0RECORDMODE and Delta Type Concepts in Delta Management

Applies to:

SAP BI 2004s or SAP BI 7.x. For more information, visit the EDW homepage

Summary

This document explains how ROCANCEL field in R3 communicates with 0RECORDMODE info object in BI, in order to send delta records into BI and different delta types available.

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Created on: 25 July 2011

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What is Delta Management?

It implies the ability to extract only new or changed data records to the BI system in a separate data request.

Whenever we activate the Data source which can serve Delta Records in R/3 system, the system automatically generates the extraction structure for Data source. This extraction structure sends the delta records to BI based on the Update mode we mention in LBWE.

Let's take an example that we have chosen update mode as "Queued delta". So first delta record will be collected into delta queue (RSA7) before it posted to BI.

The delta queue is an S-API (Service API) function. This is the central interface technology used to extract data from SAP source systems to an BI system. Consequently, the delta queue is only used in SAP or BI source systems.

The delta queue is a data store for new or changed data records for a Data Source (that have occurred since the last data request). The new or changed data records are either written to the delta queue automatically using an update process in the source system, or by means of the Data Source extractor when a data request is received from the BI system.

You can check this in below screen

Goto RSA7 either in R/3 or BI you will find the below screen

BW Delta Queue Maintenance

Stat.	DataSource	BW System	Total	Stat.
○○■	2LIS_13_VDHDR		1.021	
○○■	2LIS_11_VASCL		437	

How to Identify Delta capable Data Source?

You can check whether Data source can provide delta or not by going thorugh SBIW or RSA6

Goto RSA6,then locate your data source by drill down the SAP R/3 data source folder and then double click on the data source.You will get the below screen.

DataSource: Customer version Display

Header Data

DataSource	2LIS_13_VDITM	Package
Description	Billing Document Item Data	

Extraction

ExtractStruct.	MC13VD0ITM	
Direct Access	D	
Delta Update	☑	DataSource for Reconciliation ☐

If Delta Update is checked then this Data Source is delta capable.

Now once the data source is delta capable we have to check the type of delta process. We can find this in table the table ROOSOURCE (in the source system) or in the table RSOLTPSOURCE (in BI for DataSources 3.x) or in the table RSDS (in BI for DataSources) respectively

Properties of the delta process are determined in the table RODELTAM (in BI or in the source system)

Data Browser: Table ROOSOURCE Select Entries   2

OLTPSOURCE	OBJVERS	TYPE	APPLNM	BASOSOURCE	DELTA	STOCKUPD	UF
2LIS_13_VDITM	A	TRAN	SD		ABR		
2LIS_13_VDITM	D	TRAN	SD		ABR		

DV	Long Description
	Delta Only Via Full Upload (ODS or InfoPackage Selection)
A	ALE Update Pointer (Master Data)
ABR	Complete Delta with Deletion Flag Via Delta Queue(Cube-Comp)
ABR1	Like Method 'ABR' But Serialization Only by Requests
ADD	Additive Extraction Via Extracto (e.g. LIS Info Structures)
ADDD	Like 'ADD' But Via Delta Queue (Cube-Compatible)
AIE	After-Images Via Extractor (FI-GL/AP/AR)
AIED	After-Images with Deletion Flag Via Extractor (FI-GL/AP/AR)
AIM	After-Images Via Delta Queue (e.g. FI-AP/AR)
AIMD	After-Images with Deletion Flag Via Delta Queue (e.g. BtB)
CUBE	InfoCube Extraction
D	Unspecific Delta Via Delta Queue (Not ODS-Compatible)
E	Unspecific Delta Via Extractor (Not ODS-Compatible)
FIL0	Delta Via File Import with After-Images
FIL1	Delta Via File Import with Delta Images
NEWD	Only New Records (Inserts) Via Delta Queue (Cube-Compatible)
NEWE	Only New Records (Inserts) Via Extractor (Cube-Compatible)

Types Delta Process
In table RODELTAM

Delta Types:

It describes how the new and changed records enter the delta queue.The delta type is Property of Delta process,it deffers from one delta process to other.

To check the delta type of a particular delta process,goto SE16 and give table RODELTAM execute you will get the below screen.

DELTA	ONLYFULL	UPDM_NIM	UPDM_BIM	UPDM_AIM	UPDM_ADD	UPDM_DEL	UPDM_RIM	DREQSER	DELTATYPE	TXTLG
	X							1		Delta Only Via Full Upload (ODS or InfoPackage Selection)
A				X				2	A	ALE Update Pointer (Master Data)
ABR		X	X	X			X	2	D	Complete Delta with Deletion Flag Via Delta Queue(Cube-Comp)
ABR1		X	X	X			X	1	D	Like Method 'ABR' But Serialization Only by Requests
ADD					X			1	E	Additive Extraction Via Extracto (e.g. LIS Info Structures)
ADDD					X			1	D	Like 'ADD' But Via Delta Queue (Cube-Compatible)
AIE			X					2	E	After-Images Via Extractor (FI-GL/AP/AR)
AIED			X			X		2	E	After-Images with Deletion Flag Via Extractor (FI-GL/AP/AR)
AIM			X					2	D	After-Images Via Delta Queue (e.g. FI-AP/AR)
AIMD			X			X		2	D	After-Images with Deletion Flag Via Delta Queue (e.g. BtB)
CUBE			X					0	E	InfoCube Extraction
D								2	D	Unspecific Delta Via Delta Queue (Not ODS-Compatible)
E								2	E	Unspecific Delta Via Extractor (Not ODS-Compatible)
FIL0				X				2	F	Delta Via File Import with After-Images
FIL1				X				2	F	Delta Via File Import with Delta Images
NEWD		X						0	D	Only New Records (Inserts) Via Delta Queue (Cube-Compatible)
NEWE		X						0	E	Only New Records (Inserts) Via Extractor (Cube-Compatible)
O			X	X	X			0	E	
ODS		X	X	X			X	1	E	ODS Extraction
X								2	X	Delta Unspecified (Do Not Use!)

Form the above the above screen the different delta types are as follws

Process Ty...	Short Descript.
	Not defined
A	ALE Update Pointer
D	Generic Delta for Service API
E	Extractor Delivers OLTP Source Delta
F	File Delta
X	Delta Supported, No Further Specification (Obsolete)

' ' : The delta type is not defined

'A': The DataSource determines the delta with ALE update pointers. This method is used in the main in connection with DataSources for attributes and texts from SAP source systems.

'D': The SAP application writes delta data records directly to the delta queue(.PUSH.) for the DataSource. Each data record is either a) stored in the delta queue individually on saving / updating the corresponding transactions in the application (for example, FI-AR/AP or direct delta in the LO Cockpit),or b) written in groups of delta data records (after updating the transaction) to the delta queue by means of application-specific jobs.

'E': The DataSource determines the delta through the extractor on request.This means that the extractor must be capable of providing the delta records for the DataSource on request (.PULL.).

'F': The delta data records are loaded by flat file. This delta type is only used for DataSources for flat file source systems

ROCANCEL and 0RECORDMODE:

ROCANCEL which is automatically part of DataSource saves the record mode in R/3 side based on the type of delta process of DataSource.

This field for the DataSource is assigned to Info object 0RECORDMODE in BI system.

Mapping between Delta indicators:

To check how this fields are mapped just double click on transfer structure of Data Source to get the below screen.

In BI you can use 0RECORDMODE or 0STORNO to map the ROCANCEL field.

From the above screen we can easyly say it is direct mapping.

ROCANCEL Values:

We can analyze what are all the values by going through the data in delta queue.

Goto RSA7 →Select any Delta queue →then click on Display data records button.

Then you will get the below screen

If you want more records to display then change 1000 to 99999 then click on execute.You will get data as mentioned in below screen.

In the above screen first field indicates the ROCANCEL,from this screen we can see the different values are

' ' → After Image

'X' → Before Image(This is missed in screen shot)

'R' → Reverse Image(after image with reversed signs)

Apart from the above three you can find some more values for ROCANCEL field in some specific situation

If it is SD transaction data then you will find the below values in ROCANCEL field.

'U' → becomes an after image with a minus key figures in BI.

'V' → becomes a remove (deletion record) with a plus keyfigures in BI.

'W'→ becomes a before image with a plus keyfigures in BI.

These three values are only required for the internal conversion of keyfigures.This conversion occurs during extraction to BI, so you won't find this values in BI.This will be avialable only in RSA7 at R/3 system.

0RECORDMODE Values:

Goto changelog table of DSO,in contens screen press F4 on the selections provided for reocordmode field, you will get the below list.
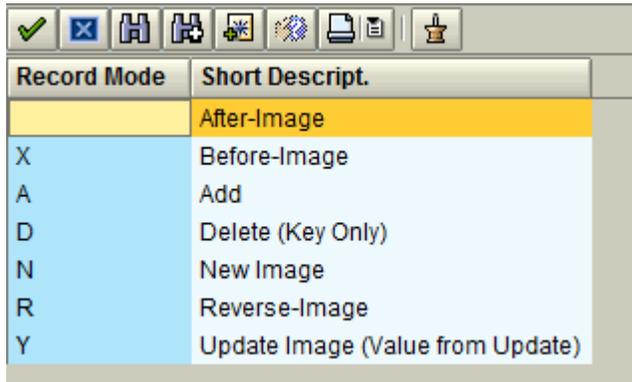
Record Mode	Short Descript.
	After-Image
X	Before-Image
A	Add
D	Delete (Key Only)
N	New Image
R	Reverse-Image
Y	Update Image (Value from Update)

' ': The record provides an after image. The status of the record is transferred after it has been

changed, or after data has been added.

'X': The record provides a before image. The status of the record is transferred before it has been changed or deleted. All attributes for the record that can be aggregated (key figures) must be transferred with a reversed plus/minus sign. These records are ignored in a non-additive (overwriting) update of a DataStore object. The before image complements the after image.

'A': The record provides an additive image. This provides the record with differences for all the numeric values are available. The record can be updated to an InfoCube without restrictions, but requires an additive update to be made to a DataStore object.

'D': The record must be deleted. Only the key is transferred. This record (and therefore the DataSource too) can only be updated to a DataStore object.

'R': The record provides a reverse image. The content of this record is equivalent to a before image. The only difference occurs when updating a DataStore object: An existing record with the same key is deleted.

'N': The record provides a new image. The content of this record is equivalent to an after image without a before image. A new image should be transferred instead of an after image when a record is created. The new image complements the reverse image.

Possible Scenarios to update Delta Records into Data Targets

Here we will have a look at the most used delta process types and how a particular record looks

The following are the most used delta process types

ABR → Which Provides After Before and Reverse Images

AIE/AIM → Which Provides After Image

ADD → Which provides additive Image

Now lets take an example of simple sales order as below

Order	Status	Quantity	U/M
11111	O	30	KG

Let's assume the quantity has changed from 30 to 40.The delta reocrds will be as follows

If Dta source is of ABR:

    11111   O   -30   KG   'X'   Before Image

    11111   O   40   KG   ' '   After Image

If Data Source of AIE/AIM:

    11111   O   40   KG   'A'   After Image

If Data Source of ADD:

    11111   O   10   KG   'A'   Additive Image

If the sales order is deleted then we will get the below records as delta

    11111   O   -30   KG   'R'   Reverse Image

    11111   'D'   Delete Image

Based on the properties of Data source we have to design our data flow in our System.The below table table illusrates How to use data targets based on Data source delta process

Case	Delta Process type		DSO		CUBE
1	ABR	Before Image	Yes(Add/Overwrite)		Yes(Add)
		After Image			
2	ADD	Additive Image	Yes(Add Only)		Yes(Add)
3	AIE/AIM	After Image	Yes(Overwrite)		No
4	R	Reverse image	Yes(Add/Overwrite)		Yes(Add)
5	D	Delete Image	Yes(Overwrite)		No

Case1: If the DataSource sends both the before image and the after image, this combination can be loaded to any InfoCube or DataStore object. If the overwrite data setting was made for DataStore objects, only the after image (the last image) arrives in the activation queue table of the DataStore object. If settings are made in the DataStore object so that data is added, both the before and the after image are necessary to load the data correctly to the target.

Case2: If the data that fills the BI system is an additive image, the data can be written to an InfoCube or a DataStore object. With a DataStore object, the update type for key figures must be set to add and not overwrite, however.

Case3: If the DataSource only sends the after image, this must first be updated to a DataStore object that is in overwrite mode

Case4: Reverse images can be processed by all targets.

Case5: Delete images can only be processed by a DataStore object. InfoCubes cannot process deletions.

Related Content

https://www.sdn.sap.com/irj/sdn/nw-bi

https://help.sap.com

For more information, visit the EDW homepage

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