



**PUBLIC**

SAP Cloud Platform OData Provisioning

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# OData Provisioning

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# 1 Overview

The SAP OData Provisioning is a function of SAP BTP which combines SAP Gateway capabilities for SAP Business Suite OData services in a Cloud context. In this documentation the short name OData provisioning is used.

OData Provisioning exposes business data and business logic as OData services on SAP Cloud, thereby enabling customers to run user-centric applications on SAP Cloud.

At present, within the SAP Cloud context, service registration for SAP Business Suite services is supported. Service registration is offered by OData Provisioning to register, activate, and maintain SAP Business Suite services.

OData Provisioning consists of several elements that are provided as a reusable service inside the SAP BTP. Connectivity towards data sources via back-end enablement, coming from the ABAP-based SAP Business Suite is one such capability.

## Use Cases

OData Provisioning will enhance its offering in the future and step into various use cases.

The OData Provisioning provides access to back-end services which are built based on the concepts of SAP Gateway, but OData Provisioning takes care of the publishing via the Cloud. Customers using OData Provisioning do not need to install an SAP Gateway hub system on-premise anymore. The installation of the non-modifying back-end-enablement components of SAP Gateway are sufficient. With a few clicks in the OData provisioning Administration, the services residing in the back-end are enabled and published in the Cloud.

## General Motivation for OData Provisioning

The Open Data Protocol (OData) has rapidly become the standard protocol for releasing data stored in SAP Business Suite applications and making it available for user-centric consumption on any device. In our digital world, users expect easy-to-use, responsive Web and mobile applications. SAP caters for the needs of a simplified user experience with SAP Fiori and SAP S/4 HANA, which use OData services to extract specific data that users can consume on engaging applications.

While the SAP HANA application server can publish OData natively, classic SAP Business Suite applications are reliant on SAP Gateway OData services to extract data from back-end systems.

SAP Gateway consists of two parts:

- SAP Gateway back-end enablement - SAP Gateway component in SAP Business Suite systems
- SAP Gateway hub (front-end server) - SAP Gateway component in a dedicated SAP Gateway system

The SAP Gateway component in SAP Business Suite back-end systems gathers data from the back-end system while the SAP Gateway hub component converts the data from an SAP proprietary format into the OData standard so that users can consume the data easily via the user interface.

## **SAP Gateway hub as front-end server: On-premise**

In an On-premise scenario, customers host both SAP Business Suite systems and the SAP Gateway hub (front-end server) in their own system landscape. However, this means that the customers are responsible for:

- Upgrading the front-end server to the newest SAP components
- Manually sizing the systems and scaling them for the peak load – meaning that the systems are often not utilized efficiently
- Monitoring system downtimes
- Monitoring security and preventing hacker attacks
- Exposing data from OData services for consumption in the cloud

## **OData Provisioning as front-end server: OnDemand**

For customers concerned by the implications of an on-premise SAP Gateway hub installation, OData Provisioning offers a much simpler solution for exposing back-end data and making it available for consumption in the cloud. The SAP Gateway hub component is hosted on the SAP BTP meaning that SAP safeguards secure operation and runtime aspects of OData provisioning including:

- Upgrading the front-end server to the newest SAP components
- Cloud elasticity ensuring the best performance for customers
- Lowering TCO: the systems are often not utilized efficiently when operated in a customer's data center, as they need to be sized for peak loads
- Exposing the exposed OData services to the cloud using the SAP Cloud Connector
- System administration and monitoring tasks
- Security monitoring
- Serves as the basis for products like SAP Fiori or SAP Mobile Services

## **Conclusion**

OData Provisioning ensures customers run simpler by greatly streamlining the way in which SAP Gateway OData services are exposed to SAP BTP. In essence, it replaces the need for an SAP Gateway hub (front-end server) in the cloud and thereby reduces the total cost of ownership and shifts responsibility for many maintenance and security tasks from the customer to SAP. OData Provisioning is an option for using other SAP cloud services such as SAP Fiori Cloud Edition.

## Related Information

[Overview \[page 3\]](#)

[Administration \[page 10\]](#)

[SAP BTP Cockpit](#)

[SAP Gateway](#)

1830712 

## 1.1 Supported Features

This topic enlists the OData features that SAP OData Provisioning supports.

OData Feature	Status
Create	Supported
Read	Supported
Update	Supported
Delete	Supported
Query	Supported
System query options: \$orderby, \$skip, \$top, \$select, \$expand, \$inlinecount, \$count, \$filter, \$skiptoken and \$format.	Supported
Function imports	Supported
Navigation	Supported
Delta token	Supported
Tombstone	Supported
Complex types	Supported
\$batch	Supported
Deep insert	Supported via single post operation and also through \$batch request using Content ID Referencing
Custom query options	Not supported
\$link	Not supported
Function import	Supported
\$value (media links/attachments)	Supported
ETags/concurrency control	Supported
<b>\$filter Details</b>	

OData Feature	Status
String functions	Partially supported
<ul style="list-style-type: none"> <li>• Supported: <ul style="list-style-type: none"> <li>• bool substringof(string p0, string p1)</li> </ul> </li> <li>• Not supported: <ul style="list-style-type: none"> <li>• string trim(string p0)</li> <li>• string concat(string p0, string p1)</li> <li>• int length(string p0)</li> <li>• int indexof(string p0, string p1)</li> <li>• string replace(string p0, string find, string replace)</li> <li>• bool endswith(string p0, string p1)</li> <li>• bool startswith(string p0, string p1)</li> <li>• string toupper(string p0)</li> <li>• string substring(string p0, int pos)</li> <li>• string substring(string p0, int pos, int length)</li> <li>• string tolower(string p0)</li> </ul> </li> </ul>	
Logical operators	Supported
Date functions	Not supported
Math functions	Not supported
Arithmetic operators	Not supported
Type functions	Not supported
\$filter supported on complex type properties within an entity	

### i Note

Currently, we only support two types of Authentication to connect to the back-end system :

- Basic Authentication
- Principal Propagation

For other related constraints, see [1830712](#) 🗨️

## 1.2 Runtime Features

This topic enlists the runtime features that SAP OData Provisioning supports.

- [SAP Performance Statistics \[page 7\]](#)
- [Standalone Annotations \[page 9\]](#)

## 1.2.1 SAP Performance Statistics

### SAP Performance Statistics for OData Requests

You can access SAP performance statistics from the SAP OData Provisioning framework for each OData request. To obtain the SAP performance statistics, you can add "?sap-statistics-hciodp=true" or "?sap-statistics=true" at the end of the request URL, regardless of whether it is an HTTP method of type GET, POST, PUT, or DELETE. Alternatively, you can enter (name=sap-statistics-hciodp or name=sap-statistics, value=true) in the HTTP request header. The setting in the URL is treated with higher priority than the setting in the HTTP header.

The OData Provisioning framework provides the performance statistics to the consumer in the HTTP response header in the following format:

- HTTP Header Name: sap-statistics-hciodp
- HTTP Header Value: total, fw, app, gwttotal, hciodp, nwoh, gwbe, gwapp, gwnongw, gwbewait, gwappsum

#### i Note

gwbewait and gwappsum parameters are available from SAP Gateway 2.0 SP 12 of IWBEP in SAP back-end system.

The description of HTTP header values is given in the table below:

HTTP Header Values

HTTP Header Value	Description
total	Total processing time for executing an OData request between OData Provisioning and back end.
app	Time consumed by implementation of the Gateway service in back-end system (in IWBEP model provider and data provider classes).
gwttotal	Same as total.
hciodp	Processing time taken by OData Provisioning on SAP BTP.
nwoh	Network overhead for communication between OData Provisioning and back-end system. It indicates the time lost on the network
gwbe	Processing time taken by SAP Gateway framework in back-end system (without app time).
gwapp	Same as app.

HTTP Header Value	Description
fw	The sum of times spent on the hub system (hciodp), in the back end (gwbe), and the network overhead (nwoh).
gwnongw	Time consumed by components other than SAP Gateway (for example, Read Access Logging(RAL), Excel-format).
gwbewait	Waiting time in SAP Gateway framework in back-end system when batch parallelization is used.
gwappsum	Sum of all processing times in app (data provider) when batch parallelization is used.

### i Note

Due to SAP security policy, OData Provisioning provides performance statistics only if the OData request is processed successfully.

## SAP Performance Statistics for SAP Cloud Connector Configurations

To obtain performance statistics for SAP Cloud Connector, you can add "?sap-statistics-hciodp=true" or "?sap-statistics=true" at the end of the request URL. You can also enter (name=sap-statistics-hciodp or name=sap-statistics, value=true) in the HTTP request header. In addition to this, to get the cloud connector headers back in response, you need to add "sap-statistics=true" to the URL of destination configuration in SAP BTP.

The OData Provisioning framework provides the performance statistics for cloud connector configurations in the HTTP header in the following format:

- HTTP Header Name: `sap-statistics-scc`
- HTTP Header Value: `total`, `ext`, `openRemoteConn`

HTTP Header Values

HTTP Header Value	Description
total	Total Time consumed by the SAP Cloud Connector component
ext	Time used in components to call other sub-components (that is, time spent in remote connection and execution)
openRemoteConn	Time consumed in opening the connection



## 1.2.2 Standalone Annotations

Standalone annotation feature of SAP Gateway enables you to create an annotation model that is independent in nature and can be assigned to any number of relevant OData services. OData Provisioning provides support for provisioning of standalone annotation models created using SAP Gateway Service Builder with project type *Annotation Model for Referenced Service*.

### i Note

As a prerequisite, to access the data related to annotation models via catalog service URL, you need to register the referenced OData service. If it is already registered, ensure that you clean the metadata cache and reload the metadata by opening the service document for that service.

You can access data related to annotation models via catalog service URL with the following URL patterns:

- List of available stand-alone annotation models  
**`https://<hostname>/CATALOGSERVICE;v=2/Annotations`**
- Read of annotations  
**`https://<hostname>/CATALOGSERVICE;v=2/Annotations(TechnicalName='<some annotation model retrieved from the list of annotations>',Version='1')`**
- Accessing the annotation file corresponding to the specified annotation  
**`https://<hostname>/CATALOGSERVICE;v=2/Annotations(TechnicalName='<some annotation model retrieved from the list of annotations>',Version='1')/$value`**

## Related Information

[Create Standalone Annotation Using SAP Gateway Service Builder](#) 

[Creating a Service Builder Project](#)

[Referencing a Service to Annotate a Model](#)

## 1.3 Accessibility Features in OData Provisioning

To optimize your experience of SAP OData Provisioning, we provide features and settings that help you use the software efficiently.

### i Note

SAP OData Provisioning is based on SAPUI5. For this reason, accessibility features for SAPUI5 also apply. See the accessibility documentation for SAPUI5 on SAP Help Portal at [Accessibility for End Users](#).

For more information on screen reader support and keyboard shortcuts, see [Screen-Reader Support for SAPUI5 Controls](#) and [Keyboard Handling for SAPUI5 Elements](#).

## 2 Administration

Introduction to administration aspects of SAP OData Provisioning.

*OData Provisioning Administration* is the central UI for all administrative tasks for OData Provisioning. Currently, OData Provisioning Administration allows you to register and activate SAP Business Suite services on SAP Cloud. OData Provisioning provisions the following activities:

- Manage registrations of the SAP Business Suite services
- Activation and deactivation of the registered services

### i Note

Every OnPremise URL (of the SAP Business Suite system) configured in OData Provisioning must be whitelisted in SAP Cloud connector (SCC). For more information, see [Configuring HTTP Destinations](#).

## User Administration and Authentication

Define the authentications in the front-end or client applications. For more information, see .

## Authorizations and Roles

Authorization in OData Provisioning determines access to the applications. This is based on an authorization concept that enables an administrator to assign authorizations to users. The assigned authorizations determine the actions that users can perform after they have been authenticated. For information on the roles required, see .

## More Information

- [Initial Configuration \(HTTP\)](#)

## 2.1 Getting Started

An overview on how to get started with OData provisioning is explained here.

Get started with OData provisioning following the below steps:

- [Access Administration \[page 11\]](#)
- [Manage Destinations \[page 12\]](#)
- [Register Services on Administration \[page 13\]](#)

### 2.1.1 Prerequisites

OData Provisioning Administration allows you to register and activate SAP Business Suite Services on SAP Cloud.

- Get the SAP Cloud account. For more information, see [Getting Started with a Customer Account in the Cloud Foundry Environment](#).
- If your SAP back end is based on SAP NetWeaver 7.02, and the IW\_BEP component version is SP 06 or lesser, implement the note [1816779](#). IW\_BEP 200 component is required to enable SAP Services as OData services on OData Provisioning.
- If your SAP back end is based on SAP NetWeaver 7.40, and the SAP\_GWFND component is on SP 02 or lesser, implement the note [1816779](#).
- The connectivity API supports Principal Propagation with latest cloud connector version SAP DB Control Center 2.8.0.1 or above.  
Install [Cloud Connector](#) and perform the necessary configurations for connecting to the on-premise back-end system. For more information, see [Cloud Connector](#)
- Assign roles to an individual or a group of users. For more information, see .

### 2.1.2 Access Administration

Get the URL to access [OData Provisioning Administration cockpit](#) (Administration)

#### Prerequisites

You should have authorization to access Administration. For more information, see .

## Context

To register SAP Business Suite services on SAP BTP, you first need access to the [Administration](#). This is the central entry point for all service activation and registration steps for backend enablement.

## Procedure

1. Log on to the and choose [Subscriptions](#).
2. From, the services list, choose ► [OData provisioning](#) ► [Subscribe](#) ► to enable the OData provisioning service.
3. You must assign roles to users before launching the application. See .
4. Choose [Go to Application](#) to open [OData Provisioning Administration](#).

## 2.1.3 Manage Destinations

You can use the Destinations editor in to configure HTTP destinations to connect to an on-premise back-end system via HTTP(S).

## Context

Create a destination in the Destinations editor in the , see [Create HTTP Destinations](#).

## Procedure

1. **Creating Destinations** - Destinations are part of SAP Cloud configurations, generally used for the outbound communication of an SAP Cloud application to an SAP system. They contain the connection details for the remote communication of an application. Use the Destinations editor in the to configure HTTP destinations to connect your Web application to the Internet or make it consume an on-premise back-end system via HTTP(S). For more information, see [Create HTTP Destinations](#) .

### i Note

The destination URL should be of the SAP Business Suite system where the service implementations are present. Here is the generic URL: **`https://<hostname>:<port>/sap/iwbep?sap-client=<client number>`**. Hostname, port, and client number depends on the system you are using.

To get the destination URL:

1. In transaction SICF, choose [Execute \(F8\)](#) to display the service tree hierarchy.

2. Expand the default host and navigate to the node IWBEP (|▶ *default\_host* ▶ *sap* ▶ *iwbep* ▶).
3. In the context menu of the node *iwbep*, choose *Test Service* and click *Allow* in the pop-up window. The URL you get in the address bar of the browser is the destination URL.

2. Navigate to your subaccount.
3. Select |▶ *Connectivity* ▶ *Destinations* ▶
4. If you want to create a new destination, choose *New Destination*; or if you want to import a destination, choose *Import Destination*.

#### **i** Note

When you add a new destination, ensure you choose *New Property* and provide an additional property `odc` with value `true`.

## 2.1.4 Register Services on Administration

This section provides information on how to register SAP Business Suite services on SAP Cloud via OData Provisioning Administration.

### Context

You can register and activate the services on Administration, thereby exposing SAP Business Suite data as OData service on SAP Cloud.

#### Prerequisites

- You have a signed certificate with a private key in your tenant environment in the OData provisioning system.
- Established trust using SAP assertion tickets from the back-end system to the OData provisioning system based on the signed certificate.
- You have access to OData Provisioning Administration. For more information, see .
- You have created destinations. For more information, see .

### Procedure

1. **Registering a Service** - Once the destination is created, you can register an SAP Business Suite service. The service registered is activated by default.
  - a. In OData Provisioning Administration, go to *Services* and choose *Register*.
  - b. Choose a destination from the *Select Destination* dropdown list.
  - c. Enter a service name in the *Search Services* field and choose search.

### i Note

To get the list of SAP Business Suite services:

1. Log on to SAP Business Suite system and go to transaction *SPRO*.
2. Open the SAP Reference IMG and navigate to: [SAP NetWeaver](#) > [Gateway Service Enablement](#) > [Backend OData Channel](#) > [Service Deployment for Backend OData Channel](#) > [Display Models and Service](#).

- d. Select the service from the list and click *Register*.

The service is registered and displayed in the *Registered Services* screen. A service document URL to access the OData service is displayed under the *Service Document* column.

### i Note

If you want to access OData services exposed via OData Provisioning Administration using OAuth based authentication, you need to create/register your own OAuth client. For more information, see [Enabling OAuth 2.0 Client Credentials Grant](#).

2. Assigning destinations for the registered service:
  - a. Choose the registered service in the *Registered Services* screen to go to the *Service Entry Details* screen.
  - b. Under *Destination*, choose *Assign Destination* and select a destination from the list.
  - c. Choose *OK*. The destination added should be displayed. You can add multiple destinations for the service by following the same procedure.

### i Note

The destination selected while registering the service is set as the default destination. To change the default destination, choose the destination you want to set as default and click *Set As Default*.

## Related Information

[Multi Origin Composition \[page 15\]](#)

[Enable and Disable Metadata Validation \[page 16\]](#)

## 2.2 Multi Origin Composition

Multiple Origin Composition (MOC) is the ability to collect data from different back-end systems, aggregate them in one single service and updating different back-end systems while using the same user. You can also execute a \$batch request with multi origin composition.

### Prerequisites

Assign multiple destinations to a service in the OData Provisioning Administration to effectively fetch data from multiple back-end systems.

#### URL Patterns

- For a QUERY (READ feed) Request  
`http://<hostname>/odata/<namespace>/<servicename>;<version>;mo/<entityset>`
- For a \$batch Request  
`http://<hostname>/odata/<namespace>/<servicename>;<version>;mo/$batch`

#### i Note

Append the URL with ';mo', else only the default system data is fetched.

### Error Tolerance

In a Multi-Origin Composition scenario, while fetching data from multiple destinations, if one or more of those destinations cause an error, then the entire response returns that error. By default, services registered in OData provisioning are **not** error tolerant. This feature provides you a configuration to make a service error tolerant so that it can handle such errors in case of multi origin scenarios.

When you make a service error tolerant, its behavior changes in the following way:

- An error is returned only if the data retrieval from all back-end systems causes an error. Otherwise if only some of the back-end systems causes an error a feed is returned to the client.
- The data retrieved successfully from some of the back-end systems is composed into that feed.
- The data from the back-end systems that caused an error can be requested again using the OData skiptoken added to that feed.

#### URL Pattern Examples

- For a single failed destination, the skiptoken URL would look like:  
`<link href="<EntitysetName?>  
$skiptoken=MISSING_DATA_FROM_<number_of_destinations>_<failed_destination_name>  
rel="next" />`
- In case of multiple failed destinations, the destination names are separated by a semicolon (;), and each of the destination names is prefixed with total number of destinations assigned to the service followed by an underscore(\_).

For example, if 3 destinations are assigned to a service out of which two destinations - DEST1 and DEST2 fail to return any data, then the skiptoken URL in the response would look like:

```
<link href="ProductCollection?$skiptoken=MISSING_DATA_FROM_3_DEST1;3_DEST2
rel="next"/>
```

- You can fetch data from a single or multiple failed destinations by appending the skiptoken to you service root URL.
  - For example, to fetch data from the failed destination DEST2:  
**https://<http://<hostname>/odata/<namespace>/<servicename>;<version>/ProductCollection?\$skiptoken=MISSING\_DATA\_FROM\_3\_DEST2**
  - To fetch data from multiple failed destinations DEST1 and DEST2:  
**https://<http://<hostname>/odata/<namespace>/<servicename>;<version>/ProductCollection?\$skiptoken=MISSING\_DATA\_FROM\_3\_DEST1;3\_DEST2**
- In case, any of the destinations still fail to return data, then the response will contain a skiptoken for that destination.

To access this functionality, ► [Choose a registered service to open its Service Details](#) ► [Under Error Tolerance, choose Activate or Deactivate as applicable](#) ►

## 2.3 Enable and Disable Metadata Validation

Enable and disable metadata validation for a registered service.

### Prerequisites

You should have a service registered in the Administration. For more information, see [Register Services on Administration \[page 13\]](#).

### Context

- You can enable or disable metadata validation for a registered service at subscription level only.
- By default, metadata validation is **inactive** for registered services.

For example, consider a scenario where you have activated metadata validation, and the ABAP type defined in the backend for a property (of an entity) supports length greater than the length of the edm type defined in the metadata for the same property. In such a case, modify requests like PUT or POST result in metadata validation error "Bad request payload or mapping error". To avoid an error in such scenarios, you may deactivate the metadata validation.

#### i Note

In the above mentioned scenario, if metadata validation is inactive but the back end does input validations, a modify request might still result in an error. Hence, it is recommended to have the length of the edm properties same as the length of the corresponding back-end (ABAP) properties.



## Procedure

1. In *SAP BTP Cockpit* application, choose *Services* from the navigation pane on left, and choose *OData provisioning* tile.
2. Choose *Go to service* under *Service Description* section.
3. Choose *Metadata* from navigation pane on the left in the *OData Provisioning Administration* application.
4. Under *Metadata Validation Setting*, choose *Activate* or *Deactivate* as applicable.

# 3 Operations

This section provides operations information for SAP OData Provisioning.

When designing, implementing, and running OData services which are based on OData Provisioning within the SAP BTP, an optimal performance 24 hours a day as well as seamless operations are of vital importance.

Since OData Provisioning is a feature of the SAP Cloud, all operational functions offered by SAP BTP are applicable.

In addition, *OData Provisioning Administration Cockpit* also offers functions for error analysis.

## 3.1 Manage Metadata Cache

SAP OData Provisioning allows caching of metadata, which significantly improves performance.

### Context

#### i Note

By default, metadata caching is active at subscription level.

To activate or deactivate the cache for metadata:

### Procedure

1. Choose *Metadata* from the navigation pane on the left in *OData Provisioning Administration* application.
2. Under *Metadata Cache Setting*, choose *Activate* or *Deactivate* as applicable.

If you have activated metadata cache, then by default, *Destination-based metadata caching* is selected or enabled. Enabling this setting fetches and caches the service metadata from a default or specific destination on the first request. All subsequent calls to the service for this destination uses the cached metadata.

Disable destination-based caching only if the metadata for a registered service is the same across all the destinations. This is applicable for all the registered services. So, in effect, disabling this setting fetches and caches the service metadata from any available destination on the first request. All subsequent calls to the service uses the cached metadata. A typical scenario where disabling this setting becomes useful is when you have users who do not have access to all destinations, especially those destinations that are set as the default or the metadata default.

### i Note

Enabling or disabling this setting first clears any existing cache.

## 3.2 Clean Metadata Cache

This feature allows you to clean up the metadata cache for registered OData services.

### Prerequisites

Metadata cache cleanup requires the metadata cache to be active.

### i Note

- If the timestamp for the service (under Metadata Cache Cleanup section) is older than the last changed time of the metadata provider class, it indicates that the metadata available for your service is outdated. Then, you have to explicitly clear the metadata cache.
- Cleaning the cache for a service also clears the cache for all the destinations assigned to that service.

### Context

To perform a cleanup of the metadata cache:

### Procedure

1. In *OData Provisioning Administration*, choose *Metadata* from the Navigation pane on the left.
2. Under *Metadata Cache Cleanup*, select the service from the list and choose *Clear*, or choose *Clear All* to clear metadata cache for all services.

## 3.3 Troubleshooting

Description of **OData Provisioning Administration Troubleshooting** tab.

### Context

The main purpose of the *Troubleshooting* tab is to analyze the root cause for errors wherever they happen (in Java or in the SAP Business Suite system). This is achieved by providing access to monitoring and error data of the respective data sources.

*Troubleshooting* is explained below with an example service **TEA\_TEST\_APPLICATION**.

#### i Note

If you are not able to analyze the error or not able to solve it, create a message in the BCP Customer Support System and provide the error details (follow step 2 of the procedure).

### Prerequisites

Register the service **ERROR\_LOG\_SRV** in the *OData Provisioning Administration* to get the SAP backend error information.

### Procedure

1. Follow the procedure below to simulate an error (step 1 is just for your reference, you can start troubleshooting (step 2) if you already have an error):
  - a. Register a service, for example, **TEA\_TEST\_APPLICATION**. For more information, see [Register Services on Administration \[page 13\]](#).

#### i Note

You must assign the right destination for the SAP Business Suite services you are registering. This is important to register the services successfully and to get the SAP backend error information in case of errors.

- b. Open the service document of the **TEA\_TEST\_APPLICATION** service.
  - c. Navigate to the *ErrorCases* collection and execute a URL for a single error case to simulate an exception. For example, **/odata/IWBEP/TEA\_TEST\_APPLICATION;v=1/ErrorCases('BUSI')**
2. When there is an error, you can start troubleshooting under *Error Log Entries*.
3. Select *From* and *To* dates to display errors generated in a particular time frame.
4. Choose *Search*. Errors occurred are displayed under *Error Log Entries*.
5. Select a *Transaction ID* URL to view details of an error.
6. In the *Application Log Entry* tab:
  - a. Expand *Service Details* to view the error details.

- b. Expand *Log Entry* to view log details.
  - c. Expand *Stack Trace* to view Java error stack trace.
7. Click *Backend Log Entry* tab to view backend error log information. If there is no error in the backend but only in the Java stack, *Backend Log Entry* tab is not displayed.
8. To see the error context information:
  - a. Copy the *Transaction ID* of the error.
  - b. Log in to your backend system and use transaction */IWBEP/ERROR\_LOG* to open the backend error log.
  - c. Filter for the copied transaction ID.
  - d. Double-click the transaction ID to display the *Error Context* section.
  - e. Click *Call Stack* to display the *Call Stack* screen.
  - f. From the *Call Stack* screen, you can navigate to the source code and set a breakpoint to see what went wrong.

# 4 Security

In this section, security aspects of SAP OData Provisioning are explained.

OData Provisioning security information describes the set of policies, technologies, and controls that are applicable specifically to SAP Gateway to protect data, applications, and their associated infrastructure within the SAP BTP environment.

This OData Provisioning security guide provides information about security aspects, including the following:

- Authentication
- Authorizations
- Cross-Site Request Forgery Protection
- Assigning User Roles
- Technical System Landscape

OData Provisioning runs on SAP BTP, for this reason, all security requirements for SAP BTP are also applicable for OData Provisioning.

## Data Protection and Privacy

Enable Read Access Logs for personal sensitive data in the back-end system. For more information, refer to SAP Note [2182094](#) and see [Read Access Logging \(RAL\) and OData V2](#).

## Related Information

[Recommendations for Secure Setup](#)

[Authorization and Trust Management in the Cloud Foundry Environment](#)

## 4.1 User Administration and Authentication

Authentication of users in SAP OData Provisioning is done using the authentication methods supported by SAP BTP, which uses the Security Assertion Markup Language (SAML) 2.0 protocol for both authentication and single sign-on.

OData provisioning security implementation spans across different systems, consumer's applications, SAP BTP, SAP Cloud Connector, existing SAP systems, and an identity provider.

SAP OData Provisioning supports identity and access management scenarios supported by SAP BTP. Each system and component must be configured to ensure that users' access to applications are restricted only to those who are authorized. The configurations for authentication can be defined into two main areas:

- Front-end or client applications.  
In front-end authentication, users interact with applications and provide their credentials in a target identity provider (IdP) system.
- Existing SAP system (back-end)  
On successful authentication and authorization, the users' requests proceed further to the SAP system.

### **i Note**

To enable Principal Propagation between SAP OData Provisioning and back-end system, you must configure the components. For reference, see [Set Up Trust for Principal Propagation](#)

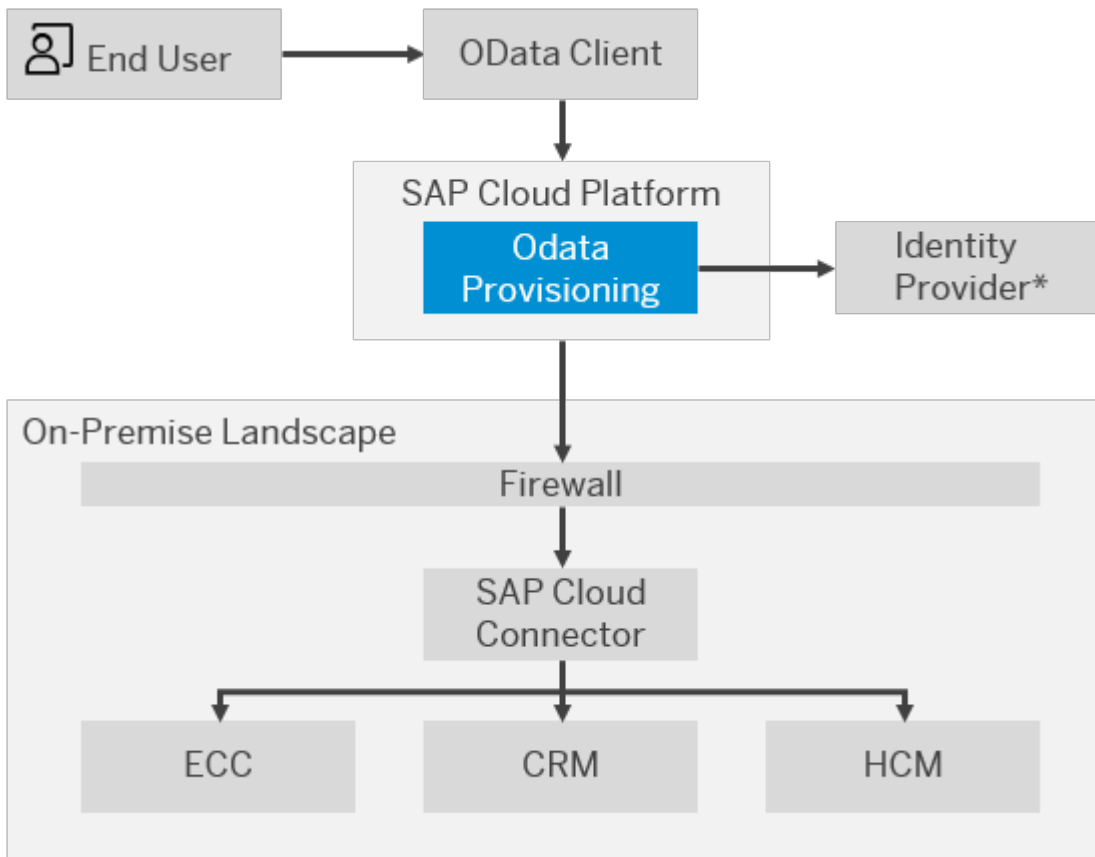
## **Related Information**

[Authorization and Trust Management in the Neo Environment](#)

## **4.2 Technical System Landscape**

This section provides information on the system landscape for OData Provisioning.

The following figure shows an overview of the technical system landscape for OData Provisioning.



The identity provider can be your corporate identity management system or the SAP ID service. Depending upon the choice of identity provider, its location may be within the on-premise landscape or outside of it.

## Related Information

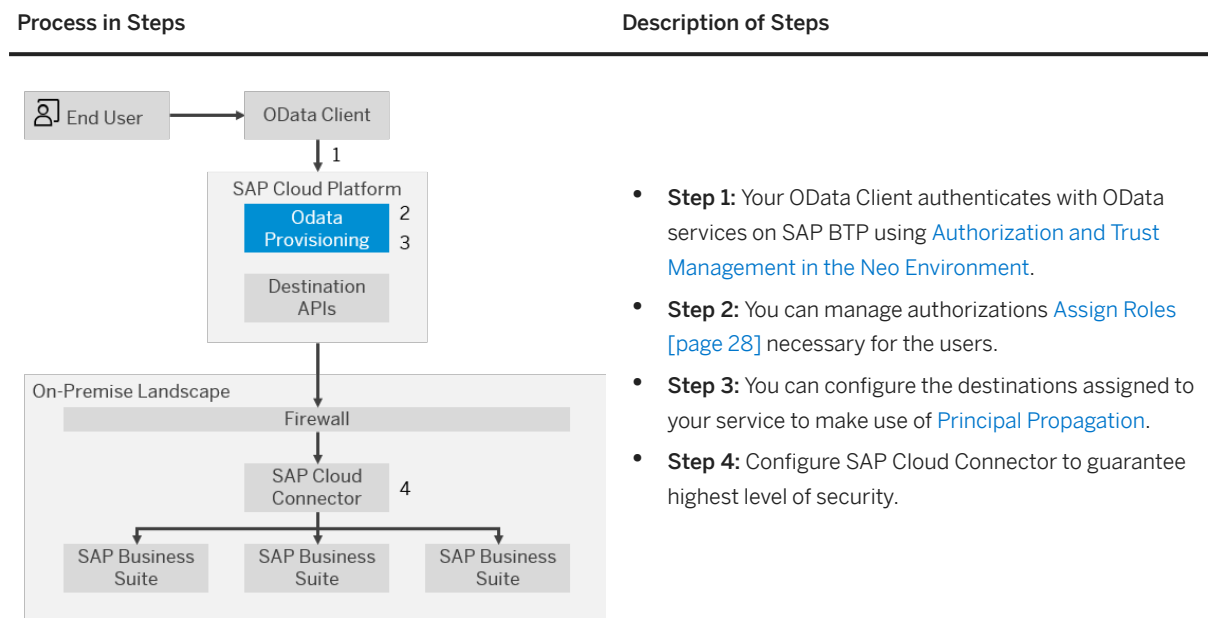
[Security on SAP BTP](#)

## 4.3 Security Aspects of Data, Data Flow, and Processes

This section provides information on the flow of data and processes, and associated security aspects.

The following figure shows an overview of the runtime flow for OData requests in OData Provisioning.





## 4.4 Data Protection and Privacy

Data protection is associated with numerous legal requirements and privacy concerns. In addition to compliance with general data protection and privacy acts, it's necessary to consider compliance with industry-specific legislation in different countries.

SAP provides specific features and functions to support compliance with regard to relevant legal requirements, including data protection. SAP doesn't give any advice on whether these features and functions are the best method to support company, industry, regional, or country-specific requirements. Furthermore, this information must not be taken as advice or a recommendation regarding additional features that would be required in specific IT environments. Decisions related to data protection must be made on a case-by-case basis, considering the given system landscape and the applicable legal requirements.

SAP BTP, OData Provisioning doesn't store any private data.

### → Remember

For provisioning an OData API, enable Read Access Logs for sensitive data in the back-end system.

### i Note

SAP doesn't provide legal advice in any form. SAP software supports data protection compliance by providing security features and specific data protection-relevant functions. In many cases, compliance with applicable data protection and privacy laws will not be covered by a product feature. Definitions and other terms used in this document aren't taken from a particular legal source.

### ⚠ Caution

The extent to which data protection is supported by technical means depends on secure system operation. Network security, security note implementation, adequate logging of system changes, and appropriate

usage of the system are the basic technical requirements for compliance with data privacy legislation and other legislation.

## Related Information

[Security](#)

## 4.5 Auditing and Logging Information

Here you can find a list of the security events that are logged by OData Provisioning.

### i Note

As the OData Provisioning does not handle personal data, no Audit Log events are generated.

Security Events Written in Audit Logs

Event grouping	What events are logged	How to identify related log events	Additional information
Authentication Failure	Authorize User access	<request> unauthorized <user>	
Clean up tasks on unsubscribe	Delete existing Account or Service	delete-account-data-done, Deletion of data for <account-id> completed data-termination  delete-account-data-failed, Deletion of data for <account-id> failed. Reason for failing the deletion is <exception message> data-termination	
Repository Services	Create a Service	Create Service <service name>-<service namespace>-<service version>	
	Update a Service	Update Service <service name>-<service namespace>-<service version>	
	Delete a Service	Delete Service <service name>-<service namespace>-<service version>	

## Related Information

[Audit Logging in the Cloud Foundry Environment](#)

[Audit Logging in the Neo Environment](#)

## 4.6 Session Security Protection

There are many types of session-based attacks, such as, impersonation, where a malicious user attempts to access another user's session by posing as that user.

These types of attacks require that the malicious user obtains a valid session identifier, as this is the minimum amount of information required for identification.

## Cross-Site Request Forgery Protection

Applications using SAP OData Provisioning must use CSRF (Cross-Site Request Forgery) protection whenever making a modifying request (example: POST/PUT/DELETE requests).

This will work in the following way:

- Call a non-modifying (GET/HEAD) request with the header **X-CSRF-Token** with value **Fetch**. OData provisioning generates a CSRF token and sends it back in the HTTP response header field X-CSRF-Token.
- Call the consequent modifying requests with the header X-CSRF-Token and value as returned in the response header of the GET/HEAD call.  
The framework checks the validity of the CSRF token for all modifying requests.
  - In case a valid CSRF token is sent, the validation succeeds and normal processing continues.
  - If the validation fails, an HTTP status code 403 (Forbidden) is sent back.
  - If any internal errors occur during CSRF token retrieval or validation, an HTTP status code 500 (Internal server error) is sent back.

### i Note

A valid CSRF token is not included in the response of a failed request.

## 4.7 Authorization

Authorization in SAP OData Provisioning determines access to applications. This is based on an authorization concept that enables an administrator to authorize users.

The assigned authorizations determine the actions that users can perform after they are authenticated.

## Roles

To access *OData Provisioning Administration*, you must assign the following predefined application roles:

- **GW\_Admin**: use this role to assign a user with administrator permissions.
- **GW\_User**: use this role to assign a user or a group of users with application permissions.

To leverage existing user attributes in your enterprise IdP, SAP BTP has a concept of user groups, in which users can automatically be assigned to a group. For more information on how to assign roles to users, see [Assign Roles \[page 28\]](#).

## Related Information

[User Administration and Authentication \[page 22\]](#)

[Session Security Protection \[page 27\]](#)

## 4.8 Assign Roles

Assign roles to an individual or a group of users.

### Context

To access *OData Provisioning Administration*, you must assign roles to users.

### Procedure

1. Choose *Services* from the navigation pane on the left in SAP BTP cockpit.
2. Choose *OData provisioning* tile.
3. Choose *Configure OData provisioning* under *Service Configuration* section.
4. Under the *Roles* section, select the role you want to assign.
5. Choose *Assign* in *Individual Users* section. You can also assign roles to a group of users by choosing *Assign* in the *Groups* section.
6. Enter the *User ID* of the respective user(s), and choose *Assign*.

# 5 Glossary

Terminology overview for SAP OData Provisioning.

The following provides an overview of the main terms and their definition as used in OData Provisioning:

Terms and Definitions

Terms	Definitions
OData Provisioning Administration	User interface for registering and activating SAP Business Suite services.
Backend Enablement	Connectivity function to enable registration and activation of OData services from a back-end system, such as the SAP Business Suite
Open Data Protocol (OData)	A Web protocol for querying and updating data. It applies and builds upon standard Web technologies such as HTTP, Atom Publishing Protocol, and JSON to provide access to information from a variety of applications. For more information, see <a href="#">OData</a> .
OData model	Root entity that represents a self-contained business object defining a people-centric view on respective business information. The nodes of this hierarchy are called entity types. For more information, see <a href="#">OData</a> .
OData metadata document	Complete XML representation of an OData model.
OData service	Service implementation used to extract data from an SAP system based on an OData model. Is a repository object used for routing (system aliases are assigned to a service) and authorization checks. It has a dedicated ICF node and can contain one or more OData models.
Service	SAP Business Suite services which can be converted into OData services using OData Provisioning Administration.

## Related Information

[SAP Terminology Database](#)



[OData](#)

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