DB2 12 — The ultimate enterprise database for business-critical transactions and analytics
Seamless, secure integration for an analytics, mobile and cloud world

Unlocking the power of DB2: IBM DB2 utilities and tools
Speaker: Umesh Mehta & Chuck Hacker
DB2 12 Utilities and Tools – delivered and available

*Unlocking the power of DB2 12 and more*

Comprehensive solutions helping clients save money and time
Making it faster and easier to take advantage of DB2 12 – no guesswork in support

Majority of DB2 ESP clients tested with IBM DB2 utilities & tools
IBM DB2 utilities/tools allowed for swift and successful DB2 12 experience

IBM DB2 utilities add more value, less risk
Unquestionable DB2 support, with more cost-saving & performance features

IBM DB2 utilities and tools
Integrated support to automate DB2 for z/OS management as your needs evolve

ESP clients gave overwhelmingly positive feedback using OMPE -- including the ISV clients.

“This was our first time using OMPE reports and I was very glad for the capabilities.”

Large U.S. Retailer

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IBM DB2 Tools: Are your tools ready for DB2 12?

**DB2 Utilities Suite 12** drives down operating costs, maximizes efficiency, eliminates application impact with greater zIIP offloads, enhanced FlashCopy use. Developed in conjunction with DB2 12 to provide maximum data integrity and exploit all new functions NOW.

**Tivoli OMEGAMON XE for DB2 Performance Expert 5.4** supports key features in DB2 12, provides more monitoring capabilities for analytics insights and enhanced buffer pool analysis. The ESP-tested and recommended performance monitor for DB2 12!

**DB2 Administration Tool/Object Compare 12** extends the value of DB2 12 with new capabilities that allow DBAs to quickly exploit features like partition by range table spaces. Significant new change management and analytics features also added!

**QMF 12** let you visualize new business opportunities, access more data, and all in real time across all users. TSO client can access non-DB2 data sources, support for Spark and Restful APIs, accelerate any non-DB2 data that is accessed by QMF and more....

**DB2 Sort** lowers the cost of DB2 Utility sort processing with significant enhancements for the REORG utility via a variable-length interface. Clients can see up to 70% reduction in sort CPU for REORG.

**DB2 Automation Tool 4.3** provides a graphical interface to automate DB2 maintenance and utility tasks including automatically exploiting DB2 v12 utility functions.

**New Release!**
IBM DB2 12 for z/OS – Utilities and Tools

Delivered in 2016:

- DB2 12 support
- More tools function with Data Server Manager (DSM)
- Comprehensive DB2 Analytics Accelerator support
- Tools exploit DB 12 utility functions

DB2 12 — The ultimate enterprise database for business-critical transactions and analytics
Seamless, secure integration for an analytics, mobile and cloud world
Why customers choose IBM DB2 utilities and tools

IBM DB2 utilities are the proven leader in data management with over 99% penetration in DB2 z/OS, including ISV accounts.

IBM DB2 utilities have been on a mission to provide superior availability and performance, reduced costs and application impact.

IBM DB2 utilities and tools are key to the exploitation of new capability in DB2.

Tools and utilities continually focus on comprehensive, efficient management of DB2 environments.

New solutions in support of ever-greater demands for simplicity, availability, efficiency.

Unquestionable support of DB2 to meet business needs.

IBM DB2 tools are inherently suited to support DB2’s future continuous delivery model.
DB2 Utilities and Utility Management
IBM DB2 Utilities – Key to enabling DB2 functionality

- Continuing evolution of REORG utility
- Diminishing importance of data re-clustering for application performance
  - Optimizer improvements, I/O performance improvements, caching improvements, contiguous buffer pools
- Increasing use of IBM REORG for schema evolution
  - Insert partition
  - PBR RPN conversion
  - Deferred column-level alter
  - LOB compression
- Improved PBG partition management
  - Overflow to new PBG partition to ensure successful partition-level REORG of PBGs
Emphasis on REORG

- IBM REORG is the trusted REORG that customers depend on for data integrity
- DB2 and z improvements together with IBM DB2 utility solutions are reducing costs
- IBM REORG is the **only** REORG that DB2 relies on for online schema changes

![Changing trend in REORG]

**DB2 12 — The ultimate enterprise database for business-critical transactions and analytics**

Seamless, secure integration for an analytics, mobile and cloud world
IBM DB2 Utilities - More than DB2 12 support

**Even better performance & reduced CPU cost**

- Up to 57% offload to zIIP in REORG, 90% in LOAD
- Option to eliminate data sharing overhead in UNLOAD and RUNSTATS
- Up to 35% elapsed time improvement in RECOVER
- Up to 25% CPU & 15% elapsed time reduction for RUNSTATS COLGROUP
- Utility decompression saving up to 16% elapsed time in REORG, 9% in REBUILD INDEX
- And MORE...

“IBM DB2 Utilities zIIP offload percentage of V12 cpu time is much better than V11.”

Mateusz Książek, PKO Bank Polski
IBM industry-leading zIIP support

DB2 LOAD Utility

zIIP Improvements in DB2 12

LOAD table  LOAD partition  LOAD Part table

DB2 11  DB2 12

DB2 12 — The ultimate enterprise database for business-critical transactions and analytics
Seamless, secure integration for an analytics, mobile and cloud world
DB2 12 ESP customer REORG experience

- zIIP improvement from DB2 11 to DB2 12
  30% to 74% of total
- 63% reduction in General Processor CPU costs
More availability delivered in IBM DB2 utility solutions

- Massive focus on improving availability
- Dramatically reducing application impact
- Bring offline function online
- Only perform the necessary work
Maximizing efficiency & eliminating application impact

- REGISTER NO option to eliminate data sharing overhead for RUNSTATS, UNLOAD
- More efficient handling of compressed data to reduce CPU & elapsed time across range of utilities
- REORG avoidance: Immediate increase of partition DSSIZE with PBR RPN
- Improved LOAD utility support for sequences with automatic handling of MAXASSIGNEDVAL
- Online LOAD REPLACE – eliminate application impact when refreshing reference tables
- Avoid invalidation of cached statements by RUNSTATS
- COLGROUP statistics CPU cost reduced by up to 25%, elapsed time up to 15%
- Improved FlashCopy support and system-level backup management
- Removed recoverability restrictions for PBG table spaces
Delivering superior application availability

Benefits:
- Eliminate application outages when loading data
- Data validation during load with no application impact

Availability Time line

Reference table
Read by DB2 app

Refresh data in reference table

Updated Reference table

LOAD REPLACE
SHRLEVEL NONE

Reference table
Read by DB2 app

Shadow version of Reference table

Load to shadow table

Rename and clean up

Updated Reference table
IBM DB2 utilities & tools: Moving from automation to self-management

- Continue to build upon existing self-management infrastructure
- Managing statistics in DB2 12
- Direct update of statistics profiles
  - Optimizer
  - DDL
- Utility inline statistics support for USE PROFILE
- Automation Tool completes the cycle to detect profile changes & drive new statistics gathering

“The RUNSTATS enhancement with profiles, inline stats and optimizer ability to update, completes the picture for us. We are extremely satisfied.”

Walter Janißen, ITERGO
Use of DB2 Sort with DB2 utilities, as compared with running DB2 utilities alone, may see:

- Reduction of Sort CPU usage
  - Up to 84.8% reduction on machines with zIIP engines
  - Up to 49.1% reduction on machines without zIIP engines

- Reduction of Utility CPU usage
  - Up to 60.6% reduction on machines with zIIP engines
  - Up to 39.7% reduction on machines without zIIP engines

- Reduction of Utility Elapsed Time
  - Up to 44.6% reduction on machines with zIIP engines
  - Up to 46% reduction on machines without zIIP engines

Q4/2016 – More performance benefit in REORG utility, especially with zIIP engine use:

- Up to 69.5% reduction of REORG sort CPU usage
- Up to 57.8% reduction of REORG CPU usage
- Up to 53.5% reduction of REORG Elapsed Time
Self-Managing DB2 Systems through…

- Smarter and more modern Interfaces
  - Consolidate and simplify information from various sources
  - Simplify the presentation of complex information (visuals)
  - Shorten the learning curve (integrated assistance and doc)

- Smarter infrastructure to:
  - Automate collection of data
  - Automate analysis of this data
  - Automate decisions based off this analysis
  - Automate execution of decisions during defined time periods

- Convergence of our tools
  - Shared infrastructure to better integrate tools and DB2 engine functions
  - IBM Tools working together and leveraging functions and information from each other
Simplified DB2 for z/OS Management

- **Symptoms/actions on subsystem and object dashboards**
- **Zero-install web-based interface**
- **Consolidate information from DB2 engine and tools from across the entire enterprise**
- **Reduced time for problem identification and resolution through automated analysis of collected DB2 operational data**
- **Dramatically reduced learning curve for new users**

**Automate Data Collection Utility History**

**View upcoming autonomic maintenance windows with scheduled actions**
IBM DB2 Utility solutions give you control

- Establish and maintain company-wide DB2 utility syntax policies
  - Provides additional level of security
- Cancel and block threads on utility jobs
- Control the return code on DB2 utilities to fit your application needs
- No need to make time-consuming syntax changes
  - Do you know where all your utility syntax resides?
  - Do you know when and how utilities are run?
- Audit all DSNUTILB executions – see who is executing what
IBM DB2 Automation Tool – Smarter DB2 utility generation

- Keeps DB2 running efficiently with least amount of resources
- Generate only necessary utilities to:
  - Reorganize data to allow more efficient access
  - Protect and backup DB2 assets, avoiding running utilities on pre-set schedule
    - Run only when necessary
    - Reduce CPU and other resources
- Ships with “best practices” examples
- DB2 12 enhancements:
  - Support for DB2 utility enhancements:
    - RECOVER, RUNSTATS, etc.
    - Index compression deferred alter
    - Supporting all new DB2 12 commands
    - Support for enhanced RUNSTATS function

IBM DB2 Automation Tool: Smarter DB2 utility generation
IBM DB2 Recovery Expert – Smarter recovery management

- Reduces the complication of recovery
  - Analyzes recovery resources
  - Creates detailed recovery plans, displaying best or fastest options
  - Provides cost-based recovery estimates in real-time
  - Detects and recovers related objects
  - Automatically uses new technologies and recovery strategies
  - Generates optimized JCL
  - Provides reporting for review and control

- DB2 12 support
  - Skip recovery of unchanged objects
  - Multiple copy pools and new recovery options
  - Recovery through online schema changes
  - Dropped object recovery of all new object attributes
  - Support for relative page numbering (larger spaces)
Recovery Expert Enhancements

- Log-based dropped object recovery
  - Complete end-to-end recovery of a dropped object from the log
  - Recovery of DDL schema, data, DCL (security), rebinding of packages and plans
  - Automated recovery to drop point

- Redirected Recovery
  - Restore to another system or different set of objects on same system
  - Validate recovery point or test recovery time objective

- Transaction Recovery
  - Generate and execute UNDO SQL for single transaction or time range
  - Filters and visual aids to help identify work to back out: user, package, URID, etc
  - Simple, visual UI to step user through process

- Mass application recovery
  - Set priority of objects to restore higher value assets first
  - Useful when recovery large groups of objects
DB2 Cloning Tool

- Fast efficient cloning of subsystem or application data
  - Create copies of DB2 data for testing or query usage
  - Reduce time and costs over home-grown or competitive offering
  - Exploits fast replication technology
  - Clone without impacting application availability

- DB2 12 support
  - Relative page number support for larger spaces,
  - New DDL attributes
  - Multiple copy pools
  - Compressed LOB data
DB2 Cloning Tool Enhancements

- Clone subsystem by dataset
  - Allows fast clone when subsystem is not properly configure on its own set of volumes
- Unload/Load support
  - Usability feature that allows for automated unload/load support when source/target schemas are incompatible
- VSAM to VSAM cloning
  - Improved support when fast replication is not available
  - Clone directly from VSAM source datasets without intermediate copy step
- Rotated partitions support
  - Automated support to clone an application where customer is rotating partitions
- Improved handling of implicit LOB and XML spaces
  - Automated mapping of proper source/target names
Administrative Solutions
IBM DB2 Administration Tool & DB2 Object Comparison Tool: Addressing the needs of the enterprise

- DBAs need to be able to define and change objects
- Need to focus on the business needs and let the tool do the detail work

- DBAs are routinely interrupted by the “unexpected”
- Need to be able to find the problem quickly and solve it even faster

*Management for Analytics Accelerator integrated Into All Services
DB2 Admin/Object Comparison Tool – DB2 12 Support

- Lift Partition Limits, support for Partition By Range UTS (aka PBR2)
  - Support for CREATE/ALTER TABLESPACE/INDEXSPACE
- Transfer Ownership
  - Syntax support and new line command on navigation panels
- SQL/PL in triggers
  - Includes CREATE/REPLACE by VERSION
    ALTER TRIGGER...ADD/DROP/ACTIVATE VERSION
  - ALTER TRIGGER...ALTER/REPLACE/REGENERATE [ACTIVE] VERSION
  - REBIND PACKAGE
- Bi-temporal enhancements
  - CREATE/ALTER TABLE with new INCLUSIVE/EXCLUSIVE clauses for BUSINESS_TIME PERIODS
- Array Global Variables
  - CREATE TYPE ..AS ..ARRAY[..];
- LOB Compression
New Features Delivered: DB2 Admin/OC

- **DB2 tools integration**
  - Ability to edit IBM DB2 High Performance Unload for z/OS (HPU) parameters using panels – easier and more effectively
  - Support via Data Server Manager (DSM) for GEN (re-engineering DDL) and CM Batch functions

- **New and enhanced Analytics Accelerator management**
  - More control over accelerated table definition when changes are made to base table
  - Ability to run accelerator functions in batch (as well as ISPF)
  - Ability to differentiate between a ‘Virtual’ and ‘Real’ accelerator
  - Additional line commands for display and management
Change Management Enhancements in Admin/OC

- Ability to overwrite RESTRICT ON DROP using masks
- Verify that the attributes for the objects being compared are valid on the subsystem
  - Work Statement List (WSL) validate function produces an impact analysis of the objects that would be affected by running the WSL
- Ignore field specifications enhancements with reporting
- More control to users when specifying multi-target comparisons
Performance Solutions
DB2 12 support for performance

- OMEGAMON XE for DB2 PE
  - Dynamic plan stability
  - Buffer pool and EDM pool enhancements
  - Lift partition limits
  - LOB compression
  - Fast unclustered insert
  - Authorization enhancements
  - New IFCIDs, system parameters
  - Enhanced statement level statistics

- Query Monitor
  - Updated for all DB2 12 control block changes
  - Infrastructure to changes to detect and properly handle DB2 12 continuous delivery
  - Performance improvements via exploitation of new opcodes based on DB2 12 hardware requirements
OMPE XE for DB2 PE V540 – New non-DB2 12 features

- Customer requirements in various areas
  - ATF with extend trace filter capability
  - Import of object placement recommendation for Buffer Pool simulation
    - No longer have to enter manually

- Performance Improvements
  - Batch Accounting improved to shorten execution and reduce CPU consumption
    - Especially helpful for high volume input trace data

- Other improvements
  - Allow specification of Accounting Class(11) for NTH trace collection
  - Date added to time in OMPE Audit Trace report
  - Object names instead of DBID/OBID in NTH
### Dynamic SQL Stmt

<table>
<thead>
<tr>
<th>Statement</th>
<th>Quantity</th>
<th>/Second</th>
<th>/Thread</th>
<th>/Commit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREPARE REQUESTS</td>
<td>210225</td>
<td>3503.74</td>
<td>N/C</td>
<td>328.99</td>
</tr>
<tr>
<td>FULL PREPARES</td>
<td>42681</td>
<td>711.35</td>
<td>N/C</td>
<td>66.79</td>
</tr>
<tr>
<td>SHORT PREPARES</td>
<td>154592</td>
<td>2576.53</td>
<td>N/C</td>
<td>241.93</td>
</tr>
<tr>
<td>BASED ON CACHE</td>
<td>154592</td>
<td>2576.53</td>
<td>N/C</td>
<td>241.93</td>
</tr>
<tr>
<td>BASED ON CATALOG</td>
<td>12952</td>
<td>215.87</td>
<td>N/C</td>
<td>20.27</td>
</tr>
<tr>
<td>LOOK-UP IN CATALOG</td>
<td>42685</td>
<td>711.41</td>
<td>N/C</td>
<td>66.80</td>
</tr>
<tr>
<td>CACHE HIT RATIO (%)</td>
<td>73.54</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>CACHE+CATALOG HIT RATIO (%)</td>
<td>79.70</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>TOTAL PREPARES</td>
<td>210232</td>
<td>3503.86</td>
<td>N/C</td>
<td>329.00</td>
</tr>
<tr>
<td>EXPLICIT PREPARES</td>
<td>210232</td>
<td>3503.86</td>
<td>N/C</td>
<td>329.00</td>
</tr>
<tr>
<td>IMPLICIT PREPARES</td>
<td>0</td>
<td>0.00</td>
<td>N/C</td>
<td>0.00</td>
</tr>
<tr>
<td>PREPARES AVOIDED</td>
<td>12948</td>
<td>215.80</td>
<td>N/C</td>
<td>20.26</td>
</tr>
<tr>
<td>CACHE LIMIT EXCEEDED</td>
<td>0</td>
<td>0.00</td>
<td>N/C</td>
<td>0.00</td>
</tr>
<tr>
<td>PREP STMT PURGED</td>
<td>0</td>
<td>0.00</td>
<td>N/C</td>
<td>0.00</td>
</tr>
<tr>
<td>LOCAL CACHE HIT RATIO (%)</td>
<td>0</td>
<td>0.00</td>
<td>N/C</td>
<td>0.00</td>
</tr>
<tr>
<td>CSWL - STMTS PARSED</td>
<td>N/C</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>CSWL - LITS REPLACED</td>
<td>0</td>
<td>0.00</td>
<td>N/C</td>
<td>0.00</td>
</tr>
<tr>
<td>CSWL - MATCHES FOUND</td>
<td>0</td>
<td>0.00</td>
<td>N/C</td>
<td>0.00</td>
</tr>
<tr>
<td>CSWL - DUPLS CREATED</td>
<td>0</td>
<td>0.00</td>
<td>N/C</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Report indicates how dynamic statements perform. A high cache hit ratio indicates many short prepares, a low ratio shows many full prepares. Also provide how the new DPS feature performs by showing a cache+catalog hit ratio and the number of short prepares with regard, to caching or loading from the catalog.

… & Accounting Report
... and Dynamic Plan Stability related metric shown zPPFM

<table>
<thead>
<tr>
<th>ZPPFM</th>
<th>VTM</th>
<th>O2</th>
<th>V540.#P</th>
<th>SZE2</th>
<th>S 08/10/16 12:27:52 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help PF1</td>
<td>Back PF3</td>
<td>Left PF10</td>
<td>Right PF11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DSNZPARM INFORMATION: Enter a selection letter on the top line.

A - THREAD  B - TRACE  C - LOGGING  D - ARCHIVING  E - AUTH/RLF/DDF  F - IRLM
G - STORAGE  H - DATASET  I - DDCS  J - DATA SHARING  K - STORED PROC  L - UTIL
M - APPL  N - DATA  * - PERF  P - BUFFERPOOL  Q - OTHERS

==============================================================================

DSNZPARM PERFORMANCE OPTIMIZATION PARAMETERS

ZPFM
Collection Interval: REALTIME  SNAPTIME: 08/10/16 12:27:52.77

DSNZPARM Module  DSNZPARM
Assembly Date  12/18/13
Initial Module  DSNZPARM
Assembly Date  12/18/13
Previous Module  DSNZPARM
Assembly Date  12/18/13

DSNTIP8-Perf and Optimization 1

Cache Dynamic SQL (CACHEDYN) YES
(CACHEDYN_STABILIZATION) BOTH
Optimization Hints (OPTHINTS) NO
Evaluate Uncommitted (EVALUNC) NO
Skip Uncomm Inserts (SKIPUNCI) NO
Immediate Write (IMMEDWRI) NO
Plan Management (PLANMGMT) OFF

---

DB2 12 - Dynamic Plan Stability - VTAM
DB2 12 - Dynamic Plan Stability - VTAM

... and SQL Detail Dynamic Plan Stability related metric shown zEDD3 and zCMDS

<table>
<thead>
<tr>
<th>ZEDD3</th>
<th>VTM</th>
<th>O2</th>
<th>V540.#P DC11 03/03/16 01:22:41</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Wait for PIPE lock 00:00:00.000</td>
<td>Wait for PQS lock 00:00:00.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ + Isolation Bind RR</td>
<td>Currentdata Bind N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Dynamic rules Bind R</td>
<td>Current Degree 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Current Rules D</td>
<td>Current Precision N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Cursor Hold N</td>
<td>Concentrate Statement N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Status of Statement UNKNOWN</td>
<td>Expansion Reason</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ + Stabilized StmtID 7763 Hash ID Version 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Query Hash ID 424D424F3024534148574E2D59472F5C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| IFCID 316 |

<table>
<thead>
<tr>
<th>ZCMDS</th>
<th>VTM</th>
<th>O2</th>
<th>V540.#P DC11 03/01/16 19:57:35</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ TERM UTILITY 11</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>+ SET LOG 0</td>
<td>0</td>
<td>0 .00 .0</td>
<td></td>
</tr>
<tr>
<td>+ DISPLAY ACCEL 0</td>
<td>0</td>
<td>0 .00 .0</td>
<td></td>
</tr>
</tbody>
</table>

| IFCID 1 |

DB2 12 — The ultimate database technology
Seamless, secure integration for an analytics, mobile and cloud world
Comparing DB2 11 vs. DB2 12 – OMPE CSV Spreadsheet

<table>
<thead>
<tr>
<th>General information</th>
<th>Run A</th>
<th>Run B</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2 Group name</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DB2 Subsystem name</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Workload description</td>
<td>???</td>
<td>???</td>
</tr>
<tr>
<td>DB2 Version, Mode</td>
<td>V10 NFM ???</td>
<td>V11 CM ???</td>
</tr>
<tr>
<td>DB2 code level</td>
<td>PUTxxxx</td>
<td>PUTxxxx</td>
</tr>
<tr>
<td>z/OS level</td>
<td>z/OS V1R13</td>
<td>z/OS V1R13</td>
</tr>
<tr>
<td>Processor Model (RMF CPU)</td>
<td>??? 2097-E64</td>
<td>??? 2097-E64</td>
</tr>
</tbody>
</table>

Statistics with ZOSMETRICS (or RMF report)

<table>
<thead>
<tr>
<th>Number processor (AVG per Interval)</th>
<th>QWOSLNCPP</th>
<th>#DIV/0</th>
<th>#DIV/0</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU utilization (AVG per Interval and per processor)</td>
<td>QWOSLPRU</td>
<td>#DIV/0</td>
<td>#DIV/0</td>
</tr>
</tbody>
</table>

Aggregated Accounting for each CONN TYPE or ACCOUNTING TRACE

<table>
<thead>
<tr>
<th>CONNTYPE</th>
<th>CL1 Elapsed / QUANTITY</th>
<th>CL1 CPU / QUANTITY</th>
<th>CL1 SE CPU / QUANTITY</th>
<th>CL2 Elapsed / QUANTITY</th>
<th>CL2 CPU / QUANTITY</th>
<th>CL2 SE CPU / QUANTITY</th>
<th>CL3 SUSP / QUANTITY</th>
<th>CL2 NOT ACCOUNT / QUANTITY</th>
<th>QUANTITY (Number of transaction aggregated for the connection type)</th>
<th>COMMIT / Rollback</th>
<th>COMMIT</th>
<th>ROLLBACK</th>
<th>DML per COMMIT</th>
<th>SELECT</th>
<th>INSERT</th>
<th>NUMBER OF ROWS</th>
<th>UPDATE</th>
<th>NUMBER OF ROWS</th>
<th>MERGE</th>
<th>DELETE</th>
<th>NUMBER OF ROWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run A</td>
<td>#DIV/0</td>
<td>#DIV/0</td>
<td>#DIV/0</td>
<td>#DIV/0</td>
<td>#DIV/0</td>
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Derived Worksheet with V11⇔V12 comparison

Import generated CSV data from V11 and V12 execution into the provided several worksheets
Integration Speeds Resolution Times

**Query Monitor and Query Workload Tuner**

- **Identify, tune and optimize workload**
  - Identify problem SQL across DB2 environment
  - Pull in query workload data to staging tables
  - Advisors improve query design, statistics quality, and index values

- **Integration via DSM**
  - Makes workload tuning more efficient thru generation and tracking of new statistics

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**DB2 12 — The ultimate enterprise database for transactions and analytics**

Seamless, secure integration for an analytics, mobile and cloud world
End-to-end application performance tuning

Collection Period
Choose the Activity Browser data from a past time period

Summaries
Access and refine view of your system's query activity

Collect Host Variables
Configure how the host variable information is captured

Request host variable collection

DB2 12 — Transactional
Seamless, secure
Staging tables workload viewer

- Identify Values most commonly used for SQL statements
- Tune Start the tuning client
Data Server Manager integrated with OMEGAMON XE for DB2 PE

Key Performance Indicators (KPIs)

Accelerate analysis and reduce downtime for urgent situations.
Continuous Delivery
Continuous Delivery

- DB2 tools will be a sponsor user for tools-related DB2 engine features

- Greater emphasis on:
  - Preventing regression
  - Supporting new function in a timely manner

- Keeping current with new function is an IBM market differentiator
Continuous Delivery

- DB2 12 forms the basis of a continuous delivery model for the future
- IBM utilities and tools have an unparalleled track record of supporting new DB2 function
- IBM utilities and tools already have a long history of delivering new capability through a continuous delivery model as needed
- Other vendors lagging behind DB2’s three year cycle today and will be further exposed by continuous delivery tomorrow
  - Lack of support for new DB2 function
  - Lack of stability
- IBM DB2 utilities and tools have a proven track record of investment in supporting z Systems, DB2 and customer requirements
IBM DB2 utilities & tools: Key to unlocking DB2 12 and beyond

- IBM utilities and tools are the key to the exploitation of new capability in DB2
- Continual focus on comprehensive, efficient management of DB2 environments
- New solutions in support of ever-greater demands for simplicity, availability, efficiency
- Unquestionable support of DB2 to meet business needs
- Inherently suited to support DB2’s future continuous delivery model
- Role of IBM utilities and tools extends far beyond the simple management of data and DB2 systems
- Ensure the manageability and viability of DB2 systems now and into the future

DB2 12 — The ultimate enterprise database for business-critical transactions and analytics
Seamless, secure integration for an analytics, mobile and cloud world
DB2 12 — The ultimate enterprise database for business-critical transactions and analytics
Seamless, secure integration for an analytics, mobile and cloud world

Thank you!