

Agenda

- What Is DB2 Object Restore?
- How does it work?
- What is new in Version 1.3?
- Summary



Slide - Agenda

IBM DB2 Object Restore Version 1.3

This presentation contains an overview of DB2 Object Restore, describing what it is, what it does and how it works. New features available in DB2 Object Restore Version 1.3 are highlighted.



Overview - What is DB2 Object Restore?

- Provides UNDO for DROP activity.
 - Restores dropped objects
 - Restores related objects, privileges, and data

- Also includes...
 - Binds for plans, packages, and collections
 - Granting of resource and system privileges



Slide - What is DB2 Object Restore?

The main function of DB2 Object Restore is to provide an un-DROP capability for DB2. Whenever you DROP an object, the object is removed and DB2 does not provide the ability to directly get it back, although it is possible to get the object back through manual effort.

DB2 Object Restore makes it very easy for you to recover objects that are dropped. It allows you to bring the objects and anything that was lost because of the DROP, such as related objects, privileges and data.

DB2 Object Restore also provides the capability to BIND or REBIND plans, packages and, starting in Version 1.3, collections. You can also use it to GRANT privileges - such as resource privileges and system privileges - if these privileges were accidentally revoked.



Overview - Object Restore Allows You To...

- Recreate dropped objects
- Rebuild dependent objects
- Restore authorizations
- Recover associated data from an image copy
- Move or copy objects
- Bind plans and packages



Slide - Object Restore Allows You To..

DB2 Object Restore can recreate dropped objects and authorizations. In the process, it recreates the dropped object and any dependent objects - for instance, if you dropped a table, you also lost the underlying tables indexes. These dependent objects are rebuilt as well. If there were any table privileges associated with a table that was dropped, then the DB2 Object Restore tool can restore those authorizations and re-GRANT them.

If there was backup of the data, then the DB2 Object Restore tool can recover the data from an image copy.

You can also use DB2 Object Restore to move or copy objects. You can select an object that has not been dropped, generate the DDL for it and execute the DDL in another subsystem, or you can use the DDL to make copies of the object in the same subsystem.

You can also use DB2 Object Restore to bind plans and packages.



Overview - How Does It Work?

- Maintains a Versioning Repository
 - Contains object, plan, package, collection, authorization, and image copy information
 - Retains multiple versions of objects
 - Populated by AUO#LOAD job
 - Execution frequency can be different for each environment, influenced by DB2 Catalog activity
 - Flexible data collection to retain only what is needed



Slide - Versioning Repository

DB2 Object Restore stores all of the information about objects, packages, collections, authorizations and image copies in a set of DB2 tables called the Versioning Repository.

The Versioning Repository can even contain multiple definitions or multiple versions of a particular object. If, for example, you have altered a table to change some of the attributes or perhaps added a column, then the tool can keep track of those multiple versions. The Versioning Repository is populated primarily by the repository load job AUO#LOAD. It is designed to be run regularly, to find all objects that exist in a particular DB2 subsystem, and then to gather all of the structural type information necessary to recreate these objects.

The frequency of processing depends on your environment. A general recommendation is to run it once a day, but it can be run more or less frequently depending on the activity in a particular subsystem.

DB2 Object Restore is flexible: you can collect only the items that you want to collect, and it is easy to omit certain types of objects from the collection process. The default is to collect everything for all objects.



Overview - Restoring Objects (1 of 2)

- Object Types
 - Storage Group
 - Database
 - Tablespace
 - Table
 - Index
 - View
 - Synonym
 - Alias
 - User-defined Type and Function
 - Trigger
 - Stored Procedure

Overview - Restoring Objects (2 of 2)

- Restore Objects
 - Create object structure
 - Create dependent objects
 - Restore lost table authorizations
 - Reinstate RI constraints
 - Recover data
 - To most recent image copy
 - To more current point in time with DB2 Log Analysis Tool
 - Rebuild indexes
 - Rebind related plans and packages

- Copy objects

- Drop objects



Slide - Restoring Objects (1 of 3)

Restoring objects is the primary function of DB2 Object Restore.

In previous versions, you could restore storage groups, databases, table spaces, tables, indexes, views and synonyms. Beginning with Version 1.3, a complete set of DB2 objects can be restored. Version 1.3 features include restoring user-defined type and function, triggers, and stored procedures. Support for large object-type tablespaces is also available.

Once the repository has been populated, the tool keeps track of this information. When you need to restore a dropped object, you use the Object Restore panels to view a list of objects to choose from. You then select an object, and DB2 Object Restore starts the process of restoring it.



Slide - Restoring Objects (2 of 3)

The object is created, as well as any dependent objects. If any table authorizations were lost, DB2 Object Restore can optionally regrant them. If there are any referential integrity constraints, DB2 Object Restore can reinstate them and put them back; this, too, is optional.

If DB2 Object Restore is aware of any image copies, it uses them to restore the data using the DSN1COPY. When objects are recreated, there is a good chance that different OBIDs will be generated. So DB2 Object Restore creates the JCL to use the DSN1COPY to restore the data and to perform OBID translation.

If you have the DB2 Log Analysis Tool, you can use the interface between DB2 Object Restore and DB2 Log Analysis Tool. Normally, you recover the data to the most recent full image copy with DB2 Object Restore. If DB2 Log Analysis Tool is available, it can generate the redo type SQL to bring the data to a more current point in time.

After the DSN1COPY is completed, indexes are rebuilt. An image copy is also taken, to ensure a valid backup of the data.



Slide - Restoring Objects (3 of 3)

If there are any plans or packages that reference dropped objects, then DB2 Object Restore can rebind them, as well.

You can make a copy of objects from the DB2 Object Restore panels. You simply select an object that is in your list, whether or not it has been dropped. This will generate DDL that you can run in another subsystem or that you can modify to run in the same subsystem. Minimally, you would change the creator id's to avoid duplicate objects.

You can also drop an object directly from the DB2 Object Restore panels. With DB2 Object Restore there is no need to code an SQL statement to drop an object.



Overview - Restoring Plans and Packages

- Rebind plans, packages, and collections
- Rebind dependent plans and packages
- ACTION ADD or REPLACE
- Override default DBRM library
- Display referenced objects
- Display plan and package relationships



Slide - Restoring Plans and Packages

With DB2 Object Restore, you can manage plans and packages by getting a list of them, then generating bind statements for the plans, packages, and (beginning with Version 1.3) collections.

If you decide to generate a BIND statement for a plan, you can optionally generate BIND statements for any related packages. If you decide to BIND a package, you can automatically generate the BIND for related plans, as well.

One option of the tool allows you to BIND with ACTION ADD, ACTION REPLACE, or both.

You can choose to override the default DBRM libraries used in accessing the DB2 catalog or the repository.

You can display objects referenced by a particular plan or package.

You can display the relationship between plans and packages: for instance, which packages are bound in a plan and which plans contain which packages.



Overview - Restoring User Privileges

- Restore user privileges
- Restore system privileges
- Restore plan and package privileges
- Revoke privileges



Slide - Restoring User Privileges

You can restore privileges other than just table authorizations.

- User type privileges include, among others, using particular cell groups or buffer pools or table spaces.
- System privileges include SYSADM or DBADM or use of different types of MONITOR privileges.
- Plan and package privileges cover privileges such as whether or not a user is able to process or bind certain plans and packages.

DB2 Object Restore keeps track of these privileges and whether they have been revoked. Using the tool, you can easily restore them.

You use the tool to regrant privileges and to revoke them.



Overview - New in Version 1.3

- Alphanumeric menu options
- Line commands to display objects contained in a specified object hierarchy
- Improved DB2 Log Analysis Tool interface
- Interface to DB2 Table Editor
- Versioning Repository enhancements
 - Repository cleanup
 - Online repository update
 - Generate repository JCL online
- Image copy viewer



Slide - New in Version 1.3 (1 of 3)

- Complete object support is available so that you can restore any DB2 object.
- Menu options are now alphanumeric rather than purely numeric, making the menu options in DB2 Object Restore compatible with the DB2 Administration Tool.
- Several line commands have been added to the different types of objects. One lets you display the object hierarchy. Starting at the database level you, can see, for a particular database, all table spaces and table indexes that are related to that particular database. Line commands allow you start at the database level, refine your request to the table space level, and pick a particular table space to be restored. Or you can select tables, and pick a particular table to be restored.
- The interface with DB2 Log Analysis Tool is easier to use. You no longer need to manually enter the DB2 Log Analysis Tool dialog to update the data to a more recent point in time.



Slide - New in Version 1.3 (2 of 3)

- An interface with the DB2 Table Editor is now available. If you have this tool installed, you can enter a line command from the list of tables, to invoke the DB2 Table Editor for editing a selected table.
- The versioning repository has been streamlined. Previously, the repository JCL had a step for each type of data that it was attempting to collect: a step for table spaces, a step for databases, and so on. Now, it runs as a single job step.
- You can generate the JCL to update the repository online. DB2 Object Restore builds the JCL for you to run in batch mode. It also allows you to update the repository online in foreground mode. Although discretion is advised, in a small environment this is the fastest way to update the repository.
- Repository cleanup capabilities have been added. You can specify how many versions of a particular object you want to keep. DB2 Object Restore maintains your specification and, when the limit is exceeded, removes the older versions.



Slide - New in Version 1.3 (3 of 3)

The repository cleanup occurs in one of two ways:

- as part of the repository LOAD process
- through a separate clean-up job

During the repository LOAD, a check is made to see if the number of versions for a particular object exceeds the limit. DB2 Object Restore LOAD removes the oldest versions in order to keep the appropriate number.

Repository clean-up may cause the repository load job to take extra time. If you need to streamline the load process, you should run a separate clean-up job instead.

Version 1.3 provides an image copy viewer which offers a fast way to determine what data recovery information is available. The image copy viewer can find all image copies that are recorded in SYSCOPY, in the repository, or in both places. You choose where to look; the information in these two places is not necessarily the same. An image copy that exists in SYSCOPY could be unknown to DB2 Object Restore, and an image copy in the repository could be unknown to DB2.



Summary - IBM DB2 Object Restore Version 1.3

- Restores dropped objects and related dependencies--even if they no longer exist in the IBM DB2 catalog
- Maximizes system availability by enabling you to clean up your DB2 system, knowing you can restore discarded objects
- Helps reduce the cost of database maintenance
- Recreates objects on additional DB2 subsystems
- Eliminate clean-up anxieties

