

# Can’t We All Be Friends?

## How Developers Help DBAs Patch the Database

EMEA Tour, nlOUG, November 2026

Photo by Maxime Gilbert on Unsplash



# Daniel Overby Hansen

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| **Episode 17**<br>From SR to Patch – Insights into the Oracle Database Development process<br>*55 minutes – June 22, 2023* |  |
| **Episode 18**<br>Cross Platform Migration – Transportable Tablespaces to the Extreme<br>*145 min – February 22, 2024* |  |
| **Episode 19**<br>Move to Oracle Database 23ai – Everything you need to know about Multitenant PART 1<br>*145 min – May 16, 2024* |  |
| **Episode 20**<br>Move to Oracle Database 23ai – Everything you need to know about Multitenant PART 2<br>*100 min – June 28, 2024* |  |

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# How often do you apply patches?


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# Critical Patch Updates

Critical Patch Updates provide security patches for supported Oracle on-premises products. A Critical Patch Update is a collection of patches for multiple security vulnerabilities. These patches address vulnerabilities in Oracle code and in third party components included in Oracle products. These patches are usually cumulative. They are available to customers with valid support contracts. Critical Patch Updates are released on the third Tuesday of January, April, July, and October. The next four dates are:

- 19 January 2027
- 20 April 2027
- 20 July 2027
- 19 October 2027

A pre-release announcement will be published on the Thursday preceding each Critical Patch Update release.

The Critical Patch Updates released since 2021 are listed in the following table. Critical Patch Updates released before 2021 are available here.

| Critical Patch Update | Latest Version/Date |
|---|---|
| Critical Patch Update - October 2026 | Rev 1, 20 October 2026 |
| Critical Patch Update - July 2026 | Rev 7, 20 August 2026 |
| Critical Patch Update - April 2026 | Rev 2, 24 April 2026 |

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# Oracle Critical Patch Update Advisory - October 2026

## Description

A Critical Patch Update is a collection of patches for multiple security vulnerabilities. These patches address vulnerabilities in Oracle code and in third party components included in Oracle products. These patches are usually cumulative, but each advisory describes only the security patches added since the previous Critical Patch Update Advisory. Thus, prior Critical Patch Update advisories should be reviewed for information regarding earlier published security patches. Refer to Critical Patch Updates, Critical Security Patch Updates, Security Alerts and Bulletins for information about Oracle Security advisories.

**Oracle continues to periodically receive reports of attempts to maliciously exploit vulnerabilities for which Oracle has already released security patches. In some instances, it has been reported that attackers have been successful because targeted customers had failed to apply available Oracle patches. Oracle therefore strongly recommends that customers remain on actively-supported versions and apply security patches without delay.**

This Critical Patch Update contains 1295 new security patches across the product families listed below. Please note that a My Oracle Support (MOS) note summarizing the content of this Critical Patch Update and other Oracle Software Security Assurance activities is located at October 2026 Critical Patch Update: Executive Summary and Analysis.

## Affected Products and Patch Information

Security vulnerabilities addressed by this Critical Patch Update affect the products listed below.

**Please click on the links in the Patch Availability Document column below to access the documentation for patch availability information and installation instructions.**

| | |
|---|---|
| Oracle Communications Network Analytics Data Director, versions 25.1.200, 25.2.100, 25.2.200 | Oracle Communications Network Analytics Da Director |
| Oracle Communications Operations Monitor, versions 6.0, 6.1 | Oracle Communications Operations Monitor |
| Oracle Communications Policy Management, versions 15.0.0.0.0, 15.1.0.0.0 | Oracle Communications Policy Management |
| Oracle Communications Service Catalog and Design, versions 8.0-8.3 | Oracle Communications Service Catalog and D |
| Oracle Communications Unified Assurance, versions 6.1.1-7.0.0 | Oracle Communications Unified Assurance |
| Oracle Communications Unified Inventory Management, versions 7.5.0, 7.5.1, 7.6.0, 7.7.0, 7.8.0, 8.0.1 | Oracle Communications Unified Inventory Management |
| Oracle Data Integrator, versions 12.2.1.4.0, 14.1.2.0.0 | Fusion Middleware |
| Oracle Database Server, versions 19.3-19.32, 21.3-21.23, 23.4.0-23.26.3 | Database |
| Oracle Demand Planning, versions 12.1, 12.2 | Oracle Supply Chain Products |
| Oracle E-Business Suite, versions 12.2.3-12.2.15 | Oracle E-Business Suite |
| Oracle Enterprise Manager Base Platform, versions 13.5, 24.1 | Oracle Enterprise Manager |
| Oracle Enterprise Manager for Oracle Database, versions 13.5, 24.1 | Oracle Enterprise Manager |
| Oracle Enterprise Manager for Siebel, versions 13.5, 24.1 | Oracle Enterprise Manager |
| Oracle Enterprise Manager for Virtualization, version 13.5 | Oracle Enterprise Manager |
| Oracle Essbase, version 21.8.3.0.0 | Database |
| Oracle Financial Services Analytical Applications Infrastructure, versions 8.0.7.9, 8.0.8.7, 8.1.2.5, 8.1.2.6 | Oracle Financial Services Analytical Applicatio Infrastructure |

# Oracle Critical Patch Update Advisory - October 2026

| CVE ID | Component | Package and/ or Privilege Required | Protocol | Remote Exploit without Auth.? | CVSS VERSION 3.1 RISK (see Risk Matrix Definitions) | | | | | | | | | Supported Versions Affected | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Base Score | Attack Vector | Attack Complex | Privs Req'd | User Interact | Scope | Confid-entiality | Inte-grity | Avail-ability | | |
| CVE-2026-75803 | RDBMS (OpenSSL) | None | TLS | Yes | 9.8 | Network | Low | None | None | Un-changed | High | High | High | 19.3-19.32, 23.4.0-23.26.3 | |
| CVE-2026-91563 | Oracle OLAP | DBMS_AW | Oracle Net | No | 8.8 | Network | Low | Low | None | Un-changed | High | High | High | 19.3-19.32, 21.3-21.23, 23.4.0-23.26.3 | |
| CVE-2026-91499 | RDBMS | DBMS_VECTOR | Oracle Net | No | 8.8 | Network | Low | Low | None | Un-changed | High | High | High | 23.4.0-23.26.3 | |
| CVE-2026-93569 | RDBMS (Micronaut) | None | HTTP | Yes | 8.2 | Network | Low | None | None | Un-changed | Low | High | None | 19.3-19.32, 23.4.0-23.26.3 | |
| CVE-2026-91503 | VPD | Create Table | Oracle Net | No | 8.1 | Network | Low | Low | None | Un-changed | High | High | None | 19.3-19.32, 21.3-21.23, 23.4.0-23.26.3 | |
| CVE-2026-91568 | RDBMS | Create Session | Oracle Net | No | 7.7 | Network | Low | Low | None | Changed | High | None | None | 23.4.0-23.26.3 | |
| CVE-2026-101512 | RDBMS | None | HTTP | No | 6.5 | Network | Low | Low | None | Un-changed | High | None | None | 23.4.0-23.26.3 | |
| CVE-2026-91479 | RDBMS | None | UDP | Yes | 6.5 | Adjacent Network | Low | None | None | Un-changed | None | None | High | 23.4.0-23.26.3 | |
| CVE-2026-91615 | Java VM | None | SOCKS5 | No | 6.3 | Network | High | Low | None | Changed | None | High | None | 19.3-19.32, 21.3-21.23, 23.4.0-23.26.3 | |


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# Why should you patch?


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Security Updates

# Accelerating Vulnerability Detection and Response at Oracle

April 29, 2026 | 3 minute read



Integrated Cyber Center (ICC)

The latest generation of AI is transforming how software vulnerabilities are identified and fixed, increasing the speed and scale of discovery and remediation.

At Oracle, we have long applied AI across our cloud and software environments to support security testing, vulnerability detection, and code analysis. These capabilities run on Oracle Cloud Infrastructure (OCI), leveraging OCI AI services, infrastructure, and development platforms to operate continuously at scale.

Oracle has access to leading frontier AI models, including Anthropic's Claude Mythos Preview and OpenAI's most capable models through Trusted Access for Cyber, and we are extending our capabilities with these models to improve how quickly and effectively vulnerabilities are identified. Combined with our AI-enabled security operations, these capabilities are applied across Oracle-developed software and services, Oracle Health, and the open-source components we build and use in our products.

The result is stronger code, earlier identification of risk and mitigations, and better protection for Oracle and our

Security Updates

# Accelerating Vulnerability Detection and Response at Oracle

April 29, 2026 | 3 [illegible] read

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# It is urgent that you upgrade to a Long-Term Support Release

- Oracle Database 19c
- Oracle AI Database 26ai


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If possible, Oracle recommends upgrading clients to the latest 26ai driver


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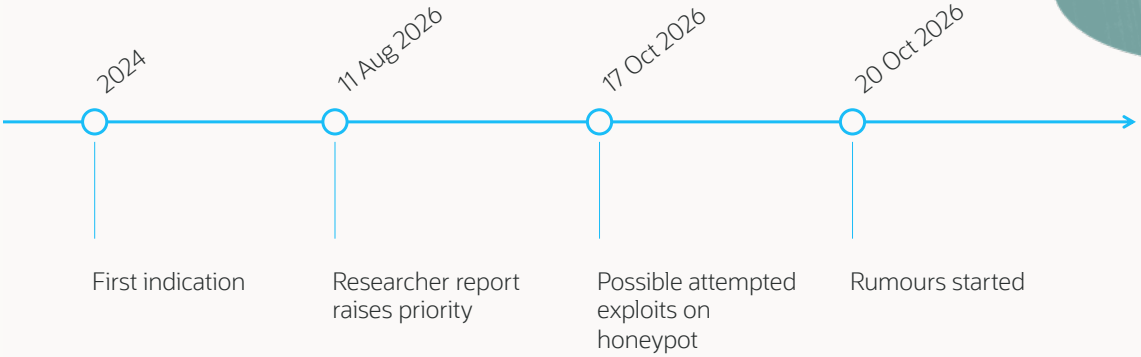
If you must use a 19c driver, update to the latest version


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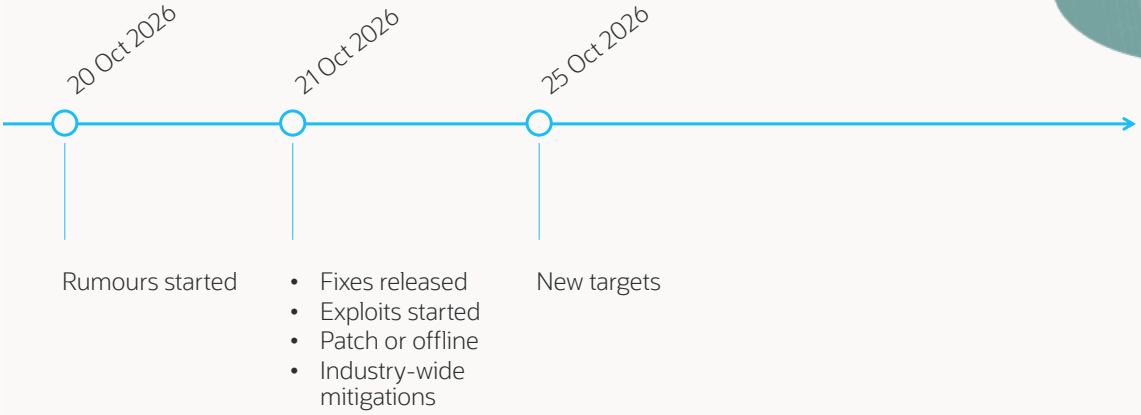
# A recent case affecting 70 % of the internet


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# The thermostats


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The security practices of yesterday are not sufficient today anymore


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# Windows Paint Remote Code Execution Vulnerability

New Recently updated

On this page

CVE-2026-83844
Security Vulnerability

**Released: Oct 13, 2026**

**Last updated: Nov 7, 2026**

**Assigning CNA**: Microsoft

**CVE.org link**: CVE-2026-83844

**Impact**: Remote Code Execution **Max Severity**: Important

**Weakness**: CWE-125: Out-of-bounds Read

**CVSS Source**: Microsoft

**Vector String**: CVSS:3.1/AV:L/AC:H/PR:N/UI:R/S:U/C:H/I:H/A:H/E:U/RL:O/RC:C

**Metrics**: CVSS:3.1 7.0 / 6.1

November 4, 2026 Security Publication

# A thousand fewer paths to root

We've developed an autonomous vulnerability discovery, exploitation, and patching pipeline. In one run with our cyber model, it validated and generated patches for 948 local privilege escalation vulnerabilities in Linux at an API cost of $1.2 million.

*For the near and medium term, having access to a low-privileged account on an operating system, that isn't up-to-date on its latest available patches should be considered functionally equivalent to root access for a well-resourced threat actor.*


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$ 1,279


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*When can I patch your database?*



*Let me tell you when I patch your database?*


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The 48-hour requirement
The 24-hour ambition


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# Please wake up

# This is real


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Photo by Glomad Marketing on Unsplash

1 Automate patching

2 Robust applications


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**DEMO**

# Download patches

Watch on YouTube


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AutoUpgrade also downloads ORDS, APEX and APEX patches


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Create new Oracle home
- matching the current Oracle home


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```
cat install19.cfg

   global.global_log_dir=/home/oracle/autoupgrade-patching/log
   global.folder=/home/oracle/autoupgrade/patches
   patch1.source_home=/u01/app/oracle/product/dbhome_19_32
   patch1.target_home=/u01/app/oracle/product/dbhome_19_33
   patch1.patch=RECOMMENDED
   patch1.create_gold_image=dbhome1933.zip
```

Settings

Patches


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```
cat install19.cfg

   global.global_log_dir=/home/oracle/autoupgrade-patching/log
   global.folder=/home/oracle/autoupgrade/patches
   patch1.source_home=/u01/app/oracle/product/dbhome_19_32
   patch1.target_home=/u01/app/oracle/product/dbhome_19_33
   patch1.patch=RECOMMENDED
   patch1.create_gold_image=dbhome1933.zip

java -jar autoupgrade.jar -config install19.cfg -patch -mode create_home
```


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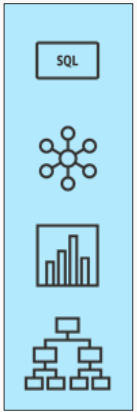
# Detect regressions with SQL Performance Analyzer

- Requires Real Application Testing option
- Limited time 90 % discount


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# SQL Tuning Set | Definition

**SQL Tuning Set**




SQL statement

Context

Statistics

Plans


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```
SQL> select name, statement_count from dba_sqlset;

NAME                           STATEMENT_COUNT
_____________________________ _________________
SALES_APP_WORKLOAD                        2343
```

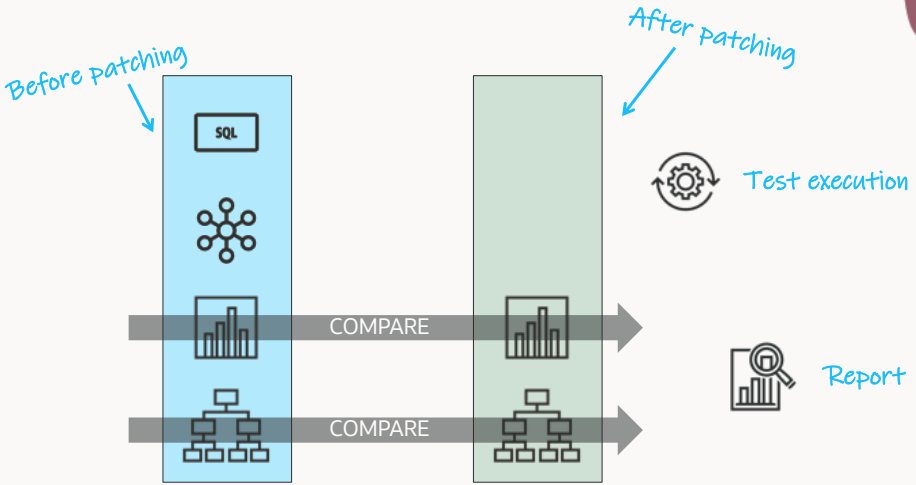

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SQL> select name, statement_count from dba_sqlset;

NAME                           STATEMENT_COUNT
------------------------------ ---------------
SALES_APP_WORKLOAD                        2343
SYS_AUTO_STS                              6426
```


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# SQL Performance Analyzer





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# Report Summary

## Projected Workload Change Impact:

| | |
|---|---|
| **Overall Impact** | **4.64%** |
| **Improvement Impact** | **30.98%** |
| **Regression Impact** | **-26.35%** |

## SQL Statement Count

| SQL Category | SQL Count | Plan Change Count |
|---|---|---|
| Overall | 43 | 5 |
| Improved | 1 | 1 |
| Regressed | 1 | 1 |
| Unchanged | 30 | 3 |
| Unsupported | 11 | 0 |

## Top 32 SQL Sorted by Absolute Value of Change Impact on the Workload

| object_id | sql_id | Impact on Workload | Execution Frequency | Metric Before | Metric After | Impact on SQL | Plan Change |
|---|---|---|---|---|---|---|---|
| 83 | f90zn75aphu4w | 30.98% | 2828 | 139319.505304102 | 41950 | 69.89% | y |
| 47 | 0cwuxyv314wcg | -26.35% | 18254 | 981.459680070122 | 13809 | -1306.99% | y |
| 80 | csv0xdm9c394t | -.36% | 2734 | 4689.26664228237 | 5868 | -25.14% | n |
| 60 | 4hbzjyh4p336s | .21% | 2818 | 668.862668559262 | 10 | 98.5% | n |
| 76 | a8ntu3081hfqw | -.18% | 2818 | 262.609297374024 | 828 | -215.3% | y |


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# Report Summary

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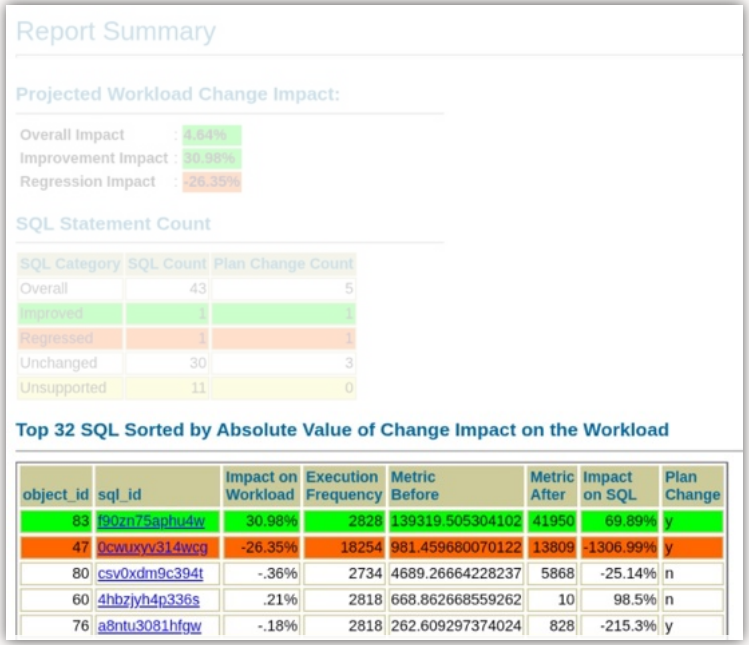
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**SQL Details:**

| | |
|---|---|
| **Object ID** | : 47 |
| **Schema Name** | : TPCC |
| **Container Name** | : Unknown (con_dbid: 344460545) |
| **SQL ID** | : 0cwuxyv314wcg |
| **Execution Frequency** | : 18254 |
| **SQL Text** | : SELECT ROWID FROM CUSTOMER WHERE C_W_ID = :B3 AND C_D_ID = :B2 AND C_LAST = :B1 |

**Bind Variables:**

1 - (NUMBER): 3
2 - (NUMBER): 7
3 - (VARCHAR2): ESEEINGOUGHT

**Execution Statistics:**

| Stat Name | Impact on Workload | Value Before | Value After | Impact on SQL |
|---|---|---|---|---|
| elapsed_time | -26.35% | .000981 | .013809 | -1306.99% |
| parse_time | | | .000477 | |
| cpu_time | -106.5% | .000494 | .013743 | -2681.43% |
| user_io_time | | | 0 | |
| buffer_gets | -130.82% | 253 | 7252 | -2759.03% |
| cost | -745969.19% | 255 | 1982 | -677.25% |
| reads | 0% | 0 | 0 | 0% |
| writes | 0% | 0 | 0 | 0% |


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SQL Details:

Object ID : 47
Schema Name : TPCC
Container Name : Unknown (con_dbid: 344460545)
SQL ID : 0cwuxyv314wcg
Execution Frequency : 18254
SQL Text : SELECT ROWID FROM CUSTOMER WHERE C_W_ID = :B3 AND C_D_ID = :B2 AND C_LAST = :B1

Bind Variables:

1 - (NUMBER): 3
2 - (NUMBER): 7
3 - (VARCHAR2): ESEEINGOUGHT

**Execution Statistics:**

| Stat Name | Impact on Workload | Value Before | Value After | Impact on SQL |
|---|---|---|---|---|
| elapsed_time | -26.35% | .000981 | .013809 | -1306.99% |
| parse_time | | | .000477 | |
| cpu_time | -106.5% | .000494 | .013743 | -2681.43% |
| user_io_time | | | 0 | |
| buffer_gets | -130.82% | 253 | 7252 | -2759.03% |
| cost | -745969.19% | 255 | 1982 | -677.25% |
| reads | 0% | 0 | 0 | 0% |
| writes | 0% | 0 | 0 | 0% |


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**Execution Plan Before Change:**

**Plan Hash Value** : 612465046

| Id | Operation | Name | Rows | Bytes | Cost | Time |
|---|---|---|---|---|---|---|
| 0 | SELECT STATEMENT | | | | 255 | |
| 1 | SORT ORDER BY | | 2 | 92 | 255 | 00:00:01 |
| 2 | TABLE ACCESS BY INDEX ROWID BATCHED | CUSTOMER | 2 | 92 | 254 | 00:00:01 |
| 3 | INDEX RANGE SCAN | CUSTOMER_I1 | 3000 | | 10 | 00:00:01 |

**Execution Plan After Change:**

**Plan Id** : 545

**Plan Hash Value** : 4040750106

| Id | Operation | Name | Rows | Bytes | Cost | Time |
|---|---|---|---|---|---|---|
| 0 | SELECT STATEMENT | | 2 | 92 | 1982 | 00:00:01 |
| 1 | SORT ORDER BY | | 2 | 92 | 1982 | 00:00:01 |
| * 2 | TABLE ACCESS FULL | CUSTOMER | 2 | 92 | 1981 | 00:00:01 |

Predicate Information (identified by operation id):

- 2 - filter("C_LAST"=:B1 AND "C_D_ID"=:B2 AND "C_W_ID"=:B3)


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Execution Plan Before Change:

Plan Hash Value : 612465046

| Id | Operation | Name | Rows | Bytes | Cost | Time |
|---|---|---|---|---|---|---|
| 0 | SELECT STATEMENT | | | | 255 | |
| 1 | SORT ORDER BY | | 2 | 92 | 255 | 00:00:01 |
| 2 | TABLE ACCESS BY INDEX ROWID BATCHED | CUSTOMER | 2 | 92 | 254 | 00:00:01 |
| 3 | INDEX RANGE SCAN | CUSTOMER_I1 | 3000 | | 10 | 00:00:01 |

**Execution Plan After Change:**

**Plan Id** : 545
**Plan Hash Value** : 4040750106

| Id | Operation | Name | Rows | Bytes | Cost | Time |
|---|---|---|---|---|---|---|
| 0 | SELECT STATEMENT | | 2 | 92 | 1982 | 00:00:01 |
| 1 | SORT ORDER BY | | 2 | 92 | 1982 | 00:00:01 |
| * 2 | TABLE ACCESS FULL | CUSTOMER | 2 | 92 | 1981 | 00:00:01 |

Predicate Information (identified by operation id):

- 2 - filter("C_LAST"=:B1 AND "C_D_ID"=:B2 AND "C_W_ID"=:B3)


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You don't need to connect your app to use SQL Performance Analyzer


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# SQL Plan Management is the best tool to ensure plan stability


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# Automatic SQL Plan Management








- User executes SQL
- Optimizer chooses a different execution plan
- Executes with new plan


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# Automatic SQL Plan Management








- Background job (30 min)
- Finds resource-intensive SQLs
- Evaluate execution statistics against previous executions


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# Automatic SQL Plan Management








- Creates a plan baseline with the best plan
- Next execution uses an accepted plan

- Oracle Database 19c Enterprise Edition, RU 19.22
- Exadata and Autonomous AI Database


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# Real-Time SQL Plan Management








- User executes SQL
- Optimizer chooses a different execution plan
- Executes with new plan


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# Real-Time SQL Plan Management








- Compares execution statistics with history
- Comparison is performed in the user foreground session


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# Real-Time SQL Plan Management








- Creates a plan baseline with the best plan
- Next execution uses an accepted plan

- Oracle AI Database 26ai Enterprise Edition
- Autonomous AI Database 19c


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Reduce downtime to the time it takes to perform a switchover


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# Avoid database downtime with RAC Rolling Patch Apply


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1 Automate patching

2 Robust applications


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# Use bind variables


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- Use database services
- Use connection pools
- Shorten transactions
- Enable Fast Application Notification


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## Use Application Continuity


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```
SQL> EXECUTE dbms_app_cont_admin.acchk_set(true);
```


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You can combine Application Continuity and Rolling Upgrades


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```
DBMS_APPLICATION_INFO.SET_CLIENT_INFO('SALES_APP');
DBMS_APPLICATION_INFO.SET_MODULE('PURCHASE');
DBMS_APPLICATION_INFO.SET_ACTION('CHECK_INVENTORY');
```


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```
DBMS_APPLICATION_INFO.SET_CLIENT_INFO('SALES_APP');
DBMS_APPLICATION_INFO.SET_MODULE('PURCHASE');
DBMS_APPLICATION_INFO.SET_ACTION('CHECK_INVENTORY');

-- Requires Tuning Option
DBMS_SQL_MONITOR.BEGIN_OPERATION('BUSINESS_PROCESS_1');
```


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# Generate a report on differences between two Release Update

- oradiff.oracle.com


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**DEMO**

# ORAdiff
# List differences



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Photo by Icons8 Team on Unsplash

**DEMO**

# Regressing statement
# Fix using SQL Plan Management



Watch on YouTube


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## What Happened?

- A statement regressed
- DBA executes `DBMS_SPM.ADD_VERIFIED_SQL_PLAN_BASELINE`
- It finds all previous executions of statement
  - Cursor cache, AWR, SQL tuning set, Automatic SQL Tuning Set
- Use SQL Plan Management Evolve Advisor to find best-performing plan
- Create SQL plan baseline with best-performing plan as *accepted* plan
- Next execution of statement uses the accepted plan


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# Automatically recover from certain ORA-00600 errors

- Automatic Error Mitigation


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```
SQL> select ... from ...
ERROR at line 1:
ORA-00600: internal error code, arguments: [...]
```


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New In 26ai

```
SQL> select ... from ...
ERROR at line 1:
ORA-00600: internal error code, arguments: [...]

SQL> alter session set sql_error_mitigation = 'on';

SQL> select ... from ...
n rows returned
```


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# Generate SQL diagnostic report


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```
DECLARE
      my_report CLOB;
BEGIN
      my_report := DBMS_SQLDIAG.REPORT_SQL(
            sql       => '6ah8zgpch6ksu',
            directory => 'DATA_PUMP_DIR',
            level     => 'ALL');
END;
/
```


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Collapse All

# SQL Report SQLID: 6ah8zgpch6ksu Report Date: 11-OCT-26 05:36

## Warning: SQL Not found in memory

### PLANS

- Last Execution Plan
- Current Plans Summary
- Historical Plans Summary
- All Execution Plans
- Historical Execution Plans
- Plan Control Objects (Parameters)
- Plan Control Objects (Baselines/Profiles)
- Plan Control Objects (DBA SQLSET STATEMENTS)
- Monitored Executions
- Reoptimization Hints

### GLOBAL

- SQL Text
- SQL History
- Parameters(Non-Default Values)
- Instance Parameters
- Observations
- DBMS STATS Table Preferences
- Historical SQL Stats - DELTA
- Historical SQL Stats - TOTAL

### CURSOR SHARING AND BINDS

- Peeked vs Monitored Bind Values - In Memory
- Peeked vs Captured Bind Values - In Memory
- Peeked vs Captured Bind Values - AWR

### TABLES

- Table Summary
- Table Columns
- Table Partitions
- Table Constraints
- Table Modifications
- Table Extensions
- Tables Statistics Versions
- Gather Table Stats Details

### INDEXES

- Index Summary
- Index Columns
- Index Partitions
- Indexes Statistics Versions

### ACTIVE SESSION HISTORY(ASH)

- ASH by Plan (in Memory)
- ASH by Plan Line (in Memory)
- ASH by Plan
- ASH by Plan Line
- Index Contention

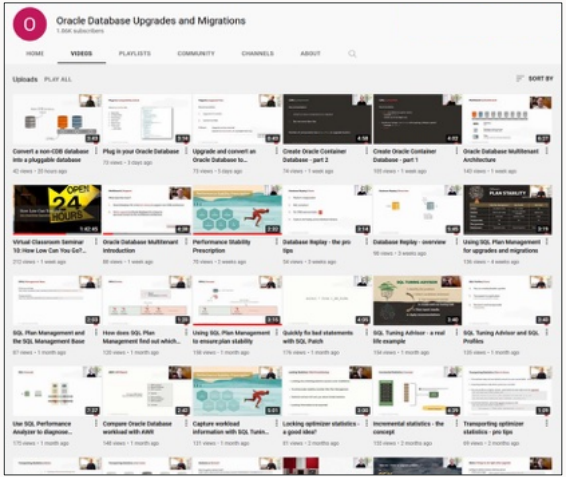
# Key Takeaways



1. Patch your database
2. Automate patching
3. Make applications robust


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# YouTube | Oracle Database Upgrades and Migrations




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- 300+ videos
- New videos every week
- No marketing
- No buzzword
- All tech

SCAN ME


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