

Feature Brief

Reconcile Transformation in Centerprise

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Overview

Reconcile transformation is a new addition to Centerprise Data Integrator's vast library of transformations. The primary purpose of this transformation is to reconcile updated, inserted, or deleted information with the existing source data.

This transformation has applications in a variety of business scenarios because in most cases, merely storing data is not sufficient. For the information to be useful in making data-driven strategic decisions, users need to monitor and capture data changes happening in the source data.

Reconcile Transformation Explained with Business Use Cases

Information reconciliation is an essential requirement to drive many critical business decisions. Hospitals need to reconcile patients' information, banks need to reconcile customers' accounts information, and multiple similar examples can be seen across industries that highlight the usefulness of Reconcile transformation.

Use Case 1: Reconciling Customer Complaints Information (Flat Source Data)

For illustration purposes, we have taken sample data of consumer complaints regarding financial services and products from *Consumer Financial Protection Bureau of the United States*. The dataset is open for public access and use and can be found [here](#).

In the sample data, we have information about the complaints filed by consumers regarding financial services and products. Assume that there is a fictitious department called *Financial Services Provision Authority (FSPA)*. The department regulates the services provided by the financial sector and keeps a check on customer complaints. Status of the complaints filed is a key variable that helps FSPA in evaluating the effectiveness of customer support departments of various financial organizations. To monitor the complaints' status, FSPA reconciles the information every month.

In this example, source data contains various fields as shown in Figure 2. The information that FSPA wants to monitor is contained in the *Complaint_Status* field. Figure 1 shows the preview of existing source data. Let's assume that this was the status of complaints on July 1st, 2018.

Data Preview

Source Record Count 0

Data Preview for action Customer_complaints. Total Records 200. Records With Errors 0. Duration 00:00:00.735.

Object Path	Complaint_ID	Complaint_Status	Date_received	Product	Sub_product	Issue	Company	State
Customer_complaints	11621	In Progress	1/25/2012 12:00:0	Mortgage	Conventional fixe	Loan modification	BANK OF AMERI	TX
Customer_complaints	18253	In Progress	1/29/2012 12:00:0	Mortgage	Other mortgage	Application, origin	QUICKEN LOAN	CA
Customer_complaints	32412	In Progress	8/3/2012 12:00:00	Mortgage	Other mortgage	Loan servicing, p	Ditech Financial L	CA
Customer_complaints	34337	In Progress	3/13/2012 12:00:0	Mortgage	Other mortgage	Settlement proces	CITIZENS FINAN	OH
Customer_complaints	37224	In Progress	4/4/2012 12:00:00	Bank account or s	Checking account	Account opening,	TD BANK US HO	NY
Customer_complaints	37300	Closed without relief	3/20/2012 12:00:0	Mortgage	Conventional fixe	Loan modification	WELLS FARGO	TX
Customer_complaints	42864	Closed with explanation	3/30/2012 12:00:0	Student loan	Non-federal stude	Repaying your loa	Student Loan Fin	MN
Customer_complaints	66969	Closed without relief	4/27/2012 12:00:0	Bank account or s	Checking account	Deposits and with	SANTANDER BA	NY
Customer_complaints	73144	In Progress	8/5/2012 12:00:00	Bank account or s	Checking account	Account opening,	WELLS FARGO	SD
Customer_complaints	88233	Closed with explanation	5/29/2012 12:00:0	Mortgage	Conventional fixe	Loan modification	Seterus, Inc.	GA
Customer_complaints	104285	Closed with monetary relief	6/19/2012 12:00:0	Student loan	Non-federal stude	Repaying your loa	Navient Solutions	CO
Customer_complaints	147148	In Progress	5/9/2012 12:00:00	Mortgage	Conventional fixe	Loan modification	BANK OF AMERI	HI
Customer_complaints	177628	In Progress	10/25/2012 12:00:	Mortgage	Conventional adju	Loan servicing, p	OCWEN LOAN S	MO
Customer complaints	182479	Closed with explanation	1/11/2012 12:00:0	Bank account or s	Checking account	Deposits and with	BANK OF AMERI	GA

Figure 1

Data preview before applying Reconcile transformation

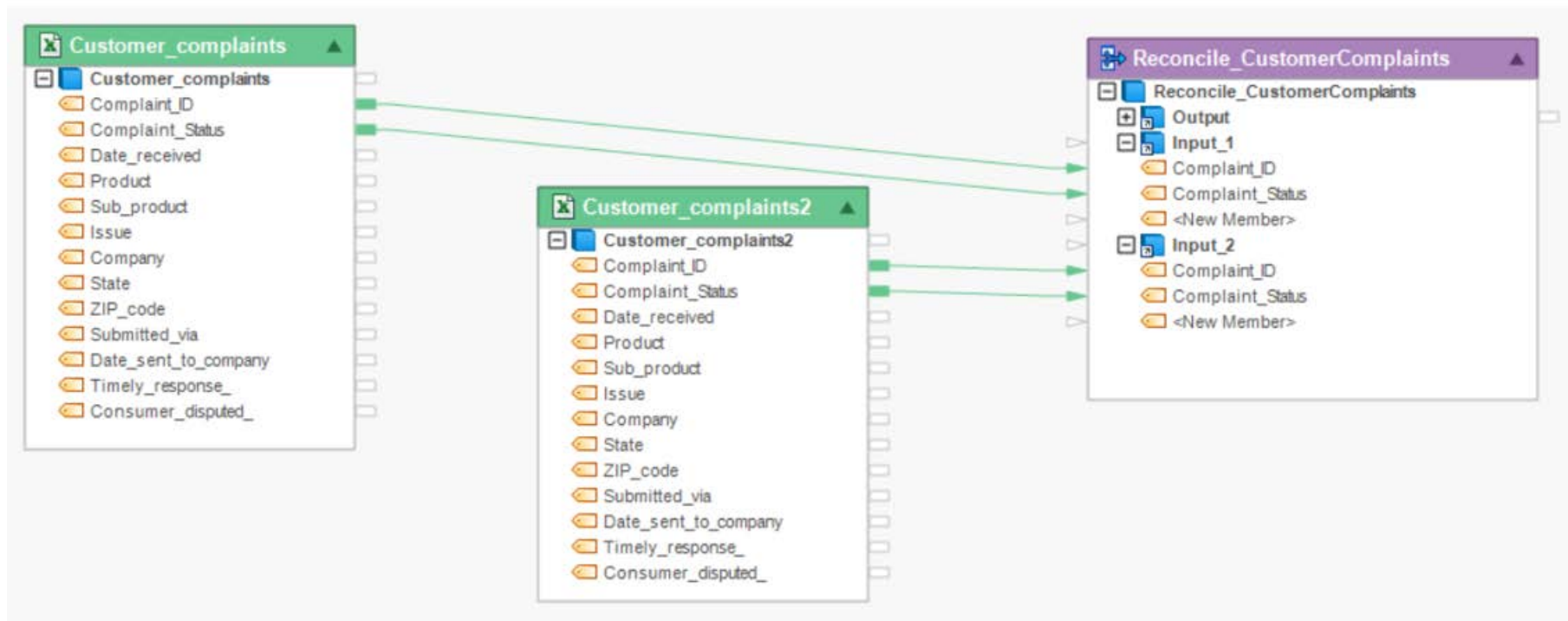


Figure 2

Reconcile transformation used in a dataflow

To measure the performance over the next one month, FSPA reconciles the information contained in the source data on August 1st, 2018. Figure 3 shows data preview after the Reconcile transformation is applied on the new and previous versions of the source data. The updated data helps FSPA analyze how many complaints are still open and pending a response or action from concerned financial organizations/departments by monitoring the complaint status.

Data Preview

Source Record Count 0

Data Preview for action Reconcile1. Total Records 200. Records With Errors 0. Duration 00:00:00.773.

Object Path	\$ReconcileResult	Complaint_ID_1	Complaint_ID_2	Complaint_ID_Diff	Complaint_Status_1	Complaint_Status_2	Complaint_Status_Diff
► Output	Updated	11621	11621	False	In Progress	Closed with explanation	True
Output	Updated	18253	18253	False	In Progress	Closed with explanation	True
Output	Unchanged	32412	32412	False	In Progress	In Progress	False
Output	Updated	34337	34337	False	In Progress	Closed with explanation	True
Output	Unchanged	37224	37224	False	In Progress	In Progress	False
Output	Unchanged	37300	37300	False	Closed without relief	Closed without relief	False
Output	Unchanged	42864	42864	False	Closed with explanati	Closed with explanation	False
Output	Unchanged	66969	66969	False	Closed without relief	Closed without relief	False
Output	Unchanged	73144	73144	False	In Progress	In Progress	False
Output	Unchanged	88233	88233	False	Closed with explanati	Closed with explanation	False
Output	Unchanged	104285	104285	False	Closed with monetary	Closed with monetary relief	False
Output	Unchanged	147148	147148	False	In Progress	In Progress	False
Output	Updated	177628	177628	False	In Progress	Closed with monetary relief	True
Output	Unchanged	182479	182479	False	Closed with explanati	Closed with explanation	False

Figure 3

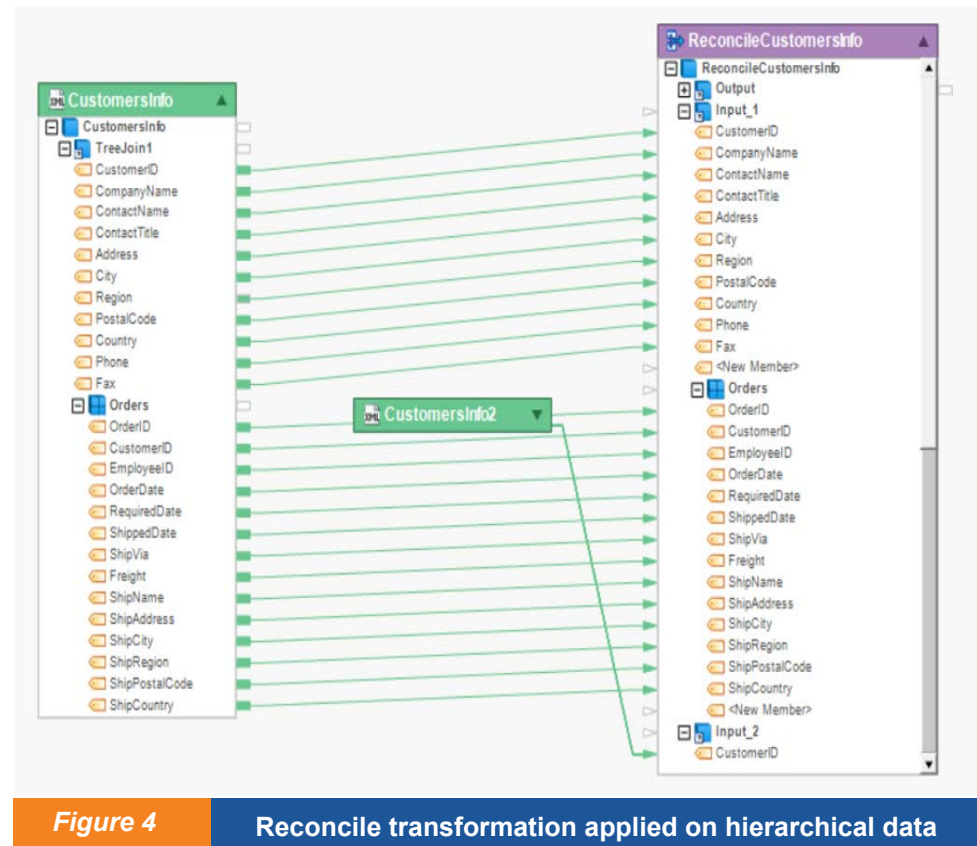
Data preview after applying Reconcile transformation

Use Case 2: Reconciling Shipping Information (Hierarchical Source Data)

With the rise of web-based applications, we have seen a surge in unstructured and hierarchical data. It has become necessary that the data integration tools today not only integrate data from relational sources but also are able to handle unstructured, semi-structured, and hierarchical data formats.

Reconcile transformation in Centerprise 7.5 not only works with relational data and flat files but can also be applied to hierarchical data to reconcile information contained in the inner/child nodes.

Consider a common use case where businesses want to reconcile customers information and monitor any changes that might have occurred. In the example shown in Figure 4, our source data is hierarchical in nature and is stored in an XML file.



When using the Reconcile transformation on hierarchical data, Centerprise also reconciles the information contained in the inner nodes. In the example shown in Figure 4, data updates in the *Orders* node (inner/child node) are also reconciled. See the data preview in Figure 5.

Data Preview

Source Record Count 50

Data Preview for action ReconcileCustomersInfo. Total Records 50. Records With Errors 0. Duration 00:00:00.688.

Object Path	\$ReconcileResult	CustomerID	CompanyName	ContactName	ContactTitle	Address	City	Region	PostalCode
Output	Updated	ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representa	Obere Str. 57	Berlin		12209
Object Path	\$ReconcileResult	OrderID	CustomerID	EmployeeID	OrderDate	RequiredDate	ShippedDate	ShipVia	Freight
Orders	Unchanged	10643	ALFKI	6	8/25/1997 12:00:0	9/22/1997 12:00:0	9/2/1997 12:00:00	1	29.46
Orders	Updated	10692	ALFKI	4	10/3/1997 12:00:0	10/31/1997 12:00:0	10/13/1997 12:00:0	2	100
Object Path	Name	OldValue	NewValue						
\$ModifiedElement	Freight	61.02	100						
Object Path	\$ReconcileResult	OrderID	CustomerID	EmployeeID	OrderDate	RequiredDate	ShippedDate	ShipVia	Freight
Orders	Unchanged	10702	ALFKI	4	10/13/1997 12:00:0	11/24/1997 12:00:0	10/21/1997 12:00:0	1	23.94
Orders	Unchanged	10835	ALFKI	1	1/15/1998 12:00:0	2/12/1998 12:00:0	1/21/1998 12:00:0	3	69.53
Orders	Unchanged	10952	ALFKI	1	3/16/1998 12:00:0	4/27/1998 12:00:0	3/24/1998 12:00:0	1	40.42
Orders	Unchanged	11011	ALFKI	3	4/9/1998 12:00:00	5/7/1998 12:00:00	4/13/1998 12:00:0	1	1.21
Object Path	\$ReconcileResult	CustomerID	CompanyName	ContactName	ContactTitle	Address	City	Region	PostalCode
Output	Updated	ANATR	Ana Trujillo Empa	Ana Trujillo	Owner	Avda. de la Const	México D.F.		05021
Output	Updated	ANTON	Antonio Moreno T	Antonio Moreno	Owner	Mataderos 2312	México D.F.		05023
Output	Updated	AROUT	Around the Horn	Thomas Hardy	Sales Representa	120 Hanover Sq.	London		W1A 1DP

Figure 5

Data preview after applying Reconcile transformation on hierarchical data

The highlighted part in Figure 5 shows the updated record. It is possible that for the same parent entry, only a few selected child entries are modified, as in this case. For the Customer ID "ALFKI" only one order with Order ID "10692" is modified and remaining orders are unchanged. Centerprise shows which records are modified and which records are left unchanged in the *\$ReconcileResult* field by labeling either the modification type (*Updated*, *Inserted*, *Deleted*) next to the record or marking it as *Unchanged*.

Output Layout Options in Reconcile Transformation

Reconcile transformation in Centerprise allows users to create output in three different formats. Users can view the reconciled output in:

1. Original Layout
2. Original Layout with Changed Element Collection
3. Side by Side Element with Changed Flag

Figures 6-9 show reconciled output using the different layouts. In the examples presented below, we are reconciling the data changes in *Complaint_Status* field in the example presented in the first use case.

In the original layout, Centerprise will show us the reconcile result for each record and the corresponding information in the reconciled field (*Complaint_Status*).

Information shown in the reconciled field is based on the *Survivor Value* specified in the properties section of the Reconcile transformation. In this example, we've specified *Input_2* as the survivor value for the *Complaint_Status* field. *Input_2* refers to the data snapshot on August 1, 2018.

Data Preview

Source Record Count 0

Data Preview for action Reconcile_CustomerComplaints. Total Records 200. Records With Errors 0. Duration 00:00:00.666.

Object Path	\$ReconcileResult	Complaint_ID	Complaint_Status
Output	Updated	11621	Closed with explanation
Output	Updated	18253	Closed with explanation
Output	Unchanged	32412	In Progress
Output	Updated	34337	Closed with explanation
Output	Unchanged	37224	In Progress
Output	Unchanged	37300	Closed without relief
Output	Unchanged	42864	Closed with explanation
Output	Unchanged	66969	Closed without relief
Output	Unchanged	73144	In Progress
Output	Unchanged	88233	Closed with explanation
Output	Unchanged	104285	Closed with monetary relief
Output	Unchanged	147148	In Progress
Output	Updated	177628	Closed with monetary relief

Figure 6

Original layout

Reconcile_CustomerComplaints : Layout Builder

Editing: Reconcile_CustomerCom

	Name	Data Type	Key	Survivor Value	Expression	Description
1	Complaint_ID	Integer	☒	Input_2		
2	Complaint_Status	String	☐	Input_2		
* 3			☐			

Figure 7

Survivor value in the Reconcile transformation's layout builder

On selecting the original layout with changed element collection output option, Centerprise will create a sub-node for the modified information, as shown in Figure 8. The new sub-node will show the old value and new value of the modified field. For example, in Figure 8 you can see the old value *"In Progress"* and the new value *"Closed with explanation"* in the *Complaint_Status* field for complaint ID 11621.

Data Preview

Source Record Count 0

Data Preview for action Reconcile_CustomerComplaints. Total Records 200. Records With Errors 0. Duration 00:00:00.723.

Object Path	\$ReconcileResult	Complaint_ID	Complaint_Status
Output	Updated	11621	Closed with explanation
Object Path	Name	OldValue	NewValue
\$ModifiedElement	Complaint_Status	In Progress	Closed with explanation
Object Path	\$ReconcileResult	Complaint_ID	Complaint_Status
Output	Updated	18253	Closed with explanation
Output	Unchanged	32412	In Progress
Output	Updated	34337	Closed with explanation
Output	Unchanged	37224	In Progress
Output	Unchanged	37300	Closed without relief
Output	Unchanged	42864	Closed with explanation
Output	Unchanged	66969	Closed without relief
Output	Unchanged	73144	In Progress
Output	Unchanged	88233	Closed with explanation
Output	Unchanged	104285	Closed with monetary relief

Figure 8

Original layout with changed element collection

In the layout shown in Figure 9, users can simultaneously see the old value for a record and the corresponding modified value. An additional column is added for each field that indicates if the old value is different from the new value by putting a flag (either True or False).

Data Preview

Source Record Count 0

Data Preview for action Reconcile_CustomerComplaints. Total Records 200. Records With Errors 0. Duration 00:00:00.770

Object Path	\$ReconcileResult	Complaint_ID_1	Complaint_ID_2	Complaint_ID_Diff	Complaint_Status_1	Complaint_Status_2	Complaint_Status_Diff
► Output	Updated	11621	11621	False	In Progress	Closed with explanation	True
Output	Updated	18253	18253	False	In Progress	Closed with explanation	True
Output	Unchanged	32412	32412	False	In Progress	In Progress	False
Output	Updated	34337	34337	False	In Progress	Closed with explanation	True
Output	Unchanged	37224	37224	False	In Progress	In Progress	False
Output	Unchanged	37300	37300	False	Closed without relief	Closed without relief	False
Output	Unchanged	42864	42864	False	Closed with explanation	Closed with explanation	False
Output	Unchanged	66969	66969	False	Closed without relief	Closed without relief	False
Output	Unchanged	73144	73144	False	In Progress	In Progress	False
Output	Unchanged	88233	88233	False	Closed with explanation	Closed with explanation	False
Output	Unchanged	104285	104285	False	Closed with monetary relief	Closed with monetary relief	False
Output	Unchanged	147148	147148	False	In Progress	In Progress	False
Output	Updated	177628	177628	False	In Progress	Closed with monetary relief	True
Output	Unchanged	182479	182479	False	Closed with explanation	Closed with explanation	False
Output	Unchanged	192496	192496	False	Closed with explanation	Closed with explanation	False

Figure 9

Side by side element with changed flag

Record and Inner Node Filters

In the properties section of the Reconcile transformation, users can decide which records to display by applying the Record and Inner Node Filters. On this screen, users can select whether they want all records to be displayed, only unchanged ones, only modified ones, or any combination of the two.

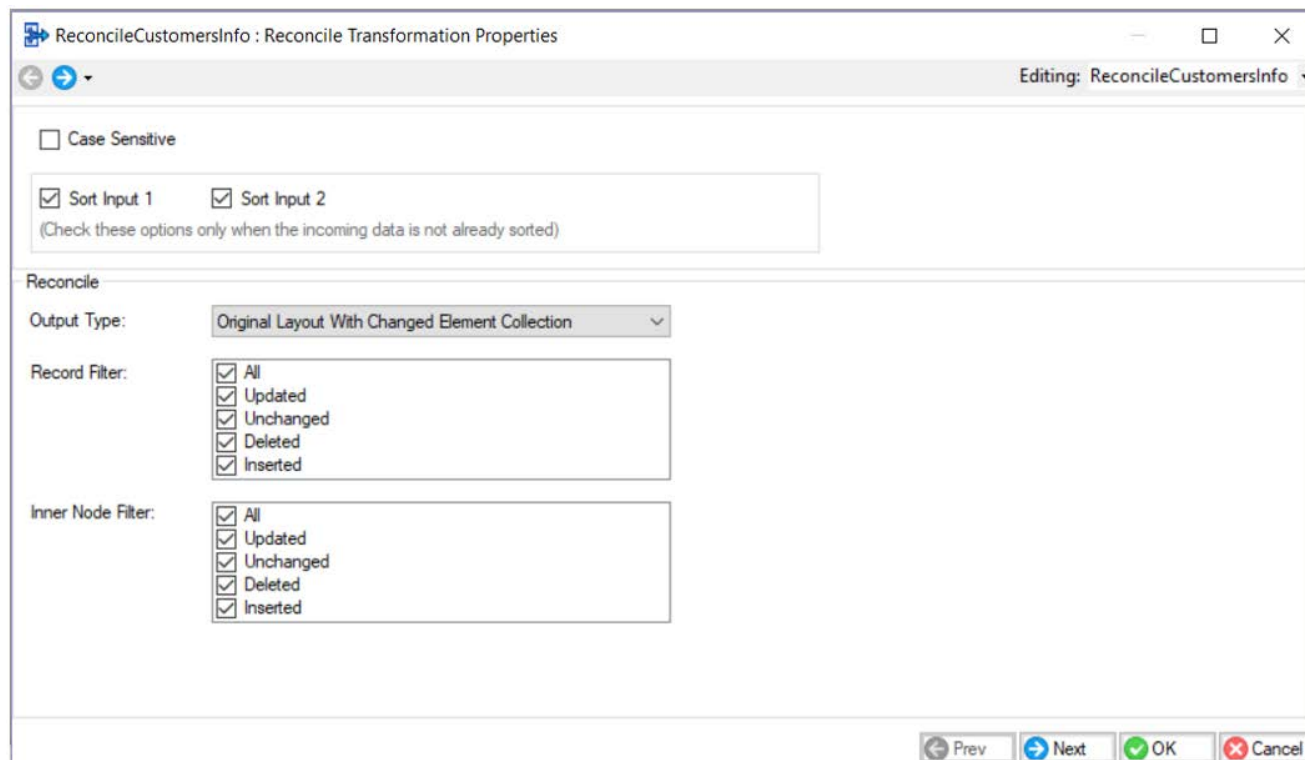


Figure 10

Record and inner node filters in Reconcile transformation

For example, if we select Updated records to be displayed for the example shown in Figure 1, Centerprise will filter out and only display the records that are updated. See Figure 11.

Data Preview

Source Record Count 50

Data Preview for action Reconcile_CustomerComplaints. Total Records 9. Records With Errors 0. Duration 00:00:00.724.

	Object Path	\$ReconcileResult	Complaint_ID	Status_of_the_complaint
►	Output	Updated	11621	Closed with explanation
	Output	Updated	18253	Closed with explanation
	Output	Updated	34337	Closed with explanation
	Output	Updated	177628	Closed with monetary reli
	Output	Updated	390390	Closed without relief
	Output	Updated	474128	Closed without relief
	Output	Updated	666162	Closed with monetary reli
	Output	Updated	759217	Closed with explanation
	Output	Updated	798528	Closed with explanation

Figure 11

Record filter (Updated) applied on reconciled data

Benefits of the Reconcile Transformation

When measuring KPIs, monitoring variables containing business information, or maintaining customer data, a common challenge that businesses face is to reconcile data changes. We have introduced the Reconcile transformation in Centerprise Data Integrator 7.5 to facilitate a wide range of business applications. Following are some of the benefits of the transformation:

1. Helps in analyzing data by presenting old values and new values for specific fields in the source data
2. Users can choose from multiple layout options to present data changes in the most effective way or as the business requirements demand
3. Can be applied to hierarchical data formats to reconcile the information contained in the inner nodes
4. Provides the flexibility to select which information should be retained by specifying the survivor value rules to each of the fields being reconciled

About Centerprise Data Integrator

Centerprise Data Integrator is a robust end-to-end data integration platform that facilitates business users by providing a code-free development environment. The data integration tool is equipped with ETL and ELT capabilities and provides native connectivity to a wide range of commonly used databases. In Centerprise 7.5, server resiliency is further improved, and new transformations are added to the transformations library. These modifications have further enhanced Centerprise's functionality.

Interested in learning more about Centerprise features? Contact us for the demo.





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