HA200
SAP HANA Installation & Operations SPS11

COURSE OUTLINE

Course Version: 11
Course Duration: 5 Day(s)
American English is the standard used in this handbook. The following typographic conventions are also used.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Example Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>This information is displayed in the instructor’s presentation</td>
<td></td>
</tr>
<tr>
<td>Demonstration</td>
<td></td>
</tr>
<tr>
<td>Procedure</td>
<td></td>
</tr>
<tr>
<td>Warning or Caution</td>
<td></td>
</tr>
<tr>
<td>Hint</td>
<td></td>
</tr>
<tr>
<td>Related or Additional Information</td>
<td></td>
</tr>
<tr>
<td>Facilitated Discussion</td>
<td></td>
</tr>
<tr>
<td>User interface control</td>
<td>Example text</td>
</tr>
<tr>
<td>Window title</td>
<td>Example text</td>
</tr>
</tbody>
</table>
# Course Overview

## Unit 1: SAP HANA Introduction

<table>
<thead>
<tr>
<th>1</th>
<th>Lesson: SAP HANA - A Short Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lesson: SAP HANA Information Sources</td>
</tr>
</tbody>
</table>

## Unit 2: Preparing Installation

<table>
<thead>
<tr>
<th>3</th>
<th>Lesson: Sizing of SAP HANA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lesson: Requirements</td>
</tr>
</tbody>
</table>

## Unit 3: Installation

<table>
<thead>
<tr>
<th>5</th>
<th>Lesson: Introduction SAP HANA Lifecycle Management Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lesson: Advanced Installation Options</td>
</tr>
<tr>
<td></td>
<td>Lesson: SAP HANA Studio installation</td>
</tr>
<tr>
<td></td>
<td>Lesson: Performing a Distributed System Installation</td>
</tr>
</tbody>
</table>

## Unit 4: Post Installation

<table>
<thead>
<tr>
<th>7</th>
<th>Lesson: Post-Installation Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lesson: Updating SAP HANA</td>
</tr>
<tr>
<td></td>
<td>Lesson: Revision strategy of SAP HANA</td>
</tr>
</tbody>
</table>

## Unit 5: Architecture and Scenarios

<table>
<thead>
<tr>
<th>9</th>
<th>Lesson: SAP HANA Memory Management and Data Persistence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lesson: Software Packaging</td>
</tr>
<tr>
<td></td>
<td>Lesson: SAP HANA Roadmap and Scenarios</td>
</tr>
<tr>
<td></td>
<td>Lesson: Deployment Options</td>
</tr>
</tbody>
</table>

## Unit 6: Admin Tools for SAP HANA

<table>
<thead>
<tr>
<th>11</th>
<th>Lesson: Administration Tool Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lesson: SAP HANA Studio and SAP HANA Cockpit</td>
</tr>
<tr>
<td></td>
<td>Lesson: SHINE - SAP HANA Interactive Education</td>
</tr>
<tr>
<td></td>
<td>Lesson: DBA Cockpit</td>
</tr>
<tr>
<td></td>
<td>Lesson: HDBSQL Command Line Tool</td>
</tr>
</tbody>
</table>
### Unit 7: Operations and Troubleshooting

<table>
<thead>
<tr>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson: Starting and Stopping SAP HANA</td>
</tr>
<tr>
<td>Lesson: Configuring SAP HANA</td>
</tr>
<tr>
<td>Lesson: SAP HANA Table Administration</td>
</tr>
<tr>
<td>Lesson: Periodic Tasks</td>
</tr>
<tr>
<td>Lesson: Configuring Traces</td>
</tr>
<tr>
<td>Lesson: Working with Diagnosis Information and Diagnosis Files</td>
</tr>
<tr>
<td>Lesson: SQL Console</td>
</tr>
<tr>
<td>Lesson: Transporting Changes</td>
</tr>
</tbody>
</table>

### Unit 8: Backup and Recovery

<table>
<thead>
<tr>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson: Concept of Backup and Recovery</td>
</tr>
<tr>
<td>Lesson: Data Area Backup</td>
</tr>
<tr>
<td>Lesson: Log Area Backup</td>
</tr>
<tr>
<td>Lesson: Additional Backup Topics</td>
</tr>
<tr>
<td>Lesson: Recovery</td>
</tr>
<tr>
<td>Lesson: Backup and Recovery using Storage Snapshot</td>
</tr>
<tr>
<td>Lesson: Database Copy</td>
</tr>
</tbody>
</table>

### Unit 9: Security

<table>
<thead>
<tr>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson: Security Overview</td>
</tr>
<tr>
<td>Lesson: Authentication and Authorization</td>
</tr>
<tr>
<td>Lesson: Encryption</td>
</tr>
<tr>
<td>Lesson: Auditing</td>
</tr>
</tbody>
</table>

### Unit 10: Maintaining Users and Authorization

<table>
<thead>
<tr>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson: User Management</td>
</tr>
<tr>
<td>Lesson: Types of Privileges</td>
</tr>
<tr>
<td>Lesson: Roles</td>
</tr>
<tr>
<td>Lesson: Administrative Tasks</td>
</tr>
<tr>
<td>Lesson: Information Sources for Administrators</td>
</tr>
<tr>
<td>Lesson: SAP HANA Live Authorization Assistant</td>
</tr>
</tbody>
</table>

### Unit 11: High Availability and Disaster Tolerance

<table>
<thead>
<tr>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson: High Availability</td>
</tr>
<tr>
<td>Lesson: SAP HANA Scale Out</td>
</tr>
<tr>
<td>Lesson: Disaster Recovery</td>
</tr>
</tbody>
</table>

### Unit 12: Multitenant Database Containers

<table>
<thead>
<tr>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson: Architecture and Technology</td>
</tr>
<tr>
<td>Lesson: Administration of Multitenant Database Containers</td>
</tr>
<tr>
<td>Lesson: Backup and Recovery of Multitenant Database Containers</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>25</td>
</tr>
</tbody>
</table>
TARGET AUDIENCE
This course is intended for the following audiences:

- System Administrator
Lesson 1: SAP HANA - A Short Introduction

Lesson Objectives
After completing this lesson, you will be able to:

• Understand the basics of SAP HANA

Lesson 2: SAP HANA Information Sources

Lesson Objectives
After completing this lesson, you will be able to:

• Find the most important information sources
Lesson 1: Sizing of SAP HANA

Lesson Objectives
After completing this lesson, you will be able to:

- Describe what needs to be taken into consideration for sizing of an SAP HANA server
- Identify where to look up sizing information depending on the SAP HANA scenario
- Use the SAP Quick Sizer for sizing an SAP HANA database server
- Describe sizing of main memory, persistence, and CPU
- Identify where to look up sizing information depending on the SAP HANA scenario
- Run the SAP Quick Sizer for sizing an SAP HANA database server

Lesson 2: Requirements

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the SAP HANA system concepts and system types
- Clarify the SAP HANA System concepts and system types
- Explain the required file system structure and directories and their recommended sizes
Lesson 1: Introduction SAP HANA Lifecycle Management Tools

Lesson Objectives
After completing this lesson, you will be able to:

- Explain SAP HANA Lifecycle Management Tools
- Explain the various installation methods
- Install SAP HANA as a single-host
- Install and configure SAP HANA Studio
- Install the SAP HANA SHINE content
- Explain a multiple-host system installation

Lesson 2: Advanced Installation Options

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the use of the command line options
- Explain the use of the configuration file.
- Explain the use of the configuration file in batch mode

Lesson 3: SAP HANA Studio installation

Lesson Objectives
After completing this lesson, you will be able to:

- Install and configure SAP HANA Studio
- Understand the different installation features
- Setup an SAP HANA Studio Update site

Lesson 4: Performing a Distributed System Installation

Lesson Objectives
After completing this lesson, you will be able to:
• Explain the preparatory steps required to install a distributed system
• Describe the steps for installing a distributed system
UNIT 4  Post Installation

Lesson 1: Post-Installation Steps
Lesson Objectives
After completing this lesson, you will be able to:

- Configure connections for remote support
- Install/check HANA licenses

Lesson 2: Updating SAP HANA
Lesson Objectives
After completing this lesson, you will be able to:

- Explain the update process as a whole
- Update dependent components

Lesson 3: Revision strategy of SAP HANA
Lesson Objectives
After completing this lesson, you will be able to:

- Understand Support Package Stack, Support Packages and SAP HANA Revisions
- Know the difference between Maintenance Revisions and Datacenter Service Points
- Explain the SAP HANA Maintenance Strategy
- Know about SAP HANA Zero Downtime Maintenance
- Explain the following terms within the framework of SAP HANA revision strategy
Lesson 1: SAP HANA Memory Management and Data Persistence

Lesson Objectives
After completing this lesson, you will be able to:

● Identify the components for memory management and persistence in the SAP HANA database architecture

● Describe the SAP HANA memory usage and allocation behavior

● Describe memory management in row store and column store

● Explain how data is persisted in data and log volumes

● Identify optimization potential with regard to memory management and persistence

Lesson 2: Software Packaging

Lesson Objectives
After completing this lesson, you will be able to:

● Talk about solution packages

● Describe the elements of the SAP HANA Platform Edition

● Name additional components that are included in SAP HANA Enterprise Edition

● Name the components that are installed by default, and those that can be activated additionally as add-ons

● Describe how content is bundled and provided with SAP HANA

Lesson 3: SAP HANA Roadmap and Scenarios

Lesson Objectives
After completing this lesson, you will be able to:

● Describe SAP HANA use cases and scenario categories

● Discuss the SAP HANA roadmap

● Look up customer stories and use cases
Lesson 4: Deployment Options

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the different deployment options for SAP HANA
- Explain SAP HANA cloud offerings
- Describe the availability and capabilities of virtualization for SAP HANA
- Describe the option for tailored data center integration
- Identify available co-deployment scenarios
- Describe which limitations exist with regard to productive usage
- Describe the new option for multitenant database containers
Lesson 1: Administration Tool Overview
Lesson Objectives
After completing this lesson, you will be able to:

- Describe which administration tools exist for SAP HANA
- Explain what capabilities the various administration tools have and when to use them

Lesson 2: SAP HANA Studio and SAP HANA Cockpit
Lesson Objectives
After completing this lesson, you will be able to:

- Understand the basic functions of the SAP HANA studio and SAP HANA Cockpit
- Explain the concept of perspectives
- Add an SAP HANA system to an SAP HANA Studio installation
- Obtain an initial system overview in the Administration Console of the SAP HANA studio
- Monitoring dashboard

Lesson 3: SHINE - SAP HANA Interactive Education
Lesson Objectives
After completing this lesson, you will be able to:

- Explain the purpose of the SAP HANA Interactive Education (SHINE)
- List the features provided by SHINE
- Install and configure SHINE

Lesson 4: DBA Cockpit
Lesson Objectives
After completing this lesson, you will be able to:

- Describe the basic functions of the DBA Cockpit
- Explain how to monitor SAP HANA using DBACOCKPIT
Lesson 5: HDBSQL Command Line Tool

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the capabilities of HDBSQL
- Explain different ways of logging on to the SAP HANA database
- Describe the functionality and usage of the hdbuserstore
- Establish a connection to SAP HANA using HDBSQL and execute commands
Lesson 1: Starting and Stopping SAP HANA

Lesson Objectives
After completing this lesson, you will be able to:

- Start and stop SAP HANA using SAP HANA Studio

Lesson 2: Configuring SAP HANA

Lesson Objectives
After completing this lesson, you will be able to:

- Configure the SAP HANA studio

Lesson 3: SAP HANA Table Administration

Lesson Objectives
After completing this lesson, you will be able to:

- Decide when to use column-based and row-based storage

Lesson 4: Periodic Tasks

Lesson Objectives
After completing this lesson, you will be able to:

- Name which administrative tasks need to be performed initially, regularly, and on demand

Lesson 5: Configuring Traces

Lesson Objectives
After completing this lesson, you will be able to:

- Activate the trace function
- Check the trace files

Lesson 6: Working with Diagnosis Information and Diagnosis Files
Lesson Objectives
After completing this lesson, you will be able to:

- Open diagnosis files for analysis
- Delete/merge files
- Download files
- Collect and download diagnosis information

Lesson 7: SQL Console

Lesson Objectives
After completing this lesson, you will be able to:

- Use the SQL console successfully

Lesson 8: Transporting Changes

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the Application Lifecycle Management of SAP HANA
Lesson 1: Concept of Backup and Recovery
Lesson Objectives
After completing this lesson, you will be able to:

- Explain the concept of backup and recovery

Lesson 2: Data Area Backup
Lesson Objectives
After completing this lesson, you will be able to:

- Perform a data area backup
- Estimate the size of a backup

Lesson 3: Log Area Backup
Lesson Objectives
After completing this lesson, you will be able to:

- Configure a log area backup

Lesson 4: Additional Backup Topics
Lesson Objectives
After completing this lesson, you will be able to:

- Use the backup catalog to get information about backups
- Perform backups using scripts

Lesson 5: Recovery
Lesson Objectives
After completing this lesson, you will be able to:

- Perform a database recovery
Lesson 6: Backup and Recovery using Storage Snapshot

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the concept of backup and recovery using a storage snapshot

Lesson 7: Database Copy

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the scenarios for a database copy
Lesson 1: Security Overview
Lesson Objectives
After completing this lesson, you will be able to:

- Describe the security perspective in different implementation scenarios
- Outline the security functions in SAP HANA

Lesson 2: Authentication and Authorization
Lesson Objectives
After completing this lesson, you will be able to:

- Explain the different authentication methods

Lesson 3: Encryption
Lesson Objectives
After completing this lesson, you will be able to:

- Explain the TLS connection encryption
- Explain the data volume encryption

Lesson 4: Auditing
Lesson Objectives
After completing this lesson, you will be able to:

- Explain the audit logging infrastructure
UNIT 10  Maintaining Users and Authorization

Lesson 1: User Management
Lesson Objectives
After completing this lesson, you will be able to:

- Explain how to handle user management and user provisioning
- Explain the user and role concept in SAP HANA
- Explain how to maintain users' roles
- Explain how to maintain SAP HANA privileges

Lesson 2: Types of Privileges
Lesson Objectives
After completing this lesson, you will be able to:

- Explain the authorization concept
- Explain what an Object privilege is
- Explain what a SYSTEM privilege is
- Explain what a package privilege is
- Explain what an analytic privilege is
- Explain what an application privilege is

Lesson 3: Roles
Lesson Objectives
After completing this lesson, you will be able to:

- Explain the purpose of the predelivered roles
- Explain what a template role is
- Explain the purpose of the support role

Lesson 4: Administrative Tasks
Lesson Objectives
After completing this lesson, you will be able to:

- Deactivate a user
- Reactivate a user
- Reset a locked user
- Manage the password policy

Lesson 5: Information Sources for Administrators

Lesson Objectives
After completing this lesson, you will be able to:

- List tables and views that support the user management
- Analyze which privileges a user has been granted

Lesson 6: SAP HANA Live Authorization Assistant

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the concept of the Analytic Authorization Assistant
Lesson 1: High Availability

Lesson Objectives
After completing this lesson, you will be able to:

• Explain the high availability scenarios for SAP HANA

Lesson 2: SAP HANA Scale Out

Lesson Objectives
After completing this lesson, you will be able to:

• Describe the basics of SAP HANA scale out
• Describe the possibilities for configuration of a distributed system

Lesson 3: Disaster Recovery

Lesson Objectives
After completing this lesson, you will be able to:

• Describe the scenarios for disaster recovery support
Lesson 1: Architecture and Technology

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the architecture of multitenant database containers.

Lesson 2: Administration of Multitenant Database Containers

Lesson Objectives
After completing this lesson, you will be able to:

- Distinguish between global administration tasks and administration tasks for a tenant database
- Manage and control the memory and CPU usage of a tenant database
- Describe security aspects when using multitenant database containers

Lesson 3: Backup and Recovery of Multitenant Database Containers

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the backup concept for multitenant database containers.
- Perform a backup of the system database
- Perform a backup a tenant database
Lesson 1: Monitoring with SAP Solution Manager

Lesson Objectives
After completing this lesson, you will be able to:

- Describe how SAP HANA is integrated in SAP Solution Manager

Lesson 2: Remote Support

Lesson Objectives
After completing this lesson, you will be able to:

- Establish a remote service connection for SAP HANA

Lesson 3: SAP Early Watch Alert (EWA)

Lesson Objectives
After completing this lesson, you will be able to:

- Set up an EarlyWatch Alert for SAP HANA

Lesson 4: Appendix

Lesson Objectives
After completing this lesson, you will be able to:

- Provide you with additional information