The Cisco UCS with NetApp Storage for SAP HANA Solution Delivers Real-Time Decisions All Day, Every Day

In today's highly competitive climate, having insight into operations and responding quickly to changing conditions are critical to success. Although an abundance of business information exists, the inability to analyze it quickly forces companies to settle for slower results or remove critical data from operational applications and analytic models to improve response time. The Cisco® UCS with NetApp Storage for SAP HANA solution helps deliver business insights more effectively, with a continuously available configuration that enables organizations that rely on Cisco and NetApp to stay ahead of the competition.

SAP HANA: Delivering Instant Insight into Operations

SAP HANA provides a flexible, cost-effective approach for analyzing detailed data in real time—literally at the speed of thought. Efficient processing and analysis of massive amounts of data is made possible by combining SAP's intelligent use of in-memory technology, columnar database design, data compression, and massive parallel processing into an integrated solution. Using the multipurpose, in-memory SAP HANA database, organizations can gain instant insight into business operations, respond quickly to changing priorities, and dramatically reduce the cost associated with running multiple data warehouses and operational and analytical systems.

What Makes SAP HANA Different

SAP HANA is the technology foundation for new and innovative applications based on in-memory technology. Providing a hybrid row- and column-oriented database, SAP HANA creates a unified view of business information captured in transaction, planning, decision support, and analysis systems to enable greater insight into operational performance and facilitate the decision-making process.

SAP HANA includes:

- A high-performance, in-memory computing database and powerful data calculation engine
- A real-time replication service that accesses and replicates SAP enterprise resource planning (ERP) application data
- Data integration services to access and index information from almost any data source
- A data repository to maintain persistent views of business information
- Highly tuned integration with SAP BusinessObjects business intelligence solutions for insight and analytics
- SQL and Multidimensional Expressions (MDX) interfaces for third-party application access
- A unified information modeling and design environment

HIGHLIGHTS

Scale Out More Effectively

The Cisco with NetApp Storage for SAP HANA solution makes it easy to add more compute and storage building blocks as demand rises.

Reduce Time to Deployment

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

Accelerate Time to Results

SAP HANA innovation, combined with the balanced resources of the Cisco Unified Computing System™ (Cisco UCS®), delivers rapid analysis and reporting at less cost.

Keep SAP HANA Services Running

The capability to create on-campus or metropolitan area synchronous clusters enables SAP HANA implementations to survive typical disaster scenarios with zero data loss and minimal disruption, and upgrades to be performed without downtime.

Simplify Management

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

With these tools, business users can immediately access, model, and analyze all their transactional and analytical data in real time—from almost any data source and in a single environment—without affecting existing applications or systems.

Cisco UCS with NetApp Storage for SAP HANA Solution

As data volumes grow, extracting deep insight within shrinking windows of time becomes more difficult. SAP HANA delivers scale-out solutions that enable IT departments to run big data, growth-oriented applications and analytics by rapidly scaling to many nodes in high-performance, highly available configurations.

Such innovative software requires an innovative deployment infrastructure that also provides continuous availability. The Cisco UCS with NetApp Storage for SAP HANA solution combines the innovative Cisco Unified Computing System™ (Cisco UCS®) with NetApp unified storage systems to deliver high-performance, scalable, always-on infrastructure that works right out of the box (Figure 1).

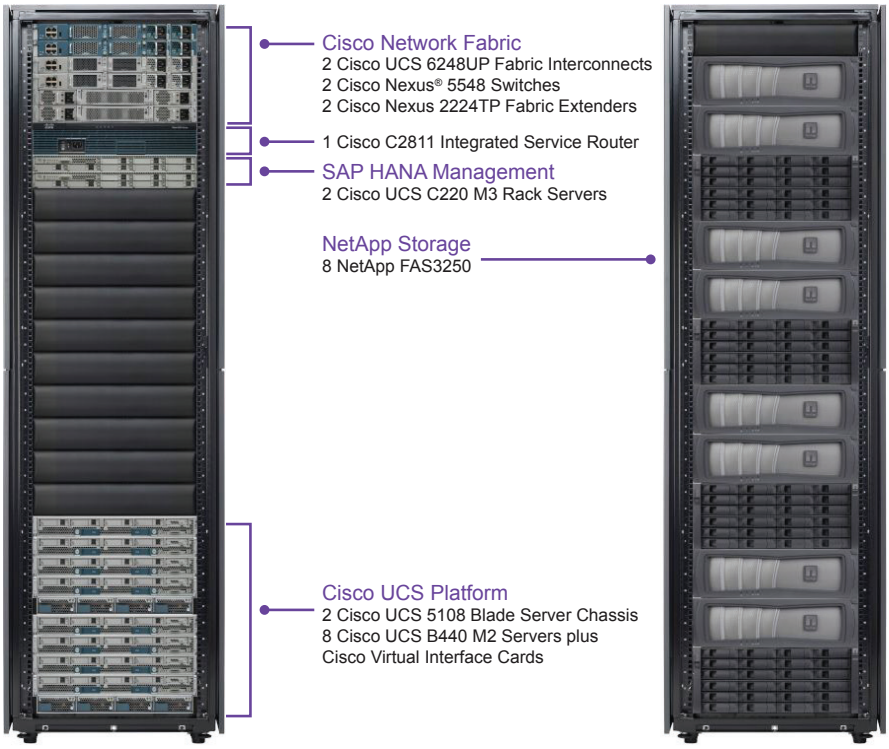
ONE RACK DATA CENTER SOLUTION

- 32 Intel Xeon Processors (320 core)
- 4 TB of Server Memory
- 8 x 10 Gigabit Ethernet Interconnects (80 Gbps)
- 50 TB of Storage

ONE ENTERPRISE IT INFRASTRUCTURE

- SAP HANA 1.0 (Production, or Test and Development)

Figure 1. Cisco UCS with NetApp Storage for SAP HANA Solution

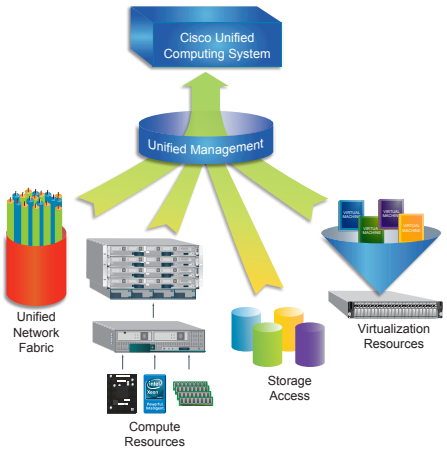


Cisco Unified Computing System

Cisco UCS is the first data center platform that integrates industry-standard, x86-architecture Intel Xeon processor-based servers with virtualization resources, networking, and storage access into a single unified system (Figure 2). Servers, networking, storage, and intelligent management resources work together in a self-aware and self-integrating system. This design delivers greater computing density and network simplicity in a smaller footprint, reducing operating costs.

Transcending the boundaries of traditional blade chassis and racks, Cisco UCS creates a physically distributed, centrally managed system that supports the solution's blade servers to deliver scalability and performance. A unified fabric supported by a single, distributed virtual switch interconnects all server resources. The system represents a radical simplification compared to traditional architectures, resulting in lower capital and operating cost.

Figure 2. Cisco UCS Integrates Servers, Networking, and Storage Access into a Single Unified System



NetApp Unified Storage Systems

Based on industry standards, NetApp storage systems offer transparent flexibility, enabling IT departments to move from small to midsize or large storage systems as data volumes grow. Using a unified storage architecture, NetApp solutions create a single, end-to-end foundation for dynamic data management that can scale from small to very large storage capacity without sacrificing application performance or service levels. Going beyond simple multiprotocol storage, NetApp unified storage systems deliver what SAP HANA deployments need—integrated data management and protection, support for all storage tiers, and a high quality of service—in a single platform.

Within the solution, NetApp unified storage systems provide the persistent storage needed by SAP HANA. Each NetApp device is connected to two fabric interconnects through 10 Gigabit Ethernet connections to provide shared access to SAP HANA data over the Network File System (NFS) protocol. Multiple storage systems can be combined to create a common storage pool for SAP HANA applications with a common set of management processes.

With the integration of NetApp MetroCluster software, racks in two locations create a single, geographically distributed cluster that writes data synchronously to both units. Since the storage is located in both locations, one system can take over in the event the other site becomes unavailable. This provides both disaster recovery and continuous availability with zero data loss, keeping SAP HANA running in the event of unplanned outages from operator error, site failures, network outages and natural disasters. The cluster enables non-disruptive upgrades so that data analysis can continue 24x7 with no need for planned downtime. In addition, mirroring at the storage layer increases read throughput up to 80 percent, reducing startup time for the HANA database and the time needed to failover an active SAP HANA node to a standby node.

Deliver Business Advantages

The solution delivers a wide range of benefits to organizations (Figure 3).

Reduce Time to Deployment

The Cisco UCS with NetApp Storage for SAP HANA solution automates configuration. The solution can be deployed quickly, and configurations can be replicated easily and accurately. Abstracting server identity, personality, and I/O connectivity from the hardware enables SAP HANA server characteristics to be applied automatically as new systems are added to support increased demand. Every aspect of a server's configuration—from firmware revisions and BIOS settings to network profiles—can be assigned through the system's open, documented, standards-based XML API or Cisco UCS Manager GUI.

Cisco UCS adapts to support bare-metal operating system and application stacks much like hypervisors support virtual machines. For SAP HANA installations, this means greater resource utilization through a reduced need for hot spares. New servers can be deployed, or existing servers upgraded, simply by applying a Cisco service profile to the target resource and rebooting to launch the new server.

Scale to Meet Demand

Using a building block approach, the Cisco UCS with NetApp Storage for SAP HANA solution enables IT departments to start with the compute and storage infrastructure needed today, and to scale easily by adding more compute and storage blocks as demand rises. Because the Cisco UCS compute and NetApp storage building blocks integrate into the unified system, they do not require additional supporting infrastructure or expert knowledge. The system simply, quickly, and cost effectively presents more compute power and storage capacity to SAP HANA applications.

Handle Large Volumes of Data

Quickly processing large-scale data sets requires massive amounts of memory. SAP HANA uses data compression to fundamentally reduce the amount of memory required. Today, Cisco UCS delivers more than enough memory capacity to support SAP HANA performance. With Cisco's history of delivering technology to support high memory densities, companies can be assured that as SAP HANA instances grow to use more memory, Cisco UCS servers will be ahead of the competition to meet the demand.

Figure 3. The NetApp FAS3250 Provides the High Performance, Massive Bandwidth, and Scale-out Capability Required for SAP HANA Deployments

NETAPP STORAGE: A FOUNDATION FOR SAP HANA SCALE-OUT INFRASTRUCTURE

Simplicity

- Mature Appliance Architecture
- Based on Standard Technologies, Such as NFS and Other Access Protocol and Interconnect Standards
- Building-Block Architecture

Scalability

- Plug-and-Play Storage
- Nearly Unlimited Scalability

High Availability

- Nonstop Operations, Even in the Event of a Controller Failure

Disaster Tolerance

- Continuous data availability and transparent failover with no data loss

Keep SAP HANA Applications and Services Running

To deliver constant access to business information, the Cisco UCS with NetApp Storage for SAP HANA solution supports continuous data availability through NetApp MetroCluster software. The combination of array-based clustering and synchronous mirroring supports continuous availability and zero data loss, and provides transparent recovery from failures so critical applications run uninterrupted. Eliminating repetitive change management activities reduces the risk of human error and administrative overhead.

Within the solution, nodes can be failed over automatically within a distributed SAP HANA database. If a node fails, the database on a standby server can be cold-started and returned to its last consistent state by replaying the log file stored on the NetApp shared storage from the last save point. In addition, NetApp high-availability capabilities provide transparent failover for storage, delivering nonstop access to data even in the event of a controller failure. In addition, Cisco UCS Manager provides end-to-end management of all devices in the Cisco UCS platform. This visibility enables the monitoring and automated remediation of physical servers, storage, and network devices.

Accelerate Time to Results

When companies need to make important business decisions, the performance of analytic and business intelligence systems is critical. The Cisco UCS with NetApp Storage for SAP HANA solution enables IT departments to use more servers and distribute data loading and analysis tasks to take advantage of massively parallel processing. The balanced resources of Cisco UCS—processing power, I/O bandwidth, and memory capacity—help ensure that IT departments get more performance from their SAP HANA implementations.

Simplify Management

The unified infrastructure inherent in the solution dramatically reduces the number of physical components required. The solution effectively uses limited space, power, and cooling by deploying less infrastructure to perform the same, or even more, work. For example, the unified fabric built into Cisco UCS results in fewer network interface cards (NICs), host bus adapters (HBAs), cables, and upstream switch ports and eliminates the need for parallel Fibre Channel or management networks.

Traditional blade server chassis-resident switches are replaced by low-cost, low-power, zero-management fabric extenders that enable the entire system to scale across multiple blade chassis and rack servers without adding management points. All hardware and software components are managed through the unified, embedded Cisco UCS Manager to improve operation efficiency with transparent scaling.

In addition, the mature appliance architecture of NetApp storage makes it easy to add capacity as SAP HANA data volumes grow. The use of standard technologies, access protocols, and interconnect standards give the appliance a plug-and-play, immediately available capability that simplifies installation, integration, provisioning, and upgrades. Clustering at the storage layer protects software layer changes without reconfiguration.

Conclusion

With so much depending on business decisions and the data used to make them, companies around the world turn to SAP applications for better insight into operations. Now the Cisco with NetApp Storage for SAP HANA solution delivers a powerful new tool for decision making. With the capability to add more compute and storage resources as data and user demand grows, the Cisco and NetApp solution delivers high-performance, scalable SAP HANA infrastructure right out of the box. If the need arises, Cisco and NetApp technical experts are available to help IT departments design and deploy a scale-out infrastructure that delivers better business visibility and agility.

FOR MORE INFORMATION

- To learn more about SAP enterprise applications on Cisco UCS, visit http://www.cisco.com/go/sap.
- To learn more about Cisco UCS, visit http://www.cisco.com/go/ucs or contact your local account representative.
- To learn more about NetApp unified storage systems, visit http://www.netapp.com/us/technology/unified-storage.

LE-35303-01 08/13

www.cisco.com
www.netapp.com