

HA450

SAP HANA 2.0 SPS05 - Application Development for SAP HANA

COURSE OUTLINE

Course Version: 17

Course Duration:

SAP Copyrights, Trademarks and Disclaimers

© 2021 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. Please see <http://global12.sap.com/corporate-en/legal/copyright/index.epx> for additional trademark information and notices.

Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors.

National product specifications may vary.

These materials may have been machine translated and may contain grammatical errors or inaccuracies.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP SE or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP SE or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of their dates, and they should not be relied upon in making purchasing decisions.

Typographic Conventions

American English is the standard used in this handbook.

The following typographic conventions are also used.

This information is displayed in the instructor's presentation	
Demonstration	
Procedure	
Warning or Caution	
Hint	
Related or Additional Information	
Facilitated Discussion	
User interface control	<i>Example text</i>
Window title	<i>Example text</i>

Contents

vii Course Overview

1 Unit 1: Introducing Application Development in SAP HANA

- 1 Lesson: Describing Prerequisite Skills for SAP HANA Application Development
- 1 Lesson: Introducing the Application Architecture in SAP HANA
- 1 Lesson: Describing the Application Development Tools in SAP HANA
- 1 Lesson: Introducing the SAP HANA Express Edition
- 1 Lesson: Describing the Information Sources for SAP HANA Developers

3 Unit 2: Developing a Basic Multi-Target Application

- 3 Lesson: Introducing the Multi-Target Application
- 3 Lesson: Describing the MTA Development Descriptor File mta.yaml
- 3 Lesson: Introducing the Node.js Module
- 3 Lesson: Creating and Deploying a Basic Node.js Module
- 3 Lesson: Debugging the Node.js Code

5 Unit 3: Creating the Persistence Data Model Using Core Data Services

- 5 Lesson: Introducing the SAP HANA Database Module
- 5 Lesson: Introducing Core Data Services
- 5 Lesson: Using the Core Data Services Entity
- 5 Lesson: Using the CDS Context, Association, and View

7 Unit 4: Creating the Analytical Data Model Using Calculation Views

- 7 Lesson: Introducing Calculation Views

9 Unit 5: Processing Data with SQLScript

- 9 Lesson: Introducing SQLScript
- 9 Lesson: Creating an SQLScript procedure
- 9 Lesson: Debugging SQLScript

11 Unit 6: Using Database Security

- 11 Lesson: Introducing Authorization in SAP HANA
- 11 Lesson: HDI Container Security Concepts

13 Unit 7: Accessing Database Objects Across Schemas and Containers

- 13 Lesson: Accessing a Remote SAP HANA Schema

15	Unit 8:	Accessing Database Objects from the Node.js Application
15		Lesson: Running SQL in the Database with Node.js
17	Unit 9:	Exposing Data as OData Services
17		Lesson: Introducing OData Services
17		Lesson: Exposing an OData Entity Set with XSODATA
17		Lesson: Using OData Key and Association in XSODATA
19	Unit 10:	Integrating HTML5 Modules Using the Router
19		Lesson: Creating a Basic HTML5 Module
19		Lesson: Configuring the Router for HTTP Message Forwarding
19		Lesson: Configuring the Router for Placeholders Replacement
21	Unit 11:	Defining the Application Security
21		Lesson: Introducing Application Security in XS Advanced
21		Lesson: Creating the User with Authorization for Development in SAP Web IDE for SAP HANA
21		Lesson: Creating the Security Concept Within an HTML5 Module
23	Unit 12:	Creating the User Interface Using UI5
23		Lesson: Introducing UI5
23		Lesson: Describing the Structure of an Elementary UI5 Application
23		Lesson: Creating the UI Using the SAP Fiori Master-Detail Template
25	Unit 13:	Using the SAP Cloud Application Programming Model
25		Lesson: Using the SAP Cloud Application Programming Model
27	Unit 14:	Managing Source Code Using Git (optional)
27		Lesson: Working with GIT Within SAP Web IDE for SAP HANA

Course Overview

TARGET AUDIENCE

This course is intended for the following audiences:

- Developer

Lesson 1: Describing Prerequisite Skills for SAP HANA Application Development

Lesson Objectives

After completing this lesson, you will be able to:

- Describe prerequisite skills for SAP HANA application development

Lesson 2: Introducing the Application Architecture in SAP HANA

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the basic concepts of application architecture in SAP HANA

Lesson 3: Describing the Application Development Tools in SAP HANA

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the tools used by the application developer in SAP HANA

Lesson 4: Introducing the SAP HANA Express Edition

Lesson Objectives

After completing this lesson, you will be able to:

- Introduce SAP HANA express edition

Lesson 5: Describing the Information Sources for SAP HANA Developers

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the information sources for SAP HANA developers

Lesson 1: Introducing the Multi-Target Application

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the basic concepts about the MTA development project

Lesson 2: Describing the MTA Development Descriptor File mta.yaml

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the information contained in the MTA Development Descriptor mta.yaml file

Lesson 3: Introducing the Node.js Module

Lesson Objectives

After completing this lesson, you will be able to:

- Describe introductory concepts required to use the Node.js module in the SAP Web IDE for SAP HANA

Lesson 4: Creating and Deploying a Basic Node.js Module

Lesson Objectives

After completing this lesson, you will be able to:

- Create, run, export, and deploy a Node.js module saying Hello World

Lesson 5: Debugging the Node.js Code

Lesson Objectives

After completing this lesson, you will be able to:

- Debugging Node.js code using the SAP Web IDE debugger

Lesson 1: Introducing the SAP HANA Database Module

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the main features of the SAP HANA Database module

Lesson 2: Introducing Core Data Services

Lesson Objectives

After completing this lesson, you will be able to:

- Explain the basic concepts of Core Data Services

Lesson 3: Using the Core Data Services Entity

Lesson Objectives

After completing this lesson, you will be able to:

- Create a Core Data Services Entity, converted at runtime into a database table

Lesson 4: Using the CDS Context, Association, and View

Lesson Objectives

After completing this lesson, you will be able to:

- Use context, association, and view in Core Data Services

Lesson 1: Introducing Calculation Views

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the basic features of Calculation Views

Lesson 1: Introducing SQLScript

Lesson Objectives

After completing this lesson, you will be able to:

- Explain the basic concepts of SQLScript

Lesson 2: Creating an SQLScript procedure

Lesson Objectives

After completing this lesson, you will be able to:

- Create an SQLScript procedure

Lesson 3: Debugging SQLScript

Lesson Objectives

After completing this lesson, you will be able to:

- Debug SQLScript using the SAP Web IDE for SAP HANA

Lesson 1: Introducing Authorization in SAP HANA

Lesson Objectives

After completing this lesson, you will be able to:

- Describe basic concepts about authorizations in the SAP HANA database

Lesson 2: HDI Container Security Concepts

Lesson Objectives

After completing this lesson, you will be able to:

- Understand the HDI Security Concepts

Lesson 1: Accessing a Remote SAP HANA Schema

Lesson Objectives

After completing this lesson, you will be able to:

- Describe how to access a remote SAP HANA schema

Lesson 1: Running SQL in the Database with Node.js

Lesson Objectives

After completing this lesson, you will be able to:

- Run SQL in the Database with Node.js

Lesson 1: Introducing OData Services

Lesson Objectives

After completing this lesson, you will be able to:

- Describe basic concepts about OData services

Lesson 2: Exposing an OData Entity Set with XSODATA

Lesson Objectives

After completing this lesson, you will be able to:

- Create a simple OData service, using XSODATA to expose a single Entity Set

Lesson 3: Using OData Key and Association in XSODATA

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the use of keys and associations in OData services, created with XSODATA

Lesson 1: Creating a Basic HTML5 Module

Lesson Objectives

After completing this lesson, you will be able to:

- Create and run an HTML5 module saying Hello World

Lesson 2: Configuring the Router for HTTP Message Forwarding

Lesson Objectives

After completing this lesson, you will be able to:

- Configure the Router to forward HTTP messages to the Node.js back end module

Lesson 3: Configuring the Router for Placeholders Replacement

Lesson Objectives

After completing this lesson, you will be able to:

- Configure the Router to replace at runtime a placeholder within an html file

Lesson 1: Introducing Application Security in XS Advanced

Lesson Objectives

After completing this lesson, you will be able to:

- Describe basic concepts of application security in XS Advanced

Lesson 2: Creating the User with Authorization for Development in SAP Web IDE for SAP HANA

Lesson Objectives

After completing this lesson, you will be able to:

- Create the user with authorization for development in the SAP Web IDE for SAP HANA

Lesson 3: Creating the Security Concept Within an HTML5 Module

Lesson Objectives

After completing this lesson, you will be able to:

- Create the security concept within an HTML5 module

Lesson 1: Introducing UI5

Lesson Objectives

After completing this lesson, you will be able to:

- Explain what UI5 is

Lesson 2: Describing the Structure of an Elementary UI5 Application

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the structure of an elementary UI5 application

Lesson 3: Creating the UI Using the SAP Fiori Master-Detail Template

Lesson Objectives

After completing this lesson, you will be able to:

- Create the UI using the SAP Fiori Master-Detail template

Lesson 1: Using the SAP Cloud Application Programming Model

Lesson Objectives

After completing this lesson, you will be able to:

- Use the SAP Cloud Application Programming model

Lesson 1: Working with GIT Within SAP Web IDE for SAP HANA

Lesson Objectives

After completing this lesson, you will be able to:

- Use the Native Git Integration of the SAP Web IDE for SAP HANA