Simplifying DB2 Data Management with BMC Next Generation Technology Utilities

Matteo Ferrari
BMC Software

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DB2 Then and Now

**DB2 1980s**
- **Database Size**: A few Gigabytes (~X10,000)
- **Table Size**: Tens of thousands of rows, Max: A few million rows (~X1,000)
- **Number of Objects**: Low Hundreds (~X500)
- **Transactions per second**: Under 100 (~X200)

**DB2 2010s**
- **Database Size**: 70+ Terabytes
- **Table Size**: Tens of millions of rows, Max: A few Billion rows
- **Number of Objects**: Over 10,000
- **Transactions per second**: Over 10,000
DB2 Utility Architecture Then and Now

Reorg 1980s

- Unload
- SORT
- Load
- Rebuild Indexes

Reorg 2010s

- Unload
- Decompress
- SORT
- Recompress
- Load
- Iterative Log Apply
- Rebuild Indexes

1. Unload/Decompress (double its size) 2
2. Sort (6 – 9 passes) x7
3. Reload/Recompress (half its size) +2
   16 passes

Plus the Index Build which is significant; and Risky!
BMC and CDB integration – a new Paradigm
NGT Utilities – Unique technology

Boost performance and resource savings
NGT Reorg – Patented NO SORT technology

- Read CLIX
- Read original data, write reorganized
- Parallel Optimized R-W of Ixs;

Take advantage of DB2 CLIX information to check and fully reorg IX and data
NO external SORT, NO data DECOMPRESS/COMPRESS, read & write data once
NGT Server Technology

NGT PROCESSES

Master Job

Server Job

Server Job

Server Job

Server Job

Server Job

Server Job

Server Job

Server Job

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Server Job

Server Job

SYSPLEX NODE

Server Job

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NGT Utilities – Unique features

• NGT REORG uses enhanced Delta Change Apply (no Log read)
• NGT REORG takes SHRLEVEL REFERENCE copies
• NGT LOAD and REORG NPIs always fully reorg NPIs
  • Better DB2 applications performance, lower MLC costs
• NGT LOAD and UNLOAD use internal zIIP-eligible eSORT
  • NO SORTworks used
• NGT UNLOAD natively interprets more data select conditions
  • Scalar functions and subselects are executed outside DB2
NGT Utilities - Expected savings

- 70% Reduction in CPU Time*
- 66% Reduction in Elapsed Time*
- 85% DASD Reduction **

No Application Outages

*Preliminary BMC Benchmarks
** NGT Customer Benchmark
NGT Utilities – Zero JCL maintenance

Simplifying DB2 Data Management
NGT Utilities – JCL simplification

The only answer to DB2’s growing complexity is **simplification**

```plaintext
//PAYRGB01  JOB ...
//JOBLIB    DD DISP=SHR, DSN=BMC.NGT.LOAD
//NGTUSTEP EXEC PGM=CDBUTIL, PARM='TST8,,RESTART'
//SYSPRINT  DD SYSOUT=*  
//UTPRINT   DD SYSOUT=*  
//CDBEXEC   DD DISP=SHR, DSN=NGT.AUTO.BMCEXEC
//SYSIN     DD *  
  REORG TABLESPACE PAYROL%.
```

**Restart Parameter**
- **RESTART**
- **NORESTART**
- **QUICKEXIT**
NGT Utilities - JCL transparent to Business logic

- REXX Automation internal to all NGT utilities makes JCL ‘transparent’ to business logic
- Your shop’s rules and logic are used to make real-time, dynamic decisions to automate your entire DB2 utility processing

Align your utility operations to your business rules
NGT LOBMaster – Simplify LOB Management

CHECK IX
- Verify if the LOB Index is valid

CHECK LOB
- Verify the internal structure of the LOB

CHECK DATA
- Verify that the ID fields in the base TS are in the LOB Index

REORG
- Separate from base tablespace Reorg
- Requires unload of the LOB data
- Utility JOB JCL change

REORG TABLESPACE DBASE.% AUX

A single command checks for integrity and reorganizes

“Free” Integrity checking (It does not increase Reorg time)

Online 100% of the time
NGT Utilities – Zero downtime

Keeping data available
NGT Reorg - Availability

• With NGT, Data is Never Unavailable
  - Not even for a Second
  - No transaction Failures

Is a 1 minute downtime almost as good as no downtime?

60 seconds 1000 tx/sec 60,000 failures 60,000 dissatisfied customers
NGT Load – Non destructive RESUME YES

Tablespace Stopped during Load

- Indexes
- Shadow Indexes
- HURBA
- Write new Data
- Write new Keys

**Successful completion:** move HURBA and rename the index datasets

**Unsuccessful:** QUICKEXIT to delete the index shadow copy and start RW. **NO RECOVERY TIME**
NGT Utilities – Zero Time to decision

Making Data Management Autonomic
Traditional DB2 Utility Automation

Immediate Application Performance Degradation and increased costs

Not corrected until Saturday!
NGT Utility Manager

REORG TABLESPACE DBASE1.% RTS

UTMgr logic

- NGT Exception Table
- NGT Schedule Table
- NGT Criteria Table

Force or exclude?
Can it run now?
Does it need to run?
Objects are intelligently processed every day based on Business and Technical policies. Application performance and response time are kept optimized.
NGT Utilities – Zero time to reaction

Making Data Management Unattended
Traditional DB2 utilities restartability

• Standard DB2 utilities require DBA knowledge and experience
• In case of problems, restartability or termination require an analysis of the utility and object status and in some cases, manual actions
• This approach requires attended operations; correlated jobs must wait for the problem to be solved

REORG DB.%

REORG DB.TS1 REORG DB.TS2 REORG DB.TS3

TERM? only 2 objects reorged
RESTART? possible impact on SLA?

Human Analysis
Restart or TERM?
Manual actions
NGT Utilities – Embedded intelligence

• NGT utilities have embedded intelligence to govern execution and termination
• In case of problems, QUICKEXIT automatically finds the quickest way to cleanup utility, delete unnecessary datasets and make data available
• Objects in error can be ‘skipped’ and execution can continue with NO manual intervention; automation can provide info to Operations
NGT Utilities in Summary...

- Unique technology
- Reduced CPU, time and resources
- Zero JCL Maintenance
- DB2 Data Management simplification
- Zero Downtime
- Risk mitigation and preserved SLAs
- Zero Time to reaction
- Built-in intelligence for unattended Ops

Lower cost of DB2 Data Management and Applications
It’s time to Rethink DB2 Data Management