

## Moving data out of Salesforce

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# Moving data out of Salesforce using Apache NiFi

Cloudera supports moving data out of Salesforce using Apache NiFi. You can use Apache NiFi to move data out of Salesforce and push the data to other systems including Cloudera Data Platform.

## Moving data out of Salesforce

You can create a NiFi dataflow to move data out of Salesforce. To do this, you must meet some prerequisites, configure Salesforce, configure your controller services, build your dataflow, and configure the source and target processors.

Objects in Salesforce are database tables. The rows are known as records, and the columns are called fields. The `QuerySalesforceObject` processor queries Salesforce objects and retrieves their records.

The processor constructs the query using Salesforce Object Query Language (SOQL) and retrieves the result record dataset using the Salesforce REST API.

The processor utilizes streams and NiFi record-based processing to be able to handle a large number of records and to allow arbitrary output format.

## Before you begin

Before setting up a NiFi dataflow to pull data from Salesforce objects, you must meet certain minimum prerequisites.

- You have a Salesforce account.
- You have a Connected App running in Salesforce.
- You have a security token for authorization.

See the following sections for installation instructions appropriate for your deployment objectives:

- *Configuring Salesforce*
- *Creating Controller Services for your dataflow*

### Related Information

[Configuring Salesforce](#)

[Creating Controller Services for your dataflow](#)

## Configuring Salesforce

Learn how to configure Salesforce so that you can move data out of Salesforce by using Apache NiFi.

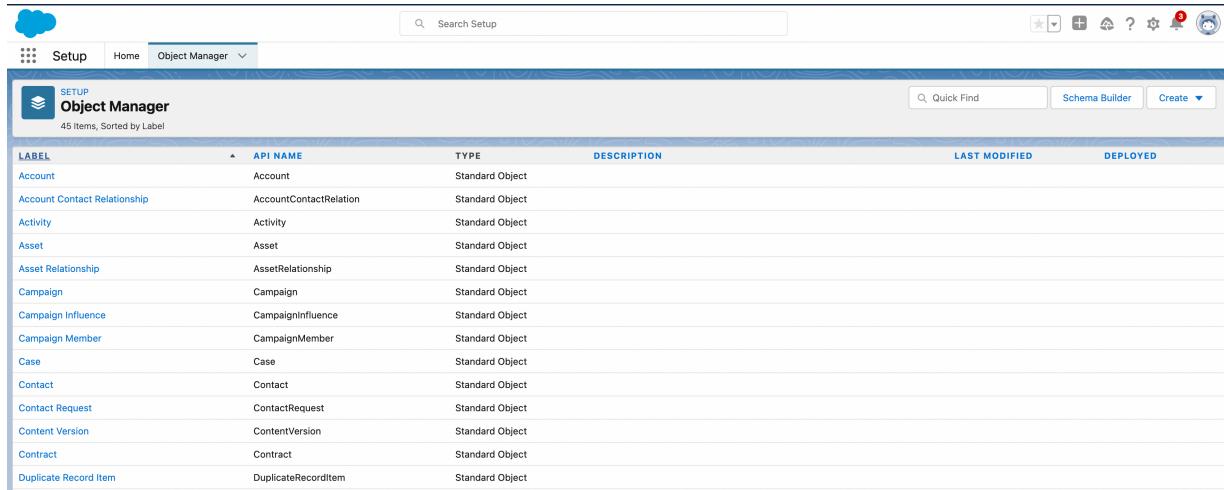
### Procedure

1. Log in to Salesforce.
2. Click the gear icon at the top-right corner of the window.

The Setup Home page appears.

3. Go to the Object Manager tab.

You can view the available standard Salesforce objects to be queried.



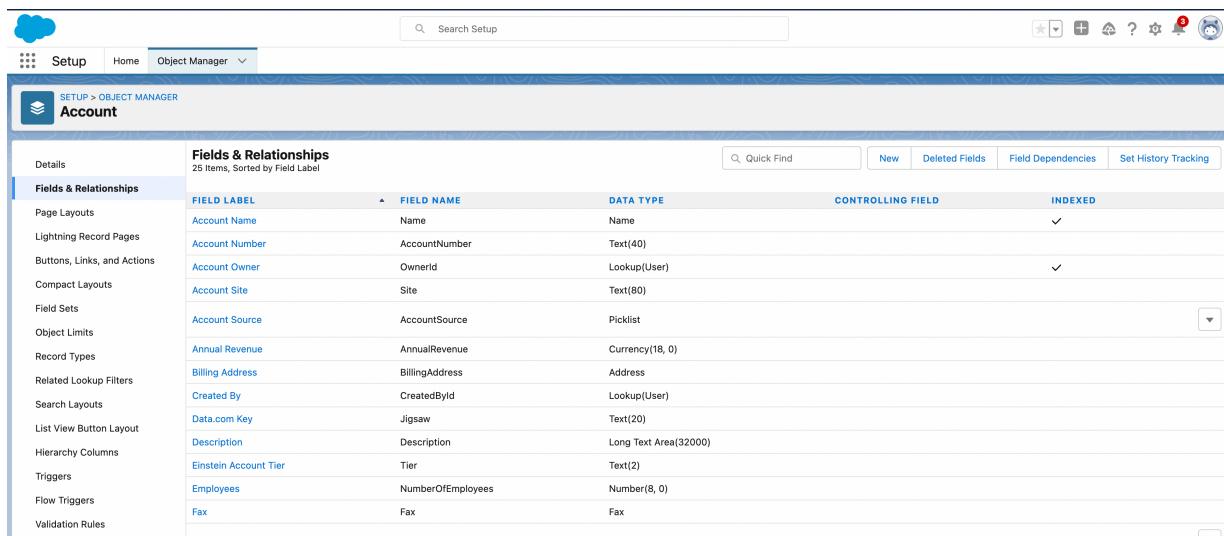
The screenshot shows the Salesforce Object Manager tab. The page title is "Object Manager" and it displays "45 Items, Sorted by Label". The table has columns: LABEL, API NAME, TYPE, DESCRIPTION, LAST MODIFIED, and DEPLOYED. The data includes:

LABEL	API NAME	TYPE	DESCRIPTION	LAST MODIFIED	DEPLOYED
Account	Account	Standard Object			
Account Contact Relationship	AccountContactRelation	Standard Object			
Activity	Activity	Standard Object			
Asset	Asset	Standard Object			
Asset Relationship	AssetRelationship	Standard Object			
Campaign	Campaign	Standard Object			
Campaign Influence	CampaignInfluence	Standard Object			
Campaign Member	CampaignMember	Standard Object			
Case	Case	Standard Object			
Contact	Contact	Standard Object			
Contact Request	ContactRequest	Standard Object			
Content Version	ContentVersion	Standard Object			
Contract	Contract	Standard Object			
Duplicate Record Item	DuplicateRecordItem	Standard Object			

4. Select an object.

For example, select Account.

5. Go to the Fields & Relationships tab.



The screenshot shows the "Fields & Relationships" tab for the Account object. The page title is "Account" and it displays "25 Items, Sorted by Field Label". The table has columns: FIELD LABEL, FIELD NAME, DATA TYPE, CONTROLLING FIELD, and INDEXED. The data includes:

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Account Name	Name	Name		✓
Account Number	AccountNumber	Text(40)		
Account Owner	OwnerId	Lookup(User)		✓
Account Site	Site	Text(80)		
Account Source	AccountSource	Picklist		
Annual Revenue	AnnualRevenue	Currency(18, 0)		
Billing Address	BillingAddress	Address		
Created By	CreatedById	Lookup(User)		
Data.com Key	Jigsaw	Text(20)		
Description	Description	Long Text Area(32000)		
Einstein Account Tier	Tier	Text(2)		
Employees	NumberOfEmployees	Number(8, 0)		
Fax	Fax	Fax		

This tab displays some of the accessible fields (columns). These fields can be utilized in the Field Names processor property as well as the Custom WHERE condition. For more details, see *Salesforce Object Query Language (SOQL)*.

6. Navigate to a Salesforce application, such as Service, to create a record for Account.

The screenshot shows the Salesforce Setup interface. The top navigation bar includes a blue cloud icon, 'Setup', 'Home', and 'Object Manager'. The 'Object Manager' tab is currently selected. The left sidebar is titled 'Apps' and lists several Salesforce applications with their respective icons: Service, Marketing, Community, Salesforce Chatter, Content, Sales Console, and Service Console. Below this is a 'View All' link. The main content area has sections for 'Relationships' (sorted by Field Label) and 'Object Limits'. A 'Record Types' section is also visible on the right.

7. Create a new account on the Service page's Account tab, which will be added as a record (row) to the Account table.
8. Click the gear symbol in the top right corner of the window to return to the Setup page.

The screenshot shows the Salesforce Object Manager for the 'Account' object. The top navigation bar includes a blue cloud icon, 'Setup', 'Home', and 'Object Manager'. The 'Object Manager' tab is selected. The main content area is titled 'FIELDS & RELATIONSHIPS' and shows 25 items, sorted by Field Label. The table lists three fields: 'Account Name' (Field Label), 'Name' (Field Name), 'Name' (Data Type), 'Name' (Controlling Field), and 'INDEXED' (Indexed). Below the table, there are links for 'Details', 'Fields & Relationships', 'Page Layouts', 'Lightning Record Pages', and 'Buttons, Links, and Actions'. A 'Setup' gear icon is visible in the top right corner of the window.

## Related Information

[Salesforce Object Query Language \(SOQL\)](#)

## Building your dataflow

Set up the elements of your NiFi dataflow that enables you to move data out of Salesforce using Apache NiFi. This involves opening NiFi in CDP Public Cloud or CDP Private Cloud Base cluster, adding processors to your NiFi canvas, and connecting the processors.

### About this task

When you are building a dataflow to move data out of Salesforce using Apache NiFi, you use the following source processor to build your dataflow:

- QuerySalesforceObject

### Procedure

1. Launch NiFi from your CDP Public Cloud or CDP Private Cloud Base cluster.
2. Add the NiFi processors to your canvas.
  - a) Select the Processor icon from the Cloudera Flow Management Actions pane, and drag a processor to the canvas.
  - b) Use the Add Processor filter box to search for the processor you want to add, and then click Add.
  - c) Add each of the processors you want to use for your dataflow.
3. Connect the two processors to create a data flow.
  - a) Click the Connection icon for the first processor, and drag it to the second processor.  
A Create Connection dialog displays. It has two tabs: Details and Settings, where you can configure the connection properties.
  - b) Click Add to close the dialog box and add the connection to your flow.  
Optionally, you can add success and failure funnels to your data flow, which help you to view where the flow files are routed when your dataflow is running.

### What to do next

After you have finished building the dataflow, move on to the following steps:

1. Create Controller Services for your dataflow
2. Configure your source processor
3. Configure your target processor

## Creating Controller Services for your dataflow

You can add controller services that can provide shared services to be used by the processors in your dataflow. Create them after you build the NiFi dataflow and before you configure the processors, so that they are available when you configure your NiFi processors.

### About this task

For this dataflow, create two controller services:

- StandardOauth2AccessTokenProvider
- JsonRecordSetWriter

For complete details about these Apache NiFi controller services, see *NiFi Documentation*.

### Before you begin

You must have built your dataflow.

## Procedure

1. To add a controller service to your flow, right-click on the canvas and select Configure from the pop-up menu.  
The Controller Services Configuration window appears.
2. Select the Controller Services tab.
3. Click the + button to display the Add Controller Service dialog.
4. Select the required controller service and click Add.
5. Click the Configure icon in the right-hand column and configure the necessary options.
6. Click Apply to save the changes.
7. Click the Enable button (flash) in the far-right column of the Controller Services tab to enable the controller service.

## Example

You require the following controller services for this example of a NiFi dataflow moving data out of Salesforce.

StandardOauth2AccessTokenProvider

This controller service allows NiFi to interact with the Salesforce database. The Salesforce REST API authorization is handled by the OAuth2 Access Token Provider Service.

**Controller Service Details | StandardOauth2AccessTokenProvider 1.17.0-SNAPSHOT**

SETTINGS	PROPERTIES	COMMENTS
<b>Required field</b>		
Property	Value	
Authorization Server URL	?	https://cloudera-2f-dev-ed.my.salesforce.com/...
Grant Type	?	User Password
Username	?	lehelb@cloudera.com
Password	?	Sensitive value set
Client ID	?	3MVG9t0sl2PpByqLVMOBOSVtIABv703Cqwom...
Client secret	?	Sensitive value set
Refresh Window	?	0 s
SSL Context Service	?	No value set

**OK**

You configure the following properties:

- Authorization Server URL
- Username
- Password
- Client ID
- Client secret

For more information about the properties, see *StandardOauth2AccessTokenProvider configurations*.

#### JsonRecordSetWriter

You use this controller service as the writer, when writing the data as JSON array or one JSON object per line in NiFi. You can choose another writer depending on your requirements.

In general, you may accept the default configurations.

#### What to do next

After you have finished configuring your controller services:

- Configure your source processor
- Configure your target processor

#### Related Information

[NiFi documentation](#)

#### StandardOauth2AccessTokenProvider configurations

Learn about how to configure the properties for the StandardOauth2AccessTokenProvider controller service.

- Authorization Server URL

The authorization server URL is the concatenation of the base URL and the token request service URL ( /services/ oauth2/token).

- Username

The username is the email address registered in the Salesforce account in use.

- Password

For the password, a security token must be requested. The password is made up of the Salesforce account password and the security token, concatenated together without a space. Perform the following steps to get the security token:

1. Log in to Salesforce.
2. Go to Profile Settings .
3. Go to Reset My Security Token tab in the left-navigation pane.
4. Click Reset Security Token.

The security token will be sent to you in an email.

- Client ID

In order to fill the Client ID, you need to create a new Connected App within Salesforce.

1. Log in to Salesforce.
2. Navigate to Setup.
3. On the left search panel find App Manager.
4. Click New Connected App.
5. Configure the properties, and click Save.

After it is done, the Consumer Key goes to the Client ID property.

- Client secret

The client secret can be found on the same page, as described in the Client ID section, under the name of Consumer Secret.

#### Configuring your source processor

You use the QuerySalesforceObject processor to get data from your Salesforce table. To do this, launch the Configure Processor window, specify the necessary configurations, and start the process to verify that you can view the Salesforce table.

## Before you begin

- You must have built the dataflow.
- You must have created your controller services.

## Procedure

1. Launch the Configure Process window, by right-clicking the processor and selecting Configure.
2. Go to the Properties tab.

Property	Value
URL	https://cloudera-2f-dev-ed.my.salesforce.com
API Version	54.0
sObject Name	Account
Field Names	Id,BillingAddress
Read Timeout	15 s
OAuth2 Access Token Provider	StandardOAuth2AccessTokenProvider
Record Writer	JsonRecordSetWriter
Create Zero Record FlowFiles	false
Age Field	No value set
Custom WHERE Condition	No value set

3. Enter the value for URL.

You can obtain the base URL from the Salesforce account profile menu and prefix it with https://.

4. Enter the value for API Version.

This is the Salesforce REST API version. For more information, see *Introduction to REST API*.

5. Specify the value for sObject.

The sObject name specifies the Salesforce object to be queried.

6. Specify the value(s) for Field Names.

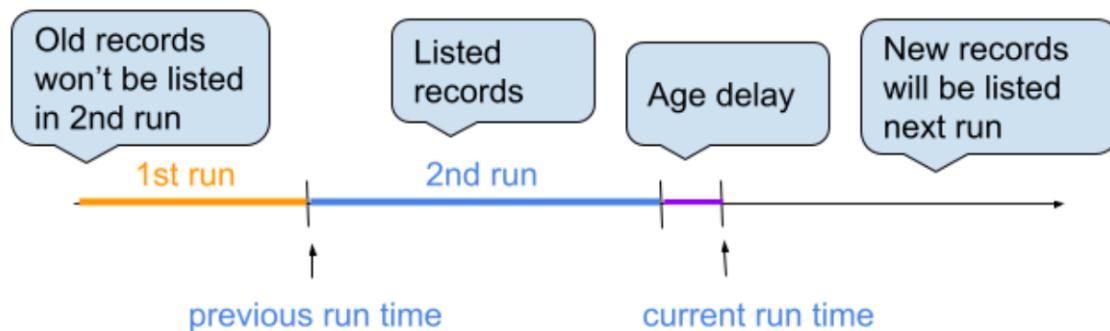
The field names are the Salesforce object's fields. Due to Salesforce limitations, it cannot be empty in order to obtain every field of an entity.

## 7. Set the value for Age Field.

The age property is important if you only want to query and process a record once. It provides a sliding window that starts with the processor's prior runtime and ends with the current runtime minus the age delay. Only records that are within the sliding window are queried and processed.

You need to define how to compare the records with the runtime. The Age Field property must be a datetime field of the queried object and this is subject to the condition that it is greater than the processor's previous runtime but less than the current runtime (for example, LastModifiedDate).

The first run, for example, queries records whose LastModifiedDate field is earlier than the current runtime. The second run looks for records with LastModifiedDate fields that are later than the previous runtime but earlier than the current runtime.



The Initial Age Filter is used to specify a specific datetime that sets the start of the sliding window from which processing starts in the first processor run. The format must meet the Salesforce SOQL standards. The Initial Age Filter is used to provide a specific datetime that sets the beginning of the sliding window from which processing occurs in the first processor run. Here, the format must adhere to the Salesforce SOQL requirements. For more information, see *SOQL and SOSL Reference*.

The purple line in the above image represents Age Delay. It moves the time of the records to be processed earlier than the current runtime if necessary.

## Results

You can confirm that you have configured QuerySalesforceObject correctly by starting the processor and confirming that you can view the Salesforce table.

## What to do next

After you have finished configuring your source processor, proceed to:

- Configure your target processor.
- Confirm your data flow is running.

## Related Information

[Introduction to REST API](#)

[SOQL and SOSL Reference](#)

## Configuring your target processor

In your dataflow that is pulling data from a Salesforce database, configure the required processor to handle data pooling from remote tables. To do this, launch the processor configuration window and provide the configurations appropriate for your use case.

## Procedure

- Right-click the target processor and click Configure Processor.

- Configure the properties of your target processor that suits your use case.

### What to do next

After you have configured your target processor, proceed to confirming your data flow success.

## Confirming your dataflow success

Learn how you can confirm success for your dataflow.

### About this task

You put the processor to the test after you enable the Controller Service. In JSON format, you obtain the ID and BillingAddress of all accessible Account data.

```
[  
  {  
    "Id": "0017Q000003JfjcQAC",  
    "BillingAddress": {  
      "city": "San Francisco",  
      "country": "US",  
      "countryCode": null,  
      "postalCode": "94087",  
      "state": "CA",  
      "stateCode": null,  
      "street": "The Landmark @ One Market",  
      "geocodeAccuracy": null  
    }  
  },  
  {  
    "Id": "0017Q000003BwDdQAK",  
    "BillingAddress": null  
  },  
  {  
    "Id": "0017Q000003ZdgjQAC",  
    "BillingAddress": {  
      "city": "Budapest",  
      "country": "Hungary",  
      "countryCode": null,  
      "postalCode": "1232",  
      "state": "Budapest",  
      "stateCode": null,  
      "street": "Apro u. 12/B",  
      "geocodeAccuracy": null  
    }  
  }  
]
```

When querying date, time, or datetime fields, Cloudera recommends setting the format properties on the RecordWriter service.