

FlexPod®

Enhance Your SAP HANA Deployments

FlexPod Datacenter for SAP HANA Tailored Datacenter Integration with Cisco Nexus 9000 Series Switches and Application Centric Infrastructure

Accelerate Your Move to SAP HANA

You need to provide critical SAP business applications to your lines of business to gain important business insights. And now you want to move to SAP HANA—the state-of-the-art, in-memory data management system that is the core of the SAP Business Suite and SAP Business Warehouse software. With this upgrade, you will gain real-time processing of your critical business data to improve your competitive advantage. But this new SAP architecture requires high-speed, flexible, integrated infrastructure. To successfully deploy and efficiently use this real-time processing capability, you don't want to overlay this powerful, next-generation software tool on past-generation infrastructure.

Now imagine removing the barriers to adoption of this exciting new technology. Imagine radically simplifying your SAP deployments to lower your total cost of ownership (TCO). Imagine reducing the risk associated with change by using certified, prevalidated configurations. Cisco and NetApp have partnered to prevalidate a new FlexPod® Datacenter integrated infrastructure with Cisco Nexus® 9000 Series Switches that you can easily and quickly deploy in your data center today. With this solution, you can use the latest switching technology from Cisco, with or without Cisco® Application Centric Infrastructure (Cisco ACI™), to scale out your data center in a simplified, automated way (Figure 1).

FlexPod Datacenter Integrated Infrastructure

According to both IDC and Gartner, FlexPod, an integrated combination of Cisco Unified Computing System™ (Cisco UCS®), Cisco Nexus switching, and NetApp® storage, continues to be one of the leading integrated infrastructure solutions on the market. It is named FlexPod because of its flexible, modular, and scalable design. You purchase exactly

Highlights

Ready for the Future

- Improve your company's competitive advantage with real-time information access.
- Deploy the integrated infrastructure of the future.
- Implement Cisco® Application Centric Infrastructure (Cisco ACI™), or be prepared to.
- Purchase exactly what you need today and scale as your business needs demand.

Flexible, Fast Computing

- Automate your IT to accelerate deployments and lower costs.
- Cisco UCS® has achieved more than 100 world-records on industry-standard benchmarks.

Flexible, Fast Switching

- Deploy a solution that works with your data center today.
- Deploy a solution that also is ready for your data center of the future.

Flexible, Fast Storage

- Get a reliable, unified storage solution with automated and fast data protection.



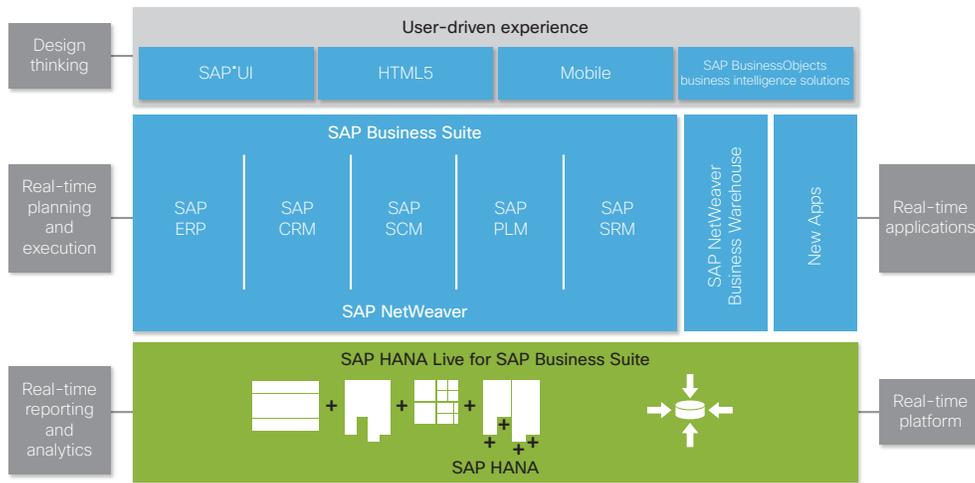


Figure 1) SAP's Architectural Vision for SAP Applications Interacting with SAP HANA

the configuration you need for your business today. You can then easily scale the solution as your business requires without loss of performance or the need to change management procedures in your data center. FlexPod Datacenter is a highly flexible prevalidated integrated infrastructure with a reduced TCO.

Flexible, Fast, and Scalable Computing

Cisco UCS industrializes IT, making organizations more efficient and more effective by automating and standardizing IT processes. It allows staff to work at a higher level, defining policies and allowing

automation to handle routine administrative tasks. Cisco UCS is the first self-aware, self-integrating, unified system that automates system configuration in a reproducible, scalable manner. It incorporates a radically simplified architecture that eliminates the complexity of "rack-in-a-box" blade systems while overcoming the challenges of virtualization by interconnecting servers and virtual machines with an equivalent level of visibility and control. The system is intelligent infrastructure that is configured through integrated, model-based management to lower TCO and enable your staff to focus on strategic initiatives rather than

troubleshooting. Server identity, personality, and I/O connectivity are abstracted so that deploying or redeploying 100 servers is as easy as deploying one. With Cisco UCS, you can run any workload on any resource with dynamic provisioning, making it the ultimate platform for building your SAP business-critical infrastructure based on SAP HANA.

To work efficiently and effectively, the SAP and SAP HANA architecture and vision require integrated infrastructure with deterministic network performance. Cisco UCS is the only system that provides this level of unified computing, networking, virtualization, and storage (Figure 2).

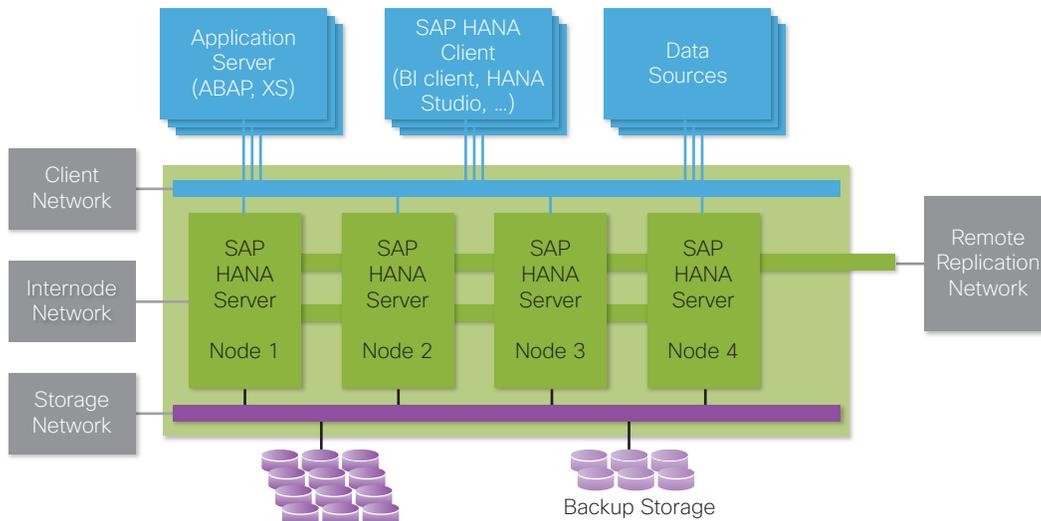


Figure 2) SAP HANA Critical Network Integration Points

Many people think that all servers based on the Intel® Xeon® processors are the same—but they aren't. We add many features to our servers that improve performance and reliability and are unique to Cisco UCS. This is why Cisco UCS servers are consistently the highest performing in their class, with more than 100 world-record benchmarks across a broad spectrum of workloads.

Flexible, Fast, and Scalable Switching

FlexPod Datacenter now integrates the latest switching technology, the Cisco Nexus 9000 Series Switches, into the system. The Cisco Nexus 9000 Series supports two modes of operation: Cisco NX-OS Software standalone mode and Cisco ACI fabric mode. In standalone mode, the switch performs as a typical Cisco Nexus switch, with increased port density, low latency, and 40-Gbps connectivity. In fabric mode, the administrator can take advantage of Cisco ACI.

Cisco ACI is a highly secure architecture designed to deliver centralized, application-based policy automation and management with equal visibility into physical and virtual networks. It helps enable you to manage even the most complex private, public, brokered, or hybrid environments more easily and transparently. Even in large, global operations running hundreds of applications, the Cisco ACI architecture can lower operational overhead and deliver higher service levels—exactly what you want for your SAP and SAP HANA deployments. It lets you scale your enterprise network without the limitations of traditional networks, making it easy to deploy multiple SAP landscapes and SAP HANA instances on the same network, with low latency. This is exactly what the SAP vision requires.

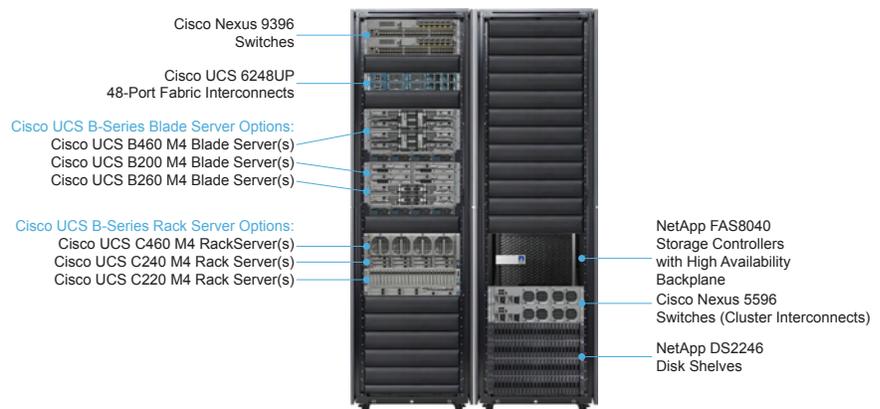


Figure 3) FlexPod Datacenter for SAP HANA TDI with the Cisco Nexus 9396 Switch in Standalone Mode

However, not every business has updated its networking infrastructure to take advantage of Cisco ACI. Therefore, you can start with the Cisco Nexus 9000 Series Switches in standalone mode (Figure 3), without Cisco ACI, and be prepared when your data center transitions to Cisco ACI. When not using Cisco ACI mode, the Cisco Nexus 9000 Series uses NX-OS mode for consistency across the Cisco Nexus portfolio. An important advantage of these switches is that they are field-upgradable to Cisco ACI mode when you are ready.

If you are already using Cisco ACI, you can order your FlexPod Datacenter with the Cisco Nexus 9000 Series Switches ready to use it

(Figure 4). The building blocks of Cisco ACI include:

- Application-centric networking
- Centralized management, automation, and orchestration
- Extensibility and openness through open-source software and open APIs
- Secure isolation between clients and application instances

These capabilities are provided through the Cisco Application Policy Controller (APIC), which is the unifying point of automation and management for the Cisco ACI fabric. Cisco APIC provides centralized access to all fabric information, optimizes the application lifecycle for scale and performance, and supports flexible application provisioning across

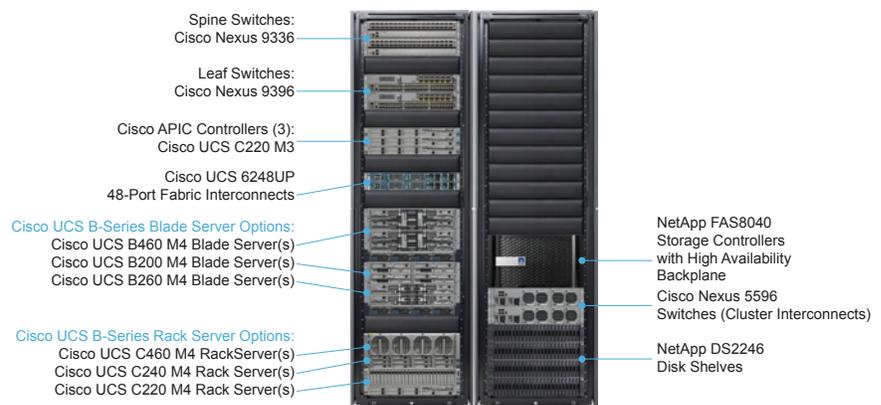


Figure 4) FlexPod Datacenter for SAP HANA TDI with the Cisco Nexus 9396 Switch with Cisco ACI

physical and virtual resources. Some of the main benefits of APIC are:

- Centralized application-level policy engine for physical, virtual, and cloud infrastructure
- Detailed visibility, telemetry, and health scores by application and by tenant
- Design based on open standards and open APIs
- Robust implementation of multi-tenant security, quality of service (QoS), and high availability
- Integration with other management systems such as VMware, Microsoft, and OpenStack solutions

APIC provides management XML APIs and both a command-line interface (CLI) and GUI to manage the fabric holistically.

Flexible, Fast, and Scalable Storage

NetApp FAS unified storage systems are certified by SAP and provide the performance that SAP and SAP HANA require. Designed to adapt faster to changing business needs, NetApp FAS storage systems deliver availability, scalability, cost efficiency, and integrated data protection to meet the stringent demands of SAP HANA deployments. This storage is built specifically for business-critical workloads, such as SAP HANA, that require robust data management capabilities to help ensure accurate data is available anywhere and anytime. NetApp Clustered Data ONTAP® is designed to eliminate planned and unplanned downtime for continuous business availability.

Best Backup Solution for SAP HANA

Information is money, and SAP HANA is the repository for your business information. The best way to protect your SAP HANA data is with continuous, fast, and automated backup operations that help protect this extremely important asset.

Depending on the amount of data managed by SAP HANA, your data can take a long time to back up using traditional methods. When NetApp FAS storage provides the persistent data storage area for an SAP HANA in-memory database, these smart storage systems are aware of data changes within the system. NetApp FAS storage can create and save multiple versions of data in a space- and time-efficient way, at scale, without affecting the performance of either the computing or storage system. This capability allows backup operations to simply occur, in seconds (rather than hours), and the solution requires a fraction of the space required by a traditional solution. As a result, the SAP HANA data is preserved regularly. The NetApp FAS storage snapshot-based backup does not affect the SAP HANA servers, and the backup is completed almost instantly. Because NetApp FAS storage systems are aware of data changes, the storage system can transport only the differences between the primary data location and the long-term backup store, implementing an incremental backup approach.

SAP HANA has supported storage-level snapshot-based backups since SPS 07. In SAP HANA Studio, NetApp backup is fully integrated and appears in the backup history just as every other backup does. NetApp AutoSupport® (ASUP™) feedback shows that the average backup time for SAP HANA, using NetApp FAS snapshot-based backups, is 19 seconds. In fact, ASUP shows that more than 50 percent of NetApp customers finish their SAP HANA backups 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 from a backup

simply requires the administrator to shut down SAP HANA, select the backup version to use, restore the corresponding storage snapshot, and then restart SAP HANA to complete the recovery procedure. Because these backups are stored directly on the storage controller, the restore process is fast and efficient, without the need to physically move any data. The FlexPod approach is to integrate the best storage solution to simplify the operation of complex SAP landscapes and put control back in your hands.

Reduced Risk

FlexPod Datacenter for SAP HANA TDI with Cisco Nexus 9000 Series Switches underwent extensive testing to become a certified Cisco Validated Design. The solution is certified by SAP for TDI deployments providing configuration validation and to help ensure interoperability. The goal of all this review is to accelerate your time to value and also your return on investment (ROI). Additionally, this solution is designed to be highly available and reliable, helping ensure continuous information access. This solution reduces risk through testing, certification, and excellent availability.

Take Your SAP HANA Deployments into the Future

Deploy the SAP vision. To gain the advantages of SAP's latest technology developments, you must move to SAP HANA. Why not also gain the advantages of the latest Cisco and NetApp integrated infrastructure technology with FlexPod Datacenter and Cisco Nexus 9000 Series Switches for SAP HANA TDI with:

- Radically simplified infrastructure
- Lower TCO
- Reduced risk
- Excellent performance
- Enterprise-class reliability

Even if you are not ready to take advantage of Cisco ACI today, you can deploy the standalone version of the solution for excellent performance, high port count, and reliability to easily network your entire SAP infrastructure. This solution allows you to deploy what you need today and easily scale the infrastructure as your business demands.

For More Information

- Read the Cisco Validated Design FlexPod Datacenter for SAP Solution with Cisco Nexus 9000 Series Switches.
- Read the Cisco Validated Design FlexPod Datacenter for SAP Applications with Cisco Application Centric Infrastructure using Policy-based Automation posted on the [SAP resources page](#).
- For more information about FlexPod Datacenter Integrated Infrastructure, visit <http://www.cisco.com/go/flexpod>.
- For more information about Cisco UCS, visit <http://www.cisco.com/go/ucs>.
- For more information about Cisco Nexus 9000 Series Switches, visit <http://www.cisco.com/go/nexus9000>.
- For more information about NetApp FAS, visit <http://www.netapp.com/us/products/storage-systems/fas8000/index.aspx>.

