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SAP SuccessFactors API Reference Guide (OData V4)



1 About the OData API Reference Guide (V4)

The Open Data Protocol (OData) is a standardized protocol for consuming REST APIs. SAP SuccessFactors HCM suite provides a variety of OData APIs for customers to build their extensions and integrations. In this guide, you'll learn how to work with OData v4 APIs in SAP SuccessFactors HCM suite and what services we currently offer.

New and Improved Features in OData V4

Note

The following features are supported in the standard OData v4 protocol. For individual OData v4 offerings in SAP SuccessFactors, the capabilities vary depending on the implementation of each module. Refer to the API references for more information.

Delta Support

Delta support allows clients to query services and receive just the set of deltas –changes— from a previous state. Designed for scalability, this hypermedia-driven model gives the service ultimate control over how changes are identified while providing a simple, well-defined model to the client.

Entity Data Model Enhancements



OData defines a consumer-oriented Entity Data Model that helps general-purpose clients understand how to interact with an OData service. OData v4 enhances the entity model, adding support for containment, singletons, enums, and type definitions. Date/Time data types have been reworked to include separate Date, TimeOfDay, Duration, and DateTimeOffset data types. Complex types now support inheritance and navigation properties. Relationships, a key part of the entity model, are simplified.

Improved Queryability

In today's device-centric world, bringing back the right subset of data is key to reducing round-trips, payload, and footprint. OData v4 includes syntax for applying filters, sorts, and selects against expanded properties, allowing clients to push processing to the service and more precisely specify the interesting set of data to be retrieved. Full text search functionality, recursive queries, and the use of user-defined functions in predicates all help clients control the data returned from the service.

Related Information

This guide provides information specific to the latest version (v4) of OData APIs in SAP SuccessFactors HCM suite. To fully understand how OData works in general or how OData v2 works in SAP SuccessFactors, refer to the following documentation:

Resource	Description
About SAP SuccessFactors OData APIs (V2)	OData v2 reference guide.
odata.org 	The official OData website where you can find more detailed specifications about the OData standard.
SAP Business Accelerator Hub 	SAP SuccessFactors content hub where can find all technical details of our public APIs and try them out.

1.1 List of SAP SuccessFactors API Servers

Learn about the API servers of your company instance and how to construct the endpoint URLs.

Endpoint URL Patterns

Restriction

We don't support IP addresses in URLs as part of our reference architecture. Use domain names instead. If you think you have a special case that requires IP addresses instead of domain names, contact Technical Support.

Protocol	URL Pattern	Endpoint Example
OData v2	/odata/v2/	https://api17.sapsf.com/odata/v2/
OData v4	/odatav4/	https://api17.sapsf.com/odatav4/
REST	/rest/	https://api17.sapsf.com/rest/
SFAPI	/sfapi/v1/soap	https://api17.sapsf.com/sfapi/v1/soap
WSDL	/sfapi/v1/soap?wsdl	https://api17.sapsf.com/sfapi/v1/soap?wsdl

API Servers

Here's a list of API servers and mTLS certificate servers for SAP SuccessFactors data centers. Use search and filter to find the corresponding servers for your company.

→ Tip

SAP SuccessFactors revised its data center numbering as part of its Next Generation Cloud Delivery Platform. While it is leading practice to update a domain name or URL to the latest domain name, the domain names

that you migrated **from** continue to work. For example, after migrating DC17 to DC60, the DC17 URL, `https://api17.sapsf.com`, continues to point to the same Toronto data center.

To view the timezone information of an API server, go to your company login page or open your account on the header bar after login, and choose [Show version information](#).

Data Center	Environment	Platform	Location	API Server	mTLS Certificate Server
DC2 (DC57)	Production	Google Cloud Platform	Eemshaven, The Netherlands	<code>https://api2.successfactors.eu/</code> <code>https://api.successfactors.eu</code>	<code>https://api2.cert.successfactors.eu</code>
DC2 (DC57)	Sales Demo	Google Cloud Platform	Eemshaven, The Netherlands	<code>https://apisalesdemo2.successfactors.eu/</code>	<code>https://apisalesdemo2.cert.successfactors.eu</code>
DC2 (DC57)	Preview	Google Cloud Platform	Eemshaven, The Netherlands	<code>https://api2preview.sapsf.eu/</code>	<code>https://api2preview.cert.sapsf.eu</code>
DC4 (DC68)	Production	Azure	Virginia, US	<code>https://api4.successfactors.com/</code>	<code>https://api4.cert.successfactors.com</code>
DC4 (DC68)	Preview	Azure	Virginia, US	<code>https://api4preview.sapsf.com/</code>	<code>https://api4preview.cert.sapsf.com</code>
DC8 (DC70)	Production	Azure	Ashburn, Virginia, US	<code>https://api8.successfactors.com/</code>	<code>https://api8.cert.successfactors.com</code>
DC8 (DC70)	Sales Demo	Azure	Ashburn, Virginia, US	<code>https://apisalesdemo8.successfactors.com/</code>	<code>https://api8sales.cert.successfactors.com</code>
DC8 (DC70)	Preview	Azure	Ashburn, Virginia, US	<code>https://api8preview.sapsf.com/</code>	<code>https://api8preview.cert.sapsf.com</code>

Data Center	Environment	Platform	Location	API Server	mTLS Certificate Server
DC10 (DC66)	Production	Azure	Sydney, Australia	https://api10.successfactors.com/	https://api10.cert.successfactors.com
DC10 (DC66)	Preview	Azure	Sydney, Australia	https://api10preview.sapsf.com/	https://api10preview.cert.sapsf.com
DC12 (DC33)	Production		Rot, Germany	https://api012.successfactors.eu/	https://api012.cert.successfactors.eu
DC12 (DC33)	Preview		Rot, Germany	https://api12preview.sapsf.eu/	https://api12preview.cert.sapsf.eu
DC15 (DC30)	Production		Shanghai, China	https://api15.sapsf.cn/	https://api15.cert.sapsf.cn
DC15 (DC30)	Preview		Shanghai, China	https://api15preview.sapsf.cn/	https://api15preview.cert.sapsf.cn
DC17 (DC60)	Preview	Azure	Toronto, Canada	https://api17preview.sapsf.com/	https://api17preview.cert.sapsf.com
DC17 (DC60)	Production	Azure	Toronto, Canada	https://api17.sapsf.com/	https://api17.cert.sapsf.com
DC19 (DC62)	Preview	Azure	Sao Paulo, Brazil	https://api19preview.sapsf.com/	https://api19preview.cert.sapsf.com
DC19 (DC62)	Production	Azure	Sao Paulo, Brazil	https://api19.sapsf.com/	https://api19.cert.sapsf.com

Data Center	Environment	Platform	Location	API Server	mTLS Certificate Server
DC22	Preview		Dubai, UAE	https://api22preview.sapsf.com/	https://api22preview.cert.sapsf.com
DC22	Production		Dubai, UAE	https://api22.sapsf.com/	https://api22.cert.sapsf.com
DC23 (DC84)	Preview		Riyadh, Saudi Arabia	https://api23preview.sapsf.com/	https://api23preview.cert.sapsf.com
DC23 (DC84)	Production		Riyadh, Saudi Arabia	https://api23.sapsf.com/	https://api23.cert.sapsf.com
DC40	Sales Demo	Azure		https://api40sales.sapsf.com	https://api40sales.cert.sapsf.com
DC41	Preview	Azure	Virginia, US	https://api41preview.sapsf.com	https://api41preview.cert.sapsf.com
DC41	Production	Azure	Virginia, US	https://api41.sapsf.com	https://api41.cert.sapsf.com
DC44 (DC52)	Preview	Google Cloud Platform	Singapore	https://api44preview.sapsf.com/	https://api44preview.cert.sapsf.com
DC44 (DC52)	Production	Google Cloud Platform	Singapore	https://api44.sapsf.com/	https://api44.cert.sapsf.com
DC47	Preview	Microsoft Azure	Canada Central	https://api47preview.sapsf.com/	https://api47preview.cert.sapsf.com

Data Center	Environment	Platform	Location	API Server	mTLS Certificate Server
DC47	Production	Microsoft Azure	Canada Central	https://api47.sapsf.com/	https://api47.cert.sapsf.com
DC50	Preview	Google Cloud Platform	Tokyo, Japan	https://api50preview.sapsf.com	https://api50preview.cert.sapsf.com
DC50	Production	Google Cloud Platform	Tokyo, Japan	https://api50.sapsf.com	https://api50.cert.sapsf.com
DC55	Preview	Google Cloud Platform	Frankfurt, Germany	https://api55preview.sapsf.eu/	https://api55preview.cert.sapsf.eu
DC55	Production	Google Cloud Platform	Frankfurt, Germany	https://api55.sapsf.eu/	https://api55.cert.sapsf.eu
DC4 (DC68)	Sales Demo	Azure	Virginia, US	https://api68sales.successfactors.com	https://api68sales.cert.successfactors.com/
DC74	Preview	Azure	Zurich, Switzerland	https://api74preview.sapsf.eu	https://api74preview.cert.sapsf.eu
DC74	Production	Azure	Zurich, Switzerland	https://api74.sapsf.eu	https://api74.cert.sapsf.eu
DC80	Production	Google Cloud Platform	Mumbai, India	https://api-in10.hr.cloud.sap	https://api-in10.cert.hr.cloud.sap
DC80	Preview	Google Cloud Platform	Mumbai, India	https://api-in10-preview.hr.cloud.sap	https://api-in10-preview.cert.hr.cloud.sap

Data Center	Environment	Platform	Location	API Server	mTLS Certificate Server
DC82	Production	Google Cloud Platform	Riyadh, Saudi Arabia	https://api-sa20.hr.cloud.sap	https://api-sa20.cert.hr.cloud.sap
DC82	Preview	Google Cloud Platform	Riyadh, Saudi Arabia	https://api-sa20-preview.hr.cloud.sap	https://api-sa20-preview.cert.hr.cloud.sap

1.2 Summary of Differences Between OData V2 and V4

Learn about the differences between OData v2 and v4 protocols in SAP SuccessFactors.

Differences Between OData v2 and v4

Capability	OData v2	OData v4	More Information
Metadata	Supports XML format only	Supports both XML and JSON formats <ul style="list-style-type: none"> XML: <code>/odatav4/Sample.svc/v1/\$metadata</code> XML: <code>/odatav4/Sample.svc/v1/\$metadata?</code> JSON: <code>\$format=JSON</code> 	OData V4 Metadata [page 32]
Metadata Scope	Supports single, full, and comma-delimited metadata queries, examples: <ul style="list-style-type: none"> Single: <code>/odata/v2/User/\$metadata</code> Full: <code>/odata/v2/User/\$metadata</code> Comma-delimited: <code>/odata/v2/User, Picklist/\$metadata</code> 	Supports metadata query on service level only.	

Capability	OData v2	OData v4	More Information
Data Type	<p>Supports the following data types:</p> <ul style="list-style-type: none"> • DateTime • Time • Float 	<p>Supports the following data types:</p> <ul style="list-style-type: none"> • Date • TimeOfDay • Single • Enum 	
Merge Operation	<p>OData v2 uses HTTP method <code>POST</code> and HTTP header <code>X-HTTP-METHOD: MERGE</code> to merge records.</p>	<p>In OData v4, you can use the <code>PATCH</code> HTTP method to merge records.</p>	
Upsert	<p>Supports SAP-proprietary function import <code>/odata/v2/upsert</code> with HTTP method <code>POST</code></p>	<p>Not supported</p>	
Function import and action import	<p>Uses HTTP method <code>GET</code> for read operations.</p> <p>Uses HTTP method <code>POST</code> for write operations.</p> <p>No action imports.</p>	<p>Uses HTTP method <code>GET</code> for function imports (read operations).</p> <p>Uses HTTP method <code>POST</code> for function imports (write operations).</p> <p>OData v4 also supports resource-bound functions and actions.</p>	
Entity reference	<p>Supports entity referencing operations with <code>\$link</code></p>	<p><code>\$ref</code> isn't supported yet.</p>	
Server-side pagination	<p>Supports cursor-based and snapshot-based pagination</p>	<p>Not supported</p>	
Query resources	<p>System query options are supported only at root entity level, for example, <code>\$filter</code>, <code>\$select</code>, and <code>\$orderby</code>.</p>	<p>Supports system query options on aggregated entities:</p> <pre>/odata/v4/ User('admin')/ reports? \$filter=username eq 'abc'</pre> <p>In this example, the filter condition applies to all users whose manager is user 'admin'.</p>	

Capability	OData v2	OData v4	More Information
System query option \$select	<ul style="list-style-type: none"> Applies to root entities only, for example: <code>/odata/v2/User? \$filter=username eq 'abc'</code> Nested filters can be used in a one-to-many relationship: <code>/odata/v2/User? \$filter=reports/ username eq 'abc'</code> Supports custom binary operators 	<p>Can be used to query both root and expanded entities:</p> <pre>/odatav4/User? \$select=username&\$expand=reports(\$select=username)</pre>	
System query option \$filter	<ul style="list-style-type: none"> Applies to root entities only. Nested filters can be applied to navigation properties with a one-to-many relationship: <code>/odata/v2/User? \$filter=reports/ username eq 'abc'</code> Supports customized operators such as like and in <code>datetimeoffset</code> must be specified in expression before a <code>DateTimeOffset</code> field type: <code>\$filter=lastModified gt datetimeoffset '2020-05-20T00:00:00Z'</code> Supports method expression <code>replace</code> (v2 only): <code>\$filter=replace(username, 'abc', 'def') eq 'hdef'</code> 	<ul style="list-style-type: none"> Can be used to query both root and expanded entities: <code>/odatav4</code> Nested filters can be applied to entities of one-to-many relationship by lambda expressions such as <code>any</code> and <code>all</code>: <code>\$filter=user=reports/any(m:m/username eq 'abc')</code> Customized operators aren't supported. <code>DateTimeOffset</code> field type can be filtered without <code>datetimeoffset</code>: <code>\$filter=lastModified gt '2020-05-20T00:00:00Z'</code> Supports method expression <code>contains</code> (v4 only): <code>\$filter=contains(username, 'abc')</code> 	

Capability	OData v2	OData v4	More Information
System query option \$expand	Supports deep expand: /odata/v2/User? \$expand=reports,reports/reports	Supports deep expand and query options in expanded entities: /odatav4/User? \$expand=reports(\$expand=reports) /odatav4/User? \$expand=reports(\$filter=username eq 'abc'; \$select=username)	
Default response format	ATOM	JSON	

Capability	OData v2	OData v4	More Information
Instance annotations in response	Not supported	<p>Annotations are supported as an extended feature in OData v4. Annotations start with \$:</p> <pre> { "@context": "\$metadata#Customers", "@com.example.customer.setkind": "VIPs", "value": [{ "@com.example.display.highlight": true, "ID": "ALFKI", "CompanyName@com.example.display.style": { "title": true, "order": 1 }, "CompanyName": "Alfreds Futterkiste", "Orders@com.example.display.style#simple": { "order": 2 } }] } </pre>	

Capability	OData v2	OData v4	More Information
Error response	OData v2 error response example:	OData v4 error response example:	
	<pre> { "error": { "code": "BadRequest", "message": { "lang": "en", "value": "Unsupported functionality" } } } </pre>	<pre> { "error": { "code": "BadArgument", "message": "Please check your inputs", "details": [{ "code": "NameRequired", "message": "Name must not be empty", "target": "name" }, { "code": "PasswordNotMeetPo licy", "message": "Password must have one upper case". "target": "password" }] } } </pre>	
Framework-level access limits	No	Yes. See Access and Rate Limits [page 39] .	

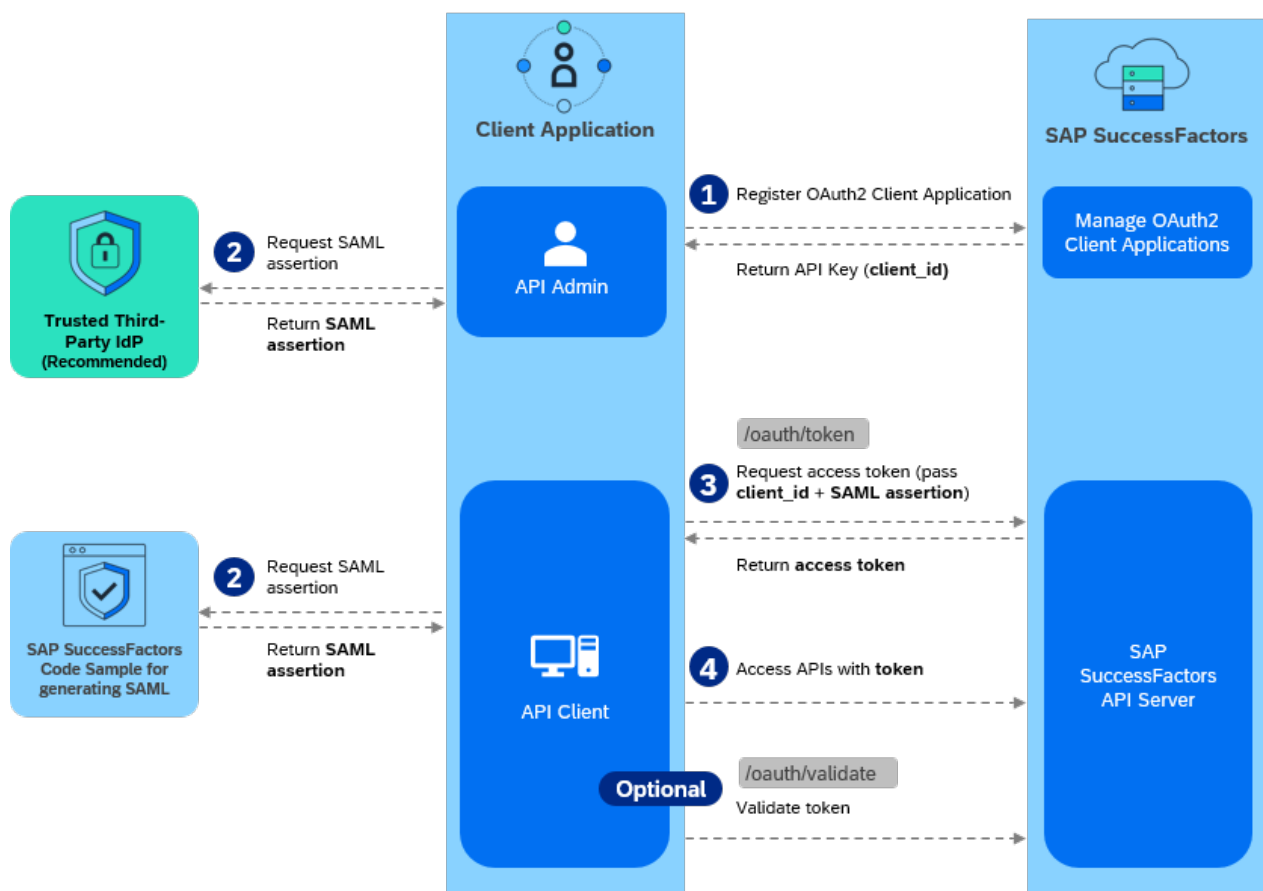
2 Authentication Using OAuth 2.0

Learn how to set up and use OAuth 2.0 for authenticating API users.

SAP SuccessFactors supports OAuth 2.0 to authenticate API users. Compared with HTTP Basic Auth, OAuth 2.0 is considered to be more secure in that it doesn't require users to provide their passwords during authentication. With OAuth 2.0, you can also use a third-party identity provider (IDP) for user management and provisioning.

Process Overview

The following diagram explains how OAuth 2.0 works with SAP SuccessFactors.



- [Registering Your OAuth2 Client Application \[page 15\]](#)
- [Generating a SAML Assertion \[page 21\]](#)
- [Requesting an Access Token \[page 24\]](#)

- [Viewing the Validity of an Access Token \[page 25\]](#)
 - [Follow the documentation of the IdP for requesting SAML assertions. \[page 14\]](#)
1. Register your client application in SAP SuccessFactors to obtain an API key.
 2. Obtain a SAML assertion from your trusted IdP (recommended, for example, Microsoft Azure) or use the sample code to generate one.
 3. Pass your SAML assertion and API key (in the client_id field) along with other information to generate an OAuth token.
 4. Use the generated token to call APIs.
 5. (Optional) Check whether your access token has expired or not.

Related Information

[SAP Cloud Identity Services - Identity Provisioning](#)

2.1 Registering Your OAuth2 Client Application

Register your client application so that you can authenticate API users using OAuth2. After you register an application, you'll get an exclusive API key for your application to access SAP SuccessFactors OData APIs.

Prerequisites

You have the [Manage Integration Tools](#) > [Manage OAuth2 Client Applications](#) permission.

Procedure

1. Log into your instance as an administrator.
2. Go to [Admin Center](#) > [API Center](#) > [OAuth Configuration for OData](#) and choose [Register Client Application](#). You can also access the tool by searching [Manage OAuth2 Client Applications](#) in Action Search.
3. On the new OAuth client registration screen, enter the following information:

Option	Description
Company	The name of your company. This value is prefilled based on the instance of the company currently logged in.
Application Name	(Required) A unique name of your OAuth client.
Description	(Optional) A description of your application.

Option	Description
Application URL	(Required) A unique URL of the page that the client wants to display to the end user. This URL is not used for connection purpose, but rather for identification purpose.
Bind to Users	<p>(Optional) You can enable this option to restrict the access of the application to specific users including business users and technical users.</p> <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>Note</p> <p>A business user in this context is a user who has permissions to call SAP SuccessFactors APIs for integration purposes.</p> <p>A technical user is a system-generated user created for integrating SAP SuccessFactors with other SAP products and solutions.</p> <p>Refer to About Technical User for more information.</p> </div>
User IDs	<p>(Required if you enabled the Bind to User option) Enter the user IDs separated by comma.</p> <p>The binding of business users and technical users works as follows:</p> <ul style="list-style-type: none"> • If you don't bind any user to the application, all business users can request OAuth tokens but technical users can't. • If you bind both business users and technical users to the application, only these users can request OAuth tokens. • If you bind only technical users to the application, these technical users and any business user can request OAuth tokens. • If you bind only business users to the application, only these users can request OAuth tokens. <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>Note</p> <p>Contact your system administrator or Technical Support if you don't know the technical user ID of your instance.</p> </div>
X.509 Certificate	(Required) The certificate corresponding to the private and public key used in the OAuth 2.0 authentication process. In this flow, SAP SuccessFactors require the public key and the client application has the private key. To register a client application, you must install the public key in SAP SuccessFactors.

Option

Description

You can obtain a certificate from a trusted service provider, or generate a self-signed certificate using a third-party tool. Either way, the certificate must be encrypted using a secure signature algorithm. Although both RSA-1 and RSA-2 algorithms are supported, we recommend using RSA-2 for better security.

If neither option is available, you can also generate an X.509 certificate in SAP SuccessFactors. If you choose to provide

For more information, see the [Related Information](#) section of this topic.

Note

For better security, we recommend that you use a self-signed certificate or one from your trusted service provider.

In a **.pem** file, the X.509 certificate is a BASE64-encoded string enclosed between -----BEGIN CERTIFICATE----- and -----END CERTIFICATE----- . Enter only the enclosed string without the beginning and ending lines. Otherwise, an error occurs.

Caution

When you change or regenerate an X.509 certificate for an application, the existing application client configurations are invalidated. This could lead to application failure until you update the configurations with the new certificate information.

4. Choose [Register](#) to save your registration.

Results

You've successfully registered your client application for OAuth2 authentication. An API key is generated and assigned to your application. You can view the API key by choosing [View](#) on the registered application list.

You can also edit, disable, and delete an OAuth2 client registration.

2.1.1 Creating a X.509 Certificate Using Your Own Tools

You can use tools such as OpenSSL to create an X.509 certificate.

Prerequisites

There are different tools you can use to create X.509 certificates. In this example, we'll show you how to use OpenSSL to create a certificate. For Windows users, download the tool at <https://www.openssl.org>. For Mac and Linux users, OpenSSL is available with the native command-line tools such as Terminal.

Context

X.509 certificates are used in many Internet protocols, including TLS/SSL. An X.509 certificate consists of a public key and a private key. The public key contains the identity information, such as a hostname, an organization, or an individual. The public/private key pair is used to establish secure communication between your application and SAP SuccessFactors.

Procedure

1. Go to the OpenSSL library in your command-line tool.

For Mac and Linux users, call OpenSSL directly in the command tool under the default path. For Windows users, the entry point is the openssl binary, located in the installation folder, for example: `C:\Program Files\OpenSSL-Win64\bin\`.

2. Use the `openssl` command to create an X.509 certificate. The example below shows how to create a certificate using the recommended SHA-2 signature algorithm:

```
$ openssl req -nodes -x509 -sha256 -newkey rsa:2048 -keyout private.pem -out public.pem
```

Note

`private.pem` and `public.pem` are the example names of the public/private key pair generated with this command. You can change them to any names of your choice.

Although SAP SuccessFactors support certificates signed using either SHA-1 or SHA-2 algorithms, we recommend that you use SHA-2 for better security.

3. Enter the following information when prompted:

Provide at least one of these values to create a certificate.

Option	Description
Country Name	Enter a two-letter country code of the entity to which the certificate is issued. A country code represents a country or a region. Example: AU
State or Province Name	Name of state or province of the entity to which the certificate is issued.
Locality Name	Name of locality of the entity to which the certificate is issued.
Organization Name	The entity to which the certificate is issued.
Organization Unit Name	The organization unit of the entity to which the certificate is issued.
Common Name	The hostname or IP address for which the certificate is valid. The common name (CN) represents the hostname of your application. It's technically represented by the commonName field in the X.509 certificate. The common name doesn't include any protocol, port number, or path. For example: www.bestrun.com
E-mail Address	Enter your e-mail address.

Results

A public/private key pair is generated and saved to the local drive with the names you specified in the command.

⚠ Caution

Only the public key is required when you register an OAuth2 client application in SAP SuccessFactors. The private key must be kept secure under all circumstances. Do not share the private key with others. If you lose the private key, you must create a new certificate.

Example of a public key:

```
-----BEGIN CERTIFICATE-----
MIIB9jCCAV+gAwIBAgIUUKR82LgtkNBccdyPYD26K87zZ+vYwDQYJKoZIhvcNAQEE
BQAwDTELMAkGA1UECwwCRVAvHhcNMTkwOTI2MDIwNDUyWhcNMTkwMDI2MDIwNDUy
WjANMQswCQYDVQQLDAJFUDCBnzANBgkqhkiG9w0BAQEFAAOBjQAwYkCgYEAwKva
NZCOGcuY90/BudS+qQic+A3luM8mLtmI60R1iEjgEWGBCxSiDb2h8mQJiXwku19W
ebaaZP7hkqkdNoJgV/6NE7++GKyyS8fIhJgeWSb6Ee1MFhjQ0nZKzbZX5ms3I91n
twzkcHtKCCQi/gi/Rouh1k/P/QVcrzSgHUHQJNY0CAwEAAANTMFEwHQYDVR0OBBYE
FHHBggqnnhm3GAJ4gy2IuEDxpLye7MB8GA1UdIwQYMBaAFHHBggqnnhm3GAJ4gy2Iu
EDxpLye7MA8GA1UdEwEB/wQFMAMBAf8wDQYJKoZIhvcNAQEEBQADgYEAG5CoqcEy
15vUpj5VfJeR/DS70tPIinp/TCC9kRO/++TSnPbqVcfPr8vIyc4L3MPKjXFBsefE
vtfHGGucVt5N1+4U/b9NxFbuH2MP7W3swZ4WM72Na+W6iohwesOr0p3IcOfxc3
RNCnagFmtbDFxAlPXQ0d+m+N5gxLRoCX1hE=
-----END CERTIFICATE-----
```

Example of a private key:

```
-----BEGIN PRIVATE KEY-----
MIICDQIBADANBgkqhkiG9w0BAQEFAASCA18wgwJbAgEAAoGBAMCr2jWQjhnLmPdP
wbnUvqkInPgN9bjPjI7ZiOtedYhI4BFhgQsUog29ofJkCY18JLpfVnm2msz+4ZKp
HTaCYff+jRO/vhiSSkvHyISYH1km+hHpTBY0NJ2Ss22V+ZrNyPdZ7cM5HB7SgkI
v4Iv0aLoZZPz/0FXK80oB1B6iTctAgMBAAEcGyAid5vVsUJ6gt2egHobkF97Rbsu
9PBcW1JtVyUTUW/1LYRIF7VKEirbYm0y04spOTgoz1dMLmIqqAX6ID9W114kN/g
lzlc2/jMg+YgP+FNCjULyggfIwtGfpX8G0qYWza5oarZVbbGAlcvpHjyNMGV7ure
7syrjIXUighkaKrxgQJBAObVbGTVr/5xxScB1mPYoBe02JMyTzuVW0ts7NyfxXJu
w9vUoMDLV+2wuDE4w8/gUkKf26eojn3kwD708V61G4kCQQDVRVC7HcXYfU4wkr5S
JPMQzAln0RUf6LgFpgIDPKpq7VUt1A9aQUbdddxcudFj057ksr2yU9sOLQgh3A
+2GFAkAwkRDavsVI48h5asWR11C3YJe3tDhow848DncNjpUX/dop+JyKnJaJBzjK
nxkNjomcN9Kajnd3v9BH11ytewi5AkA8IAWscUc/kJrUziXhpWYD3vXykYG5Ndm6
```

```

NSkx0dmLprZifNSlB7nAyduqqXTe4eVyNxxN3d9PyZs5ArPuno2lAkAQ8WiHbqGA
Jl06R9+D6HiWywpCaQ0oh6H/+84mb1ew2SUw1mFxROxgfsRVNUe+ahs3nSIhoba0
cqS0ZSBtNDxV
-----END PRIVATE KEY-----

```

2.1.2 Creating an X.509 Certificate in SAP SuccessFactors

You can create an X.509 certificate in SAP SuccessFactors HCM suite if you're unable to create a certificate using your own tools.

Context

⚠ Caution

We don't recommend creating the X.509 certificate in the API Center and downloading the private key. It's a less secure approach because downloading the private key increases the risk of exposing it. Only consider this approach if you're unable to create an X.509 certificate using your own tools.

Procedure

1. Log into your instance as an administrator.
2. Go to **Admin Center** > **API Center** > **OAuth Configuration for OData** and choose **Register Client Application**. You can also access the tool by searching **Manage OAuth2 Client Applications** in Action Search.
3. On the new OAuth client registration screen, choose **Generate X.509 Certificate** and enter the following information:

Option	Description
Issued By	Value set to SuccessFactors
Common Name	The hostname or IP address for which the certificate is valid. The common name (CN) represents the hostname of your application. It's technically represented by the commonName field in the X.509 certificate. The common name doesn't include any protocol, port number, or path. For example: www.bestrun.com
Organization	(Optional) The entity to which the certificate is issued.
Organization Unit	(Optional) The organization unit of the entity to which the certificate is issued.
Locality	(Optional) Name of locality of the entity to which the certificate is issued.
State/Province	(Optional) Name of state or province of the entity to which the certificate is issued.
Country	(Optional) Enter a two-letter country code of the entity to which the certificate is issued. A country code represents a country or a region. Example: AU
Validity	(Optional) The number of days for which you want the X.509 certificate to be valid. If left empty, the validity defaults to 365 days.

Option	Description
	<p>Note</p> <p>Validity check works only when the <i>Enable validity check</i> option is selected.</p>
Enable validity check	Indicates whether or not the system checks the validity of the certificate. If disabled, the certificate never expires. If checked, you can either specify the validity period in days in the <i>Validity</i> field, or leave it empty so that the validity defaults to 365 days.

4. Choose *Generate*.

Results

A new X.509 certificate is generated and filled in the *X.509 Certificate* field on the new OAuth2 client registration screen. Continue your registration in [Registering Your OAuth2 Client Application \[page 15\]](#) with this certificate.

⚠ Caution

Both the public key and private key are available to you in the generated certificate. You must save the private key before you register your client application. Only the public key is available for viewing when the client application is registered. The private key must be kept secure under all circumstances. Do not share the private key with others. If you lose the private key, you create a new one.

2.2 Generating a SAML Assertion

Generate a Security Assertion Markup Language (SAML) assertion for requesting an OAuth token. This topic explains the options to generate SAML assertions for accessing SAP SuccessFactors APIs.

Prerequisites

You've registered your application in [Manage OAuth2 Client Applications](#) and obtained the API key for the application.

Context

You have the following options to generate a SAML assertion:

- (Recommended) Use a trusted IdP to generate a SAML assertion, such as Microsoft Azure. Make sure that the elements in the Required Elements for IdP-based SAML Assertions section are included in the assertion. For more information, refer to the corresponding documentation of the trusted IdP.

- If your client system can automatically generate SAML assertions, you can skip this step and use the assertion provided by the client. You can also let the client handle it internally, depending on its capabilities.
- Use the example code attached to KBA 3031657 to generate SAML assertions for your application. This sample code provides a SAML generator tool that processes the input information offline and generates a SAML assertion without having to expose your private key to the Internet.

Note

Do not use the `/oauth/idp` API to generate SAML assertions. This approach is unsecure and has been deprecated. For more information, see the Related Information section.

Signing certificates using SHA-1 is no longer supported. We recommend that you use SHA-2 for better security. For more information, see the Related Information section.

Required Elements for IdP-based SAML Assertions

If you choose to use a trusted IdP to generate a SAML assertion, make sure that you follow the [SAML 2.0 standard](#) and include the following elements in the assertion:

Tip

SAML assertions are Base64-encoded. To view the detailed information in XML format, decode the assertion using a Base64 decode tool.

Required Elements for IdP-based SAML Assertions

Element	Description	Example
<code><saml2:Issuer></code>	Issuer information of the SAML assertion	<pre><saml2:Issuer>www.myidp.com</saml2:Issuer></pre>
<code><saml2:Subject></code> , <code><saml2:NameID></code> , and <code>Recipient</code>	Enter the SAP SuccessFactors user ID that you use to access the APIs in the <code>NameID</code> element. The recipient attribute must be set as the URL of the API server from which you request the OAuth token.	<pre><saml2:Subject> <saml2:NameID Format="urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified">admin </saml2:NameID> <saml2:SubjectConfirmation Method="urn:oasis:names:tc:SAML:2.0:cm:bearer"> <saml2:SubjectConfirmationData NotOnOrAfter="2020-08-21T09:23:24.511Z" Recipient="http://<api-server>/oauth/token"/> </saml2:SubjectConfirmationData> </saml2:SubjectConfirmation> </saml2:Subject></pre>

Element	Description	Example
<code><saml2:AttributeStatement></code> and <code><saml2:Attribute></code>	The <code>AttributeStatement</code> element must contain the API key (<code>clientId</code>) that you obtained after you register the client application in Registering Your OAuth2 Client Application [page 15] .	<pre><saml2:AttributeStatement> <saml2:Attribute Name="api_key"> <saml2:AttributeValue xsi:type="xs:string">NDU0 MDE0MDkwYj**5YTE5MWIxMTN kNjc1Zg</ saml2:AttributeValue> </saml2:Attribute> </ saml2:AttributeStatement></pre>
<code><saml2:Conditions></code> , <code>NotBefore</code> , <code>NotOnOrAfter</code> , and <code><saml2:Audience></code>	The <code>NotBefore</code> and <code>NotOnOrAfter</code> attributes in the <code><saml2:Conditions></code> element defines the validity period of the SAML assertion. The <code><saml2:Audience></code> element is used to tag the SAML assertion. Any value is accepted except empty value. For example, www.successfactors.com .	<pre><saml2:Conditions NotBefore="2020-08-21T09: 03:24.511Z" NotOnOrAfter="2020-08-21T 09:23:24.511Z"> <saml2:AudienceRestriction> <saml2:Audience>www.succe ssfactors.com</ saml2:Audience> </ saml2:AudienceRestriction > </saml2:Conditions></pre>
<code><saml2:AttributeStatement></code> and <code><saml2:Attribute></code>	If you want to authenticate SAP SuccessFactors Learning users that don't also exist in platform, you must include an additional custom attribute called "external_user" with value "true".	<pre><saml2:AttributeStatement> <saml2:Attribute Name="external_user"> <saml2:AttributeValue xsi:type="xs:string">>true </saml2:AttributeValue> </saml2:Attribute> </ saml2:AttributeStatement></pre>

Related Information

[Deprecation of OAuth IdP API /oauth/idp](#)

[Deprecation of SHA-1 Signing Certificate for Assertion Consumer Services \(ACS\) Entries](#)

2.3 Requesting an Access Token

With a SAML assertion, you can now call API `/oauth/token` to request an access token for authentication with the API server.

Prerequisites

The `/oauth/token` API follows IP restriction settings in the following tools:

- In [Admin Center](#) [Password & Login Policy Settings](#) [Set API login exceptions...](#), you can set access restriction for individual users by IP.
- In [Admin Center](#) [IP Restriction Management](#), you can set access restriction by IP on the instance level.

Before you request an OAuth token, check the above settings and make sure that the client IP address is allowed to access the corresponding API server. For more information about IP restrictions, see the related information section.

Note

If both instance-level and user-level IP restrictions are set, a user can access these APIs if either condition is met.

Context

The API returns the token type, expiration time in seconds, and the token value you can use to authorize API requests. An access token expires in 24 hours after it's generated.

Example

Here is a sample request:

HTTP Method	POST
URI	<code>https://<API-Server>/oauth/token</code>
Authentication	No Auth
Headers	<code>Content-Type: application/x-www-form-urlencoded</code>

ⓘ Note

If both instance-level and user-level IP restrictions are set, a user can access these APIs if either condition is met.

Context

An access token expires within 24 hours after it's generated. You can use this API to check if an access token is still valid.

Example

The following sample request shows how to validate an access token:

HTTP Method	GET
URI	https://<API-Server>/oauth/validate
Headers	Authorization: Bearer <Your access token>

A valid token returns status 200 OK in the header. The response body contains the access token, token type, and expiry time in seconds. Example:

```
{
  "access_token": "<Your Bearer token>",
  "token_type": "Bearer",
  "expires_in": 86312
}
```

Related Information

[IP Restrictions](#)

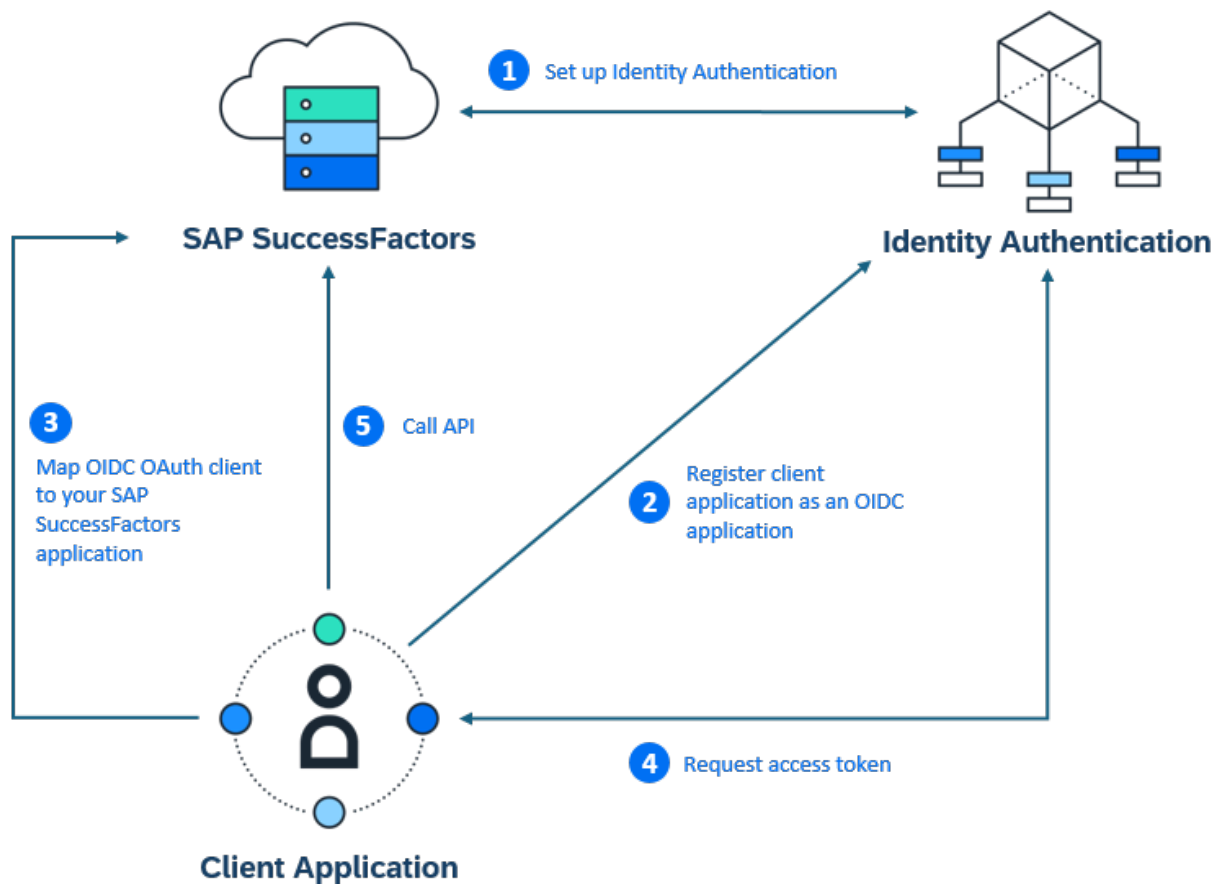
3 Authentication Using OpenID Connect (OIDC)

You can use OpenID Connect (OIDC) as your authentication preference for incoming calls to SAP SuccessFactors HCM suite with Identity Authentication.

The OIDC protocol is one of the most popular and widespread methods of authentication. With this feature, SAP SuccessFactors HCM suite integrations can use OAuth and OIDC to receive incoming API calls from other SAP applications, with Identity Authentication as the central authentication provider. This allows for reduced setup and maintenance of API authentication, using a single identity provider to manage these tasks.

To use OIDC to authenticate API calls, your system must be set up to use Identity Authentication as the authentication provider. The following diagram shows the process overview to set up and use OIDC to authenticate API calls.

This image is interactive. Hover over each area for a description. Click highlighted areas for more information.



- [Checking to See if You Already Have Identity Authentication Enabled](#)
- [Register Your Own Application to Communicate with SAP SuccessFactors HCM Suite with OpenID Connect](#)
- [Register Your Own Application to Communicate with SAP SuccessFactors HCM Suite with OpenID Connect](#)

- [Accessing APIs Using OpenID Connect \(OIDC\) Through Identity Authentication \[page 28\]](#)

Setting Up OpenID Connect for API Calls

Related Information

[Consuming APIs from Other Applications](#)

3.1 Accessing APIs Using OpenID Connect (OIDC) Through Identity Authentication

Authenticate API calls securely using OpenID Connect (OIDC) access tokens through Identity Authentication in SAP Cloud Identity Services.

Prerequisites

Before you can use OIDC to access APIs, make sure that the following conditions are met:

- Your SAP SuccessFactors instance is set up to use Identity Authentication in SAP Cloud Identity Services as the authentication provider.
- You've registered the client application in Identity Authentication so that it can communicate with SAP SuccessFactors using OIDC.
- You have access to the administration console of your SAP Cloud Identity Services instance that's connected to your SAP SuccessFactors instance.

For more information, see the Related Information section.

Context

OpenID Connect (OIDC) is a popular protocol for authentication. If you've set up your SAP SuccessFactors instance to use SAP's Identity Authentication service as the authentication provider, then you can use OIDC to securely authenticate API calls.

Procedure

1. Sign into the administration console of your SAP Cloud Identity Services instance.
2. Go to ► [Applications and Resources](#) ► [\[Your OIDC Application\]](#) ► [Application APIs](#) ► [Client Authentication](#) ► [Secrets](#) ►, add a new secret. Once created, copy the client ID and secret for later use. Note that you won't be able to retrieve the secret from the system later. For more information, see [Configure Secrets for API Authentication](#).
3. Call the `/oauth2/token` API with the following details and obtain an ID token from the Identity Authentication service.

HTTP Method	POST
URI	<code>https://<ias-host>/oauth2/token</code> You can find the <ias-host> server address in the URL of your Identity Authentication instance.
Authentication	No Auth
Headers	<code>Accept: application/json</code> <code>Content-Type: application/x-www-form-urlencoded</code>
Request Body (x-www-form-urlencoded)	Enter the following information: <ul style="list-style-type: none">• <code>client_id</code>: The client ID value that you copied from the OIDC application in the previous step• <code>client_secret</code>: The client secret value you copied from the OIDC application in the previous step• <code>grant_type</code>: <code>password</code>• <code>username</code>: User name of your SAP SuccessFactors user logging in through Identity Authentication• <code>password</code>: Password of your SAP SuccessFactors user logging in through Identity Authentication

Example code snippet in cURL:

```
curl --location 'https://example.accounts400.ondemand.com/oauth2/token' \  
--header 'Accept: application/json' \  
--header 'Content-Type: application/x-www-form-urlencoded' \  
--data-urlencode 'client_id=d0f00c0a-****-****-8f88-f555fe056e3d' \  
--data-urlencode 'client_secret=nOwYDe*****s0?4uy?-30iPvUYR@B' \  
--data-urlencode 'grant_type=password' \  
--data-urlencode 'username=*****' \  
--data-urlencode 'password=*****'
```

A successful call returns an ID token (`id_token`) in the JSON response.

```
{  
  "access_token": "eyJraWQiOiJvRG5tRjh****8WC1j_7EaOcfG",  
  "refresh_token": "08e929d****deb52c49b5d0b",  
  "id_token": "eyJraWQiOiJvRG5tRjh****8WC1j_7EaOcfG",  
  "token_type": "Bearer",  
  "expires_in": 3600
```

```
}
```

→ Tip

The `expires_in` value indicates the ID token lifetime in seconds. You can change the token policy to change the ID and access token lifespan in the administration console under ► [Applications and Resources](#) ► [\[Your OIDC Application\]](#) ► [Single Sign-On](#) ► [OpenID Connect Configuration](#) ► [IdP Certificates](#) ► [Token Policy](#) . For more information, see [Token Policy Configuration for Applications](#).

4. Make a second API call to obtain an API access token using the ID token you received from the previous step.

HTTP Method	POST
URI	<code>https://<ias-host>/oauth2/token</code> You can find the <ias-host> server address in the URL of your Identity Authentication instance.
Authentication	No Auth
Headers	<code>Accept: application/json</code> <code>Content-Type: application/x-www-form-urlencoded</code>
Request Body (x-www-form-urlencoded)	Enter the following information: <ul style="list-style-type: none">• <code>client_id</code>: The client ID value that you copied from the OIDC application in the previous step.• <code>client_secret</code>: The client secret value you copied from the OIDC application in the previous step.• <code>grant_type</code>: <code>urn:ietf:params:oauth:grant-type:jwt-bearer</code>• <code>assertion</code>: Enter the <code>id_token</code> value that you obtained from the previous step.• <code>resource</code>: <code>urn:sap:identity:application:provider:name:<dependency-name></code> You can find the <dependency-name> value in the Identity Authentication administration console under ► Applications and Resources ► [Your OIDC Application] ► Application APIs ► Dependencies ► APIs . Use the name in the <i>Dependency Name</i> column.

Example code snippet in cURL:

```
curl --location 'https://example.accounts400.ondemand.com/oauth2/token' \  
--header 'Accept: application/json' \  
--header 'Content-Type: application/x-www-form-urlencoded' \  
--data-urlencode 'client_id=d0f00c0a-****-****-****-f555fe056e3d' \  
--data-urlencode 'client_secret=n0wYDekH1zbZ*****OiPvUYR@B' \  
--data-urlencode 'grant_type=urn:ietf:params:oauth:grant-type:jwt-bearer' \  
--data-urlencode 'assertion=eyJraWQiOiJv*****ej54wthk_Wpwzg' \  
--data-urlencode 'resource=urn:sap:identity:application:provider:name:****'
```

A successful call returns a bearer token (`access_token`) in the JSON response. You can now use this token to call APIs in SAP SuccessFactors HCM suite.

```
{
  "access_token": "eyJraWQSlNPR0***Pq2nCsqBGXn3S1A",
  "token_type": "Bearer",
  "expires_in": 3600
}
```

Related Information

[Setting Up SAP SuccessFactors with Identity Authentication and Identity Provisioning Services](#)

[Register Your Own Application to Communicate with SAP SuccessFactors HCM Suite with OpenID Connect](#)

[Consuming APIs from Other Applications](#)

[Error and Success Codes](#)

4 OData V4 Metadata

Learn how to retrieve metadata of an OData V4 service.

An OData metadata document is a representation of the data model that describes the data and operations exposed by an OData service. OData V4 exposes its metadata on the service group level. You can append `/ $metadata` to the service root URL and issue a `GET` request to fetch the metadata. For example:

```
GET /odatav4/talent/cdp/Learning.svc/v1/$metadata
```

Metadata Annotations

An OData service can have metadata annotations that define and expose additional descriptive data about the resources and their elements, for example, read and write capabilities, field control metadata, documentation, etc. The `/ $metadata` query doesn't include annotations in the response by default. However, you can get the annotations in the following ways:

Request the metadata of an OData service with inline annotations by adding a `prefer` header `prefer: include-annotations="*"`. For example:

```
GET /odatav4/talent/cdp/Learning.svc/v1/$metadata HTTP/1.1
prefer: include-annotations="*"
```

Request the annotations of an OData service as a separate document:

```
GET /odatav4/talent/cdp/Learning.svc/v1/Annotations HTTP/1.1
```

Refreshing Metadata

In OData V4, you can refresh the metadata of an individual service. The `refreshMetadata` action is available for each service by default. For example, to refresh the metadata of the Learning service:

```
POST /odatav4/talent/cdp/Learning.svc/v1/refreshMetadata
```

A successful operation returns a `204 No Content` HTTP status code.

4.1 Basic Concepts

Learn about the basic concepts in OData v4 in SAP SuccessFactors HCM suite.

Before you start using the services, it's important to understand the following basic concepts in OData v4.

Concept	Description
Service	<p>A service is a collection of resources exposed by OData including entity sets, complex types, functions, and actions. An OData service is identified by its service root. Below is a pattern of an OData v4 service root:</p> <pre>https://<api-server>/odatav4/<accessing-mode>/<namespace>/<service>/<version>/</pre> <p>Example:</p> <pre>https://<api-server>/odatav4/cal/CalSession.svc/</pre> <p>You can further query the resources in the service by appending the resource name:</p> <pre>https://<api-server>/odatav4/cal/CalSession.svc/CalibrationSession</pre>
Entity Type, Entity Set, and Entities	<p>An entity type is a collection of entities that share the similar attributes. An entity set is a set of entities of the same entity type. An entity is a real-world instance of the entity type.</p>
Complex Type	<p>A complex type is a list of properties without a key. Complex types are commonly used as property values in an entity or as parameters to operations.</p>
Actions and Functions	<p>Actions and functions are operations exposed by OData that executes custom logic on parts of a data model. Functions are operations that do not allow side effects and must return results. Actions are operations that allow side effects and may return results. A side effect means that the data base state is changed by the operation.</p>
Bound and unbound actions and functions	<p>Actions and functions can be bound to an entity instance or a collection of entities. Unbounded actions and functions are static operations.</p>

4.2 Supported Data Types in OData V4

A list of primitive data types supported in SAP SuccessFactors HCM suite OData v4.

Supported primitive types in OData v4

Type	Meaning
Edm.Binary	Binary data
Edm.Boolean	Binary-valued logic
Edm.Byte	Unsigned 8-bit integer
Edm.Date	Date without a time-zone offset
Edm.DateTimeOffset	Date and time with a time-zone offset, no leap seconds
Edm.Decimal	Numeric values with decimal representation

Type	Meaning
Edm.Double	IEEE 754 binary64 floating-point number (15-17 decimal digits)
Edm.Guid	16-byte (128-bit) unique identifier
Edm.Int16	Signed 16-bit integer
Edm.Int32	Signed 32-bit integer
Edm.Int64	Signed 64-bit integer
Edm.Single	IEEE 754 binary32 floating-point number (6-9 decimal digits)
Edm.String	Sequence of characters
Edm.TimeOfDay	Clock time 00:00-23:59:59.999999999999

ⓘ Note

Data type `Edm.DateTime` from OData v2 is no longer supported.

Related Information

[Primitive Types in OData Version 4.0 \(oasis-open.org\)](https://www.oasis-open.org/committees/odata/) ➔

5 Supported Features

A list of OData v4 features supported in SAP SuccessFactors HCM suite.

The SAP SuccessFactors HCM suite OData v4 API framework is built based on the OASIS Standardized Open Data (OData) Protocol Version 4.01. This topic lists the features from the standard protocol currently supported by SAP SuccessFactors HCM suite.

For detailed information about each feature, refer to the [official OASIS documentation](#) .

Headers

Common Headers

All common headers are supported.

For more information about common headers, see [Common Headers](#) .

Request Headers

Supported Request Headers in OData v4

Header	More Information
Accept	
Accept-Charset	
Accept-Language	
If-None-Match	
Prefer	The following preference values are supported: <ul style="list-style-type: none">• continue-on-error• include-annotations• maxpagesize• omit-values• return=representation and return=minimal

For more information about request headers, see [Request Headers](#) .

Response Headers

All standard response headers are supported.

For more information about response headers, see [Response Headers](#) .

Common Response Status Codes

For more information about response status codes and error codes, see [Common Responses \[page 41\]](#).

Data Request and Modification

Supported Operations

OData v4 supports operations to request and modify data including:

- Query (GET)
- Create (POST)
- Update (PATCH for merging data or PUT for replacing data)
- Delete (DELETE)

Note

The upsert operation is no longer supported in OData v4.

System Query Options

The following system query options are supported:

- `$format`
- `$count`
- `$orderby`
- `$top`
- `$skip`
- `$expand`

Built-in Query Functions

Supported Built-In Query Functions in OData v4

Function	Description	Example
<code>contains</code>	Returns true if the string contains the substring	<code>contains(lastName, 'Wilson')</code>
<code>startswith</code>	Returns true if the string starts with the substring	<code>startswith(username, 'cgr')</code>
<code>endswith</code>	Returns true if the string ends with the substring	<code>endswith(email, 'sap.com')</code>
<code>year</code>	Returns the year from the date/time value	<code>year(startDate) eq 2015</code>
<code>month</code>	Returns the month from the date/time value	<code>month(startDate) eq 9</code>
<code>day</code>	Returns the day from the date/time value	<code>day(endDate) le 10</code>

Function	Description	Example
hour	Returns the hour from the date/time value	hour(endDateTime) eq 12
minute	Returns the minute from the date/time value	minute(endDateTime) eq 0
second	Returns the second from the date/time value	second(endDataTime) eq 0
length	Returns the length of a string	length(username) gt 8
indexof	Returns the index of the beginning of the substring	indexof(username, 'grant') eq 1
substring	Returns the string beginning at the index	substring(username, 1) eq 'grant'
tolower	Converts the string to lower case	tolower(firstName) eq 'david'
toupper	Converts the string to upper case	toupper(firstName) eq 'DAVID'
trim	Trims trailing and leading spaces	trim(username) eq 'cgrant'
concat	Concatenates two strings	concat(firstName, lastName)
round	Round to the nearest integer	round(score) eq 5
floor	Round down to the nearest integer	floor(score) eq 5
ceiling	Round up to the nearest integer	ceiling(score) eq 10

For more information, see [Built-in Query Functions](#) ↗.

5.1 Examples

A list of example operations in OData V4.

Query Operations

This section lists only examples that are different from OData V2.

Query with \$filter

```
GET /Employees?$filter=reports/any(d:d/age lt 30)
```

Query with \$expand and \$select/\$filter expanded records

```
GET /Employees?$expand=reports($select=name;$filter=age lt 30)
```

Bound Functions and Actions

In OData V4, functions and actions can be bound to an entity instance or an entity collection. To invoke a bound function or action, you must specify an entity or entity collection in the request URI.

Invoking bound functions

```
GET /Category(1)/ProductsByColor(color='red')
```

```
GET /Categories/getCategoriesByType(type='shoe')
```

Invoking bound actions

```
POST /LeaveRequest(4)/Reject
```

```
POST /LeaveRequests/Reject
```

Related Information

<https://www.odata.org/getting-started/basic-tutorial/> 

6 Access and Rate Limits

Learn about the framework-level access and rate limits in OData v4.

To ensure optimal availability and performance for customers, we've introduced the following access and rate limits to SAP SuccessFactors HCM suite OData APIs on the framework level. A module can implement specific limits for their services that override the framework-level limit. In such cases, the module-specific limits apply. Refer to the individual API reference for more information about module-specific service limits.

Operation	Limit
URL length	8,000 characters
Query page size	200
Expand page size	200
Expand depth	2
Total expand size	3 entities
Filter depth	1
Number of filter parameters	20
Length of filter parameter values	100 bytes
Number of literals in a filter clause	200
Total batch request size	50
Inline insert depth	3

7 Timeouts

Understand the timeout scenarios during API calls and learn how to handle timeouts.

Timeout is a common error during API calls when a client waits for too long for the server to response. Timeouts can happen due to various reasons. In this topic, you'll learn the common timeout scenarios and how to handle timeouts.

Type	Timeout	Timeout Error Response (HTTP Code)	Solution
Session timeout	10 minutes (API server)	502	Retry is possible.
	30 minutes (CF server)		Avoid complex API calls with large data requests.
Gateway timeout	7 minutes	504	Retry gap is 5 minutes. Avoid complex API calls with large data requests.
Client timeout	Client-specific	Client-specific	Timeouts that occur on the client side are handled by the client. See client-specific guidelines on how to avoid them.

8 Common Responses

This section lists the common errors in OData v4 in SAP SuccessFactors HCM suite.

Common OData v4 Responses

HTTP Code	Status	Error Code
200	OK	Successful
201	Created	Created
202	Accepted	Asynchronous request
204	No Content	Requested resource has null value.
400	Bad Request	Bad input parameter. The error message indicates which one and why.
401	Unauthorized	Authentication failure because of invalid credentials, OAuth tokens, or sessions.
403	Forbidden	Role or permission required, or others
404	Not Found	Resource not found such as Entity.
405	Method Not Allowed	HTTP method is not allowed to resources.
409	Conflict	Conflict for optimistic or pessimistic locks
412	Precondition Failed	Header condition such as <code>if-matched</code>
413	Payload Too Large	Payload too large (the request payload is larger than the server is willing or able to process).
429	Too Many Requests	Too many requests in a given amount of time
500	Internal Server Error	Servers are not working as expected.
501	Not implemented	Not implemented
503	Service Unavailable	Service unavailable

Error Response Structure

The error response body of OData v4 consists of two levels:

- The first level is the error response body that contains the general error code, message, and details.

- The second level is the module-specific error details. The details section contains one or more errors. The `target` field may refer to a property or other elements.

```
{
  "error": {
    "code": "BadArgument",
    "message": "Please check your inputs",
    "details": [
      {
        "code": "NameRequired",
        "message": "Name must not be empty",
        "target": "name"
      },
      {
        "code": "PasswordNotMeetPolicy",
        "message": "Password must have one upper case letter".
        "target": "password"
      }
    ]
  }
}
```

9 API Reference

9.1 Career Development Planning

A list of services offered in the Career Development Planning module.

9.1.1 Learning.svc

The `Learning` service allows you to create and update learning activities in bulk. It's only supported when you've enabled integration with a third-party learning management system.

Note

To use this service, make sure that you've enabled *Learning Management System (Third party LMS integrations)* in Provisioning. However, it's not supported for new customers as of April 2012.

Remember

As a customer, you don't have access to Provisioning. To complete tasks in Provisioning, contact your implementation partner or Account Executive. For any non-implementation tasks, contact Technical Support.

Overview

URI: `https://<api-server>/odatav4/talent/cdp/Learning.svc/v1/`

Authentication: Bearer <Token>

Error Codes

Error Code	Description
0	The responseCode 0 means that the requested operation has failed.

9.1.1.1 Creating Learning Activities

This example shows how to create two learning activities for a specific user and associate them with development goals.

Request

Operation	Insert
HTTP Method	POST
URI	<code>https://<api-server>/odatav4/talent/cdp/Learning.svc/v1/createLearningActivities</code>
Payload	<pre>{ "learningActivities": [{ "username": "cgrant", "learningActivityGUID": "123", "learningActivityCode": "321", "learningActivityName": "Information Security", "score": "100" }, { "username": "cgrant", "learningActivityGUID": "127", "learningActivityCode": "326", "learningActivityName": "Data Privacy", "score": "100" }] }</pre>

Response

```
{
  "@odata.context": "https://<api-server>/odatav4/talent/cdp/
Learning.svc/v1/$metadata#learning.svc.Learn
ingActivityResponse",
  "@odata.metadataEtag": "\"5ef16e08-5b52-47c6-826a-ab0753813dc7\"",
  "errorMessage": "",
  "responseCode": 1
}
```

9.2 Calibration (Feature)

A list of services offered in the Calibration feature.

9.2.1 CalSession.svc

The service `CalSession` allows you to get and update information of sessions and of a single subject or multiple subjects.

Overview

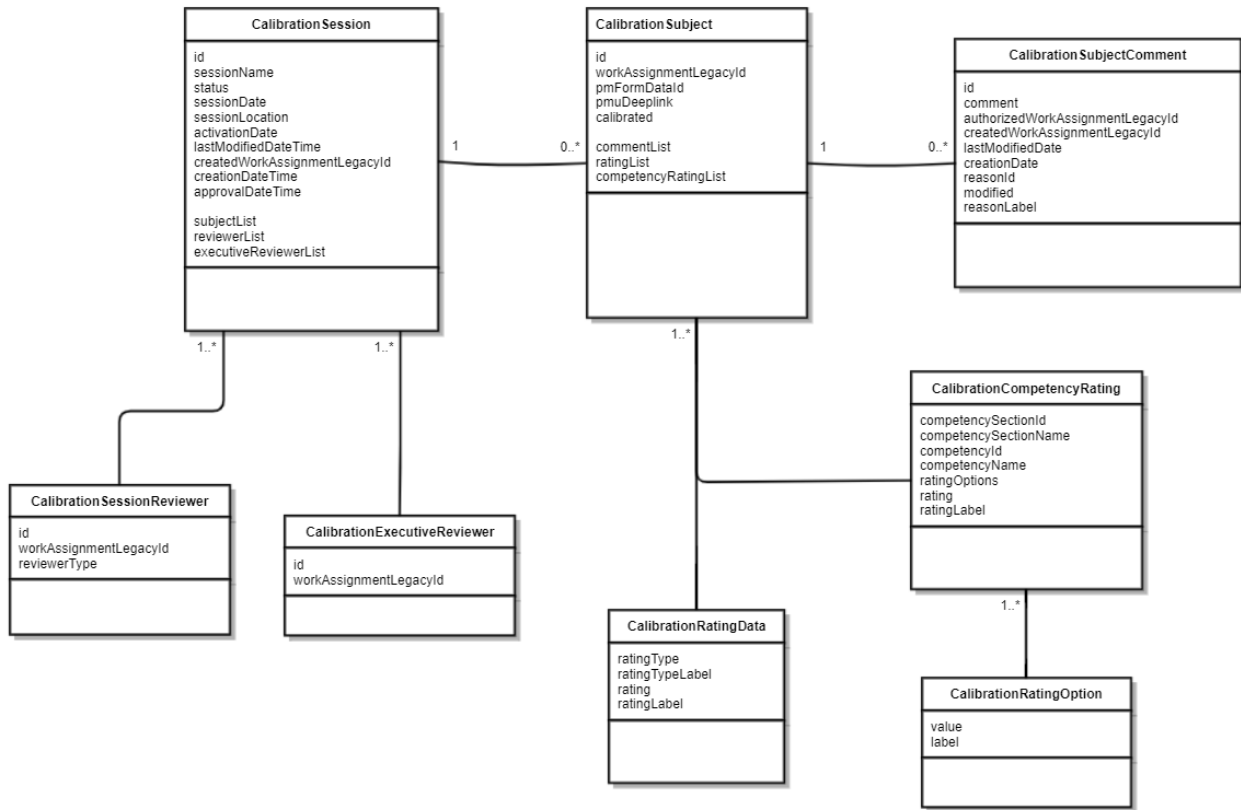
URI: `http://<api-server>/odatav4/talent/calibration/CalSession.svc/v1/`

Authentication: Bearer <Token>

Error Codes

Error Code	Description
403	The responseCode 403 means that users didn't query the data of subjects by accessing the session they belong to.

Entity Relationship Diagram



9.2.1.1 Querying All Available Sessions

This example shows how to query all the sessions that a user can access.

Request

Operation	Query
HTTP Method	GET
URI	https://<api-server>/odatav4/talent/calibration/CalSession.svc/v1/CalibrationSession
Payload	N/A

Response

```
{
  "@odata.context": "https://<api-server>/odatav4/talent/calibration/CalSession.svc/v1/$metadata#CalibrationSession",
}
```

```

"@odata.metadataEtag": "\"5f7d183d-11d4-43b4-85f8-9f93276aef20\"",
"value": [
  {
    "activationDate": "2012-02-01",
    "approvalDateTime": null,
    "createdByWorkAssignmentLegacyId": "lokamoto1",
    "id": 361,
    "lastModifiedDateTime": "2020-01-07T03:31:41Z",
    "sessionDate": "2012-02-29",
    "sessionLocation": "Shanghai",
    "sessionName": "EnvDataSessionEmployeeProfile",
    "status": 1
  },
  {
    "activationDate": null,
    "approvalDateTime": "2020-01-14T00:58:32Z",
    "createdByWorkAssignmentLegacyId": "admin",
    "id": 2598,
    "lastModifiedDateTime": "2020-01-14T00:58:32Z",
    "sessionDate": null,
    "sessionLocation": "sh",
    "sessionName": "Test ER 1",
    "status": 1
  }
]
}

```

9.2.1.2 Querying a Subject's Information Using Session ID

This example shows how to query a subject's ratings, competency ratings, and comments by using session ID.

Request

Operation	Query
HTTP Method	GET
URI	<pre> https://<api-server>/odatav4/talent/ calibration/CalSession.svc/v1/ CalibrationSession(2621)? \$expand=subjectList(\$expand=ratingList,com petencyRatingList,commentList) </pre>
Payload	N/A

Response

```

{
  "@odata.context": "https://<api-server>/odatav4/talent/calibration/
CalSession.svc/v1/$metadata#CalibrationSession(subjectList(commentList(),competencyR
atingList(),ratingList()))/$entity",
  "@odata.metadataEtag": "\"5f7d183d-11d4-43b4-85f8-9f93276aef20\"",
  "activationDate": null,
  "approvalDateTime": null,
  "createdByWorkAssignmentLegacyId": "lokamoto1",
  "id": 2621,
  "lastModifiedDateTime": "2021-03-10T03:50:38Z",
  "sessionDate": null,

```

```

"sessionLocation": "SF",
"sessionName": "Session with calc PM",
"status": 1,
"subjectList": [
  {
    "calibrated": true,
    "id": 11507,
    "pmFormDataId": 991,
    "pmuDeeplink": "/acme?
bplte_company=Echo&fbacme_n=my_forms&inbox_os=list&inbox_fbfl_flist_act=open_form&in
box_fbfl_flist_fmid=1093&inbox_fbfl_flist_csid=2621&inbox_tm=1616643964449&inbox_tk=
-15988237201679769397954880168053049755775751972&pp_pm_owner=caluser",
    "workAssignmentLegacyId": "aaronchen12",
    "commentList": [],
    "competencyRatingList": [
      {
        "competencyId": 25,
        "competencyName": "Professional ethics",
        "competencySectionId": 1,
        "competencySectionName": null,
        "rating": 3.0,
        "ratingLabel": "Comp3"
      },
      {
        "competencyId": 26,
        "competencyName": "Customer focus",
        "competencySectionId": 1,
        "competencySectionName": null,
        "rating": 4.0,
        "ratingLabel": "Comp4"
      },
      {
        "competencyId": 27,
        "competencyName": "Siemens values",
        "competencySectionId": 1,
        "competencySectionName": null,
        "rating": 2.0,
        "ratingLabel": "Comp2"
      },
      {
        "competencyId": 41,
        "competencyName": "Communication skills",
        "competencySectionId": 1,
        "competencySectionName": null,
        "rating": 5.0,
        "ratingLabel": "Comp5"
      }
    ],
    "ratingList": [
      {
        "rating": null,
        "ratingLabel": "",
        "ratingType": 1,
        "ratingTypeLabel": "Manual Competency Rating"
      },
      {
        "rating": 4.0,
        "ratingLabel": "Partially Exceeded",
        "ratingType": 2,
        "ratingTypeLabel": "Overall Rating"
      }
    ]
  },
  {
    "calibrated": false,
    "id": 11510,
    "pmFormDataId": 995,

```

```

    "pmuDeeplink": "/acme?
bplte_company=Echo&fbacme_n=my_forms&inbox_os=list&inbox_fbfl_flist_act=open_form&in
box_fbfl_flist_fmid=1091&inbox_fbfl_flist_csid=2621&inbox_tm=1616643964449&inbox_tk=
-507859345285655787392038001572558945417418342768&pp_pm_owner=caluser",
    "workAssignmentLegacyId": "jlo1",
    "commentList": [],
    "competencyRatingList": [
      {
        "competencyId": 41,
        "competencyName": "Communication skills",
        "competencySectionId": 1,
        "competencySectionName": null,
        "rating": 2.0,
        "ratingLabel": "Comp2"
      },
      {
        "competencyId": 27,
        "competencyName": "Siemens values",
        "competencySectionId": 1,
        "competencySectionName": null,
        "rating": 3.0,
        "ratingLabel": "Comp3"
      },
      {
        "competencyId": 26,
        "competencyName": "Customer focus",
        "competencySectionId": 1,
        "competencySectionName": null,
        "rating": 5.0,
        "ratingLabel": "Comp5"
      },
      {
        "competencyId": 25,
        "competencyName": "Professional ethics",
        "competencySectionId": 1,
        "competencySectionName": null,
        "rating": 4.0,
        "ratingLabel": "Comp4"
      }
    ],
    "ratingList": [
      {
        "rating": 2.0,
        "ratingLabel": "Needs Improvement",
        "ratingType": 1,
        "ratingTypeLabel": "Manual Competency Rating"
      },
      {
        "rating": 2.0,
        "ratingLabel": "Partially Achieved",
        "ratingType": 2,
        "ratingTypeLabel": "Overall Rating"
      }
    ]
  }
}

```

9.2.1.3 Querying a Subject's Ratings

This example shows how to query a subject's competency ratings and ratings.

Request

Operation	Query
HTTP Method	GET
URI	https://<api-server>/odatav4/talent/ calibration/CalSession.svc/v1/ CalibrationSession(2621)/ subjectList(11506)? \$expand=competencyRatingList(\$expand=ratin gOptions),ratingList
Payload	N/A

Response

```

{
  "@odata.context": "https://<api-server>/
odatav4/talent/calibration/CalSession.svc/v1/$metadata#CalibrationSession(2621)/
subjectList(competencyRatingList(ratingOptions()),ratingList())/entity",
  "@odata.metadataEtag": "\"5f7d183d-11d4-43b4-85f8-9f93276aef20\"",
  "calibrated": true,
  "id": 11506,
  "pmFormDataId": 993,
  "pmuDeepLink": "/acme?
bplte_company=Echo&fbacme_n=my_forms&inbox_os=list&inbox_fbfl_flist_act=open_form&in
box_fbfl_flist_fmId=1094&inbox_fbfl_flist_csid=2621&inbox_tm=1616644014015&inbox_tk=
134690500506414363964370016507676888983179820128&pp_pm_owner=caluser",
  "workAssignmentLegacyId": "aaronchen14",
  "competencyRatingList": [
    {
      "competencyId": 25,
      "competencyName": "Professional ethics",
      "competencySectionId": 1,
      "competencySectionName": "Competency",
      "rating": null,
      "ratingLabel": null,
      "ratingOptions": [
        {
          "label": "Comp1",
          "value": 1.0
        },
        {
          "label": "Comp2",
          "value": 2.0
        },
        {
          "label": "Comp3",
          "value": 3.0
        },
        {
          "label": "Comp4",
          "value": 4.0
        },
        {
          "label": "Comp5",
          "value": 5.0
        }
      ]
    }
  ],
  "competencyId": 26,
  "competencyName": "Customer focus",

```

```

    "competencySectionId": 1,
    "competencySectionName": "Competency",
    "rating": 3.0,
    "ratingLabel": "Comp3",
    "ratingOptions": [
      {
        "label": "Comp1",
        "value": 1.0
      },
      {
        "label": "Comp2",
        "value": 2.0
      },
      {
        "label": "Comp3",
        "value": 3.0
      },
      {
        "label": "Comp4",
        "value": 4.0
      },
      {
        "label": "Comp5",
        "value": 5.0
      }
    ]
  },
  {
    "competencyId": 27,
    "competencyName": "Siemens values",
    "competencySectionId": 1,
    "competencySectionName": "Competency",
    "rating": 5.0,
    "ratingLabel": "Comp5",
    "ratingOptions": [
      {
        "label": "Comp1",
        "value": 1.0
      },
      {
        "label": "Comp2",
        "value": 2.0
      },
      {
        "label": "Comp3",
        "value": 3.0
      },
      {
        "label": "Comp4",
        "value": 4.0
      },
      {
        "label": "Comp5",
        "value": 5.0
      }
    ]
  },
  {
    "competencyId": 41,
    "competencyName": "Communication skills",
    "competencySectionId": 1,
    "competencySectionName": "Competency",
    "rating": 4.0,
    "ratingLabel": "Comp4",
    "ratingOptions": [
      {
        "label": "Comp1",
        "value": 1.0
      }
    ]
  }
]

```

```

    },
    {
      "label": "Comp2",
      "value": 2.0
    },
    {
      "label": "Comp3",
      "value": 3.0
    },
    {
      "label": "Comp4",
      "value": 4.0
    },
    {
      "label": "Comp5",
      "value": 5.0
    }
  ]
},
"ratingList": [
  {
    "rating": null,
    "ratingLabel": "",
    "ratingType": 1,
    "ratingTypeLabel": "Manual Competency Rating"
  },
  {
    "rating": null,
    "ratingLabel": "",
    "ratingType": 2,
    "ratingTypeLabel": "Overall Rating"
  }
]
}

```

9.2.1.4 Updating a Subject's Competency Ratings

This example shows how to update a subject's competency ratings.

Request

Operation	Update
HTTP Method	PATCH
URI	<a href="https://<api-server>/odatav4/talent/calibration/CalSession.svc/v1/CalibrationSession(2621)/subjectList(11506)">https://<api-server>/odatav4/talent/calibration/CalSession.svc/v1/CalibrationSession(2621)/subjectList(11506)

Payload

```
{
  "calibrated": true,
  "ratingList": [
    {
      "ratingType": 2,
      "rating": null
    }
  ],
  "competencyRatingList": [
    {
      "competencyId": 25,
      "competencySectionId": 1,
      "rating": -1
    }
  ]
}
```

Response

```
status: 204
```

9.2.1.5 Finalizing Calibration Sessions with Bound Action approveSession

The following example shows how to use the bound action, approveSession, to finalize a calibration session that is the In Progress or Approving status. The associated form will be automatically routed to the next step if the source of the Calibration data is Performance Management.

Request

Operation	finalizeSession
HTTP Method	POST
URI	https://<api-server>/odatav4/talent/calibration/CalSession.svc/v1/CalibrationSession(9999)/approveSession
Payload	N/A

Note

In the URI, 9999 stands for calibration session ID. When you open a calibration session, the session ID can be found in the URL.

Response

```
{
  "@odata.context": "https://localhost:443/odatav4/talent/calibration/CalSession.svc/v1/$metadata#CalSession.svc.ApproveSessionResponse(1452)",
}
```

```
"@odata.metadataEtag": "\"04a4e21c-d8b5-44ee-8470-58ec25eb8559\"",
"errorCode": null,
"errorMessage": null,
"isSuccess": true
}
```

9.3 Onboarding

A list of services offered in the Onboarding module.

9.3.1 AdditionalServices.svc

The service `AdditionalServices` allows you to update the internal username of the new hires after the hiring process is completed from the Active Directory.

Overview

URI: `http://<api-server>/odatav4/onboarding/AdditionalServices.svc/v1/`

Authentication Bearer <Token>

9.3.1.1 Updating the Username of a New Hire

This example shows how to update the new hire's internal username from the Active Directory. This means that after conversion job is completed the username from Active Directory is picked up.

Context

The `updateUserNamePostHiring` API allows you to update the internal username of new hires with the username that is generated from Active Directory. You can invoke this API any number of times during its lifespan. The API's lifespan is between the time after the hiring process of the new hire and before the new hire is converted as an employee.

📌 Note

This API supports the SuccessFactors Employee Central solution and the other external HRIS integrates systems.

Permissions

You have the [Manage Onboarding 2.0 or Offboarding 2.0](#) > [Update New Hire Data for External HRIS](#) permission.

Note

Define the target population to ensure that the permission works optimally. For more information, refer to [Assigning External User Target Populations to Responsible Users' Permission Role](#) topic.

Request

Operation	Update
HTTP Method	POST
URI	<code>https://<api-server>/odatav4/ onboarding/AdditionalServices.svc/v1/ updateUserNamePostHiring</code>
Payload	<pre>{ "userId" : "103280", "userName" : "frankboehm@sap.com" }</pre>

Response

```
{  
  "@odata.context": "https://<api-server>/odatav4/onboarding/  
AdditionalServices.svc/$metadata#Edm.String",  
  "@odata.metadataEtag": "\"bec992aa-2ec8-4ba1-8cc7-cb322fb62412\"",  
  "value": "Success"  
}
```

Error Codes

Error Code	Description
COE0000	The responseCode COE0000 means that the requested operation was not completed because Onboarding is not enabled.
COE0001	The responseCode COE0001 means that you don't have permission to invoke this API. Contact your administrator to enable the required permission.
COE0002	The responseCode COE0002 means that the requested operation was not completed because the values provided for the <code>userId</code> is invalid. Check the values in Admin Center > OData API Data Dictionary and include it in the request.

Error Code	Description
COE0005	The responseCode COE0005 means that the requested operation was not completed because the userId for the given userName could not be found. Ensure that the userName is associated to a valid userId.
COE0006	The responseCode COE0006 means that the requested operation was not completed because the userName value provided for userId already exists in the system. Provide an unique value.
COE0007	The responseCode COE0007 means that the requested operation was not completed because the user doesn't have a valid Onboarding process.
COE0008	The responseCode COE0008 means that the requested operation was not completed because the user isn't yet hired.
COE0009	The responseCode COE0009 means that the requested operation was not completed because the user isn't a new hire any more.

9.3.1.2 Fetching the Username of a New Hire

This example shows you how to fetch the username of the Onboarding new hire, after the new hire has gone through the [Manage Pending Hires](#) process.

Context

The `getUserUsernameOfNewlyHiredEmployee` API allows you to fetch the username of the onboarding new hire, after the employee has gone through the [Manage Pending Hires](#) process. This is applicable to the newly hired employees whose joining date is in the future.

Permissions

You have the [Manage Onboarding or Offboarding](#) [Initiate Onboarding API Permission](#) permission.

Request

HTTP Method	GET
-------------	-----

URI `https://api-server /odatav4/onboarding/AdditionalServices.svc/getUserNameOfNewlyHiredEmployee(userId=' 2011024364 ')`

Response

```
{
  "@odata.context": "https://<api-server>/odatav4/onboarding/AdditionalServices.svc/$metadata#Edm.String",
  "@odata.metadataEtag": "\"f811def3-3f8f-420b-bb35-6ccdc15dea5a\"",
  "value": "BR501347"
}
```

Error Codes

Error Code	HTTP Status Code	Description	Comment
COE0000	403	Onboarding application is not enabled	The request could not completed because Onboarding is not enabled in provisioning. As a customer, you do not have access to Provisioning. To complete tasks in provisioning, contact your implementation partner.
COE0001	403	No permission to invoke this API	You don't have permission to invoke this API. Contact your administrator to enable the required permission.
COE0002	400	Bad Property Value	The request could not be completed because the values provided for the parameter {0} is invalid. Please check the values in Admin Center and OData API Data Dictionary and include it in the request.
COE0004	400	Mandatory Parameter is missing	The request could not be completed because the mandatory parameter {0} is missing. Please check the values in Admin Center and OData API Data Dictionary and include it in the request.

Error Code	HTTP Status Code	Description	Comment
COE0005	400	Onb2Process record not found.	The request could not be completed because the {0} for the given {1} could not be found. Ensure that the {2} is associated to a valid {3}.
COE0007	400	Invalid process type	The request couldn't be completed because the user doesn't have a valid Onboarding process.
COE0008	400	Invalid hire status of process	The request couldn't be completed because the user isn't yet hired.
COE0009	400	Invalid user status	The request couldn't be completed because the user isn't a new hire any more.

9.4 Time Tracking

A list of services offered in the Time Tracking module.

9.4.1 ClockInClockOutIntegration.svc

The service `ClockInClockOutIntegration` allows you to read the Clock In Clock Out related entities.

Overview

URI: `https://<api-server>/odatav4/timemanagement/timeeventprocessing/ClockInClockOutIntegration.svc/v1`

Authentication: Bearer <Token>

Note

The user should have the role of a business user when creating the OAuth token. For more information, see the *Related Information* section.

Related Information

[Creating API Key to Create OAuth TokenParameter details for the ClockInClockOutIntegration service](#)

[ClockInClockOutIntegration service](#)

[Registering Your OAuth2 Client Application \[page 15\]](#)

9.4.1.1 Querying a Clock In Clock Out Group Using a Code

This example shows how to read a Clock In Clock Out Group with the code **TETG-1**, and expand the assigned Time Event Types.

Request

Operation	Query
HTTP Method	GET
URI	<code>https://<api-server>/odatav4/ timemanagement/timeeventprocessing/ ClockInClockOutIntegration.svc/v1/ ClockInClockOutGroups('TETG-1')? \$expand=timeEventTypeNav</code>
Payload	N/A

Response

Note

You will get the results for the Clock In Clock Out groups, only if you have the [View Clock In Clock Out Groups](#) permission.

```
{
  "@odata.context": "https://<api-server>/odatav4/timemanagement/  
$metadata#ClockInClockOutGroups(timeEventTypeNav())",
  "@odata.metadataEtag": "\"\fdbcac9ff-5818-44fd-9828-8a1a86c7ee48\"",
  "value": [
    {
      "code": "TETG-1",
      "createdAt": "2022-01-25T13:22:10.105Z",
      "createdBy": "admin",
      "lastChangedAt": "2022-01-25T13:22:10.105Z",
      "lastChangedBy": "admin",
      "name": "Clock In Clock Out Group 1",
      "timeEventTypeNav": [
        {
          "active": true,
          "code": "CI",
          "description": "Clock In",
          "event": "START",
          "name": "Clock In"
        }
      ]
    }
  ]
}
```

```

    {
      "active": true,
      "code": "CO",
      "description": "Clock Out",
      "event": "STOP",
      "name": "Clock Out"
    },
    {
      "active": true,
      "code": "BR",
      "description": "Break",
      "event": "START",
      "name": "Break"
    }
  ]
}

```

Viewing Translations for a Clock In Clock Out Group and Time Event Types

This example shows how to read and view translations for a Clock In Clock Out Group with the code CICOG-1, and expand the assigned Time Event Types along with their translations.

Request

Operation	Query
HTTP Method	GET
URI	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/ClockInClockOutIntegration.svc/v1/ClockInClockOutGroups('CICOG-1')?\$expand=translations,timeEventTypeNav(\$expand=translations)</code>
Payload	N/A

Response

Note

You will get the results for the Clock In Clock Out groups, only if you have the [View Clock In Clock Out Groups](#) permission.

```

{
  "@odata.context": " https://<api-server>/odatav4/timemanagement/timeeventprocessing/ClockInClockOutIntegration.svc/v1/$metadata#ClockInClockOutGroups(timeEventTypeNav(translations()),translations())",
  "@odata.metadataEtag": "\"1d45c94d-56c9-4d50-9f87-96b523f6c3c5\"",
  "value": [
    {
      "code": "CICOG-1",
      "createdAt": "2022-05-17T16:49:02.817Z",
      "createdBy": "admin",
      "lastChangedAt": "2022-05-17T16:49:02.817Z",
      "lastChangedBy": "admin",
      "name": "English US Text",
    }
  ]
}

```

```

"timeEventTypeNav": [
  {
    "active": true,
    "code": "CI",
    "description": "Clock In",
    "event": "START",
    "name": "English US Text",
    "translations": [
      {
        "localeId": "defaultValue",
        "name": "Default Text",
        "timeEventTypeCode": "CI"
      },
      {
        "localeId": "en_US",
        "name": "Clock In",
        "timeEventTypeCode": "CI"
      },
      {
        "localeId": "de_DE",
        "name": "Den Arbeitsbeginn restriieren",
        "timeEventTypeCode": "CI"
      }
    ]
  },
  {
    "active": true,
    "code": "CO",
    "description": "Clock Out",
    "event": "STOP",
    "name": "English US Text",
    "translations": [
      {
        "localeId": "defaultValue",
        "name": "Default Text",
        "timeEventTypeCode": "CO"
      },
      {
        "localeId": "en_US",
        "name": "Clock Out",
        "timeEventTypeCode": "CO"
      },
      {
        "localeId": "de_DE",
        "name": "Ausstempeln",
        "timeEventTypeCode": "CO"
      }
    ]
  }
],
"translations": [
  {
    "clockInClockOutGroupCode": "CICOG-1",
    "localeId": "de_DE",
    "name": "CICO Gruppe 1"
  },
  {
    "clockInClockOutGroupCode": "CICOG-1",
    "localeId": "en_US",
    "name": "CICO Group 1"
  },
  {
    "clockInClockOutGroupCode": "CICOG-1",
    "localeId": "defaultValue",
    "name": "Default Text"
  }
]

```

```
}
  ]
}
```

9.4.1.2 Querying All Available Clock In Clock Out Groups

This example shows how to read all the available Clock In Clock Out Groups and the time event types associated with them.

Request

Operation	Query
HTTP Method	GET
URI	https://<api-server>/odatav4/ timemanagement/timeeventprocessing/ ClockInClockOutIntegration.svc/v1/ ClockInClockOutGroups? \$expand=timeEventTypeNav
Payload	N/A

Response

ⓘ Note

You will get the results for the Clock In Clock Out groups, only if you have the [View Clock In Clock Out Groups](#) permission.

```
{
  "@odata.context": "https://<api-server>/odatav4/timemanagement/  
$metadata#ClockInClockOutGroups",
  "@odata.metadataEtag": "\"f19acb74-52d3-4d73-8100-06f11f448331\"",
  "value": [
    {
      "code": "TETG-1",
      "createdAt": "2022-01-25T13:22:10.105Z",
      "createdBy": "admin",
      "lastChangedAt": "2022-01-25T13:22:10.105Z",
      "lastChangedBy": "admin",
      "name": "Clock In Clock Out Group 1",
      "timeEventTypeNav": [
        {
          "active": true,
          "code": "CI",
          "description": "Clock In",
          "event": "START",
          "name": "English US Text"
        },
        {
          "active": true,
          "code": "CO",
          "description": "Clock Out",

```


Note

You will get the results for the Clock In Clock Out groups, only if you have the [View Clock In Clock Out Groups](#) permission.

```
{
  "@odata.context": "https://<api-server>/odatav4/timemanagement/
timeeventprocessing/
ClockInClockOutIntegration.svc/v1/$metadata#ClockInClockOutGroups(timeEventTypeNav(
,translations()))",
  "@odata.metadataEtag": "\"026566dd-9e92-4c2d-a398-93a8c04704f5\"",
  "value": [
    {
      "code": "CICOG-1",
      "createdAt": "2022-05-17T16:49:02.817Z",
      "createdBy": "admin",
      "lastChangedAt": "2022-05-17T16:49:02.817Z",
      "lastChangedBy": "admin",
      "name": "CICO Group 1",
      "timeEventTypeNav": [
        {
          "active": true,
          "code": "CI",
          "description": "Clock In",
          "event": "START",
          "name": "Clock In",
          "translations": [
            {
              "localeId": "defaultValue",
              "name": "Default Text",
              "timeEventTypeCode": "CI"
            },
            {
              "localeId": "en_US",
              "name": "Clock In",
              "timeEventTypeCode": "CI "
            },
            {
              "localeId": "de_DE",
              "name": " Den Arbeitsbeginn restrieren",
              "timeEventTypeCode": "CI"
            }
          ]
        }
      ],
      "active": true,
      "code": "CO",
      "description": "Clock Out",
      "event": "STOP",
      "name": "English US Text",
      "translations": [
        {
          "localeId": "de_DE",
          "name": "Ausstempeln",
          "timeEventTypeCode": "CO"
        },
        {
          "localeId": "en_US",
          "name": "Clock Out",
          "timeEventTypeCode": "CO"
        },
        {
          "localeId": "defaultValue",
          "name": "Default Text",
          "timeEventTypeCode": "CO"
        }
      ]
    }
  ]
}
```

```

    ]
  },
  "translations": [
    {
      "clockInClockOutGroupCode": "CICOG-1",
      "localeId": "de_DE",
      "name": "CICO Gruppe 1"
    },
    {
      "clockInClockOutGroupCode": "CICOG-1",
      "localeId": "en_US",
      "name": "CICO Group 1"
    },
    {
      "clockInClockOutGroupCode": "CICOG-1",
      "localeId": "defaultValue",
      "name": "Default Text"
    }
  ]
},
{
  "code": "CICOG-2",
  "createdAt": "2022-05-17T16:50:42.503Z",
  "createdBy": "admin",
  "lastChangedAt": "2022-05-17T16:50:42.503Z",
  "lastChangedBy": "admin",
  "name": "CICO Group 2",
  "timeEventTypeNav": [
    {
      "active": true,
      "code": "CI",
      "description": "Clock In",
      "event": "START",
      "name": "English US Text",
      "translations": [
        {
          "localeId": "defaultValue",
          "name": "Default Text",
          "timeEventTypeCode": "CI"
        },
        {
          "localeId": "en_US",
          "name": "Clock In",
          "timeEventTypeCode": "CI"
        },
        {
          "localeId": "de_DE",
          "name": "Den Arbeitsbeginn restriieren ",
          "timeEventTypeCode": "CI"
        }
      ],
      ...
    }
  ],
  "translations": [
    {
      "clockInClockOutGroupCode": "CICOG-2",
      "localeId": "defaultValue",
      "name": "Default Text"
    },
    {
      "clockInClockOutGroupCode": "CICOG-2",
      "localeId": "en_US",
      "name": "CICO Group 2"
    },
    {
      "clockInClockOutGroupCode": "CICOG-2",

```

```
    "localeId": "de_DE",  
    "name": "CICO Gruppe 2"  
  }  
]  
}
```

9.4.2 clockinlogout

The service `clockinlogout` allows you to export the time event details.

Overview

URI: `https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinlogout/v1`

Authentication: Bearer <Token>

Note

The user should have the role of a business user when creating the OAuth token.

Permissions:

- Ensure you have the Administrator permission for
▶ [Manage Clock In Clock Out](#) ▶ [View Time Events](#) ▶

Access Limits

Operation Type	Limit	Notes
Query page size	1000	You can retrieve upto 1000 time events with every API call.
API Quota	300 per day	You can make upto 300 API calls in a single day.
Rate limiter	10 API calls per minute	You can make upto 10 API calls per minute at the rate of 1 API call for every 6 seconds.

Error Codes

Error Code	Description
400	Bad request. For example, if you send an invalid request.
401	Unauthorized. For example, the access token is expired.
500	Internal server error. For example, if there is an unexpected server error.

Additional Information

Only the GET HTTP method is supported by this API.

Limitations

This API currently does not support the following:

- Geolocation information
- Logical day

9.4.2.1 Exporting Time Events

This example shows how to export all the time events available in the system.

Export All Time Events in a System

This API request allows you to get all the time events that are available in a system. You also have the API request and response for the following operations:

- [Export all Time Events with pagination \[page 69\]](#)
- [Export all Time Events with filter \[page 69\]](#)
- [Export all Time Events with Sorting \[page 71\]](#)
- [Export all Time Events with selected properties \[page 71\]](#)

Request

Operation	Query
HTTP Method	GET
URI	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents</code>

Properties Table

<i>Property</i>	<i>Description</i>
approvalStatusCode	Approval status of the time event.
comments	Additional information for creation of manual time event.
createdAt	Creation date and time for the time event.
createdBy	User who created the time event.
creationSourceCode	Source of created time event.
externalId	Unique alphanumeric ID of the time event.
lastChangedAt	Last modified date and time for the time event.
lastChangedBy	User who last modified the time event.
pairingStatusCode	Pairing status of the time event.
reasonForManualTimeEvent-Code	Reason for creation of the manual time event.
terminalId	Terminal ID of the time event.
timeEventTypeCode	Unique alphanumeric code for the Time Event Type.
timeTypeCode	Time Type Code of the created the time event.
timeZoneOffset	The time difference between UTC and a given time zone.
timestampUTC	Timestamp in UTC at which the time event was created. To get local timestamp, the timeZoneOffset value has to be added or subtracted from the timestampUTC value.
validationMessages	Messages for any validation failures.
validationStatusCode	Validation Status of the time event.
workAssignmentId	Work assignment ID of the user.

Response

Note

You will get the results for the time events, only if you have the **View time events** permission.

```
{
  "@odata.context": "https://<api-server>/odatav4/timemanagement/
timeeventprocessing/clockinclockout/v1/$metadata#timeevents",
  "@odata.metadataEtag": "\"58e8f908-136d-44f5-8068-a528b99b8d3e\"",
  "value": [
    {
      "approvalStatusCode": "APPROVED",
      "comments": null,
      "createdAt": "2022-11-28T08:41:40.42Z",
      "createdBy": "Admin",
      "creationSourceCode": "MANUAL",
      "externalId": "e137ffa1fa7f48e89d537a88ffbd3f0c",
      "lastChangedAt": "2022-11-28T08:41:40.42Z",
      "lastChangedBy": "Admin",
      "pairingStatusCode": "PROCESSED",
      "reasonForManualTimeEventCode": null,
      "terminalId": null,
      "timeEventTypeCode": "CO",
      "timeTypeCode": null,
      "timeZoneOffset": "+0530",
    }
  ]
}
```

```

    "timestampUTC": "2022-11-28T14:11:24Z",
    "validationMessages": [],
    "validationStatusCode": "SUCCESS",
    "workAssignmentId": "workuser6"
  }
]
}

```

Export All Time Events in a System with Pagination

This API request allows you to get all the time events that are available in a system along with pagination

Request

Operation	Query
HTTP Method	GET
URI	https://<api-server>/odatav4/timemanagement/ timeeventprocessing/clockinclockout/v1/timeevents? \$skip=0&\$top=300

Response

Note

You will get the results for the time events, only if you have the **View time events** permission.

```

{
  "@odata.context": "http://<api-server>/odatav4/timemanagement/  
timeeventprocessing/clockinclockout/v1/$metadata#timeevents",
  "@odata.metadataEtag": "\"773de5f2-ebf6-4478-8a74-e802cc2a136a\"",
  "value": [
    {
      "approvalStatusCode": "APPROVED",
      "comments": null,
      "createdAt": "2022-11-28T08:41:40.42Z",
      "createdBy": "Admin",
      "creationSourceCode": "MANUAL",
      "externalId": "e137ffalfa7f48e89d537a88ffbd3f0c",
      "lastChangedAt": "2022-11-28T08:41:40.42Z",
      "lastChangedBy": "Admin",
      "pairingStatusCode": "PROCESSED",
      "reasonForManualTimeEventCode": null,
      "terminalId": null,
      "timeEventTypeCode": "CO",
      "timeTypeCode": null,
      "timeZoneOffset": "+0530",
      "timestampUTC": "2022-11-28T14:11:24Z",
      "validationMessages": [],
      "validationStatusCode": "SUCCESS",
      "workAssignmentId": "workuser6"
    }
  ],
  "@odata.nextLink": "http://<api-server>/odatav4/timemanagement/timeeventprocessing/  
clockinclockout/v1/timeevents?$skiptoken=eyJsaWpdCI6MSwib2Zmc2V0IjoxfQ=="
}

```

Export All Time Events in a System with Filter

This API request allows you to get all the time events that are available in a system using filters. Following filters are supported:

- Date range
- Specific assignment IDs
- Specific TimeEventType IDs
- Specific external IDs
- Creation source

Note

Supported properties for filters include externalId, workAssignmentId, timestampUTC, timeEventTypeCode, pairingStatusCode, validationStatusCode, creationSourceCode, and approvalStatusCode.

Request Examples for the Supported Filters

Operation	Query
HTTP Method	GET
URI example to extract all time events using a date range	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents?\$filter=timestampUTC ge 2022-01-01T07:00:00Z AND timestampUTC le 2022-01-31T007:00:00Z</code>
URI example to extract all time events using specific assignment IDs	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents?\$filter=workAssignmentId in ('user1','user2')</code>
URI example to extract all time events using specific TimeEventTypes IDs	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents?\$filter=timeEventTypeCode eq 'CI'</code>
URI example to extract all time events using specific external IDs	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents?\$filter=externalId in ('E1','E2','E3')</code>
URI example to extract all time events based on the creation source. In this example, the source is a terminal.	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents?\$filter=creationSourceCode eq 'TERMINAL'</code>

Response

Following is a sample response which is a filtered list of time events for various values of the supported properties. For example, approvalStatusCode is APPROVED, creationSourceCode is MANUAL, and so on.

Note

You will get the results for the time events, only if you have the **View time events** permission.

```
{
  "@odata.context": "http://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/$metadata#timeevents",
  "@odata.metadataEtag": "\"773de5f2-ebf6-4478-8a74-e802cc2a136a\"",
  "value": [
    {
      "approvalStatusCode": "APPROVED",
      "comments": null,
      "createdAt": "2022-11-28T08:41:40.42Z",
      "createdBy": "Admin",
    }
  ]
}
```

```

    "creationSourceCode": "MANUAL",
    "externalId": "e137ffa1fa7f48e89d537a88ffbd3f0c",
    "lastChangedAt": "2022-11-28T08:41:40.42Z",
    "lastChangedBy": "Admin",
    "pairingStatusCode": "PROCESSED",
    "reasonForManualTimeEventCode": null,
    "terminalId": null,
    "timeEventTypeCode": "CO",
    "timeTypeCode": null,
    "timeZoneOffset": "+0530",
    "timestampUTC": "2022-11-28T14:11:24Z",
    "validationMessages": [],
    "validationStatusCode": "SUCCESS",
    "workAssignmentId": "workuser6"
  }
]
}

```

Export All Time Events in a System with Sorting

This API request allows you to get all the time events that are available in a system with sorting. Following sorting orders are supported:

- Creation date and time in an ascending order
- Creation date and time in a descending order

Note

Supported properties for orderby include timestampUTC, timeEventTypeCode, pairingStatusCode, validationStatusCode, creationSourceCode, and approvalStatusCode.

Request Examples for Sorting

Operation	Query
HTTP Method	GET
URI example to extract all time events in an ascending order	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents?\$orderby=createdAt</code>
URI example to extract all time events in a descending order	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents?\$orderby=createdAt desc</code>

Response

By default, the sorting happens in an ascending order for all the properties. However, for timestampUTC, the default sorting is in descending order.

Note

You will get the results for the time events, only if you have the **View time events** permission.

Export All Time Events in a System with Selected Properties

This API request allows you to get all the time events for selected properties.

Request Example for Selected Properties

Operation	Query
HTTP Method	GET
URI example to extract all time events with properties that include workAssignmentId,time-EventTypeId,timeEventTypeId,timeEventTypeId,timestampUTC, and creationSourceCode	<code>https://<api-server>/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents?\$select=workAssignmentId,timeEventTypeId,timestampUTC,creationSourceCode</code>

Response

Following is a sample response for the selected properties.

Note

You will get the results for the time events, only if you have the **View time events** permission.

```
{
  "@odata.context": "http://<api-server>/odatav4/timemanagement/timeeventprocessing/ClockInClockOutIntegration.svc/v1/$metadata#TimeEvents(workAssignmentId,creationSource,externalId,timeEventTypeId,timestampUTC)",
  "@odata.metadataEtag": "\"c3457ed3-d2be-4cd5-b1a5-22fe46462892\"",
  "value": [
    {
      "@odata.id": "https://tep-svc.sc25k8sc101.cksd25.c.eu-de-1.cloud.sap/odatav4/timemanagement/timeeventprocessing/clockinclockout/v1/timeevents('e137ffa1fa7f48e89d537a88ffbd3f0c')",
      "creationSourceCode": "MANUAL",
      "externalId": "e137ffa1fa7f48e89d537a88ffbd3f0c",
      "timeEventTypeId": "CO",
      "timeZoneOffset": "+0530",
      "timestampUTC": "2022-11-28T14:11:24Z",
      "workAssignmentId": "workuser6"
    }
  ]
}
```

9.5 Succession Planning

A list of services offered in the Succession Planning module.

9.5.1 NominationService.svc

The OData V4 service `NominationService.svc` allows you to create, update, or delete successor nominations and talent pool nominations.

Note

`NominationService.svc` cannot be used to manage nomination history.

Overview

To manage successor nominations using this service, you must have the [User Permissions](#) > [Succession Planners](#) > [Succession Planning Permission](#) permission.

To manage talent pool nominations using this service, you must have the following permissions:

- [User Permissions](#) > [Miscellaneous Permissions](#) > [Talent Pool](#) > [View Current](#)
- [User Permissions](#) > [Succession Planners](#) > [View Talent Pool Nominations](#)
- [User Permissions](#) > [Succession Planners](#) > [Add/Edit/Delete Talent Pool Nominations](#)

URI: `https://<api-server>/odatav4/talent/succession/NominationService.svc/v1/`

Authentication: Bearer <Token>

Error Codes

Error Code	Description
400	This type of error is caused by one of the following cases: <ul style="list-style-type: none">• The nomination target or the user ID is empty.• The nomination record doesn't exist.• The readiness is invalid.• The rank is invalid.
403	You don't have the permission to access this feature.
404	The nomination target or the user ID is invalid.
501	The nomination method is not MDF position-based.

Related Information

[NominationService.svc on SAP Business Accelerator Hub](#)

9.5.1.1 Nominating a User to a Position or Talent Pool

This example shows how to nominate a user to a position. To manage a talent pool nomination, add `isPoolNomination=true` to the request URI.

Request

Operation	Upsert
-----------	--------

HTTP Method	POST
URI	https://<api-server>/odatav4/talent/succession/NominationService.svc/v1/upsertNomination
Payload	<div style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> <p>↗ Sample Code</p> <pre>{ "nominationTarget": "8859", "userId": "SF05241", "readiness": 3, "rank": 4, "note": "UserId SF05241 note", "emergencyCover": false }</pre> </div>

Response

```
{
  "@odata.context": "https://<api-server>/odatav4/talent/succession/NominationService.svc/$metadata#Edm.Boolean",
  "@odata.metadataEtag": "\"253318d9-3cff-4f5d-916b-4d026ed9ab14\"",
  "action": "add",
  "value": true
}
```

9.5.1.2 Updating a Nomination for a Position or Talent Pool

This example shows how to update the successor information of a position. To manage a talent pool nomination, add `isPoolNomination=true` to the request URI.

Request

The following use case updates the readiness of the successor from 3 to 4.

Operation	Upsert
HTTP Method	POST
URI	https://<api-server>/odatav4/talent/succession/NominationService.svc/v1/upsertNomination

Payload

Sample Code

```
{
  "nominationTarget": "8859",
  "userId": "SF05241",
  "readiness": 4,
  "rank": 4,
  "note": "UserId SF05241 note",
  "emergencyCover": false
}
```

Response

```
{
  "@odata.context": "https://<api-server>/odatav4/talent/succession/
NominationService.svc/$metadata#Edm.Boolean",
  "@odata.metadataEtag": "\"253318d9-3cff-4f5d-916b-4d026ed9ab14\"",
  "action": "update",
  "value": true
}
```

9.5.1.3 Deleting a Nomination for a Position or Talent Pool

This example shows how to delete the nomination information of a position. To manage a talent pool nomination, add `isPoolNomination=true` to the request URI.

Request

Operation	Upsert
HTTP Method	POST
URI	<code>https://<api-server>/odatav4/talent/succession/NominationService.svc/v1/deleteNomination</code>

Payload

Sample Code

```
{
  "nominationTarget": "8859",
  "userId": "SF05241"
}
```

Response


```
{
  "@odata.context": "https://<api-server>/odatav4/talent/succession/
NominationService.svc/$metadata#Edm.Boolean",
  "@odata.metadataEtag": "\"253318d9-3cff-4f5d-916b-4d026ed9ab14\"",
  "action": "delete",
}
```

```
} "value": true
```

9.6 ContinuousFeedback.svc

The Continuous Feedback service for Continuous Performance Management allows users to view, request, decline, and provide feedback to coworkers.

SAP Business Accelerator Hub

The API Resources for *ContinuousFeedback.svc* are available on the [SAP Business Accelerator Hub](#) 

This service includes:

- Feedback
 - Give feedback or respond to a feedback request.
 - Get feedback records.
 - Update feedback visibility.
 - Get feedback by record Id.
 - Get default feedback questions.
- Feedback Requests
 - Create a feedback request.
 - Get pending feedback requests.
 - Decline a feedback request.
 - Get default feedback questions.
 - Get feedback requests by record Id.
 - Get feedback request records.
- Check user for which operations they can perform on the target user.
- Refresh Metadata.

URI

```
https://<api-server>/odatav4/talent/continuousfeedback/v1/feedback
```

Authentication

Basic

Permissions

No Service Level Permissions. Permission checks are enforced at the entity level depending on the use case..

For example, to [Request Feedback](#) a Continuous Feedback user is able to:

- Access Continuous Feedback.
- Request feedback from others.
- Be in the target population of the receiver.

To [Decline a Feedback Request](#) no additional Continuous Performance user permissions are required. Someone requested to provide feedback can decline the request with having Access Continuous Feedback permission.

Service Level Feature check: [Enable Continuous Feedback](#).

Reference: [Enabling Features for Continuous Performance Management \(Latest\)](#)

Related Information

[SAP Business Accelerator Hub](#) 

10 Change History

Learn about changes to the documentation for SAP SuccessFactors HCM suite API Reference Guide (OData V4) in recent releases.

2H 2025

Type of Change	Description	More Info
New	<code>NominationService.svc</code> is now available for all nomination methods, so we removed the information that you must use the MDF position-based nomination method.	NominationService.svc [page 72]

1H 2025



Type of Change	Description	More Info
New	You can now use <code>NominationService.svc</code> to create, update, and delete talent pool nominations, in addition to successor nominations. The <code>emergencyCover</code> and <code>action</code> properties are also newly available.	NominationService.svc [page 72] Nominating a User to a Position or Talent Pool [page 73] Updating a Nomination for a Position or Talent Pool [page 74] Deleting a Nomination for a Position or Talent Pool [page 75]
New	We added a new option to authenticate API users using OpenID Connect (OIDC).	Authentication Using OpenID Connect (OIDC) [page 27]

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