MS-AZ120T00: PLANNING AND DEPLOYING SAP ON AZURE

DURATION	LEVEL	TECHNOLOGY	DELIVERY METHOD	TRAINING CREDITS
3 Days	Advanced	Azure	Instructor-led	NA

INTRODUCTION

This course teaches IT Professionals experienced in SAP solutions how to leverage Azure resources that include deployment and configuration of virtual machines, virtual networks, storage accounts, and Azure AD that includes implementing and managing hybrid identities. Students of this course will learn through concepts, scenarios, procedures, and hands-on labs how to best plan and implement migration and operation of an SAP solution on Azure. Your will receive guidance on subscriptions, create and scale virtual machines, implement storage solutions, configure virtual networking, back up and share data, connect Azure and on-premises sites, manage network traffic, implement Azure Active Directory, secure identities, and monitor your solution.

AUDIENCE PROFILE

This course is for Azure Administrators who migrate and manage SAP solutions on Azure. Azure Administrators manage the cloud services that span storage, networking, and compute cloud capabilities, with a deep understanding of each service across the full IT lifecycle. They take end-user requests for new cloud applications and make recommendations on services to use for optimal performance and scale, as well as provision, size, monitor, and adjust as appropriate. This role requires communicating and coordinating with vendors. Azure Administrators use the Azure Portal, and as they become more proficient, they use PowerShell and the Command Line Interface.

PREREQUISITES

This course doesn't have strict prerequisites. However, it's recommended that you have:

- Experience with SAP applications and databases like SAP HANA, SAP Business Suite, and SAP NetWeaver.
- Knowledge of Azure services and experience with Azure administration.
- Familiarity with virtualization, cloud infrastructure, storage structures, high availability, backup, disaster recovery, data protection, and networking

COURSE OBJECTIVES

After completing this course, students will be able to:

- Migrate SAP Workloads to Azure
- Design an Azure Solution to Support SAP Workloads
- Build and Deploy Azure for SAP Workloads
- Validate Azure Infrastructure for SAP Workloads
- Operationalize Azure SAP Architecture

COURSE CONTENT

Module 1: Explore Azure for SAP workloads

Explore the expanded partnership between Microsoft and SAP. This partnership allows you to run fully supported SAP applications across development, test, and production scenarios in Azure alongside other Microsoft components.

Lessons

- Introduction
- Discover the SAP and Microsoft partnership
- Explore your options with SAP on Azure
- Evaluate Microsoft components
- Knowledge check
- Summary

After completing this module, you will be able to:

- Discover the SAP and Microsoft partnership.
- Explore your options with SAP on Azure.

Module 2: Discover common terms and meanings for SAP on Azure

You will be introduced to some of the common terms that will be used in working with SAP workloads on Azure.

Lessons

- Introduction
- Discover common terms and meanings - SAP
- Discover common terms and meanings - SAP deployments on Azure
- Discover common terms and meanings - Azure
- Knowledge check
- Summary

After completing this module, you will be able to:

- Discover common terms and meanings for SAP, Azure, and SAP deployments on Azure.

Module 3: Identify SAP-certified configurations

Help identify prerequisites, deployment options, and SAP-certified configurations available to you when deploying SAP products in Azure.

Lessons

- Introduction
- Explore general prerequisites for SAP support in public cloud environments
- Identify deployment options for SAP solutions on Azure
- Discover supported Azure Virtual Machines for SAP products on Windows and Linux
- Discover supported Azure Virtual Machines for SAP NetWeaver instances
- Discover SAP-certified operating systems for Azure Virtual Machines
- Discover SAP certifications and configurations running on Microsoft Azure
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore general prerequisites for SAP support in public cloud environments.
- Discover SAP certifications and configurations running on Microsoft Azure.

Module 4: Examine SAP NetWeaver with AnyDB on Azure virtual machines

Examine the architecture options available when deploying SAP AnyDB workloads on Azure VMs.

Lessons

- Introduction
- Explore SAP NetWeaver with AnyDB on Azure Virtual Machines
- Recognize architectural components
- Examine a sample functional workflow
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore SAP NetWeaver with AnyDB on Azure virtual machines and learn to recognize the architecture's components.
- Examine a sample functional workflow.

Module 5: Examine SAP S/4HANA on Azure virtual machines

Examine the architecture when deploying SAP S/4HANA workloads and in-memory SAP HANA databases, running on Azure VMs.

Lessons

- Introduction
- Explore SAP S/4HANA on Azure Virtual Machines
- Recognize architectural components
- Examine a sample functional workflow
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore SAP S/4HANA on Azure virtual machines and learn to recognize the architecture's components.
- Examine a sample functional workflow.

Module 6: Explore Azure for SAP compute

This module explores the design of scalable, performant, and resilient compute components for SAP deployments in Azure.

Lessons

- Introduction
- Plan for implementing SAP solutions
- Explore Azure Virtual Machines
- Examine constrained vCPU capable virtual machine sizes
- Scale Azure Virtual Machines
- Examine Azure Virtual Machine scaling considerations
- Explore network bandwidth allocation
- Explore data flows
- Examine Azure Virtual Machine compute considerations
- Implement and verify high availability SAP HANA on Azure Virtual Machines
- Knowledge check
- Summary

After completing this module, you will be able to:

- Plan for implementing SAP solutions.
- Explore Azure virtual machines.
- Examine Azure virtual machine compute considerations.
- Implement and verify high availability SAP HANA on Azure virtual machines.

Module 7: Explore Azure for SAP networking

This module explores the use of Azure network components to design scalable, performant, and resilient SAP deployments in Azure.

Lessons

- Introduction
- Explore Azure virtual networks
- Consider IP addressing
- Explore name resolution
- Explore accelerated networking
- Explore Azure load balancer
- Examine Azure Virtual Machine networking considerations
- Examine load balancing considerations
- Explore Azure Traffic Manager
- Explore Azure Front Door
- Explore Azure Firewall
- Consider networking changes for Azure Virtual Machines
- Examine Azure routing configurations
- Explore virtual network connectivity
- Explore Distributed Denial-of-Service (DDoS) protection options
- Examine the virtual datacenter
- Explore cross-premises connectivity
- Explore SAProuter
- Examine networking support of Azure for SAP workloads
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore Azure virtual networks.
- Examine Azure virtual machine networking considerations.
- Examine load balancing considerations.
- Explore virtual network connectivity.
- Explore cross-premises connectivity.

Module 8: Explore Azure for SAP storage

This module explores the use of Azure he storage component to design scalable, performant, and resilient SAP deployments in Azure.

Lessons

- Introduction
- Explore Azure Storage types
- Explore Azure Files
- Examine Azure Virtual Machine disks
- Recognize virtual machine images and disks
- Explore managed and unmanaged disks
- Explore caching for virtual machines and data disks
- Explore Write Accelerator
- Examine general database sizing
- Examine Azure Virtual Machine storage considerations
- Examine SAP HANA Dynamic Tiering 2.0

- Explore Azure Virtual Machine disks best practices
- Explore Azure Virtual Machine NFS storage
- Explore Azure Virtual Machine SMB storage
- Examine SAP HANA Azure Virtual Machine storage configurations
- Explore solutions with Premium Storage and Azure Write Accelerator for Azure M-Series
- virtual machines
- Explore Azure Ultra disk storage configuration for SAP HANA
- Explore NFS v4.1 volumes on Azure NetApp Files
- Examine sizing for SAP HANA databases on Azure NetApp Files
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore Azure Storage types.
- Examine general database sizing.
- Examine SAP HANA Azure virtual machine storage configurations.
- Explore solutions with Premium Storage and Azure Write Accelerator for Azure M-Series virtual machines.
- Examine sizing for HANA databases on Azure NetApp Files.

Module 9: Explore Azure for SAP databases

This module explores SAP on Azure database support and best practices for Azure for SAP workloads.

Lessons

- Introduction
- Explore database support of Azure for SAP workloads
- Explore SQL Server
- Consider database compression
- Store database files directly on Azure Blob Storage
- Explore Azure Virtual Machine security
- Consider security recommendations for Blob storage
- Apply SQL Server Transparent Data Encryption
- Explore the SQL Server 2014 Buffer Pool Extension
- Examine Oracle recommendations
- Lab - Implement Linux clustering for SAP on Azure Virtual Machines
- Lab - Implement Windows clustering for SAP on Azure Virtual Machines
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore database support of Azure for SAP workloads.
- Explore storing database files directly on Azure Blob Storage.
- Explore Azure virtual machine and blob storage security.
- Examine SQL Server and Oracle recommendations.

Module 10: Explore Azure networking for SAP RISE

This module shows you how to use your Azure networks to connect to your SAP RISE architecture running in SAP's Azure subscription.

Lessons

- Introduction
- Explore responsibilities during Azure integration with SAP RISE managed workloads
- Explore Azure virtual network peering with SAP RISE
- Explore Azure virtual private network connection to SAP RISE
- Connect on-premises to SAP RISE
- Connect SAP RISE with the internet
- Knowledge check
- Summary

After completing this module, you will be able to

- Differentiate the responsibilities of the SAP RISE team, Azure support, and the customer.
- Connect to SAP RISE with Azure virtual private network (VPN) peering.
- Connect to SAP RISE with VNet-to-VNet.
- Connect SAP RISE with an on-premises network.
- Connect SAP RISE with the internet.

Module 11: Explore identity services for SAP on Azure

This module explores using identity services to design multiple authentication and authorization scenarios Azure facilitates, which includes support for a range of identity providers.

Lessons

- Introduction
- Explore Azure Virtual Machine authentication, authorization, and access control
- Explore Microsoft Entra ID
- Explore SAP Cloud Platform Identity authentication
- Integrate Microsoft Entra ID with SAP Cloud Platform Identity Authentication
- Integrate Microsoft Entra ID with SAP Fiori
- Integrate Microsoft Entra ID with SAP HANA
- Integrate Microsoft Entra ID with SAP NetWeaver
- Integrate Active Directory with SAP single sign-on (Kerberos-SPNEGO)
- Discover Active Directory Domain Services (AD DS)
- Explore primary scenarios using Active Directory Domain Services and Azure Virtual Machines
- Discover Microsoft Entra Domain Services
- Integrate Linux with Active Directory Domain Services
- Knowledge check
- Summary

After completing this module, you will be able to:

- Define Active Directory Domain Services (AD DS)
- Define Azure Active Directory (Azure AD)
- Discuss Azure Active Directory Domain Services (Azure AD DS)

Module 12: Explore remote management for SAP on Azure

This module explores ways to apply Azure remote management components to design remote management of virtual machines and set up the Azure connector for SAP Landscape Management.

Lessons

- Introduction
- Consider remote management of Azure Virtual Machines
- Set up the Azure connector for SAP Landscape Management
- Explore access management
- Explore Azure Bastion
- Examine just-in-time (JIT) virtual machine access
- Knowledge check
- Summary

After completing this module, you will be able to:

- Consider remote management of Azure virtual machines.
- Set up the Azure connector for SAP Landscape Management.
- Explore access management.

Module 13: Explore governance and manageability for SAP on Azure

This module explores using the Azure Governance collection of concepts and services that are designed to enable the management of Azure resources at scale

Lessons

- Introduction
- Explore Azure Resource Manager

- Examine Azure Resource Manager templates
- Explore the Azure Resource Manager template structure and schema
- Examine role-based access control (RBAC)
- Organize Azure resources with tags
- Explore Azure Policy
- Explore management groups
- Explore Azure Automation
- Explore security and compliance services
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore Azure Resource Manager and Azure Resource Manager templates.
- Examine role-based access control and Azure Policy.
- Explore security and compliance services.

Module 14: Deploy single-instance implementations of SAP on Azure (2-tier and 3-tier)

SAP professionals need to evaluate deploying SAP solutions on Azure. This module explores the preparation for single-instance SAP HANA deployment on Azure.

Lessons

- Introduction
- Explore deployment methodologies
- Deploy via Azure Resource Manager templates
- Manually install single-instance SAP HANA on Azure Virtual Machines
- Prepare Azure Virtual Machines for a manual installation of SAP HANA
- Discover key steps for SAP HANA installation using SAP SWPM
- Discover key steps for SAP HANA installation using HDBLCM
- Implement SAP HANA scale-out
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore deployment methodologies.
- Deploy via Azure Resource Manager templates.
- Prepare Azure virtual machines for a manual installation of SAP HANA.
- Implement SAP HANA scale-out.

Module 15: Implement high availability in SAP NetWeaver with AnyDB on Azure virtual machines

SAP professionals need to evaluate deploying SAP solutions on Azure. This module explores the preparation for SAP NetWeaver high availability AnyDB deployment on Azure.

Lessons

- Introduction
- Implement high availability in SAP NetWeaver with AnyDB on Azure Virtual Machines
- Examine single SID 3-tier SAP NetWeaver high availability AnyDB deployment
- Examine multi-SID 3-tier SAP NetWeaver high availability AnyDB deployment
- Set the required DNS IP addresses
- Add registry entries on both cluster nodes of the SAP ASCS-SCS instance
- Set up a Windows Server failover cluster for an SAP ASCS-SCS instance
- Install SIOS DataKeeper Cluster Edition for the SAP ASCS-SCS cluster shared disk
- Implement a highly available NFS share
- Lab - Implement SAP architecture on Azure Virtual Machines running Linux
- Lab - Implement SAP architecture on Azure Virtual Machines running Windows
- Knowledge check
- Summary

After completing this module, you will be able to:

- Examine single SID 3-tier SAP NetWeaver high availability AnyDB deployment.
- Examine multi-SID 3-tier SAP NetWeaver high availability AnyDB deployment.
- Set up a Windows Server failover cluster for an SAP ASCS-SCS instance.
- Examine Installation of SIOS DataKeeper Cluster Edition for the SAP ASCS-SCS cluster shared disk.

Module 16: Explore Azure Center for SAP solutions

SAP professionals are responsible for managing SAP workloads more efficiently on a secure, scalable, and reliable cloud platform. In this module, we will explore how Azure Center for SAP Solutions (ACSS) can help you achieve these goals.

Lessons

- Introduction
- Discover Azure Center for SAP solutions
- Examine prerequisites for Azure Center for SAP solutions
- Choose deployment options with Azure Center for SAP solutions
- Exercise - Deploy S/4HANA infrastructure with Azure Center for SAP solutions
- Exercise - Install the SAP software
- Register an existing SAP system
- Exercise - Use Azure Center for SAP solutions features
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explain Azure Center for SAP Solutions (ACSS) and its services.
- Deploy SAP workloads on Azure or register existing SAP workloads with ACSS.
- Use ACSS to manage new and existing SAP workloads on Azure.
- Monitor and troubleshoot SAP workloads on Azure.

Module 17: Implement high availability for SAP workloads in Azure

This module explores high availability and disaster recovery support of Azure for SAP workloads, such as SAP application servers, SAP ASCS-SCS instances, DBMS instances, and SAP HANA.

Lessons

- Introduction
- Explore high availability and disaster recovery support of Azure for SAP workloads
- Explore high availability of SAP workloads
- Examine failover clustering
- Explore deployment scenarios
- Explore high availability of SAP application servers
- Explore high availability of SAP ASCS-SCS instances
- Examine high availability of DBMS instances
- Explore SAP HANA availability
- Explore SQL Server high availability for SAP in Azure
- Explore Oracle high availability for SAP in Azure
- Examine high availability capabilities of Azure infrastructure
- Understand service-level agreements
- Explore availability zones
- Examine principal architectures
- Determine latency between Azure Virtual Machines across availability zones
- Explore the Active/Active deployment scenario
- Explore the Active/Passive deployment scenario

- Configure combined high availability and disaster recovery
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore high availability and disaster recovery support of Azure for SAP workloads.
- Examine principal architectures.
- Determine latency between Azure virtual machines across Availability Zones.

Module 18: Implement disaster recovery for SAP workloads in Azure

This module explores disaster recovery support of Azure for SAP workloads, including deployments within single and multiple Azure regions, multi-tier SAP NetWeaver app deployment in Azure, and Azure services, such as Active Directory and DNS.

Lessons

- Introduction
- Explore disaster recovery of SAP workloads
- Explore simple availability between two Azure regions
- Combine availability within one region and across regions
- Explore site recovery
- Implement disaster recovery for SAP deployments across Azure regions with Azure Site Recovery
- Set up disaster recovery for a multi-tier SAP NetWeaver app deployment (in Azure)
- Replicate Azure Virtual Machines running in proximity placement groups to another region
- Set up disaster recovery for Active Directory and DNS
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore disaster recovery of SAP workloads.
- Combine availability within one region and across regions.
- Explore site recovery.
- Implement disaster recovery for SAP deployments across Azure regions with Azure Site Recovery.

Module 19: Perform backups and restores for SAP workloads on Azure

This module explores backup and restore of Azure virtual machines and examines the steps and important considerations involved in backing up and restoring SAP workloads on Azure.

Lessons

- Introduction
- Explore backup and restore of Azure Virtual Machines
- Examine application-consistent backup of Azure Linux virtual machines
- Explore application backup
- Explore database backup
- Explore SAP HANA backup
- Implement SAP HANA backup scheduling strategy
- Explore SAP HANA file-level backups
- Create SAP HANA snapshot-based backups
- Explore SQL Server Backup to URL (Azure Storage)
- Explore SQL Server file-snapshot backups
- Explore Oracle backup
- Explore SQL Server backups
- Set up disaster recovery for SQL Server
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore backup and restore of Azure virtual machines.
- Explore application backup.
- Explore SAP HANA backup.
- Explore Oracle backup.
- Explore SQL Server backups.

Module 20: Use the planning and deployment checklist for SAP workloads on Azure

This module uses the SAP workload planning and deployment checklist to guide SAP deployment teams through each phase of the SAP on Azure migration process.

Lessons

- Introduction
- Examine the SAP workload planning and deployment checklist
- Explore the project preparation and planning phase
- Explore the pilot phase
- Explore the nonproduction phase
- Explore the production preparation phase
- Explore the Go Live phase
- Explore the post-production phase
- Knowledge check
- Summary

After completing this module, you will be able to:

- Examine the SAP workload planning and deployment checklist.
- Explore the phases from project preparation and planning, and through the Go Live and post production phases.

Module 21: Explore migration options for SAP on Azure

This module explores strategies for migration of SAP workloads to Azure, including migration of on-premises SAP workloads to Azure in conjunction to performing an upgrade.

Lessons

- Introduction
- Analyze strategies for migrating SAP systems to Microsoft Azure
- Migrate to SAP S/4HANA from SAP Business Suite
- Compare classical migration with the SAP database migration option (DMO)
- Analyze the SAP database migration option methodology
- Explore one-step migration - DMO with system move option
- Explore two-step migration - lift and shift followed by DMO
- Explore downtime-optimized DMO
- Knowledge check
- Summary

After completing this module, you will be able to:

- Analyze strategies for migrating SAP systems to Microsoft Azure.
- Compare classical migration options.
- Explore downtime-optimized migration.

Module 22: Migrate very large databases (VLDB) to Azure for SAP

This module explores migration of databases over 20 TB, considered very large databases. These databases use extra techniques and procedures to achieve migration from on-premises to Azure within acceptable downtime and with low risk.

Lessons

- Introduction
- Explore very large database migration
- Optimize the source system
- Optimize the source system - advanced
- Optimize network upload
- Optimize the target system
- Create recommended migration project documents
- Monitor the migration
- Examine very large database migration best practices
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore very large database migration.
- Learn best practices for optimizing the source system, network upload, and the target system.

- Examine very large database migration best practices.

Module 23: Explore monitoring requirements of Azure for SAP workloads

This module covers monitoring of data from several Azure systems and tools to support SAP on Azure workloads.

Lessons

- Introduction
- Explore the monitoring requirements of Azure for SAP workloads
- Examine monitoring, logging, and alerting services
- Explore Azure Virtual Machine monitoring considerations
- Troubleshoot Azure Enhanced Monitoring for SAP
- Explore Azure Monitor and Log Analytics
- Explore SAP HANA alerts
- Examine diagnostic tools
- Explore operating system and workload updates for Azure Virtual Machines
- Knowledge check
- Summary

After completing this module, you will be able to:

- Examine monitoring, logging, and alerting services.
- Explore Azure Monitor and Log Analytics.
- Explore operating system and workload updates for Azure virtual machines.

Module 24: Configure the Azure Enhanced Monitoring Extension for SAP

This module covers the configuration of the Azure Enhanced Monitoring Extension for SAP.

Lessons

- Introduction
- Explore the Azure Enhanced Monitoring Extension for SAP
- Configure the Azure Enhanced Monitoring Extension for SAP
- Knowledge check
- Summary

After completing this module, you will be able to:

- Explore the Azure Enhanced Monitoring Extension for SAP.
- Configure the Azure Enhanced Monitoring Extension for SAP.

Module 25: Explore licensing, pricing, and support for SAP on Azure virtual machines

This module explores Azure and SAP licensing requirements and licensing costs and walks through the support request process for Azure virtual machines.

Lessons

- Introduction
- Price Azure Virtual Machine-based solutions
- Explore licensing, pricing, and support of Azure for SAP workloads
- Knowledge check
- Summary

After completing this module, you will be able to:

- Learn how to price Azure virtual machine-based solutions.
- Explore licensing, pricing, and support of Azure for SAP workload

ASSOCIATED CERTIFICATIONS & EXAM

This course will prepare delegates to write the Microsoft AZ-120: Planning and Administering Microsoft Azure for SAP Workloads exam.