Rule DB2-120:   Invalid select procedure was encountered

Finding: An invalid select procedure was encountered.

Impact: This finding can have a LOW IMPACT, or MEDIUM IMPACT on the performance of the DB2 subsystem.

Discussion: A select procedure is made invalid by applying DB2 maintenance that directly affects the select procedure. Plans and packages with invalid select procedures continue to function correctly, but with a small performance degradation.

DB2 statistics record the total number of columns (Rows times columns) for which an invalid select procedure was encountered. Invalid select procedures are bypassed by DB2, and this can cause some degradation in performance.

CPExpert compares the QISTCOLS variable in DB2STATS (the number of invalid select procedures) with the **QISTCOLS** guidance variable in USOURCE(DB2GUIDE). CPExpert produces Rule DB2-120 when the number of invalid select procedures exceeds the value specified by the **QISTCOLS** guidance variable.

The default value for the **QISTCOLS** guidance variable is 0, indicating that CPExpert should produce Rule DB2-120 when any invalid select procedures were encountered.

The following example illustrates the output from Rule DB2-120:

```
RULE DB2-120: INVALID SELECT PROCEDURE WAS ENCOUNTERED

   A select procedure is made invalid by applying DB2 maintenance that
   directly affects the select procedure.  Invalid select procedures are
   bypassed by DB2, and this can cause some degradation in performance.
   Plans and packages with invalid select procedures continue to function
   correctly but incur some performance degradation. You should consider
   running REBIND for any plan or package that has encountered invalid
   select procedures to eliminate this degradation.  An invalid select
   procedure was encountered during the intervals shown below:


                                         TIMES INVALID SELECT
   MEASUREMENT INTERVAL               PROCEDURES WERE ENCOUNTERED
   21:44-21:59, 08SEP1998                     270,864
```

Suggestion: To eliminate the performance degradation caused by invalid select procedures, rebind any plan or package with the invalid select procedure. Rebinding a plan or package reenables its select procedures. Use IFCID 0224 to determine which plans and packages should be rebound, and to prioritize which rebinds should be done first.

The IBM DSNWSMGS macro gives some excellent guidance in this regard:

"_____IFCID 0224_____

Rebinding a plan or package reenables its select procedures. Use IFCID 0224 to determine which plans and packages should be rebound, and to prioritize which rebinds should be done first. We recommend that the plans with the highest column count be rebound first.

The IFCID 0224 column count is collected by plan, not by package. Therefore, if a plan's column count is nonzero, any packages executed by the plan should also be rebound."

This is the approach that one user of CPExpert implemented:

_START TRACE (PERFM) CLASS(30) IFCID(224)

After collecting the IFCID224 data, the site used a SAS procedure to summarize the information after having run MXG against the SMF records:

```
PROC FREQ DATA=PDB.T102S224;
    TABLES QWHCPLAN;
    WEIGHT QW0224CL;
```

The resulting output will give the plans with the most invalid selects, ordered by number of invalid selects. You can go down the ordered list, rebinding until the opportunities for significant performance improvement are exhausted.

You can alter CPExpert's analysis by modifying the **QISTCOLS** guidance variable in USOURCE(DB2GUIDE).

Reference: DB2 for OS/390 Version 3: DSNWSMGS macro (QISTCOLS variable)

DB2 for OS/390 Version 4: DSNWSMGS macro (QISTCOLS variable)

DB2 for OS/390 Version 5: DSNWSMGS macro (QISTCOLS variable)

DB2 for OS/390 Version 6: DSNWSMGS macro (QISTCOLS variable)

DB2 UDB for OS/390 and z/OS, Version 7:
    DSNWSMGS macro (QISTCOLS variable)

DB2 UDB for z/OS Version 8:
    DSNWSMGS macro (QISTCOLS variable

"DB2 9 for z/OS Performance Update",Rafael Garcia, IBM SVL, IBM |
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Vegas, Nevada |