

How to Select Your Optimal SAP HANA Systems Vendor

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Analyst(s): Philip Dawson, Donald Feinberg, Tony Harvey

Industry momentum remains high for SAP HANA; however, lack of SAP HANA development skills and virtualization limits is curtailing widespread adoption. Infrastructure and operations leaders should select their SAP HANA vendors based on project maturity, market share, system size and virtualization.

Key Findings

- The adoption of SAP HANA continues to climb, increasing from 23,000 licensed customers in 2Q18 to about 29,000 customers in 2Q19. Gartner estimates that 35% of on-premises customers have yet to initiate production workloads.
- New persistent memory and storage technologies threaten the viability of several vendors' platforms by enabling two-socket servers to support databases of 12TB and beyond.
- Server platform vendors offer on-premises deployments for SAP HANA, with the client installed base skewed heavily toward Fujitsu, Hewlett Packard Enterprise and Lenovo.
- As SAP HANA gains mature users, an increasing share of customers use multiple vendors to develop a hybrid SAP HANA architecture, with a combination of on-premises, hosted and public cloud deployments.

Recommendations

Infrastructure and operations leaders responsible for optimizing data center infrastructures should:

- Request quotes from at least three systems vendors, including at least one of the three global installed base leaders (Fujitsu, HPE and Lenovo) to optimize the purchase price for SAP HANA hardware solutions.
- Check applicable references to validate their incumbent SAP ECC 6.0 hardware platform vendor for SAP HANA skills, especially when migrating ERP applications to S/4HANA.

- Prioritize the long-term track record of a vendor's collaboration with SAP when selecting a hardware vendor by evaluating ERP and S/4HANA application capabilities alongside a well-articulated technology roadmap.
- Scope systems by determining required memory size and performance.
- Choose on-premises, near-term deployment for any system larger than 1TB to 2TB of memory and 30 vCPUs, or qualify the system with production references.

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Analysis

SAP HANA is quickly becoming the principal platform for SAP-centralized, in-memory data management. As SAP HANA continues to gain industry momentum, the relationships between SAP and its hardware and software partners are evolving. Infrastructure and operations (I&O) leaders need to assess their long-term ambitions for the platform and to determine which vendors provide the optimal deployments.

SAP offers two deployment models for on-premises SAP HANA platforms:

- **The Certified Hardware Appliance Approach.** Strategic hardware partners use this approach to define, certify and optimize reference architecture configurations for specific SAP HANA workloads. Appliance and hyperconverged infrastructure (HCI) solutions include precertified software and preconfigured hardware that are delivered ready to run. Hardware vendors partner

closely with SAP to create predictable outcomes for users, and to provide reliable support and escalation infrastructures for live environments.

- **The Tailored Data Center Integration (TDI) Approach.** With this model, customers select the hardware on which they want to deploy SAP HANA. This allows users to leverage existing infrastructure, including hardware, OS, virtualization, storage and software. Customers using the TDI delivery model are responsible for installing and configuring the software and hardware.

Gartner expects the SAP HANA market to continue experiencing rapid growth during the next five to 10 years, as it displaces the other database management system (DBMS) platforms for SAP applications. Although the proliferation of SAP HANA is underway, widespread adoption is inhibited by a lack of SAP HANA skills in the market. The skills shortage leads to slower adoption, because TDI solutions are often more complicated and costlier to implement, although they do afford greater flexibility and integration (i.e., third-party storage). In addition, most SAP HANA adoptions focus on migrating highly customized applications from ERP Central Component (ECC) to S/4HANA. Given the SAP HANA skills deficiency, some users of IBM Db2, Microsoft SQL Server or Oracle DBMSs are holding off migrating to SAP HANA.

SAP also provides off-premises SAP HANA deployment options. SAP HANA Enterprise Cloud (HEC) is a hosted, private managed cloud option. Private hosting is available from multiple managed services vendors. SAP offers two public cloud solutions — SAP HANA as-a-service and SAP HANA One — from the following vendors:

- Alibaba Cloud
- Amazon Web Services (AWS)
- Google Cloud Platform (GCP)
- Huawei
- IBM Cloud
- Microsoft Azure

As SAP HANA gains more mature users, an increasing share of customers will use multiple vendors to develop a hybrid HANA architecture with on-premises, hosted and public cloud deployments. For example, an I&O leader may select a Business Warehouse or BW/4HANA analytics solution from Hewlett Packard Enterprise (HPE), while moving test/development to SAP HANA on AWS.

The composition of these hybrid SAP HANA environments will be driven partially by the network, storage and performance limitations of virtualization and cloud environments. All SAP HANA platform vendors can support configurations with less than 1TB to 2TB of memory and under 30 vCPUs. When adopting configurations that surpass these thresholds, I&O leaders should favor on-premises deployments, or qualify with references from providers.

An increasing number of vendors have developed capabilities to support systems larger than 1TB to 4TB, and configurations with more than 6TB of memory are possible with proprietary technology. These large cloud and hosted solutions are feasible due to advances in memory density on new

chipsets, with new cloud offerings of as many as four sockets. For example, Intel Optane DC Persistent Memory is enabling commodity vendors to run 8TB memory systems on standard Intel chipsets. Because the technology is so new, I&O leaders should get a reference or be a reference when adopting large, virtualized configurations. With these parameters in mind, this research will evaluate the SAP HANA systems vendor ecosystem, based on project maturity, market share, system size and virtualization.

How Gartner Measures the HANA Hardware Landscape

SAP does not publish detailed statistics on vendor deployments, preferring to maintain a neutral state regarding vendors. For this reason, Gartner created a model to extrapolate the SAP HANA installed base. Gartner combines data from SAP and the various vendors with our observations of end-user behavior to create an estimate of installed systems. This model is now in its fourth iteration, and we continue to assess the data on a regular basis.

As of April 2019, SAP reported that 29,000 customers have SAP HANA licenses for use with on-premises deployments, the cloud or HEC. This represents a 20% increase from 2Q18. Although we estimate that about 65% of projects have been initiated, approximately 30% of these projects are in production. The remaining 35% (10,150 customers) have yet to initiate their projects. These licenses might be for projects that are still in the planning phases, or licenses that were acquired to obtain larger discounts with other products.

Of the 19,285 SAP HANA customers with active on-premises and HEC projects, Gartner estimates that about 70% (13,600 customers) are in production, preproduction, or late development and nearing rollout. Of those 13,600 customers, only 2,750 are in mature production, with systems deployed in full production for more than one year. We estimate that 5,200 customers are at the early or mid-stages of development. Gartner estimates that there are more than 79,000 total physical servers running SAP HANA associated with the 18,850 customers that have active projects underway.

Many client inquiries show a preference for deploying on-premises SAP HANA. However, SAP has invested in hosted and cloud SAP HANA solutions that enable users to access SAP HANA deployed in SAP's own data centers, plus those of close partners. SAP has deployed hosting hardware based on x86 servers from Fujitsu, HPE and Lenovo with IBM on Power.

The use of virtualization for SAP HANA workloads has been supported for test/development since 2014; however, adoption for production use cases has been slow. Virtualization is widely used at the test/development phase and increasingly for early production. We also track the degree of virtualization deployed, which peaks at the late development stage. The number of deployed physical systems grows in live production sites, where users need to deploy production servers, test/development servers and parallel infrastructure for disaster recovery (DR).

Although approximately 80% of SAP HANA deployments continue to be on-premises, an increasing proportion is off-premises. SAP reports 13,000 total cloud customers. Half of these customers (6,500) use cloud services other than SAP HANA or ECC (e.g., SAP Concur). We estimate that about 25% (3,150 customers) use HANA Enterprise Cloud (HEC), a hosted private cloud solution (see "Is SAP HANA Enterprise Cloud Right for Your Organization?"). Public cloud hosting of SAP HANA is

beginning to gain traction in the market, with an estimated 3,350 cloud-based customers. (HEC is covered as a separate, off-premises deployment.) About 85% of these cloud-based customers use this hybrid delivery deployment as a complement to on-premises SAP HANA.

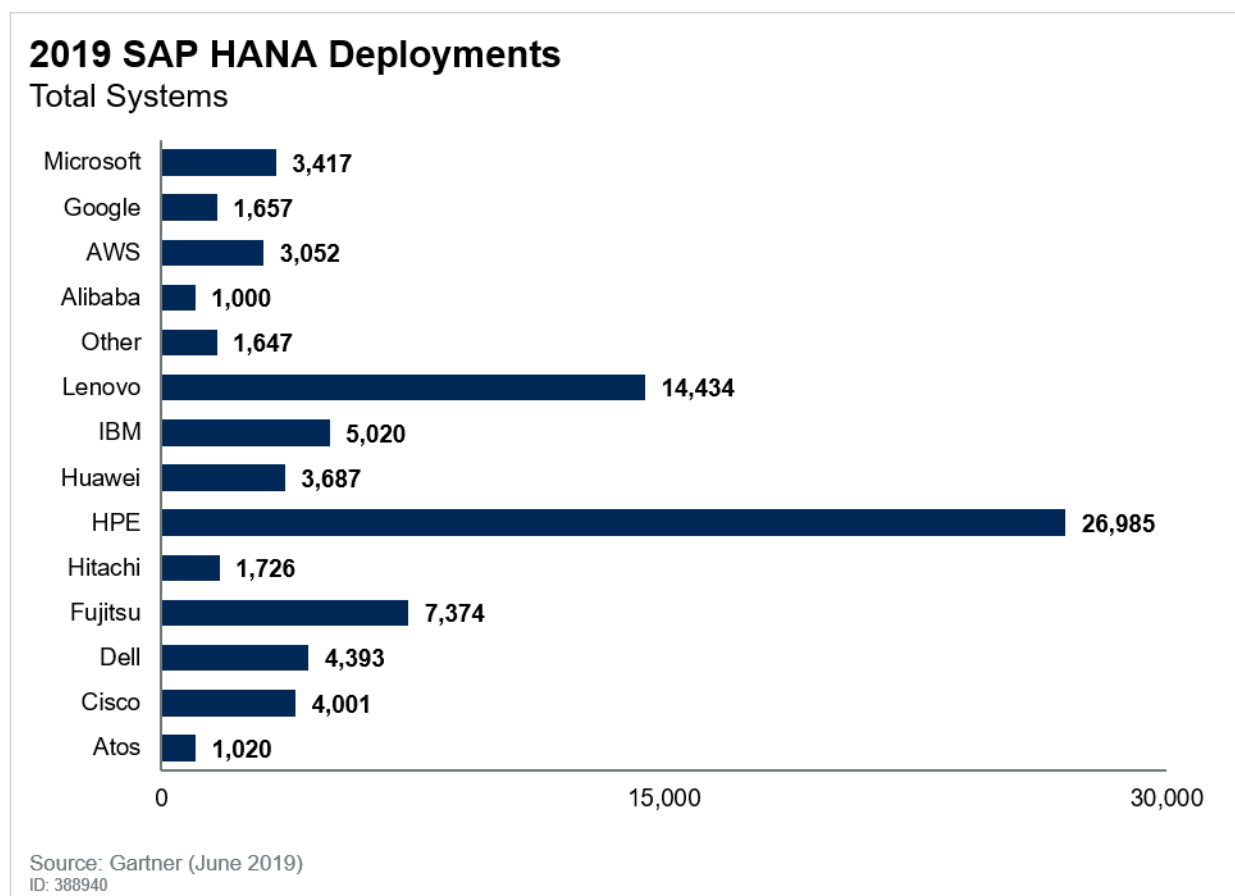
SAP HANA vendors Alibaba Cloud, AWS, GCP and Microsoft Azure have been added to the model, as they penetrate the SAP HANA market and become established alternatives to on-premises or hosted SAP HANA. Here, we introduce the cloud vendors and their systems capabilities (cloud capabilities are addressed in “How to Select SAP HANA Cloud Systems”).

Overview of SAP HANA Vendors

Although SAP HANA adoption has grown from 10,000 customers to more than 28,000 in just three years, the number of vendors has remained steady. Although emerging vendors have joined the market since 2016, other vendors have been acquired. Oracle is the only major hardware vendor that is holding off on support for SAP HANA. The SAP systems vendor list now includes:

- Atos
- Cisco
- Dell EMC
- Fujitsu
- Hitachi (Hitachi Ltd. and Hitachi Vantara)
- HPE
- Huawei
- IBM
- Lenovo
- Other vendors with less than 1% of market share (e.g., Inspur, NEC, Nutanix, Supermicro and other cloud vendors). These niche players are viewed as a collective.

Figure 1. SAP HANA Deployments by Hardware Vendor



For 2019, there are 10 SAP HANA platform vendors. We anticipate that further consolidation of the market share will continue, with three vendors eventually commanding more than 60% of the SAP HANA installed base. I&O leaders should observe the following trends in the vendor landscape:

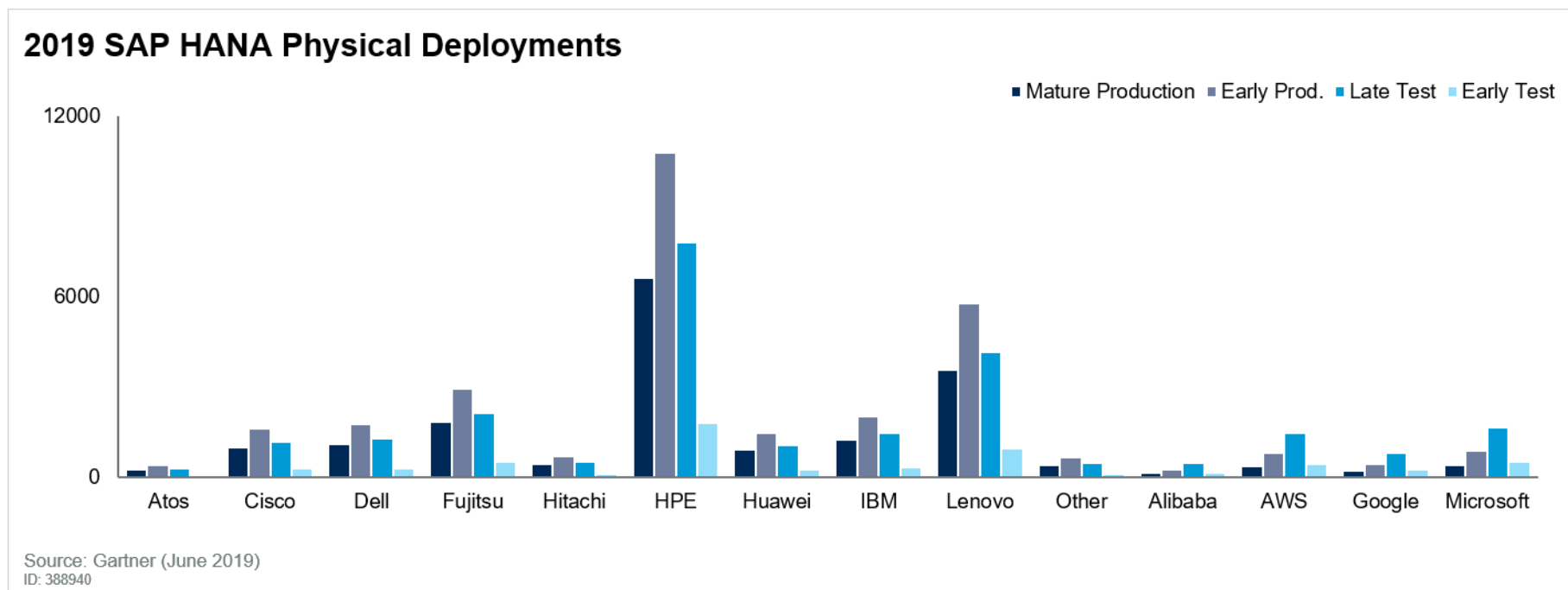
- In terms of total number of SAP HANA servers deployed, HPE maintains the largest market share. The HPE installed base is estimated to be about 27,000 deployments (refer to Figure 1), an increase from 7,000 in 2016. Due to its long track record and strength with SAP services and its in-memory, high-availability architecture (acquired from SGI), HPE is regarded by end users as a “safe” choice for on-premises and hosted SAP HANA installations.
- Lenovo has grown considerably during the past four years, partly as a result of its acquisition of IBM’s x86 server business in 2014, and partly as a result of it developing its own up-to-eight-socket, 12TB memory Intel system. Lenovo is also looking to support standard Intel Persistent Memory offerings that address the 12TB market and beyond.
- IBM re-entered the SAP HANA appliance market in 2015 with a strategy based on POWER8. Since then, it has increased its installed base to approximately 1,700 customers. In 2019, IBM announced high-end POWER9-based server models specific for SAP HANA. IBM is the only vendor selling non-x86-based options, which it sells predominantly to the large legacy SAP AIX/

Oracle and Db2 installed base. Its track record as a strong hosting/service provider has helped it establish its market share.

- Fujitsu remains relatively static in the market. Gartner believes that Fujitsu holds a comfortable third place due to its Business Warehouse installed base. Its position is bolstered by strong market share in the German-speaking countries, where it works closely with both SAP and SUSE (based in Walldorf and Nürnberg, respectively). Fujitsu also has a solid presence in Northern Europe, India and the Americas. However, its reliance on the German-speaking market restricts its ability to expand globally.
- Huawei continues to capitalize on the Chinese market as a system and cloud vendor. It has also developed a large installed base of SAP HANA systems in most geographies, including Europe, the Middle East and Africa (EMEA); the Asia/Pacific (APAC) region; and other emerging markets. However, it has not yet made an impact on the U.S. market.
- Cisco and Dell have been traditional four-socket volume players. With the new Optane technology and standard chipset available (addressing up to 12TB), we expect Cisco and Dell to continue diluting the 4TB to 12TB memory market with standardized hardware (rather than OEM relationships).
- Atos, Hitachi and “other” vendors remain niche players, although Atos increased its market share slightly after developing reselling partnerships with Cisco and Dell. Hitachi Ltd. sells SAP solutions in Japan only, while Hitachi Vantara sells solutions outside Japan. As Intel continues to implement chipsets and platforms that address systems as large as 12TB, niche vendors will increasingly be compromised in their OEM partnerships. Clients should consider mainstream technology wherever possible.
- With the addition of Alibaba, AWS, Google and Microsoft, cloud adoption of SAP HANA has been realized. Initially, the adoption was similar to that of virtualized SAP HANA platforms (1TB to 2TB memory); however, this is growing to an adoption of as much as 4Tb to 6TB memory on a virtualized four-socket system. These systems are also benefiting from standard chipset improvements. In particular, AWS and Microsoft have large cloud installed bases running SAP ERP on SQL Server and some Oracle/Db2. This is driving a large cloud transition, and client inquiries are moving to SAP HANA in the public cloud.
- Finally, “other” vendor momentum encapsulates niches such as Inspur, NEC and Supermicro, as well as emerging technologies such as Nutanix HCI, which is built on its Acropolis Kernel-based Virtual Machine (KVM)-based hypervisor. Clients should also check for local, relevant-sized references on these systems. Mainstream systems as large as 12TB and 4TB to 6TB per virtual machine (VM) are diluting the market for niche vendors, unless they take standardized variants.

Despite its recent expansion, the SAP HANA market is still maturing. Most customer projects have yet to undergo the full hardware buying cycle. Therefore, I&O leaders should compare vendors across multiple phases, including market share, track record and experience with full production deployments. (See Figure 2 for Gartner’s vendor breakdown by physical deployment and project maturity.)

Figure 2. SAP HANA Physical Deployments by Hardware Vendor and Project Maturity



The scaling and performance demands of SAP HANA vary widely by customer use case. SAP HANA use is becoming increasingly business-critical, and I&O leaders are adopting the DBMS as frequently for online transaction processing (OLTP) purposes as for business intelligence (BI) and data warehousing. As a result, the sizes of SAP HANA database instances are growing. The potential for SAP HANA projects with larger than 10TB databases and massive node sizes is attractive to server vendors, which have proven skills in these areas. This is creating a divergence of the SAP HANA hardware landscape, where a handful of vendors with proven, large-system expertise are investing heavily in huge configurations that support multiterabyte database sizes. However, most current SAP HANA deployments are at 2TB of memory and below, and all vendors can offer viable server platforms for SAP HANA projects of this scale. I&O leaders should seek a reference when evaluating configurations larger than 2TB of memory.

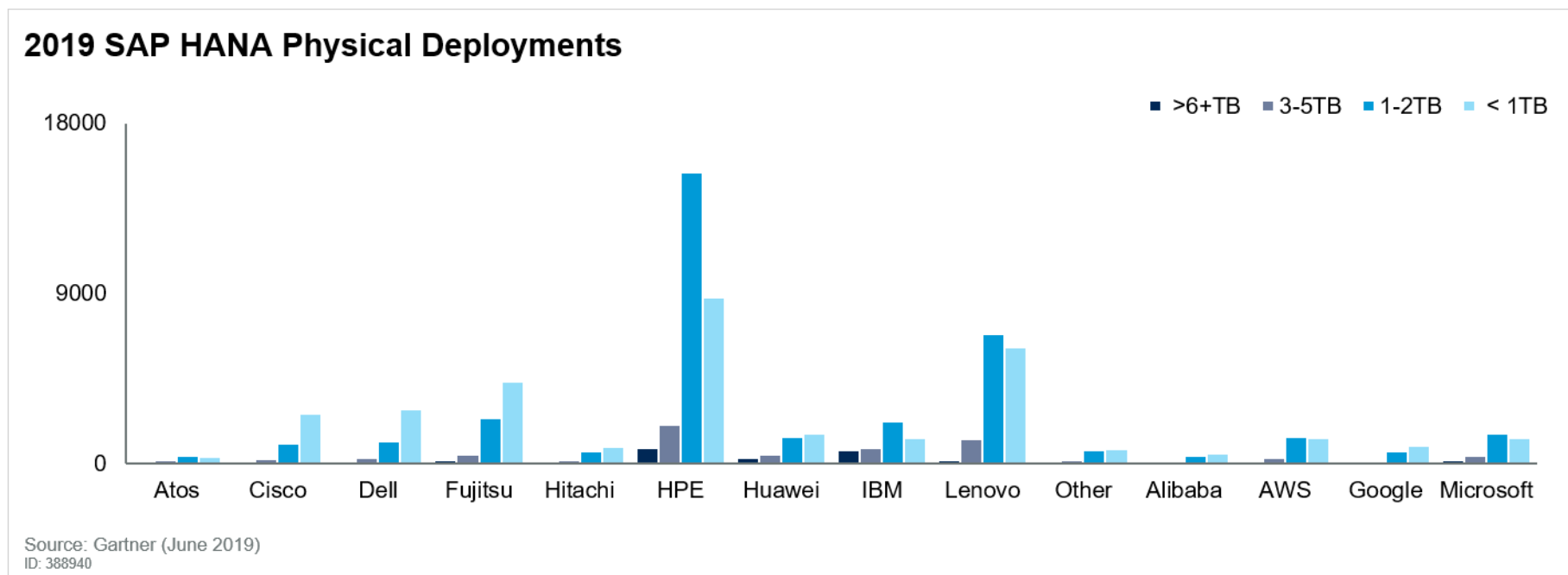
Memory capacity per socket has grown considerably. The Intel Skylake Scalable Performance (SP) processor, introduced in 2017, is capable of 1.5TB of memory per socket. With the advent of Intel Optane DC Persistent Memory technology, memory densities and addressing per node are also increasing to 4TB to 12TB instances. However, this technology is newly emerging and requires fully proven customer references (not just technology announcements).

By the next iteration of this research, we expect Intel Optane DC Persistent Memory to improve its memory density to run on standard Intel chipsets on most systems and cloud vendor offerings. Also, the rise of Nonvolatile Memory Express (NVMe) storage protocols is also delivering lower latency and preventing bottlenecks (see “Predicts 2019: In-Memory Computing at a Turning Point, Driven by Emerging Persistent-Memory Innovation”).

Given these new developments in storage technology, I&O leaders will find it more useful to measure capability with memory density (as opposed to socket count). Memory is often the primary constraint on performance.

Although a niche market still exists for four-socket servers or greater, most SAP HANA workloads can now be satisfied with the memory available from just one or two sockets. IBM, with its POWER-based HANA systems, is also addressing a high-end memory niche with its systems. It is gaining success in the 3TB to 5TB and 6TB+ HANA market with its high-end systems. Figure 3 illustrates the vendors’ capabilities by memory size.

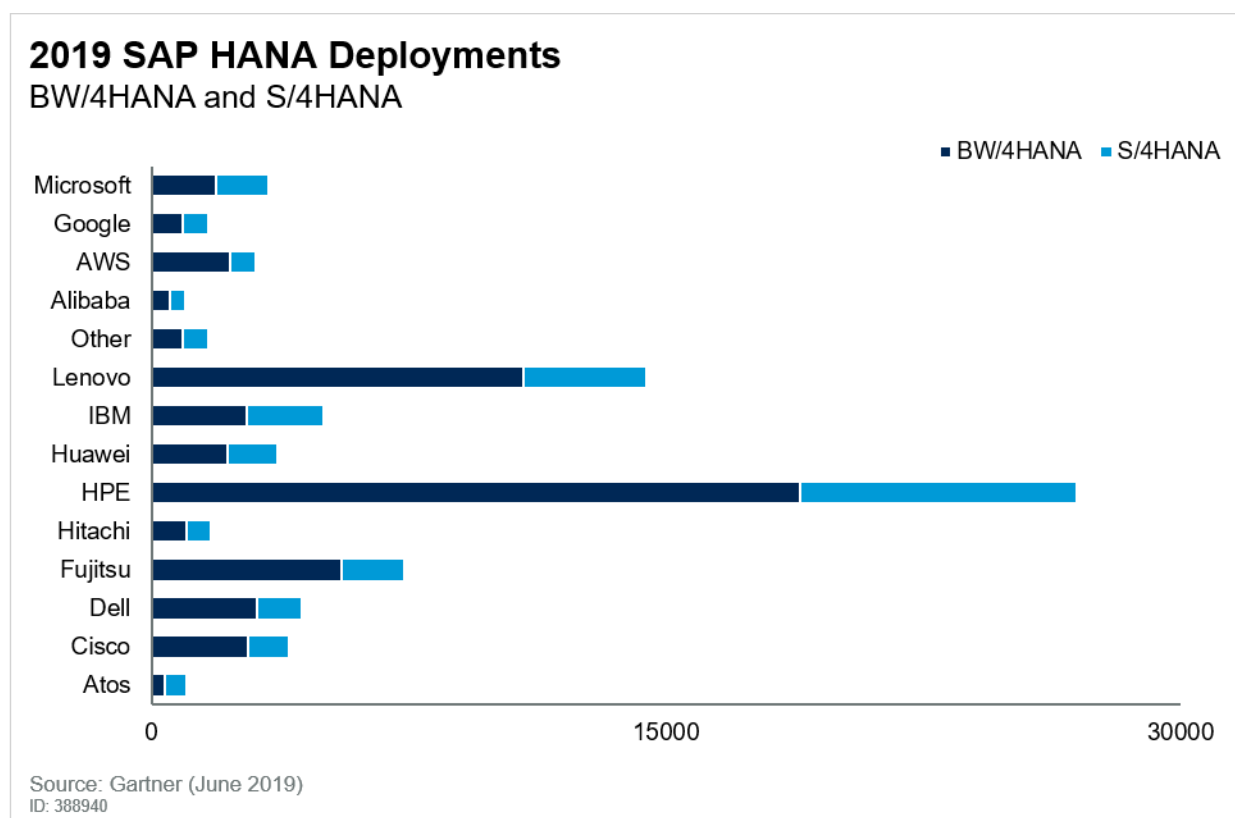
Figure 3. SAP HANA Physical Deployments by Hardware Vendor and Memory Size



The Split Between SAP Business Warehouse and SAP S/4HANA

The SAP Business Warehouse (SAP BW) market on SAP HANA is well-established. Early SAP HANA vendors — such as Fujitsu, HPE and IBM — had a strong foundation for SAP BW that now dominates the SAP Business Suite with the installed base. Other vendors, such as Huawei and IBM (now using POWER-processor-based servers), have a higher penetration of new sales for SAP Business Suite on S/4HANA, but a lower overall installed base (see “Best Practices in Planning for SAP S/4HANA — 2017 Update”). Other vendors, such as Cisco and Dell EMC, have a greater balance of new business sales and installed bases for SAP BW/4HANA and SAP S/4HANA. Figure 4 shows the installed base of SAP HANA customers broken down by hardware vendor and by SAP BW and SAP Business Suite.

Figure 4. SAP HANA Physical Deployments by Hardware Vendor by S/4 and Warehouse



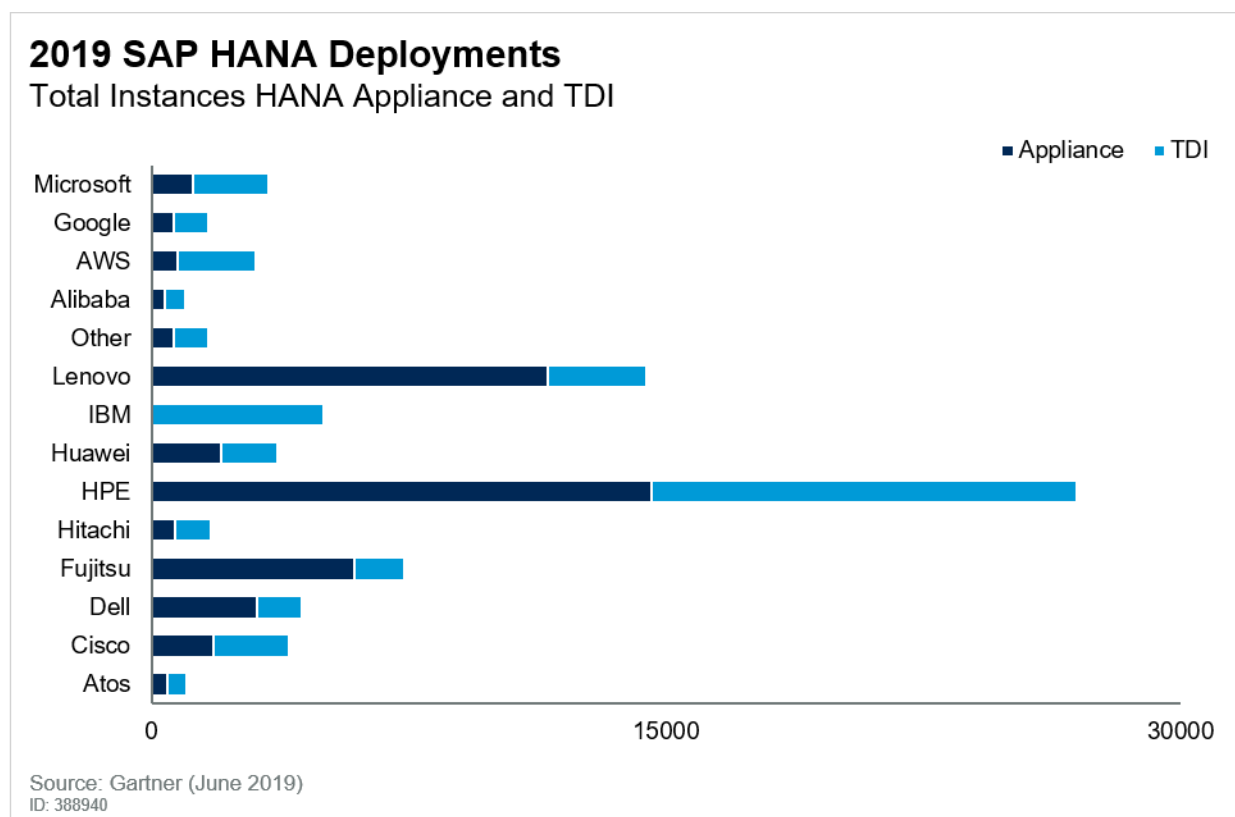
I&O leaders using ERP transactional workloads should consider high-availability (HA)/DR capabilities when choosing a vendor and platform. This puts pressure on the HA/DR and sourcing issues to allow the transactional SAP HANA deployment to be more resilient in a scalable production environment. Intel Optane DC Persistent Memory will also help with HA/DR on-premises in the future, because it is nonvolatile memory that can be recovered quickly. Additional considerations include support for virtualization technologies and workload portability to the public cloud.

The Use of SAP HANA TDI Versus Appliances

Initial deployments of SAP BW favored separately certified, prebuilt configurations (deemed “appliances” by SAP). Because SAP simplified its process for certifying new SAP HANA configurations in 2017, it is no longer necessary for SAP HANA vendors to go through the labor-intensive, costly process of certifying every possible combination of server, processor and memory configuration. Rather, a dedicated test-and-review process enables hardware partners to be listed in the SAP HANA directory, even without certification as an appliance. For example, all Intel Broadwell E7 CPUs; Intel Skylake systems; and Xeon Platinum, Gold and Silver CPUs (with eight or more cores) are supported.

Alternatively, TDI platforms can use most server platforms, processors and memory amounts; however, they require software integration and some testing for each system. Figure 5 shows the split of SAP HANA appliances, as well as tailored or TDI offerings.

Figure 5. SAP HANA Physical Deployments by Appliance and TDI



SAP Business Suite, ECC and S/4HANA have driven the new installations around TDI and appliances. Although TDI certification allows flexibility, more SAP HANA skills are required for SAP HANA TDI than a certified appliance. Those SAP HANA skills are still limited in the market and come at a premium, eroding some of TDI’s advantage over appliances. With TDI, a range of servers can also be certified, which can also include a third-party storage area network (SAN) and network-

attached storage (NAS). This storage must be a certified option. Thus, TDI can be more varied in its configuration, a trend we often see with hosts and providers. HCI systems have also been certified by vendors for SAP HANA appliances. Because this development is in the embryonic stage and involves memory densities of 2TB to 4TB, I&O leaders should get a certified customer reference before adopting.

The introduction of SAP HANA in the public cloud also adds additional platform and hosting choices, which should widen SAP HANA adoption. SAP HANA is offered in the public cloud as bring-your-own-licensing (BYOL) for SAP HANA licenses, and as pay-by-the-hour SAP HANA. Six vendors (Alibaba, AWS, Google, Huawei, IBM and Microsoft Azure) offer infrastructure as a service (IaaS) public cloud options for BYOL SAP HANA licenses, and two (Alibaba and AWS) offer pay-as-you-go SAP HANA licenses via the SAP HANA One offering. SAP HANA Cloud platforms are discussed in Gartner companion research (see “How to Select SAP HANA Cloud Systems”).

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

“How to Select SAP HANA Cloud Systems”

“20 Selection Criteria for Picking the Right SAP HANA Hardware Vendor”

“Market Guide for In-Memory Computing Technologies”

“Predicts 2019: In-Memory Computing at a Turning Point, Driven by Emerging Persistent-Memory Innovation”

“Forecast: In-Memory Computing Platforms (AIM Components), Worldwide, 2017-2022”

“Hype Cycle for In-Memory Computing Technology, 2018”

“Magic Quadrant for Analytics and Business Intelligence Platforms”

“Magic Quadrant for Operational Database Management Systems”

“Custom-Built Applications Restrict Infrastructure Modernization”

“Simplify Intelligent Infrastructure by Using Workload Architectures”

“Optimize Infrastructure Patterns to Extend Control to the Edge and IoT”

“Is SAP HANA Enterprise Cloud Right for Your Organization?”

GARTNER HEADQUARTERS

Corporate Headquarters

56 Top Gallant Road
Stamford, CT 06902-7700
USA
+1 203 964 0096

Regional Headquarters

AUSTRALIA
BRAZIL
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