



**SAP**

**FlexPod**

NetApp

February 12, 2024

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# Table of Contents

- SAP ..... 1
  - Introduction to SAP on FlexPod ..... 1
  - FlexPod Datacenter for SAP solution using FibreChannel SAN with Cisco UCS Manager 4.0 and NetApp ONTAP 9.7 ..... 1
  - SAP Non-HANA with SQL white paper - Design ..... 1
  - FlexPod Datacenter for SAP Solution with Cisco UCS third-generation fabric and NetApp AFF A-Series. . . 2
  - FlexPod Datacenter for SAP solution using FibreChannel SAN with Cisco UCS Manager 4.0 and NetApp ONTAP 9.7 - Design ..... 2
  - FlexPod Datacenter for SAP solution with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series - Design ..... 2
  - FlexPod Datacenter for SAP with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series - Deployment ..... 3
  - FlexPod Datacenter for SAP Solution with Cisco UCS Manager 4.0 and NetApp AFF A-Series - Design . . . 3
  - FlexPod Datacenter for SAP solution with Cisco ACI on Cisco UCS M5 servers with SLES 12 SP3 and RHEL 7.4 ..... 4
  - FlexPod Datacenter for SAP Solution with IP-based storage using NetApp AFF A-Series and Cisco UCS Manager 3.2 ..... 4
  - FlexPod Datacenter for SAP solution using FibreChannel SAN with Cisco UCS Manager 4.0 and NetApp ONTAP 9.7 ..... 4
  - Deploy SAP application servers on FlexPod with SQL ..... 5
  - FlexPod Datacenter for SAP with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series. . . . . 5
  - FlexPod Datacenter for SAP solution with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series - Design ..... 6
  - FlexPod Datacenter for SAP solution with Cisco UCS third-generation fabric and NetApp AFF A-Series . . . 6
  - FlexPod Datacenter for SAP solution with Cisco UCS Manager 4.0 and NetApp AFF A-Series - Design . . . 7

# SAP

## Introduction to SAP on FlexPod

The FlexPod platform is a predesigned, best practice data center architecture that is built on the Cisco Unified Computing System (Cisco UCS), the Cisco Nexus family of switches, and NetApp storage controllers.

FlexPod is a suitable platform for running SAP applications, and the solutions provided here allows you to quickly and reliably deploy SAP HANA with a model of tailored datacenter integration. FlexPod delivers not only a baseline configuration, but also the flexibility to be sized and optimized to accommodate many different use cases and requirements.

## FlexPod Datacenter for SAP solution using FibreChannel SAN with Cisco UCS Manager 4.0 and NetApp ONTAP 9.7

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes the Cisco and NetApp FlexPod Datacenter with NetApp ONTAP 9.7 on NetApp AFF A400 storage and Cisco UCS Manager unified software release 4.1(1) with second-generation Intel Xeon Scalable Processors for SAP HANA in particular.

FlexPod Datacenter with NetApp ONTAP 9.7 and Cisco UCS unified software release 4.1(1) is a pre-designed, best-practice datacenter architecture built on the Cisco Unified Computing System (Cisco UCS), the Cisco Nexus 9000 family of switches, MDS 9000 multilayer fabric switches, and NetApp AFF A-Series storage arrays running ONTAP 9.7 storage OS.

[FlexPod Datacenter for SAP solution using FibreChannel SAN with Cisco UCS Manager 4.0 and NetApp ONTAP 9.7](#)

## SAP Non-HANA with SQL white paper - Design

The current IT industry is witnessing a dramatic transformation in data center solutions. In recent years, there has been a considerable interest in prevalidated and engineered data center solutions. Introduction of virtualization technology in critical areas has had a major impact on the design principles and architecture of these solutions. It has allowed many applications running on bare-metal systems to migrate to new virtualized integrated solutions. FlexPod is one such prevalidated and engineered data center solution designed to address the rapidly changing needs of IT departments. Cisco and NetApp have partnered to deliver FlexPod, which uses best-in-class computing, networking, and storage components as the foundation for a variety of enterprise workloads, including databases, enterprise resource planning (ERP), customer relationship management (CRM), and web applications.

The consolidation of IT applications, particularly databases, has generated considerable interest in recent years. The most widely adopted and deployed database platform over the past several years is Microsoft SQL Server. SQL Server databases frequently have become subject to database sprawl, leading to IT challenges

such as underutilized servers, incorrect licensing, security concerns, management concerns, and huge operational costs. Therefore, SQL Server databases are good candidates for consolidation on a more robust, flexible, and resilient platform. This document discusses a FlexPod reference architecture for deploying and consolidating SQL Server databases.

[SAP Non-HANA with SQL white paper - Design](#)

## **FlexPod Datacenter for SAP Solution with Cisco UCS third-generation fabric and NetApp AFF A-Series**

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes the deployment methodology of Cisco and NetApp FlexPod Datacenter for SAP HANA based on second-generation Intel Xeon Scalable Processors supported Cisco UCS Computing System (Cisco UCS).

Cisco UCS Manager (UCSM) 4.0(4) provides consolidated support of all current Cisco UCS Fabric Interconnect models (6200, 6300, 6324 and 6454), 2200/2300 series IOM, Cisco UCS B-Series Blade, and Cisco UCS C-Series Rack Formfactor servers. FlexPod Datacenter with Cisco UCS unified software release 4.0(4d) and NetApp ONTAP 9.6, is a pre-designed, best-practice data center architecture built on the Cisco UCS, the Cisco Nexus 9000 family of switches, and NetApp AFF A-Series storage arrays.

[FlexPod Datacenter for SAP Solution with Cisco UCS third-generation Fabric and NetApp AFF A-Series](#)

## **FlexPod Datacenter for SAP solution using FibreChannel SAN with Cisco UCS Manager 4.0 and NetApp ONTAP 9.7 - Design**

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

Cisco and NetApp have partnered to deliver a series of FlexPod solutions that enable strategic data center platforms. The FlexPod solution delivers an integrated architecture that incorporates computing, storage, and network design best practices, thereby minimizing IT risks by validating the integrated architecture to ensure compatibility between various components. The solution also addresses IT pain points by providing documented design guidance, deployment guidance, and support that can be used in various stages (planning, designing, and implementation) of a deployment.

[FlexPod Datacenter for SAP solution using FibreChannel SAN with Cisco UCS Manager 4.0 and NetApp ONTAP 9.7 - Design](#)

## **FlexPod Datacenter for SAP solution with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series - Design**

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes Cisco ACI integrated FlexPod solution as a validated approach for deploying SAP HANA Tailored Data Center Integration (TDI) environments. This validated design provides guidelines and a framework for implementing SAP HANA with best practices from Cisco and NetApp.

The recommended solution architecture is built on the Cisco Unified Computing System (Cisco UCS) using a unified software release to support Cisco UCS hardware platforms that include the following components:

- Cisco UCS B-Series blade servers and Cisco UCS C-Series rack servers configurable with the Intel Optane Data Center Persistent Memory Module (DCPMM) option
- Cisco UCS 6400 series Fabric Interconnects
- Cisco Nexus 9000 Series Leaf and Spine switches
- NetApp All Flash series storage arrays

Additionally, this document provides validations for both Red Hat Enterprise Linux and SUSE Linux Enterprise Server for SAP HANA.

[FlexPod Datacenter for SAP solution with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series - Design](#)

## **FlexPod Datacenter for SAP with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series - Deployment**

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes the architecture and deployment procedures for the SAP HANA Tailored DataCenter Integration option on FlexPod infrastructure, which is composed of:

- Cisco UCS Computing System (Cisco UCS) supported by second-generation Intel Xeon Scalable Processors.
- Switching products that leverage Cisco Application Centric Infrastructure (ACI).
- NetApp A-series AFF arrays.

The intent of this document is to show the detailed configuration steps for SAP HANA deployment

[FlexPod Datacenter for SAP with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series - Deployment](#)

## **FlexPod Datacenter for SAP Solution with Cisco UCS Manager 4.0 and NetApp AFF A-Series - Design**

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes the Cisco and NetApp FlexPod solution, which is a validated approach for deploying SAP HANA Tailored Data Center Integration (TDI) environments. This validated design provides guidelines and a framework for implementing SAP HANA

with best practices from Cisco and NetApp.

FlexPod is a leading integrated infrastructure that supports a broad range of enterprise workloads and use cases. This solution allows you to quickly and reliably deploy SAP HANA with a model of a tailored data center integration mode.

[FlexPod Datacenter for SAP Solution with Cisco UCS Manager 4.0 and NetApp AFF A-Series - Design](#)

## **FlexPod Datacenter for SAP solution with Cisco ACI on Cisco UCS M5 servers with SLES 12 SP3 and RHEL 7.4**

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes the architecture and deployment procedures for SAP HANA Tailored DataCenter Integration option on FlexPod infrastructure composed of Cisco compute and switching products that leverage Cisco Application Centric Infrastructure (ACI) - the industry-leading software-defined networking solution (SDN) - along with NetApp A-series AFF arrays. The intent of this document is to show the design principles with the detailed configuration steps for SAP HANA deployment.

[FlexPod Datacenter for SAP solution with Cisco ACI on Cisco UCS M5 servers with SLES 12 SP3 and RHEL 7.4](#)

## **FlexPod Datacenter for SAP Solution with IP-based storage using NetApp AFF A-Series and Cisco UCS Manager 3.2**

Shailendra Mruthunjaya, Cisco  
Ralf Klahr, Cisco  
Marco Schoen, NetApp

The reference architecture detailed in this document highlights the resiliency, cost benefit, and ease of deployment of an IP-based storage solution. A storage system capable of serving multiple protocols across a single interface allows for customer choice and investment protection because it truly is a wire-once architecture. The solution is designed to host scalable SAP HANA workloads.

[FlexPod Datacenter for SAP Solution with IP-based storage using NetApp AFF A-Series and Cisco UCS Manager 3.2](#)

## **FlexPod Datacenter for SAP solution using FibreChannel SAN with Cisco UCS Manager 4.0 and NetApp ONTAP 9.7**

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes the Cisco and NetApp FlexPod Datacenter with NetApp ONTAP 9.7 on NetApp AFF A400 storage and Cisco UCS Manager unified software release

4.1(1) with second-generation Intel Xeon Scalable Processors for SAP HANA in particular.

FlexPod Datacenter with NetApp ONTAP 9.7 and Cisco UCS unified software release 4.1(1) is a pre-designed, best-practice datacenter architecture built on the Cisco Unified Computing System (Cisco UCS), the Cisco Nexus 9000 family of switches, MDS 9000 multilayer fabric switches, and NetApp AFF A-Series storage arrays running ONTAP 9.7 storage OS.

[FlexPod Datacenter for SAP solution using FibreChannel SAN with Cisco UCS Manager 4.0 and NetApp ONTAP 9.7](#)

## **Deploy SAP application servers on FlexPod with SQL**

FlexPod is a pre-validated and engineered data center solution designed to address the rapidly changing needs of IT departments. Cisco and NetApp have partnered to deliver FlexPod, which uses best-in-class computing, networking, and storage components as the foundation for a variety of enterprise workloads, including databases, enterprise resource planning (ERP), customer relationship management (CRM), and web applications. The consolidation of IT applications, particularly databases, has generated considerable interest in recent years. The most widely adopted and deployed database platform over the past several years is Microsoft SQL Server. SQL Server databases frequently have become subject to database sprawl, leading to IT challenges such as underutilized servers, incorrect licensing, security concerns, management concerns, and huge operational costs. Therefore, SQL Server databases are good candidates for consolidation on a more robust, flexible, and resilient platform. This document discusses a FlexPod reference architecture for deploying and consolidating SQL Server databases.

[Deploy SAP application servers on FlexPod with SQL](#)

## **FlexPod Datacenter for SAP with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series**

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes the architecture and deployment procedures for the SAP HANA Tailored DataCenter Integration option on FlexPod infrastructure, which is composed of:

- Cisco UCS Computing System (Cisco UCS) supported by second-generation Intel Xeon Scalable Processors.
- Switching products that leverage Cisco Application Centric Infrastructure (ACI).
- NetApp A-series AFF arrays.

[FlexPod Datacenter for SAP with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series](#)

# FlexPod Datacenter for SAP solution with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series - Design

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes Cisco ACI integrated FlexPod solution as a validated approach for deploying SAP HANA Tailored Data Center Integration (TDI) environments. This validated design provides guidelines and a framework for implementing SAP HANA with best practices from Cisco and NetApp.

The recommended solution architecture is built on the Cisco Unified Computing System (Cisco UCS) using a unified software release to support Cisco UCS hardware platforms that include the following components:

- Cisco UCS B-Series blade servers and Cisco UCS C-Series rack servers configurable with Intel Optane Data Center Persistent Memory Module (DCPMM) option
- Cisco UCS 6400 series Fabric Interconnects
- Cisco Nexus 9000 Series Leaf and Spine switches
- NetApp All Flash series storage arrays

Additionally, this document provides validations for both Red Hat Enterprise Linux and SUSE Linux Enterprise Server for SAP HANA.

[FlexPod Datacenter for SAP solution with Cisco ACI, Cisco UCS Manager 4.0, and NetApp AFF A-Series - Design](#)

## FlexPod Datacenter for SAP solution with Cisco UCS third-generation fabric and NetApp AFF A-Series

Shailendra Mruthunjaya, Cisco  
Ralf Klahr, Cisco  
Marco Schoen, NetApp

This document describes the deployment methodology of Cisco and NetApp FlexPod Datacenter for SAP HANA based on based on the Cisco UCS Computing System (Cisco UCS) supported by second-generation Intel Xeon Scalable Processors.

Cisco UCS Manager (UCSM) 4.0(4) provides consolidated support of all current Cisco UCS Fabric Interconnect models (6200, 6300, 6324 and 6454), 2200/2300 series IOM, Cisco UCS B-Series Blade, and Cisco UCS C-Series Rack Formfactor servers. FlexPod Datacenter with Cisco UCS unified software release 4.0(4d) and NetApp ONTAP 9.6 is a predesigned, best-practice data center architecture built on the Cisco UCS, the Cisco Nexus 9000 family of switches, and NetApp AFF A-Series storage arrays.

[FlexPod Datacenter for SAP solution with Cisco UCS third-generation fabric and NetApp AFF A-Series](#)



# FlexPod Datacenter for SAP solution with Cisco UCS Manager 4.0 and NetApp AFF A-Series - Design

Pramod Ramamurthy, Cisco  
Marco Schoen, NetApp

This document describes the Cisco and NetApp FlexPod solution, which is a validated approach for deploying SAP HANA Tailored Data Center Integration (TDI) environments. This validated design provides guidelines and a framework for implementing SAP HANA with best practices from Cisco and NetApp.

FlexPod is a leading integrated infrastructure that supports a broad range of enterprise workloads and use cases. This solution allows you to quickly and reliably deploy SAP HANA with a model of a tailored datacenter integration mode.

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- Cisco UCS 6300 series Fabric Interconnects
- Cisco Nexus 9000 Series switches
- NetApp All Flash series storage arrays

In addition, this document provides validations for both Red Hat Enterprise Linux and SUSE Linux Enterprise Server for SAP HANA.

[FlexPod Datacenter for SAP solution with Cisco UCS Manager 4.0 and NetApp AFF A-Series - Design](#)

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