

**Oracle® Retail Xstore Office Cloud Service**

Security Guide

Release 18.1

**F18629-03**

November 2020

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# Preface

The *Oracle® Retail Xstore Office Cloud Service Security Guide* describes the security features and security considerations for the Oracle Retail Xstore Office Cloud Service application.

## Audience

This guide is for technical personnel who configure, maintain and support, or use Oracle Retail Xstore Office.

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## Related Documents

For more information, see the Oracle Retail Xstore Point- of-Service and Oracle Retail Xstore Office documentation set.

<http://www.oracle.com/technetwork/documentation/oracle-retail-100266.html>

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- Exact error message received

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# Oracle Retail Documentation on the Oracle Technology Network

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<http://www.oracle.com/technetwork/documentation/oracle-retail-100266.html>

(Data Model documents are not available through Oracle Technology Network. You can obtain them through My Oracle Support.)

## Conventions

The following text conventions are used in this document:

<b>Convention</b>	<b>Meaning</b>
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.



This chapter provides a product and cloud deployment overview of Xstore Office Cloud Service.

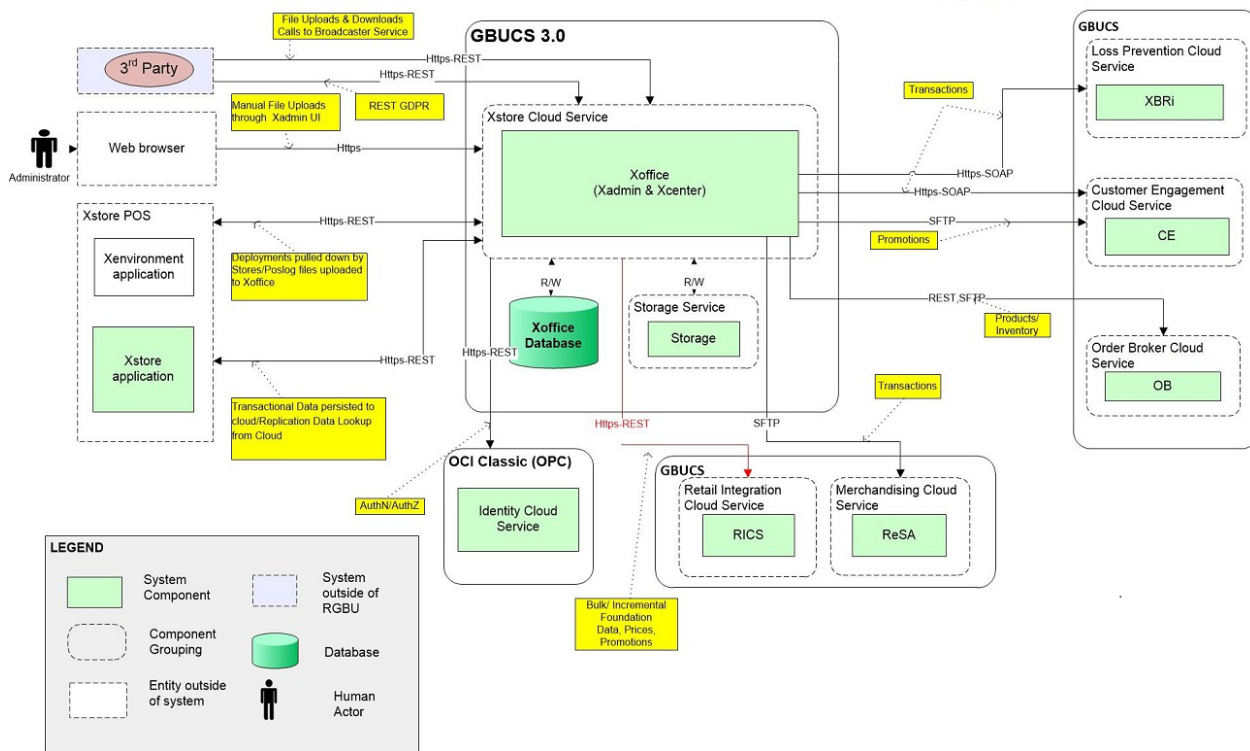
## **Product Overview**

Oracle Retail Xstore Office Cloud Service is a web-based application used to administer corporate based functions such as Oracle Retail Xstore Point-of-Service configuration setup and maintenance, file management for the Oracle Retail Xstore Suite, viewing the electronic journal, viewing store reports, monitoring Oracle Retail Xstore Point-of-Service versions in use at the store and register levels, and monitoring alerts.

Xstore Office Cloud Service consists of a User Interface component called Xadmin and a Web Services component called Xcenter, a Java and JSON-based messaging framework.

Xstore Office Cloud Service integrates with several other products as shown in the following Architecture Model. All incoming web services are RESTful and secured with OAuth 2.0. Outgoing web services are RESTful or SOAP based and secured with OAuth, Basic Auth or Custom Auth.

**Figure 1–1 Architecture Model**



## Identity Cloud Service

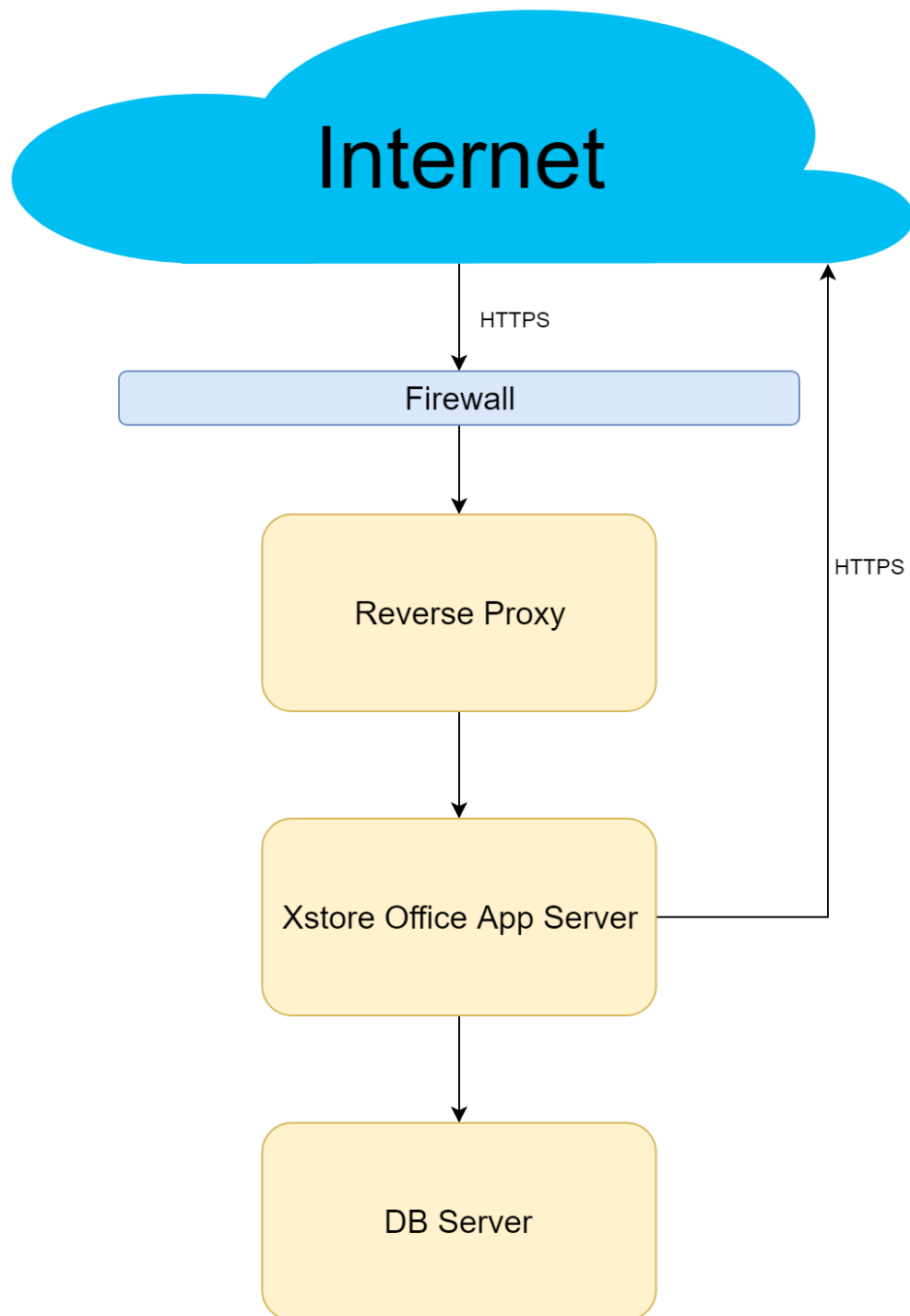
The Identity Cloud Service (IDCS) is an Identity Management Service and Authorization Server and has a host of other features and capabilities. For more information on IDCS, see the Oracle Identity Cloud Service documentation set, Get Started portal for IDCS.

<https://docs.oracle.com/en/cloud/paas/identity-cloud/index.html>

Xstore Office Cloud Service integrates with Identity Cloud Service (IDCS). For Xstore Office Cloud, IDCS is primarily used for Identity Management (that is, storing user information), for securing REST services using the Open Authorization (OAuth) 2.0 and Login via the OAuth 2.0 and OpenID Connect (OIDC) protocols.

## Cloud Deployment Overview

The following diagram describes an Xstore Office Cloud deployment.

**Figure 1–2 Xstore Office Cloud Deployment Process**

All incoming and outgoing service communication with the Cloud instance requires TLS for transport security.

**Reverse Proxy:** The Reverse Proxy intercepts all incoming requests to Xstore Office Cloud and authorizes and/or authenticates the requests based on the Xstore Office Cloud Web Tier Policy defined in IDCS.

**Xstore Office Application Server:** The Application Server hosts the Xstore Office Cloud Service Applications including Xadmin which is the User Interface component and Xcenter which is the Web Services component (a Java and JSON-based messaging framework).

**DB Server:** The Oracle database server contains the database schemas required by the Xstore Office Cloud Service.

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## Security Features

This chapter describes the available security features of the Xstore Office Cloud Service.

### Security Model

Xstore Office Cloud Service integrates with Identity Cloud Service (IDCS) for Identity Management (that is, storing user information), for securing REST services using the Open Authorization (OAuth) 2.0 and Secure User Authentication via the OAuth 2.0 and OpenID Connect (OIDC) protocols.

A Reverse Proxy is in place that intercepts all incoming requests to Xstore Office Cloud Service and authorizes and/or authenticates the requests based on the Xstore Office Cloud Web Tier Policy defined in IDCS.

### Xstore Office Cloud Service Provisioning

During Xstore Office Provisioning, Xstore Office OAuth Clients (or Apps) are created in IDCS with custom AppRoles. The Custom AppRoles are used to perform additional Application Level authorizations in addition to Application Level Privilege authorizations.

At the time of provisioning, a Customer Administration User is also created, who initially, is the sole user with access to the Xstore Office Cloud Service application. It is the responsibility of the Customer Administration User to create users with the appropriate privileges for functionality that will become available to them. It is recommended that users are granted the least level of access they require to perform their duties.

### Authentication

Xadmin delegates the login to IDCS. Therefore, it does not prompt the user to login and does not store any user credentials. Instead, when a user accesses Xadmin, the Reverse Proxy determines whether this user's session already exists in IDCS. If so, it forwards to Xadmin. If this user's session does not exist, then the Reverse Proxy redirects to IDCS prompting the user to enter their credentials. If the user successfully authenticates in IDCS, then the request is forwarded to Xadmin. Once at Xadmin, additional application level authorization is performed to determine the user's role and privileges granted to the user in order to display the appropriate features that the user is authorized to access.

For details on how users are created and provisioned, see the [Creation of Users](#) section.

## Multi-Factor Authentication (MFA)

IDCS provides the ability to enable Multi-Factor Authentication. For more information on enabling Multi-Factor Authentication, see the *Oracle Cloud Administering Oracle Identity Cloud Service Guide*.

## Access Control

Xcenter REST APIs are secured with OAuth 2.0 protocols and use OAuth tokens. When Xcenter REST Services are invoked, the Reverse Proxy intercepts the requests, uses the OAuth 2.0 protocol to authorize the OAuth tokens and forwards the request to Xcenter. Xcenter then examines the tokens and performs additional application level authorization by examining the tokens to see if they were requested by an OAuth Client that was granted specific AppRoles defined in IDCS when Xstore Office OAuth Clients were provisioned. If the token contains the necessary AppRole Grants, Xcenter provides access to the endpoint and the appropriate response is returned.

For details on how users are created and provisioned, see the [Creation of Users](#) section.

## Security Audit

User Identity (account name or IP address) is recorded in the application logs when accessing Xadmin or invoking Xcenter REST APIs. In addition, date, time, information, software or configuration changes are also recorded in the application logs.

IDCS provides several reports that are detailed in the *Oracle Cloud Administering Oracle Identity Cloud Service Guide*.

## Credential Rotation

All credentials in use within the Xstore Office Cloud Service will be rotated on a regular schedule.

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## Security Considerations for Developers

This chapter describes the security considerations for developers.

### Creation of Users

A Customer Administration User will be created as part of the Xstore Office Cloud Service provisioning process. Before end users can access the Xstore Office Cloud Service application it is necessary to create and provision users. This includes provisioning access to the system, assigning organizations, a role and org nodes to each user to control what functionality will be available to them. This will need to be done by the Customer Administration User.

### IDCS

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**Note:** While users can be created using the IDCS UI, it is important to note that they must still be provisioned through the Xadmin UI. This includes provisioning access to the system, assigning organizations, a role and org nodes to each user to control what functionality will be available to them.

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#### Manual Creation

Users can be created manually (that is one at a time) in IDCS by following the instructions on how to create user accounts in the *Oracle Cloud Administering Oracle Identity Cloud Service Guide*.

#### Bulk Import

Users can be bulk imported into IDCS by following the instructions on how to import user accounts in the *Oracle Cloud Administering Oracle Identity Cloud Service Guide*.

#### REST APIs

Users can also be imported (either individually or in bulk) into IDCS by invoking IDCS REST APIs. For more information about the REST APIs, see the *Oracle Cloud REST API for Oracle Identity Cloud Service Guide*. This requires the creation of an OAuth Client in order to be able to obtain an OAuth Token to be able to invoke the REST APIs. For more information about creating OAuth Clients, refer to the [Creation of the Setup OAuth Client in IDCS](#) section.

### User Access AppRole

When a user is created using IDCS (either manually or via bulk import, or via REST APIs), it is the Customer Admin's responsibility to grant the User the *User Access* AppRole. This can be done in the IDCS UI as follows:

- Click on the Xstore Office App.
- Click on the Application Roles tab.
- Select the menu icon on the far right of the User Access AppRole.
- Select **Assign Users** and select the Users in the popup to be granted this AppRole.

## Xadmin

Refer to the *Oracle Retail Xstore Office/Xstore Office Cloud Service User Guide* for details on how to provision users via the Xadmin User Management UI.

## Xoffice OAuth Client AppRoles

AppRoles have been created in Xoffice OAuth Clients in order to perform additional App Level Authorization.

## User Access

Typically, the IDCS tenant will represent several applications which are independent of each other. The *User Access* AppRole has been created in the Xstore Office App (which typically has a display name of either RGBU\_XSTCS\_PRD\_XOFFICE or RGBU\_XSTCS\_UAT\_XOFFICE depending on the environment). The *User Access* AppRole is used to link IDCS users with the Xstore Office Cloud Service Application.

When Xadmin performs a user sync against IDCS, it will do the sync based on the users that have been granted this *User Access* AppRole. Refer to the *Oracle Retail Xstore Office/Xstore Office Cloud Service User Guide* for details on the user sync between Xadmin and IDCS.

Whenever a user is created using the Xadmin UI, the user is automatically granted the *User Access* AppRole. When a user is created using the IDCS UI (either manually or via Bulk Import), it is the Customer Admin's responsibility to grant the user the *User Access* AppRole. This can be done as follows:

- Click on the Xstore Office App.
- Click on the Application Roles tab.
- Select the menu icon on the far right of the User Access AppRole.
- Select **Assign Users** and select the Users in the popup to be granted this AppRole.

## Xstore Access

The *Xstore Access* AppRole is used for additional App Level Authorization. This authorization is done when Xstore Office REST APIs are invoked. Therefore, if the Xstore Office REST APIs are to be invoked, then they must be done by using an OAuth Client (App) that has been granted the *Xstore Access* AppRole. For instance, refer to the [Xstore Office Setup App](#) or in the [Creation of the Setup OAuth Client in IDCS](#) section.

## Data Privacy Access

The *Data Privacy Access* AppRole is used for additional App Level Authorization. This authorization is done when the Data Privacy REST APIs are invoked. Therefore, if the Data Privacy REST APIs are to be invoked, they must be done by using an OAuth Client (App) that has been granted the *Data Privacy Access* AppRole. Refer to the [Creation of the Setup OAuth Client in IDCS](#) section.

## Service Access

The *Service Access* AppRole is used for internal manipulation of the OAuth Clients. This is also needed in case OAuth Clients need to be deleted.

## Cloud Enrollment of Xstore Clients

Any Xstore register (desktop, thin client, tablet, or mobile) or other client (like Xenvironment or Xservices) that communicates with Xstore Office Cloud Service must first be enrolled in IDCS via Xstore Office Cloud Service. This can be done either via Xadmin or Xenvironment. The sections below contain information about the steps to be followed for Cloud Enrollment of Xstore Clients.

### Xadmin

Xstore Stores can be enrolled in Xstore Office Cloud Service via Xadmin On-Premise, if the retailer has an existing Xadmin On-Premise application 18.0.1 or higher. Refer to the on-premise *Oracle Retail Xstore Office User Guide* for these steps.

### Xenvironment

Xstore stores can be enrolled in the Xstore Office Cloud Service via Xenvironment by following these steps.

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**Note:** Collect the following data prior to starting the Cloud Enroll process via Xenvironment.

1. Xstore Office Cloud Service hostname and port. The Customer Administrator can look this up by logging into their Cloud Service Account.
  2. IDCS User credentials: Username and password of any IDCS user belonging to the provisioned IDCS tenant.
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1. Once the Xenvironment installation is complete, open a web browser on the same system where Xenvironment is installed, that is on the lead register. The enrollment process only works when performed on the lead register. Go to the following URL: `https://<lead_register_hostname>:9096/cloudenroll`.
2. Log in as the user that runs Xstore Point of Service.
3. In the form that is presented, enter the Xcenter Application Server Settings for Xstore Office Cloud.
  - a. Host: Xstore Office Cloud Hostname
  - b. Port: Xstore Office Cloud Port
  - c. Provisioning ID: Customer's Provisioning ID
  - d. Username: Username of an IDCS user (This is typically an email address)

- e. Password: Password of an IDCS user
- 4. Click **Enroll Location**. This will validate the user credentials and enroll the location.
- 5. Once the enrollment is complete the systems will be restarted. When the registers start up again they will be configured for Xstore Office Cloud Service.
- 6. At Store close all the registers, Xenvironment, and Xservices will be enabled with Xstore Office Cloud Service configurations and all systems will be restarted.

## Creation of the Setup OAuth Client in IDCS

OAuth Clients (also called Apps) are required in order to invoke REST Services exposed by Xstore Office.

A new REST API has been exposed for creating an OAuth Client to be able to perform initial setup of the Xstore Office Cloud Service.

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**Note:** While OAuth Clients can be created via the IDCS User Interface, the resulting OAuth Clients do not have all the needed properties in order to be able to function accurately. Instead, follow the steps detailed below in order to create the OAuth Clients using the IDCS REST APIs.

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### Prerequisites

- It is very helpful to understand tools and terminologies such as Basic Auth, OAuth, curl, json and their usage.
- For example, knowing that OAuth uses Bearer Tokens in the HTTP Authorization Header whereas Basic Auth uses Base 64 encoded credentials will help you understand the commands below.
- Authorization Header for an OAuth Token would look like this: "Authorization: Bearer <token>"
- Authorization Header for a Basic Auth Token would look like this: "Authorization: Basic <Base64\_encode(client\_id:client\_secret)>"

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- Note:**
1. OAuth Clients are also called Apps. These terms are used interchangeably.
  2. Be sure to use the correct App Client IDs and Client Secrets based on the environment. These steps will have to be repeated for each environment. Using the artifacts from one environment in another environment can lead to unexpected results.
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### Required Data

Collect the following data prior to creation of the setup OAuth Client.

1. **IDCS\_TENANT\_HOST:** The Customer Administrator can look this up by logging into their Cloud Service Account.
2. **IDCS User credentials:** Username and Password of an IDCS user belonging to the provisioned IDCS tenant who is either an *Identity Domain Administrator* or an *Application Administrator*, or both. An IDCS user who is neither an *Identity Domain*

*Administrator* nor an *Application Administrator* will not be authorized to invoke this API.

## Tools

The following steps are executed using curl. However, any similar tool such as SoapUI or Postman can be used.

## Xstore Office Setup App

Before the newly provisioned Xstore Office Cloud Service can be used, some initial setup is required. For instance, the Xstore Office database needs Tax Location data to be present in order to be able to setup new stores or organization hierarchy via the Xadmin UI. This can be achieved by using the Xcenter auto deployment functionality via REST services. In order to utilize the Xcenter REST services, an OAuth Client is required. This client can also be used to insert any other seed Xstore Office data that needs to be present in the database besides the Tax Location data.

This Xstore Office Setup OAuth Client can be created by invoking the Enroll Client API as described below.

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- Note:**
1. This OAuth Client can also be used to invoke RTLog Generator REST APIs.
  2. This OAuth Client credentials can also be used to configure the Data Migration Utility.
  3. This OAuth Client can also be used to invoke Data Privacy APIs.
  4. This OAuth Client can also be used for any additional recurring customer operations where Xcenter REST Services need to be invoked.
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- Note:**
1. The intent of this API is to create an OAuth Client for the setup of Xstore Office Cloud Service, primarily for Data Migration purposes, uploading "seed" data and for invoking the Data Privacy API. It is not intended to be used for integration with other systems.
  2. On rerunning this API, the OAuth Client will be recreated with a new secret. Therefore, any clients or systems using these credentials will need to have their secrets updated (with the intent being that this should only be used for setup purposes and not for integration purposes).
- 
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1. Request creation of the Setup OAuth Client. The response will contain the client id, client secret of the OAuth Client as well as the IDCS\_TENANT\_HOST (which is already known to the Customer Admin).

Replace the <IDCS\_username> and <IDCS\_password> with those of an IDCS user who is either an Identity Domain Administrator or an Application Administrator or both.

```
curl -i -H "Authorization: Basic <Base64_encode(<IDCS_username>:<IDCS_password>)>" "https://<XSTORE_OFFICE_HOST>/xcenter/rest/{provisioning.id}/v1/enrollclient?type=setup"
```

2. Request an Access token using the Setup OAuth Client credentials (from the previous step).

Replace the <client\_id> and <client\_secret> with those of the Setup OAuth Client (App).

```
curl -i -H "Authorization: Basic <Base64_encode(<client_id>:<client_secret>)" -H "Content-Type: application/x-www-form-urlencoded;charset=UTF-8" https://<IDCS_TENANT_HOST>/oauth2/v1/token -d "grant_type=client_credentials&scope=urn:opc:idm:__myscopes__"
```

3. This token can now be used to invoke Xoffice REST APIs in order to configure Xstore Office Cloud Service.
4. RTLog Generator REST APIs:
  - a. The credentials (Client Id and Client Secret) of the Setup OAuth Client (App) can be similarly used to obtain a token in order to invoke RTLog Generator REST APIs.
5. Data Migration Utility:
  - a. The credentials (Client Id and Client Secret) of the Setup OAuth Client (App) can be used when configuring the Data Migration Utility (to update `idp.properties`) in order to migrate data from an existing Xstore Office to Xstore Office Cloud Service.
6. Data Privacy API:
  - a. The credentials (Client Id and Client Secret) of the Setup OAuth Client (App) in conjunction with an IDCS user's `userid/password` can be used in order to request an Access token to invoke the Data Privacy REST API.

Replace the `<client_id>` and `<client_secret>` with those of the Data Privacy OAuth Client (App).

Replace the `<IDCS_username>` and `<IDCS_password>` with those of an IDCS user.

```
curl -i -H "Authorization: Basic <Base64_encode(<client_id>:<client_secret>)" -H "Content-Type: application/x-www-form-urlencoded;charset=UTF-8" https://<IDCS_TENANT_HOST>/oauth2/v1/token -d "grant_type=password&username=<IDCS_username>&password=<IDCS_password>&scope=urn:opc:idm:__myscopes__"
```

- b. Invoke the Data Privacy endpoint (example – replace with appropriate data).

Replace `<token>` with the token from the previous step.

```
curl -i -H "Authorization: Bearer <token>" "https://<XSTORE_OFFICE_HOST>/xcenter/rest/privatedata/1000::100?type=employee"
```