





IBM z Analytics  Db2 Tools 

Cloning Tool Enhancements from Q3/Q4 2017

Delivering greater usability, performance and availability

- **Enhanced usability**
 - Unload/Load support
 - Versioning mismatch
 - VSAM to VSAM cloning
 - Improved XML handling
 - CATMAINT schema switch
 - Connect: Direct integration
- **Availability and Performance**
 - Consistent FlashCopy Image Copies
 - Improving performance on clone target
- **Miscellaneous**

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Cloning Tool Enhancements – Usability

VSAM to VSAM

- Provides a faster way to clone when Fast Replication is not available
- For customers that cannot use Fast Replication and do not want to use an Image Copy method for Application Cloning
 - Alternative to slow copy
 - Source job reads pages once
 - Copies to the Target data set (Table Spaces, Index Spaces, LOBs)
 - Performs translations, RBA reset, Log apply (always TO_CURRENT)
 - The Target job still performs Index REBUILDS, REPAIRS as needed
 - DATA-MOVER PGM(SRCVSCPY)
- Considerations
 - No XML or data masking
 - Shared DASD required for cross LPAR cloning
 - No simulate mode
 - Cannot use subtasks

DATA-MOVER PGM SRCVSCPY
 FASTREP
 FCTOPPRCPRIARY

APAR PI82463 / PTF UI50037

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Cloning Tool Enhancements – Usability

Improved XML handling

- This enhancement improves XML processing to remove issues with updating or creating XML documents on the cloned application.
- Db2 XML includes information metadata in the Catalog
 - SYSXMLSTRINGS
 - DOCID Sequence Number
- XML Log Apply and maintenance of SYSXMLSTRINGS has been included in the Application Cloning Target Job
- Without DOCID maintenance
 - Reading or Updating XML documents likely worked
 - Creation of XML documents may have failed
- This maintenance will update the Target DOCID
 - DB2_GENERATED_DOCID_FOR_XML

APAR PI83216 / PTF UI51684

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Cloning Tool Enhancements – Usability

CATMAINT Schema switch

- Some customers run CATMAINT during Subsystem Cloning to switch the Schema Names on objects
 - Not all Schema Names are modifiable via CATMAINT
- This enhancement
 - Generates SQL statements needed to rename Schemas not supported by CATMAINT
 - Views, Materialized Query Tables, SQL Scalar Functions, Triggers, Native Stored Procedures
 - Calls CATMAINT SWITCH for CATMAINT supported objects
- DB2SCHEMA-UPDATE Cloning Tool command
 - Required a Plan be bound from customization (TCz)
 - Uses Schema Masks
 - Submitting User ID must be SYSADM or SYSADM2 (Special Zparms)
 - Some unsupported objects will cause this command to fail
 - Index on Expression
 - Column Masks
 - Row Permissions

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APAR PI85474 / PTF UI52340

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Cloning Tool Enhancements – Availability and Performance



Consistent Flashcopy ICs

- If Log Apply is used, for each table space changed, a REBUILD INDEX is required
- **Interim solution:** Avoid Log Apply and avoid REBUILD INDEX by using FlashCopy consistent image copies, process target data sets in parallel subtasks
- New parameter USE-LAST-CONSISTENT-FLASHCOPY (PI79277)

APAR PI79277 / PTF UI47025

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Cloning Tool Enhancements – Availability and Performance

Consistent Flashcopy ICs

- This allows users to avoid stopping source objects and create a clone from consistent data without having to stop source objects or use Log Apply
- There is no limitation regarding the number of subtasks Cloning Tool can run concurrently on the Target job
- Note: Affected indexes need to be copied in the same COPY statement to obtain the same PIT_RBA in SYSINDEXES
- **Requirement:**
The structure of data for objects in consistent FLASHCOPY should be the same as source objects structures.

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Cloning Tool Enhancements – Availability & Performance

Ensuring Clone Target Performance

- Problems were reported to run utilities and SQL performance on cloned table spaces
- Copy statistics from source to target to address reported issues
- COPY command option ,Set RTS-COPY':

```

Option =====> DB2 tablespace RTS-COPY Command
-----
Creator . . . . : CSREGG      Name . . . . . : CKZDEMO DEMO_1
Share Option . . : UPDATE     Description . . : TABLE SPACE REFRESH PA1B
Source SSID . . : IA1A        Target SSID . . : PA1B

RTS-COPY-ENABLE . . . . . NO_      (Yes/No)
RTS-DETAILS . . . . . NO_         (Yes/No)
RTSFILE-DATA-SET-HLQ . . . . . CKZ_RTSDATA
RTSFILE-UNIT-TYPE . . . . . SYSALLDA (DISK, CART, or etc.)
RTSFILE-QUANTITY-IN-TRACKS . . . . YES      (Yes/No)
RTSFILE-PRIMARY-QUANTITY . . . . 100     (1-16777215, disk only)
RTSFILE-SECONDARY-QUANTITY . . . . 100     (1-16777215, disk only)
RTSFILE-DATACLAS . . . . .         (1-8 characters or blank)
RTSFILE-STORCLAS . . . . .         (1-8 characters or blank)
RTSFILE-MGMTCLAS . . . . .         (1-8 characters or blank)
DELETE-RTS-DATASETS . . . . . NO_      (Yes/No)
    
```

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Cloning Tool Enhancements – Troubleshooting

Maintenance Level

- Determine current maintenance level using 'DISPLAY MEPL' for reported issues
 - Enter 'DISPLAY MEPL' from any Cloning Tool ISPF panel

```

Build Job for Display MEPL Utility

Build Job in:
  Data set name . . . TS5817.TEST.CNTL
  Member name . . . CTMEPL

Processing options
  Enter '/' to select option
  _ Specify new data set allocation parameters

Output Sequential Data Set for Display MEPL Utility:
  Data set name . . . TS5817.CTMEPL.OUTPUT
  Unit device . . . SYSDA (SYSDA, DISK, or etc.)

Job Cards:
//TS5817DM JOB (36000999,06606221,83000000),'CT_DISPLAY_MEPL',
//          CLASS=A,NOTIFY=&SYSUID,MSGCLASS=H,MSGLEVEL=(1,1),REGION=OK
//*
//*

Press ENTER or F3 to process. Press F12 to cancel.
    
```



Cloning Tool Enhancements – Troubleshooting*

Maintenance Level

- Each Cloning Tool load module is listed including latest maintenance applied (job output should be attached when opening a PMRs)

```

BROWSE TS5817.CTMEPL.OUTPUT Line 00000000 Col 001 080
Command ==> Scroll ==> CSR
*****
OBJECT SERVICE DATE Top of Data *****
TIME
-----
Load module CKZ00990:
CKZF0001 PI80906 May 2 2017 11:10:04
CKZF0002 PI80906 May 2 2017 11:10:01
CKZF0003 PI80906 May 2 2017 11:10:08
CKZF0004 PI80906 May 2 2017 11:10:12
CKZF0005 PI80906 May 2 2017 11:10:13
CKZF0006 PI80906 May 2 2017 11:10:10
CKZF0007 PI80906 May 2 2017 11:10:18
CKZF0008 PI80906 May 2 2017 11:10:20
CKZF0009 PI80906 May 2 2017 11:10:16
CKZF0010 PI80906 May 2 2017 11:10:23
CKZF0011 PI80906 May 2 2017 11:10:25
CKZF0012 PI80906 May 2 2017 11:10:27
-----
Load module CKZ00991:
CKZF0013 PI80906 May 2 2017 11:11:09
CKZF0014 PI80906 May 2 2017 11:11:11
    
```

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Cloning Tool Enhancements – Usability

Connect:Direct integration

- Integration of Connect:Direct for environments with non-shared DASD
- Copy FlashCopy image copy data sets to Db2 for zOS VSAM datasets on the target system
 - Job template CKZJOB4 to contain Connect:Direct statements
 - If applicable: job template CKZJOB5 to add volumes for cloned datasets
 - Submit CKZJOB5 (if applicable) before CKZJOB4, followed by the target job
- Performance influence factors
 - Available network bandwidth
 - Distance between CECs
 - For Hipersockets: available IFL capacity

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LPAR A

DB2A

↓ ① COPY

FC/IC

LPAR B ② If applicable: DROP/CREATE

DB2A
(Data Sharing)

↑

Db2
VSAM

③ Transfer
(eg Connect:Direct)

- ① Create FLASHCOPY CONSISTENT SHRLEVEL CHANGE image copy
- ② If applicable: DROP and CREATE objects
- ③ Transfer FC image copy to target system, overwrite Db2 for z/OS VSAM cluster of target object(s) – C:D template generator coming soon

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