WebSphere Data Interchange (WDI) for z/OS - Converting from a DB2 DBRM Based Plan to a DB2 Package Based Plan

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Agenda

- Why make the move to DB2 packages?
- Review of traditional DBRM-based plan
- Review of new DB2 package-based plan
- Converting from DBRM-based plan to packages
- Maintaining DB2 packages
- Additional resources

IBM

Why make the move to DB2 packages

- From the *DB2 Version 9.1 for z/OS Installation Guide* (GC18-9846-13), "Releases of DB2 after Version 9.1 do not support plans that contain DBRMs. In preparation, ensure that all of your plans contain only package lists."

- From the *DB2 10 for z/OS Installation and Migration Guide* (GC19-2974-04), "Binding DBRMs directly into plans is no longer supported. For pre-existing plans that are bound from DBRMs, you can use the COLLID parameter of the REBIND PLAN command to create packages. If you execute a plan that is bound from DBRMs, DB2 performs an automatic rebind that creates packages from the DBRMs and binds those packages into a plan. However, the recommendation is to use REBIND with the COLLID option so that you can specify bind options and receive more diagnostic information. If the installation uses the RACF access control module, owners of plans with DBRMs need to explicitly rebind the plans to convert the DBRMs to packages."

- References: http://www.ibm.com/support/docview.wss?uid=swg27019288

Why make the move to DB2 packages (cont'd)

- The key benefit is with "change management"

- Easier to manage package list (PKLIST) because only the affected package(s) need to be rebound as changes are made to WDI supplied DBRMs

- In other words, the entire plan with all DBRMs need not be rebound

- Customers who utilize any WDI Application Programming Interface (API) calls and the calling API also makes SQL calls need not include its DBRM(s) with WDI's when binding

- This is especially useful for CICS customers when a transaction calls another CICS transaction, then that DBRM had to be included in the plan that was allocated for the initial transaction

- Now, with PKLIST, you only have to rebind the package, which contains a single DBRM

Review of traditional DBRM-based plans

- WDI sample bind plan JCL for batch environment: EDI.V3R3M0.SEDIINS1(EDIJBIND)

  ▸ Binds together all 68 DBRMs needed for EDIFFUT batch utility program:

```
BIND PLAN    (EDIENU33)                            -
    OWNER    (OOOOOOOO)                             -
    MEMBER    (<all 68 DBRM members as listed in SEDIDBR1>)  -
    LIBRARY   ('EDI.V3R3M0.SEDIDBR1')               -
    ACTION    (REP) RETAIN                          -
    VALIDATE  (BIND)                                -
    ENCODING  (UNICODE)                             -
    ISOLATION (CS)                                  -
    ACQUIRE   (USE)                                 -
    RELEASE   (COMMIT)                              -
    EXPLAIN   (NO)
```
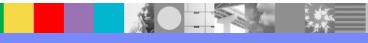
Review of traditional DBRM-based plans (cont'd)

▸ Also binds package for use with WDI Stored Procedure

```
BIND PACKAGE    (EDI33001) -
    OWNER      (OOOOOOOO) -
    MEMBER     (EDIDPROC) -
    LIBRARY    ('EDI.V3R3M0.SEDIDBR1') -
    ACTION     (REPLACE) -
    ENCODING   (UNICODE) -
    VALIDATE   (BIND)-
    ISOLATION  (CS)-
    RELEASE    (COMMIT)-
    CURRENTDATA (NO)-
    EXPLAIN    (NO)
END
```

Review of traditional DBRM-based plans (cont'd)

- WDI sample bind plan JCL for CICS environment: EDI.V3R3M0.SEDIINS2(FXXJBIND)

  - Binds together all DBRMs needed for EDIFFUT utility program as invoked by EXEC CICS LINK or START APIs:

```
BIND PLAN     (DIENU33C)                        -
   OWNER    (OOOOOOOO)                           -
   MEMBER    (<all DBRM members as listed in SEDIDBR1>)   -
   LIBRARY   ('EDI.V3R3M0.SEDIDBR2')                -
   ACTION    (REP) RETAIN                         -
   VALIDATE  (BIND)                               -
   ENCODING  (UNICODE)                            -
   ISOLATION (CS)                                 -
   ACQUIRE   (USE)                                -
   RELEASE   (COMMIT)                             -
   EXPLAIN   (NO)
END
```

Review of new DB2 package-based plan

- Also referred to as Package list or PKLIST
- New sample JCL to support this process is provided on PTF UK63010

    ▶ PTF merely includes new sample JCL to accommodate package binding – no existing code or DBRMs are updated on this PTF

- Sample JCL for batch environment:

    ▶ EDI.V3R3M0.SEDIINS1(EDIJRBND) – Uses DB2 REBIND command to convert the traditional, pre-existing WDI DBRM-based plan to a package-based plan assigning collection id EDIENU33 – default plan name is the same as the COLLID

    ▶ EDI.V3R3M0.SEDIINS1(EDIJBNDK) – Bind the packages for one or more WDI DBRMs – serves two purposes:

        • In its entirety, binds all packages facilitating customers who wish to create new package collections in support of new plans

        • Future PTF HOLD ACTIONs will identify any specific packages requiring BIND

Review of new DB2 package-based plan (cont'd)

- Sample JCL for batch environment (cont'd) – customizing EDIJBNDK
- Each EXEC stmt references a different member in EDI.V3R3M0.SEDISQL1
- One EDIS* member for each of the 68 packages included in plan EDIENU33
- Sample BIND PACKAGE statement as taken from member EDISELAS

```
BIND PACKAGE (EDIENU33)

    MEMBER  (EDIELAS)

    OWNER    (EDIENU33)

    QUALIFIER (EDIENU33)

    LIBRARY  ('EDI.V3R3M0.SEDIDBR1')

    ACTION   (REP)

    VALIDATE  (BIND)

    ENCODING  (UNICODE)

    ISOLATION (CS)

    RELEASE   (COMMIT)

    CURRENTDATA (NO)

    SQLERROR (NOPACKAGE)

    EXPLAIN   (NO)

  END
```

- ▸ Note: red highlighter denotes parameters most likely to be modified to meet installation requirements

Review of new DB2 package-based plan (cont'd)

- Sample JCL for batch environment – customizing EDIJBNDK – sample BIND PACKAGE statement (cont'd)
  - ▶ If you require a different naming convention for your installation, then all 68 members will need to be updated accordingly
    - PACKAGE() = Collection ID for all DBRMs in main WDI batch plan
    - OWNER() = SQLID under which the WDI DB2 objects were created
    - QUALIFIER() = Table high-level-qualifier, and must match the OWNER
    - LIBRARY() = SMP/E target library containing all WDI DBRM members

Review of new DB2 package-based plan (cont'd)

- Sample JCL for batch environment (cont'd)

  - EDI.V3R3M0.SEDIINS1(EDIJBIN2) – Binds the plan using packages (PKLIST) rather than specifying all DBRM members in the BIND request – serves two purposes:

    - It will BIND a collection of WDI packages as previously generated by either EDIJRBND or EDIJBDNK

    - Future PTF HOLD ACTIONs may call on this JCL in the event a new BIND PLAN is necessary (this has not yet been called for)

Review of new DB2 package-based plan (cont'd)

- Sample JCL for CICS environment:

  ▶ EDI.V3R3M0.SEDIINS2(FXXJRBND)

  ▶ EDI.V3R3M0.SEDIINS2(FXXJBNDK)

  ▶ EDI.V3R3M0.SEDIINS2(FXXJBIN2)

- Very similar in concept to batch environment – only the names are different

  ▶ FXXJRBND to REBIND pre-existing DBRMs into packages under collection id FXXENU33 – the default plan name is DIENU33C

  ▶ FXXJBNDK, in its entirety, binds all packages to create a new package collection for a new plan, and will be called for on future PTF HOLD ACTIONs where only specific packages require BIND

  ▶ FXXJBIN2 to BIND a collection of WDI packages as previously generated by either FXXJRBND or FXXJBDNK

Converting from DBRM-based plan to packages

- Depends on DB2 version and WDI maintenance (PTF) level

- WDI maintenance level is important since:

  - Post PTF UK63010, new verbiage in HOLD ACTIONs now include the individual package names required for use with the new EDIJBNDK

  - Pre PTF UK63010, as this was before the new process, only the all-member bind, e.g. EDIJBIND, was called for as HOLD ACTION –

    - Meaning, EDIJBNDK will need to be run for all members to satisfy these older ACTIONs that do not identify specific package names

- If DB2 v9.1, you can continue to use the old, traditional method as you apply any additional WDI maintenance

- If DB2 v10, you will need to convert in order to apply any additional WDI maintenance which calls for a bind HOLD ACTION

Converting from DBRM-based plan to packages (cont'd)

- While job EDIJRBND makes it easy to convert over to packaged-based plan by simply using the existing DBRMs stored in the DB2 catalog, job EDIJBNDK will be needed eventually to apply WDI maintenance

- While new PTFs will contain HOLD ACTION to support either traditional or PKLIST binding, older PTFs do not as IBM® cannot update PTFs retroactively

- Recommendations:

  - ▸ Create one version of EDIJBNDK which will accommodate the inclusion of all packages as this will help when applying older PTFs

    Note: remove comments from all EXEC statements in JCL

  - ▸ Create a second version to accommodate binding for only specific members, i.e. only those affected, hence listed on new PTF actions

    Note: remove comment from only EXEC statement(s) as listed in PTF hold action

Converting from DBRM-based plan to packages (cont'd)

- The discussion thus far has been around the "as provided" plans
- If you have other plans integrated with API interface(s) where your program also makes DB2 calls,

  ▸ You can convert these other plans with EDIJRBND, however, the COLLID will need to be different to prevent duplicate package names

  ▸ Alternatively, use a modified EDIJBNDK to bind your own packages in one of the following ways:

    • Bind into the existing COLLID, then use EDIJBIN2 as is to bind the plan under the existing list, e.g.

      PKLIST (EDIENU33.*)

    • Bind into a new COLLID of your choosing, then EDIJBIN2 to bind the plan so as to include your package(s) COLLID under the list, e.g.

      PKLIST (EDIENU33.*, your_collid.*)

Converting from DBRM-based plan to packages (cont'd)

- For the CICS environment, it is more likely to have other plans integrated with API interface(s) where your program also make DB2 calls

  ▸ You can convert these plans as with FXXJRBND, however, the COLLID will need to be different to prevent duplicate package names

  ▸ Alternatively, use a modified FXXJBNDK to bind your own packages in one of the following ways:

    • Bind into the existing COLLID, then use FXXJBIN2 as is to bind the plan under the existing list, e.g.

      PKLIST (FXXENU33.*)

    • Bind into a new COLLID of your choosing, then FXXJBIN2 to bind the plan so as to include your package COLLID under the list, e.g.

      PKLIST (FXXENU33.*, your_collid.*)

Maintaining DB2 packages

- While the REBIND or BIND PACKAGE processes will create the initial DB2 packages, it is also necessary to maintain these packages after applying SMP/E PTF maintenance to WDI

- PTF HOLD ACTION will let you know that DB2 changes have occurred, and will identify the individual package names

- Use the JCL provided in EDIJBNDK to BIND each of the affected packages
    - Each BIND command is provided in the EDI.V3R3M0.SEDISQL1 library, members EDIS*

- From EDIJBNDK JCL, remove the comment from the package names as specified in the PTF HOLD action

Maintaining DB2 packages (cont'd)

- Example PTF hold action:

```
++HOLD(UK68046)  SYS  FMID(H28N330)  REASON(ACTION)  DATE(11158)
  COMMENT(This PTF requires post-SMP/E action as follows:

All customers should edit as appropriate and
 - run JCL member EDIJBIND from EDI.V3R3M0.SEDIINS1
All CICS customers should edit as appropriate and
 - run JCL member FXXJBIND from EDI.V3R3M0.SEDIINS2

Alternatively, if DB2 Packages are used and PTF UK63010
is applied:
- edit EDIJBNDK from EDI.V3R3M0.SEDIINS1 and remove the
   JCL comment from the EXEC statement(s) as follows:
     //EVIDB     EXEC    BINDPKG,MEMBER=EDISVIDB
- then run JCL member EDIJBNDK from EDI.V3R3M0.SEDIINS1

CICS customers should edit FXXJBNDK from
EDI.V3R3M0.SEDIINS2 and remove the JCL comment
from the EXEC statement(s) as follows:
     //EVIDB     EXEC    BINDPKG,MEMBER=FXXSVIDB
- then run JCL member FXXJBNDK from EDI.V3R3M0.SEDIINS2
```

Maintaining DB2 packages

- Example of corresponding EDIJBNDK:

```
//EDIJBNDK JOB (INSTALLATION DEPENDENCIES)
//BINDPKG  PROC  MEMBER=
//* ----------------------------------------------------------------- *
//*  BINDS PACKAGE NAMED IN VARIABLE MEMBER                            *
//* ----------------------------------------------------------------- *
//STEP0100 EXEC PGM=IKJEFT01,DYNAMNBR=20,REGION=2000K
//STEPLIB  DD DSN=DB2.SDSNEXIT,DISP=SHR  <- DB2 LOAD LIBRARY
//         DD DSN=DB2.SDSNLOAD,DISP=SHR  <- DB2 LOAD LIBRARY
//SYSTSPRT DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//LISTING  DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//* BIND Package
//SYSTSIN  DD DSN=EDI.V3R3M0.SEDISQL1(EDISYST),DISP=SHR
//         DD DSN=EDI.V3R3M0.SEDISQL1(&MEMBER),DISP=SHR
//         PEND
//*ELAS     EXEC   BINDPKG,MEMBER=EDISELAS
//*ELOG     EXEC   BINDPKG,MEMBER=EDISELOG
//*MSGS     EXEC   BINDPKG,MEMBER=EDISMSGS
//EVIDB    EXEC   BINDPKG,MEMBER=EDISVIDB
//*EVUDB    EXEC   BINDPKG,MEMBER=EDISVUDB
//*IIOS     EXEC   BINDPKG,MEMBER=EDISIIOS
...
```

Additional Resources

- See the following technical document on WDI support portal for the latest information:

    ▸ http://www-01.ibm.com/support/docview.wss?uid=swg27019377

- APAR PM26227: ALLOW FOR DB2 PACKAGES IN DB2

    ▸ http://www-01.ibm.com/support/docview.wss?uid=swg1PM26227

    ▸ Note: click on the link, "Obtain the fix for this APAR" and then the (PTF) UK63010 link to order the PTF from ShopzSeries or IBMLink

- Configuring WDI Stored Procedures previous webcast:

    ▸ http://www-01.ibm.com/support/docview.wss?uid=swg27013790

- Redbook: DB2 9 for z/OS: Packages Revisited (SG24-7688-00)

    ▸ http://www.redbooks.ibm.com/abstracts/sg247688.html?Open

Summary

- Everyone will eventually need to move to DB2 packages since traditional DBRM-based plans will become obsolete

- New WDI sample JCLs are provided in support of DB2 packages

- We covered the conversion from DBRM-based plans to packages

- Lastly, we reviewed how DB2 packages are maintained as future WDI maintenance is applied

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