SAP ABAP ON CLOUD, RAP, BTP & S/4HANA

Professional Training Program

Course Duration: 35 Hours
Training Focus: SAP ABAP Cloud | RESTful ABAP Programming Model (RAP) | SAP BTP | S/4HANA | OData | SAP Fiori

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1. Course Overview

This comprehensive training program introduces modern SAP development using ABAP Cloud, the RESTful ABAP Programming Model (RAP), SAP Business Technology Platform (BTP), and SAP S/4HANA.

The program combines conceptual learning with practical development exercises, enabling participants to understand modern SAP architecture and build enterprise-ready applications using CDS, RAP, OData services, and SAP Fiori technologies.

2. Course Objectives

By the end of this training, participants will be able to:

- Understand SAP HANA, SAP S/4HANA and SAP BTP architecture.
- Configure Eclipse ADT and SAP BTP development environments.
- Develop CDS views and ABAP Cloud applications.
- Implement managed and unmanaged RAP business objects.
- Build and expose OData V4 services.
- Develop SAP Fiori Elements applications.
- Implement validations, determinations and custom actions.
- Work with EML and modern ABAP SQL.
- Integrate Git-based development workflows.
- Develop and maintain SAP Gateway OData services.

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3. Detailed Course Curriculum

Module 01 – Introduction to SAP HANA, S/4HANA & BTP

- Introduction to SAP HANA architecture.
- Overview of SAP S/4HANA.
- Introduction to SAP Business Technology Platform.
- ABAP Cloud development concepts.
- Introduction to RAP on SAP BTP.

- On-premise versus cloud development.

Module 02 – SAP BTP Account Creation & Development Tools

- SAP BTP account and subaccount setup.
- Configuring SAP BTP ABAP Environment.
- Eclipse IDE and different perspectives.
- Installing and configuring ABAP Development Tools (ADT).
- Creating ABAP Cloud projects.
- Introduction to SAP Business Application Studio (BAS).

Module 03 – CDS & ABAP on HANA

- ABAP data types, domains and database tables.
- ABAP classes and modern ABAP syntax.
- CDS entities and CDS views.
- Virtual Data Model (VDM).
- CDS annotations and metadata.
- Access Control using DCL.
- Introduction to AMDP.
- AMDP practical development.
- CDS and AMDP in on-premise and cloud environments.
- SQL scripting.
- Code pushdown optimization techniques.

Module 04 – Introduction to RESTful ABAP Programming Model (RAP)

- Introduction to RESTful Application Programming.
- RAP architecture and big picture.
- RAP framework components.
- Business Objects and their architecture.
- RAP implementation types.
- Managed and unmanaged scenarios.
- Business Object Definition.
- Projection views and projection behavior.
- Introduction to RAP development lifecycle.

Module 05 – RAP Core Concepts & Reference Scenario

- Associations versus compositions.
- Business Object relationships.
- Parent-child application development.
- Processor and approver workflow scenario.
- SAP Fiori Elements architecture.
- List Report and Object Page applications.
- Behaviour Definition (BDEF).
- Framework-generated identifiers.
- CDS annotations and metadata extensions.
- Developer experience with Fiori Elements.

Module 06 – EML, Modern ABAP SQL & RAP Behaviour

- Entity Manipulation Language (EML).
- EML syntax and operations.
- Modern ABAP SQL.
- Class pools and behaviour pools.
- RAP transactional processing.
- Reading and modifying business object instances.
- Implicit response parameters.
- Custom actions.
- Feature control.
- Determinations.
- Validations.
- Sequence of RAP operations.

Module 07 – Managed RAP Application Development

- Managed RAP architecture.
- Create, Read, Update and Delete operations.
- Business workflow development.
- Approve and reject scenarios.
- Custom actions and validations.
- Determinations and feature control.
- Attachments and file handling.

- Behavior Definition and Implementation.
- Service Definition.
- Service Binding.
- OData V4 service exposure.
- RAP development in cloud and on-premise environments.

Module 08 – Unmanaged RAP Development

- Introduction to unmanaged RAP.
- Managed versus unmanaged implementation.
- Unmanaged business object development.
- Create, Update and Delete implementations.
- Custom transactional logic.
- Behaviour Definition.
- Behaviour Implementation.
- Service Definition and Service Binding.
- Unmanaged RAP practical scenario.
- Cloud and on-premise implementation considerations.

Module 09 – RAP Application Lifecycle, Git & Extensibility

- RAP application development lifecycle.
- Git integration with ABAP Cloud.
- Pushing ABAP source code to Git.
- Importing and managing source code.
- Transport and deployment concepts.
- Registering service definitions and bindings.
- RAP extensibility.
- Consuming APIs from SAP Business Accelerator Hub.
- Custom Entities and external API integration.

Module 10 – File Upload & Download

- OData V2 versus OData V4.
- File upload implementation.
- File download implementation.
- Attachment handling in RAP.

- Media handling and stream processing.
- Practical file management scenario.

Module 11 – SAP AI & Generative AI Overview

- Introduction to Artificial Intelligence.
- Generative AI concepts.
- Overview of SAP Business AI.
- Introduction to SAP Joule.
- AI-assisted SAP development.
- Enterprise AI use cases.

Module 12 – OData V4 Application Development

- Introduction to OData V4.
- Creating OData V4 services.
- Service Definition and Service Binding.
- Developing read-only applications.
- CRUD application development.
- Testing and consuming OData V4 services.
- Integration with SAP Fiori Elements.

Module 13 – SAP Business Application Studio & Fiori Development

- Introduction to SAP Business Application Studio.
- Dev Space configuration.
- Fiori application development.
- Fiori Elements templates.
- Application configuration and customization.
- Deploying Fiori applications.
- Connecting Fiori applications to backend services.

Module 14 – SAP HANA Migration & ABAP Optimization

- Introduction to SAP HANA migration.
- ABAP reports and database objects.
- ABAP Dictionary compatibility.
- ATC and code review tools.
- ABAP coding standards.

- Performance optimization.
- SQL performance analysis.
- Adapting ABAP objects for SAP HANA.

Module 15 – SAP NetWeaver Gateway & OData Fundamentals

- Introduction to SAP Gateway architecture.
- REST architecture and OData protocols.
- OData advantages and use cases.
- JSON and XML formats.
- OData service structure.
- Service Document.
- Service Metadata Document.
- Gateway technical components.

Module 16 – SAP OData Service Development

- OData data types.
- SAP Gateway Service Builder (SEGW).
- Entity Types and Entity Sets.
- Properties and Navigation Properties.
- Associations and Referential Constraints.
- Principal and Dependent Entities.
- Cardinality and mappings.
- OData data model design.

Module 17 – OData Runtime Artifacts

- Model Provider Base (MPC).
- Model Provider Extension (MPC_EXT).
- Data Provider Base (DPC).
- Data Provider Extension (DPC_EXT).
- Runtime artifact generation.
- Service implementation techniques.

Module 18 – OData Service Registration & Maintenance

- Gateway service registration.
- Hub system configuration.

- Service maintenance.
- Gateway Client testing.
- Error log analysis.
- HTTP status codes.
- Common OData errors.
- Debugging OData services.

Module 19 – OData Mapping & Integration

- BAPI integration with mapping.
- Database views with mapping.
- BAPI integration without mapping.
- Multiple BAPIs with a single Entity Set.
- Backend integration approaches.
- Error handling and response management.

Module 20 – OData CRUD Operations & Advanced Features

- CREATE_ENTITY.
- GET_ENTITY.
- GET_ENTITYSET.
- UPDATE_ENTITY.
- DELETE_ENTITY.
- Expanded entity queries.
- Stream upload and download.
- ExecuteAction.
- Query options and filtering.
- Practical end-to-end OData service development.

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4. Practical Development Projects

Participants will work on practical development scenarios covering:

1. CDS-based data modelling and reporting.
2. Managed RAP application with complete CRUD functionality.
3. Unmanaged RAP application with custom business logic.
4. Processor and approver workflow with validations and actions.

5. File upload and download functionality.
6. OData V4 service development and Fiori Elements integration.
7. SAP Gateway OData CRUD service implementation.

5. Tools & Technologies Covered

- SAP S/4HANA
- SAP HANA
- SAP BTP
- ABAP Cloud
- Eclipse IDE
- ABAP Development Tools (ADT)
- CDS Views
- AMDP
- RAP
- EML
- OData V2 and V4
- SAP Fiori Elements
- SAP Business Application Studio
- SAP Gateway (SEGW)
- Git

6. Training Duration

Total Duration: 35 Hours