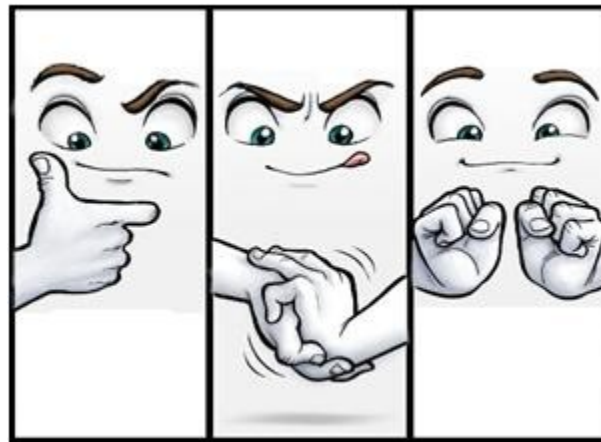


ABAP

Advanced Business Application Programming

OData-Service – Access to data
[CRUD]



Goals of the workshop

After this workshop, you should be able to :

- Create an OData-Service based on an existing DB-Table, implement and test it



Start	4
Create Service	5
Implementation	6-7
Functionimport	8
Add Service	9-11
Test Service	12



■ Transactions

- ▼ Favoriten
 - ★ SE80 - Object Navigator
- ▼ odata_ui5
 - ★ SEGW - Transaktion SEGW
 - ★ /IWFND/MAINT_SERVICE - Services aktivieren u
 - ★ /IWFND/GW_CLIENT - Gateway Client
 - ★ /IWFND/ERROR_LOG - Gateway-Fehlerprotokoll

■ Table

Modify first dataset : <Prename>, <Lastname>, Department TST

<

Create Service

Transaction SEGW

▼	Z_ODS_EMPLOYEE_MSC
▼	Data Model
▼	Entitätstypen
▼	employee_msc
▼	Eigenschaften
•	Carrier
•	IdEmployee
•	Firstname
•	Lastname
•	Department
•	Area
•	Salary
•	Currency
•	Navigationseigenschaften
•	Assoziationen
▼	Entitätsmengen
•	employee_mscSet
▼	Serviceimplementierung
▼	employee_mscSet
•	Create
•	Delete
•	GetEntity (Read)
•	GetEntitySet (Query)
•	Update
▼	Laufzeitartefakte
•	Z_ODS_EMPLOYEE_MSC_MDL
•	Z_ODS_EMPLOYEE_MSC_SRV
•	ZCL_Z_ODS_EMPLOYEE_MSC_DPC
•	ZCL_Z_ODS_EMPLOYEE_MSC_DPC_EXT
•	ZCL_Z_ODS_EMPLOYEE_MSC_MPC
•	ZCL_Z_ODS_EMPLOYEE_MSC_MPC_EXT

Eigenschaften															
Name	Schl.	EDM-Coretyp	Gen...	Skali...	Max...	Ein...	Anle...	Akt...	Sort...	Null...	Filte...	Bezeichner	B...	KompTyp	Feld
Carrier	<input checked="" type="checkbox"/>	Edm.String	0	0	3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fluggesellschaft	T		CARRIER
IdEmployee	<input checked="" type="checkbox"/>	Edm.String	0	0	10		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID employee	T		ID_EMPL...
Firstname	<input type="checkbox"/>	Edm.String	0	0	15		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FIRSTNAME	T		FIRSTNA...
Lastname	<input type="checkbox"/>	Edm.String	0	0	20		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LASTNAME	T		LASTNA...
Department	<input type="checkbox"/>	Edm.String	0	0	4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	department	T		DEPART...
Area	<input type="checkbox"/>	Edm.String	0	0	1		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	area	T		AREA
Salary	<input type="checkbox"/>	Edm.Decimal	11	2	0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	salary	T		SALARY
Currency	<input type="checkbox"/>	Edm.String	0	0	5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Zahl.Währung	T		CURRENCY

Vorgänge der Entitätsmenge employee_mscSet							
Vorgangsname	DS-Gr...	Name D...	DQ-Typ	Dest.	Name der Implementierungsklasse	Name der Methode	Zu...
Aktualisieren					ZCL_Z_ODS_EMPLOYEE_MSC_DPC_EXT	EMPLOYEE_MSCSET_UPDATE_ENTITY	
Anlegen					ZCL_Z_ODS_EMPLOYEE_MSC_DPC_EXT	EMPLOYEE_MSCSET_CREATE_ENTITY	
GetEntity (Les...					ZCL_Z_ODS_EMPLOYEE_MSC_DPC_EXT	EMPLOYEE_MSCSET_GET_ENTITY	
GetEntitySet (...)					ZCL_Z_ODS_EMPLOYEE_MSC_DPC_EXT	EMPLOYEE_MSCSET_GET_ENTITYSET	
Löschen					ZCL_Z_ODS_EMPLOYEE_MSC_DPC_EXT	EMPLOYEE_MSCSET_DELETE_ENTITY	

Laufzeitartefakte				
Name	Erzeugter Artefakttyp	PgID	Obj-Typ	Objektnamen
Z_ODS_EMPLOYEE_MSC_MDL	Registriertes Modell	R3TR	IWMO	Z_ODS_EMPLOYEE_MSC_MDL
Z_ODS_EMPLOYEE_MSC_SRV	Registrierter Service	R3TR	IWSV	Z_ODS_EMPLOYEE_MSC_SRV
ZCL_Z_ODS_EMPLOYEE_MSC_DPC	Data-Provider-Basisklasse	R3TR	CLAS	ZCL_Z_ODS_EMPLOYEE_MSC_DPC
ZCL_Z_ODS_EMPLOYEE_MSC_DPC_EXT	Data-Provider-Erweiterungsklasse	R3TR	CLAS	ZCL_Z_ODS_EMPLOYEE_MSC_DPC_EXT
ZCL_Z_ODS_EMPLOYEE_MSC_MPC	Model-Provider-Basisklasse	R3TR	CLAS	ZCL_Z_ODS_EMPLOYEE_MSC_MPC
ZCL_Z_ODS_EMPLOYEE_MSC_MPC_EXT	Model-Provider-Erweiterungsklasse	R3TR	CLAS	ZCL_Z_ODS_EMPLOYEE_MSC_MPC_EXT

Implementation : Methods

■ Redefine the Class-Methods

ZCL_ZOD_EMPLOYEE_MSC_DPC_EXT		Sekundäre Data-Provider-Klasse
Superklassen		
> ZCL_ZOD_EMPLOYEE_MSC_DPC		Data-Provider-Basiskl.
Attribute		
Geerbte Attribute		
> /IWBEP/IF_MGW_CORE_SRV_RUNTIME		OData Channel - Core Runtime Interface - Framework
• MO_CONTEXT		MGW Context
• MR_REQUEST_DETAILS		the request details for a remote request to a mgw server
• MR_SERVICE_DOCUMENT_NAME		
• MR_SERVICE_NAMESPACE		
• MR_SERVICE_VERSION		Count parameters
• mo_injection		
Methoden		
Geerbte Methoden		
> /IWBEP/IF_SB_DPC_COMM_SERVICES		DPC Common Services
> /IWBEP/IF_MGW_APPL_SRV_RUNTIME		Gateway Application Interface
> /IWBEP/IF_MGW_CONV_SRV_RUNTIME		OData Channel - Application Convenience Interface
> /IWBEP/IF_MGW_CORE_SRV_RUNTIME		OData Channel - Core Runtime Interface - Framework
• CHECK_SUBSCRIPTION_AUTHORITY		
Redefinitionen		
• /IWBEP/IF_MGW_APPL_SRV_RUNTIME~EXECUTE_ACTION		executes a function import
• ZTT_EMPLOYEE_MSC_CREATE_ENTITY		
• ZTT_EMPLOYEE_MSC_DELETE_ENTITY		
• ZTT_EMPLOYEE_MSC_GET_ENTITY		
• ZTT_EMPLOYEE_MSC_GET_ENTITYSET		
• ZTT_EMPLOYEE_MSC_UPDATE_ENTITY		
Typen		
Geerbte Typen		
> /IWBEP/IF_MGW_APPL_SRV_RUNTIME		Gateway Application Interface
> /IWBEP/IF_MGW_CORE_SRV_RUNTIME		OData Channel - Core Runtime Interface - Framework
• S		Single-Character Indicator
• TY_S_MEDIA_RESOURCE		Media Type Information

Implementation : Parameters

Art	Parameter	Typisierung
▶	IV_ENTITY_NAME	TYPE STRING
▶	IV_ENTITY_SET_NAME	TYPE STRING
▶	IV_SOURCE_NAME	TYPE STRING
▶	IT_FILTER_SELECT_OPTIONS	TYPE /IWBEP/T_MGW_SELECT_OPTION
▶	IS_PAGING	TYPE /IWBEP/S_MGW_PAGING
▶	IT_KEY_TAB	TYPE /IWBEP/T_MGW_NAME_VALUE_PAIR
▶	IT_NAVIGATION_PATH	TYPE /IWBEP/T_MGW_NAVIGATION_PATH
▶	IT_ORDER	TYPE /IWBEP/T_MGW_SORTING_ORDER
▶	IV_FILTER_STRING	TYPE STRING
▶	IV_SEARCH_STRING	TYPE STRING
▶	IO_TECH_REQUEST_CONTEXT	TYPE REF TO /IWBEP/IF_MGW_REQ_ENTITYSET OPTIONAL
▶	ET_ENTITYSET	TYPE ZCL_ZOD_EMPLOYEE_MSC_MPC=>TT_ZTT_EMPLOYEE_MSC
▶	ES_RESPONSE_CONTEXT	TYPE /IWBEP/IF_MGW_APPL_SRV_RUNTIME=>TY_S_MGW_RESPONSE_CONTEXT
⚠	/IWBEP/CX_MGW_BUSI_EXCEPTION	
⚠	/IWBEP/CX_MGW_TECH_EXCEPTION	

Methode **ZTT_EMPLOYEE_MSC_GET_ENTITYSET** aktiv

Art	Parameter	Typisierung
▶	IV_ENTITY_NAME	TYPE STRING
▶	IV_ENTITY_SET_NAME	TYPE STRING
▶	IV_SOURCE_NAME	TYPE STRING
▶	IT_KEY_TAB	TYPE /IWBEP/T_MGW_NAME_VALUE_PAIR
▶	IO_TECH_REQUEST_CONTEXT	TYPE REF TO /IWBEP/IF_MGW_REQ_ENTITY_D OPTIONAL
▶	IT_NAVIGATION_PATH	TYPE /IWBEP/T_MGW_NAVIGATION_PATH
⚠	/IWBEP/CX_MGW_BUSI_EXCEPTION	
⚠	/IWBEP/CX_MGW_TECH_EXCEPTION	

Methode **ZTT_EMPLOYEE_MSC_DELETE_ENTITY** aktiv

Art	Parameter	Typisierung
▶	IV_ENTITY_NAME	TYPE STRING
▶	IV_ENTITY_SET_NAME	TYPE STRING
▶	IV_SOURCE_NAME	TYPE STRING
▶	IT_KEY_TAB	TYPE /IWBEP/T_MGW_NAME_VALUE_PAIR
▶	IO_REQUEST_OBJECT	TYPE REF TO /IWBEP/IF_MGW_REQ_ENTITY OPTIONAL
▶	IO_TECH_REQUEST_CONTEXT	TYPE REF TO /IWBEP/IF_MGW_REQ_ENTITY OPTIONAL
▶	IT_NAVIGATION_PATH	TYPE /IWBEP/T_MGW_NAVIGATION_PATH
▶	ER_ENTITY	TYPE ZCL_ZOD_EMPLOYEE_MSC_MPC=>TS_ZTT_EMPLOYEE_MSC
⚠	/IWBEP/CX_MGW_BUSI_EXCEPTION	
⚠	/IWBEP/CX_MGW_TECH_EXCEPTION	

Methode **ZTT_EMPLOYEE_MSC_GET_ENTITY** aktiv

Art	Parameter	Typisierung
▶	IV_ENTITY_NAME	TYPE STRING
▶	IV_ENTITY_SET_NAME	TYPE STRING
▶	IV_SOURCE_NAME	TYPE STRING
▶	IT_KEY_TAB	TYPE /IWBEP/T_MGW_NAME_VALUE_PAIR
▶	IO_TECH_REQUEST_CONTEXT	TYPE REF TO /IWBEP/IF_MGW_REQ_ENTITY_C OPTIONAL
▶	IT_NAVIGATION_PATH	TYPE /IWBEP/T_MGW_NAVIGATION_PATH
▶	IO_DATA_PROVIDER	TYPE REF TO /IWBEP/IF_MGW_ENTRY_PROVIDER OPTIONAL
▶	ER_ENTITY	TYPE ZCL_ZOD_EMPLOYEE_MSC_MPC=>TS_ZTT_EMPLOYEE_MSC
⚠	/IWBEP/CX_MGW_BUSI_EXCEPTION	
⚠	/IWBEP/CX_MGW_TECH_EXCEPTION	

Methode **ZTT_EMPLOYEE_MSC_CREATE_ENTITY** aktiv

Methode **ZTT_EMPLOYEE_MSC_UPDATE_ENTITY**

Add/Activate Service

■ Transaction /IWFND/MAINT_SERVICE

Ausgewählte Services hinzufügen

Services abrufen

Filter

Systemalias	LOCAL	Technischer Servicename		Version	
Externer Servicename		Externe Zuordnungs-ID			

Ausgewählte Services hinzufügen

Ausgewählte Backend-Services

Typ	Techn. Servicename	Ver...	Servicebeschreibung	Externer Servicename	Namensraum	Externe Zuordn
BEP	/IWBEP/EPM_DEV_SCENARIO_2_SRV	1	/IWBEP/CL_EPM_DEV_SC2_DPC_EXT	EPM_DEV_SCENARIO_2_SRV	/IWBEP/	
BEP	/IWBEP/EPM_DEVELOPER_SCENARIO_SRV	1	/IWBEP/CL_EPM_DEVELOPE_DPC_EXT	EPM_DEVELOPER_SCENARIO_SRV	/IWBEP/	
BEP	/IWBEP/EPM_RETAIL_SCENARIO_SRV	1	/IWBEP/CL_EPM_RETAIL_S_DPC_EXT	EPM_RETAIL_SCENARIO_SRV	/IWBEP/	
BEP	/IWBEP/ERROR_LOG_SRV	1		ERROR_LOG_SRV	/IWBEP/	
BEP	/IWBEP/GWDEMO	1		GWDEMO	/IWBEP/	

Sicht "SAP-Systemaliasse zu OData Service zuweisen" ändern: Übersicht

Neue Einträge

SAP-Systemaliasse zu OData Service zuweisen

Servicedokument-ID	Benutzerr...	Host-Name	SAP-Systemalias	Standardsyst...	Techn. Servicename	Externer Servicename	Version	Benutzername
ZOD_EMPLOYEE_MSC_SRV_0001			LOCAL	<input checked="" type="checkbox"/>	ZOD_EMPLOYEE_MSC_SRV	ZOD_EMPLOYEE_MSC_SRV	1	

Add/Activate Service

■ Result

Services aktivieren und verwalten

Service hinzufügen Service löschen Servicedetails Metadaten laden Fehlerprotokoll Katalog aktualisier. OAuth

Servicekatalog

Typ	Techn. Servicenamen	V...	Servicebeschreibung	Externer Servicenamen	Namensraum	OAut...	S
	/IWFND/SG TEST APPLICATION STC	1		TeaStcProcessing	/IWFND/	<input type="checkbox"/>	
	/IWFND/USAGEEXTRACTOR	1		USAGEEXTRACTOR	/IWFND/	<input type="checkbox"/>	
	/IWFND/SG USER SERVICE	1		USERSERVICE	/IWFND/	<input type="checkbox"/>	
	/IWCNT/SG WF ACTIVITY TASK	1		WFACTIVITYTASKPROCESSING		<input type="checkbox"/>	
	/IWCNT/SG WF DECISION TASK	1		WFDECISIONTASKPROCESSING		<input type="checkbox"/>	
	/IWCNT/SG WF GEN TASK	1		WFGENTASKPROCESSING		<input type="checkbox"/>	
	/IWCNT/SG ODC RMT WORKFLOW	1		WFODCPROCESSING	/IWCNT/	<input type="checkbox"/>	
BEP	ZOD_EMPLOYEE MSC SRV	1	test odata service for ztt_employee_msc	ZOD_EMPLOYEE MSC SRV		<input checked="" type="checkbox"/>	

ICF-Knoten Browser aufrufen Gateway-Client

ICF-Knoten

Status	ICF-Knoten	Beschreibung
○○○	SDATA	Kompatibilitätsmodus für SP 02
○○■	ODATA	

Systemalias hinzufügen Systemalias entfernen Customizing Service-Implementierung

Systemalias

SAP-Systemalias	Benutzerrolle
LOCAL	local alias

Add/Activate Service

■ Detailview

Service anzeigen

Service-Informationen

Name des technischen Service	ZOD_EMPLOYEE_MSC_SRV
Serviceversion	1
Beschreibung	test odata service for ztt_employee_msc
Name des externen Service	ZOD_EMPLOYEE_MSC_SRV
Namensraum	
Data-Provider-Klasse	ZCL_ZOD_EMPLOYEE_MSC_DPC_EXT
Angelegt von	DEV-000
Geändert von	
Paket	ZP_2018_MSC

Modellinformationen

Name des technischen Modells	ZOD_EMPLOYEE_MSC_MDL
Modellversion	1
Beschreibung	test odata service for ztt_employee_msc
Modell-Provider-Klasse	ZCL_ZOD_EMPLOYEE_MSC_MPC_EXT
Angelegt von	DEV-000
Geändert von	
Paket	ZP_2018_MSC

Test Service

■ Gateway Client (as in a Webbrowser)

SAP NetWeaver Gateway Client

Ausführen Auswählen Service verwalten Serviceimplementierung EntitySets

HTTP-Meth. ☒ GET ☐ POST ☐ PUT ☐ PATCH ☐ MERGE ☐ DELETE

Request-URI URI-Opt. hinz.

Protok. ☒ HTTP ☐ HTTPS Testgruppe Testfall

Antwort in Browser Fehlerprotokoll HTTP-Header Als Anf. verwenden Daten-Explorer

HTTP-Request

Header-Name	Wert
Content-Type	application/atom+xml;type=entry; charset=utf-8
X-CSRF-Token	-HZ1WNtnWwZBYw2ytdcMCg==

HTTP-Response

Header-Name	Wert
~status_code	200
~status_reason	OK
~server_protocol	HTTP/1.0
set-cookie	SAP_SESSIONID_G12_200=ezt7BCnsGsRkLwDUPG9y5rM6h79VGRHopAsAUFadXF...
content-type	application/atom+xml;type=feed; charset=utf-8
content-length	8142
dataserviceversion	2.0
sap-metadata-last-modified	Fri, 11 May 2018 12:36:19 GMT
~remote_addr	
uri_scheme	https

```
<?xml version="1.0"?>
- <feed xmlns="http://www.w3.org/2005/Atom"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xml:base="http://vlhsapg12.hevs.ch:8012/sap/opu/odata/sap/ZOD_EMPLOYEE_MS"
  <id>http://vlhsapg12.hevs.ch:8012/sap/opu/odata/sap/ZOD_EMPLOYEE_MS
  <title type="text">ZTT_EMPLOYEE_MSCSet</title>
  <updated>2018-05-11T12:49:10Z</updated>
- <author>
  <name/>
</author>
<link title="ZTT_EMPLOYEE_MSCSet" rel="self"
  href="EmployeeSalaryBarBar" />
```

Functionimport

- Additional functionality to change/prepare data

The screenshot shows the SAP Data Model Explorer for the project 'ZOD_EMPLOYEE_MSC'. The tree structure is as follows:

- ✓ ZOD_EMPLOYEE_MSC
 - ✓ Data Model
 - Entitätstypen
 - Assoziationen
 - Entitätsmengen
 - ✓ Funktionsimporte
 - EmployeesSalaryPerDay
 - ✓ Funktionsimportparameter
 - DaysPerMonth

The main table displays the details for the 'EmployeesSalaryPerDay' function import:

Name	Rückgabeart	Rückgabeart	Rückgabekardin.	Rückgabeentit...	HTTP	Aktion für Entit...	Bezeichner	B...
EmployeesSalar...	Entitätstyp	ZTT_EMPLOYE...	0..n	ZTT_EMPLOYE...	GET			T

The screenshot shows the SAP Data Model Explorer for the project 'ZOD_EMPLOYEE_MSC'. The tree structure is as follows:

- ✓ ZOD_EMPLOYEE_MSC
 - ✓ Data Model
 - Entitätstypen
 - Assoziationen
 - Entitätsmengen
 - ✓ Funktionsimporte
 - EmployeesSalaryPerDay
 - ✓ Funktionsimportparameter
 - DaysPerMonth

The main table displays the details for the 'DaysPerMonth' data element:

Name	UDM-Kerntyp	Datenelement	Gen...	Skali...	Max...	Semantik	Einheitsreferenzpa...	Bezeichner	B...
DaysPerMonth	Edm.Decimal		0	0	0				T