SUPERMICRO SOLUTIONS FOR SAP HANA®

Supermicro X13 Scale-Up Servers Now Certified for SAP HANA

Supermicro 8 CPU Scale Up Server

Executive Summary

Digital transformation is a top priority for any enterprise or business seeking a competitive advantage in the rapidly evolving information economy. Real time, actionable business insights and continuous operational improvements, once just wishful thinking, have become standard requirements for today's information-driven CEOs. SAP customers now require a robust, scalable platform for running all SAP HANA database-related applications, such as SAP S/4HANA and BW/4HANA. Customers require the ability to manipulate, extract, and analyze large volumes of live transactional data, all in real time, without interrupting business operations.

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SAP HANA enables your digital transformation by providing a real-time, in-memory computing platform that is a thousand times faster than traditional databases, all while allowing real-time Online Transaction Processing (OLTP) and Online Analytical Processing (OLAP) on the same system or environment. Supermicro has partnered with SAP to pre-certify, validate, and architect SAP HANA systems to power your digital transformation infrastructure.

Introduction

SAP HANA In-memory database helps enable real-time analysis and accelerate transactional workloads by using an entire solution designed and sized accordingly based on certified SAP HANA systems.

To support SAP customers alongside their SAP S/4HANA installation or migration journey, Supermicro made a considerable number of systems available that are SAP HANA certified, pre-defined, and tested to fully meet workload requirements and short-time-to-value of practically any kind of critical S/4HANA systems.

SAP HANA Implementation Options

SAP HANA appliance

SAP started delivering SAP HANA in the form of standardized and highly optimized appliances, offering companies the possibility to choose between several SAP HANA hardware partners. Those SAP HANA appliances are built based on a well-defined hardware specification designed for the performance requirements of a solution that leverages in-memory technology. If you prefer the delivery of a preconfigured hardware setup with preinstalled software packages that can be quickly implemented by your SAP HANA hardware partner of choice, then an appliance is the suitable delivery model for you. Both the hardware partner and SAP fully support it.

SAP HANA TDI

While the appliance delivery is easy and comfortable, it might introduce hardware flexibility limitations and require changes to your established IT operation processes. Therefore, SAP offers an additional delivery approach for SAP HANA - SAP HANA tailored data center integration. Compared to the appliance delivery, to optimally integrate SAP HANA in your data center, SAP HANA tailored data center integration provides you with more flexibility regarding the hardware. With TDI, you can reduce hardware and operational costs by reusing existing hardware components and operating processes. Mitigate risks and optimize time-to-value by enabling existing IT management processes for SAP HANA implementation.

SAP HANA TDI helps you to stay within your IT budget, shortens implementation cycles, and allows better consumption of hardware innovations to drive the adoption of SAP HANA.

Certified Supermicro Solutions for SAP HANA, S/4HANA

Supermicro has certified best-of-breed systems underneath SAP HANA since many Intel CPU generations. While this paper focuses on the 4th generation Intel, you can find information about previous versions of Supermicro systems and CPUs under https://www.supermicro.com/en/solutions/sap/hana-appliance-tdi

This solution brief focuses on the new Supermicro generation X13 based 4th Gen Intel Xeon Scalable processors. Compared with the previous generation, the X13 systems have 2X the core count, 1.33X the memory capacity, and 2X the memory bandwidth. Also, these systems deliver up to 4X the I/O bandwidth compared to previous generations of systems for connectivity to peripherals.

8-socket system: The Multi-Processor server with up to 480 cores and 32TB of DDR5 memory is ideal for critical, large in-memory databases, maximum performance, and virtualized landscapes. Once you consolidate many databases into this system, you can reduce maintenance costs and administration effort and lower TCO.

This system, the Supermicro SYS-681E-TR, has been certified as an appliance, and customers can use it as HANA TDI without any limitation if they want to. A customer's bill of material can look as follows, while customers' systems may look different regarding practically all components.

Figure 1 - Supermicro 8 CPU SYS-681E-TR

The following specification is for a large database using an 8-socket system for high end load or consolidation purposes:

Quantity	Part Number	Description
1	SYS-681E-TR	X13 6U 8-way, X13OEi, CSE-618TS-R5K62P
8	P4X-SPR8490H-SRM7J-XCC	SPR 8490H 8/4/2P 60C 1.9G 350W 112.5MB BI(4444) E5
128	MEM-DR596L-CL01-ER48	96GB DDR5 4800 ECC REG---MEM-DR596L-CL01-ER48
1	AOC-S3908L-H8IR-16DD	RAID 8 int 12Gb/s ports, x8 Gen4, ROC - LP, 16 HDD w/ exp,RoHS
1	BTR-CVPM05	Broadcom 05-50039-00 CacheVault w/ 24" Remote Extender
8	HDS-SMP-MZILT7T6HALA07	Samsung PM1643A 7.68TB SAS 12Gb/s 2.5" 15mm Sample
1	CBL-MCIO-1232M5	MCIO x8 (STR to STR),32cm,85OHM,RoHS
1	CBL-SAST-1261-100	Slimline x8 (STR) to 2x Slimline x4 (STR),60/60CM,100 O
2	HDS-S2T1-MZ7LH960HAJR05	Samsung PM883 960GB SATA 6Gb/s V4 TLC 2.5" 7mm 1.3 DWPD

Summary: SYS-681E-TR: 6U, 8 CPUs, 128 DIMMs, 24x 2.5" Hot-swap NVMe/SAS3/SATA3 drive bays; 2x internal M.2 NVMe/SATA; Optional RAID support via storage add-on card.

4-socket systems: Unlike the 8-socket certification, Supermicro designs and manufactures two different 4-socket systems available to our SAP HANA customers, who can choose one based on their needs and workload. So, they can select the SYS-241E-TNRTTP with CPUs up to 32 cores and 24 drives, while SYS-241H-TNRTTP can be configured with CPUs up to 60 cores and six drives only. Those two examples show how a customer's workload and database size determine the most appropriate system to use and meet customer expectations.

Figure 2 - Supermicro 4way Server - SYS-241E-TNRTP

The following bill of materials is for a mid-size customer who intends to use a 4-socket system with a moderate workload:

Quantity	Part Number	Description
1	SYS-241E-TNRTTP	X13QEH+, CSE-218HTS-R3K2AWP
4	P4X-SPR6448H-SRMGW-MCC	SPR 6448H 4/2P 32C 2.4G 250W (2.1/225, 1.9/205) 60M BI(1122)
32	MEM-DR564L-HL01-ER48	64GB DDR5 4800 ECC REG---MEM-DR564L-HL01-ER48
8	HDS-I2T0-SSDSC2KB960GZ	D3 S4520 960GB SATA 6Gb/s 3D TLC 2.5 7.0mm <2DWPD
1	AOC-S3908L-H8IR-16DD-O	8 int 12Gb/s ports, x8 Gen4, ROC - LP, 16 HDD w/ exp,RoHS
1	BTR-CVPM05	Cachevault supercap for storage controller
1	MCP-240-00203-0N	PCIe plastic battery holder with FH/LP-bracket
1	SKT-1424L-001B-LTS	SOCKET E E1B CARRIER LGA 4677 W/SHIM MCC LCC, DG1.0 ,RoHS

SYS-241E-TNRTP: 2U, 4 CPUs, 64 DIMMs, 24x 2.5" Hot-swap NVMe/SAS3/SATA3 Hybrid Drive bays (Default with 24 SAS3/SATA3 drive bays); 2x internal M.2 NVMe/SATA; Optional RAID support via storage add-on card.

SYS-241H-TNRTTP: 2U, 4 CPUs, 64 DIMMs, 8x 2.5" Hot-swap NVMe/SAS3/SATA3 drive bays (Default with 8 SAS3/SATA3 drive bays); 2x internal M.2 NVMe/SATA; Optional RAID support via storage add-on card.

2-socket systems: Because of the diversity and business cases the dual processor systems can be used for, regarding number and type of drives, system height (1U or 2 U), and even memory size (up to 4 or 8 TB), among others, we certified four for different systems for SAP HANA up to now. Those systems are widespread in customers' data centers because they can be used as development, quality, HCI nodes, or even SAP application servers, to mention only a few possibilities.

The following bill of materials is for a small to mid-size customer who intends to use a 2-socket system with a moderate workload:

Quantity	Part Number	Description
1	SYS-221H-TNR	Hyper 2U, 8x2.5", X13DEM, HS219-R1K24P
2	P4X-SPR6416H-SRMGU-MCC	SPR 6416H 4/2P 18C 2.2G(16C/2.3G, 12C/2.7G)165W 45M BI(1100)---P4X-SPR6416H-SRMGU-MCC
32	MEM-DR532L-CL01-ER48	32GB DDR5 4800 ECC REG---MEM-DR532L-CL01-ER48
6	HDS-I2T0-SSDSC2KB960GZ	D3 S4520 960GB SATA 6Gb/s 3D TLC 2.5 7.0mm <2DWPD
1	AOC-S3908L-H8IR-16DD-O	8 int 12Gb/s ports, x8 Gen4, ROC - LP, 16 HDD w/ exp,RoHS
1	BTR-CVPM05	Cachevault supercap for storage controller
1	AOC-S25G-M2S-O	2-ports 25GbE SFP28 Mellanox CX-4 LX EN, Gen3 x8 LP -- AOC-S25G-M2S-O

SYS-221H-TNR: 2U, 2 CPUs, 32 DIMMs, 8x 2.5" hot-swap NVMe/SATA/SAS drive bays; Optional 8x 2.5" hot-swap NVMe/SAS/SATA drive bays; 2x internal M.2 NVMe/SATA drive slots; Optional RAID support via storage add-on card.

SYS-121H-TNR: 1U, 2 CPUs, 32 DIMMs, 8x 2.5" hot-swap NVMe/SATA/SAS drive bays; Optional 4x 2.5" hot-swap NVMe/SAS/SATA drive bays; 2x internal M.2 NVMe/SATA drive slots; Optional RAID support via storage add-on card.

SYS-621C-TN12R: 2U, 2 CPUs, 16 DIMMs, 12x 3.5/2.5" hot-swap hybrid NVMe/SATA/SAS drive bays

SYS-121C-TN10R: 1U, 2 CPUs, 16 DIMMs, 10x 2.5" hot-swap hybrid NVMe/SATA/SAS drive bays

SAP HANA on Hyperconverged Infrastructure (HCI) Solutions Powered by VMware vSAN

Supermicro certified three Hyper SuperServer: SYS-221H-TN24R, SYS-221H-TNR, and SYS-121H-TNR based on 4th Gen Intel® Xeon® Scalable Processors (Sapphire Rapids) as HCI Solution powered by VMware vSphere & vSAN underneath SAP HANA. These systems are designed for sizeable in-memory computing and mission-critical enterprise applications in density optimized 2U and 1U chassis. The servers support enterprises that require the highest operational efficiency and maximum performance.

Why SAP HANA on HCI

With HCI, storage components share compute and memory with the server infrastructure. This eliminates the need for separate storage arrays, controllers, memory, SANs, etc. All storage technologies are fully integrated into the virtualization cluster. It's like creating a SAN storage from the internal storage of vSAN cluster members. SAP HANA customers can take advantage of HCI, which is extremely simple and flexible, with a much higher degree of scalability to help reduce costs compared to old SAP infrastructure. With SAP support, customers are now ready to migrate or install their virtualized mission-critical SAP HANA systems on top of Hyperconverged Infrastructure powered by VMware vSAN.

Supermicro Solutions Integrated with VMware vSAN

Supermicro has a long-standing experience with VMware products such as vSphere and vSAN, which was constantly shown in ReadyNode™ certification of many different systems. It focuses on deploying VMware vSAN, a hyper-converged solution, as quickly as possible. Working with VMware, Supermicro delivers an alternative to traditional Fiber Channel SAN-based storage infrastructure, known for its complexity and interoperability challenges. vSAN provides you with the ability to provision and manage compute, network, and storage resources from a single pane of management:

vSAN integrated management panel with vSphere provides simplicity, consistent user interface, ease of management, and flexibility to spin up HANA instances quickly as required across the vSAN cluster.

vSAN enables software defined storage with flexible customer defined per VM policy-based management that can be tailored to test, development, and QA instances and provides high availability as required. Especially with all flash deployments, Supermicro vSAN ReadyNode™ introduces a new high performance storage tier optimized for enterprise-class virtual environments that is simple, resilient, and efficient and reduces the total ownership cost. It is a perfect solution for enterprises to efficiently grow and manage virtualized infrastructure for maximum ROI.

Supermicro HCI Solution for SAP HANA

The Supermicro HCI for SAP HANA certified systems is based on Supermicro vSAN ReadyNode™ systems with proven reliability and stability in high end environments. Because the SAP HANA certification has more demanding and different KPIs to meet, Supermicro assembled the most

appropriate components to easily meet all certification requirements and pass the certification. Both certified systems are Hyper SuperServer, which is designed to deliver the highest performance, flexibility, scalability, and serviceability to demanding IT environments and to power mission-critical enterprise workloads.

Benefits of the solution include standardized and highly optimized for SAP HANA database workload systems, combined with VMware vSAN for better TCO. Supermicro is the single point of contact through the SAP support portal for HCI joint solutions covering triage whenever needed.

Supermicro Hyper SuperServer for VMware vSAN: Certified Solution	
HCI Models included	SYS-221H-TN24R, SYS-221H-TNR, SYS-121H-TNR
CPUs (total/HANA)	2/2
CPU Range	Xeon SP (Sapphire Rapids) Silver, Gold, Platinum
RAM per CPU-socket	up to 2 TiB
Range of HCI nodes	3-64
Range Hypervisor	vSphere 8.0U2c
Range SDS Version	vSAN 8.0U2c

The Hyper SuperServer SYS-221H-TN24R, SYS-221H-TNR, and SYS-121H-TNR are designed for large in-memory computing and mission critical enterprise applications in a density optimized 2U and 1U chassis. These servers support enterprises that require the highest operational efficiency and maximum performance. The systems support two 4th Gen Intel® Xeon® Scalable Processors (Sapphire Rapids) with up to 60 cores each, support TDP support 350W (Air and Liquid cooled) CPUs, up to 4 UPI and 16 GT/s, 32 DDR5-5600 DIMM slots, up to 24x 2.5" hot-swap NVMe/SATA/SAS drive bays; 2x internal M.2 NVMe/SATA drive slots; Optional RAID support via storage add-on card PCI-E 3.0 slots for diverse expansion options.

For more information, see:
Hyper SuperServer SYS-221H-TN24R: https://www.supermicro.com/en/products/system/hyper/2u/sys-221h-tn24r
Hyper SuperServer SYS-221H-TNR: https://www.supermicro.com/en/products/system/hyper/2u/sys-221h-tnr
Hyper SuperServer SYS-121H-TNR: https://www.supermicro.com/en/products/system/hyper/1u/sys-121h-tnr

Key Features

• Certified to run all kinds of workloads: scale-up or scale-out.
• Factory-integrated, pre-configured, ready-to-go appliances built on proven and reliable Supermicro services that provide compute power for SAP HANA workloads.
• Support of workload demands with performance-optimized all-flash storage configurations.
• All certified SAP HANA systems can be connected to external storage (NFS or SAN) using appropriate networking cards.
• Easy deployment to support SAP HANA database high availability (HA) and disaster recovery (DR)

Conclusions

Supermicro and SAP continually work together on new solutions to help customers meet their needs and speed up their digital transformation. These solutions will always keep pace with the newest and most effective technology regarding the latest processor and memory technology, among others. Supermicro systems are pre-defined and tested to fully meet workload requirements and short-time-to-value of practically any kind of critical S/4HANA systems.

SUPERMICRO

As a global leader in high performance, high efficiency server technology and innovation, we develop and provide end-to-end green computing solutions to the data center, cloud computing, enterprise IT, big data, HPC, and embedded markets. Our Building Block Solutions® approach allows us to provide a broad range of SKUs and enables us to build and deliver application-optimized solutions based upon your requirements.

For more information: www.supermicro.com