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Write your questions marked with **A**, **B**, **C**, **D**, **E**

A. SQL Tuning Advisor

B. SQL Monitoring

C. SQL Plan Management

D. Optimizer Statistics

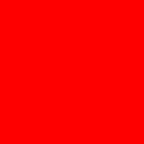
E. Open topic



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SQL Tuning Round Table

Oracle Database Development team



The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

Participants

Panelists

- Benoit Dageville, Architect, SQL Tuning
- Graham Wood, Architect, Database Manageability
- Mohamed Ziauddin, Architect, Optimizer

Moderator

- Jagan Athreya, Director, Database Manageability

Topics

A. SQL Tuning Advisor

B. SQL Monitoring

C. SQL Plan Management

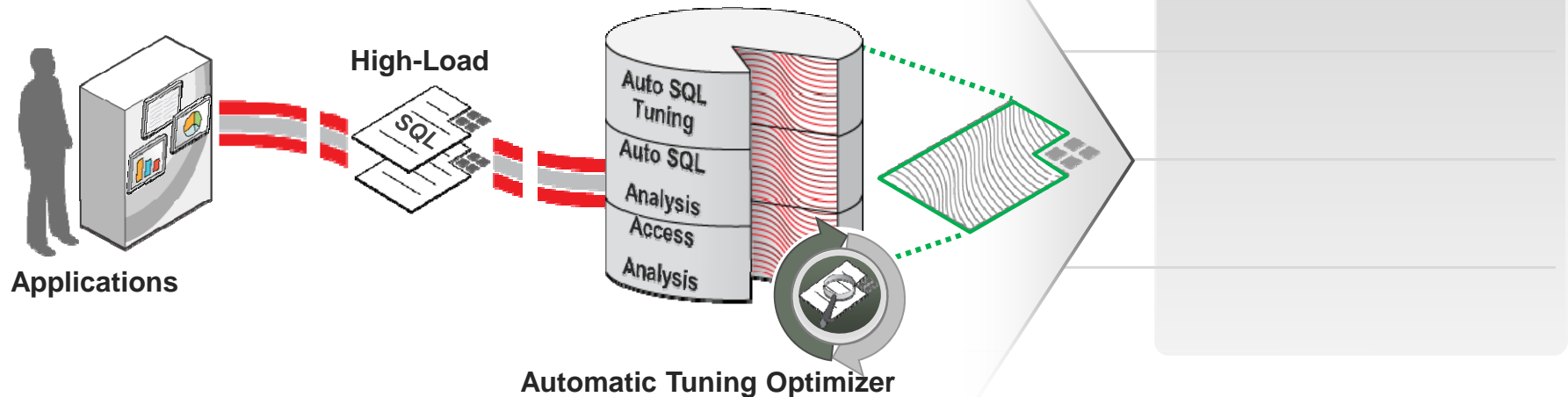
D. Optimizer Statistics

E. Open mic

SQL Tuning Challenges

Comprehensive tuning recommendations

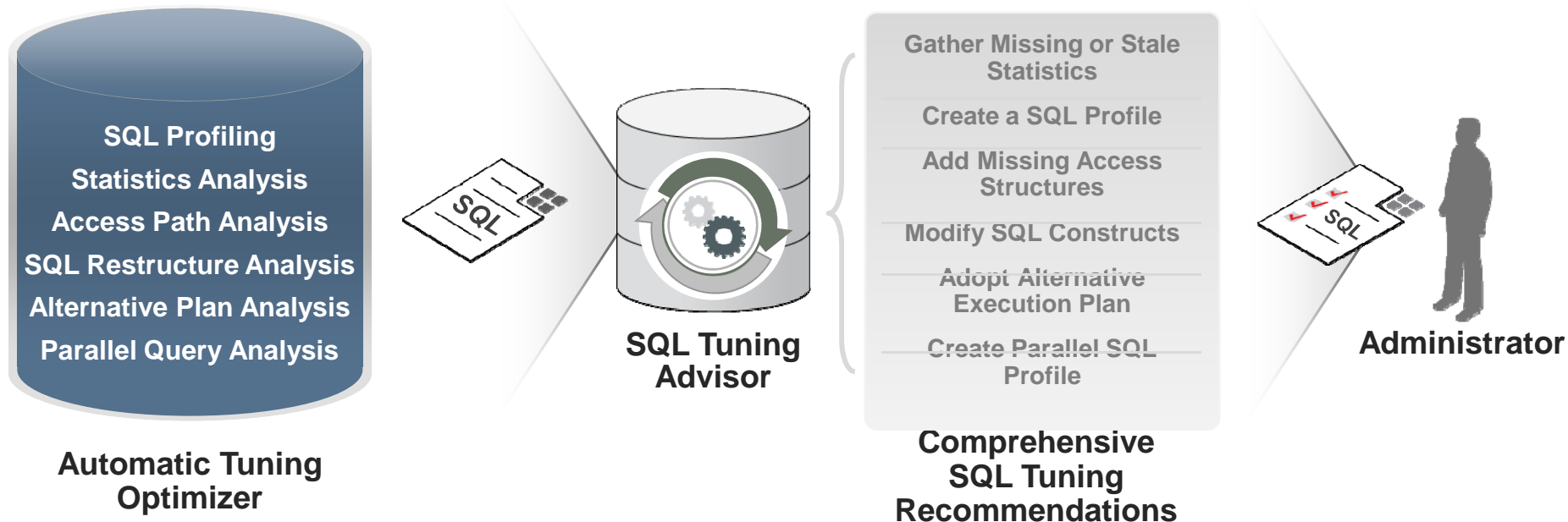
Well-Tuned SQL



- Challenge
 - SQL tuning is
 - Complex – requires significant domain expertise
 - Time consuming – requires considerable time even for experts
 - Repetitive – tuned SQL can regress and need to be tuned again

SQL Tuning Advisor

Comprehensive tuning recommendations



- **SQL Tuning Advisor**

- **NEW:** Identifies alternate execution plans using real-time and historical performance data
- **NEW:** Recommends parallel profile if it will improve SQL performance significantly (2x or more)

SQL Tuning Advisor

Comprehensive tuning recommendations



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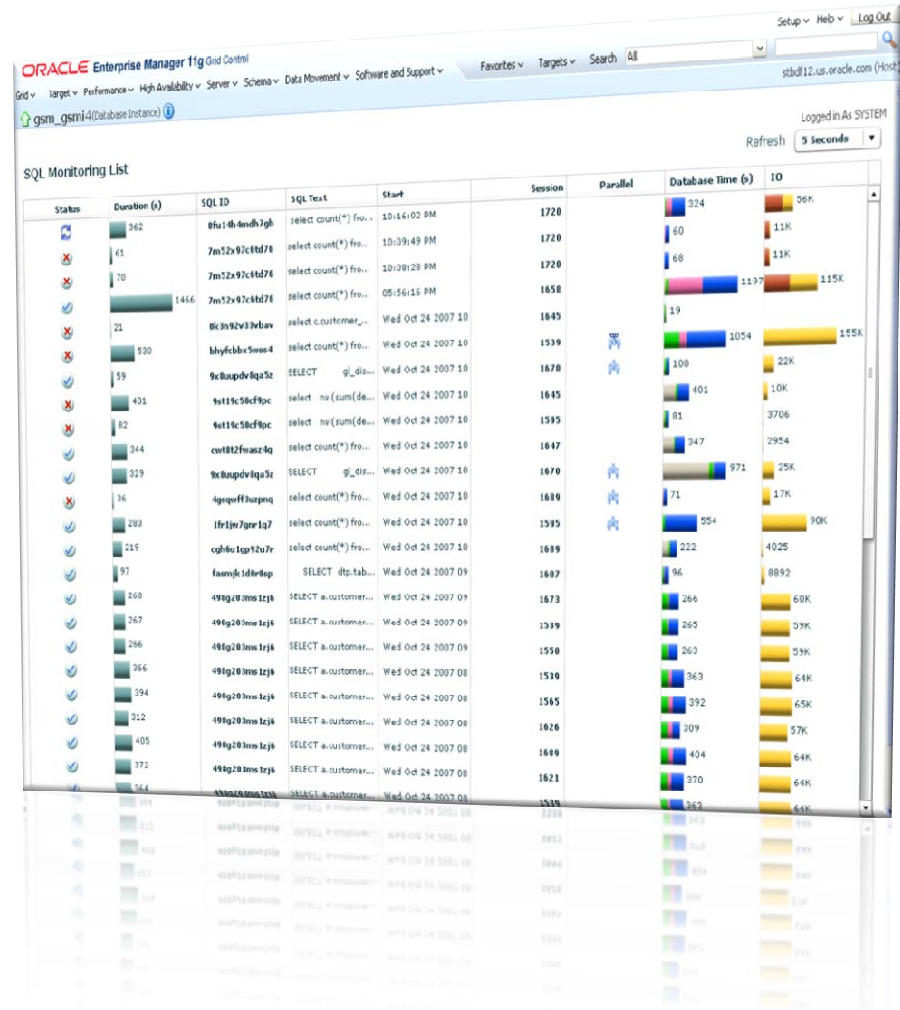
E. Open questions

Monitoring problem SQL

Looking Inside SQL Execution

- Challenge

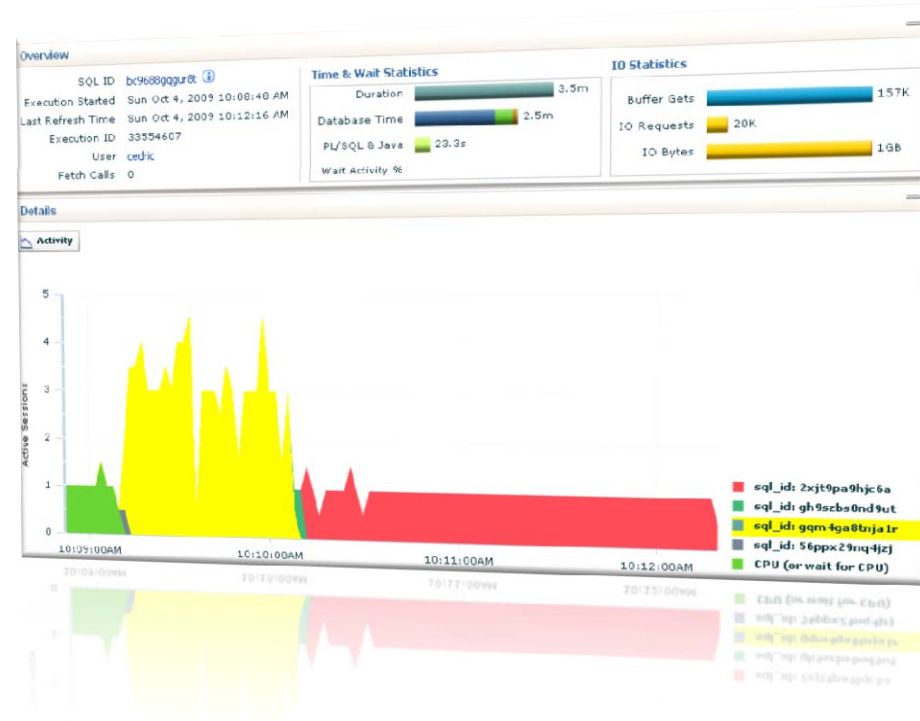
- SQL and PL/SQL execution is a black box
- Difficult to determine if SQL will finish in 30 secs or 3 hours
- Difficult to determine if execution plan is optimal



Real-Time SQL Monitoring

Looking Inside SQL Execution

- **NEW:** PL/SQL monitoring including associated high load SQL monitored recursively
- **NEW:** Exadata aware I/O performance monitoring and associated metric data
- **NEW:** Capture rich metadata such as bind values, session details e.g. user, program, client_id and error codes and error messages
- **NEW:** Save as Active Report for rich interactive offline analysis



Real-Time SQL Monitoring

Looking Inside SQL Execution

- Automatically monitors and reports on long running SQL
- Enabled out-of-the-box with no performance overhead
- Monitors every SQL execution
- Exposes monitoring statistics
 - Global execution level
 - Plan operation level
 - Parallel execution level
- Guides tuning
- **NEW:** PL/SQL Support
- **NEW:** Exadata-integrated metrics
- **NEW:** Rich program, session metadata
- **NEW:** Offline viewing using Active Reports



Topics

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B. SQL Monitoring

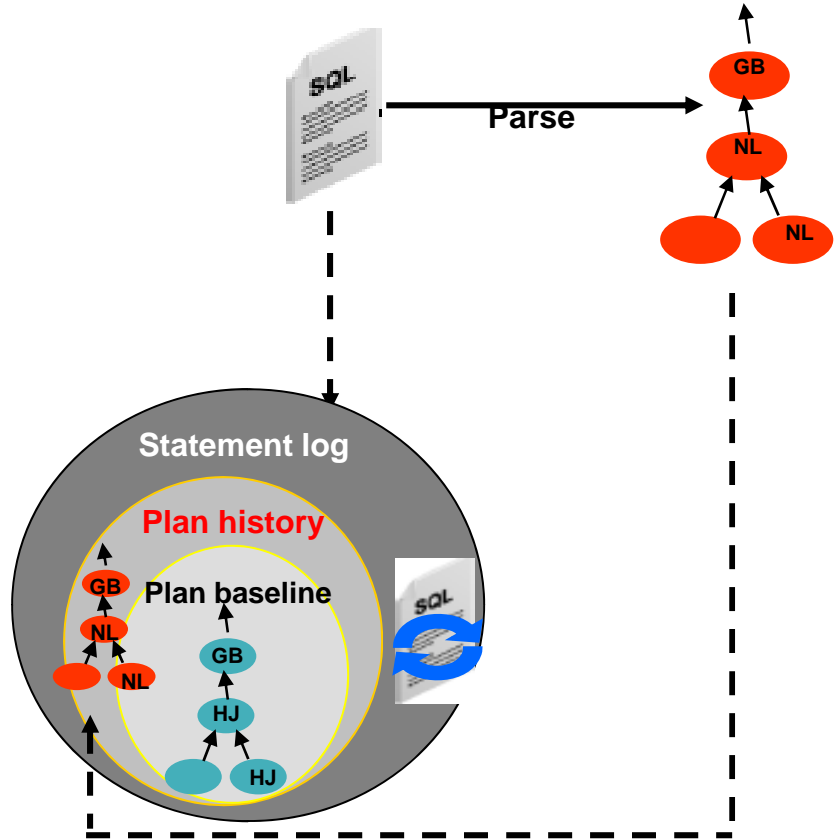
C. SQL Plan Management

D. Optimizer Statistics

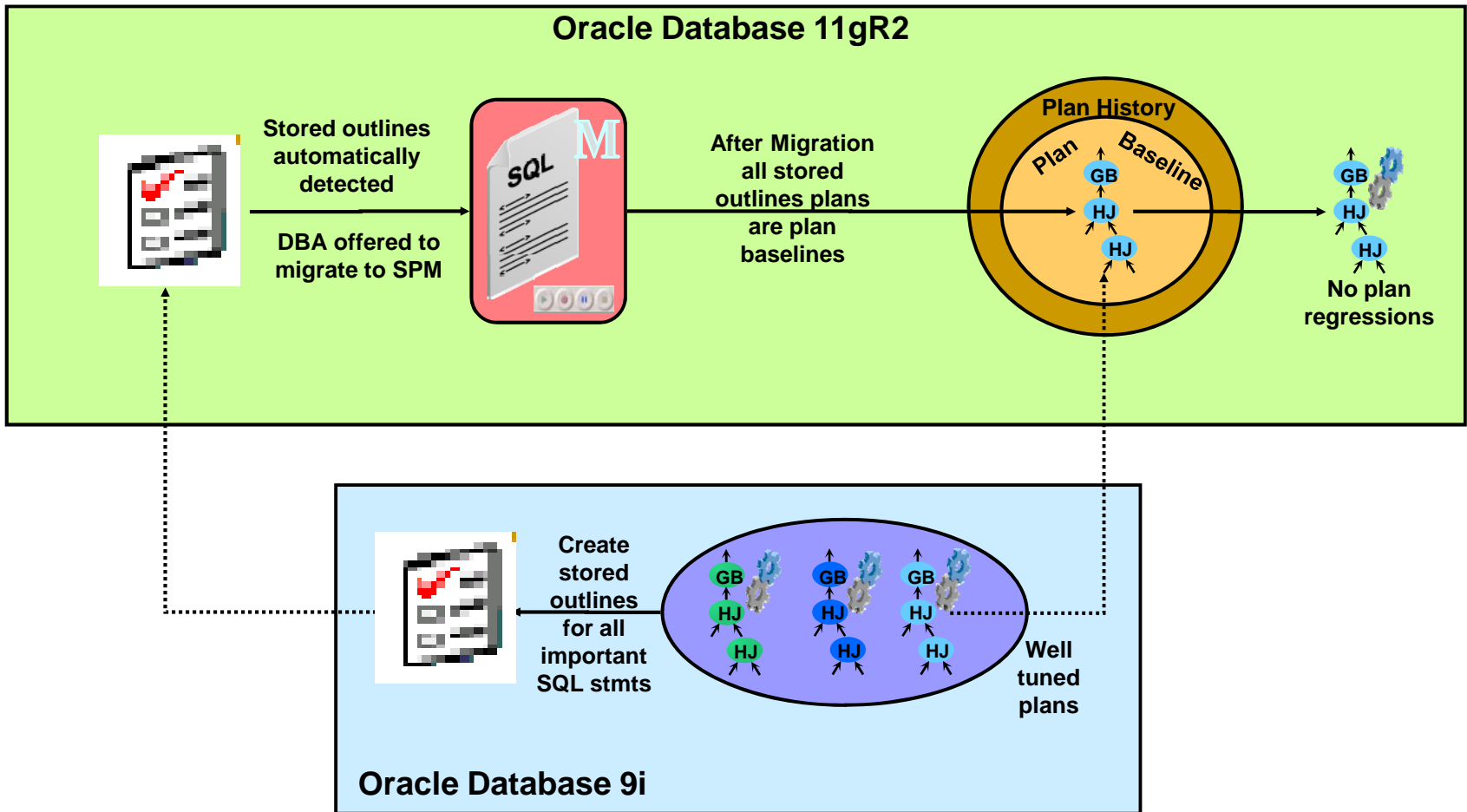
E. Open questions

Preventing problems with SQL Plan Management

- Problem: changes in the environment cause plans to change
- Plan baseline is established
- SQL statement is parsed again and a **different plan is generated**
- New plan is **not executed** but marked for verification

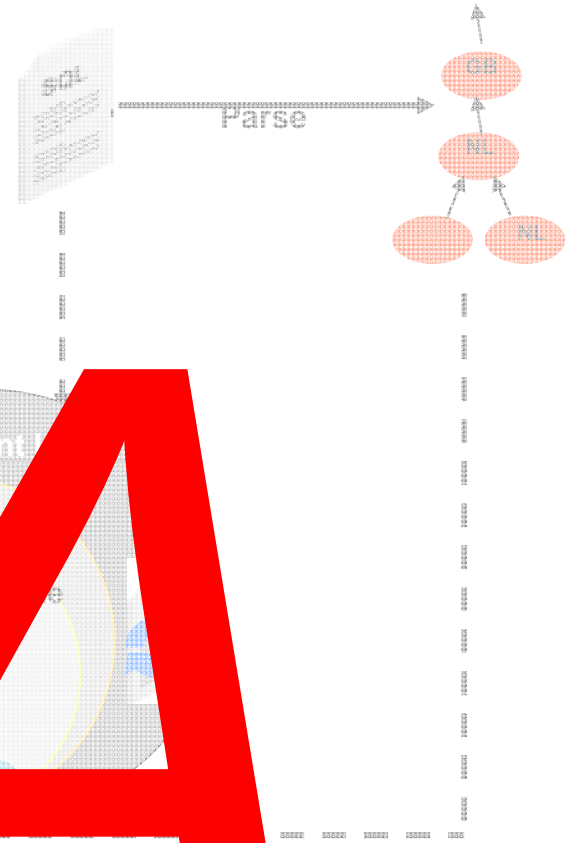
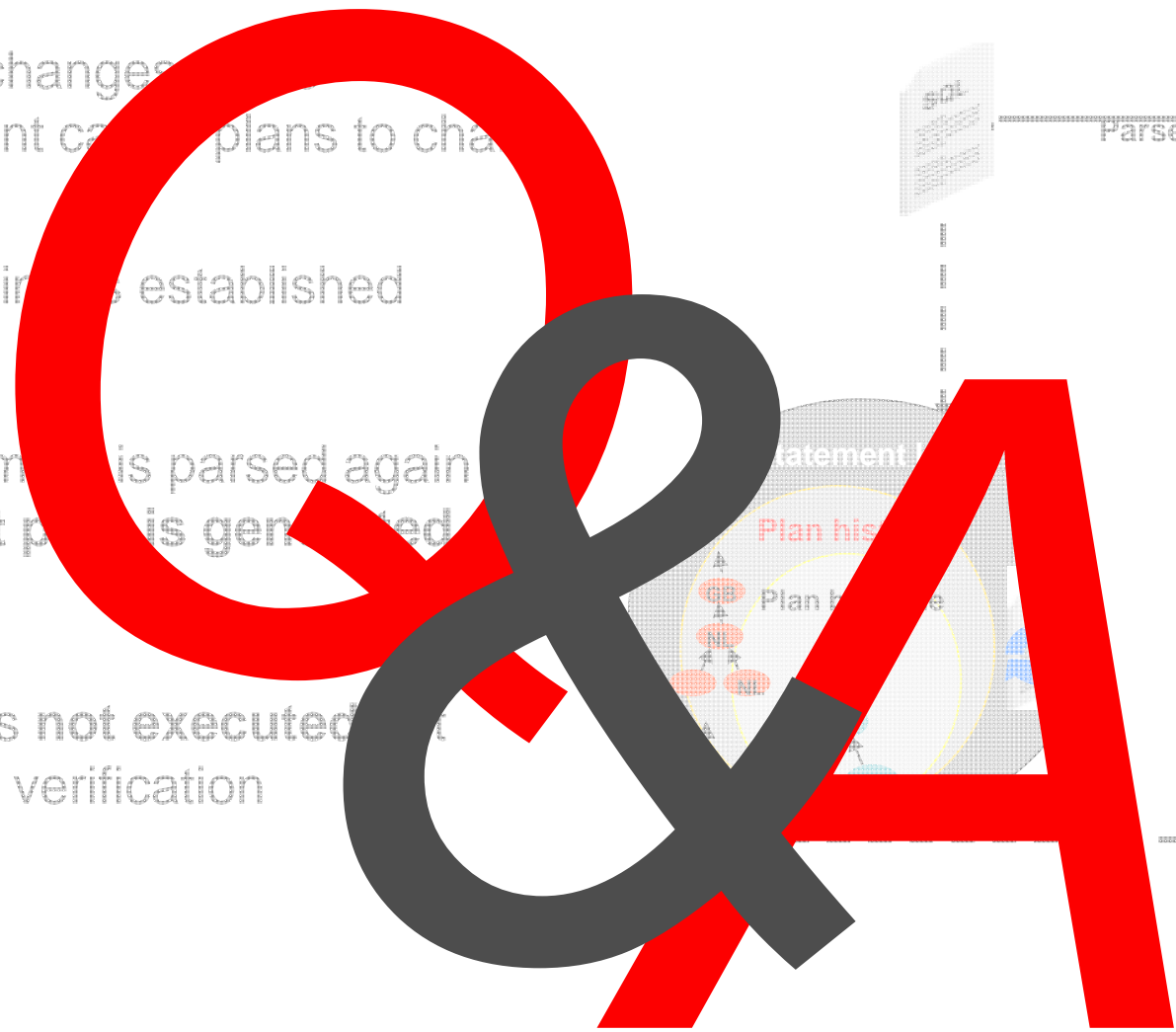


SQL Plan Baseline Upgrade Scenario



Preventing problems with SQL Plan Management

- Problem: changes in environment cause plans to change
- Plan baseline is established
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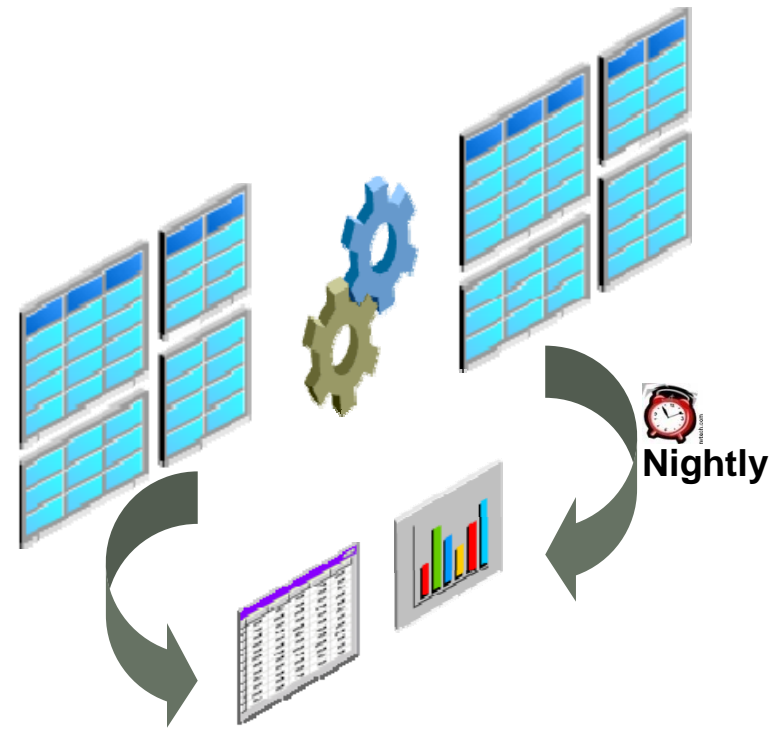
D. Optimizer Statistics

E. Open questions

Oracle Optimizer Statistics

Preventing SQL Regressions

- Automatic Statistics Collection Job (stale or missing)
 - Out-of-the box, runs in maintenance window
 - Configuration can be changed (at table level)
 - Gathers statistics on user and dictionary objects
- Uses new collection algorithm with accuracy of compute and speed faster than sampling of 10%
- Incrementally maintains statistics for partitioned tables – very efficient
 - Set `DBMS_STATS.SET_GLOBAL_PREFS`



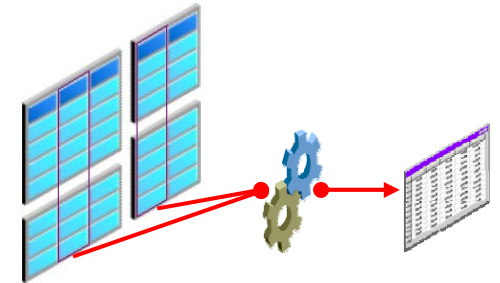
Oracle Optimizer Statistics

Preventing SQL Regressions

- Extended Statistics

- Extended Optimizer Statistics provides a mechanism to collect statistics on a group of related columns:
 - Function-Based Statistics
 - Multi-Column Statistics
- Full integration into existing statistics framework
 - Automatically maintained with column statistics

```
DBMS_STATS.CREATE_EXTENDED_STATS
```



- Pending Statistics

- Allows validation of statistics before publishing
- Disabled by default
- To enable, set table/schema PUBLISH setting to FALSE

```
DBMS_STATS.SET_TABLE_PREFS('SH', 'CUSTOMERS', 'PUBLISH', 'false')
```
- To use for validation

```
ALTER SESSION SET optimizer_pending_statistics = TRUE;
```
- Publish after successful verification



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