Week 2 Unit 6:
Working with OData Services

SAP

open**SAP**
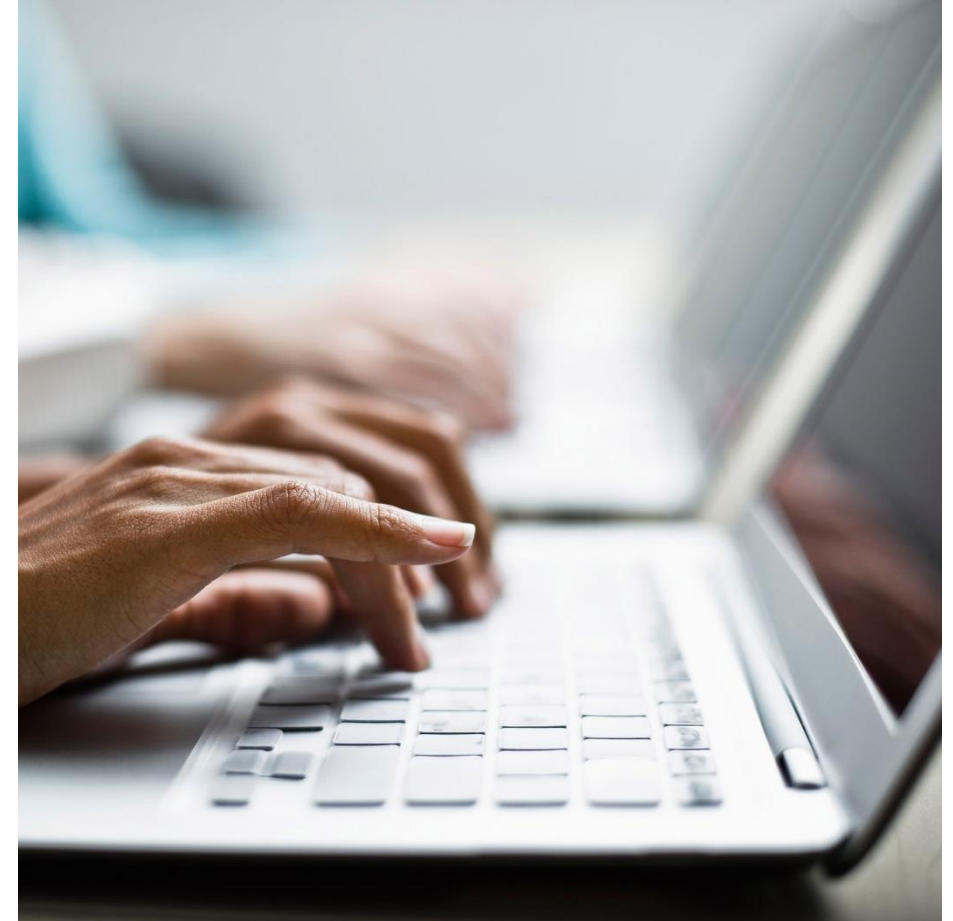
Working with OData Services
OData – Open Data Protocol

An **open protocol** to allow the creation and consumption of **queryable** and **interoperable** **RESTful APIs**

- Enables provision of data services based on REST principles

- Contains a complete description of the feeds, types, properties, and relationships exposed by the service in EDM (service metadata)

- Defines data formats representing resources like collections, entries, and properties

Documentation at odata.org

Working with OData Services
Entity types and OData types

Entity Type

Key

OData Type

Property

Navigation Property

Annotations

```
<EntityType Name="Product" sap:content-version="1">
  <Key>
    <PropertyRef Name="ProductID"/>
  </Key>
  <Property  Name="Name" Type="Edm.String" Nullable="false" MaxLength="80"
             sap:label="Product Name" sap:creatable="false" sap:filterable="false"/>
  <Property  Name="Description" Type="Edm.String" Nullable="false" MaxLength="12"
             sap:label="Prod.Descrip." sap:creatable="false" sap:filterable="false"/>
  <Property  Name="Price" Type="Edm.String" Nullable="false" MaxLength="40"
             sap:label="Price" sap:creatable="false" sap:filterable="false"/>
  <Property  Name="WeightMeasure" Type="Edm.String" Nullable="false" MaxLength="40"
             sap:label="WeightMeasure name" sap:creatable="false" sap:filterable="false"/>
  <NavigationProperty Name="ToSupplier" Relationship="/IWBEP/GWSAMPLE_BASIC.
             Assoc_BusinessPartner_Products"
             FromRole="ToRole_Assoc_BusinessPartner_Products"
             ToRole="FromRole_Assoc_BusinessPartner_Products"/>
</EntityType>
```

Working with OData Services
URI structure and data access and query options

OData	URI	Results
Service Document	`<service_root_url>`	Collection of entity sets, e.g. a list of available tables in a service
EDMX	`/$metadata`	Definitions of the schema, like entity type, property type, associations, navigations
Entity Set	`/<entityset>`	All entities of an entity set, e.g. all rows of a table
Entity	`/<entityset>(<key>=<value>,<key>=<value>)`	Entity of an entity set, based on key fields
Property	`/<entityset>(<key>=<value>,<key>=<value>)/<property>`	Property of the entity, e.g. a field of a row

- The content of an OData service can be accessed directly in the browser

- You can browse entities, entity sets, and properties via URI

GWSAMPLE_BASIC service on system ES4 (requires login)

Working with OData Services
OData simple query language

https://sapes4.sapdevcenter.com/sap/opu/odata/IWBEP/GWSAMPLE_BASIC/Entity?<query parameters>

Service Root URI	Resource path	Query options

- The names of all query string parameters defined by OData are prefixed with a $ character

Operation	Query Option	SQL Equivalent	Out-of-the-Box Support
Filtering	`$filter`	Where clause	Aggregation filter
Projecting	`$select`	Field selection	On demand usage
Sorting	`$orderby`	Sort	Aggregation sort
Paging	`$top`	Up to .. rows	sap.m.List growing
	`$skip`	-	sap.m.List growing
Inlining	`$expand`	Innerjoin	On demand usage
Count	`$count`	Count(..)	Aggregation binding
	`$inlinecount`	-	On demand usage

List of (most important) Query options: http://www.odata.org/developers/protocols/uri-conventions#QueryStringOptions

Working with OData Services
OData debugging tool for SAP NetWeaver OData services

- URL parameter:
  sap-ds-debug=true

- Can be used to analyze and explore your service

- Provides additional information on queries, performance, and the back end itself

ProductSet entity on GWSAMPLE_BASIC (requires login)

Body   Request   Response   Server   URI   Runtime

<feed xmlns="http://www.w3.org/2005/Atom" xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata" xmlns:d="http://schemas.micro
xml:base="https://SAPES4.SAPDEVCENTER.COM:443/sap/opu/odata/IWBEP/GWSAMPLE_BASIC/">
  <id>https://SAPES4.SAPDEVCENTER.COM:443/sap/opu/odata/IWBEP/GWSAMPLE_BASIC/ProductSet</id>
  <title type="text">ProductSet</title>
  <updated>2016-02-17T13:57:42Z</updated>
 - <author>
    <name/>
  </author>
  <link href="ProductSet" rel="self" title="ProductSet"/>
 - <entry m:etag="W/"datetime'2016-02-16T22%3A30%3A51.0000000'"">
    <id>https://SAPES4.SAPDEVCENTER.COM:443/sap/opu/odata/IWBEP/GWSAMPLE_BASIC/ProductSet('HT-1000')</id>
    <title type="text">ProductSet('HT-1000')</title>
    <updated>2016-02-17T13:57:42Z</updated>
    <category term="/IWBEP/GWSAMPLE_BASIC.Product" scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme"/>
    <link href="ProductSet('HT-1000')" rel="edit" title="Product"/>
    <link href="ProductSet('HT-1000')/ToSalesOrderLineItems" rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ToSalesOrderLin
    <link href="ProductSet('HT-1000')/ToSupplier" rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ToSupplier" type="applicat
   - <content type="application/xml">
     - <m:properties xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata" xmlns:d="http://schemas.microsoft.com/ado/2007/08/
        <d:ProductID>HT-1000</d:ProductID>
        <d:TypeCode>PR</d:TypeCode>
        <d:Category>Notebooks</d:Category>
        <d:Name>Notebook Basic 15</d:Name>
        <d:NameLanguage>EN</d:NameLanguage>
        <d:Description>Notebook Basic 15 with 2,80 GHz quad core, 15" LCD, 4 GB DDR3 RAM, 500 GB Hard Disc, Windows 8 Pro</d:Description>
        <d:DescriptionLanguage>EN</d:DescriptionLanguage>
        <d:SupplierID>0100000000</d:SupplierID>
        <d:SupplierName>SAP</d:SupplierName>
        <d:TaxTarifCode>1</d:TaxTarifCode>
        <d:MeasureUnit>EA</d:MeasureUnit>
        <d:WeightMeasure>4.200</d:WeightMeasure>
        <d:WeightUnit>KG</d:WeightUnit>
        <d:CurrencyCode>EUR</d:CurrencyCode>

Thank you

Contact information:

open@sap.com

openSAP

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