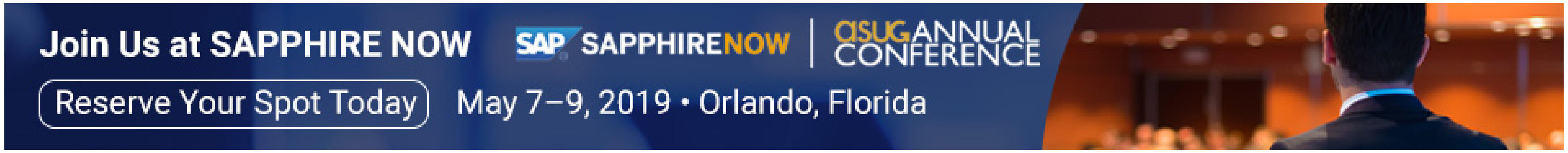
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Article

OData Service and SAP Fiori: A Step-by-Step Tutorial to Building a Custom UI5 Application Using MM Data

by Lukas Dietzsch, CEO, Blackvard Management Consulting, LLC

February 1, 2016

This integrated example of how to build an SAP Fiori application provides a step-by-step approach for how to transfer SAP materials management data onto a mobile device. This real-world business case, which is similar to any user's Open Data Protocol (OData) service request, illustrates the entire process: covering the app creation, required services, publishing, and the app deployment.

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This following example of how to build an SAP Fiori application (using an SAPUI5/HTML5 user interface) is based on a realmobile solution is required in order to obtain the information for each picker, without the use of a paper-based loading/inventory list.

The above request is the starting point for this article, which provides all the information required to create a working application.

Obtaining access to time-critical materials management (MM) information, such as real-time inventory information, goods received, and goods issued, helps you to manage business processes. I show how to develop an SAP Fiori application that retrieves MM master data from the SAP Gateway back-end system. You then can display the data as a material list on the screen within the SAP Fiori application. The user can search for a specific material based on the material description. This mobile approach shows new opportunities for using your MM data.

In my example of this process, I focus on an easy-to-understand example containing MM information such as material data with a description.

SAP Gateway provides the ability to create an Open Data Protocol (OData) service that exposes information from one, or many, systems to the outside world. The underlying system can either be an SAP system (such as SAP ERP/SAP Customer Relationship Management [CRM], SAP ERP Central Component [ECC]), or a non-SAP system.

The SAP Fiori application is based on standard protocols: OData and SAPUI5. OData is an open-standard protocol for exchanging (querying and updating) data over the web, using standard protocols (HTTP, XML, or Simple Object Access Protocol [SOAP]). It provides a web-based application programming interface (API) that fully complies with the design principles of Representational State Transfer (REST). The application information can be retrieved via JavaScript Object Notation (JSON) or XML.

In the SAP Gateway system, complete the following steps:

- Create and generate the OData Model
- Implement the OData service
- Publish and test the service. Afterwards, the SAP Fiori application that uses this new SAP Gateway Service is created.

Figure 1 is a process overview of the SAP Fiori sample application.

Basis & SAP Administration: Case study: Practical lessons from thyssenkrupp's implementation and rollout of SAP Fiori transactional apps

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SAP Basis and Administration Collection

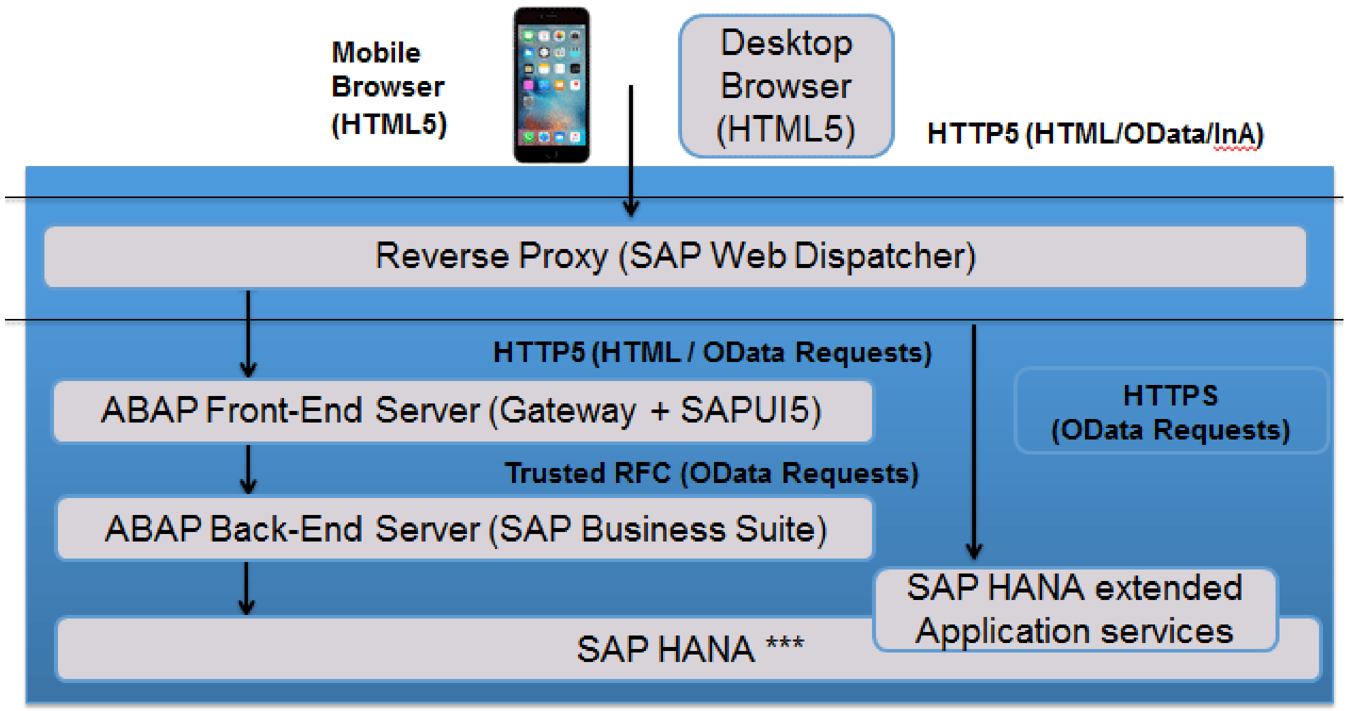
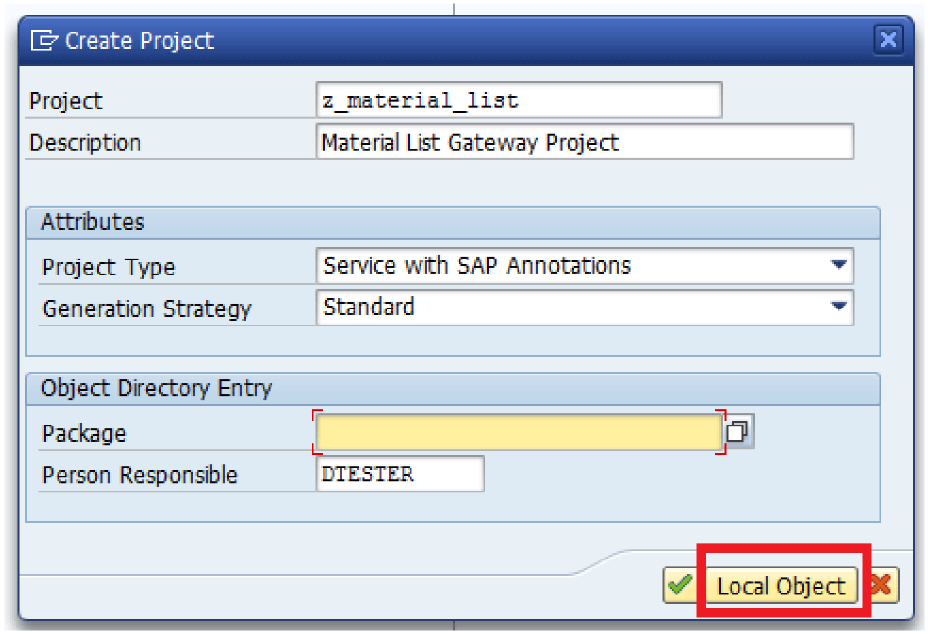

Mobile Browser (HTML5)
Desktop Browser (HTML5)
HTTP5 (HTML/OData/InA)
Reverse Proxy (SAP Web Dispatcher)
HTTP5 (HTML / OData Requests)
ABAP Front-End Server (Gateway + SAPUI5)
HTTPS (OData Requests)
Trusted RFC (OData Requests)
ABAP Back-End Server (SAP Business Suite)
SAP HANA extended Application services
SAP HANA ***

Figure 1
Process overview of an SAP Fiori sample application

Note that in **Figure 1**, InA stands for the Info Access—InA—toolkit for HTML5. The InA toolkit is a set of HTML5 templates and user interface (UI) controls that can be used to configure a modern, highly interactive UI that runs in a browser. The technical prerequisites for this process are Eclipse Luna, SAP Gateway, the SAP ERP MM module, and SAP Fiori.

Developing the Gateway Service

To develop the SAP Gateway Service, log on to the SAP back-end system. Start transaction code SEGW (the SAP Gateway Service Builder) and then click the create project icon 🗋 to begin creating a new project. Once you click the create project icon, the Create Project pop-up in **Figure 2** appears.


Create Project

Project	z_material_list
Description	Material List Gateway Project

Attributes

Project Type	Service with SAP Annotations
Generation Strategy	Standard

Object Directory Entry

Package	
Person Responsible	DTESTER

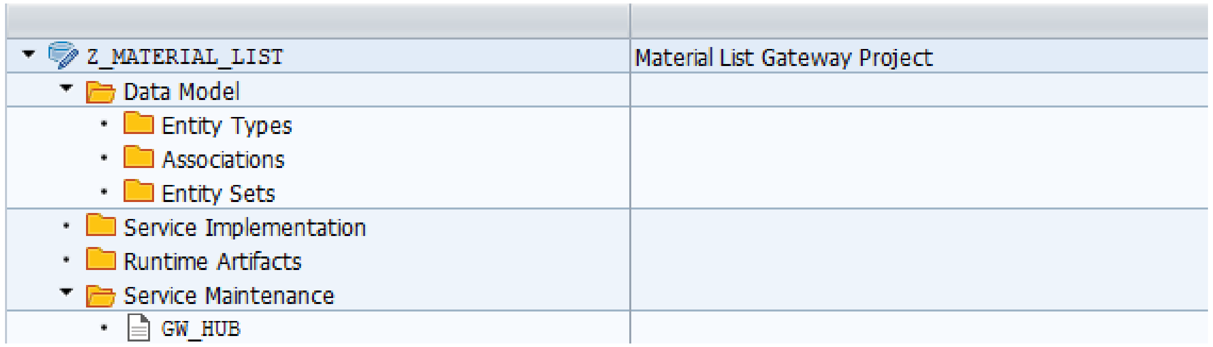
Figure 2
The Create Project pop-up window

Assign your project a Project name and Description. In the example, the name is z_material_list. Neither the Project Type nor the Generation Strategy has to be changed here. Stick to the standard approach in this example.

You can select the Local Object button or assign your project to a transport package. In my example, I create a local object. Local objects are not transported into other systems. If your SAP landscape consists of multiple SAP systems and instances, you have to select a transport package to move your developments to the connected systems—but here I keep it simple, using it just locally.

In **Figure 2** the user can enter the project details such as the Project name, Description, Attributes details, and Object Directory Entry details. Click the Local Object button to store it as a local object. In some systems, you could select a dedicated package to store it in a different location – but for this sample, simply store it locally.

Once you click the Local Object button, the screen in **Figure 3** opens. It displays the project structure that is created, called Z_MATERIAL_LIST.

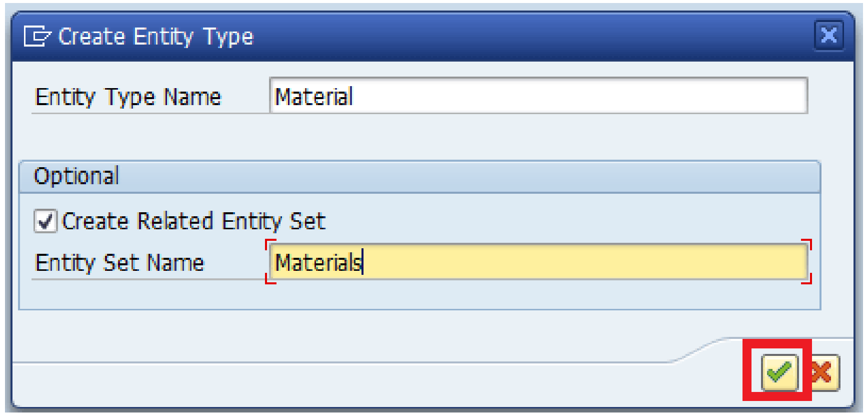


- Z_MATERIAL_LIST — Material List Gateway Project
  - Data Model
    - Entity Types
    - Associations
    - Entity Sets
  - Service Implementation
  - Runtime Artifacts
  - Service Maintenance
    - GW_HUB

Figure 3
The Z_MATERIAL_LIST project structure

Now create a new entity type. Entity types are physical or abstract objects that represent a specific type of data—for example, an item or a concept that can be distinguished from other informational objects. Entities are divided into entity types according to their properties. Each entity type must be assigned attributes, describing them. The properties of entities are described by values for the attributes.

Right-click the Entity Types folder and then select the Create option to go to **Figure 4**. Keeping it simple, my sample Gateway Model contains one single new entity type for the material.



Create Entity Type

Entity Type Name	Material

Optional

[✓] Create Related Entity Set

Entity Set Name	Materials

Figure 4
The Create Entity Type pop-up window

Assign an Entity Type Name (Material) and Entity Set Name (Materials) in the Create Entity Type pop-up window. Entity sets group together instances of an entity type with instances of any type, derived from a particular entity type. Entity types describe a data structure and entity sets contain the instances of that structure. In my example, the Entity Set Name Materials represents all the material data retrieved from the database. In more complex use cases, there can be multiple entities.

Ensure the Create Related Entity Set option is selected. Click the green checkmark icon ✓ to proceed to the

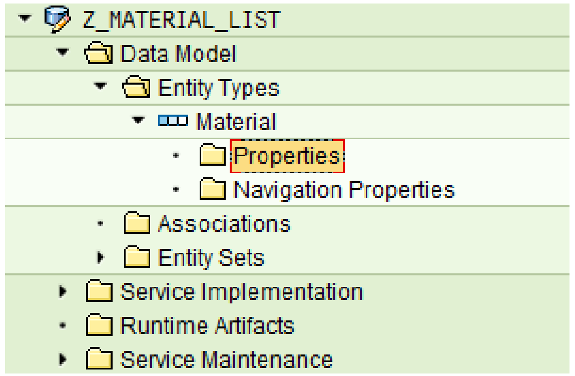


Figure 5
Properties folder in the Z_MATERIAL_LIST project menu path

Expand the structure under the newly created Material entity. Then double-click the Properties folder of the Material entity. This opens the screen on the right, shown in **Figure 6**.

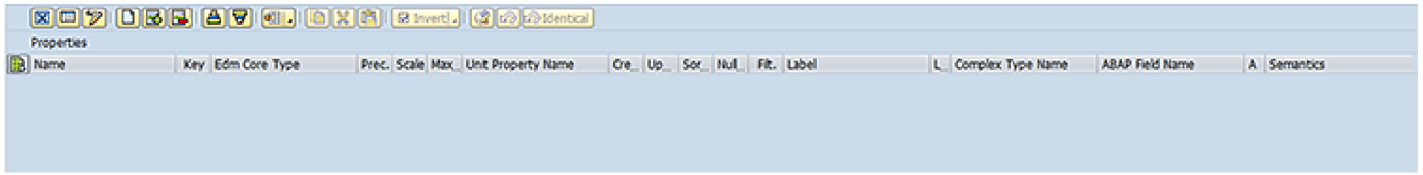


Figure 6
Empty entity properties overview

The appropriate properties/fields must be added to the Material entity. Begin adding the properties/fields data (featured in **Table 1**) to the Entity Type by clicking the create icon seen in the ribbon in **Figure 6**. After all the entries are completed according to **Table 1**, **Figure 6** should look like **Figure 7** (**Figure 6** with values).

Expose (SAPUI5) name	**ABAP field name**	**Field type maximum length**
MaterialNumber	MATNR	18
MaterialDescription	MAKTX	40
MaterialType	MTBEZ	25
MaterialGroup	WGBEZ	20

Table 1 Mapping information

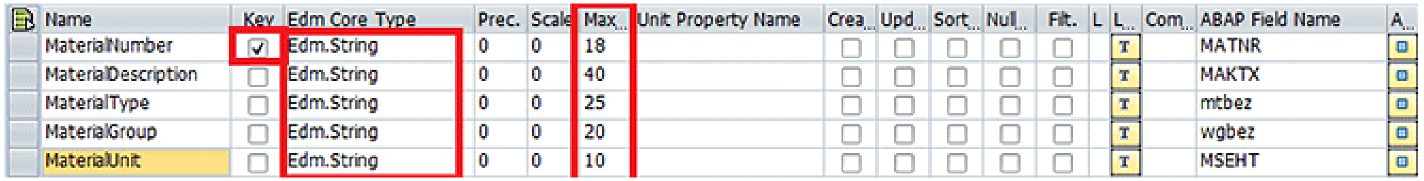
Table 1 displays the properties/fields data criteria for the Expose (SAPUI5) name, ABAP field name, and Field type maximum length. The OData Core Types specify the Entity Data Model (EDM) type allowed in OData for this property at run time. The OData Organization defines so-called primitive data types. Every member of this organization sticks to this required standard for data exchange. Their definition can be found at http://www.odata.org/documentation/odata-version-2-0/overview/.

You must provide the mapping information from the SAPUI5 property with the internal SAP data types and fields (**Table 1**). MaterialNumber is the key for this entity. Ensure that these entries all have the type Edm.String, which is a required prefix, according to the Odata.org definition.

The Expose (SAPUI5) Name is the field name for the outside world (e.g., the SAPUI5 application). The ABAP field name is used when implementing the OData service. All fields are of the type string, so it's important to give the fields a maximum length. The maximum length can be found in the underlying tables. The details of the underlying tables and their column specifications can be found using transaction code SE11 or SE16N.

In my example, I am using the table MARA (MaterialNumber/Type Code/Group Code/Unit Code) and the tables MAKT (MaterialDescription), T134T (Material Type Description), T023T (Material Group Description), and T006A (Unit Description).

After adding each of the properties lines from **Table 1**, the fields shown in **Figure 7** are displayed. In this case, all values derived from the OData service were of the data string type originally. Therefore, provide the name according to **Table** 1, and insert Edm.String in the Edm Core Type field. Then provide the length of the data type (according to **Table 1**) and, finally, map the SAP data field for each line added.



Name	Key	Edm Core Type	Prec.	Scale	Max...	Unit Property Name	Crea...	Upd...	Sort...	Nul...	Flt.	L	L...	Com...	ABAP Field Name	A...
MaterialNumber	✓	Edm.String	0	0	18		☐	☐	☐	☐	☐		T		MATNR	▣
MaterialDescription	☐	Edm.String	0	0	40		☐	☐	☐	☐	☐		T		MAKTX	▣
MaterialType	☐	Edm.String	0	0	25		☐	☐	☐	☐	☐		T		mtbez	▣
MaterialGroup	☐	Edm.String	0	0	20		☐	☐	☐	☐	☐		T		wgbez	▣
MaterialUnit	☐	Edm.String	0	0	10		☐	☐	☐	☐	☐		T		MSEHT	▣

Figure 7
Filled in MaterialNumber, MaterialDescription, MaterialType, MaterialGroup, and MaterialUnit properties' fields

Sample:

Step 1: In the Name column, MaterialNumber is the key field; this has to be marked with a checkmark in the Key column, as seen in **Figure 7**.

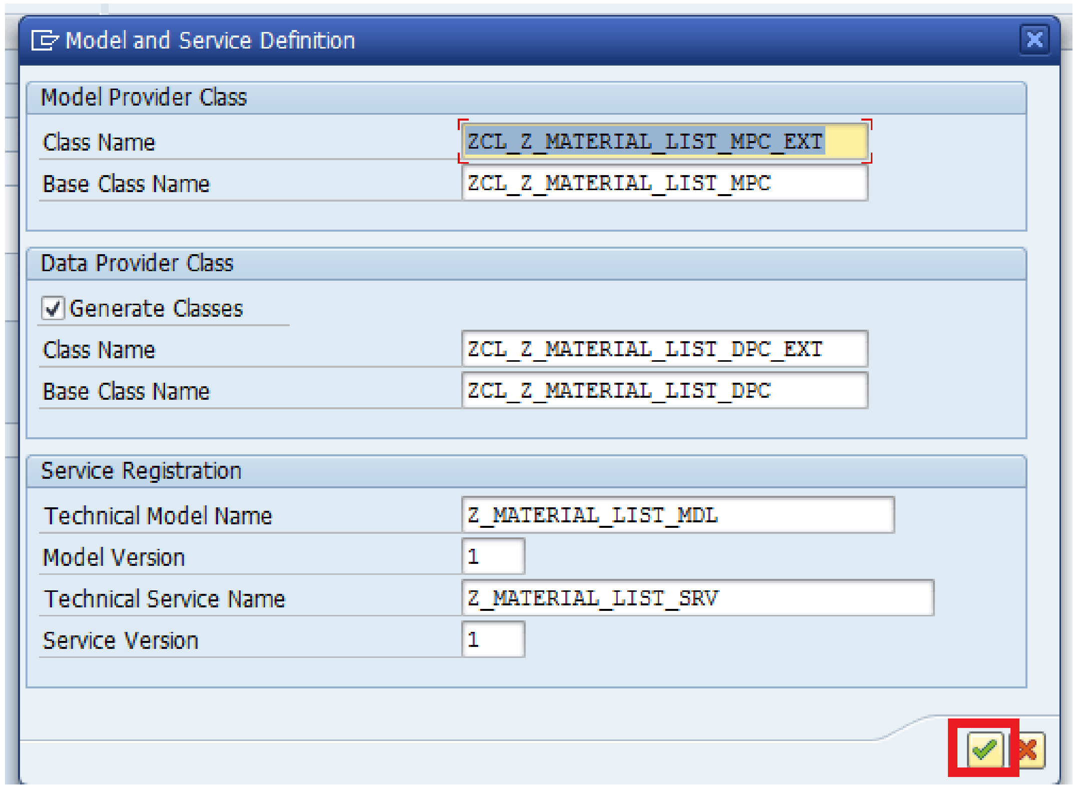
Step 2: In column Edm Core Type, enter the type Edm.String, and provide its length of 18 signs.

Step 3: Map the new OData field with its column in the SAP table. In the case of MaterialNumber, the matching SAP table column is MATNR— this has to be mapped in the same line found in the ABAP Field Name column.

Repeat these three steps for each field/column the service provides (MaterialNumber, MaterialDescription, MaterialType, Again, ensure that all the fields are of type Edm.String. It is important to fill the Max… column with the maximum allowed characters for each field. **Figure 7** displays the properties' fields, now containing the specified properties for MaterialNumber, MaterialDescription, MaterialType, MaterialGroup, and MaterialUnit.

Click the save icon (not shown). The SAP Gateway Model is complete. If you edit the entity (such as adding new fields, or renaming or updating the type) ensure that you regenerate the model again.

In the screen that opens after you click the save icon (not shown), click the generate run-time objects icon . The pop-up window shown in **Figure 8** appears. It depicts the Model and Service Definition pop-up window, containing the Model Provider Class, Data Provider Class, and Service Registration details.



Model and Service Definition

Model Provider Class

Class Name	ZCL_Z_MATERIAL_LIST_MPC_EXT
Base Class Name	ZCL_Z_MATERIAL_LIST_MPC

Data Provider Class

☑ Generate Classes

Class Name	ZCL_Z_MATERIAL_LIST_DPC_EXT
Base Class Name	ZCL_Z_MATERIAL_LIST_DPC

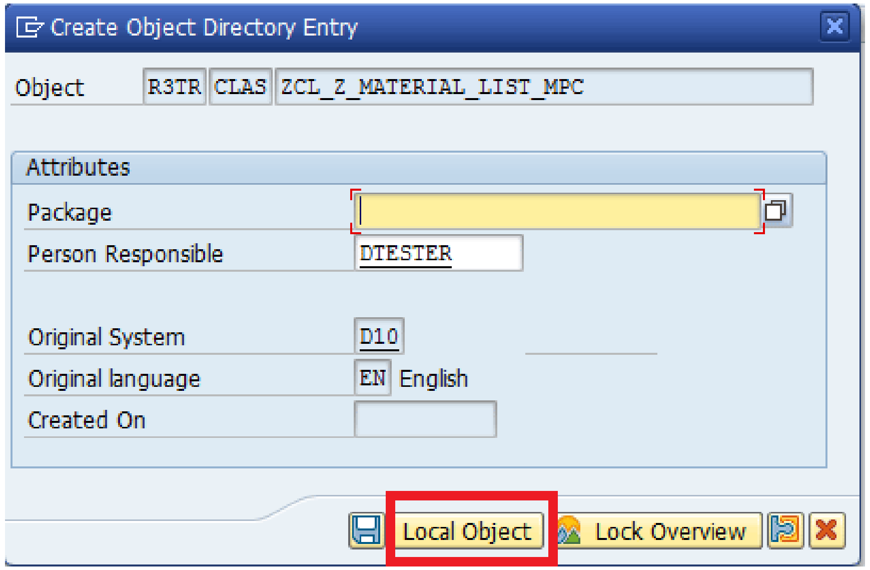
Service Registration

Technical Model Name	Z_MATERIAL_LIST_MDL
Model Version	1
Technical Service Name	Z_MATERIAL_LIST_SRV
Service Version	1

Figure 8
The Model and Service Definition pop-up

Leave the suggested names as they are, although you can edit them if required. Classes ZCL_Z_MATERIAL_LIST_MPC and ZCL_Z_MATERIAL_LIST_MPC_EXT are model provider classes. Classes ZCL_Z_MATERIAL_LIST_DPC and ZCL_Z_MATERIAL_LIST_DPC_EXT are data provider classes. Most work for the implementation is done by redefining the methods in class ZCL_Z_MATERIAL_LIST_DPC_EXT (the methods can be found in the generated data provider class

Click the green checkmark icon and the Create Object Directory Entry pop-up appears (**Figure 9**). It contains the Object attributes, where the object can be saved as a local object or assigned to a package. Save the object by clicking the Local Object button.


Create Object Directory Entry

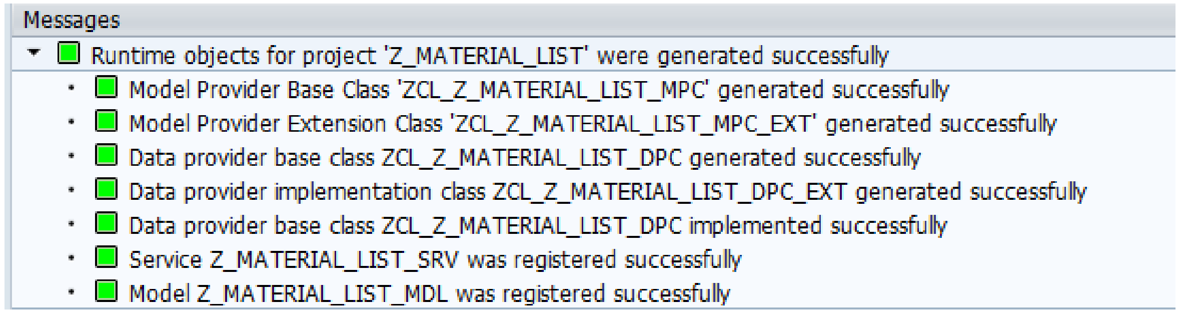
Object	R3TR	CLAS	ZCL_Z_MATERIAL_LIST_MPC

Attributes

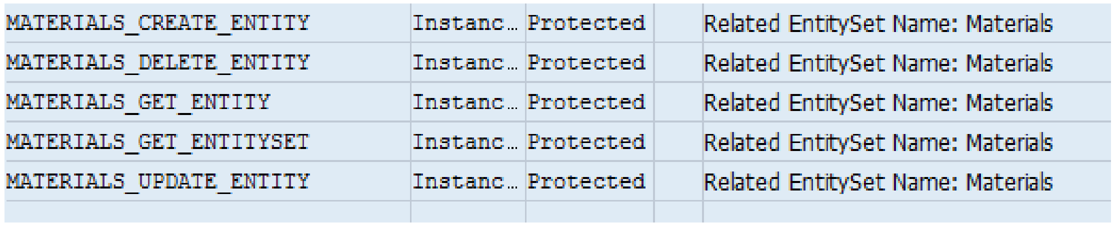
Package	
Person Responsible	DTESTER
Original System	D10
Original language	EN English
Created On	

Figure 9
Save the object as a local object

Figure 10 displays the generated system messages that appear.


```
Messages
▾ 🟩 Runtime objects for project 'Z_MATERIAL_LIST' were generated successfully
    • 🟩 Model Provider Base Class 'ZCL_Z_MATERIAL_LIST_MPC' generated successfully
    • 🟩 Model Provider Extension Class 'ZCL_Z_MATERIAL_LIST_MPC_EXT' generated successfully
    • 🟩 Data provider base class ZCL_Z_MATERIAL_LIST_DPC generated successfully
    • 🟩 Data provider implementation class ZCL_Z_MATERIAL_LIST_DPC_EXT generated successfully
    • 🟩 Data provider base class ZCL_Z_MATERIAL_LIST_DPC implemented successfully
    • 🟩 Service Z_MATERIAL_LIST_SRV was registered successfully
    • 🟩 Model Z_MATERIAL_LIST_MDL was registered successfully
```
Figure 10
Generated system messages

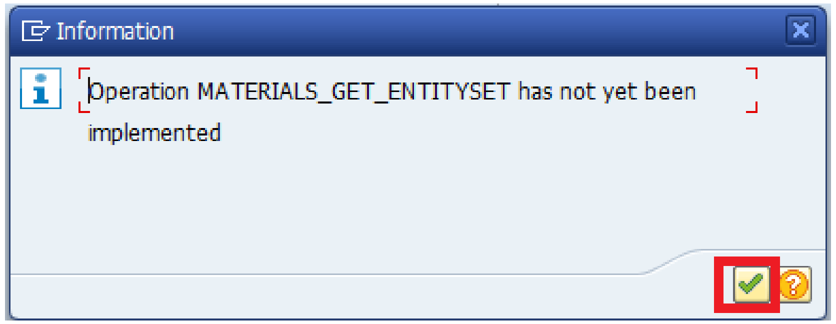
For each defined Entity Type of the OData model, a number of standard entity methods are generated. For example, **Figure 11** displays the standard entity methods for the Material Entity.



MATERIALS_CREATE_ENTITY	Instanc…	Protected		Related EntitySet Name: Materials
MATERIALS_DELETE_ENTITY	Instanc…	Protected		Related EntitySet Name: Materials
MATERIALS_GET_ENTITY	Instanc…	Protected		Related EntitySet Name: Materials
MATERIALS_GET_ENTITYSET	Instanc…	Protected		Related EntitySet Name: Materials
MATERIALS_UPDATE_ENTITY	Instanc…	Protected		Related EntitySet Name: Materials

Figure 11
Material Entity standard entity methods

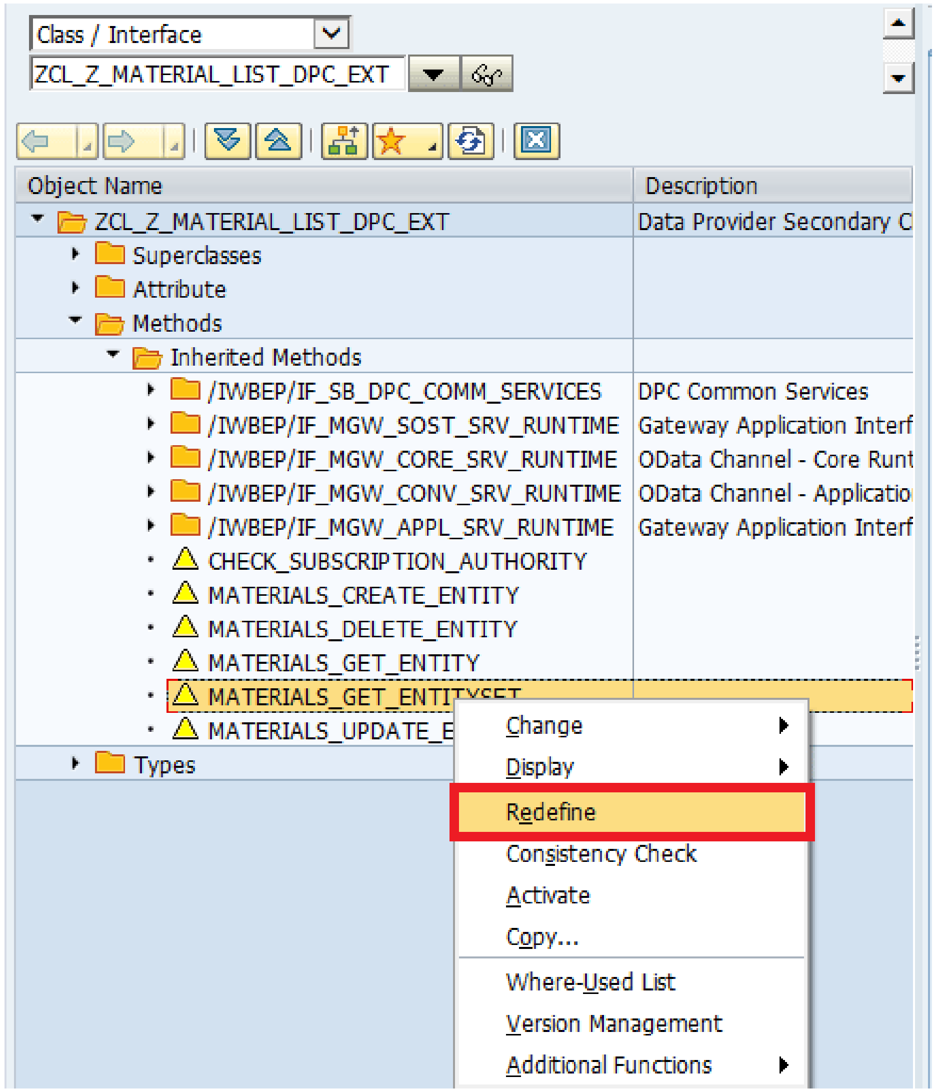
Now implement the necessary methods for the application. Go to Service Implementation > Materials > GetEntitySet (Query) and right-click GetEntitySet (Query). From the context-menu options that open select Go to ABAP Workbench, and the Information pop-up window shown in **Figure 12** opens.



Operation MATERIALS_GET_ENTITYSET has not yet been implemented

Figure 12
The Information pop-up window

This pop-up window notifies the user that the MATERIALS_GET_ENTITYSET operation has not yet been implemented. For each entity type of the OData model, a number of methods are generated. The GetEntitySet method is the automatically generated query method for obtaining a material set. Click the green checkmark icon in **Figure 12** and the Inherited Methods folder in **Figure 13** appears.



Object Name	Description
ZCL_Z_MATERIAL_LIST_DPC_EXT	Data Provider Secondary C
Superclasses	
Attribute	
Methods	
Inherited Methods	
/IWBEP/IF_SB_DPC_COMM_SERVICES	DPC Common Services
/IWBEP/IF_MGW_SOST_SRV_RUNTIME	Gateway Application Interf
/IWBEP/IF_MGW_CORE_SRV_RUNTIME	OData Channel - Core Runt
/IWBEP/IF_MGW_CONV_SRV_RUNTIME	OData Channel - Applicatio
/IWBEP/IF_MGW_APPL_SRV_RUNTIME	Gateway Application Interf
CHECK_SUBSCRIPTION_AUTHORITY	
MATERIALS_CREATE_ENTITY	
MATERIALS_DELETE_ENTITY	
MATERIALS_GET_ENTITY	
MATERIALS_GET_ENTITYSET	
MATERIALS_UPDATE_E	
Types	

Figure 13
The MATERIALS_GET_ENTITYSET Redefine option

Now select and redefine the MATERIALS_GET_ENTITYSET inherited method. To do this, right-click the method name (MATERIALS_GET_ENTITYSET) and select the Redefine option. The method MATERIALS_GET_ENTITYSET is the query method for retrieving a set of materials (this is required to generate the list of materials). After the redefinition, the methods are saved automatically.

Registering the Gateway Service

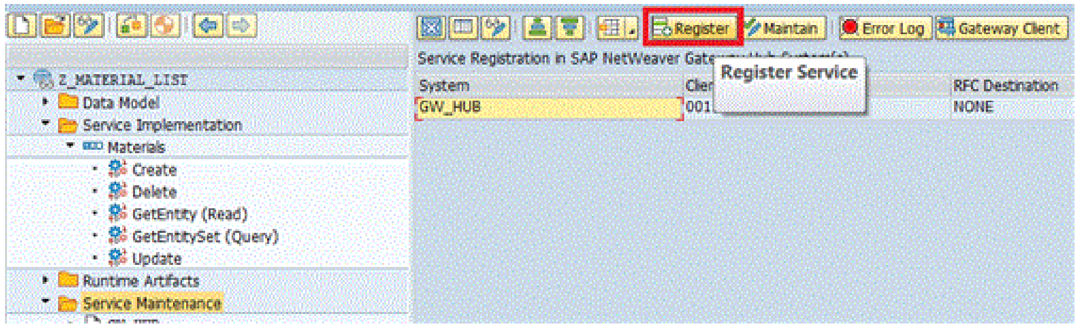
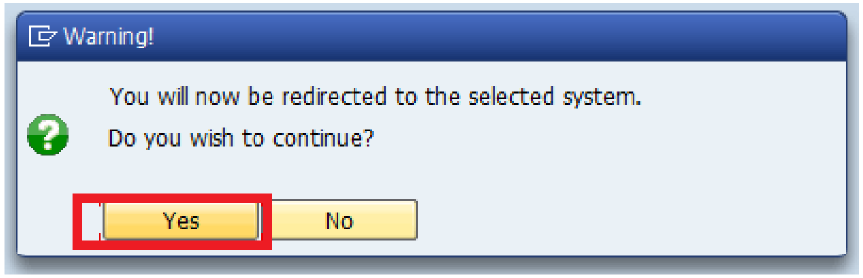


Figure 14
Register the service

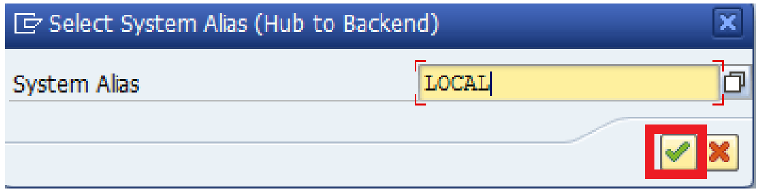
Figure 15 displays an SAP system warning pop-up. This Warning! notifies users that they are about to be redirected to the selected system. Click the Yes button in the pop-up to proceed to the Select System Alias (Hub to Backend) screen in **Figure 16**.


Warning!

You will now be redirected to the selected system.

Do you wish to continue?

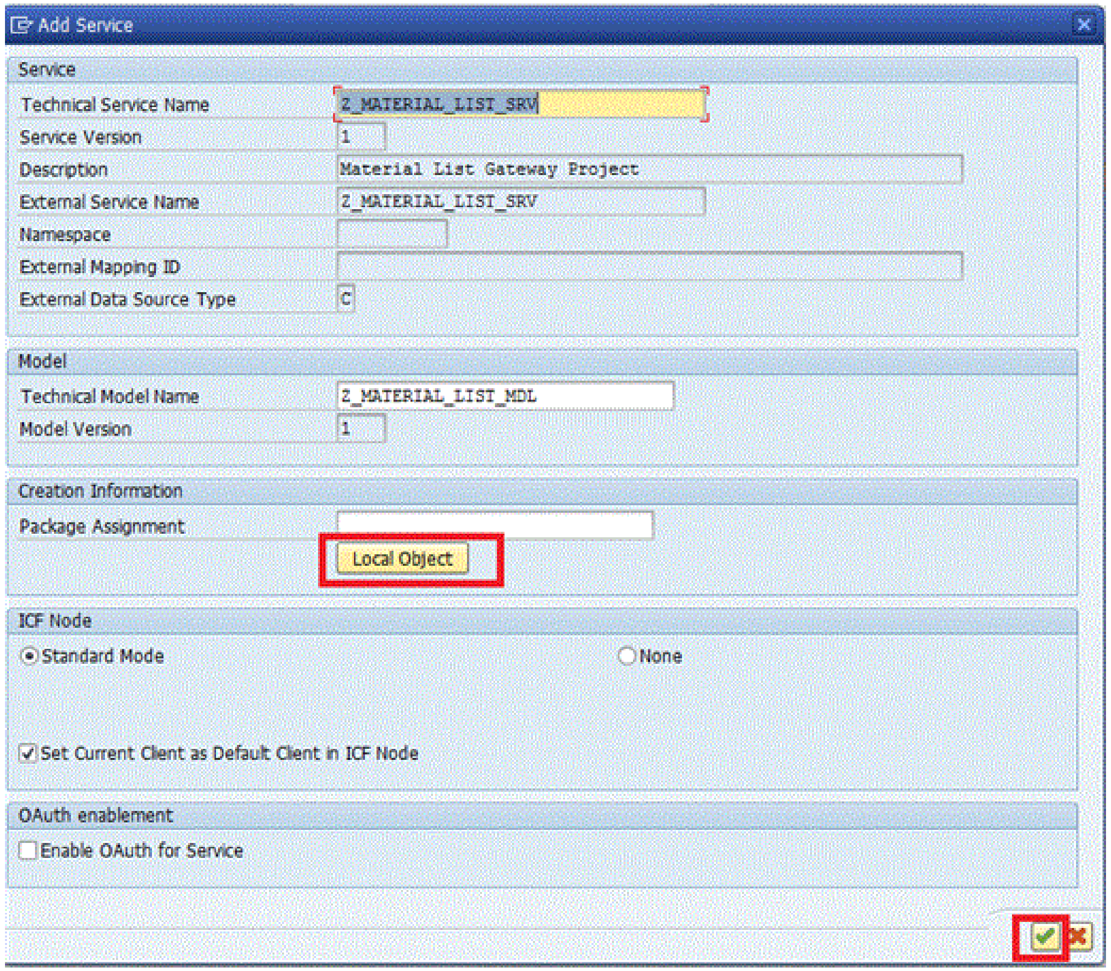
Figure 15
SAP system warning


Select System Alias (Hub to Backend)

System Alias: LOCAL

Figure 16
Select the System Alias in the pop-up window

Choose the LOCAL system alias option as shown in **Figure 16** and then click the green checkmark icon to proceed to the Add Service screen in **Figure 17**. The system alias can be local or another alias depending on the SAP Gateway installation.


Add Service

Service

Technical Service Name	Z_MATERIAL_LIST_SRV
Service Version	1
Description	Material List Gateway Project
External Service Name	Z_MATERIAL_LIST_SRV
Namespace	
External Mapping ID	
External Data Source Type	C

Model

Technical Model Name	Z_MATERIAL_LIST_MDL
Model Version	1

Creation Information

Package Assignment	

ICF Node

● Standard Mode ○ None

☑ Set Current Client as Default Client in ICF Node

OAuth enablement

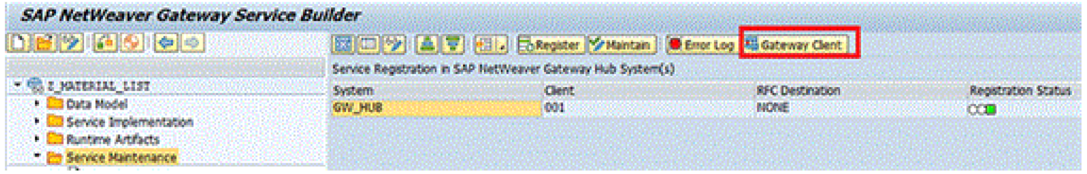
☐ Enable OAuth for Service

Figure 17
Add Service pop-up window

The user can select the Local Object option, Service details, Model details, Creation Information details, ICF Node details, and OAuth enablement details in the Add Service pop-up. Enter the service details pertinent to your project and then click the Local Object button. Click the green checkmark icon to proceed and finish the registration process.

Testing the Gateway Service

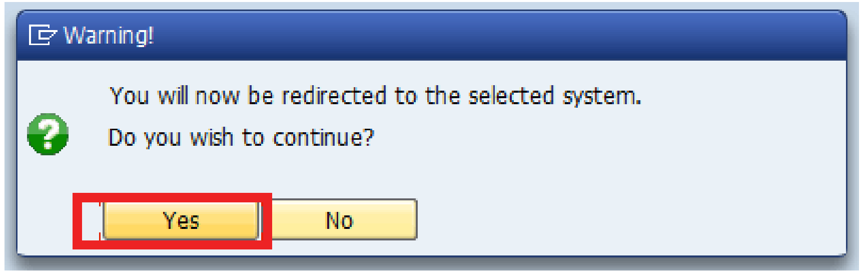
After successfully registering the service, a green traffic light appears in the Registration Status field (**Figure 18**). Now test the service using the Gateway Client. Therefore mark the service and click the Gateway Client button in the toolbar. A warning pop-up window appears (**Figure 19**).



Service Registration in SAP NetWeaver Gateway Hub System(s)

System	Client	RFC Destination	Registration Status
GW_HUB	001	NONE	🟩

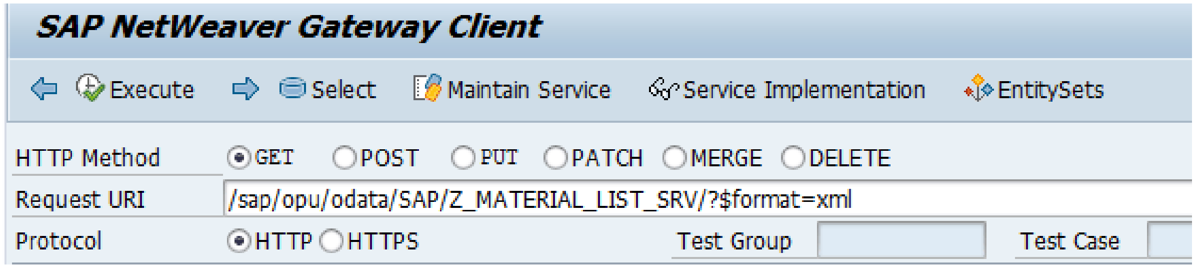
Figure 18
Click the Gateway Client button



You will now be redirected to the selected system.
Do you wish to continue?

Figure 19
The redirect warning pop-up window

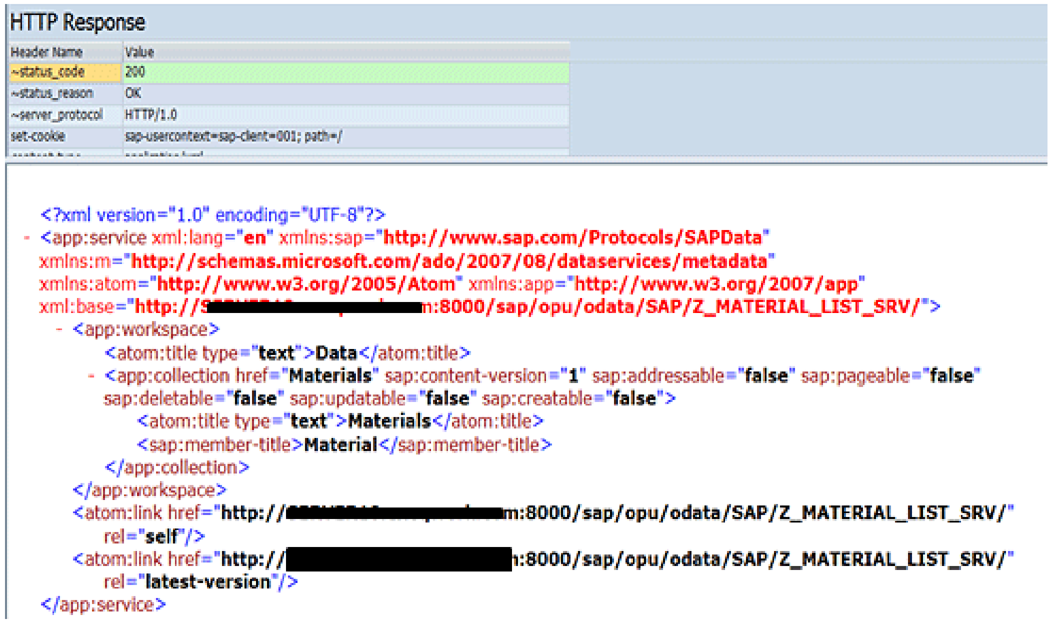
Click the Yes button in the Warning! pop-up window and the SAP NetWeaver Gateway Client screen appears (**Figure 20**) displaying the current Request URI details. Click the Execute button.



HTTP Method	[✓ GET] POST PUT PATCH MERGE DELETE
Request URI	/sap/opu/odata/SAP/Z_MATERIAL_LIST_SRV/?$format=xml
Protocol	[✓ HTTP] HTTPS
Test Group	
Test Case	

Figure 20
SAP NetWeaver Gateway Client screen and Request URI details

The HTTP Response screen is presented with a sample of the generated HTTP response (**Figure 21**). The response is in Atom/XML format.



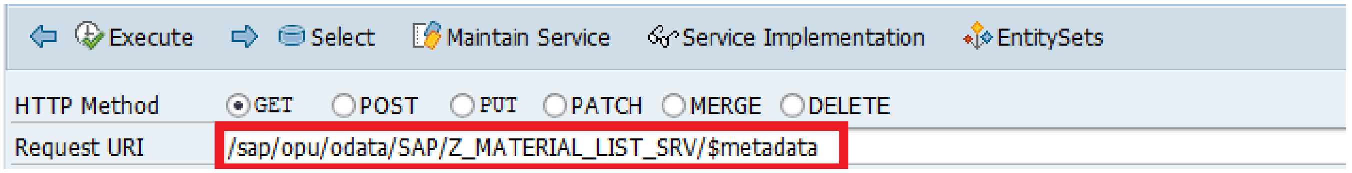
HTTP Response

Header Name	Value
~status_code	200
~status_reason	OK
~server_protocol	HTTP/1.0
set-cookie	sap-usercontext=sap-client=001; path=/

```
  <?xml version="1.0" encoding="UTF-8"?>
- <app:service xml:lang="en" xmlns:sap="http://www.sap.com/Protocols/SAPData"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns:atom="http://www.w3.org/2005/Atom" xmlns:app="http://www.w3.org/2007/app"
  xml:base="http://[redacted]m:8000/sap/opu/odata/SAP/Z_MATERIAL_LIST_SRV/">
  - <app:workspace>
      <atom:title type="text">Data</atom:title>
    - <app:collection href="Materials" sap:content-version="1" sap:addressable="false" sap:pageable="false"
      sap:deletable="false" sap:updatable="false" sap:creatable="false">
        <atom:title type="text">Materials</atom:title>
        <sap:member-title>Material</sap:member-title>
      </app:collection>
    </app:workspace>
    <atom:link href="http://[redacted]m:8000/sap/opu/odata/SAP/Z_MATERIAL_LIST_SRV/"
      rel="self"/>
    <atom:link href="http://[redacted]:8000/sap/opu/odata/SAP/Z_MATERIAL_LIST_SRV/"
      rel="latest-version"/>
  </app:service>
```

Figure 21
The generated HTTP response

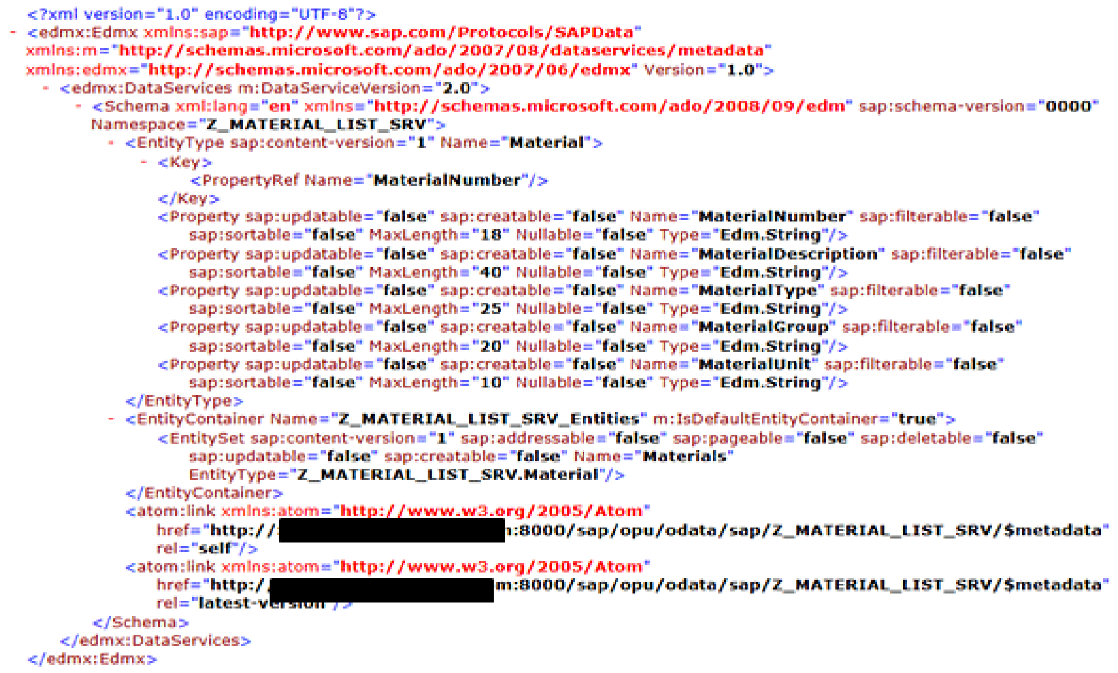
Modify the Request URI to create the structure of the OData service (e.g., change the code suffix from ?$format=xml to $metadata). OData metadata is only available in XML format, not JSON. **Figure 22** shows the full Request URI, containing the required $metadata suffix.



HTTP Method	[✓ GET] POST PUT PATCH MERGE DELETE
Request URI	/sap/opu/odata/SAP/Z_MATERIAL_LIST_SRV/$metadata

Figure 22
Edited Request URI, displaying the $metadata suffix

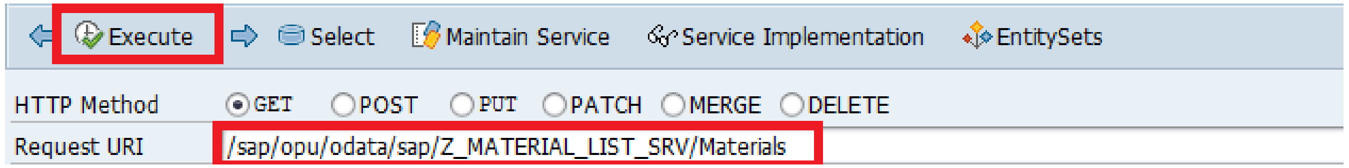
Click the Execute button and the response is presented on the right side of the screen. **Figure 23** shows an example of the newly generated HTTP response.



```
  <?xml version="1.0" encoding="UTF-8"?>
- <edmx:Edmx xmlns:sap="http://www.sap.com/Protocols/SAPData"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns:edmx="http://schemas.microsoft.com/ado/2007/06/edmx" Version="1.0">
  - <edmx:DataServices m:DataServiceVersion="2.0">
    - <Schema xml:lang="en" xmlns="http://schemas.microsoft.com/ado/2008/09/edm" sap:schema-version="0000"
      Namespace="Z_MATERIAL_LIST_SRV">
      - <EntityType sap:content-version="1" Name="Material">
        - <Key>
            <PropertyRef Name="MaterialNumber"/>
          </Key>
          <Property sap:updatable="false" sap:creatable="false" Name="MaterialNumber" sap:filterable="false"
            sap:sortable="false" MaxLength="18" Nullable="false" Type="Edm.String"/>
          <Property sap:updatable="false" sap:creatable="false" Name="MaterialDescription" sap:filterable="false"
            sap:sortable="false" MaxLength="40" Nullable="false" Type="Edm.String"/>
          <Property sap:updatable="false" sap:creatable="false" Name="MaterialType" sap:filterable="false"
            sap:sortable="false" MaxLength="25" Nullable="false" Type="Edm.String"/>
          <Property sap:updatable="false" sap:creatable="false" Name="MaterialGroup" sap:filterable="false"
            sap:sortable="false" MaxLength="20" Nullable="false" Type="Edm.String"/>
          <Property sap:updatable="false" sap:creatable="false" Name="MaterialUnit" sap:filterable="false"
            sap:sortable="false" MaxLength="10" Nullable="false" Type="Edm.String"/>
        </EntityType>
      - <EntityContainer Name="Z_MATERIAL_LIST_SRV_Entities" m:IsDefaultEntityContainer="true">
          <EntitySet sap:content-version="1" sap:addressable="false" sap:pageable="false" sap:deletable="false"
            sap:updatable="false" sap:creatable="false" Name="Materials"
            EntityType="Z_MATERIAL_LIST_SRV.Material"/>
        </EntityContainer>
        <atom:link xmlns:atom="http://www.w3.org/2005/Atom"
          href="http://[redacted]:8000/sap/opu/odata/sap/Z_MATERIAL_LIST_SRV/$metadata"
          rel="self"/>
        <atom:link xmlns:atom="http://www.w3.org/2005/Atom"
          href="http:/[redacted]m:8000/sap/opu/odata/sap/Z_MATERIAL_LIST_SRV/$metadata"
          rel="latest-[redacted]
      </Schema>
    </edmx:DataServices>
  </edmx:Edmx>
```

Figure 23
The generated HTTP response

To retrieve the materials, change the suffix of the Request URI to Materials. Click the Execute button. **Figure 24** depicts the new Materials suffix in the Request URI field.

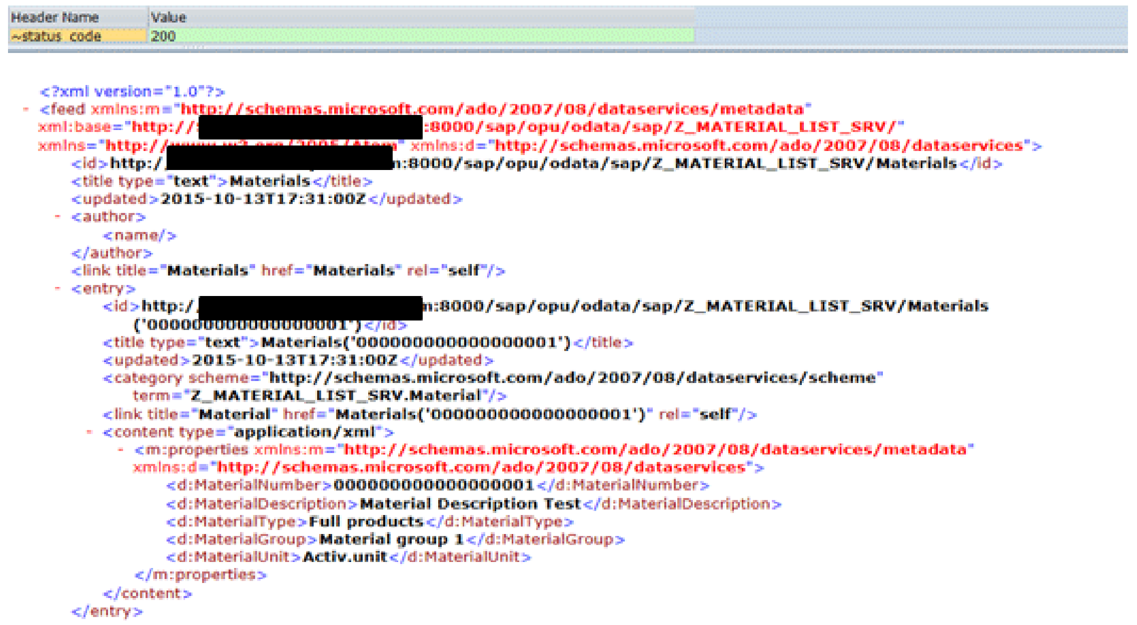


HTTP Method [✓ GET] POST PUT PATCH MERGE DELETE

Request URI /sap/opu/odata/sap/Z_MATERIAL_LIST_SRV/Materials

Figure 24
New Request URI, with a new suffix

Figure 25 shows part of the HTTP response that is presented on the right side of the screen. Each entity represents a material.

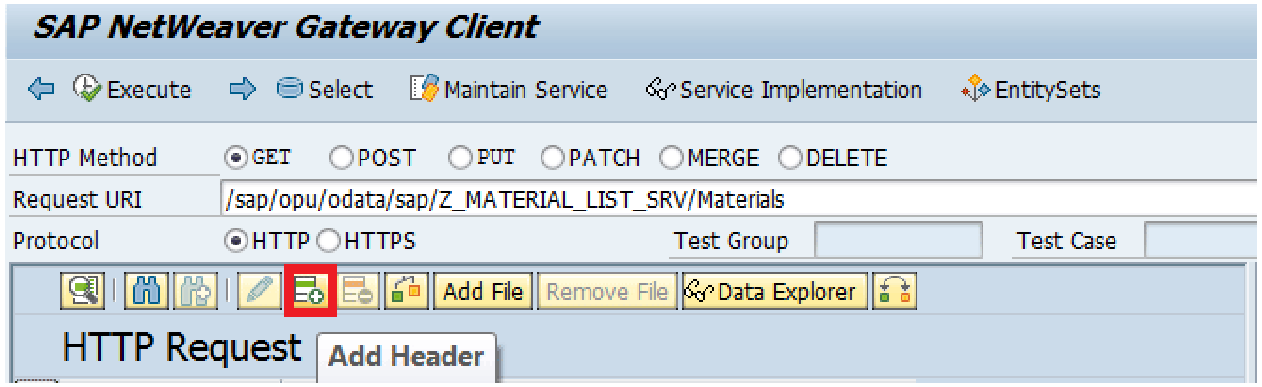


Header Name	Value
~status_code	200

```
  <?xml version="1.0"?>
- <feed xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xml:base="http://[redacted]:8000/sap/opu/odata/sap/Z_MATERIAL_LIST_SRV/"
  xmlns="http://[redacted]" xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices">
    <id>http:/[redacted]n:8000/sap/opu/odata/sap/Z_MATERIAL_LIST_SRV/Materials</id>
    <title type="text">Materials</title>
    <updated>2015-10-13T17:31:00Z</updated>
  - <author>
      <name/>
    </author>
    <link title="Materials" href="Materials" rel="self"/>
  - <entry>
      <id>http:/[redacted]n:8000/sap/opu/odata/sap/Z_MATERIAL_LIST_SRV/Materials
        ('000000000000000001')</id>
      <title type="text">Materials('000000000000000001')</title>
      <updated>2015-10-13T17:31:00Z</updated>
      <category scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme"
        term="Z_MATERIAL_LIST_SRV.Material"/>
      <link title="Material" href="Materials('000000000000000001')" rel="self"/>
    - <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/dataservices">
          <d:MaterialNumber>000000000000000001</d:MaterialNumber>
          <d:MaterialDescription>Material Description Test</d:MaterialDescription>
          <d:MaterialType>Full products</d:MaterialType>
          <d:MaterialGroup>Material group 1</d:MaterialGroup>
          <d:MaterialUnit>Activ.unit</d:MaterialUnit>
        </m:properties>
      </content>
    </entry>
```

Figure 25
The generated HTTP response

The last HTTP response displayed in **Figure 25** is in XML format. Change the format of the response to JSON format, which is an open-standard format and is lightweight and easier to read. To do that, click the add header icon in the SAP NetWeaver Gateway Client screen (**Figure 26**).

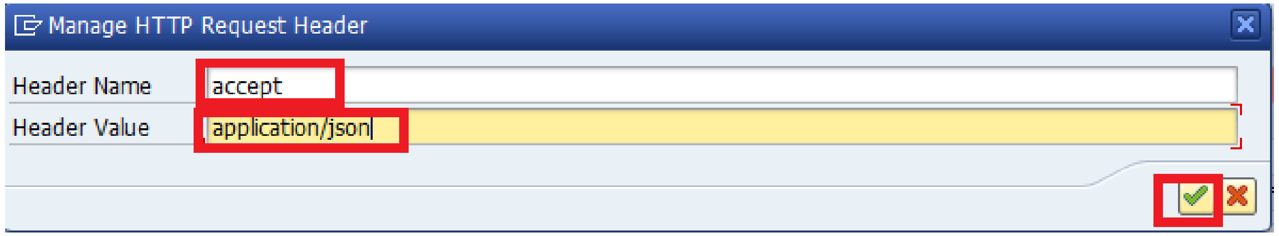


HTTP Method [✓ GET] POST PUT PATCH MERGE DELETE
Request URI /sap/opu/odata/sap/Z_MATERIAL_LIST_SRV/Materials
Protocol [✓ HTTP] HTTPS Test Group Test Case

Figure 26
Change the format of the response from XML to JSON

Header Name: accept

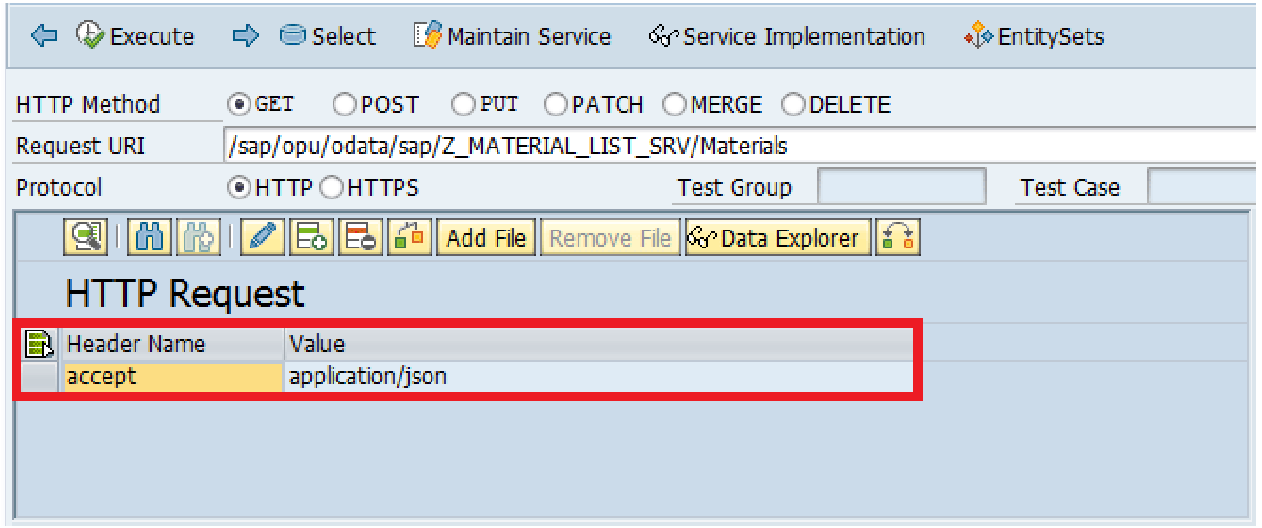
Header Value: application/json


Manage HTTP Request Header

Header Name	accept
Header Value	application/json

Figure 27
The Manage HTTP Request Header pop-up window

Click the green checkmark icon and the new HTTP Request is added. **Figure 28** shows an example of the new HTTP Request Header Name and Value.



HTTP Method (● GET ○ POST ○ PUT ○ PATCH ○ MERGE ○ DELETE)

Request URI /sap/opu/odata/sap/Z_MATERIAL_LIST_SRV/Materials

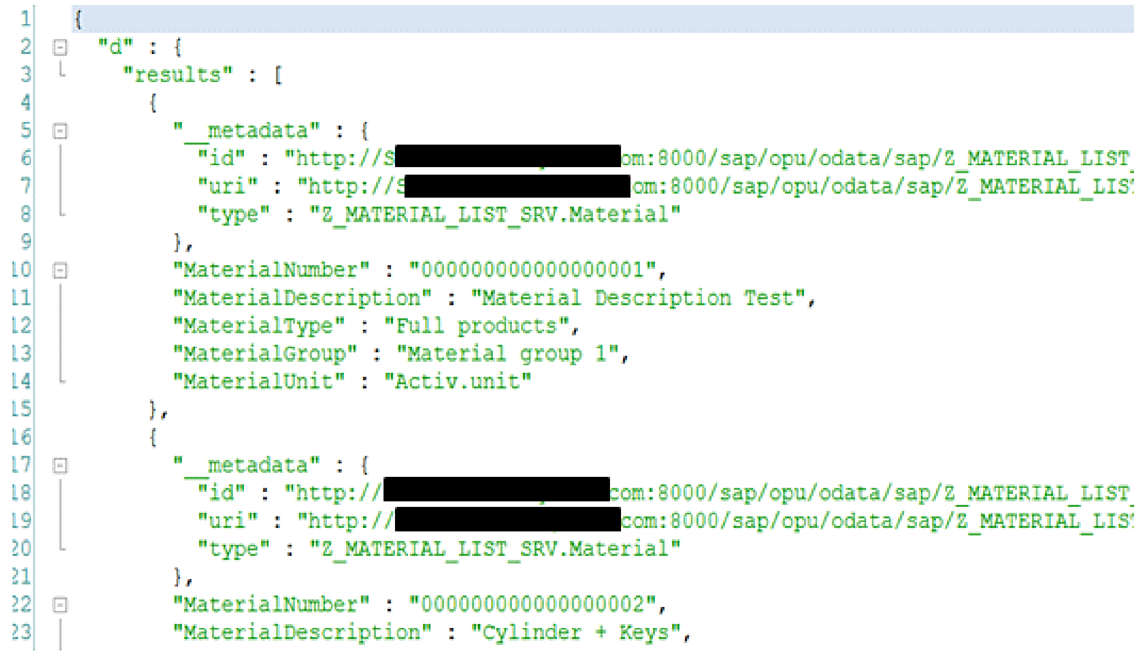
Protocol (● HTTP ○ HTTPS) Test Group Test Case

HTTP Request

Header Name	Value
accept	application/json

Figure 28
The new HTTP request header

Click the Execute button. **Figure 29** is a sample section of the response that is presented on the screen. This is the response of retrieving materials in JSON format.



```
{
  "d" : {
    "results" : [
      {
        "__metadata" : {
          "id" : "http://s[redacted]om:8000/sap/opu/odata/sap/Z_MATERIAL_LIST_
          "uri" : "http://s[redacted]om:8000/sap/opu/odata/sap/Z_MATERIAL_LIS
          "type" : "Z_MATERIAL_LIST_SRV.Material"
        },
        "MaterialNumber" : "000000000000000001",
        "MaterialDescription" : "Material Description Test",
        "MaterialType" : "Full products",
        "MaterialGroup" : "Material group 1",
        "MaterialUnit" : "Activ.unit"
      },
      {
        "__metadata" : {
          "id" : "http://[redacted]com:8000/sap/opu/odata/sap/Z_MATERIAL_LIST_
          "uri" : "http://[redacted]com:8000/sap/opu/odata/sap/Z_MATERIAL_LIS
          "type" : "Z_MATERIAL_LIST_SRV.Material"
        },
        "MaterialNumber" : "000000000000000002",
        "MaterialDescription" : "Cylinder + Keys",
```

Figure 29
Response of retrieving materials in JSON format

The OData Service is working properly.

Building the SAPUI5 Application

To build the SAPUI5 application, open the SAP HANA Development Eclipse system. Follow menu path File > New > Other… and the Eclipse wizard appears (**Figure 30**).

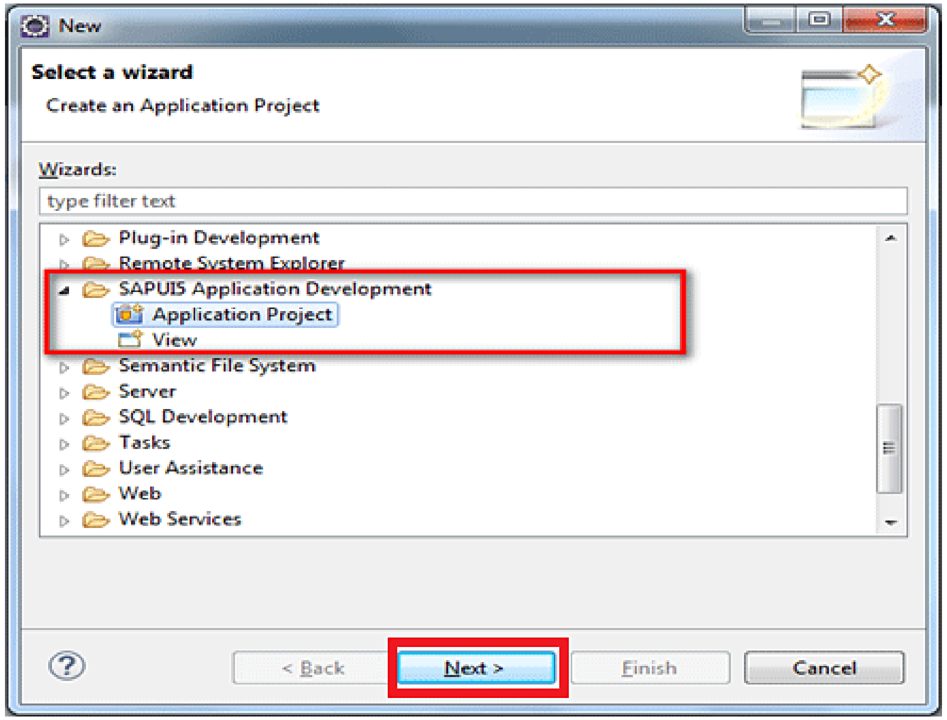
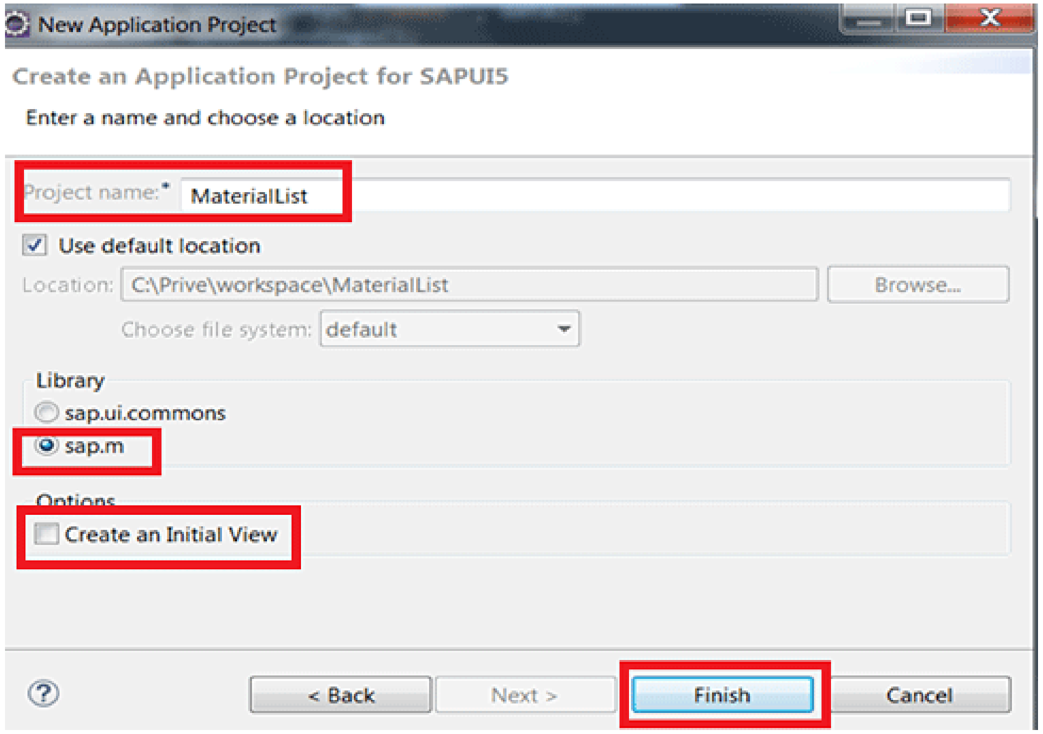


Figure 30
SAPUI5 Application Development Application Project option

Scroll down the wizard's screen to locate the Application Project under the SAPUI5 Application Development folder. Select the Application Project folder and click the Next button. The New Application Project screen appears (**Figure 31**).


New Application Project

Create an Application Project for SAPUI5

Enter a name and choose a location

Project name:* MaterialList

[✓] Use default location

Location: C:\Prive\workspace\MaterialList

Choose file system: default

Library

sap.ui.commons [✓ sap.m]

Options

[ ] Create an Initial View

Figure 31
Open the New Application Project pop-up window

Figure 31 displays the Create an Application Project for SAPUI5 Library options. Give the project a name; in this case, MaterialList. The UI Library radio-button option sap.m, currently the leading library for SAPUI5 mobile application development, is selected by default. The Library sap.ui.commons option can be used for standard controls. In my mobile example here, I leave the sap.m option selected.

Uncheck the Create an Initial View check box and click the Finish button. The sap.m library becomes the main library of SAPUI5 (responsive library). The MaterialList project structure shown in **Figure 32** is generated in the project structure of Eclipse.

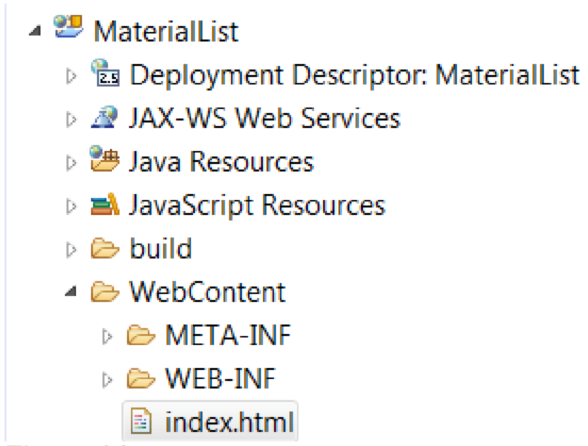


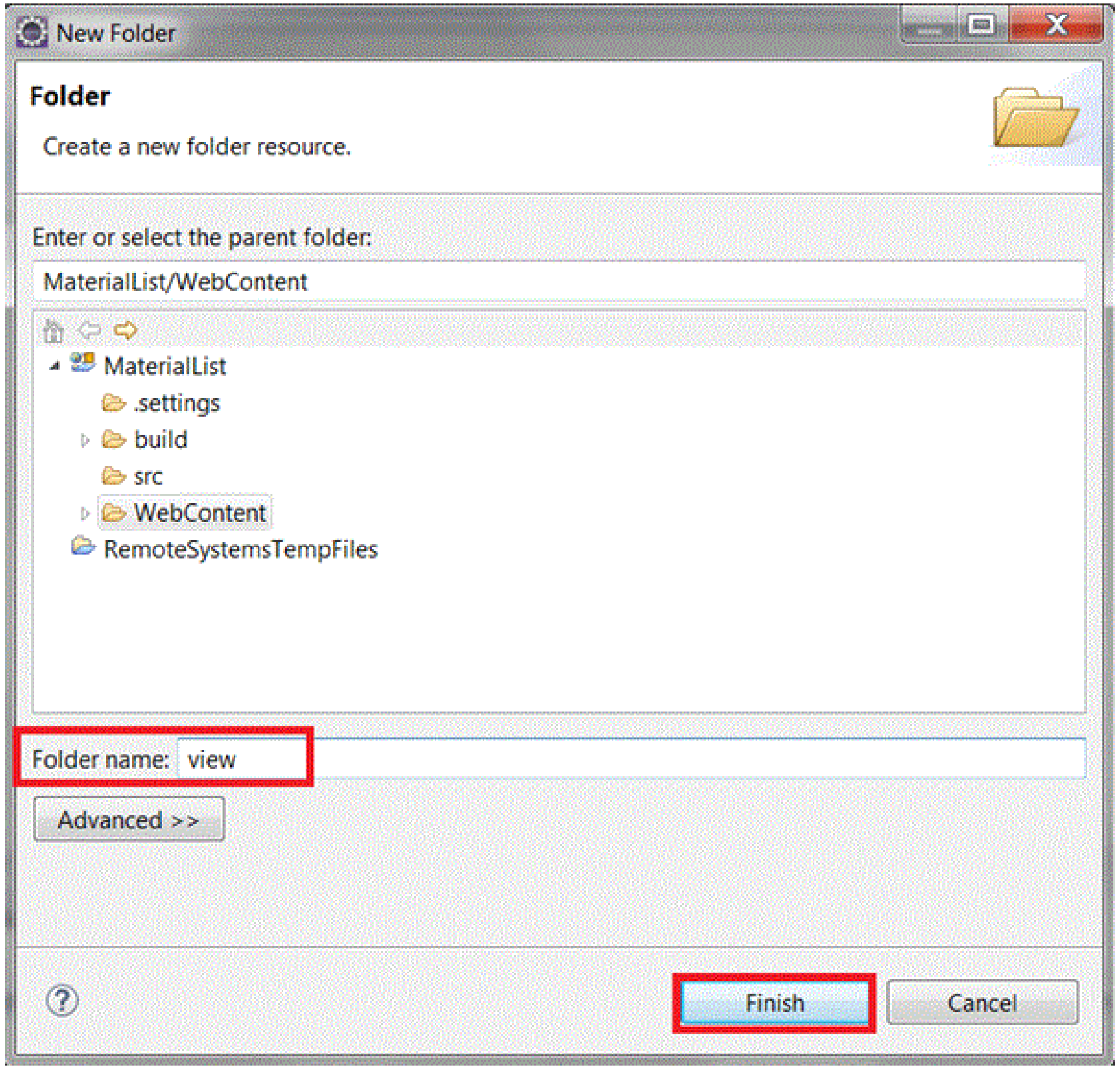
Figure 32
MaterialList project structure is generated

In this article, I am structuring all the required development in the folder WebContent. Depending on your project or team structure, multiple folders or a folder hierarchy could be useful. **Figure 32** displays the simple MaterialList project structure, found under the WebContent folder.

To provide the project with an efficient structure, create two new folders under the WebContent folder:

1. The view folder, to contain all views and controllers.
2. The i18n folder, to contain translatable texts to be used on the views.

First, create the first view folder. Right-click the WebContent folder and follow menu path New > Folder. This opens the New Folder pop-up window (**Figure 33**). Give the new folder the Folder name view. The view folder later contains all views and controllers. The application to be built is based on the Model View Controller (MVC) paradigm. Click the Finish button and the new view folder appears under the WebContent folder.


New Folder

Folder

Create a new folder resource.

Enter or select the parent folder:

MaterialList/WebContent

Folder name: view

Figure 33
Create the new view folder

Under the MaterialList project structure, repeat the same process for the new folder i18n. The i18n (short for internationalization) folder contains (translatable) texts files.

After you create the two new folders, the project structure is displayed. **Figure 34** shows the new WebContent MaterialList menu path, containing the new i18n and view folders.

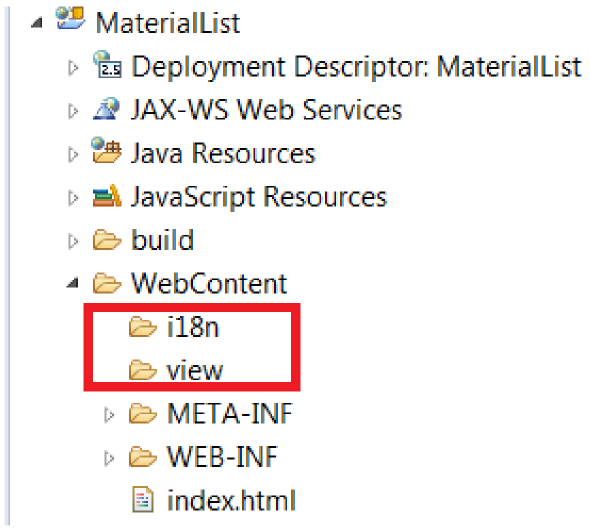
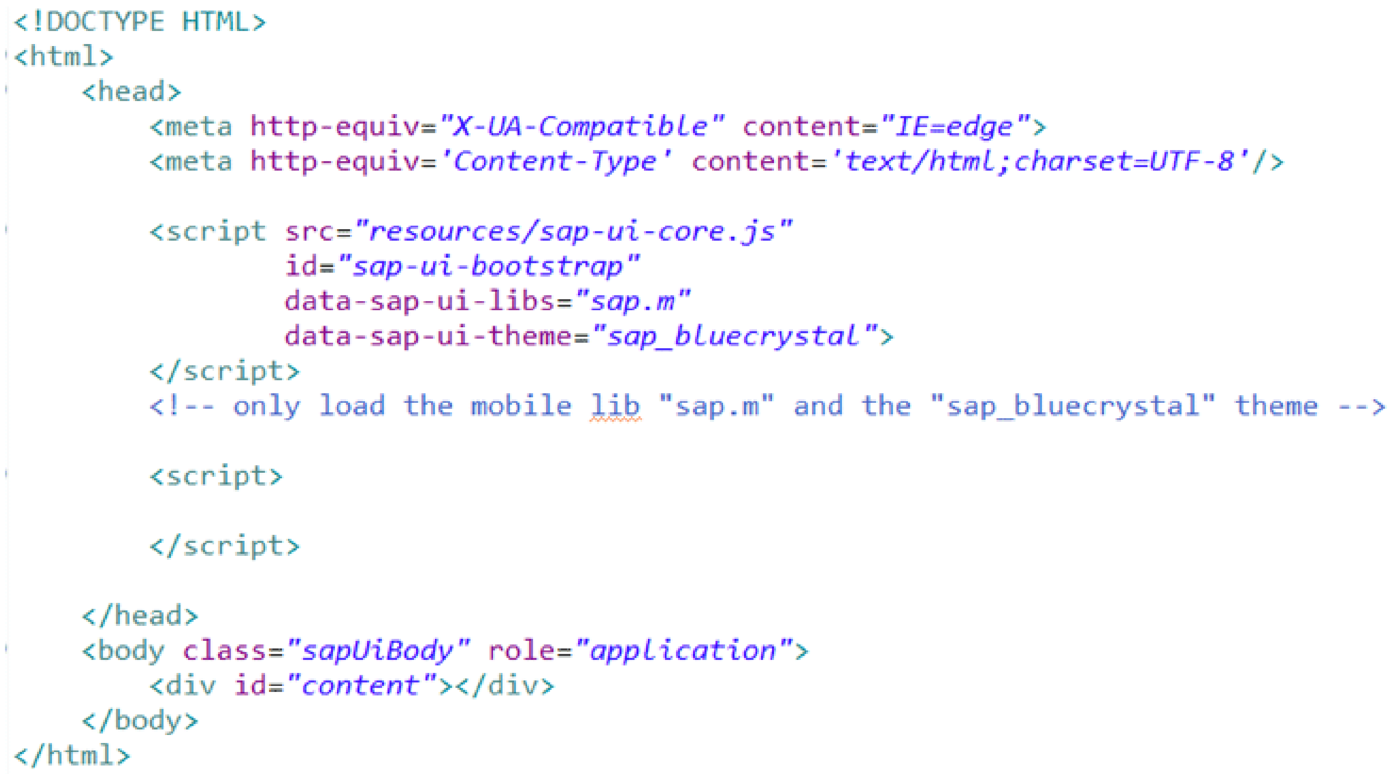


Figure 34
The two new folders are added to the MaterialList WebContent folder

Now begin changing the project's index.html, as required. The metatag "X-UA-Compatible" is required for the web browser to use the last rendering mode. **Figure 35** shows a sample of the index.html content.



```html
<!DOCTYPE HTML>
<html>
    <head>
        <meta http-equiv="X-UA-Compatible" content="IE=edge">
        <meta http-equiv='Content-Type' content='text/html;charset=UTF-8'/>

        <script src="resources/sap-ui-core.js"
                id="sap-ui-bootstrap"
                data-sap-ui-libs="sap.m"
                data-sap-ui-theme="sap_bluecrystal">
        </script>
        <!-- only load the mobile lib "sap.m" and the "sap_bluecrystal" theme -->

        <script>

        </script>

    </head>
    <body class="sapUiBody" role="application">
        <div id="content"></div>
    </body>
</html>
```

Figure 35
Sample of the index.html content

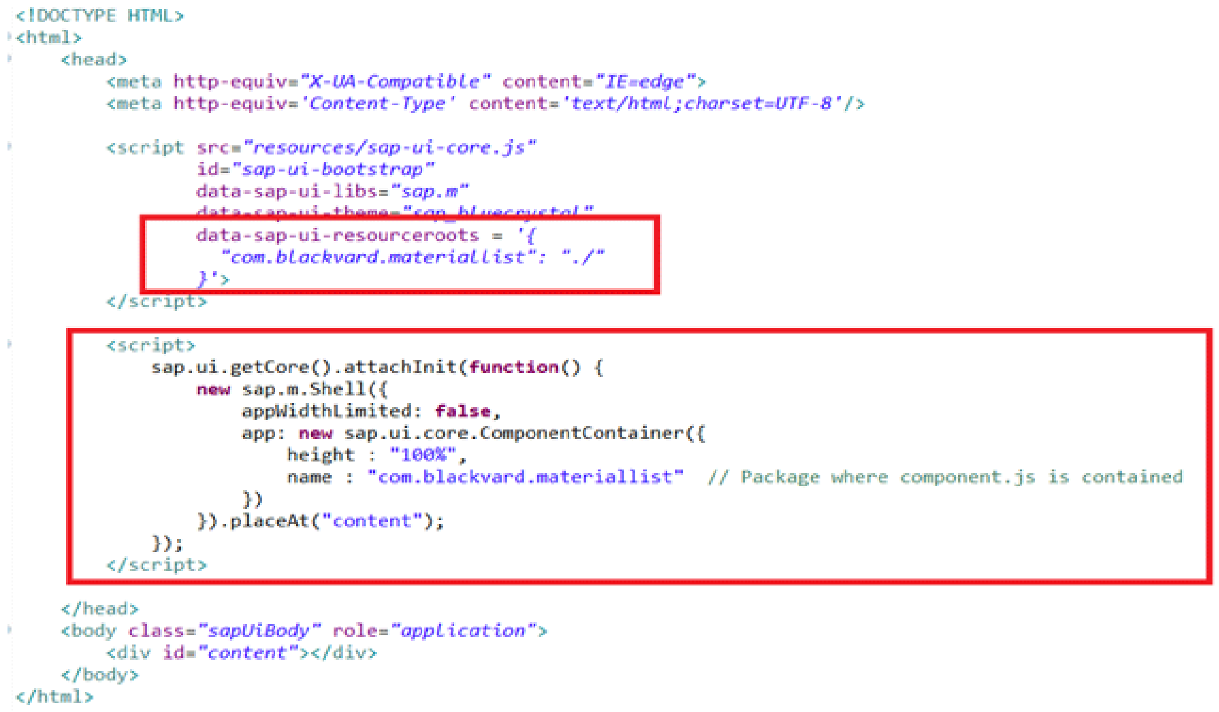
The <script> coding in **Figure 36**, also depicted in **Figure 35**, is required for bootstrapping the SAPUI5 framework.

```
<script src="resources/sap-ui-core.js"

          id="sap-ui-bootstrap"

          data-sap-ui-libs="sap.m"

     data-sap-ui-theme="sap_bluecrystal"

     data-sap-ui-resourceroots = '{

            "com.blackvard.materiallist":"./"

          }'>

 </script>
```

data-sap-ui-resourceroots = '{ "com.blackvard.materiallist": "./"}'

Figure 37 Sample namespace

The artifacts with the namespace "com.blackvard.materiallist" are in the same folder as the index.html. SAPUI5 uses the component concept. **Figure 38** displays a sample of the newly changed index.html.



```
<!DOCTYPE HTML>
<html>
    <head>
        <meta http-equiv="X-UA-Compatible" content="IE=edge">
        <meta http-equiv='Content-Type' content='text/html;charset=UTF-8'/>

        <script src="resources/sap-ui-core.js"
                id="sap-ui-bootstrap"
                data-sap-ui-libs="sap.m"
                data-sap-ui-theme="sap_bluecrystal"
                data-sap-ui-resourceroots = '{
                  "com.blackvard.materiallist": "./"
                }'>
        </script>

        <script>
            sap.ui.getCore().attachInit(function() {
                new sap.m.Shell({
                    appWidthLimited: false,
                    app: new sap.ui.core.ComponentContainer({
                        height : "100%",
                        name : "com.blackvard.materiallist"  // Package where component.js is contained
                    })
                }).placeAt("content");
            });
        </script>

    </head>
    <body class="sapUiBody" role="application">
        <div id="content"></div>
    </body>
</html>
```

Figure 38
The new index.html sample

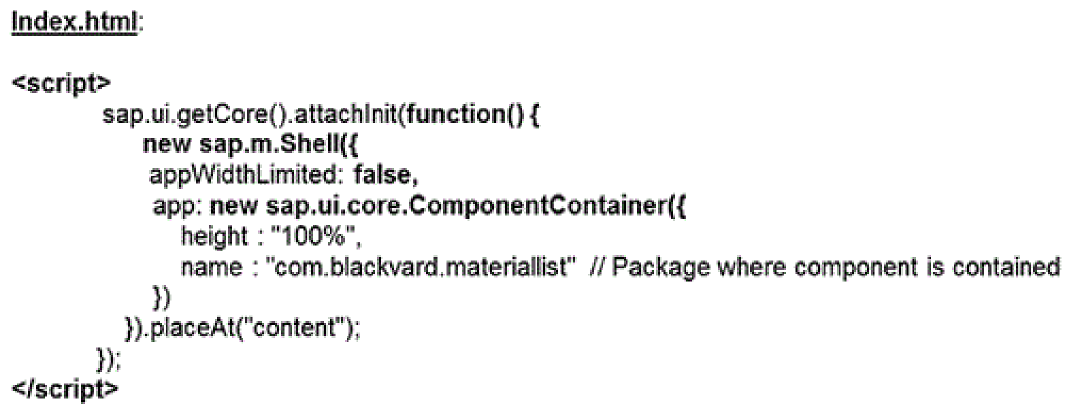
When all the resources and libraries are loaded and SAPUI5 is ready, the library throws the global initialization event to signal that the library is ready to use. As mentioned before, I am using the sap.m library. It provides controls and elements for the mobile-device front end, meaning that the requested material data of my sample fits to the screen sizes of multiple mobile devices.

The resources and libraries used are:

- resources/sap-ui-core.js: This is the core JavaScript of SAPUI5.
- sap.m: The mobile library.
- Theme sap_bluecrystal is applied

In the example shown in **Figure 38**, a reference to the SAPUI5 core was received by calling sap.ui.getCore() and an anonymous callback function was registered by calling attachInit(…) in the core.

A component container was also initialized, which is a wrapper for the application. The shell was used for the correct margins and paddings. **Figure 39** shows a sample of the index.html.



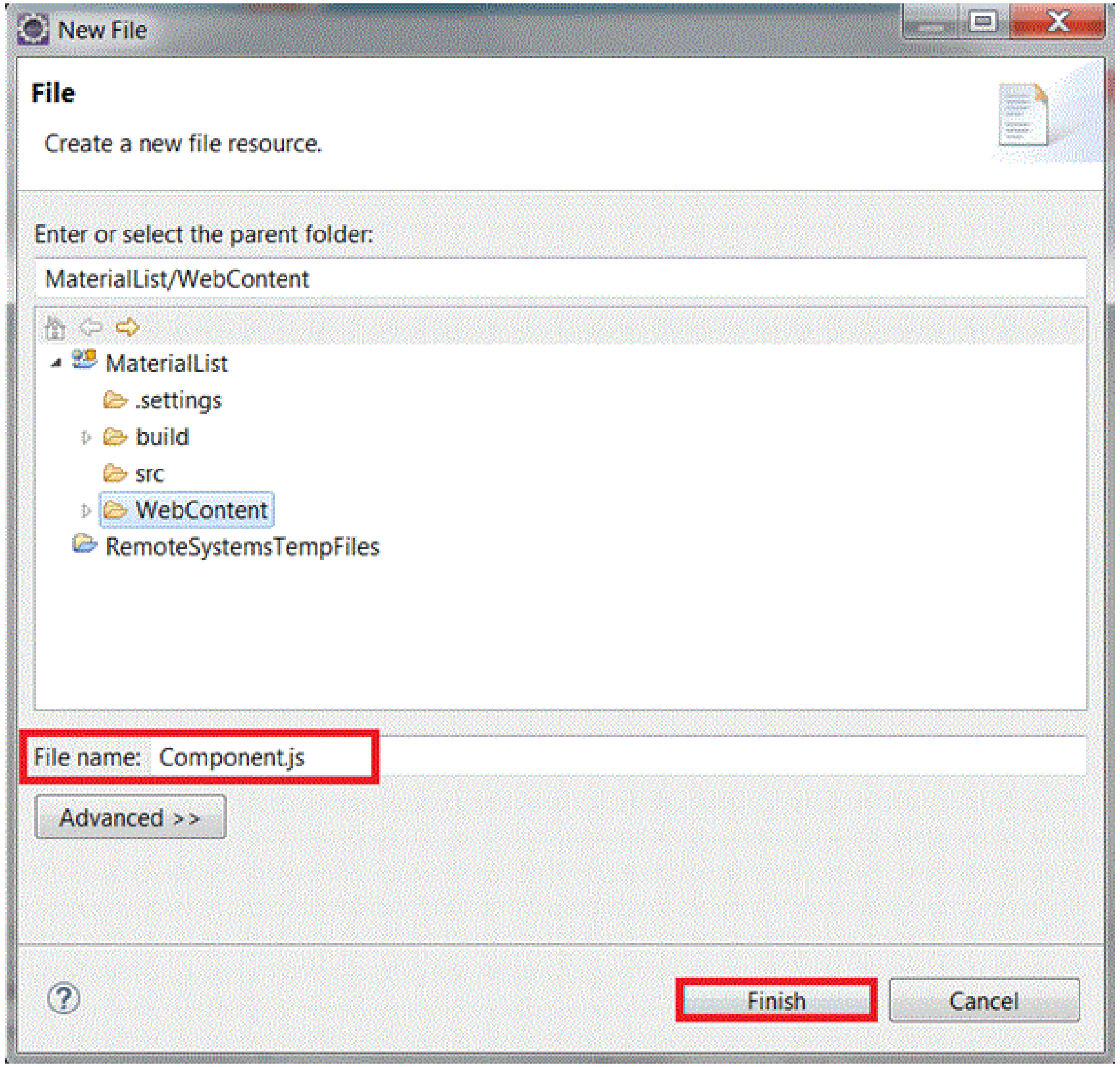
Index.html:

```
<script>
        sap.ui.getCore().attachInit(function() {
            new sap.m.Shell({
             appWidthLimited: false,
             app: new sap.ui.core.ComponentContainer({
                height : "100%",
                name : "com.blackvard.materiallist"  // Package where component is contained
             })
           }).placeAt("content");
        });
</script>
```

Figure 39
index.html sample

Now create the Component.js file in the same folder <WebContent> as the index.html. The file Component.js is the component controller, and contains run-time metadata and methods. Component.js initializes the models and the router.

Right-click the <WebContent> folder and choose New > File to go to **Figure 40**, which is the New File pop-up window. Give the file the File name Component.js and click the Finish button.


New File

File

Create a new file resource.

Enter or select the parent folder:

MaterialList/WebContent

- MaterialList
  - .settings
  - build
  - src
  - WebContent
- RemoteSystemsTempFiles

File name: Component.js

Figure 40
Open the new File pop-up window

Component.js is added under the WebContent folder, as shown in **Figure 41**.

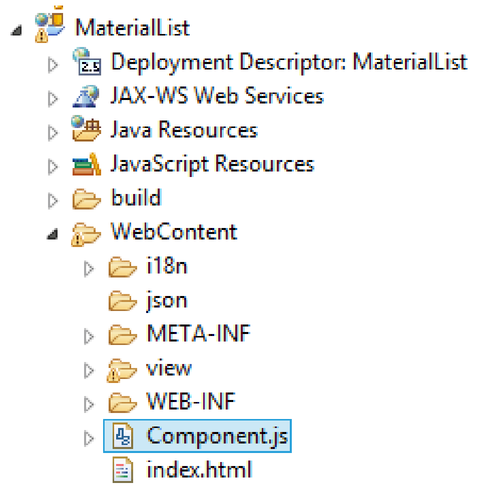
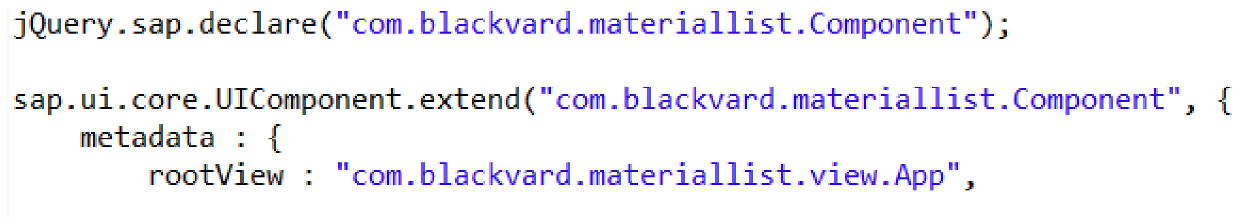


Figure 41
Component.js file

In the first part of the Component.js file, the component inherits from the base class sap.ui.core.UIComponent. The text rootView refers to the view that is automatically loaded. I show how to create this view later in this article.

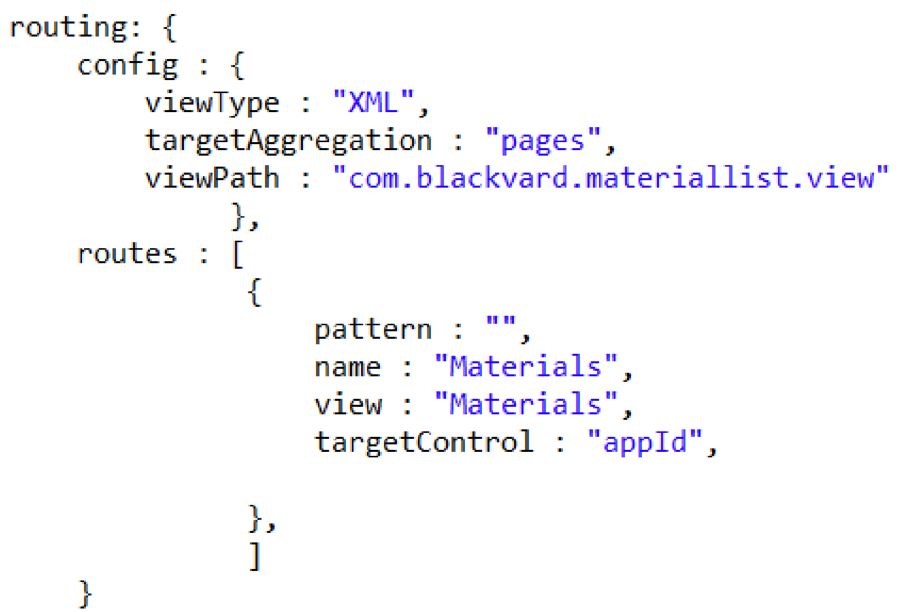
Figure 42 shows a sample of the sap.ui.core.UIComponent base class coding.



```
jQuery.sap.declare("com.blackvard.materiallist.Component");

sap.ui.core.UIComponent.extend("com.blackvard.materiallist.Component", {
    metadata : {
        rootView : "com.blackvard.materiallist.view.App",
```

Figure 42
sap.ui.core.UIComponent base class coding

The routing part of the Component.js file is shown in **Figure 43**.

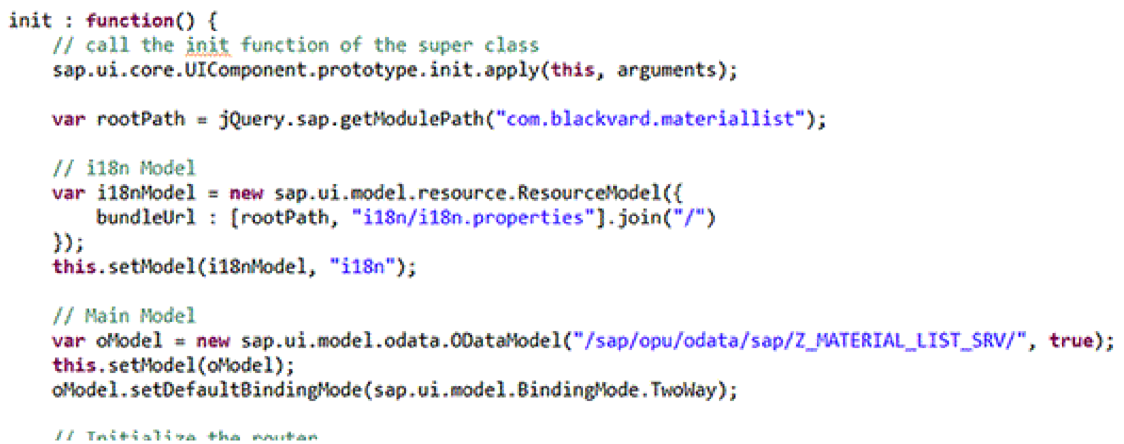


```
routing: {
    config : {
        viewType : "XML",
        targetAggregation : "pages",
        viewPath : "com.blackvard.materiallist.view"
            },
    routes : [
              {
                  pattern : "",
                  name : "Materials",
                  view : "Materials",
                  targetControl : "appId",

              },
              ]
    }
```

Figure 43
Component.js routing

In the routing part of the Component.js file (**Figure 43**), viewType : “XML” means that all views are a default of the type XML. viewPath : “com.blackvard.materiallist.view” means that all views are created inside the view folder. The first view that is displayed is the Materials view. I show how to build this view later in this article.

Figure 44 displays a sample of the init method of Component.js.



```
init : function() {
    // call the init function of the super class
    sap.ui.core.UIComponent.prototype.init.apply(this, arguments);

    var rootPath = jQuery.sap.getModulePath("com.blackvard.materiallist");

    // i18n Model
    var i18nModel = new sap.ui.model.resource.ResourceModel({
        bundleUrl : [rootPath, "i18n/i18n.properties"].join("/")
    });
    this.setModel(i18nModel, "i18n");

    // Main Model
    var oModel = new sap.ui.model.odata.ODataModel("/sap/opu/odata/sap/Z_MATERIAL_LIST_SRV/", true);
    this.setModel(oModel);
    oModel.setDefaultBindingMode(sap.ui.model.BindingMode.TwoWay);

    // Initialize the router
```

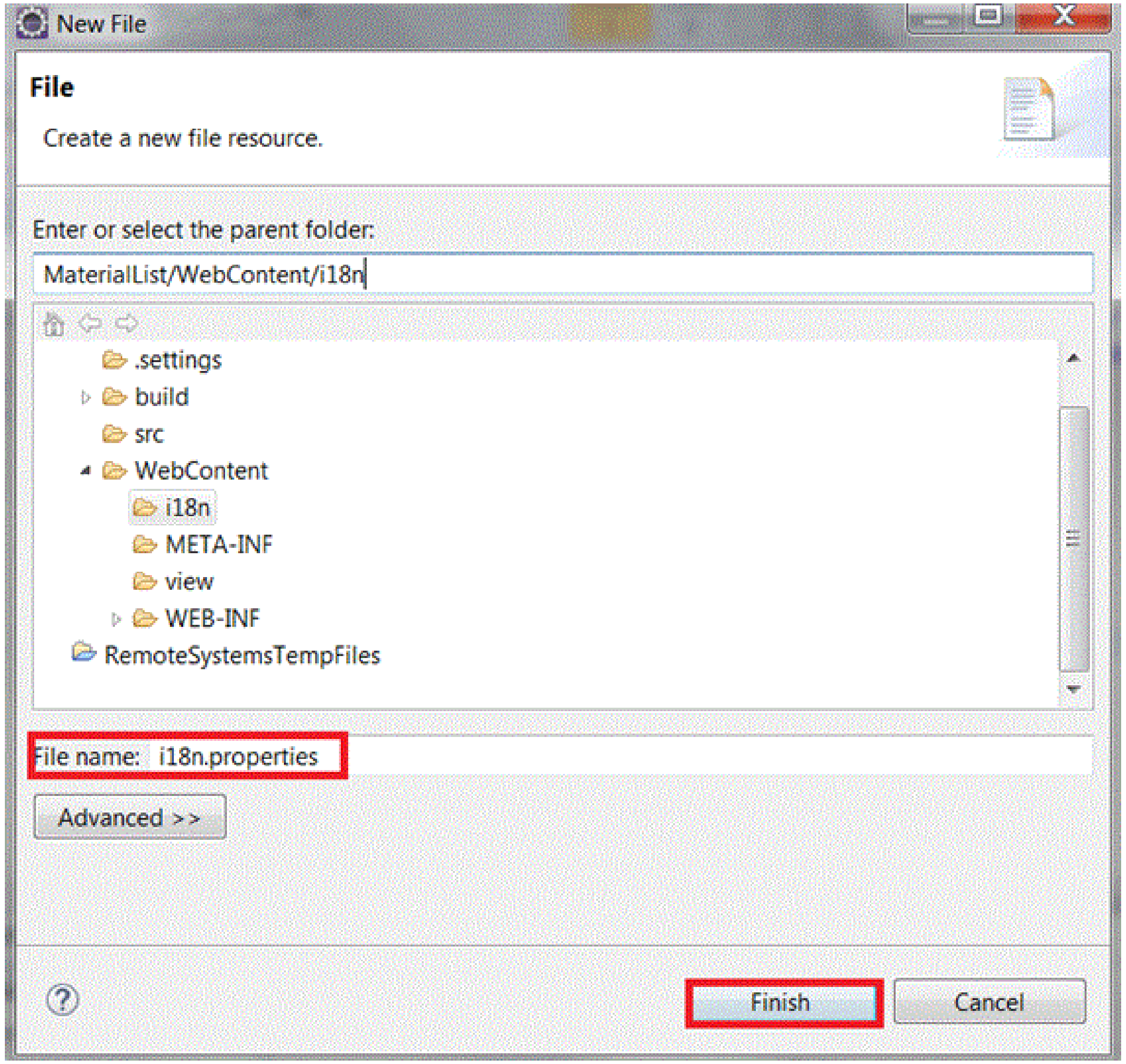
Figure 44
Component sample.js init method

The init method of the super class sap.ui.core.UIComponent is called when the component is initialized. Inside the init method two models are set:

1. The resource bundle model will be called i18n. This model looks in the folder i18n for i18nproperties files.
2. The main model, which refers to the Gateway OData service, has already been developed.

The router will be initialized. Now create the i18n file. During this step, store all used texts regarding the application in a central place. The text can be easily maintained and translated into other languages, if required.

The process of i18n is achieved by using the concept of Resource Model and data binding, inside SAPUI5. In the project structure, create a new file under the i18n folder. Right-click the i18n folder and follow menu path New > File. This opens the New File pop-up window (**Figure 45**) where you can give the file a name. Give the file the name i18n.properties and click the Finish button.



MaterialList/WebContent/i18n

File name: i18n.properties

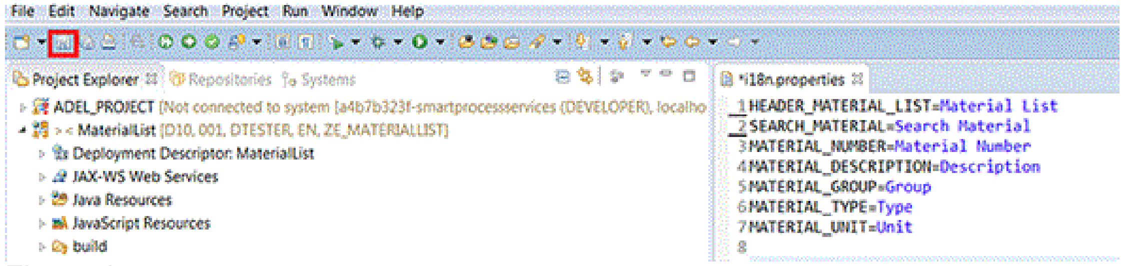
Figure 45
New File pop-up window

The i18n.properties file contains text IDs and text values, following the syntax <Text id >=< Text Value>. The text IDs are used later on in the Materials view. Fill the content of the i18n.properties file with the text seen in **Figure 46**, which displays an image of the required i18n.properties text.

```
HEADER_MATERIAL_LIST=Material List
SEARCH_MATERIAL=Search Material
MATERIAL_NUMBER=Material Number
MATERIAL_DESCRIPTION=Description
MATERIAL_GROUP=Group
MATERIAL_TYPE=Type
MATERIAL_UNIT=Unit
```

Figure 46
Enter the required i18n.properties text

Save the file by clicking the save icon on top of the Eclipse tool bar. Now it should look like the image shown in **Figure 47**. On the left, you see your project details and folders, and on the right you see the content of the i18.properties file.

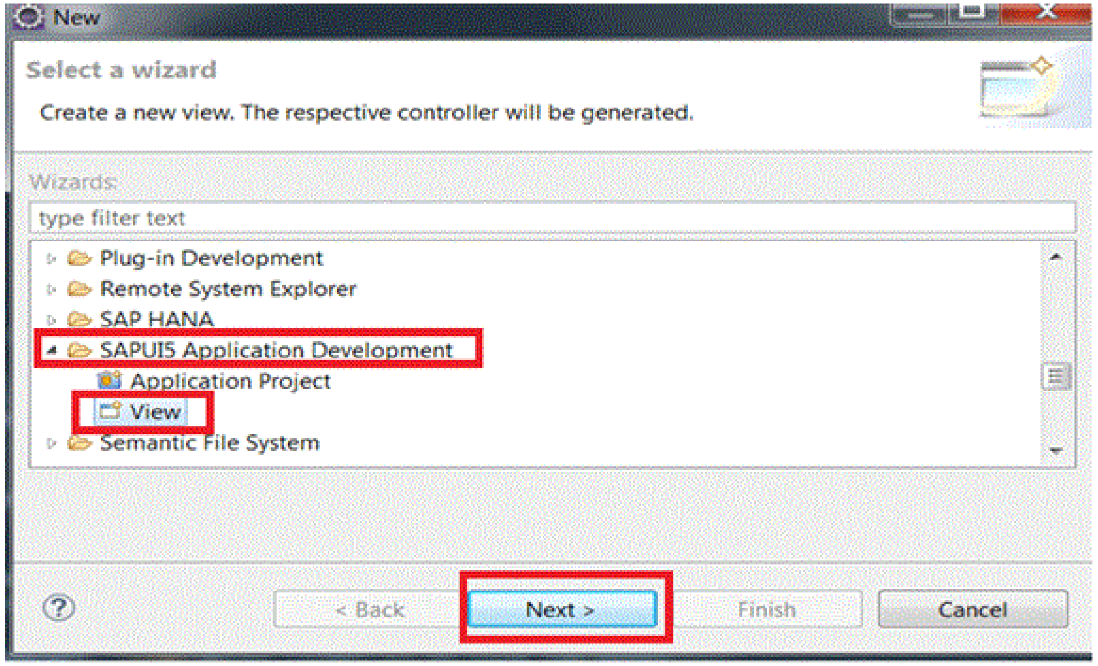


```
ADEL_PROJECT [Not connected to system [a4b7b323f-smartprocessservices (DEVELOPER), localho
> < MaterialList [D10, 001, DTESTER, EN, ZE_MATERIALLIST]
    Deployment Descriptor: MaterialList
    JAX-WS Web Services
    Java Resources
    JavaScript Resources
    build
```

```
HEADER_MATERIAL_LIST=Material List
SEARCH_MATERIAL=Search Material
MATERIAL_NUMBER=Material Number
MATERIAL_DESCRIPTION=Description
MATERIAL_GROUP=Group
MATERIAL_TYPE=Type
MATERIAL_UNIT=Unit
```

Figure 47
The SAP Project Explorer screen

Now create the views and the controllers. As already mentioned, all views and controllers should be built under the view folder. Begin building the first view. From the project structure, right-click the view folder and follow menu path New > Other… . The wizard appears again, as seen in **Figure 48**. Locate the SAPUI5 Application Development folder and open it. Select View and click the Next button.


New

Select a wizard

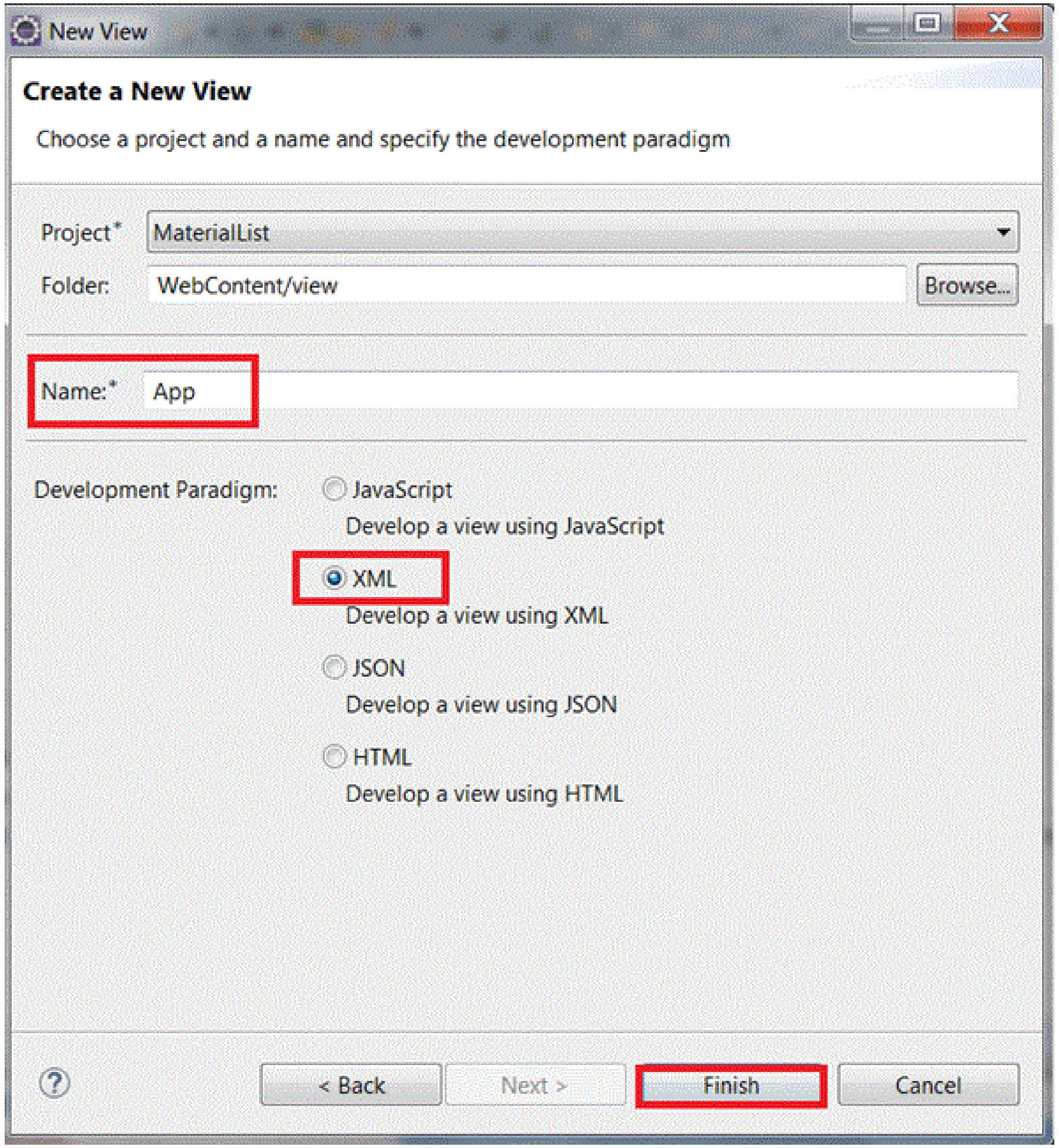
Create a new view. The respective controller will be generated.

Wizards:

type filter text

Figure 48
SAPUI5 Application Development > View > Next menu path

This opens the New View pop-up window shown in **Figure 49** with the Project, Folder, Name, and paradigm type. Give the view the name App (this must be the same name defined in Component.js with the metadata name rootView). Choose XML as the Development Paradigm type and click the Finish button.



New View

Create a New View

Choose a project and a name and specify the development paradigm

Project*: MaterialList

Folder: WebContent/view

Name:* App

Development Paradigm:

( ) JavaScript — Develop a view using JavaScript

[✓ XML] — Develop a view using XML

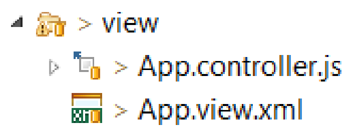
( ) JSON — Develop a view using JSON

( ) HTML — Develop a view using HTML

Figure 49
The New View pop-up window

This creates two App files under the view folder (**Figure 50**):

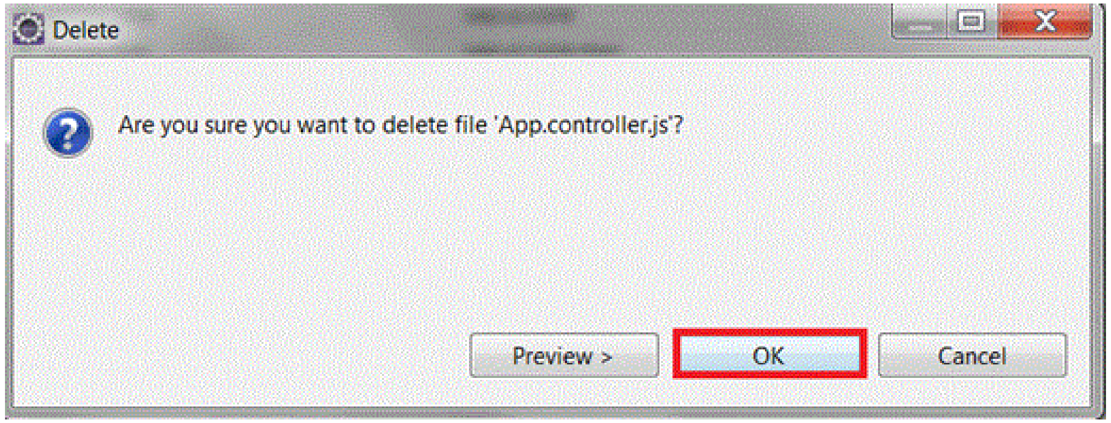
2. App.controller.js: The controller.



◢ > view
  ▷ > App.controller.js
    > App.view.xml

Figure 50
The view folder with App.controller.js and App.view.xml files

The App.controller.js file is not required. Delete this file by right-clicking the file name and selecting the Delete option from the context menu. This opens a pop-up window (**Figure 51**) where you confirm the deletion by clicking the OK button.



Delete

Are you sure you want to delete file 'App.controller.js'?

Figure 51
Confirm the deletion

Back in the screen in **Figure 50**, double-click the App.view.xml file. In the screen that opens (not shown) change the content of the file to the coding shown in **Figure 52**.

displayBlock=”true” is required to avoid scrolling.

Figure 52 The required displayBlock=”true” coding.

The ID of the app is important and must be the same as the targetControl defined in Component.js. **Figure 53** shows a sample of the App.view.xml coding.

```
<mvc:View
    xmlns:mvc="sap.ui.core.mvc" xmlns="sap.m"
    displayBlock="true">
    <App id="appId" />
```

Figure 53
App.view.xml coding

Save the file by clicking the save icon on the Project Explorer screen toolbar (not shown).

Now create the next view under the view folder. Right-click the view folder and follow menu path New > Other…, which again takes you to the wizard screen (**Figure 48**). Under SAPUI5 Application Development, select View. Click the Next button. Give the view the Name: Materials. Choose XML view as the paradigm (**Figure 49**). Click the Finish button.

This creates two Materials files under the view folder (**Figure 54**).

1. Materials.view.xml: The view itself.
2. Materials.controller.js: The controller.

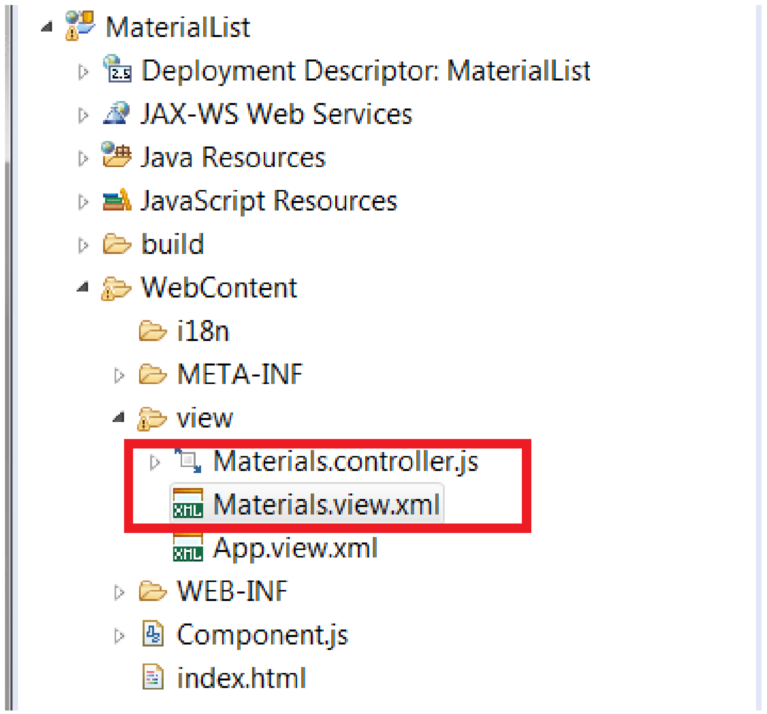
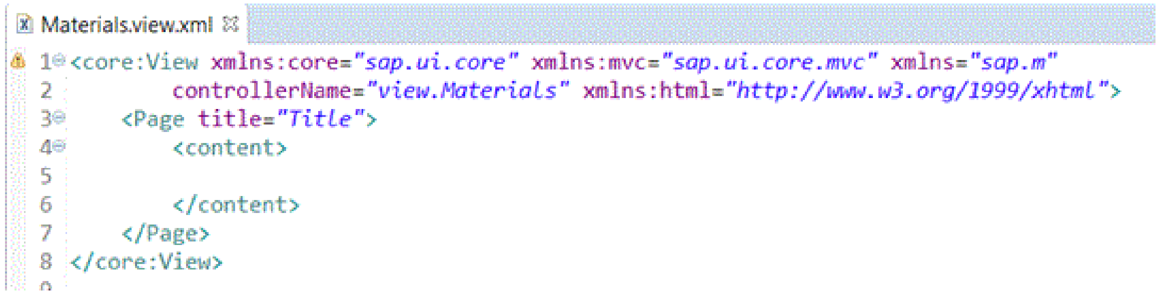


Figure 54
The Materials.controller.js and Materials.view.xml files are added to the view folder

Now change the content of the Materials view. Double-click Materials.view.xml and the code editor displays the coding (**Figure 55**). It is a sampling of the initial content of the Materials.view.xml coding.

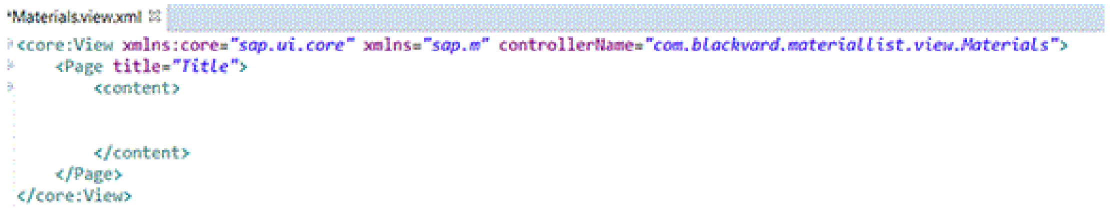


```xml
<core:View xmlns:core="sap.ui.core" xmlns:mvc="sap.ui.core.mvc" xmlns="sap.m"
        controllerName="view.Materials" xmlns:html="http://www.w3.org/1999/xhtml">
    <Page title="Title">
        <content>

        </content>
    </Page>
</core:View>
```

Figure 55
Materials.view.xml coding

Now, correct the namespaces and the relation with the controller. Only the sap.ui.core and sap.m libraries are required, so delete the other namespaces. Change the controller name to “com.blackvard.materiallist.view.Materials”. Remember from the index.html, all artifacts under the WebContent folder must begin with the namespace "com.blackvard.materialist”.

The new content of the Materials view is shown in **Figure 56**.



```xml
<core:View xmlns:core="sap.ui.core" xmlns="sap.m" controllerName="com.blackvard.materiallist.view.Materials">
    <Page title="Title">
        <content>


        </content>
    </Page>
</core:View>
```

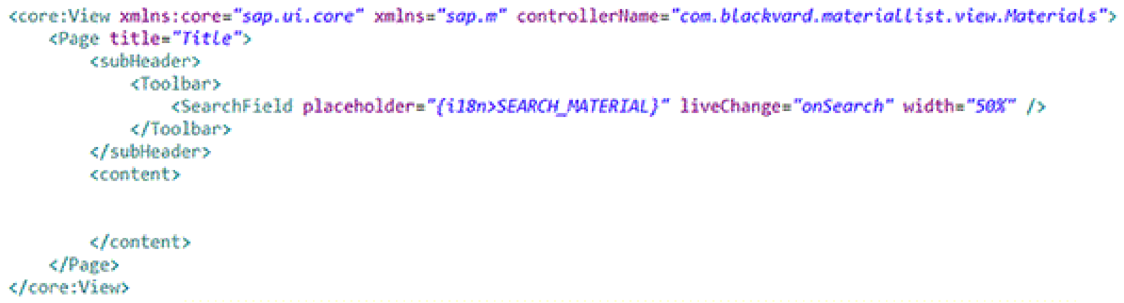
Figure 56
The Materials coding content

Further, upon analyzing the preview of materials, notice that two UI controls are required: one control represents the Search field for search criteria and the other control is dedicated to a table with five columns containing the resulting data (MaterialNumber, MaterialDescription, MaterialType, MaterialGroup, and MaterialUnit).

For the Search field, use the sap.m.SearchField control. For the table, use the sap.m.Table control. For texts, use the resource bundle. Refer to a text ID using “{i18n>TEXT_ID}”. For example, “{i18n>MATERIAL_NUMBER}” refers to the text Material Number.

Finally, search for a specific material based on the material description. For this purpose, assign a method that reacts on an event every time the user types something in the Search field. Call the method onSearch. The method has to be implemented in the controller (MVC pattern).

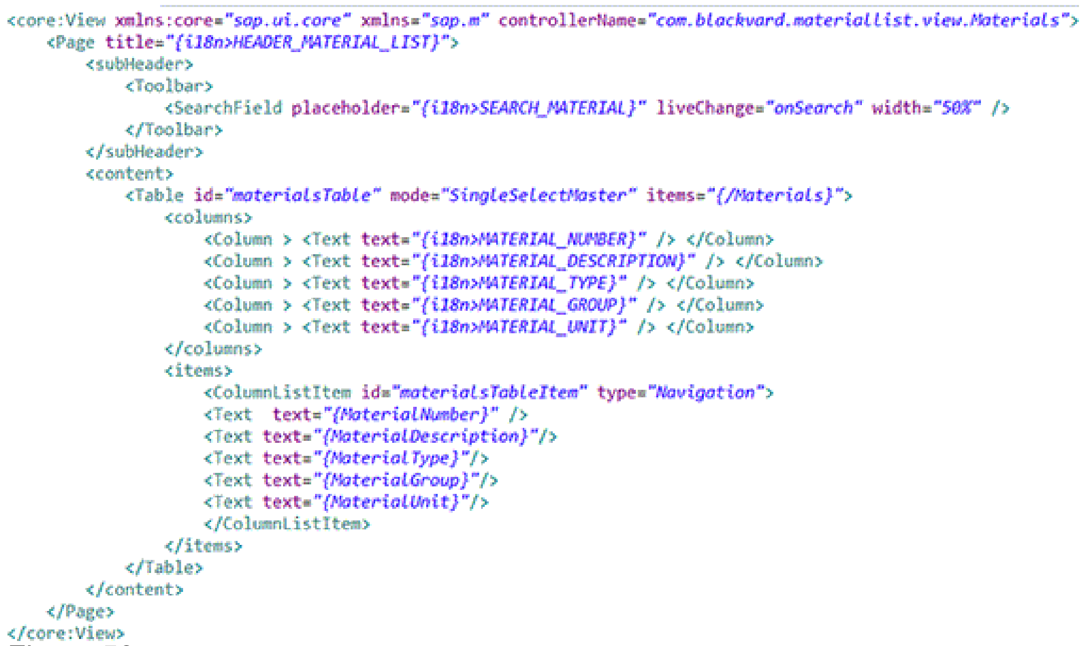
Add the Search Control with placeholder text, and name the method. The method onSearch will be triggered on liveChange events. **Figure 57** shows a sample of the Search field and table coding.



```
<core:View xmlns:core="sap.ui.core" xmlns="sap.m" controllerName="com.blackvard.materiallist.view.Materials">
    <Page title="Title">
        <subHeader>
            <Toolbar>
                <SearchField placeholder="{i18n>SEARCH_MATERIAL}" liveChange="onSearch" width="50%" />
            </Toolbar>
        </subHeader>
        <content>


        </content>
    </Page>
</core:View>
```

Figure 57
Search field and table coding sample

Manually change the page title and add the table with five columns within the XML code,? as follows (see **Figure 58**). Note: To change the content of any file, double-click the file name, change the content, and click the save icon.



```
<core:View xmlns:core="sap.ui.core" xmlns="sap.m" controllerName="com.blackvard.materiallist.view.Materials">
    <Page title="{i18n>HEADER_MATERIAL_LIST}">
        <subHeader>
            <Toolbar>
                <SearchField placeholder="{i18n>SEARCH_MATERIAL}" liveChange="onSearch" width="50%" />
            </Toolbar>
        </subHeader>
        <content>
            <Table id="materialsTable" mode="SingleSelectMaster" items="{/Materials}">
                <columns>
                    <Column > <Text text="{i18n>MATERIAL_NUMBER}" /> </Column>
                    <Column > <Text text="{i18n>MATERIAL_DESCRIPTION}" /> </Column>
                    <Column > <Text text="{i18n>MATERIAL_TYPE}" /> </Column>
                    <Column > <Text text="{i18n>MATERIAL_GROUP}" /> </Column>
                    <Column > <Text text="{i18n>MATERIAL_UNIT}" /> </Column>
                </columns>
                <items>
                    <ColumnListItem id="materialsTableItem" type="Navigation">
                    <Text  text="{MaterialNumber}" />
                    <Text text="{MaterialDescription}"/>
                    <Text text="{MaterialType}"/>
                    <Text text="{MaterialGroup}"/>
                    <Text text="{MaterialUnit}"/>
                    </ColumnListItem>
                </items>
            </Table>
        </content>
    </Page>
</core:View>
```

Figure 58
Final Materials coding

Editing the page title: <Page title="{i18n>HEADER_MATERIAL_LIST}"> should be the page title. For this example, set the title of the page to the text element HEADER_MATERIAL_LIST, which was already defined in the i18n.properties file (under the i18n folder).

Editing the table: Give the materials table an ID. The ID in this case is "materialsTable". You use that ID later on in the Materials

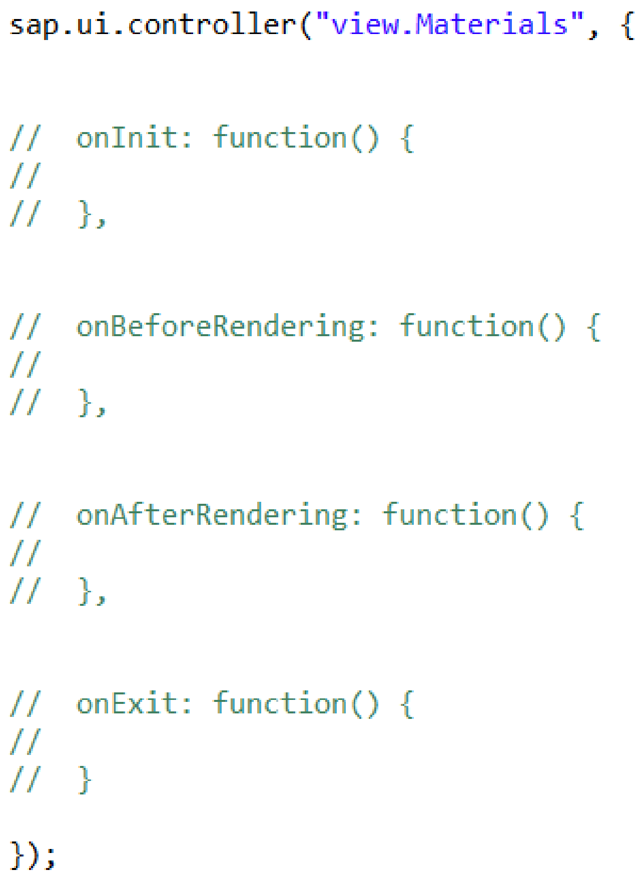
Editing the column headers: The column headers correspond to the <columns> tag. Inside the <columns> tag, define the columns. Refer to text elements defined in the i18n.properties file (under the i18n folder).

Editing rows with data: The rows correspond with the <items> tag. The values of the rows come from the mail model (Own Gateway model). For each column, define the correct property. For example, the first column is the MaterialNumber property value.

The item property of the table is set to /Materials. This value triggers the SAPUI5 framework to send a request to the SAP Gateway system to retrieve the materials and bind them to the table.

Figure 58 shows the final code of the Materials view.

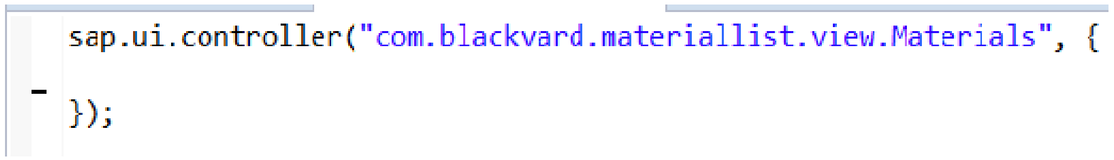
The Materials view is finished. Move on to the Materials controller. The Materials controller corresponds to the Materials.controller.js file. **Figure 59** shows a sample of the initial code of the controller.



```
sap.ui.controller("view.Materials", {


//  onInit: function() {
//
//  },


//  onBeforeRendering: function() {
//
//  },


//  onAfterRendering: function() {
//
//  },


//  onExit: function() {
//
//  }

});
```

Figure 59

Change the name of the controller to "com.blackvard.materiallist.view.Materials". **Figure 60** shows the coding change to "com.blackvard.materiallist.view.Materials".

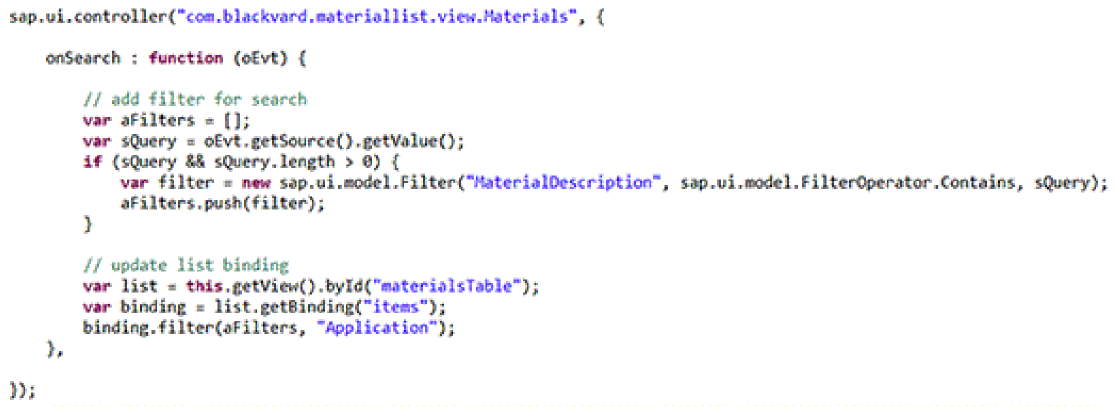


```
sap.ui.controller("com.blackvard.materiallist.view.Materials", {

});
```

Figure 60
Coding change to "com.blackvard.materiallist.view.Materials"

Now implement the method onSearch. The onSearch method is triggered every time the user fills a value. The entered value is stored in variable : var sQuery = oEvt.getSource().getValue();. Only if that value is empty is an object of type sap.ui.model.Filter created in the field MaterialDescription, and added to the array aFilters.

Finally, update the table binding with the newly created filter (aFilters). This triggers an HTTP Request to the SAP system in order to retrieve the materials with that filter. **Figure 61** shows a sample of the final coding of Materials.controller.js.



```
sap.ui.controller("com.blackvard.materiallist.view.Materials", {

    onSearch : function (oEvt) {

        // add filter for search
        var aFilters = [];
        var sQuery = oEvt.getSource().getValue();
        if (sQuery && sQuery.length > 0) {
            var filter = new sap.ui.model.Filter("MaterialDescription", sap.ui.model.FilterOperator.Contains, sQuery);
            aFilters.push(filter);
        }

        // update list binding
        var list = this.getView().byId("materialsTable");
        var binding = list.getBinding("items");
        binding.filter(aFilters, "Application");
    },

});
```

Figure 61
Final Materials.controller.js coding

To save the controller, click the save icon on the Project Explorer SAP toolbar.

Deploying the Application

To deploy the application, right-click the project name MaterialList and choose Team > Share Project. Share Project sets a connection between the Eclipse project and the SAP Gateway Business Server Pages Application. Follow menu path MaterialList > Team > Share Project… to go to **Figure 62**.

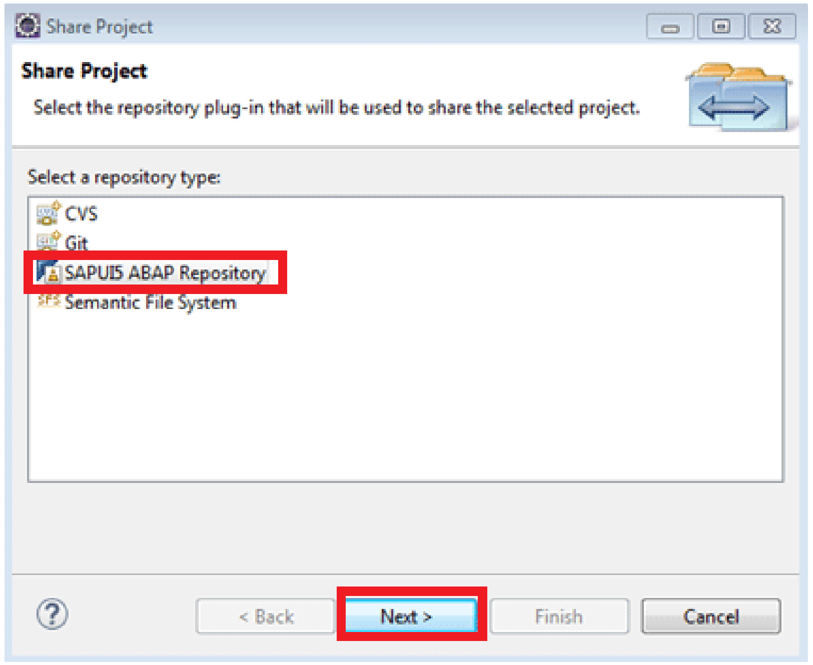
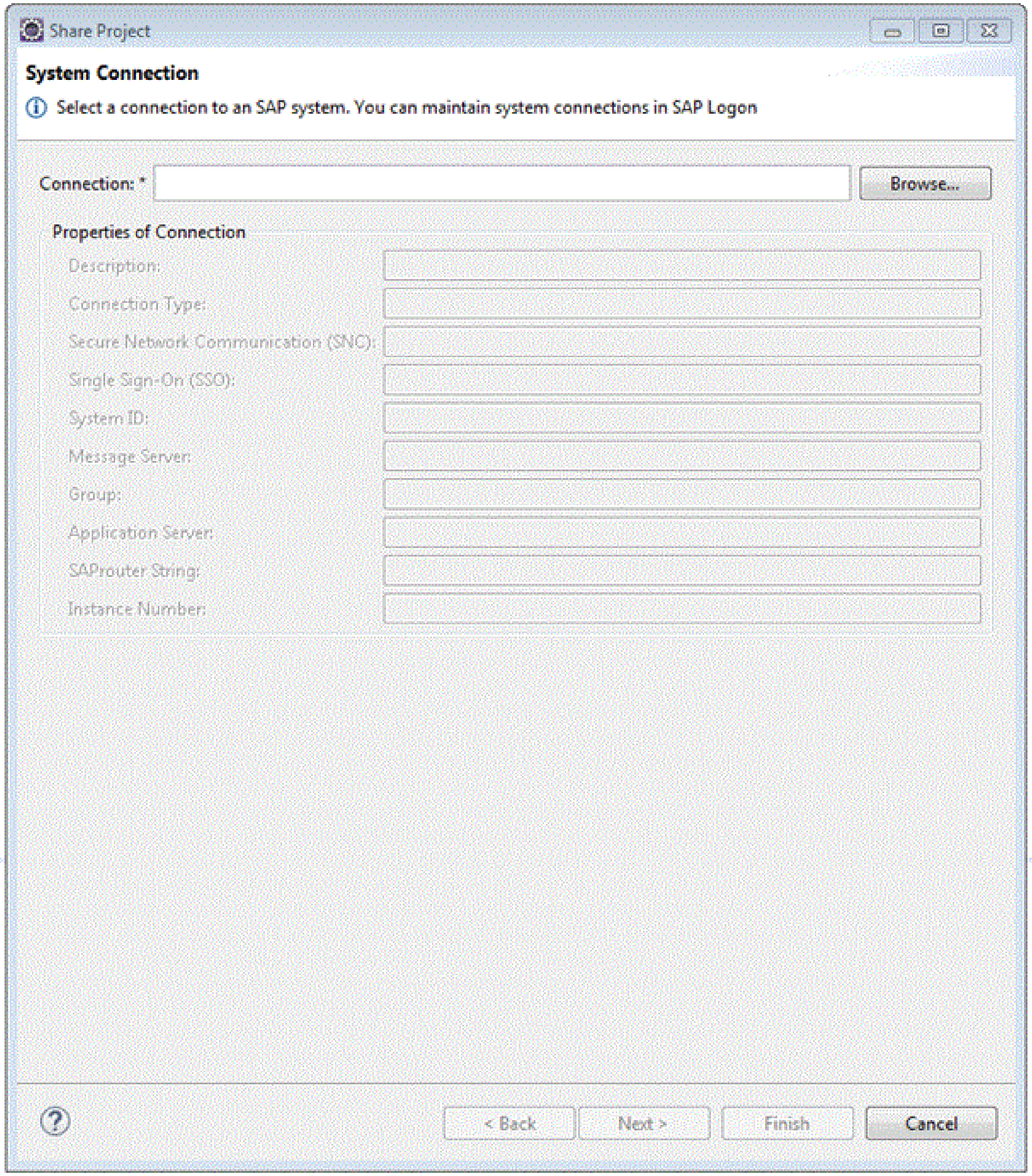

Share Project
Share Project
Select the repository plug-in that will be used to share the selected project.
Select a repository type:
CVS
Git
SAPUI5 ABAP Repository
Semantic File System
< Back
Next >
Finish
Cancel

Figure 62
The Share Project pop-up window opens

Select SAPUI5 ABAP Repository and click the Next button. SAPUI5 ABAP Repository is the plug-in you should download and install, along with the SAPUI5 installation tools. You can download the plug-in from https://tools.hana.ondemand.com/. The SAPUI5 ABAP Repository helps deploy applications from Eclipse to SAP. In the System Connection window that opens (**Figure 63**), click the Browse… option, which locates the SAP system from the logon pad.



System Connection

Select a connection to an SAP system. You can maintain system connections in SAP Logon

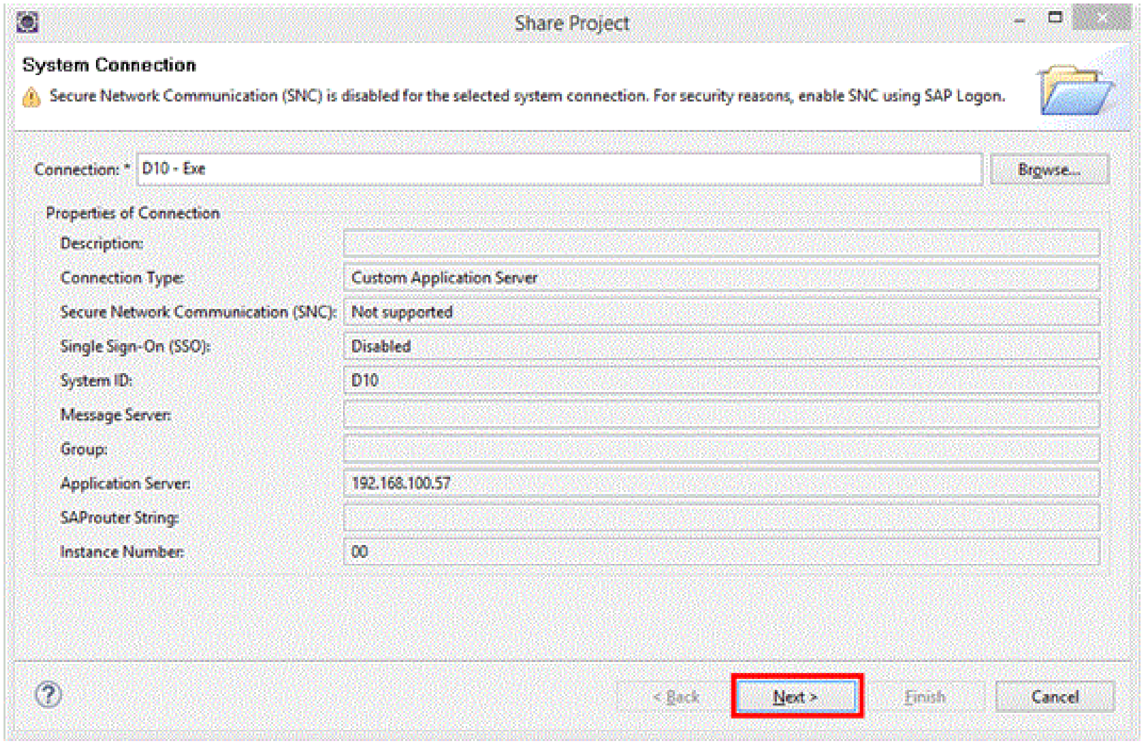
Connection: *

Properties of Connection

Description:
Connection Type:
Secure Network Communication (SNC):
Single Sign-On (SSO):
System ID:
Message Server:
Group:
Application Server:
SAProuter String:
Instance Number:

Figure 63

After selecting the correct SAP system, the system displays the screen in **Figure 64**. After verifying that the information is correct, click the Next button.



System Connection

Secure Network Communication (SNC) is disabled for the selected system connection. For security reasons, enable SNC using SAP Logon.

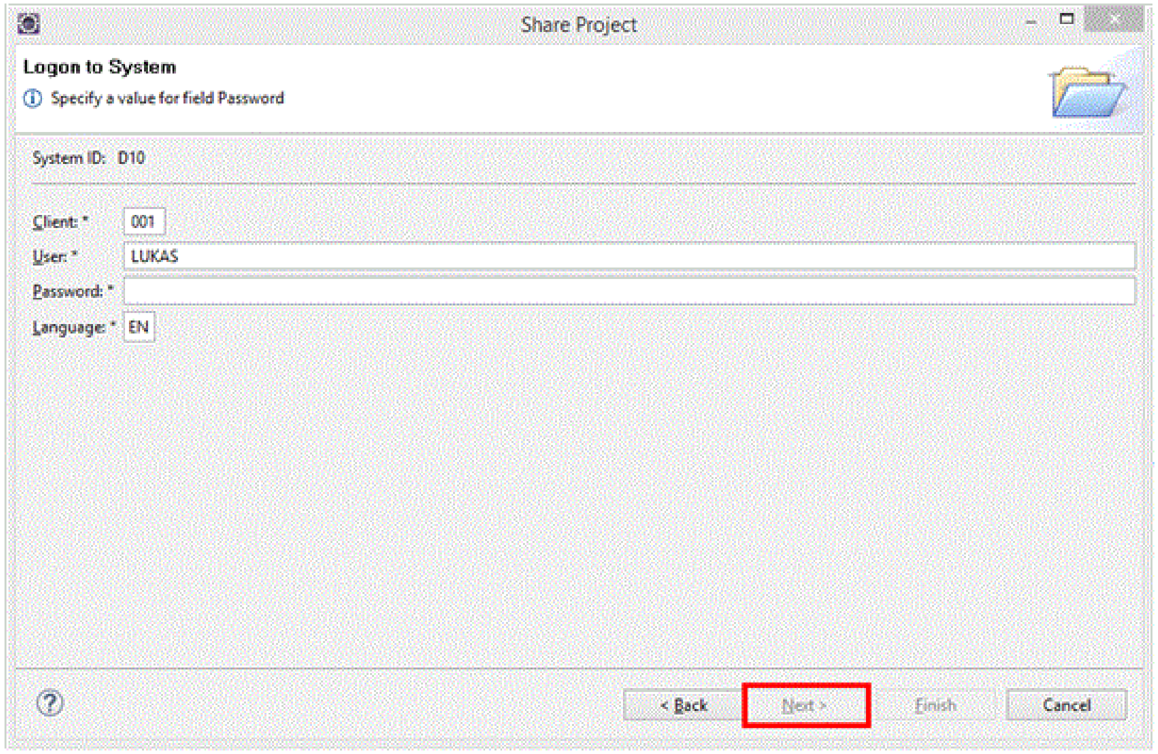
Connection: * D10 - Exe

Properties of Connection

Description:	
Connection Type:	Custom Application Server
Secure Network Communication (SNC):	Not supported
Single Sign-On (SSO):	Disabled
System ID:	D10
Message Server:	
Group:	
Application Server:	192.168.100.57
SAProuter String:	
Instance Number:	00

Figure 64
The Share Project System Connection pop-up window

This opens the Logon to System window (**Figure 65**) where you enter your log-in details (Client, User, and Password) and click the Next button.



Share Project

Logon to System

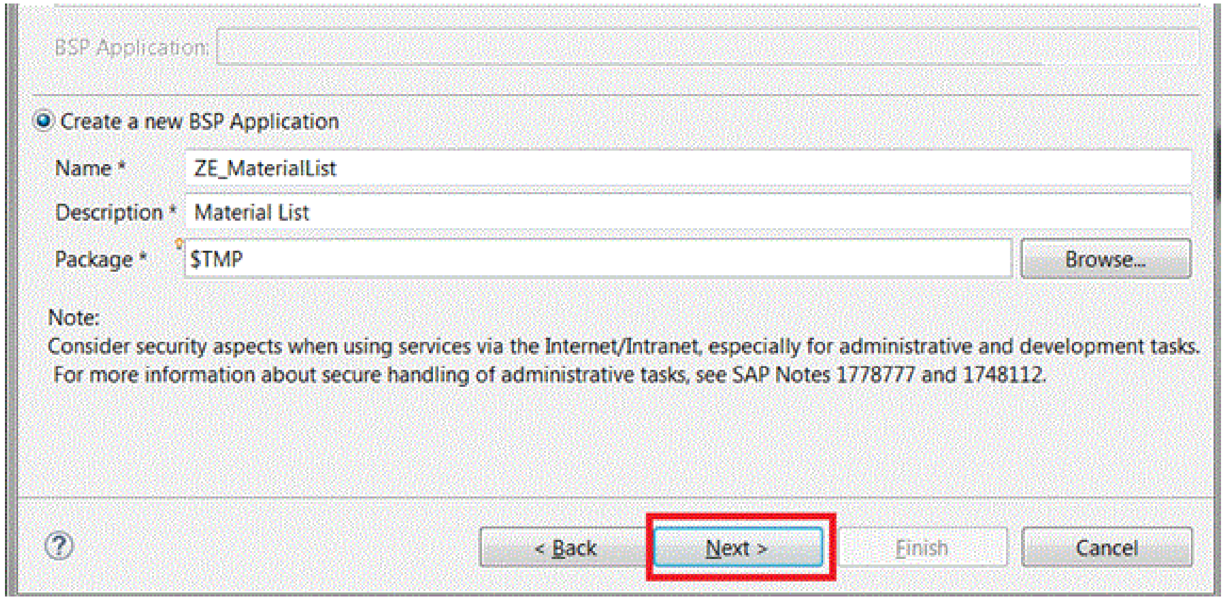
Specify a value for field Password

System ID: D10

Client: *	001
User: *	LUKAS
Password: *	
Language: *	EN

Figure 65
Share Project Logon to System pop-up window

In the screen that opens (**Figure 66**), you can create a new BSP application or add it to an existing BSP application. Adding the application to an existing one allows you to share your front-end development and connect to another landscape. In my example, you could connect your simple MM application only to your demo system, or you could attach/connect/share it with another landscape where you are authorized to do so.


BSP Application:

Create a new BSP Application

Name * ZE_MaterialList

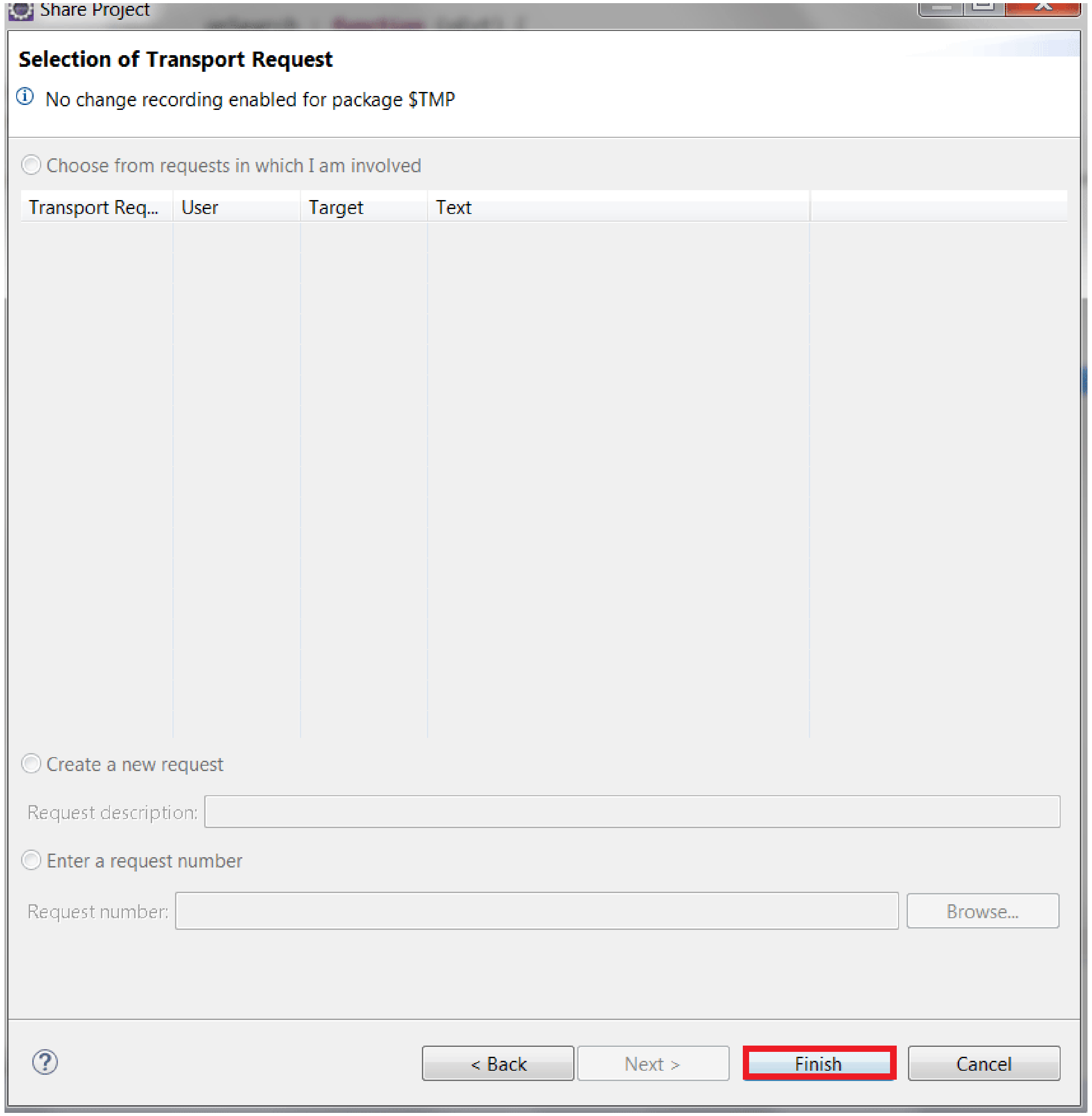
Description * Material List

Package * $TMP

Note:
Consider security aspects when using services via the Internet/Intranet, especially for administrative and development tasks.
For more information about secure handling of administrative tasks, see SAP Notes 1778777 and 1748112.

Figure 66
Enter the BSP application details

Enter the BSP application details (Name, Description, and Package) and click the Next button. In the screen that opens (**Figure 67**), select a transport request (if required), and click the Finish button.


Share Project

Selection of Transport Request

No change recording enabled for package $TMP

Choose from requests in which I am involved

Transport Req...	User	Target	Text

Create a new request

Request description:

Enter a request number

Request number:

Figure 67
Selection of the Transport Request pop-up window

Sharing a project is similar to setting a connection between Eclipse and the SAP system. After sharing the project, the changes

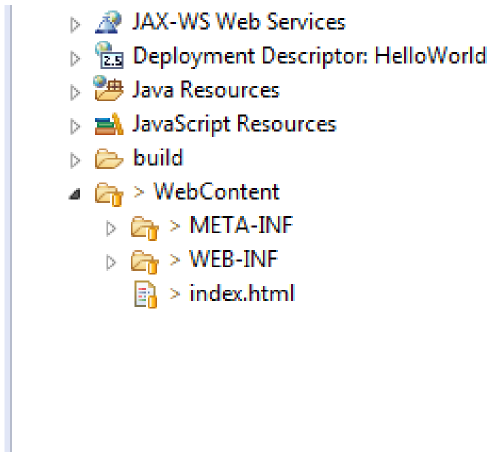
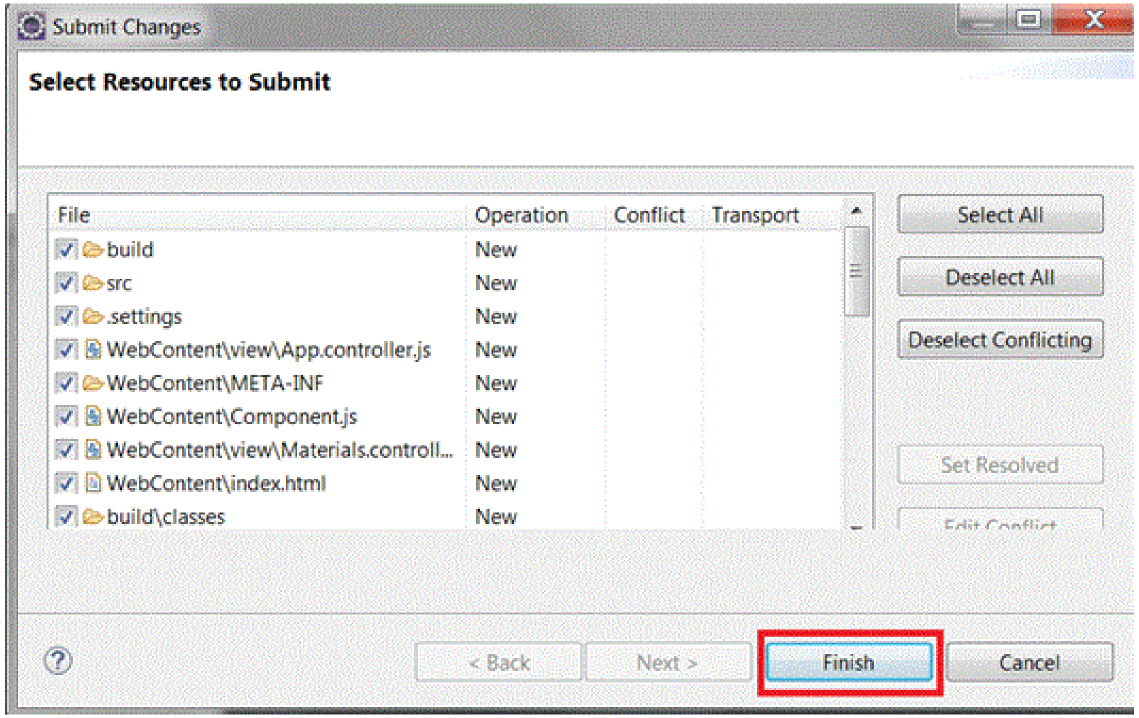

JAX-WS Web Services
Deployment Descriptor: HelloWorld
Java Resources
JavaScript Resources
build
> WebContent
> META-INF
> WEB-INF
> index.html

Figure 68
index.html context

After successful connection to the SAP system, the changes must be moved into the SAP system. Right-click the index.html context component (Project Name) under the WebContent folder. In the screen that opens (not shown), follow menu path MaterialList > Team > Submit.

After you click the Submit button, Eclipse displays the list of changes (**Figure 69**). Check for conflicting changes in the system and resolve any issues. If the changes are correct, click the Finish button to move the changes into the SAP system.



Submit Changes

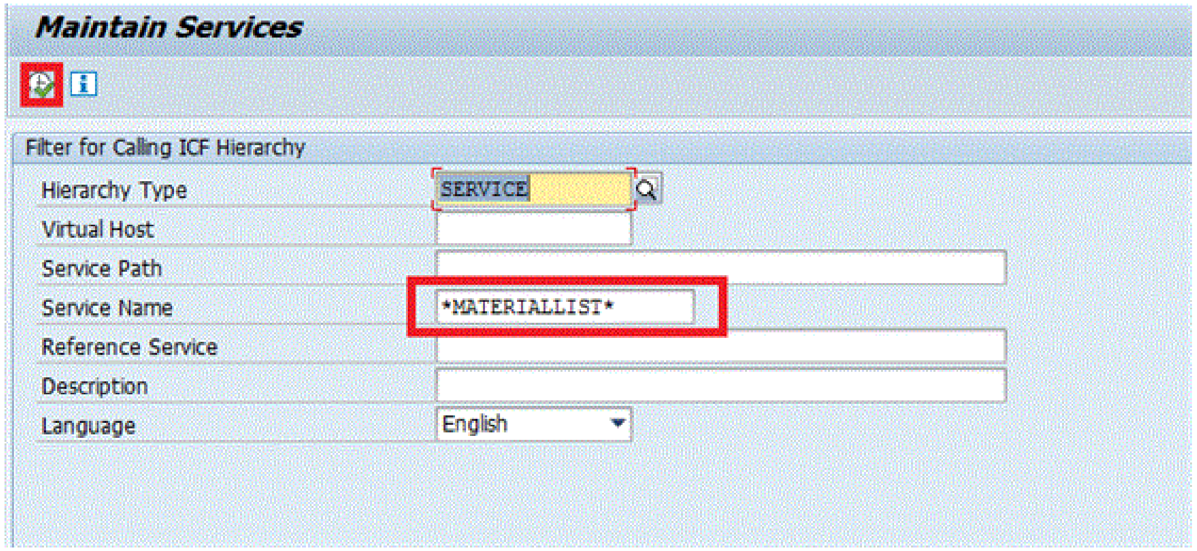
Select Resources to Submit

File	Operation	Conflict	Transport
✓ build	New		
✓ src	New		
✓ .settings	New		
✓ WebContent\view\App.controller.js	New		
✓ WebContent\META-INF	New		
✓ WebContent\Component.js	New		
✓ WebContent\view\Materials.controll...	New		
✓ WebContent\index.html	New		
✓ build\classes	New		

Figure 69
Submit Changes Select Resources to the Submit Changes pop-up window

Testing the SAPUI5 Application

To test the application, start transaction code SICF (HTTP Service Hierarchy Maintenance). In the screen that opens (**Figure 70**), fill in *MATERIALLIST* as the Service Name and click the execute icon.



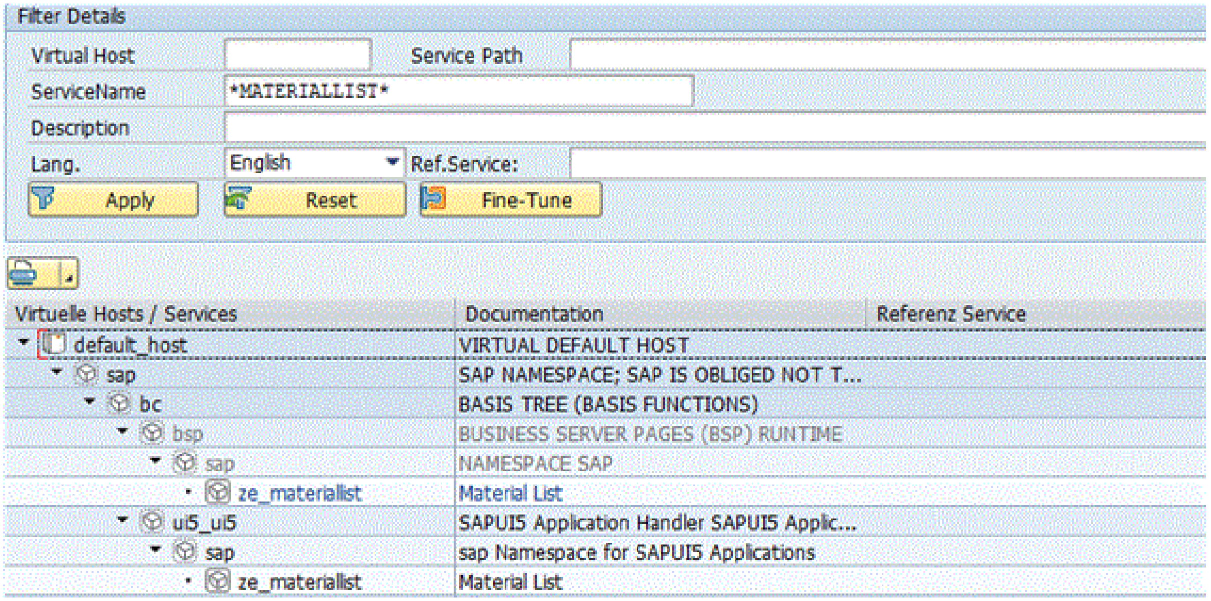
Maintain Services

Filter for Calling ICF Hierarchy

Hierarchy Type	SERVICE
Virtual Host	
Service Path	
Service Name	*MATERIALLIST*
Reference Service	
Description	
Language	English

Figure 70
Open the Maintain Services screen

The system returns a list of services that are already available (e.g., pre-defined standard services), as shown in **Figure 71**.



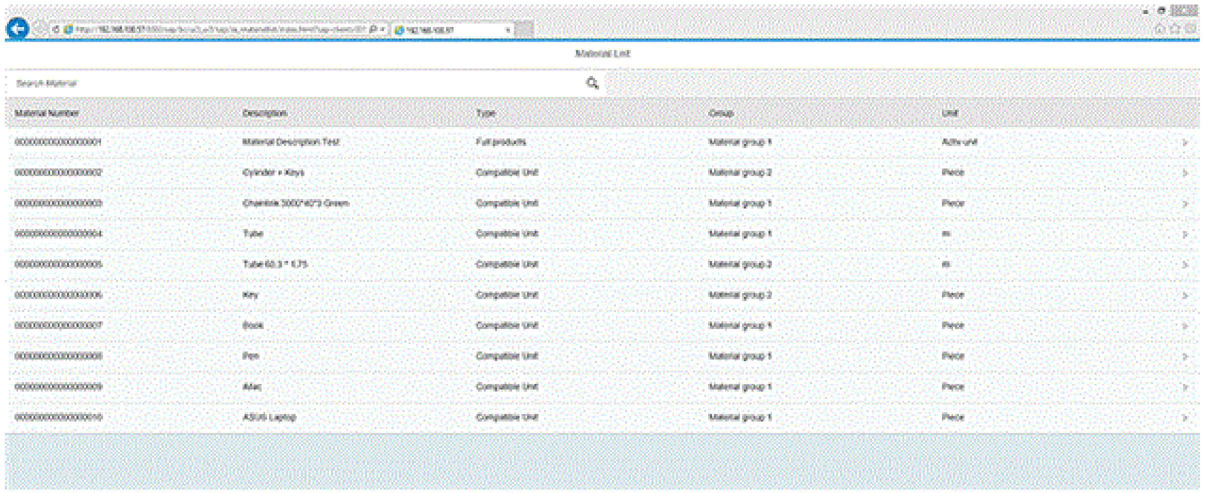
Filter Details

Virtual Host		Service Path	
ServiceName	*MATERIALLIST*		
Description			
Lang.	English	Ref.Service:	

Virtuelle Hosts / Services	Documentation	Referenz Service
default_host	VIRTUAL DEFAULT HOST	
sap	SAP NAMESPACE; SAP IS OBLIGED NOT T...	
bc	BASIS TREE (BASIS FUNCTIONS)	
bsp	BUSINESS SERVER PAGES (BSP) RUNTIME	
sap	NAMESPACE SAP	
ze_materiallist	Material List	
ui5_ui5	SAPUI5 Application Handler SAPUI5 Applic...	
sap	sap Namespace for SAPUI5 Applications	
ze_materiallist	Material List	

Figure 71

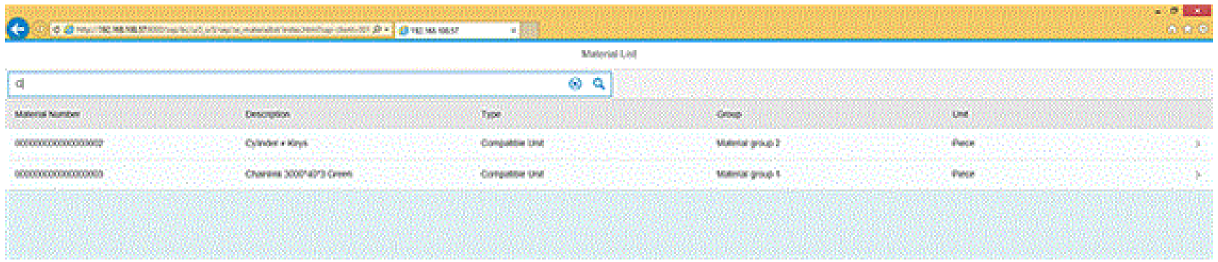
To test the application directly from the SAP system, right-click the ze_materiallist application and select the Test Service option from the context menu, which takes you to **Figure 72**. It shows a sample of the final application output.



Material Number	Description	Type	Group	Unit
000000000000000001	Material Description Test	Full products	Material group 1	Activ unit
000000000000000002	Cylinder + Keys	Compatible Unit	Material group 2	Piece
000000000000000003	Chainlink 3000*40*3 Green	Compatible Unit	Material group 1	Piece
000000000000000004	Tube	Compatible Unit	Material group 1	m
000000000000000005	Tube 60.3 * 6.75	Compatible Unit	Material group 2	m
000000000000000006	Key	Compatible Unit	Material group 2	Piece
000000000000000007	Book	Compatible Unit	Material group 1	Piece
000000000000000008	Pen	Compatible Unit	Material group 1	Piece
000000000000000009	Mac	Compatible Unit	Material group 1	Piece
000000000000000010	ASUS Laptop	Compatible Unit	Material group 1	Piece

Figure 72
Final application output

Now, the user can search for specific products. When the user types something in the Search Material field, only the products with that string are displayed. **Figure 73** shows the product string search results.



Material Number	Description	Type	Group	Unit
000000000000000002	Cylinder + Keys	Compatible Unit	Material group 2	Piece
000000000000000003	Chainlink 3000*40*3 Green	Compatible Unit	Material group 1	Piece

Figure 73
Product string search results

Lukas Dietzsch

Lukas M. Dietzsch is CEO at Blackyard Management Consulting, LLC. He holds

in 2001 and focused on SAP software development and architecture in 2007. He is SAP certified in various technologies and was involved in numerous global SAP rollouts with various SAP modules such as Logistics, ERP, SRM, MM, and FS-CM. Lukas has a proven expertise in adapting to requirements and processes in different industries and on various software platforms. Due to his knowledge and experience, Lukas frequently works as an SAP coach and trainer. You can follow him on Twitter #dietzslu.

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