



White Paper

A Move to HANA Means a Move to Linux – But Not All Linux Is Created Equal

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IDC OPINION

The market for HANA is evolving rapidly as customers are presented with multiple choices for an SAP HANA deployment, including multiple platform selections, deployment choices, and Linux distribution choices.

The operating system (OS) layer in an SAP HANA environment can contribute significantly to the system's performance, availability, security, and other key aspects. Even though Linux is an open source OS, the adage that Linux is Linux is Linux isn't necessarily true.

This white paper looks at the current situation with SAP HANA adoption, the choices SAP customers are facing, and the various options that one featured Linux distribution – SUSE – is providing or developing to support SAP customers on their journey to HANA and S/4HANA.

The white paper also looks at three customers that have successfully deployed SAP HANA on SUSE Linux Enterprise Server to provide anecdotal evidence with regard to the benefits customers are experiencing by deploying HANA on SUSE Linux Enterprise Server for SAP Applications.

SITUATION OVERVIEW

The clarity with which SAP announced the end of support for Oracle, DB2, and MS SQL Server by 2025 and the fact that, from then on, SAP will require HANA to run SAP applications or S/4HANA continue to be top of mind for hundreds of thousands SAP customers. For many, it will mean switching either their database, typically a core part of their IT environment, to HANA or their applications from SAP to business analytics software from another vendor that is compatible with their database. Either proposition is daunting enough.

Yet, for customers on Unix and Windows, the largest contingent of SAP customers, the impact is essentially doubled because they will also need to migrate not just from their existing database to HANA but also from Unix or Windows to Linux, an operating environment they may not be familiar with. Indeed, Unix customers may even be facing a triple migration because their hardware may not be suitable for Linux. If hardware renewal is required, customers face even more choices, not just in terms of vendors but also with regard to the architecture that will be most suitable for them: x86 or POWER.

Windows customers represent roughly 50% of the SAP market. In other words, a significant number of SAP customers are looking for solutions for their journey from SAP on SQL Server on Windows to SAP on HANA on Linux. The other 50% is divided between SAP customers running Linux and Unix.

There is no doubt that SAP's new Business Suite integrated with HANA – S/4HANA – is the intended goal for SAP and its many customers. S/4HANA has multiple benefits with regard to the cleanliness of the code, the effort required for operating and maintaining the code base, the size of the databases, and overall performance. But even though SAP's deadline is still nine years out, it will undoubtedly take those nine years to help the majority of customers with their journey to HANA and then S/4HANA. Not all of them are expected to make the move, though – some will continue their existing environments and pay the higher maintenance fees; some may switch their ERP software.

Those that do make the decision need a lot of hand-holding from SAP, systems integrators (SIs), hardware vendors, and Linux vendors. The good news is that many of these vendors have shown themselves to be keenly aware of the challenges their customers are facing and are responding accordingly.

From an OS perspective, two Linux vendors are certified for HANA to date: SUSE and Red Hat. This too represents a choice that customers have to make. This white paper focuses on SUSE's offering and how SUSE responds to the needs of SAP customers that are faced with making these critical decisions with regard to their SAP landscapes. Regarding the OS, these customers are asking a multitude of urgent questions around OS migration, high-availability options, virtualization options, performance optimization, skill sets, support, and so forth.

As if these various intertwined variables aren't enough to deal with, additional decisions need to be made. Many customers will consider leaving their SAP landscape in the hands of a systems integrator such as Accenture, Capgemini, or Wipro. What's more, these customers may subsequently become fairly agnostic as to where the SIs will deploy SAP for them, whether in their own datacenter – on, say, Amazon – or on SAP HANA Enterprise Cloud, as long as they don't have to think about it too much.

SAP claims strong momentum with HANA and S/4HANA adoption. Estimates for the number of SAP customers on HANA range from fewer than 10,000 to 12,000. To date, according to SAP, the company counts more than 3,700 S/4HANA customers, an increase of 500 compared with the previous quarter. SAP also states that more than 10% of its ERP customer base has signed on. Finally, SAP published in its half-year 2016 results that it has around 110 million cloud subscribers.

In terms of market share in the worldwide database management systems market, SAP still has a long way to go. SAP's share grew by 10.6% from 2014 to 2015 and now stands at 7.1% of the total market. In comparison, market leader Oracle has a 43.9% share, followed by Microsoft (21.3%) and IBM (14.4%) (see *Worldwide Relational Database Management Systems Software Market Shares, 2015: The Year of Transition to the Cloud*, IDC #US41484516, June 2016).

Linux as a Prerequisite for HANA

Linux is the fastest-growing operating system for SAP as well as for all workloads. The Linux operating systems market has been growing steadily and rapidly over the past decade, and IDC predicts that Linux will continue to grow substantially through 2019. Originally popular because it was affordable or even free, the OS over the years has gained quality and reliability and shifted from running infrastructure workloads to all workloads, including big data and analytics such as SAP and SAP HANA. Linux has also become the preferred solution for public cloud infrastructure.

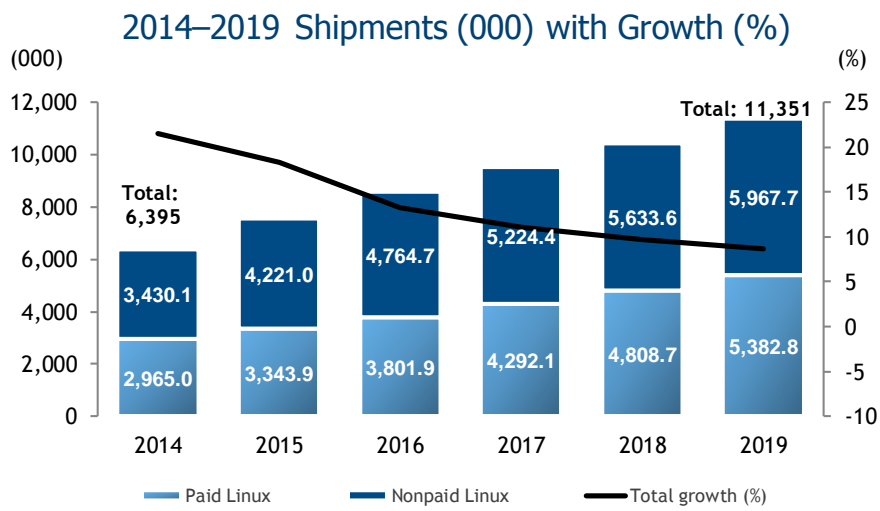
With SAP's decision to run HANA and S/4HANA on Linux only, the OS has been getting an additional innovation boost thanks to HANA- and S/4HANA-focused codevelopments with SAP and HANA solutions providers and the two commercial Linux distributors that to date have been certified: SUSE and Red Hat. Innovations are often contributed to the Linux community, as such further enhancing the operating system.

For customers that are new to Linux, because they have historically operated in a Windows or Unix environment, the good news is that today, Linux is a mainstream OS with 31% of worldwide server revenue attributable to servers that ship with Linux.

Figure 1 shows 2014-2019 Linux shipments, for both paid and unpaid distributions.

FIGURE 1

Worldwide Linux Server Operating Environment Shipment Snapshot



Selected Segment Growth Rate

- ▲ Paid Linux shipment CAGR 12.7%
- ▲ Nonpaid Linux shipment CAGR 11.7%

Total Market CAGR 12.2%

Note: For details, see *Worldwide Linux Server Operating Environments Forecast, 2015-2019* (IDC #US40313215, December 2015).

Source: IDC, 2015

SUSE LINUX ENTERPRISE SERVER FOR HANA: THREE CASE STUDIES

The sections that follow examine three companies that have adopted HANA with SUSE Linux Enterprise Server for SAP Applications as the operating system. The sections describe the three companies' current HANA installation as well as the journey each company made toward HANA and – in some detail – the role that SUSE plays in the journey. Where relevant, the case studies will be intertwined with brief descriptions of SUSE features, technologies, or strategies.

Hamm Reno

Hamm Reno is a German shoe retailer and wholesaler with 530 branches in 10 countries around the world. The company has its headquarters in Osnabrück, Germany, and is well known for its diversity of shoe brands and its broad range of fashionable footwear.

About Hamm Reno's SAP Landscape

Hamm Reno has been running SAP applications for nearly 20 years. Its current HANA installation is an SAP Business Warehouse (BW) system that it built from scratch rather than migrating its old BW system – it is based on completely new structures for reporting needs. The company uses SAP's BusinessObjects server with DesignStudio and with the Analysis for Microsoft Office add-on for reporting and planning.

Hamm Reno also uses SAP's POS Data Management, a retail module that allows for cash register sales data to be transmitted to the back-office system from hundreds of store locations in real time. The company said that it takes about 3 or 4 seconds from the closing of the cash drawer until the point when the receipt enters the SAP system at headquarters. This has enabled IT to develop, among other things, an app for the management team that allows the team members to see up-to-the-minute revenue on their smartphones.

About Hamm Reno's HANA Journey

Hamm Reno started with HANA in 2012 on Intel appliances based on IBM System x servers (now Lenovo). It had two appliances, one for test and development and one for production. When IBM launched HANA on POWER in 2015, the company, which was running most of its operations on POWER already, switched its HANA environment to POWER as well: a POWER S822L with SUSE for HANA for the production system and an LPAR on one of its three S824 POWER machines for the test and development system.

HANA on POWER is not available as an appliance; rather, a customer needs to perform SAP's "Tailored Datacenter Integration" (TDI) using SAP-certified components. Hamm Reno said this was not a problem but in fact an advantage because it has substantial experience with IBM POWER VM technology and cherishes its live partition mobility feature. The company said it treated the installation as "just another LPAR in terms of the hardware." This better integration into the company's common SAP infrastructure was the main motivation behind the switch from x86 to IBM POWER. The SUSE Linux installation was taken care of by IBM and Fritz & Macziol GmbH, a German company that sells hardware and provides SAP Consulting.

Hamm Reno is considering a move to S/4HANA once the SAP Retail solution becomes available as part of S/4HANA. As Hamm Reno stated, "We're not in a hurry with this. Probably at the end of the decade, we will change to S/4HANA because we do believe that S/4HANA will be the future of SAP applications."

About Hamm Reno's SUSE Experience

Hamm Reno runs strictly on SUSE. The Unix-to-Linux shift was straightforward for Hamm Reno's IT staff because the company already had several Linux servers in its datacenter next to the POWER systems running AIX. For example, it uses IBM Lotus Connections, a social business application, as well as other applications on SUSE Linux Enterprise on x86-based servers. As the company said, "Our admins like Linux more than Windows, so if we have a choice, we choose Linux, and we always choose SUSE for mission-critical environments." The Linux team consists of the same people as the Unix team – every team member knows AIX as well as Linux.

SUSE Migration Support

For Unix-to-Linux migrations (and for Windows to Linux, for that matter), SUSE supports SAP's initiative to simplify the OS migration for the database as much as possible. To this end, SUSE works closely with regional and global systems integrators (companies such as Fritz & Macziol in Hamm Reno's case) that help customers with a database and OS migration if they do not have the necessary skill sets in-house. It provides these SIs with all the capabilities, knowledge, tools, references, and best practices they need for the OS migration. SAP, too, offers guidelines and best practices for database and OS migrations, and SUSE leverages and endorses them. For very large customers that prefer a SUSE consultant to execute the migration, SUSE provides training and consulting services.

Hamm Reno said that the database and OS installation was straightforward. Fritz & Macziol was in-house at the company, and it encountered few, if any, problems. At the time of installation – early summer 2015 when HANA on POWER had just launched – it did have to perform a kernel patch as the 8-way multithreading feature of the POWER hardware was not yet supported by the SUSE Linux Enterprise Server. Hamm Reno said that SUSE delivered the patch very quickly. Today, the SUSE kernel is designed to take full advantage of POWER's 8-way multithreading.

SUSE Installation Support

SAP and SUSE codeveloped a capability called "Co-installation with SAP" that is template driven and that provides customers with choices to include middleware, NetWeaver, SAP HANA, and so forth when they deploy the SUSE platform. This ability has been available for several years. The deployment is guided – a customer inputs basic information and then the installation of SUSE will also initiate the installation of SAP.

For small and medium-sized businesses (SMBs), which are typically running the Windows Server OS and are getting started on SAP's Business One, SUSE makes an image available for download for SAP's Business One HANA partners that is ready for deployment. These customers are typically changing the database from SQL Server to HANA and the OS from Windows Server to Linux. SUSE claims that even without Linux knowledge, an SAP partner can deploy the full stack of SAP Business One HANA, ERP systems, the HANA database, and SUSE's automated installation in about 20 minutes.

Performance

As stated previously, Hamm Reno has standardized on SUSE, and the organization was able to say with plenty of certainty from day-to-day experience that "it runs stable and fast."

Performance on SUSE

SAP's requirements for hardware certification are very demanding with regard to a system's performance. SUSE's approach to performance enhancement is through optimization. SUSE provides certification support to its hardware partners, with SUSE engineers working alongside a hardware vendor at SAP's headquarters throughout the certification process to address any performance issues and to ensure the greatest possible performance on the vendor's system. The company is also involved with deep engineering efforts in collaboration with hardware vendors outside the SAP certification process.

Furthermore, SUSE develops new features that can help boost performance. One example is the page cache limit capability called Memory Management, which provides customers with a high level of control as to how much memory the OS can access. This functionality (which had been known in Unix environments) allows IT to fine-tune how much memory the OS can use for caching and swapping in order to optimize the ERP software's performance.

Hamm Reno said that the departments it serves have indicated that they are "very satisfied with the speed of their queries and everything else they do on the system."

According to Hamm Reno, day-to-day management runs smoothly, including the HANA database ("once it's tuned, there's not much to do"), the backup system, and SUSE. The company said the SUSE OS "runs very well." SUSE Manager helps with operational planning around a HANA environment, especially with keeping each level of the HANA stack automatically updated, including database patches, OS patches, kernel updates, and configuration updates. With regard to the hardware layer in a nonvirtualized environment, it manages updates for hardware-specific software.

Having begun this journey on HANA – and in the near future to S/4HANA – and looking 5-10 years ahead with more SAP innovation around the corner for these platforms, Hamm Reno said it is very comfortable going through this experience with SUSE: "We have about 10 years' experience with SUSE, and I have no doubt that they're a good company, and we'll go on this journey with them. What's more, if SAP trusts SUSE, why should we not?"

itelligence

itelligence is one of the leading international full-service providers of SAP solutions, employing about 5,300 employees. As a global value-added reseller, the company is SAP certified for cloud services and for hosting services for SAP HANA Enterprise Cloud. The company's services in support of SAP solutions range from consulting and licensing to application management services and hosting services to industry-specific SAP. The organization is part of NTT DATA Corp. and is located in 22 countries, with 10 datacenters worldwide. itelligence runs its SAP hosting environments as well as its own SAP ERP on HANA on SUSE. For the conversation that informed this case study, the focus was on the company's hosting services.

About itelligence's SAP Landscape

Depending on the "delivery center," as the company calls its datacenters, itelligence offers a variety of deployment infrastructures; however, all its datacenters utilize SAP TDI for HANA, not HANA appliances. By using TDI, the datacenters can leverage existing components such as shared storage, shared network components, and bare metal servers. This has allowed the company to take advantage of its existing infrastructure for installing HANA. The other commonality among the centers is that they all run on SUSE, even though they have different server, storage, and network vendors. As itelligence said, "We have several hundred HANA instances right now, whether POWER or x86, and all are running on SUSE Linux Enterprise Server."

SUSE Virtualization

SAP allows HANA servers to be virtualized on VMware so that they can run different relationship models in the database and leverage multitenancy. SUSE worked closely with VMware to resolve the tests for Linux and then built best practices to virtualize SAP HANA systems with VMware, and today, the company has a strategic alliance with VMware. SUSE also supports Microsoft Hyper-V, and the company has a long-standing co-engineering agreement with Microsoft. IBM POWER customers use LPAR virtualization, which enables them to go up to 4.8TB with 96 vCPUs.

Furthermore, SUSE delivers KVM and Xen and supports both. SUSE is the only Linux vendor that has guaranteed Xen Enterprise support for the next 10 years. This is at the request of several large customers, including SAP, that wanted to ensure that Xen will continue even as the general trend is toward KVM.

About itelligence's SUSE Experience

itelligence primarily runs SUSE in its datacenters, but because the company also offers remote services, it does service some customers that have another Linux distribution on-premises and that wish to stay on that Linux brand for their HANA implementation.

itelligence said that it keenly takes notice of performance improvements of the kernel that result from SUSE's optimization efforts, generally via the SAP channel. When SAP identifies a kernel issue, for example an issue that is related to performance, SAP updates its best practices or information guidelines and issues recommendations developed by SUSE and SAP to customers such as itelligence to update the kernel. This is true for both x86 and POWER environments.

Regarding support, the company stated, "We have really good experiences with the support from SAP and SUSE." It said that the documentation and information for SUSE Linux Enterprise Server for SAP Applications – how to tune it and optimize it for SAP HANA – has "helped us a lot." The company also said the predefined scripts for how to operate an environment with SUSE and SAP HANA "provide a lot of benefit."

With a variety of SAP HANA customers in production on itelligence's hosted service, high availability has become an important feature for the organization because its customers are increasingly less tolerant of downtime. Currently, the company by default offers internal SAP HANA systems replication, which is triggered manually when a problem is identified and then runs automatically. "If a customer demands automatic failover, we will use SUSE's High Availability Extension."

SUSE High Availability and Disaster Recovery

As attested by itelligence, with SAP system replication, a failover for disaster recovery needs to be done manually by the administrator, which can take anywhere from a few minutes to an hour or longer. Also, while VMware HA covers a server outage, it does not recognize what application was running in the container. Unlike with VMware HA, SUSE HA is application aware, meaning the HA framework is aware whether the SAP application or HANA workload is running or not. SUSE has therefore collaborated with SAP to integrate its SUSE HA capability into HANA and enable automated failover. SAP provides System Replication capabilities within HANA, which SUSE leverages to automate failover between two nodes (scale up) or multiple nodes (scale out). Scale out is somewhat more complex, with clusters consisting of potentially dozens of systems on one side being duplicated to another side.

These technologies have been made part of SUSE Linux Enterprise Server for SAP Application; they're not available as standalone products. They are accompanied by additional SUSE software to initiate connectivity to the SAP system. The SUSE software "talks to" SAP NetWeaver or SAP HANA to interpret the signals from these systems before making decisions.

itelligence volunteered that SUSE clearly differentiates itself from other Linux vendors with its HA technology. "SAP HANA is more and more becoming a standard, and everyone is getting familiar with it, including the other OS vendors. But SUSE's HA represents one of those features where SUSE is clearly ahead."

In addition, itelligence trusts that SUSE will continue to be in sync with everything that SAP develops for SAP HANA and S/4HANA in the next 5-10 years. As the company said, "We hope that SUSE follows SAP in those new technology directions ... and that SUSE will be a good future platform for SAP for further development. And I hope that the collaboration between SUSE and SAP continues to be really close because, of course, we take advantage of this."

Global Reinsurance Company

This company is one of the world's largest reinsurance firms, with headquarters in Europe and offices in more than 25 countries around the globe.

About the Global Reinsurance Company's SAP Landscape

The company has approximately 80 SAP systems that are running on SUSE, with some of them running HANA and S/4HANA and others running Oracle. The primary reason it implemented HANA servers is, as it stated, "Because with S/4HANA, there is no choice other than HANA." The company developed its S/4HANA implementation with TDI on scale-up HPE servers, SUSE, and VMware.

In addition, the company runs SAP's Process Orchestrator, which allows it to automate and optimize simple as well as vast and complex business processes. It also runs HANA on HPE, SUSE, and VMware. And, finally, it has a dedicated SAP Fiori server, which provides a device-agnostic user interface to about two dozen SAP applications. The Fiori server consists of a HANA database and VMware ESX server, which is an enterprise-level virtualization tool from VMware that reliably manages large numbers of VMs on bare metal.

The company expects around 1,000 business users for the systems by the time they are fully operational. It is planning for a 1TB database in the first year and 250GB RAM, with flexibility to go up to 500GB.

The system will be used for the firm's legal entities that are currently being handled in different systems, which is causing excessively large volumes of data exchange. The idea for the S/4HANA project is to merge them in a single system. The production system will be considered mission critical because it will run core finance applications, with all the legal entities combined on the system.

About the Global Reinsurance Company's HANA Journey

The firm is running both SAP and Oracle on SUSE Linux Enterprise Server for SAP Applications because, in 2010, before HANA was launched, the company made a strategic, organizationwide decision to migrate all its systems from Solaris to SUSE Linux Enterprise for cost reasons. Later, when it became evident that HANA at first would run on only SUSE Linux Enterprise Server for SAP Applications, there was no new OS migration awaiting the company by the time it was ready to adopt HANA.

The company took the TDI approach, which it thought was not easy a year ago; however, it said that SAP had recently changed the process and streamlined it. "SAP will tell you what hardware is supported – they check the storage and the network, and then they sign off on it." SAP also provides a report that a customer can execute to check the performance of its HANA implementation. "We executed this report, and it went fine. So we understood that this setup is sufficient."

The organization has considered the HANA Enterprise Cloud but has not made any decisions as to whether it will start deploying HANA in the cloud. Most important for the company is to be able to achieve scalability in case the system needs to meet higher requirements or needs to be bigger at a later stage. It believes such scalability could theoretically be achieved with the HANA Enterprise Cloud, so this remains an option.

About the Global Reinsurance Company's SUSE Experience

The company considers SUSE to be "quite a robust OS." From an OS management perspective, it believes that SUSE is very efficient to manage: "We have about 1,000 SUSE Linux Enterprise installs and around 10 people who also manage other systems, so we think it's a very good ratio."

The company noted the memory consumption is significantly higher with HANA than with Oracle because everything runs in-memory. "We need to get used to not assigning 50GB RAM but 300, 400, or even 500GB." According to the firm, this is not necessarily an issue because the company can manage up to 6TB or more, but it requires a different way of thinking. The organization, and other companies with similar "memory consumption shock," could benefit from SUSE's Memory Management feature, described previously, to limit memory for the OS and free up more for the database.

Live Patching

In terms of planned downtime, the company is an ideal candidate for SUSE's recently released live patching capability for SUSE on HANA because today, it typically performs a reinstallation with each upgrade, which means up to 90 minutes of downtime.

SUSE expects this feature to be adopted in significant numbers as some HANA systems are quite large, possibly 6TB or even 12TB of main memory, and currently, certain Linux patches require a reboot, for example if there's a kernel bug. Rebooting and then writing back 12TB of memory can take hours, far exceeding any SLA that a datacenter has with its lines of business or a hosting company or managed services company with its customers.

The reinsurance company still has much to prepare before it can go live with the HANA installation. The company said that it typically lets all the support run via SAP as it gets ready. But there is also a possibility to directly connect with VMware and SUSE, which the company did when it did the first installation. "There were some specific settings on the OS and VMware for which we needed to get SUSE and VMware involved, so we had a consultant from SUSE and one from VMware come in to set up the initial configuration. Now, each time we deploy an SAP server, the SUSE OS will directly set the settings accordingly, something we built together with SUSE."

Enterprise Support

SUSE said that its focus on optimization means listening to customer demand and SAP recommendations and taking a general-purpose Linux OS and optimizing it for SAP customers. This means having processes, agreements, and resources in place to make sure that, worldwide, SAP customers with SUSE calling into SAP are passed on seamlessly to the SUSE support organization. SUSE has a service account management that works with SAP's priority support team to handle customer installations.

The reinsurance company said that it believes SUSE is a safe bet for the next 5-10 years as SAP brings more HANA- and S/4HANA-based innovations to market: "We've looked at other Linux distributions, but there's no incentive for us to change to anything else – why should we? We're still on a journey, of course. We don't have 10 years' experience yet. But overall, we are quite satisfied with SUSE."

CURRENT AND FORTHCOMING DEVELOPMENTS

Cloud

Customers that run HANA on SUSE Linux Enterprise for SAP Applications do not need to worry that they are somehow restricted to on-premises deployment only, because SUSE provides offerings for all options that SAP is providing, including various cloud deployment models. This allows for a smooth transition from an on-premises approach to a cloud strategy or a combination of the two.

Working with cloud service providers is a high priority for SUSE. Right now, the company is focused on Amazon and Azure (which together control about 90% of the market), and specifically Azure, because for many Windows customers, the first point of entry into a cloud deployment for HANA will be on Azure.

Azure

SAP and Microsoft announced availability of HANA on Azure with different technology stacks – a colocation offering and a native offering running HANA on Azure/Hyper-V for BW workloads in production.

ERP workloads on Azure will likely come by the end of 2016, when Microsoft updates its Hyper-V infrastructure, which involves swapping out the hypervisor in the Azure datacenters. This will be a nonproduction environment because of current storage limitations on Azure related to the hypervisor.

Amazon

SUSE has been working with Amazon on Linux for about seven years, and Amazon began offering SAP HANA (HANA One) about four years ago. SUSE stated that this is a popular offering that represents a sizable revenue stream for the company through Amazon.

In 2015, SUSE developed availability of the SAP HANA HA/DR resource agents for Amazon. The infrastructure on Amazon is different from that in a typical on-premises installation, and the HA/DR agents couldn't be replicated on Amazon. That was part of SUSE's product release in February, going hand in hand with the new X1 instances that Amazon has made available, a new addition to the Amazon EC2 memory-optimized instance family for running large-scale, in-memory applications and in-memory databases in the AWS cloud, certified by SAP to run production environments of HANA and S/4HANA.

Customers can set up a cluster of SAP HANA instances on Amazon, in either the same availability zone or between availability zones. A typical East Coast-West Coast scenario might be an Amazon datacenter in Virginia that, in case of a crash, fails workloads over to a California datacenter.

SAP HANA Enterprise Cloud

SAP HANA Enterprise Cloud is the private managed service cloud from SAP, a kind of "HANA out of the box" deployment. SAP HANA Enterprise Cloud mostly runs on SUSE. SUSE is currently working to expand the hypervisor choices. Today, customers can buy either physical instances on the SAP HANA Enterprise Cloud or virtualized instances based on VMware. SUSE is collaborating with SAP on releasing this offering on Xen and KVM; however, no timeline has been set for the certification of these open source hypervisors.

SAP HANA Cloud Platforms

SAP HANA Cloud Platforms is SAP's platform as a service (PaaS), first offered from SAP datacenters and then from partner datacenters (SAP HANA Cloud Platform runs on SAP HANA Enterprise Cloud). SUSE is focused on collaboration with SAP around OpenStack – the infrastructure-as-a-service (IaaS) layer – and CloudFoundry, specifically the CPI (Cloud Provider Interface) project, which enables applications that are developed on CloudFoundry to be deployed in various environments – Amazon, Azure, enterprise environments, OpenStack, or providers of cloud-based SAP solutions such as T-Systems. The next step in this effort is to set up a cloud lab staffed by SAP and SUSE employees for testing, benchmarking, and developing reference architectures. SAP and SUSE then intend to deploy the SAP HANA Cloud Platform outside of SAP datacenters.

SUSE Little Endian for HANA on POWER

SUSE is optimized for SAP on POWER and has been certified for HANA. SUSE has seen multiple large customer deals as IBM focuses on the top 5% of the SAP customer base where procuring 50 or 100 HANA systems is not uncommon. However, to date, HANA on POWER has been available only on big endian even as today the overall POWER strategy is to provide little endian Linux. SUSE said that IBM has made the decision to switch to little endian for SAP on POWER. SUSE has the little endian product, called SUSE Linux Enterprise Server for SAP Applications for POWER, ready and is waiting for IBM and SAP to give the green light, possibly in the fall of 2016 or early 2017.

S/4HANA Optimization

There's constant interaction between SAP engineering and SUSE engineering on an architectural level with regard to how SAP is bringing HANA to market. Any requirements from SAP to satisfy its go-to-market strategy are by default addressed by SUSE's engineering team. In this sense, SUSE is in receiving mode, constantly reviewing what SAP brings to market and what SAP's expectations are and then acting accordingly. SUSE expects that SAP will have numerous new requirements in the next several years that SUSE will incorporate into its road map to continue optimizing Linux for SAP.

CHALLENGES/OPPORTUNITIES

- **Challenge:** If a customer is already using a competing Linux product for other workloads, it may want to continue standardization within the datacenter around its Linux version, even for SAP.
- **Opportunity:** SUSE Manager (SUSE's systems management solution for Linux) can also manage RHEL servers. SUSE has customers using RHEL while SUSE Linux Enterprise for SAP Applications is the key application environment for their HANA. SUSE is neutral with regard to PaaS and middleware. It supports key offerings and is developing a partnership with CloudFoundry as well as codeveloping the cloud provider interface between CloudFoundry and OpenStack for SAP HANA Cloud Platform. CloudFoundry is a truly open PaaS layer, with many large organizations – including SAP and SUSE – collaborating and contributing.
- **Challenge:** The competitor's HA system technology is comparable with SUSE's because, even though this is SUSE expertise, it is open source and competing Linux vendors can incorporate the technology into their Linux product.
- **Opportunity:** By being at the forefront of innovation and optimization for SAP, SUSE manages to stay ahead – close to two years for such technologies as SUSE HA by some estimates – of other Linux distributions. Furthermore, larger customers that require support will need SUSE expertise, especially in more complex situations.

- **Challenge:** A large customer segment is running SAP on SQL Server, and for these Windows customers, a migration to HANA on Linux is a double migration further complicated by a lack of Linux skill sets. This conversion process has only just begun and may last up to a decade.
- **Opportunity:** SUSE is addressing the needs of Windows customers with its Service Pack 2 for SUSE Linux Enterprise Server for SAP Applications, to be released in fall 2016, which features integration with Windows desktops and Windows servers. The company said that it intends to release more features that make it easier for on-premises Windows customers to make the switch to Linux by making it easier to use; covering more workloads, including an automatic setup for clustering; and providing migration support to administrators. Availability of SAP HANA on SUSE Linux Enterprise Server for SAP Applications on Microsoft Azure and other cloud offerings could be viable alternatives to on-premises deployments.
- **Challenge:** Customers are starting to put their SAP landscape in the hands of SIs so they don't have to worry about them.
- **Opportunity:** SUSE said it is aggressively expanding its collaboration with systems integrators in terms of technical enablement, best practices, reference architectures, and support.
- **Challenge:** The competition has pushed in on what was historically a SUSE-exclusive market; even IBM POWER's 2016 road map shows direction for RHEL support.
- **Opportunity:** Having a head start on competitors and having worked closely with SAP for years to optimize SUSE Linux Enterprise Server for SAP Applications for traditional SAP solutions as well as HANA and S/4HANA give SUSE the opportunity to retain a lead. As all SAP innovation moves toward S/4HANA, SUSE Linux Enterprise Server for SAP Applications needs to continue developing performance, availability, security, and simplicity differentiators for an operating environment that optimizes S/4HANA. This is a major opportunity for SUSE. Support plays an important role as well because, today, fear and confusion rule among SAP customers with regard to HANA, and especially S/4HANA.

CONCLUSION

Hundreds of thousands of businesses, small, medium sized, and large, around the globe are running SAP applications on databases such as Oracle, SQL Server, or DB2 leveraging Windows, Unix, Linux, or z/OS. SAP has started corralling these customers into a single database option, SAP HANA, which runs on Linux only. While IDC expects that not all customers will give up their non-HANA database, quite a few have already made the move, and many more are preparing a migration. The stakes are high and the complexities daunting, more for some than for others; in particular, users of Microsoft SQL on Windows are facing a stark skill set gap.

In the first year after SAP announced its HANA strategy, anxieties were high. But today, the market has calmed down, not in the least because of the customer focus from SAP, the hardware vendors, and the Linux vendors. With regard to the latter, IDC believes that SUSE is playing an important role not only in ensuring that HANA performs optimally and reliably on SAP-certified hardware through ongoing innovations but also by making a HANA migration easier, faster, and less fraught with uncertainties. SUSE's support, training, best practices, templates, and strong ties with SAP and with the many hardware vendors should give customers some peace of mind as they commence the HANA journey.

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