

Cisco Solution for SAP HANA Scale-Out with Cisco UCS and NetApp Storage

Solution Brief
September 2015



With the Intel Xeon Processor E7-8800 v3 Family

Highlights

Scale SAP HANA on Demand

- Scale-out capabilities, combined with high-performance NetApp storage and the balanced resources of the Cisco Unified Computing System™ (Cisco UCS®), help you get more performance from your SAP HANA implementations.
- This solution is by default certified for up to 24 terabytes (TB) of total memory space. Larger installations are available using the SAP Tailored Datacenter Integration (TDI) deployment model.
- With the Cisco® and NetApp solution you can easily add more computing and storage building blocks as demand increases.

Deploy Infrastructure Faster

- Built-in automation enables configurations to be deployed quickly, easily, and accurately.

Handle Large Amounts of Data

- Cisco UCS, combined with NetApp FAS8040 unified scale-out storage systems, provides persistent storage for SAP HANA and real-time business-critical data.

Deliver High Availability

- The capability to distribute data processing enables SAP HANA implementations to scale beyond a single server and removes single points of failure that can negatively affect timely delivery of results.

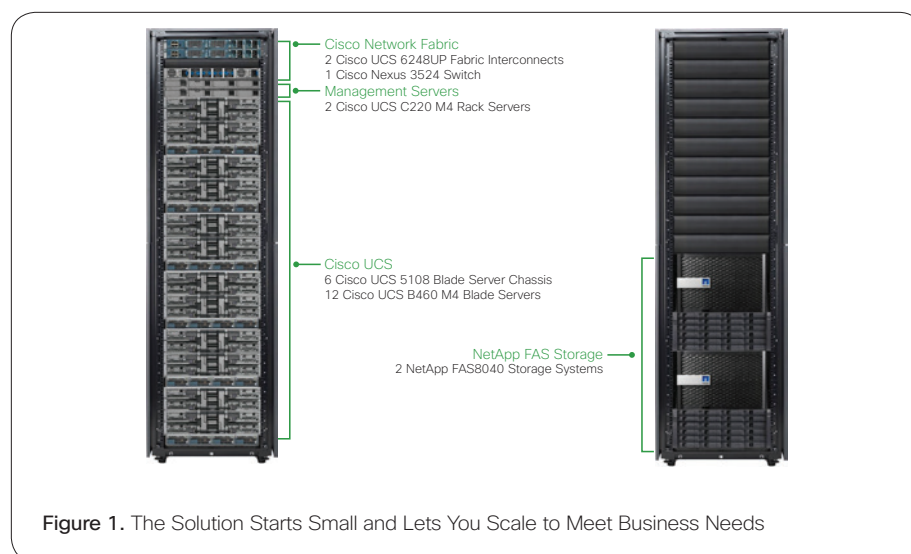
Simplify Management

- End-to-end management provides visibility and enables the monitoring and automated remediation of physical servers, storage, and network devices.

You need fast insight into your data. SAP HANA on Cisco UCS® and NetApp Storage helps you make real-time decisions at the speed of thought.

Organizations in every industry are generating and using more data than ever before: from customer transactions and supplier delivery considerations to real-time user-consumption statistics. Without scalable infrastructure that can store, process, and analyze big data sets in real time, companies are unable to use this information to their advantage. The Cisco® Solution for SAP HANA Scale-Out with the Cisco Unified Computing System™ (Cisco UCS) and NetApp storage helps companies more easily harness information and make better business decisions that let them stay ahead of the competition.

Cisco partners with industry-leader NetApp to develop prepackaged and affordable solutions that you can deploy using a predefined bill of materials with help from Cisco or our partners. Having claimed more than 100 world records on industry-standard benchmarks, we deliver the performance you need. We also offer flexibility, efficiency, scalability, and low total cost of ownership (TCO). With Cisco's building-block approach, you can easily start small and then scale your SAP HANA deployments up and out. You can scale on demand to support more than 50 terabytes (TB) of SAP HANA capacity (Figure 1). The 16 nodes are not a technical



restriction but the standard for SAP HANA scale-out certification. Larger Cisco UCS configurations are available upon request.

The Cisco Solution for SAP HANA Scale-Out with Cisco UCS and NetApp storage is built with the following components, summarized in Table 1:

Cisco UCS 6200 Series Fabric

Interconnects: These interconnects provide high-speed, low-latency connectivity for servers and integrated, unified management for all connected devices.

- **Cisco UCS 2200 Series Fabric Extenders:** These fabric extenders provide highly scalable and extremely cost-effective connectivity by bringing the system’s unified fabric to each blade server chassis with no chassis-resident switches or management points.
- **Cisco Nexus® 3500 Series Switches:** These switches provide increased resiliency in the event of a single component failure and offer the lowest latency in the industry today. These top-of-rack switches are well suited for SAP HANA environments that demand latencies of 250 nanoseconds or less.
- **Cisco UCS B460 M4 Blade Servers:** These servers provide industry-leading performance and enterprise-critical stability for memory-intensive workloads, such as large-scale databases, in-memory analytics, and business intelligence. The unique service profiles associated with the

Table 1. Cisco Solution for SAP HANA with NetApp Storage Can Be Scaled to Meet Your Business Needs

Solution Options	Blade Server Solution
Workload	• All SAP HANA workloads, analytic or transactional
Computing	Cisco UCS 5108 Blade Server Chassis • Support for 2 Cisco UCS B460 M4 Blade Servers per chassis Cisco UCS B460 M4 Blade Servers, each with: • 4 Intel® Xeon® processor E7-8880 v3 CPUs at 2.3 GHz (default), or E7-8890 v3 CPUs at 2.5 GHz, or E7-8880L v3 CPUs at 2.0 GHz • 1.5 TB of memory using 96 x 16-GB DIMMs • Cisco UCS VIC 1340 • Cisco UCS VIC 1380
Network	10-Gbps unified fabric supported by: • 2 Cisco UCS 6248UP 48-Port Fabric Interconnects or 2 Cisco UCS 6296UP 96-Port Fabric Interconnects • 2 Cisco Nexus 2204XP 10GE Fabric Extenders per blade chassis Internal state synchronization supported by: • 1 Cisco Nexus 3524P Switch with 24 x 10 Gigabit Ethernet ports
Storage	NetApp FAS8040 Storage System, 1 for every 8 servers
Appliance deployment	• Up to 16 servers
SAP HANA TDI deployment	• Up to 35 servers

servers accelerate provisioning, improve lifecycle management and compliance, and simplify high-availability recovery operations. The solution uses one server for every 1.5 TB of memory capacity required.

- **Cisco UCS Virtual Interface Card (VIC) 1340:** This LAN-on-motherboard (LOM) converged

network adapter (CNA) supports 40 Gbps of bandwidth and more than 256 PCI Express (PCIe) devices, with the number and type of devices programmable on demand. With the optional port expander card, it supports up to 80 Gbps of bandwidth. Supporting three networks with one adapter reduces

both capital expenditures (CapEx) and operating expenses (OpEx) because you need to purchase, configure, manage, maintain, power, and cool fewer interfaces, cables, and upstream switch ports.

- **Cisco UCS VIC 1380:** This mezzanine form-factor CNA provides industry-leading performance and enterprise-critical stability for memory-intensive workloads, such as large-scale databases, in-memory analytics, and business intelligence. It supports up to 80 Gbps of bandwidth and more than 256 PCIe devices.

NetApp FAS Storage

Designed to adapt quickly to changing business needs, the NetApp FAS8040 delivers availability, scalability, and cost efficiency to meet the stringent demands of SAP HANA deployments. NetApp FAS8000 series storage is built specifically for business-critical workloads, such as SAP HANA deployments, that require massive performance, multiple-petabyte scale, and leading flash-memory integration. The solution incorporates one FAS8040 storage system for every six servers.

World-Class Backup Solution for SAP HANA

Depending on the amount of data managed by SAP HANA, the backup process can take a long time using traditional methods. When NetApp FAS storage provides the persistent data storage area for a SAP HANA

in-memory database, the storage systems are aware of data changes. The storage systems can create and save multiple versions of data in a space- and time-efficient manner and without performance impact at scale. Backups require a fraction of the space that traditional methods need and take seconds rather than hours. As a result, the database data is preserved regularly. NetApp FAS storage snapshot-based backup operations have no negative impact on SAP HANA servers and are completed almost instantly. And because NetApp FAS storage systems are aware of data changes, the storage system can perform incremental backups by transporting only the differences between the data in the primary data location and the data in the long-term backup store.

SAP HANA has supported storage-level snapshot-based backups since Support Package Stack (SPS) 06. Within SAP HANA Studio, the NetApp backup is fully integrated and appears in the backup history just like every other backup. NetApp AutoSupport (ASUP) feedback has shown that the average backup time for SAP HANA is 19 seconds. In fact, ASUP shows that more than 50 percent of NetApp customers finish their SAP HANA backup operations in less than 15 seconds, 75 percent in less than 22 seconds, and 98 percent in less than 60 seconds.

Recovery takes a similar amount of time. Recovery of a backup simply requires

the administrator to shut down SAP HANA, select the backup file, restore the corresponding storage snapshot, and then restart SAP HANA to complete the recovery procedure. Because these backups are stored directly on the storage system, the restore process is fast and efficient, with no need to physically move any data.

The FlexPod approach, developed by Cisco and NetApp, integrates the best storage solution to simplify the operation of complex SAP landscapes and puts control back in your hands. This goal is accomplished by integrating SAP Landscape Virtualization Management (LVM), NetApp SnapCreator, and NetApp Storage Service Connector (SSC) to automate routine backup tasks.

Solution Options

The Cisco Solution for SAP HANA Scale-Out supports your choice of operating system: Red Hat Enterprise Linux (RHEL) or SUSE Linux Enterprise Server (SLES).

The default configuration uses a SAN boot, but optional management servers can be added to allow preexecution environment (PXE) boot capabilities.

The solution is designed to run on a bare-metal server or in a virtualized environment on VMware vSphere 5.

SAP HANA TDI: Customize Your Configuration

SAP HANA Tailored Datacenter Integration (TDI) allows you to use our

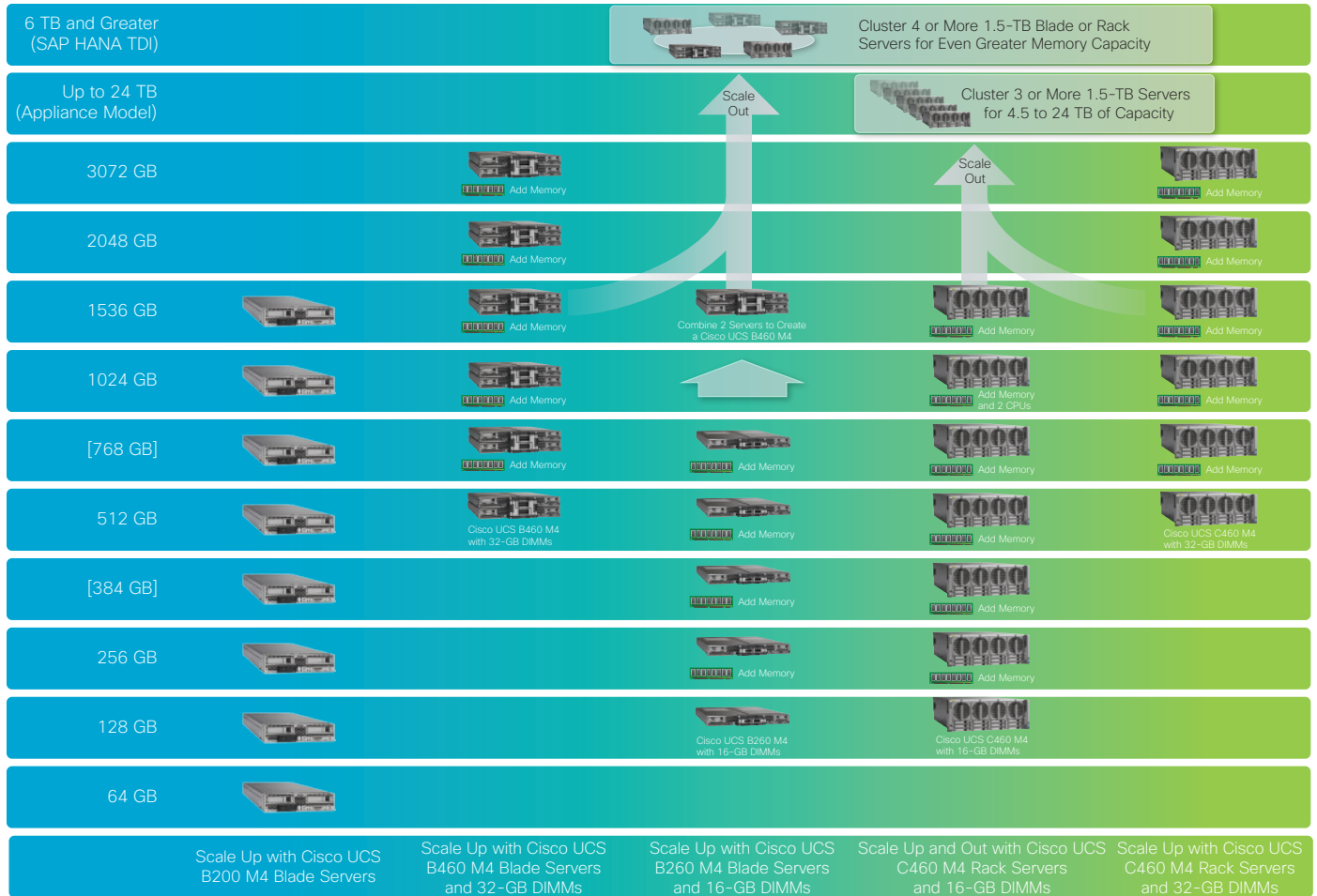


Figure 2. Cisco Offers a Full Range of Scale-Up and Scale-Out Solutions for Production, Test, and Development Workloads

certified server configurations with your own enterprise storage and networking components that have been certified by SAP to complete your solution. TDI also allows you to scale beyond our 16-server certification level to accommodate up to 35 servers in a single scale-out solution.

Flexible Scaling with Investment Protection

The solution described in this document is a scale-out solution that allows you to add increments of 1.5 TB of memory capacity as needed up to a total of up to 60 TB of capacity. Your investment in Cisco products is protected because you never have to discard a server as

your data center grows: you can add memory in scale-up solutions and you can add servers in scale-out solutions.

Cisco offers a full range of scale-up and scale-out solutions that can meet all your SAP application requirements, whether for production, test, or development environments. This range of solutions is illustrated in Figure 2:

- You can support your small and medium-size production environments and your nonproduction environments with Cisco UCS B200 M4 servers in a scale-up configuration with from 64 GB to 1.5 TB in a single server. These servers powered by the Intel Xeon processor E5-2600 v3 family delivers excellent performance at a modest price.
- You can scale up single-server solutions using Cisco UCS B260 M4 servers to support from 128 to 768 GB of memory capacity. You can continue to scale by coupling two servers together to create a 4-socket Cisco UCS B460 M4 server with up to 3 TB of memory. If you want to transition to a scale-out solution, you can cluster multiple 1.5-TB servers. Powered by the Intel Xeon processor E7-8800 v3 family, these servers deliver the utmost in performance with excellent reliability, scalability, and serviceability.

- We give you choice, allowing you to use the form factor that best suits your business and your SAP deployment model. If you prefer to use rack servers the exact same memory scaling characteristics are available using Cisco UCS C460 M4 Rack Servers.

Cisco Support

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

Easy Ordering

Cisco partners make the purchase of a Cisco Solution for SAP HANA Scale Out easy, with simplified ordering and onsite installation services available.

The program enables you to easily and quickly deploy a powerful, SAP HANA environment in your enterprise 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 at <http://www.cisco.com/go/sap>.

For more information about Cisco UCS, visit <http://www.cisco.com/go/ucs>

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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