Nutzung der In Memory Option für SAP BW

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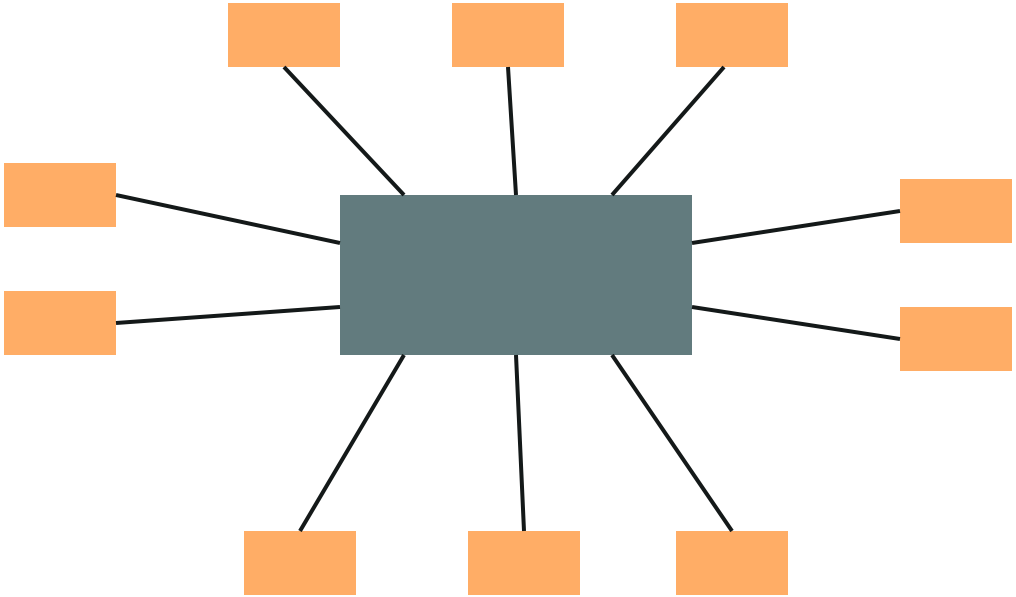
ORACLE

Agenda

1. Flache Tabelle
2. Star Cube
3. Flat Cube

Flache Tabelle



Fakten

Characteristiken

Flache Tabelle

- Nachteile
  - Viel Platzverbrauch
  - Redundante Schlüsselfelder
  - Viele Indizes
  - Langsames Laden
- Vorteile
  - Einfache Struktur

Agenda

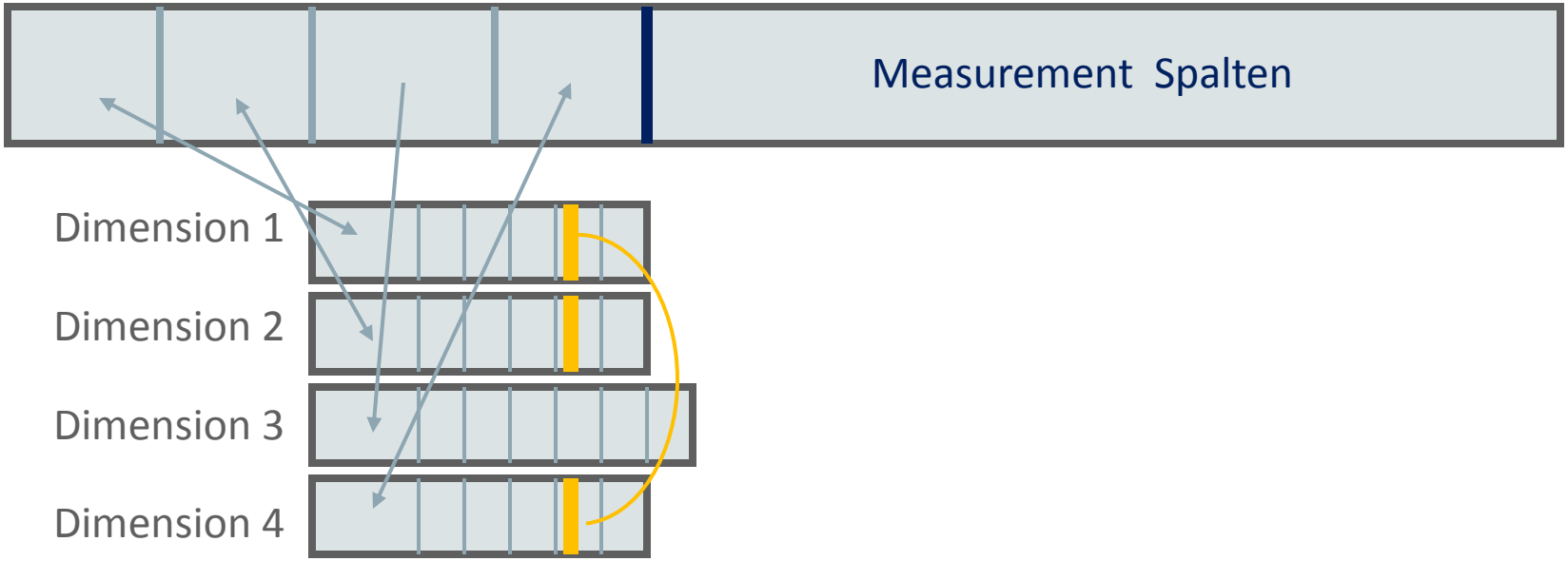
1. Flache Tabelle
2. Star Cube
3. Flat Cube

Star Cube

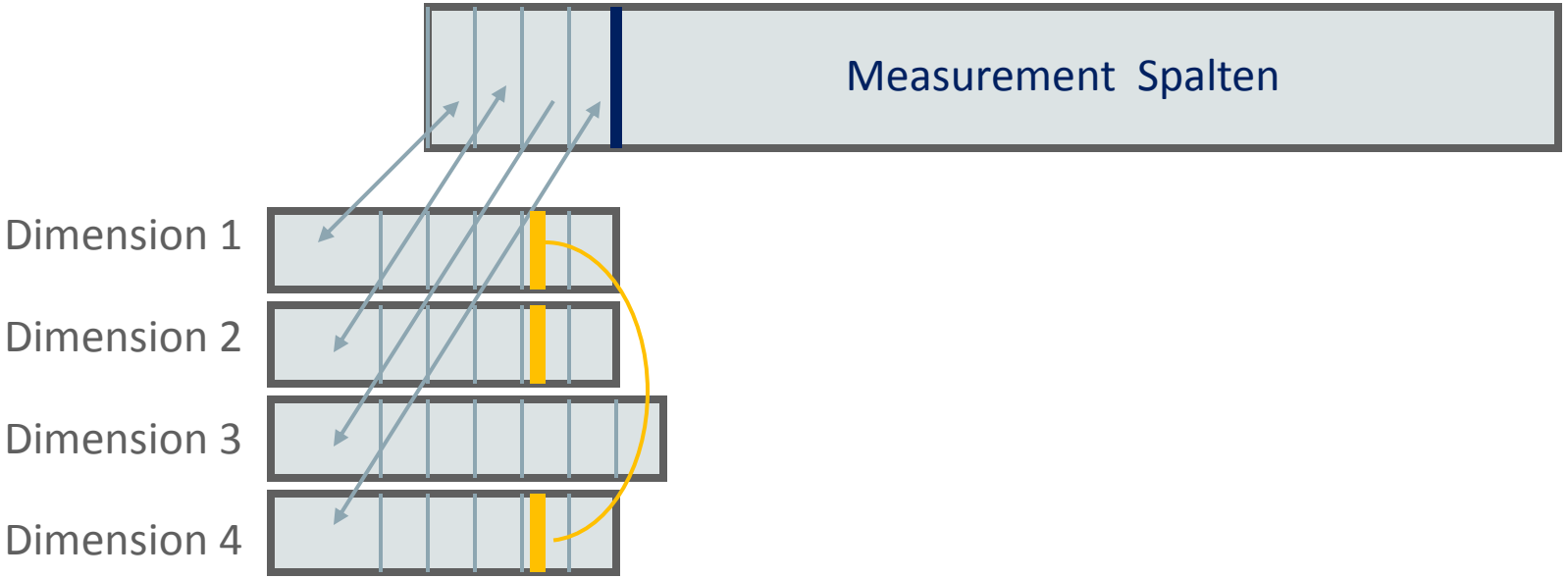
Star Cube

- Definition der Dimensionen

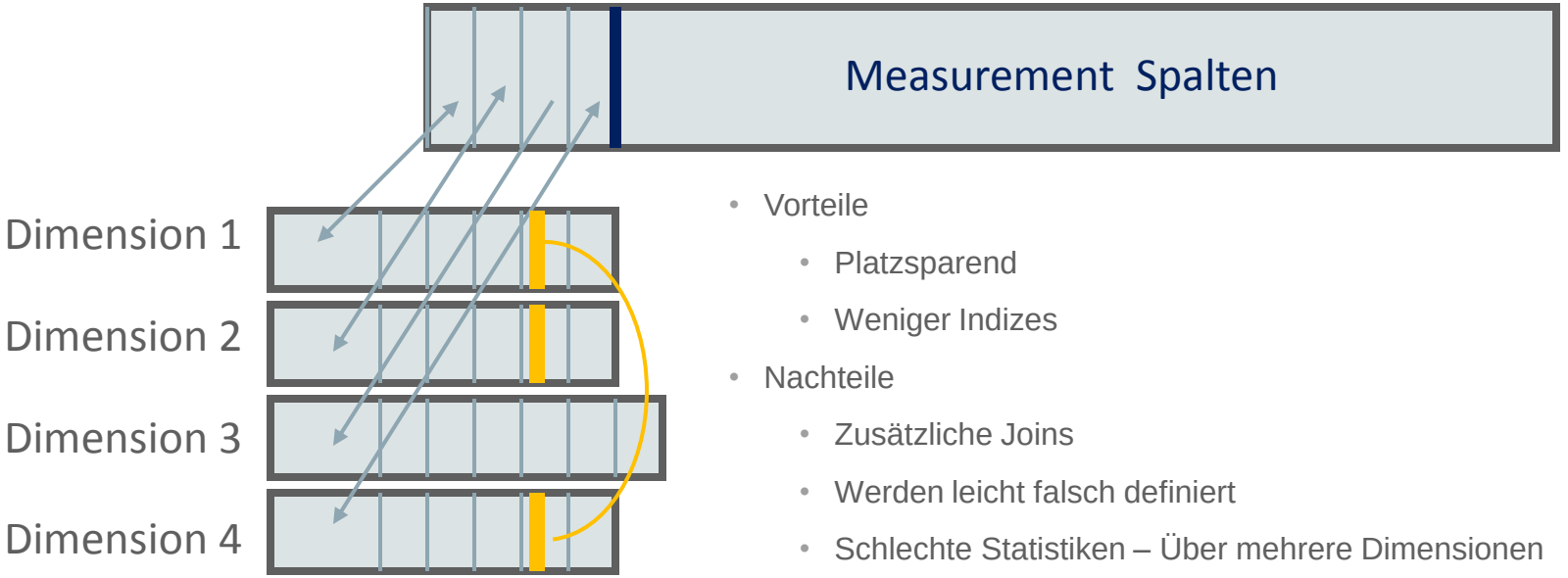
Star Cube



Star Cube

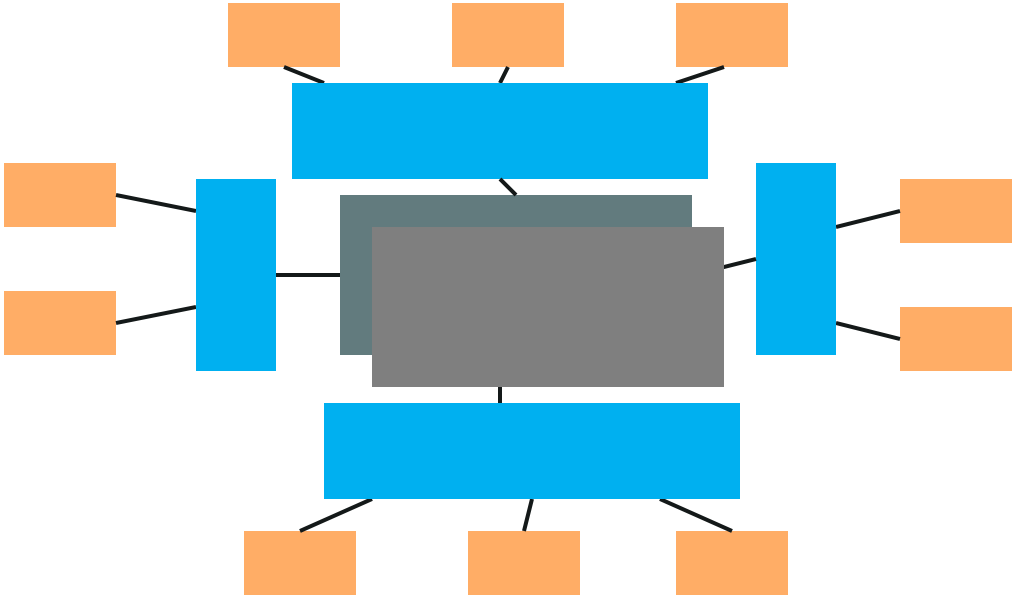


Star Cube



- Vorteile
  - Platzsparend
  - Weniger Indizes
- Nachteile
  - Zusätzliche Joins
  - Werden leicht falsch definiert
  - Schlechte Statistiken – Über mehrere Dimensionen
  - Langsames Laden – Dimensions Ermittlung

Star Cube (heutiger Oracle - SAP BW Standard)



Fakten E/F

Characteristiken

Dimensionen

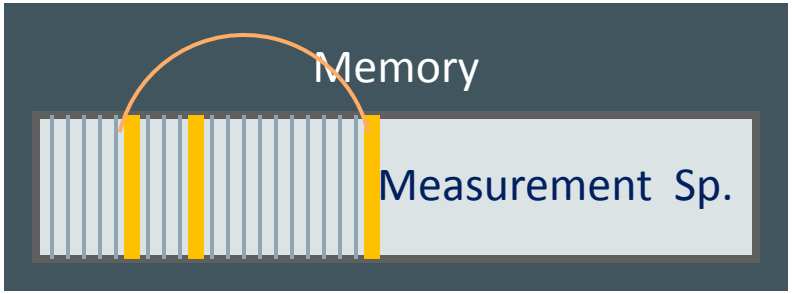
Agenda

1. Flache Tabelle
2. Star Cube
3. Flat Cube

Flat Cube ohne In-Memory (nicht für Oracle – SAP BW)

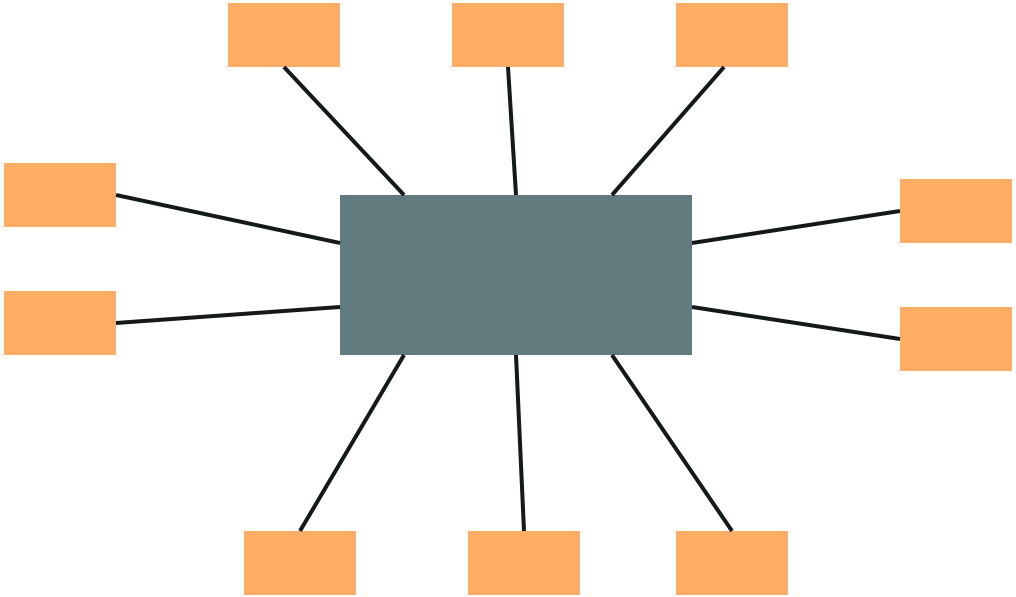
- Viel Platzverbrauch
  - Redundante Schlüsselfelder
  - Viele Indizes
  - Langsames Laden
  - Schlechte Statistiken

Flat Cube mit In-Memory (neuer Oracle - SAP BW Standard)



- InMemory
  - Keine Indizes notwendig
  - Keine Joins für Dimensions Tabellen
  - Schnelles Laden
  - Komprimiert
  - Optimierter InMemory Join (Vector Join)

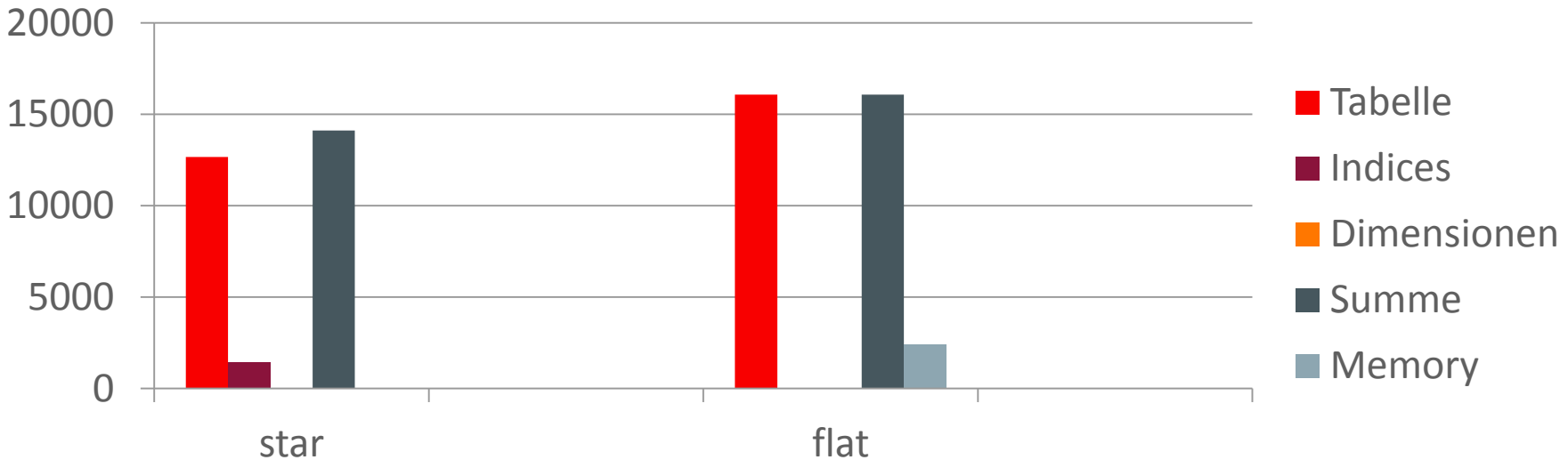
Flat Cube



Fakten

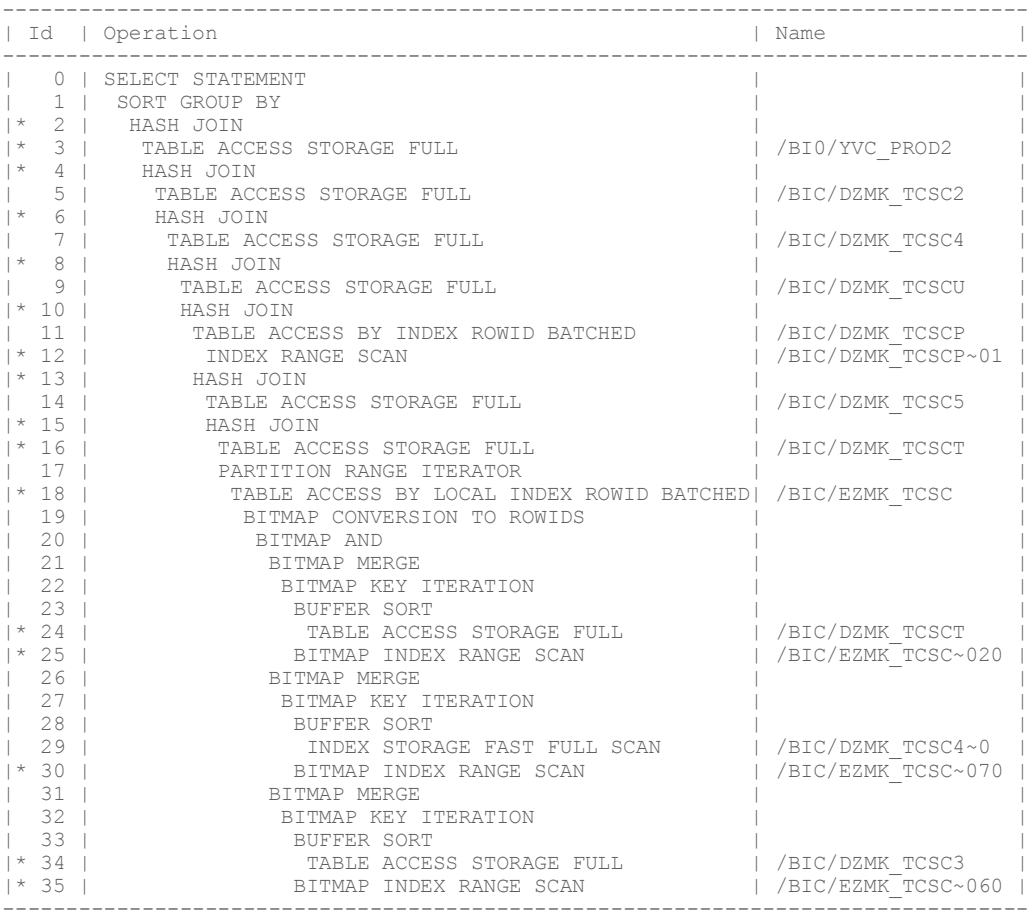
Characteristiken

Größenvergleich Star - Flat



8 Dimensionen 188 Werte

Plan Startransformation



```
-------------------------------------------------------------------------------
| Id  | Operation                                          | Name             |
-------------------------------------------------------------------------------
|   0 | SELECT STATEMENT                                   |                  |
|   1 |  SORT GROUP BY                                     |                  |
|*  2 |   HASH JOIN                                        |                  |
|*  3 |    TABLE ACCESS STORAGE FULL                       | /BI0/YVC_PROD2   |
|*  4 |    HASH JOIN                                       |                  |
|   5 |     TABLE ACCESS STORAGE FULL                      | /BIC/DZMK_TCSC2  |
|*  6 |     HASH JOIN                                      |                  |
|   7 |      TABLE ACCESS STORAGE FULL                     | /BIC/DZMK_TCSC4  |
|*  8 |      HASH JOIN                                     |                  |
|   9 |       TABLE ACCESS STORAGE FULL                    | /BIC/DZMK_TCSCU  |
|* 10 |       HASH JOIN                                    |                  |
|  11 |        TABLE ACCESS BY INDEX ROWID BATCHED         | /BIC/DZMK_TCSCP  |
|* 12 |         INDEX RANGE SCAN                           | /BIC/DZMK_TCSCP~01 |
|* 13 |        HASH JOIN                                   |                  |
|  14 |         TABLE ACCESS STORAGE FULL                  | /BIC/DZMK_TCSC5  |
|* 15 |         HASH JOIN                                  |                  |
|* 16 |          TABLE ACCESS STORAGE FULL                 | /BIC/DZMK_TCSCT  |
|  17 |          PARTITION RANGE ITERATOR                  |                  |
|* 18 |           TABLE ACCESS BY LOCAL INDEX ROWID BATCHED| /BIC/EZMK_TCSC   |
|  19 |            BITMAP CONVERSION TO ROWIDS             |                  |
|  20 |             BITMAP AND                             |                  |
|  21 |              BITMAP MERGE                          |                  |
|  22 |               BITMAP KEY ITERATION                 |                  |
|  23 |                BUFFER SORT                         |                  |
|* 24 |                 TABLE ACCESS STORAGE FULL          | /BIC/DZMK_TCSCT  |
|* 25 |                BITMAP INDEX RANGE SCAN             | /BIC/EZMK_TCSC~020 |
|  26 |              BITMAP MERGE                          |                  |
|  27 |               BITMAP KEY ITERATION                 |                  |
|  28 |                BUFFER SORT                         |                  |
|  29 |                 INDEX STORAGE FAST FULL SCAN       | /BIC/DZMK_TCSC4~0 |
|* 30 |                BITMAP INDEX RANGE SCAN             | /BIC/EZMK_TCSC~070 |
|  31 |              BITMAP MERGE                          |                  |
|  32 |               BITMAP KEY ITERATION                 |                  |
|  33 |                BUFFER SORT                         |                  |
|* 34 |                 TABLE ACCESS STORAGE FULL          | /BIC/DZMK_TCSC3  |
|* 35 |                BITMAP INDEX RANGE SCAN             | /BIC/EZMK_TCSC~060 |
-------------------------------------------------------------------------------
```

Plan Flat Cube

```
-------------------------------------------------------------------------------
| Id  | Operation                                | Name                 |
-------------------------------------------------------------------------------
|   0 | SELECT STATEMENT                         |                      |
|   1 |  SORT GROUP BY                           |                      |
|*  2 |   HASH JOIN                              |                      |
|   3 |    JOIN FILTER CREATE                    | :BF0001              |
|   4 |     PART JOIN FILTER CREATE              | :BF0000              |
|   5 |      NESTED LOOPS                        |                      |
|   6 |       TABLE ACCESS BY INDEX ROWID BATCHED| /BIC/DZMK_TCSCP      |
|*  7 |        INDEX RANGE SCAN                  | /BIC/DZMK_TCSCP~01   |
|*  8 |       TABLE ACCESS STORAGE FULL          | /BI0/YVC_PROD2       |
|   9 |    JOIN FILTER USE                       | :BF0001              |
|  10 |     PARTITION LIST JOIN-FILTER           |                      |
|  11 |      PARTITION RANGE ITERATOR            |                      |
|* 12 |       TABLE ACCESS INMEMORY FULL         | /BIC/FZMK_TCFL       |
-------------------------------------------------------------------------------
```

Oracle 12cR1 In-Memory Real World POC and what´s coming up with 12cR2

Christian Pfundtner

DB Masters (www.dbmasters.at)

SAP BW/BI POC

- Customer provides a bunch of „often used slow queries“
- This queries where accessing mainly about 10 tables
- We put this tables into Column Store using different levels of compression

Objekt	DISK	FOR QUERY LOW	FOR QUERY HIGH	Remark
RSRWBSTORE	17.3 GB	14.4GB	14.2GB	4 Spalten + BLOB
/BIC/ECOPA_01	6.9G	1.7G	1.2G	Many columns mostly numbers, Rows 300 Bytes
/BIC/EEG_BCO_12	1.8G	0.97G	0.65G	Many columns mostly numbers, Rows 160 Bytes

- Queries should run as they are (no changes to statement and no changes to degree of parallelism)

How to compare the results?

- Over all test queries
  - Original runtime production environment (still 11.2.0.x) and 20GB Buffer Cache — 2746 Sec
  - Oracle 12c (only test queries), 20 GB Buffer Cache — 1500 Sec
  - Oracle 12c using a 256GB Buffer Cache — 380 Sec
  - Oracle 12c using 20GB BC and 80GB In-Memory — 100 Sec
- So having sufficient Buffer Cache will also speed it up quite well but using the memory with the In-Memory functionality does a quite good job here!
  - One Query got slower by using In-Memory
  - All others where faster
  - Out of POC testing with using parallel (2, 4 and 8) shows also speeding up

SAP BW/BI POC - conclusion

- SAP BW/BI definitely is a very good candidate for Oracle In-Memory
- SAP certified Oracle In-Memory a few weeks ago (and Oracle was able to run the SAP BW-EML Benchmark more then 2 times faster compared to SAP HANA on the same hardware platform)
- With In-Memory you are able to speed up most queries within an SAP BW/BI Environment – maybe not by 100 times but mostly by at least 5-10 times.

Examples (not an original query)

- Example for just doing aggregation

```
select /*+  FULL(s) */ sum(KEY_EG_BCO_12P), sum(KEY_EG_BCO_127)
  from SAPEBI."/BIC/EEG_BCO_12" s;
```

- Execution Time:
  - Buffer Cache: about 7 seconds
  - In-Memory: about 70 ms ... which is 100 times faster

Q & A

Fragen werden gerne gesehen!

Und es werden Pilot Kunden gesucht!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