hardware. To remain competitive, enterprises no longer have the option of letting infrastructure restrict the agility of their business operations or the quality of their business decisions. Instead, they need to rethink their hardware strategy and pursue a solution for the SAP HANA platform that meets the high standards and demands of their businesses.

Introducing HPE Superdome Flex for the SAP HANA platform

To address these challenges, Hewlett Packard Enterprise has introduced [HPE Superdome Flex](#) for the SAP HANA platform, powered by Intel® Xeon® Platinum processors. HPE Superdome Flex is a high-performance server platform that provides scalability, flexibility, and mission-critical reliability with 4–32 sockets and 1–48 TB of memory in a single system.

Scalability

With data already flooding in, and increasing at a rate of more than 3% per month (3.3%), businesses need a scalable solution that will allow them to grow for years into the future.⁴ HPE Superdome Flex is, in fact, the world's most scalable and most modular in-memory computing platform.⁵ The groundbreaking architecture allows modular growth in increments of four-socket building blocks, allowing businesses to start small and grow their SAP HANA environments as much as needed. HPE Superdome Flex solutions for the SAP HANA platform are currently certified by SAP® up to 16 sockets and 12 TB of memory per node for both scale-up and scale-out use cases.⁶

For single-node, online transaction processing (OLTP) workloads, such as SAP S/4HANA, HPE Superdome Flex can scale up from 4 to 16 sockets and from 1.5 to 12 TB of memory (as shown in Figure 1). For multinode, online analytical processing (OLAP) workloads such as SAP BW/4HANA, HPE Superdome Flex can scale out to 48 nodes and 288 TB of memory (as shown in Figure 2).

¹ Number of Internet of Things (IoT) devices connected worldwide in 2017 and 2018, by type (in millions), Statista, 2018. [statista.com/statistics/789615/worldwide-connected-iot-devices-by-type/](https://www.statista.com/statistics/789615/worldwide-connected-iot-devices-by-type/)

² Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021 White Paper, March 2017. [cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html](https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html) (Data produced converted from 16 exabytes per month shown in chart.)

³ Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021 White Paper, March 2017. [cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html](https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html) (Data produced converted from 16 exabytes per month shown in chart. Forty-seven percent refers to the estimated change per year from 2016 to 2021.)

⁴ Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016–2021 White Paper, March 2017. [cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html](https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html) (Data produced converted from 16 exabytes per month shown in chart.)

⁵ Hewlett Packard Enterprise Unveils the World's Most Scalable and Modular In-Memory Computing Platform, November 2017. [news.hpe.com/hewlett-packard-enterprise-unveils-the-worlds-most-scalable-and-modular-in-memory-computing-platform/](https://www.news.hpe.com/hewlett-packard-enterprise-unveils-the-worlds-most-scalable-and-modular-in-memory-computing-platform/)

⁶ The SAP HANA Hardware Directory. sap.com/dmc/exp/2014-09-02-hana-hardware/enEN/appliances.html#categories=certified%2CHewlett%20Packard%20Enterprise



Scale-up (OLTP) Configurations

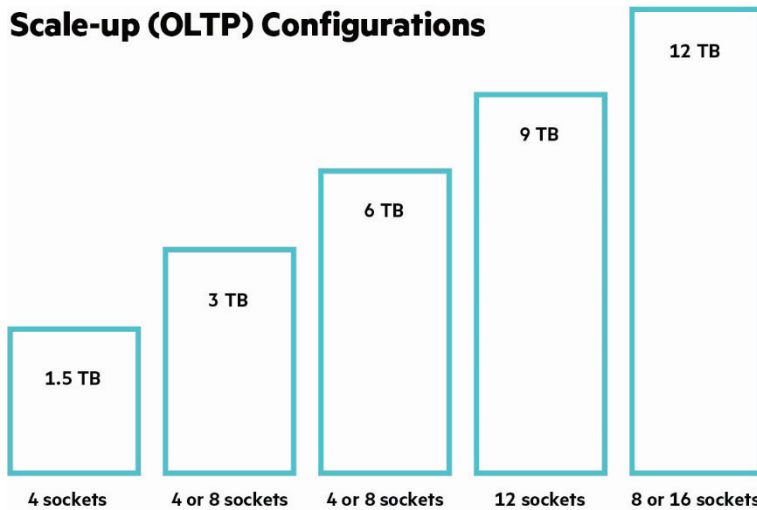


Figure 1. Scale-up (OLTP) configurations of HPE Superdome Flex for the SAP HANA platform currently offer up to 16 sockets and 12 TB of memory; SAP, HPE, and Intel® engineering collaborated for one and a half years to optimize the SAP HANA platform for large scale-up (OLTP) deployments

Scale-out (OLAP) Configurations

Scale-out Node Size	Total Scale-out System Memory
4 sockets, 1.5 TB	72 TB (48 nodes)
4 sockets, 3 TB	144 TB (48 nodes)
8 sockets, 3 TB	144 TB (48 nodes)
16 sockets, 12 TB	192 TB (16 nodes)
8 sockets, 6 TB	288 TB (48 nodes)

Figure 2. Scale-out (OLAP) configurations of HPE Superdome Flex for the SAP HANA platform can be architected to allow up to 288 TB of memory

The modular design of HPE Superdome Flex for the SAP HANA platform allows enterprises to harness increasingly large datasets for high-speed in-memory computing. With this world-leading modular design and scalability, businesses can reduce over-provisioning with an in-memory analytics solution that is sized for the current workload. Businesses can then scale the solution as their data volumes grow—seamlessly and cost-efficiently.

Flexibility

HPE Superdome Flex offers thousands of configuration choices, providing flexible and simple deployment options for the SAP HANA platform. Solutions can be purchased in one of two deployment models—as an appliance with all the required hardware and software preinstalled and preconfigured, or as an SAP HANA Tailored Datacenter Integration (TDI) solution, for which firms can use their own hardware for added flexibility.

HPE Superdome Flex also gives businesses the flexibility to easily repurpose their SAP HANA workloads and the agility to respond to evolving business needs. Because HPE Superdome Flex solutions for the SAP HANA platform can be deployed in both scale-up and scale-out configurations, customers can fully repurpose their SAP HANA infrastructure investments and avoid forklift upgrades.

The broad range of deployment options lets firms customize their SAP HANA journey as needed, without compromising performance or scalability.



Reliability

Reliability is a crucial aspect of an SAP solution. For many enterprises, in fact, it is fair to say that if the SAP software isn't running, the business is not either.

Designed with proven five-nines (99.999%) HPE Superdome RAS, HPE Superdome Flex gives customers the confidence that critical SAP HANA workloads will remain available, which can help maintain business continuity.^{7, 8}

Numerous high-reliability features and services that differentiate the HPE solution for the SAP HANA platform from other solutions include:

- Error analysis engine, an automated software service that predicts hardware faults and initiates self-repair without operator assistance, which can help reduce downtime
- HPE Serviceguard for Linux® software, which offers a fully automated and unattended high-availability and disaster-recovery solution for the SAP HANA platform, allowing firms to achieve near-zero downtime for SAP HANA workloads
- HPE Workload Aware Security for Linux software, which is easy to install and delivers up to 90% security compliance to the SAP HANA application standard in minutes, not in weeks⁹
- The HPE High Availability for SAP HANA Service, which is an on-site consulting service that automates and enhances SAP HANA system replication through HPE Serviceguard
- HPE Pointnext, which provides partner services to help customers optimize their infrastructure and reduce complexity

HPE Pointnext

Services from [HPE Pointnext](#) provide access to expertise and support for various aspects of an SAP HANA deployment, including support for SAP HANA remote services and SAP migration services. For more information about HPE Pointnext, visit news.hpe.com/hpe-pointnext-services-to-accelerate-your-digital-transformation/.

Huge memory capacity enables higher performance

To harness the full value of in-memory computing, the underlying system must be capable of addressing extremely large datasets to process analytics and achieve real-time insights. Designed for environments of all sizes, HPE Superdome Flex is architected to scale to the industry's largest memory capacity for the SAP HANA platform.¹⁰

World-record performance in new SAP HANA benchmarks

Businesses need raw power to minimize the time to insight. HPE Superdome Flex for the SAP HANA platform delivers the power to turn a system of record into a system of real-time intelligence at unparalleled scale. In April 2018, HPE Superdome Flex, powered by eight Intel Xeon Platinum 8180 processors, delivered the top single-database-node results on an 8-processor system, for the SAP BW Edition for SAP HANA Standard Application Benchmark Version 2 @ 10.4 billion initial records in the scale-up configuration.¹¹ (The SAP BW edition for SAP HANA Standard Application Benchmark Version 2 is an SAP BW benchmark that uses the full capabilities of the SAP HANA platform to process its workload.¹²) The HPE Superdome Flex was able to complete phase 1 of the benchmark in 134,501 seconds. In phase 2, it was able to achieve 2,277 query executions/hour, and it completed phase 3 in 226 seconds.¹³ All three results were the fastest for single database nodes @ 10.4 billion initial records.

⁷ HPE Superdome Flex Server. [hpe.com/us/en/product-catalog/servers/mission-critical-x86-servers/pip.hpe-superdome-flex-server.1010323140.html](https://www.hpe.com/us/en/product-catalog/servers/mission-critical-x86-servers/pip.hpe-superdome-flex-server.1010323140.html).

⁸ Based on HPE lab availability analysis results. The single-system HPE Superdome Flex server availability of five-nines (99.999%) can be greatly increased when used in combination with failover clustering solutions such as HPE Serviceguard for Linux.

⁹ HPE Workload Aware Security for Linux x86. [hpe.com/us/en/product-catalog/detail/pip.hpe-workload-aware-security-for-linux-x86.1010309514.html](https://www.hpe.com/us/en/product-catalog/detail/pip.hpe-workload-aware-security-for-linux-x86.1010309514.html).

¹⁰ HPE Superdome Flex QuickSpecs. [h20195.www2.hpe.com/v2/getdocument.aspx?docname=a00026242enw](https://www2.hpe.com/v2/getdocument.aspx?docname=a00026242enw)

¹¹ Performance results are based on testing by HPE as of April 8, 2018 and may not reflect all publicly available security updates. See configuration disclosure for details: <https://www.sap.com/dmc/benchmark/2018/Cert18012.pdf>. No product can be absolutely secure.

¹² SAP NetWeaver webpage. [sap.com/about/benchmark/appbm/netweaver.sap-bw-edition-for-sap-hana-benchmark-version-2.html](https://www.sap.com/about/benchmark/appbm/netweaver.sap-bw-edition-for-sap-hana-benchmark-version-2.html).

¹³ HPE Superdome Flex Server Wins Records on SAP BW Edition for SAP HANA Standard Application Benchmark Version 2, April 2018. [h20195.www2.hpe.com/v2/GetDocument.aspx?docname=a00045649enw&doctype=Benchmark%20and%20Performance%20Guide&doclang=EN_US&searchquery=&cc=us&lc=en](https://www2.hpe.com/v2/GetDocument.aspx?docname=a00045649enw&doctype=Benchmark%20and%20Performance%20Guide&doclang=EN_US&searchquery=&cc=us&lc=en).



Intel Xeon Scalable processors: A feature-rich, future-forward infrastructure platform

These results are the first for this benchmark with Intel Xeon Scalable processors. These processors can deliver excellent performance because they are engineered with:

- Fifty percent more memory support for OLTP and OLAP workloads for the SAP HANA 2 platform (up to 12 and 288 TB, respectively), compared to the Intel Xeon processor E7 v4 family¹⁴
- Six times more system memory and more flexible configurations to better meet requirements for high-capacity, massive streaming workloads compared to the Intel Xeon processor E5 v2 family, which launched in 2013¹⁵

That added memory support is made possible with systems that support up to eight sockets and up to 1.5 TB memory capacity per socket for a total of up to 12 TB in an 8-socket configuration. Intel Xeon Platinum processors also offer more threads, DDR4-2666 memory with up to six memory channels versus four channels in the Intel Xeon processor E7 v4 family. Eight more lanes of Peripheral Component Interconnect Express (PCIe) 3.0 bandwidth—48 compared to 40 in the Intel Xeon processor E7 v4 family.

Intel Xeon Scalable processors offer more cores and threads than the previous generation, and they are also architected with a new microarchitecture, the Intel mesh internal microarchitecture, which improves performance relative to the earlier “ring” architecture. A uniform shape for all CPUs with the new microarchitecture enables any CPU to fit into the same Intel Socket P socket type. This means systems can scale from two sockets to four and on to eight without external chipsets from third parties.

HPE Superdome Flex builds on these new improvements by offering the following range of processor configurations:

- Four Intel Xeon Platinum processors per module, with up to eight modules in a single system
- 4, 12, 14, 18, or 28 cores per processor
- 16.5 MB, 19.25 MB, 24.75 MB, or 38.5 MB processor cache
- Up to 3.6 GHz processor speed

A robust and scalable SAP solution

HPE is a trusted name in SAP deployments, having successfully deployed more than 23,000 servers for SAP HANA solutions world- and industry-wide, and has partnered with Intel and SAP for more than 29 years. As a result of this long-standing collaboration, HPE Superdome Flex solutions for the SAP HANA platform, powered by Intel Xeon Platinum processors, are able to deliver high standards of scalability, flexibility, reliability, and performance for SAP HANA applications.

Resources

Intel and SAP partnership

intel.com/sap

Intel Xeon Scalable processors

intel.com/content/www/us/en/processors/xeon/scalable/xeon-scalable-platform.html

HPE Superdome Flex for SAP HANA

hpe.com/us/en/product-catalog/detail/pip.hpe-superdome-flex-for-sap-hana.1010323145.html

HPE solutions for the SAP HANA platform

hpe.com/info/sap/hana

HPE Pointnext

hpe.com/services/sap

¹⁴ Up to 6X greater system memory supported vs. available solutions from four years ago (representing the currently installed data-center base). SAP has certified its SAP HANA 2 platform for OLAP workloads to support up to 3 TB of memory per system for the upcoming Intel Xeon processor Scalable family for a 4-socket configuration (or 6 TB for an 8 socket configuration). Systems available four years ago (representing the typical data center installed base infrastructure) could only support 0.5 TB (or 1 TB in an 8-socket configuration), respectively. For comparative purposes, SAP certifies support for up to 2 TB of memory for the current Intel Xeon processor E7 v4 family in a 4-socket configuration, so upcoming Intel Xeon Scalable processor family-based systems are certified to support up to 50% greater system memory than the generation they replace.

¹⁵ Up to 6X greater system memory supported vs. available solutions from four years ago (representing the currently installed data-center base). SAP has certified its SAP HANA 2 platform for OLAP workloads to support up to 3 TB of memory per system for the upcoming Intel Xeon processor Scalable family for a 4-socket configuration (or 6 TB for an 8 socket configuration). Systems available four years ago (representing the typical data center installed base infrastructure) could only support 0.5 TB (or 1 TB in an 8-socket configuration), respectively. For comparative purposes, SAP certifies support for up to 2 TB of memory for the current Intel Xeon processor E7 v4 family in a 4-socket configuration, so upcoming Intel Xeon Scalable processor family-based systems are certified to support up to 50% greater system memory than the generation they replace.



Notes:

The benchmark results reported above may need to be revised as additional testing is conducted. The results depend on the specific platform configurations and workloads utilized in the testing, and may not be applicable to any particular user's components, computer system, or workloads. The results are not necessarily representative of other benchmarks and other benchmark results may show greater or lesser impact from mitigations.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark® and MobileMark®, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to intel.com/benchmarks.

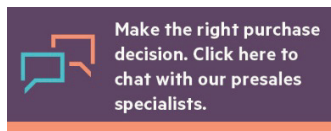
Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

Intel does not control or audit third-party benchmark data or the websites referenced in this document. You should visit the referenced website and confirm whether referenced data are accurate.

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