

White Paper

Data center transformation with hyper-converged infrastructure for SAP HANA®

SAP is responding to customer demands for extremely flexible and money-saving IT concepts and is certifying hyper-converged infrastructures (HCI) for SAP HANA®. Fujitsu is one of the first manufacturers to have a 4-socket system certified by SAP for VMware vSAN. This white paper provides an overview of the solution and outlines the criteria that businesses that use SAP solutions should keep in mind when running productive HCI environments.



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Management summary

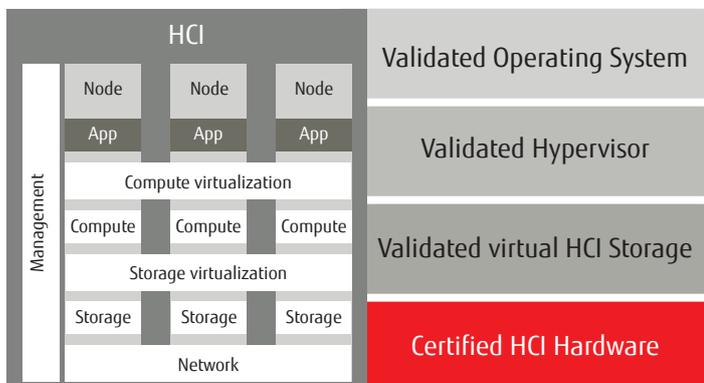
Fujitsu is one of the first manufacturers to receive SAP certification of a hyper-converged infrastructure (HCI) based on VMware vSAN with a 4-socket server for SAP HANA. The FUJITSU Integrated System PRIMEFLEX for VMware vSAN is based on VMware vSphere, the leading virtualization platform. The native vSAN in vSphere is capable of using all 4 CPU sockets and the 6 TB of memory in a PRIMERGY RX4770 M4 server when running SAP HANA. In other words, most customers can run their SAP HANA production databases with only one node. PRIMEFLEX for VMware vSAN thus offers the highest levels of performance and cost-effectiveness for software-defined SAP operation.

HCI – ready for mission-critical SAP HANA

In an HCI solution, all previously separate components such as compute, storage, network and other technologies are brought together and precisely meshed in a software-defined platform. More and more business enterprises are taking this extremely flexible and cost-saving approach to considerably simplify data center design and achieve a higher degree of agility and scalability. And since these solutions are already proving their value in terms of performance and reliability, many enterprises want to use them to modernize their business-critical applications. SAP is responding to this trend by certifying HCI solutions for SAP HANA.

Certification criteria

The certification of an HCI for SAP HANA takes place within the scope of the SAP Integration Certification Program. The program is focused on the certification of the hardware that will serve as the basis for an HCI solution. In addition, all solution components – including the operating system, hypervisor and software-defined storage – must also be validated. The components are tested in an end-to-end solution to make sure that isolation is guaranteed so that other workloads will not have an impact when SAP HANA is in operation.



To fulfill SAP certification criteria, all the components of an HCI solution must pass a special validation process.

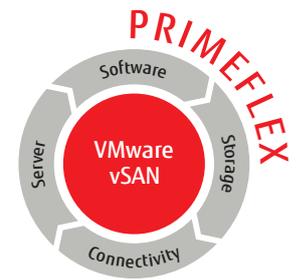
The Fujitsu HCI solution for SAP HANA: PRIMEFLEX for VMware vSAN

The PRIMEFLEX brand from Fujitsu stands for complete converged and hyper-converged systems. These solutions integrate tested combinations of servers, storage, network and software. All of these components are pre-defined, pre-configured and installed at the factory. When compared with traditional architectures, these solutions make data center modernization much simpler, faster and more flexible. What's more, they sustainably reduce the risks, complexity and costs involved in setting up and operating modern data center infrastructures. PRIMEFLEX for VMware vSAN from Fujitsu is the hyper-converged infrastructure offering a next-generation virtualization platform with software-defined computing, storage and network resources.

- The solution is based on the FUJITSU Server PRIMERGY series, which is ranked No. 1 in 70% of all VMware performance benchmarks. The PRIMERGY RX4770 is used for SAP HANA because of its proven performance. The PRIMERGY RX4770 M4 is an x86 system with four sockets that delivers outstanding performance, scalability and efficiency. Thanks to extremely fast DDR4 technology with up to 6 TB of capacity, along with outstanding performance from NVMe flash drives, the system can easily handle complex and data-intensive workloads – like several SAP HANA in-memory databases and business analytics – all in real time.
- The solution includes VMware vSphere, the industry's leading virtualization platform. VMware vSphere has been certified for SAP HANA for quite some time now, and it has proven itself in productive environments around the world.
- VMware vSAN, which is integrated in the vSphere kernel, is the software-defined storage technology from VMware for hyper-converged infrastructures. VMware vSAN offers high-performance shared storage for virtual VMware vSphere machines.
- The solution offers a fully usable 4-socket server and is ready for SAP HANA scale-out. The certification will take effect as soon as official support for scale-out with HCI is provided by SAP.

PRIMEFLEX for VMware vSAN – components of the certified solution in brief

Certification scenario	SAP HANA-HyCI 1.0
Server	PRIMERGY RX4770 M4
CPUs (total/SAP HANA)	4/4
CPU Range	Xeon SP (Skylake) silver, gold, platinum
RAM per CPU-socket	up to 1,5 TB
Range of HCI nodes	3-64
Range Hypervisor	vSphere 6.5, 6.7
Range SDS Version	vSAN 6.7



What are the advantages of PRIMEFLEX for VMware vSAN when running SAP HANA?

Businesses that use SAP HANA who are considering the deployment of an HCI for productive operations need to consider several aspects in advance, for example: performance, scalability, management, ease of operation, and support. These factors are discussed in more detail below.

Full access to CPU sockets

SAP HANA VMs must not share CPU sockets with storage controller VMs (CVMs). Since vSAN runs natively in vSphere, no CVM is required to execute the storage stack – for this reason vSAN gives SAP HANA VMs complete access to all four CPU sockets in the PRIMERGY RX4770 M4 server. PRIMEFLEX for VMware vSAN thus offers the highest SAP HANA VM density per node. Thus, customers have the flexibility to run up to four productive SAP HANA VMs or even one huge 6 TB SAP HANA system on one PRIMERGY RX4770 M4 server. By contrast, an HCI platform with CVM on a 4-socket system would only have three sockets available and therefore less CPU and fewer memory resources available for SAP HANA VMs. Thus PRIMERGY RX4770 M4, integrated with PRIMEFLEX for VMware vSAN, represents the most powerful, efficient and flexible platform for SAP HANA on HCI in the market.

Full storage capacity support

SAP HANA with its in-memory capabilities delivers extraordinary performance. About 9 out of 10 SAP customers running SAP HANA in production run databases that are typically between 2 TB and 6 TB in size. VMware vSphere/ESXi 6.7 supports SAP HANA VM storage capacities of up to 6 TB with some 10.4 billion data sets in the database. Since the PRIMERGY RX4770 M4 server can also be equipped with up to 6 TB DDR4 memory, SAP HANA customers can run extremely large databases on just a few nodes. At the same time, the best CPU utilization and the most efficient use of hard disks, as well as four network cards with 10 GB each, ensure that the solution offers the best total cost of ownership.

Support of the latest technologies

SAP HANA customers profit from the latest hardware innovations in PRIMEFLEX for VMware vSAN. The RX4770 M4 is equipped with the very latest processors from the Intel® Xeon® Scalable Family with up to 28 cores and Intel UltraPath Interconnect for boosting the data rate among CPUs and ensuring outstanding performance for even the most complex workloads. What’s more, the system can be flexibly scaled with up to 12 ultra-fast NVMe SSDs. Components such as hot-plug power supplies with 94% energy efficiency – along with Cool-safe® Advanced Thermal Design from Fujitsu – support the highest levels of operational efficiency.

Integrated management

PRIMEFLEX for VMware vSAN, together with the FUJITSU Software Infrastructure Manager (ISM) in combination with VMware vSphere, is a software-defined infrastructure solution that enables quick provisioning of services, easy shifting of workloads and automated SAP operations. ISM makes running the SAP infrastructure much simpler thanks to central capacity and health management, along with automatic configuration and other features. Integration with vCenter supports consistent lifecycle management as well as high availability with automatic fault tolerance.

One-stop support from a single source

Fujitsu supports PRIMEFLEX for VMware vSAN as a complete product with hardware and software. What’s more, Fujitsu is the customer’s single-source contact for all matters related to the infrastructure solution. This clear and direct line of communication keeps maintenance and eventual troubleshooting very simple.

Important findings

HCI's make the provisioning and management of private cloud solutions much simpler. Furthermore, they serve as a bridge to the public cloud and represent an effective approach for reducing operational costs while supporting business processes with higher flexibility at the same time. PRIMEFLEX for VMware vSAN from Fujitsu with 4-socket PRIMERGY RX4770 M4 servers is one of the first HCI's based on VMware vSAN to be certified for SAP HANA. Since vSAN is capable of completely addressing the performance of the servers, customers can realize nearly all SAP HANA application scenarios with a high degree of efficiency. The outstanding scalability of PRIMEFLEX for VMware vSAN with up to 64 nodes opens up a host of options when setting up a software-defined data center.

Further links:

- FUJITSU Integrated System PRIMEFLEX (Internet)
- PRIMEFLEX for VMware vSAN (Internet)
- FUJITSU Server PRIMERGY RX4770 M4 (Internet)
- Certified and Supported SAP HANA Hardware Directory (Internet)

FUTURE-PROOF THROUGH PARTNERSHIPS

For years Fujitsu has been working very closely with strategic partners such as SAP and VMware in developing solutions that deliver tangible value to our mutual customers.

The strategic partnership with VMware was initiated more than 15 years ago and has resulted in more than 5,000 successful customer projects throughout EMEA.

The partnership with SAP has grown over a period of more than 40 years, and Fujitsu is one of the very few SAP partners having Global Partnership Status for Technology, Services and Hosting. From the very beginning Fujitsu was involved in the development of SAP HANA and can offer customers in-depth know-how and comprehensive support, ranging from consulting to the actual operation of SAP HANA platforms.

