GW100
SAP Gateway - Building OData Services

COURSE OUTLINE

Course Version: 10
Course Duration: 4 Day(s)
SAP Copyrights and Trademarks

© 2015 SAP SE. 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. The information contained herein may be changed without prior notice.

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

- Microsoft, Windows, Excel, Outlook, and PowerPoint are registered trademarks of Microsoft Corporation.

- IBM, DB2, DB2 Universal Database, System i, System i5, System p, System x, System z, System z10, System z9, z10, iSeries, pSeries, xSeries, zSeries, eServer, z/VM, z/OS, i5/OS, S/390, OS/390, OS/400, AS/400, S/390 Parallel Enterprise Server, PowerVM, Power Architecture, POWER6+, POWER6, POWER5+, POWER5, POWER, OpenPower, PowerPC, BatchPipes, BladeCenter, System Storage, GPFS, HACMP, RETAIN, DB2 Connect, RACF, Redbooks, OS/2, Parallel Sysplex, MVS/ESA, AIX, Intelligent Miner, WebSphere, Netfinity, Tivoli and Informix are trademarks or registered trademarks of IBM Corporation.

- Linux is the registered trademark of Linus Torvalds in the U.S. and other countries.

- Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

- Oracle is a registered trademark of Oracle Corporation

- UNIX, X/Open, OSF/1, and Motif are registered trademarks of the Open Group.

- Citrix, ICA, Program Neighborhood, MetaFrame, WinFrame, VideoFrame, and MultiWin are trademarks or registered trademarks of Citrix Systems, Inc.

- HTML, XML, XHTML and W3C are trademarks or registered trademarks of W3C®. World Wide Web Consortium, Massachusetts Institute of Technology.

- Java is a registered trademark of Sun Microsystems, Inc.

- JavaScript is a registered trademark of Sun Microsystems, Inc., used under license for technology invented and implemented by Netscape.

- SAP, R/3, SAP NetWeaver, Duet, PartnerEdge, ByDesign, SAP BusinessObjects Explorer, StreamWork, and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE in Germany and other countries.

- Business Objects and the Business Objects logo, BusinessObjects, Crystal Reports, Crystal Decisions, Web Intelligence, Xcelsius, and other Business Objects products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of Business Objects Software Ltd. Business Objects is an SAP company.

- Sybase and Adaptive Server, iAnywhere, Sybase 365, SQL Anywhere, and other Sybase products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of Sybase, Inc. Sybase is an SAP company.
All other product and service names mentioned are the trademarks of their respective companies. Data contained in this document serves informational purposes only. National product specifications may vary.

These materials are subject to change without notice. These materials are provided by SAP SE and its affiliated companies ("SAP Group") for informational purposes only, without representation or warranty of any kind, and SAP Group shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP Group 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.
Typographic Conventions

American English is the standard used in this handbook. The following typographic conventions are also used.

<table>
<thead>
<tr>
<th>Typographic 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></td>
</tr>
<tr>
<td>Window title</td>
<td></td>
</tr>
</tbody>
</table>

© Copyright. All rights reserved.
## Contents

<table>
<thead>
<tr>
<th>ix</th>
<th>Course Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Unit 1:</strong> SAP Gateway Overview</td>
</tr>
<tr>
<td>1</td>
<td>Lesson: Explaining SAP Gateway</td>
</tr>
<tr>
<td>1</td>
<td>Lesson: Describing the SAP Gateway Deployment Options</td>
</tr>
<tr>
<td>3</td>
<td><strong>Unit 2:</strong> OData Overview</td>
</tr>
<tr>
<td>3</td>
<td>Lesson: Explaining REST</td>
</tr>
<tr>
<td>3</td>
<td>Lesson: Explaining OData</td>
</tr>
<tr>
<td>3</td>
<td>Lesson: Performing OData Operations</td>
</tr>
<tr>
<td>3</td>
<td>Lesson: Performing OData Queries</td>
</tr>
<tr>
<td>5</td>
<td><strong>Unit 3:</strong> SAP Gateway Service Implementation</td>
</tr>
<tr>
<td>5</td>
<td>Lesson: Implementing a Gateway Service</td>
</tr>
<tr>
<td>5</td>
<td>Lesson: Defining a Data Model</td>
</tr>
<tr>
<td>5</td>
<td>Lesson: Implementing Read Operations</td>
</tr>
<tr>
<td>5</td>
<td>Lesson: Implementing Navigation</td>
</tr>
<tr>
<td>5</td>
<td>Lesson: Implementing Query Options</td>
</tr>
<tr>
<td>6</td>
<td>Lesson: Implementing Change Operations</td>
</tr>
<tr>
<td>7</td>
<td><strong>Unit 4:</strong> SAP Gateway Service Generation</td>
</tr>
<tr>
<td>7</td>
<td>Lesson: Operating the RFC/BOR Generator</td>
</tr>
<tr>
<td>7</td>
<td>Lesson: Operating the Search Help Generator</td>
</tr>
<tr>
<td>7</td>
<td>Lesson: Operating the CDS/SADL Generator</td>
</tr>
<tr>
<td>7</td>
<td>Lesson: Redefining a Data Service</td>
</tr>
<tr>
<td>9</td>
<td><strong>Unit 5:</strong> SAP Gateway Service Extensibility</td>
</tr>
<tr>
<td>9</td>
<td>Lesson: Redefining a Gateway Service</td>
</tr>
<tr>
<td>11</td>
<td><strong>Unit 6:</strong> SAP Gateway Hub Functionalities</td>
</tr>
<tr>
<td>11</td>
<td>Lesson: Assigning Multiple Back-End Systems Support</td>
</tr>
<tr>
<td>11</td>
<td>Lesson: Configuring Routing Capabilities</td>
</tr>
<tr>
<td>11</td>
<td>Lesson: Performing Multi-Origin Composition</td>
</tr>
<tr>
<td>11</td>
<td>Lesson: Describing Workflow Support</td>
</tr>
<tr>
<td>13</td>
<td>Unit 7:</td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
</tr>
<tr>
<td>13</td>
<td>Lesson: Implementing Function Imports</td>
</tr>
<tr>
<td>13</td>
<td>Lesson: Implementing Expand Operations</td>
</tr>
<tr>
<td>13</td>
<td>Lesson: Implementing Deep Insert Operations</td>
</tr>
<tr>
<td>13</td>
<td>Lesson: Handling ETags</td>
</tr>
<tr>
<td>13</td>
<td>Lesson: Processing Batch Requests</td>
</tr>
<tr>
<td>13</td>
<td>Lesson: Explaining Offline Support</td>
</tr>
<tr>
<td>14</td>
<td>Lesson: Explaining Media Links</td>
</tr>
<tr>
<td>14</td>
<td>Lesson: Describing Server Side Caching</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15</th>
<th>Unit 8:</th>
<th>SAP Gateway Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Lesson: Enabling Authentication</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Lesson: Managing Data Security</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>17</th>
<th>Unit 9:</th>
<th>OData Service Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Lesson: Consuming OData Services</td>
<td></td>
</tr>
</tbody>
</table>
TARGET AUDIENCE
This course is intended for the following audiences:

- Application Consultant
- Developer
- Development Consultant
- Systems Architect
Lesson 1: Explaining SAP Gateway

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

- Describe the benefits of SAP Gateway and the Open Data (OData) protocol
- List SAP products that use SAP Gateway

Lesson 2: Describing the SAP Gateway Deployment Options

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

- Describe SAP Gateway components
- Describe SAP Gateway deployment scenarios
Lesson 1: Explaining REST
Lesson Objectives
After completing this lesson, you will be able to:

• Describe Representational State Transfer (REST)

Lesson 2: Explaining OData
Lesson Objectives
After completing this lesson, you will be able to:

• Examine an OData service

Lesson 3: Performing OData Operations
Lesson Objectives
After completing this lesson, you will be able to:

• Perform OData read operations

Lesson 4: Performing OData Queries
Lesson Objectives
After completing this lesson, you will be able to:

• Perform OData queries
• Describe patterns for UI-centric applications
Lesson 1: Implementing a Gateway Service
Lesson Objectives
After completing this lesson, you will be able to:
• Explain the role of the SAP Gateway Service Builder
• Define a data model
• Implement a Gateway service
• Register and test a Gateway service
• Perform basic error handling

Lesson 2: Defining a Data Model
Lesson Objectives
After completing this lesson, you will be able to:
• Plan Gateway service development
• Define a Data Model based on a Data Dictionary

Lesson 3: Implementing Read Operations
Lesson Objectives
After completing this lesson, you will be able to:
• Implement query operation
• Implement read operation

Lesson 4: Implementing Navigation
Lesson Objectives
After completing this lesson, you will be able to:
• Implement association and navigation

Lesson 5: Implementing Query Options
Lesson Objectives
After completing this lesson, you will be able to:

- Implement query options

Lesson 6: Implementing Change Operations
Lesson Objectives
After completing this lesson, you will be able to:

- Implement create, update, delete operations
Lesson 1: Operating the RFC/BOR Generator

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

- Define a data model based on an RFC/BOR interface
- Generate implementation for RFC/BOR operations

Lesson 2: Operating the Search Help Generator

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

- Implement the search help generator

Lesson 3: Operating the CDS/SADL Generator

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

- Operate the CDS/SADL generator

Lesson 4: Redefining a Data Service

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

- Redefine a data service
Lesson 1: Redefining a Gateway Service

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

- Redefine Gateway services
Lesson 1: Assigning Multiple Back-End Systems Support

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

• Assign multiple system aliases

Lesson 2: Configuring Routing Capabilities

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

• Configure routing

Lesson 3: Performing Multi-Origin Composition

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

• Perform multi-origin composition

Lesson 4: Describing Workflow Support

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

• Describe the Task Gateway Service
Lesson 1: Implementing Function Imports

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

- Implement function imports

Lesson 2: Implementing Expand Operations

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

- Implement expand operations

Lesson 3: Implementing Deep Insert Operations

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

- Implement deep insert operations

Lesson 4: Handling ETags

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

- Handle ETags

Lesson 5: Processing Batch Requests

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

- Process batch requests

Lesson 6: Explaining Offline Support

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

- Explain offline support

### Lesson 7: Explaining Media Links

**Lesson Objectives**

After completing this lesson, you will be able to:

- Explain media links

### Lesson 8: Describing Server Side Caching

**Lesson Objectives**

After completing this lesson, you will be able to:

- Describe soft state
- Describe soft-state-based query result cache
Lesson 1: Enabling Authentication

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

- Outline authentication options
- Outline authorization elements

Lesson 2: Managing Data Security

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

- Outline how to secure data
Lesson 1: Consuming OData Services

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

- Consume OData using SAP Web IDE