

Cisco UCS Infrastructure for SAP Applications

Solution Brief
October 2016



With Intel Xeon Processor E5 and E7 v4 Family CPUs

Highlights

Realize the Possibilities

- Cisco delivers a broad spectrum of solutions to meet all your SAP needs.

Appliance and TDI Options

- Deploy the appliance model with Cisco® storage, SAP HANA Tailored Datacenter Integration (TDI) with Cisco storage, or TDI with storage from our certified enterprise storage vendors.

Bare-Metal or Virtualized

- These solutions are designed to run in bare-metal or virtualized environments.

Flexible Scaling with Cisco Support

- Cisco hardware is supported by your choice of Cisco SMARTnet™ Service level.

Easy Ordering

- Purchase Cisco Solutions for SAP through a simplified ordering process, with onsite installation services available.

Comprehensive Solution Support

- Whether you choose an appliance or SAP HANA TDI deployment, you get single-source support for both hardware and software issues.

Imagine the possibilities you unleash when you choose Cisco UCS infrastructure for SAP applications.

Moving to Cisco Unified Computing System™ (Cisco UCS®) for SAP applications offers a new level of flexibility, scalability, efficiency, and performance for your data center. You are about to realize the possibilities (Figure 1):

- We deliver both SAP HANA Appliance solutions and SAP Tailored Datacenter Integration (TDI) solutions.
- You gain a single management domain that can support all your SAP application infrastructure.
- Only Cisco lets you mix and match blade and rack servers and support them both within a single management domain.
- You can choose from a breadth of solutions from Cisco to match all your SAP needs, from small two-processor solutions to very large eight-processor solutions (Figure 2) with all the supported configurations listed in Tables 1 through 4.
- Intel® Xeon® processor E5 and E7 families power these Cisco® solutions. You can use servers based on the Intel Xeon processor E5 family for small production and development and test environments, and you can use servers based on the Intel Xeon processor E7 family for your business-critical workloads.

You get to choose. We integrate with solutions from all the major enterprise-class storage vendors, including NetApp, EMC, Nimble Storage, Hitachi, Pure Storage, and IBM. We also offer a solution that uses all Cisco products, using our storage-dense servers and a clustered, highly available storage system for SAP HANA and SAP applications.

Business Value Highlights

528%

Five-year ROI

9 Months

To break even

48 Percent

Lower IT infrastructure costs

67%

Less IT staff spent keeping the lights on

98%

Less unplanned downtime

29%

Faster application development lifecycles

Figure 1 Business Benefits for SAP Running on Cisco UCS Integrated Infrastructure ([IDC document #US41084916](#))

Cisco UCS Infrastructure for SAP Applications

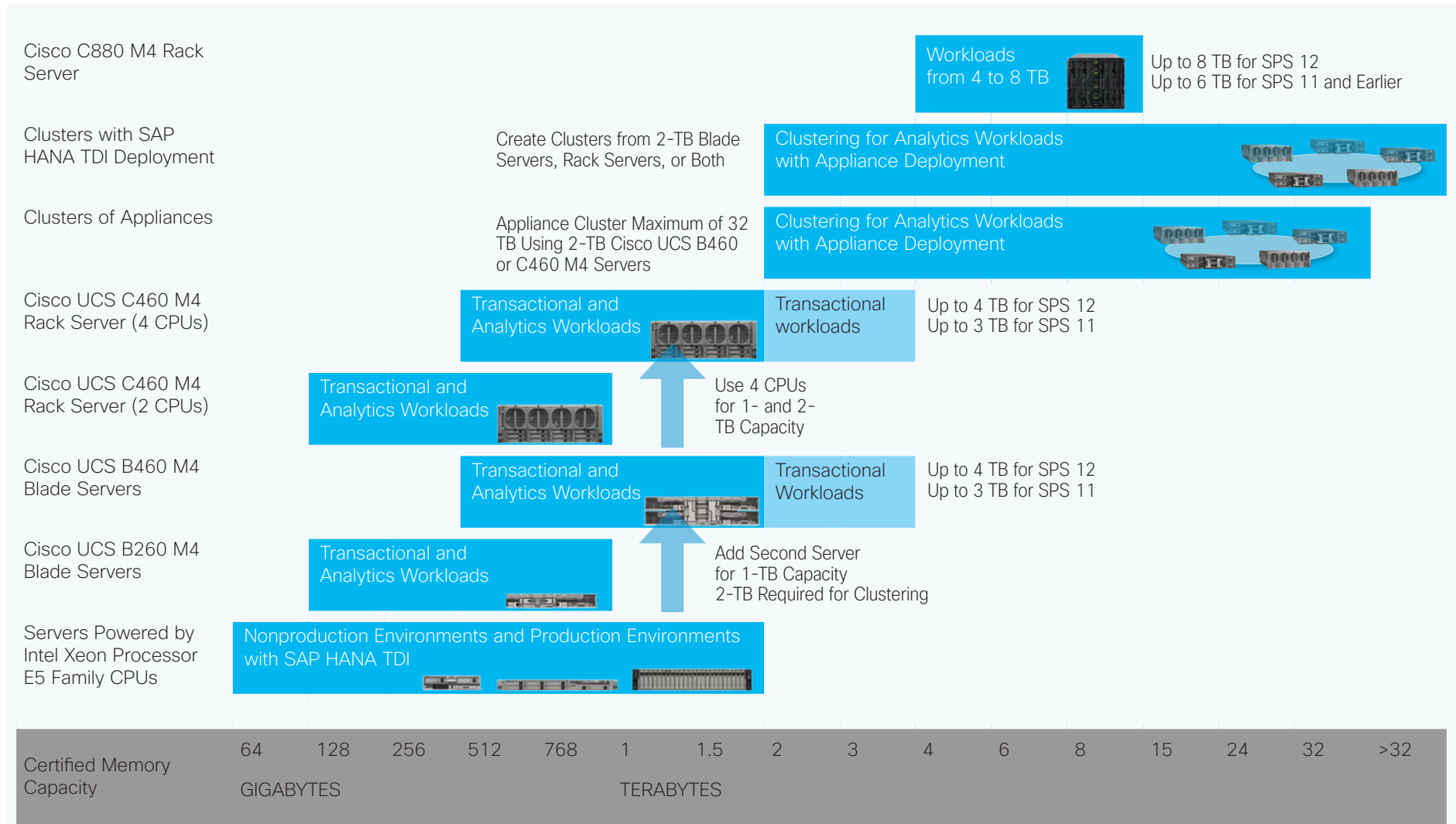


Figure 2 Cisco Offers Infrastructure for a Wide Range of SAP Applications Requirements

Cisco Unified Computing System

Cisco Solutions for SAP are part of Cisco UCS, which allows you to run all your applications in a single management domain connected to the same unified fabric. This feature gives you high-speed, low-latency, deterministic networking to accelerate the flow of intelligence to business applications and to meet SAP’s networking requirements.

The system is integrated with a pair of fabric interconnects with 10- or 40-Gbps unified fabric connectivity, with a single set of cables connecting your IP, storage, and management networks. With Cisco UCS management, you can define your SAP landscape using policies that automatically configure your servers to comply with SAP’s certifications. Cisco UCS is form-factor neutral, so you can deploy blade and rack servers in the same system.

Solutions with the Intel Xeon Processor E5 v4 Family

Table 1 illustrates the SAP HANA configurations available with the Intel Xeon processor E5 v4 family.

- **Cisco UCS B200 M4 Blade Server** delivers world-class performance at a modest price, a 1.5 terabyte (TB) memory capacity, and a compact half-width form factor. Our most popular server, its power and cooling system can support some of the fastest Intel Xeon processor E5 v4 family CPUs. Its small form factor

Table 1 We Offer Three Servers for SAP HANA with Intel Xeon Processor E5 v4 Family CPUs

Cisco UCS Servers	Cisco UCS B200 M4	Cisco UCS C220 M4	Cisco UCS C240 M4
Form Factor	• Half-width blade server	• 1RU rack server	• 2RU rack server
Recommended CPU	<ul style="list-style-type: none"> • Nonproduction environments: 2 Intel Xeon processors with at least 8 cores each is recommended, and at minimum the Intel Xeon processor E5-2630 v4 at 2.2 GHz with 10 cores • Production environments: 2 Intel Xeon processors with at least 14 cores each is recommended, and at minimum the Intel Xeon processor E5-2683 v4 at 2.1 GHz with 16 cores, or the Intel Xeon processor E5-2699 v4 at 2.2 GHz with 22 cores 		
Memory	• 64 GB to 1.5 TB of memory using up to 24 DIMM slots		
I/O	• Cisco UCS Virtual Interface Card (VIC) 1340	• Cisco UCS VIC 1225 or 1227	• Cisco UCS VIC 1225 or 1227
Storage (Production Use)	• Using an SAP HANA TDI deployment model, use Cisco UCS Integrated Infrastructure, the SAP HANA TDI shared storage solution or existing enterprise networking and storage systems		
Storage (Nonproduction Use)	• Not applicable	• You can use internal 300, 600, or 900-GB 10K-rpm disk drives configured with RAID 1 or 5	
RAID Controller (Nonproduction Use)	• Not applicable	• Cisco 12-Gbps SAS Modular RAID Controller (RAID 0, 1, and 10; and RAID 5 and 6 with optional cache module)	

- cuts your space requirements in half compared to other SAP-certified blade servers.
- **Cisco UCS C220 M4 Rack Server** is a 2-socket, 1-rack-unit (1RU) system that supports up to 1.5 TB of memory and up to 8 small-form-factor (SFF) disk drives or solid-state disk (SSD) drives with various internal RAID controller options.
- **Cisco UCS C240 M4 Rack Server** is a 2-socket, 2RU system that supports up to 1.5 TB of memory and up to 24 SFF disk drives or SSD drives with various internal RAID controller options.



4-Socket Blade and Rack Server Solutions

Our blade and rack server solutions are built with the components described in Table 2. Both of our 4-socket blade and rack server solutions have identical specifications for CPU and memory capacity (Table 2).

Cisco UCS B260 M4 Blade Server

For single-server Suite for HANA TDI deployments with a maximum capacity of 2 TB, you can deploy Cisco UCS C260 M4 Blade Servers with memory sizes at half that of the Cisco UCS B460 M4 (128 GB to 2 TB).

Cisco UCS B460 M4 Blade Server

The 4-socket Cisco UCS B460 Blade Server is certified to meet the needs

of solution sizes ranging from 512 GB to 4 TB. For needs beyond 4 TB, these servers can be clustered using three or more servers for tens of gigabytes of memory capacity.

If you start with the Cisco UCS B260 M4 and your needs grow beyond the 768-GB solution size, you can add a second server with a scalability connector to create a 4-socket Cisco UCS B460 M4 Blade Server.

Cisco UCS C460 M4 Rack Server

The Cisco UCS C460 M4 Rack Server is a 4-socket server with superior performance designed for enterprise and mission-critical workloads, large-scale virtualization, and database applications. The solution is certified to 4 TB and the server can scale to support up to 6 TB of memory.

When used as an SAP HANA appliance, the server is configured with 12 SFF SSD drives for high-performance, flexible, scalable local storage to support the SAP HANA persistence layer. Ten PCI Express (PCIe) card slots give the server outstanding I/O bandwidth. For SAP HANA capacities of less than 1 TB, you can populate the server with just two Intel Xeon processor E7-8890 v3 family CPUs. For capacities of 1 TB and greater, your configuration requires four processors.

When used in SAP HANA TDI deployments, the server connects to your existing network and uses shared storage or our SAP HANA TDI shared storage solution to support the SAP HANA persistence layer.

Table 2 Scale-Up and Scale-Out Solutions with Cisco UCS C460 M4 Rack Servers and B460 Blade Servers

Solution Options		Solutions Up to 2 TB	Solutions Up to 4 TB	
Workload		<ul style="list-style-type: none"> All SAP HANA workloads, analytics, or transactional processing, with data-set sizes up to 2 TB 	<ul style="list-style-type: none"> SAP Suite for HANA and S4/HANA data set sizes of 512 GB to 4 TB 	
Cluster Options		<ul style="list-style-type: none"> For analytics workloads, you can cluster up to 16 x 2-TB configurations in appliance deployment, and larger configurations with SAP HANA TDI deployment. 		
Computing		Cisco UCS C460 M4 Rack Server with: <ul style="list-style-type: none"> 4 Intel Xeon processors E7-8880 v4 at 2.2 GHz 2 Cisco UCS VIC 1225 	Cisco UCS C460 M4 Rack Server with: <ul style="list-style-type: none"> 4 Intel Xeon processors E7-8880 v4 at 2.2 GHz (default) or E7-8890 v4 at 2.2 GHz (see below) 2 Cisco UCS VIC 1225 or 2 Cisco UCS VIC 1385 	Cisco UCS B460 M4 Blade Server with: <ul style="list-style-type: none"> 4 Intel Xeon processor E7-8880 v4 CPUs at 2.2 GHz (default) 2 Cisco UCS VIC 1340 2 Cisco UCS VIC 1380
SAP HANA Certified Memory Capacity	128 GB	<ul style="list-style-type: none"> 4 x 32-GB DIMMs 		
	256 GB	<ul style="list-style-type: none"> 8 x 32-GB DIMMs 		
	384 GB	<ul style="list-style-type: none"> 12 x 32-GB DIMMs 		
	512 GB	<ul style="list-style-type: none"> 16 x 32-GB DIMMs 	<ul style="list-style-type: none"> 16 x 32-GB DIMMs 	<ul style="list-style-type: none"> 16 x 32-GB DIMMs
	768 GB	<ul style="list-style-type: none"> 24 x 32-GB DIMMs 		
	1 TB	<ul style="list-style-type: none"> 32 x 32-GB DIMMs or 16 x 64-GB DIMMs Requires 4 CPUs 	<ul style="list-style-type: none"> 32 x 32-GB DIMMs or 16 x 64-GB DIMMs 	<ul style="list-style-type: none"> 32 x 32-GB DIMMs or 16 x 64-GB DIMMs
	1.5 TB	<ul style="list-style-type: none"> 48 x 32-GB DIMMs or 24 x 64-GB DIMMs Requires 4 CPUs 	<ul style="list-style-type: none"> 48 x 32-GB DIMMs or 24 x 64-GB DIMMs 	<ul style="list-style-type: none"> 48 x 32-GB DIMMs or 24 x 64-GB DIMMs
	2 TB	<ul style="list-style-type: none"> 64 x 32-GB DIMMs or 32 x 64-GB DIMMs Requires 4 CPUs 	<ul style="list-style-type: none"> 64 x 32-GB DIMMs or 32 x 64-GB DIMMs 	<ul style="list-style-type: none"> 64 x 32-GB DIMMs or 32 x 64-GB DIMMs
	3 TB		<ul style="list-style-type: none"> 96 x 32-GB DIMMs or 48 x 64-GB DIMMs 	<ul style="list-style-type: none"> 96 x 32-GB DIMMs or 48 x 64-GB DIMMs
	4 TB		<ul style="list-style-type: none"> 64 x 64-GB DIMMs Requires 4 x Intel Xeon processor E7-8890 v4 CPUs at 2.2 GHz 	<ul style="list-style-type: none"> 64 x 64-GB DIMMs Requires 4 x Intel Xeon processor E7-8890 v4 CPUs at 2.2 GHz
Storage: Appliance Deployment		<ul style="list-style-type: none"> Up to 2 TB: 8 x 1.6-TB Enterprise Value 6-Gbps SAS SSD drives Above 2 TB: 12 x 1.6-TB Enterprise Value 6-Gbps SAS SSD drives 1 Cisco 12-Gbps SAS modular RAID controller with 4 GB of flash-backed write cache (FBWC) 	<ul style="list-style-type: none"> Not applicable 	
Storage: SAP HANA TDI Deployment		<ul style="list-style-type: none"> Use Cisco UCS Integrated Infrastructure, the SAP HANA Tailored Datacenter Integration (TDI) shared storage solution, or existing enterprise networking and storage systems 		

Cisco C880 M4 Server Solutions

Cisco Solutions for SAP with the Cisco C880 M4 Server support SAP Business Suite for HANA (S4/HANA) and SAP analytics applications such as SAP Business Warehouse (BW). Using industry-standard architecture and recognized best practices, no special IT processes are needed to incorporate or maintain our solutions in your data center. Our solutions are designed to support data center readiness requirements, including high availability, reliability, and business continuance. Configurations are outlined in Table 3.



Table 3 Cisco Solutions for SAP with the Cisco C880 M4 Rack Server

Solution	Any Analytic Workload Up to 4 TB Any Transactional Workload Up to 6 TB	Any Transactional Workload at 8 TB
Computing	Cisco C880 M4 Rack Server with: <ul style="list-style-type: none"> • 8 Intel Xeon processors E7-8880 v4 at 2.2 GHz or 8 Intel Xeon processors E7-8890 v4 at 2.2 GHz • 2 TB of DDR4 memory (base unit) • 1-TB expansion kit for Intel Xeon processor E7-8880 v4 base unit • 2-TB expansion kit for Intel Xeon processor E7-8890 v4 base unit • 8 dual-channel 10-Gbps LAN cards (Enhanced Small Form-Factor Pluggable [SFP+]) • Optional dual-channel 40-Gbps LAN card (Quad Small Form-Factor Pluggable [QSFP+]) • 4 dual-channel 16-GBps Fibre Channel host bus adapters (HBAs) • Dual-channel 1-GE base card • Dual-channel 6-Gbps SAS RAID controller card 	Cisco C880 M4 Rack Server with: <ul style="list-style-type: none"> • 8 Intel Xeon processors E7-8890 v4 at 2.2 GHz (for 8-TB solution with SAP SPS 12 only) • 2 TB of DDR4 memory (base unit) • 3 x 2-TB expansion kits • 8 dual-channel 10-Gbps LAN cards (SFP+) • Optional dual-channel 40-Gbps LAN card (QFSP+) • 4 dual-channel 16-GBps Fibre Channel HBAs • Dual-channel Gigabit Ethernet base card • Dual-channel 6-Gbps SAS RAID controller card
Storage: Appliance Deployment	2 Cisco C880 M4 Storage Subsystems with: <ul style="list-style-type: none"> • 22 x 1.2-TB 10K-rpm SAS drives configurable with RAID 0, 1, 5, 6, 10, 50, and 60 	
Storage: SAP HANA TDI Deployment	<ul style="list-style-type: none"> • Use Cisco UCS Integrated Infrastructure, the SAP HANA TDI shared storage solution, or existing enterprise networking and storage systems 	

Cisco UCS Integrated Infrastructure for SAP HANA

In addition to providing solutions that include EMC, NetApp, and VCE storage, we offer a Cisco UCS Integrated Infrastructure solution that includes clustered storage built from Cisco UCS C240 high-capacity rack servers running Linux and the MapR Converged Data Platform. This completely Cisco approach includes both appliance and TDI solutions. A shared network TDI solution with 40-Gbps Cisco UCS 6300 Series Fabric Interconnects is offered as well.

SAP HANA Appliance Solutions

Our SAP HANA appliance solutions begin with a starter kit that includes:

- **SAP HANA compute servers:** 4 Cisco UCS B460 M4 or C460 M4 servers with 2 TB of main memory as specified in Table 2 to run SAP HANA
- **Storage servers:** 3 Cisco UCS C240 M4 servers as specified in Table 4

The starter solution can scale to up to six SAP HANA compute servers with no additional Cisco UCS C240 M4 servers. Scaling beyond this point requires maintaining a 2:1 ratio between SAP HANA servers and storage servers.

SAP HANA TDI Solutions

In an SAP HANA TDI deployment, you can begin with a starter kit and scale further, maintaining a 4:1 ratio between SAP HANA compute servers and Cisco UCS 240 M4 servers.

Table 4 Cisco UCS C240 M4 Storage Server Configuration

	Cisco UCS C240 Storage Server
Form Factor	• 2RU rack server
CPU	• 2 Intel Xeon processor E5-2630 CPUs at 2.2 GHz
Memory	• 256 GB of memory with 32-GB DIMMs
I/O	• Cisco UCS VIC 1385 with 2 x 40-Gbps unified fabric connectivity
Storage (Production Use)	• 24 x 1.8-TB 12G 10K-rpm SAS disk drives for a total of 43.2 TB of unformatted capacity • 2 x 120-GB 6G Enterprise Value SATA SSD drives for booting
RAID Controller	• Cisco 12G SAS Modular Raid Controller with 4-GB FBWC cache module
Software	• Your choice of Red Hat Enterprise Linux or SUSE Linux Enterprise Server • MapR Converged Data Platform with MapR Enterprise Hadoop

Completely Cisco Solution

With the completely Cisco solution, Cisco UCS management gives you role- and policy-based automation for both your SAP servers and your storage infrastructure. Now you can manage your storage with the same ease and agility as you manage your Cisco UCS servers. This solution enables you to deploy your environment quickly, scale on demand, and repurpose servers within minutes. As with other Cisco Solutions for SAP, the servers described previously run SAP applications. This solution provides persistent SAP HANA storage as a certified SAP appliance

for Business Warehouse on HANA and SAP analytics solutions and is a flexible TDI solution.

Bare-Metal or Virtualized Deployment

Cisco Solutions for SAP support your choice of operating system: Red Hat Enterprise Linux for SAP HANA (RHEL4HANA) or SUSE Linux Enterprise Server for HANA (SES4HANA).

The solutions are designed to run on a bare-metal server or in a virtualized environment on VMware vSphere or SAP HANA multiple-container systems. These options give you the flexibility to run production environments on bare-metal servers while supporting your test and development environments as virtual machines.

One Call Support

If you have a problem with your solution, regardless where you think the problem lies, call Cisco. Our support team is trained to help you with all the components contained in this solution to best help quickly resolve any issues.

Cisco SMARTnet Service

The Cisco hardware is supported by your choice of nonproduction, production, and business-critical levels of Cisco SMARTnet™ Service.

Cisco Solution Support

Cisco Solution Support helps you quickly resolve problems by adding a solution-level perspective to the underlying device-level service contracts. Solution Support also gives you a single point of contact to help you manage, troubleshoot, and resolve the problems that may arise in complex, multivendor systems across a variety of Cisco and third-party products.

Cisco Managed Services

Cisco Managed Services for SAP HANA provides you with a comprehensive managed service offering, including a single point of contact for managing the overall solution. You get complete end-to-end monitoring and visibility capabilities through comprehensive customer-facing dashboards. You get proactive health checks, including checks of memory, CPU, disk and network utilization, and throughput. Managed Services can provide system ID (SID)-specific recommendations based on a review of the SAP Service Marketplace, SAP notes, and any open incidents. In addition, Managed Services includes quarterly patching support for SAP HANA Appliance components.

Easy Ordering

Cisco partners make it easy to purchase a Cisco Solution for SAP, with simplified ordering and onsite installation services available.

This makes it easy to quickly deploy a small but powerful, SAP HANA environment in your enterprise and to scale it quickly without the expense or risk entailed in designing and building your own custom solution.

For More Information

Learn more about [Cisco Solutions for SAP HANA](#)

More information about [Cisco UCS](#)

Power Consumption

Solution power consumption varies with the specific server and storage configurations ordered. Please contact your sales representative or your product solutions specialist to determine the exact power requirements for your configuration.



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