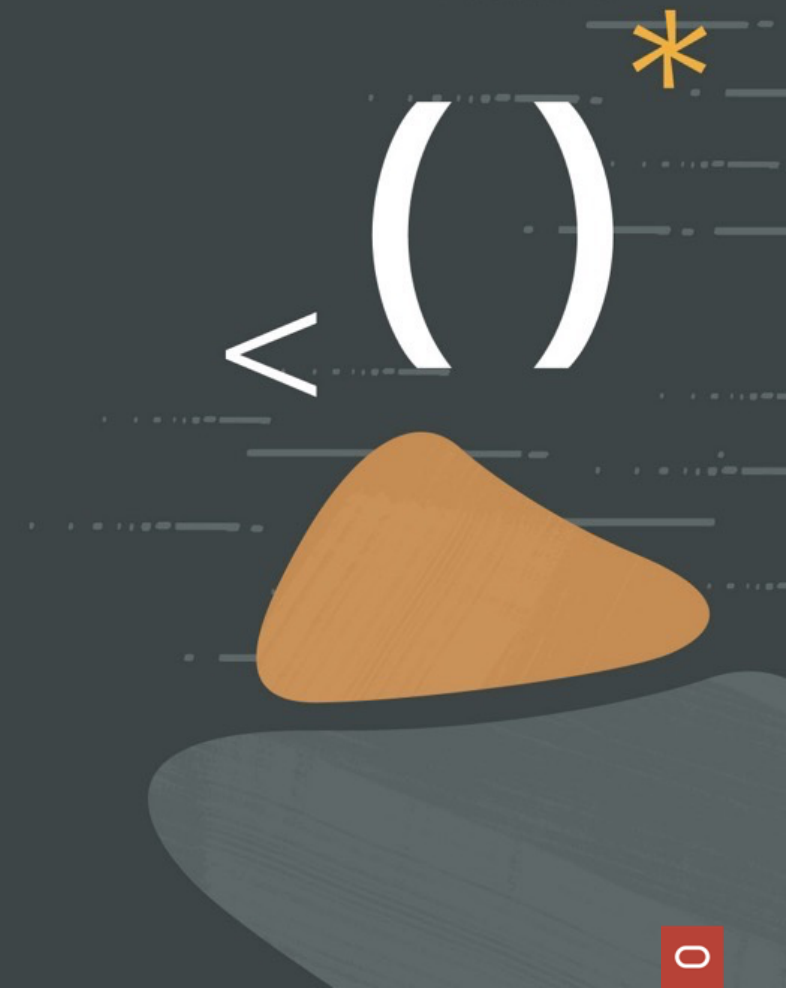
Upgrade to Oracle AI Database 26ai

Multicloud Edition



Oracle

DBAs

run the world

Daniel Overby Hansen

Distinguished Product Manager

dohdatabase

@dohdatabase.com

https://dohdatabase.com

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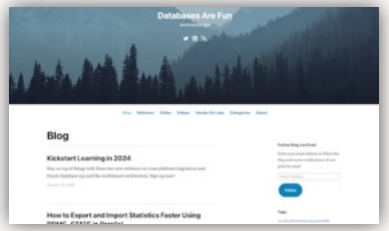
MikeDietrichDE.com

Mike.Dietrich@oracle.com



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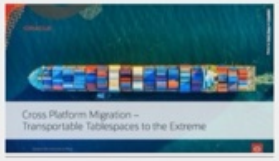
Virtual Classroom Seminars	Slides
Episode 16 (replaces Episode 1 from Feb 2021) Oracle Database Release and Patching Strategy for 19c and 23c *115 minutes – May 10, 2023*	
Episode 17 From SR to Patch – Insights into the Oracle Database Development process *55 minutes – June 22, 2023*	
Episode 18 Cross Platform Migration – Transportable Tablespaces to the Extreme *145 min – February 22, 2024*	
Episode 19 Move to Oracle Database 23ai – Everything you need to know about Multitenant PART 1 *145 min – May 16, 2024*	
Episode 20 Move to Oracle Database 23ai – Everything you need to know about Multitenant PART 2 *100 min – June 28, 2024*	

Recorded Web Seminars

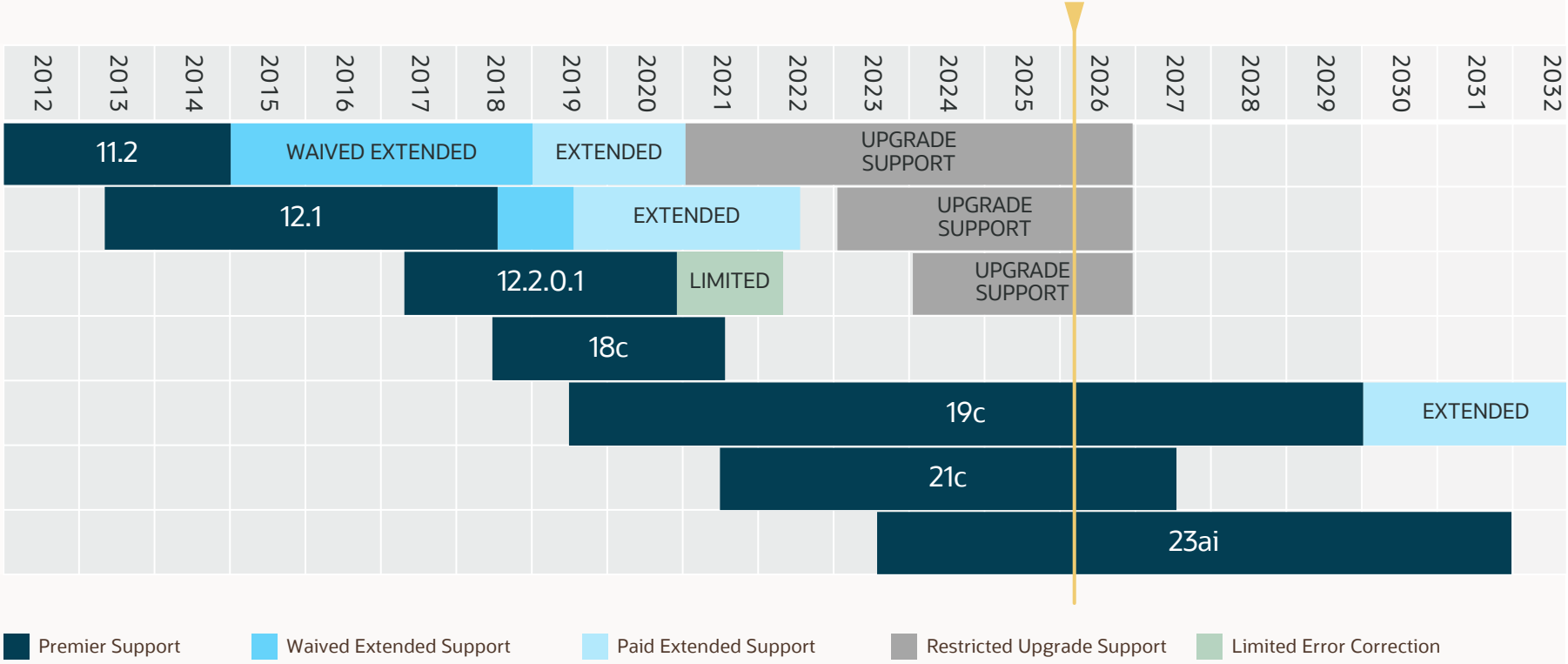
https://MikeDietrichDE.com/videos

More than 40 hours of technical content, on-demand, anytime, anywhere

Release Strategy

Lifetime Support Policy and Upgrade Path

Lifetime Support Policy



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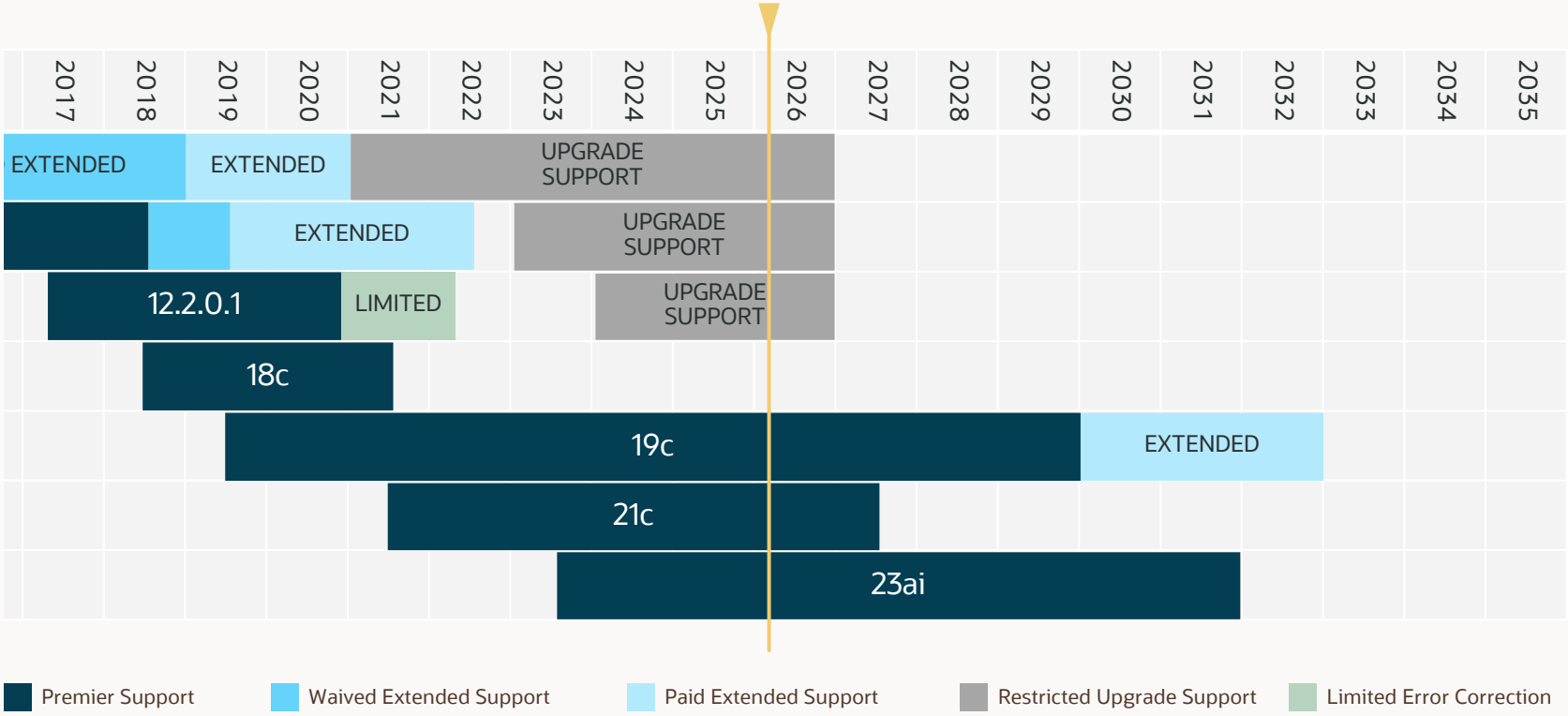
Lifetime Support Policy



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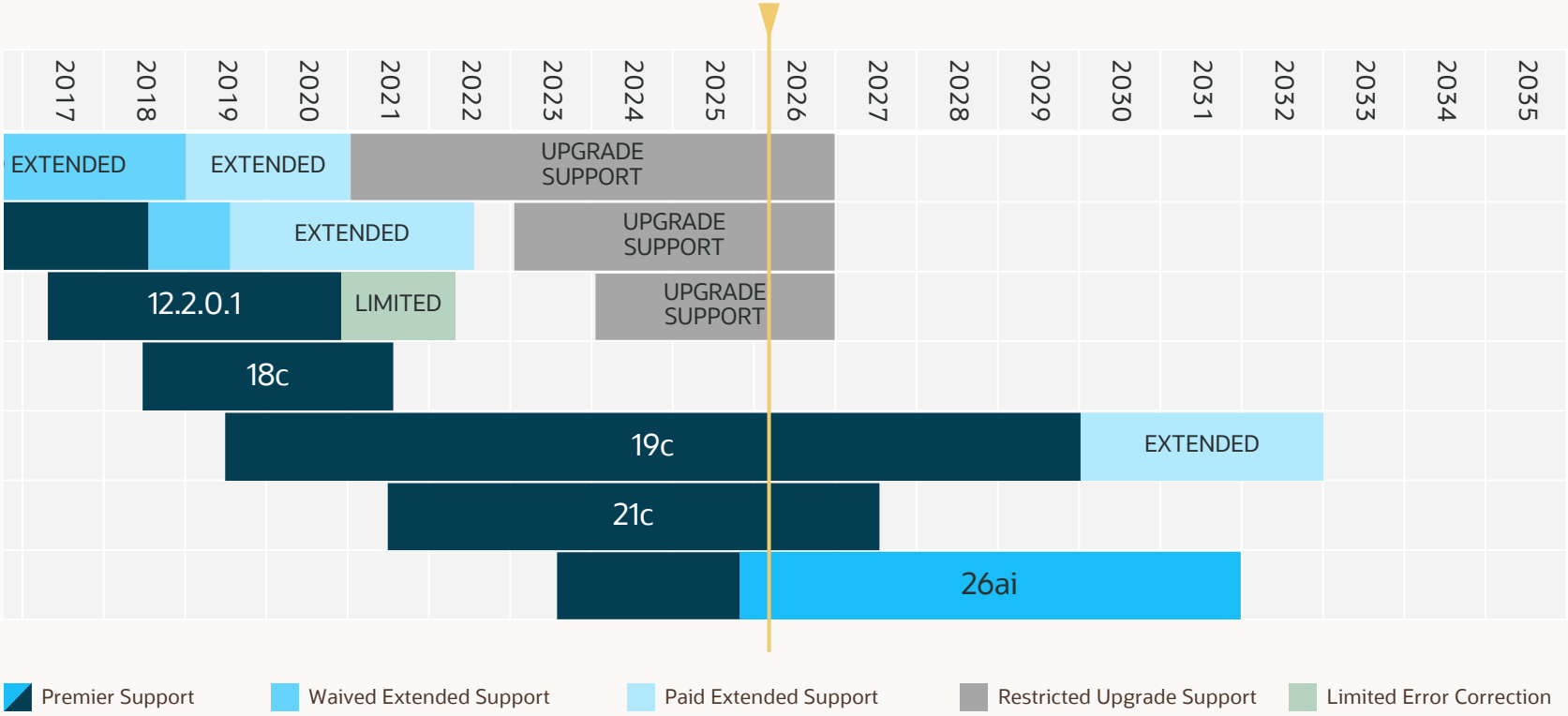
Lifetime Support Policy



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Do you want to upgrade?

Oracle Database 11.2.0.4
Oracle Database 12.1.0.2
Oracle Database 12.2.0.1
Oracle Database 18c

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Oracle Database 11.2.0.4
Oracle Database 12.1.0.2
Oracle Database 12.2.0.1
Oracle Database 18c

Oracle Database 19c

Oracle Database 23ai

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Oracle Database 11.2.0.4
Oracle Database 12.1.0.2
Oracle Database 12.2.0.1
Oracle Database 18c

Oracle Database 19c

Oracle Database 23ai

Oracle AI Database 26ai

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26ai

When is a database upgrade required?

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Oracle Database 19c ⇒ Oracle Database 23ai ⇒ Oracle AI Database 26ai

UPGRADE

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Oracle Database 19c

Oracle AI Database 26ai

UPGRADE

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Oracle Database 19c ⇒ Oracle Database 23ai ⇒ Oracle AI Database 26ai

UPDATE

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July 2025	Oracle Database 23ai	23.9.0.25.07
October 2025	Oracle AI Database 26ai	23.26.0.0.0
January 2026	Oracle AI Database 26ai	23.26.1.0.0
April 2026	Oracle AI Database 26ai	23.26.2.0.0

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July 2025	Oracle Database 23ai	23.9.0.25.07
October 2025	Oracle AI Database 26ai	23.26.0.0.0
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July 2025	Oracle Database 23ai	23.9.0.25.07
October 2025	Oracle AI Database 26ai	23.26.0.0.0
January 2026	Oracle AI Database 26ai	23.26.1.0.0
April 2026	Oracle AI Database 26ai	23.26.2.0.0

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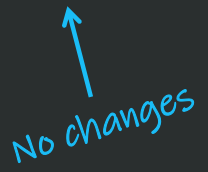
```
SQL> select version, version_full from v$instance

VERSION           VERSION_FULL
----------------- -----------------
23.0.0.0.0        23.26.1.0.0
```



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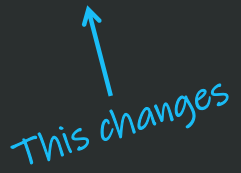
```
SQL> select version, version_full from v$instance

VERSION             VERSION_FULL
------------------- -------------------
23.0.0.0.0          23.26.1.0.0
```



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26ai

There is no need to re-certify your app

- Certification for Oracle Database 23ai applies to Oracle AI Database 26ai

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Your Road to Oracle AI Database 26ai

ANALYZE ⇛ UPGRADE ⇛ GO-LIVE

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Before Upgrade

Considerations and tasks

Oracle AI Database 26ai supports the multitenant architecture only

- You must convert your database to a PDB

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```
--Use up to 3 user-created PDBs
--without a license for Multitenant option.
--Applies to Oracle Database 19c and newer, including SE2

alter system set max_pdbs=3;
```


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Update Exadata System Software to the latest version

- VM Cluster OS updates

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Further Information

Exadata System Software

Recommended to use latest version.
However, minimum version is 25.1

MOS Note: 888828.1
Exadata Database Machine and Exadata Storage Server Supported Versions

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Upgrade to Oracle Grid Infrastructure 26ai

- Manages Oracle Database 19c and newer
- Upgrade older databases in advance

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```
--Grid Infrastructure 26ai requires a minimum compatible setting
--Databases older than 19c may not use this disk group anymore

alter diskgroup DATA set attribute 'compatible.rdbms' = '19.0.0.0.0';
```


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Confirm your clients can connect to Oracle AI Database 26ai

- Upgrade your clients well in advance of the upgrade

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Client / Server Interoperability

Client Version	Server Version						
	26ai	21c	19c	18c	12.2.0	12.1.0	11.2.0
26ai[#11]	Yes	Yes	Yes	No	No	No	No
21c	Yes	Yes	Yes	Was	Was	Yes[#12]	No
19c	Yes	Yes	Yes	Was	Was	Yes[#12]	Yes[#9]
18c	No	Was	Was	Was	Was	Was	Was[#9]
12.2.0	No	Was	Was	Was	Was	Was	Was
12.1.0	No	Yes[#12]	Yes[#12]	Was	Was	Yes[#12]	Yes[#12]
11.2.0	No	No	Yes[#9]	Was[#9]	Was	Yes[#12]	Yes[#9]

MOS Note: 207303.1 - Client / Server Interoperability Support Matrix

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Client / Server Interoperability

Client Version	Server Version						
	26ai	21c	19c	18c	12.2.0	12.1.0	11.2.0
26ai[#11]	Yes	Yes	Yes	No	No	No	No
21c	Yes	Yes	Yes	Was	Was	Yes[#12]	No
19c	Yes	Yes	Yes	Was	Was	Yes[#12]	Yes[#9]
18c	No	Was	Was	Was	Was	Was	Was[#9]
12.2.0	No	Was	Was	Was	Was	Was	Was
12.1.0	No	Yes[#12]	Yes[#12]	Was	Was	Yes[#12]	Yes[#12]
11.2.0	No	No	Yes[#9]	Was[#9]	Was	Yes[#12]	Yes[#9]

MOS Note: 207303.1 - Client / Server Interoperability Support Matrix

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```
--List current connections and their driver details
--Join to gv$session for more details.

select * from gv$session_connect_info;
```


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The same certification matrix applies to database links as well

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Further Information

Client / Server Interoperability

Client / Server Interoperability Support Matrix (Doc ID 207303.1)

Blog post:
Are Your Oracle Database Clients Ready for the next Database Upgrade?

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On important databases, execute a dictionary check before upgrade

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```
set serverout on

exec dbms_dictionary_check.full;
```


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Familiarize yourself with the changes in Oracle AI Database

- Check the Upgrade Guide

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Home
Parameters
Users, Roles, etc
Privileges
Included Fixes
Oracle Database Home
Objects
Fixed Objects
Audit
System
Scheduler
Release & Updates Timeline
Report
Custom Patch Sets

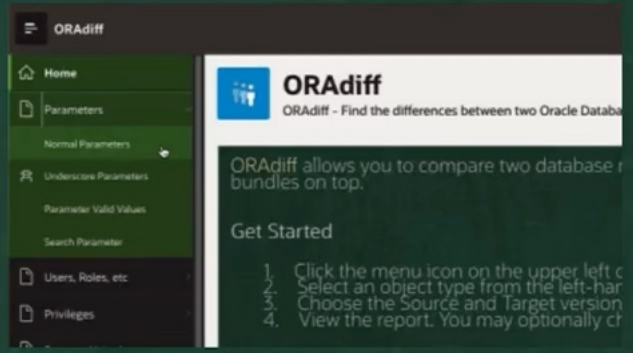
Oracle Release Analyzer Diff Utility

Find the differences between two Oracle Database releases

Oracle Release Analyzer Diff Utility (ORAdiff) allows you to compare two database releases to each other - with or without patch bundles on top.

Get Started

1. Click the menu icon on the upper left corner of the page
2. Select an object type from the left-hand navigation menu
3. Choose the Source and Target versions and patch levels
4. View the report. You may optionally choose a filter



The tool will display the differences such as "new tables", "added parameters", "changed columns", "removed privileges" and much more. It search can tell you when a parameter was added and which files changed in your Oracle Home.

Further Information

ORAdiff / Oracle Release Analyzer Diff Utility

[Watch the demo]

[http://oradiff.oracle.com]

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Build a software image

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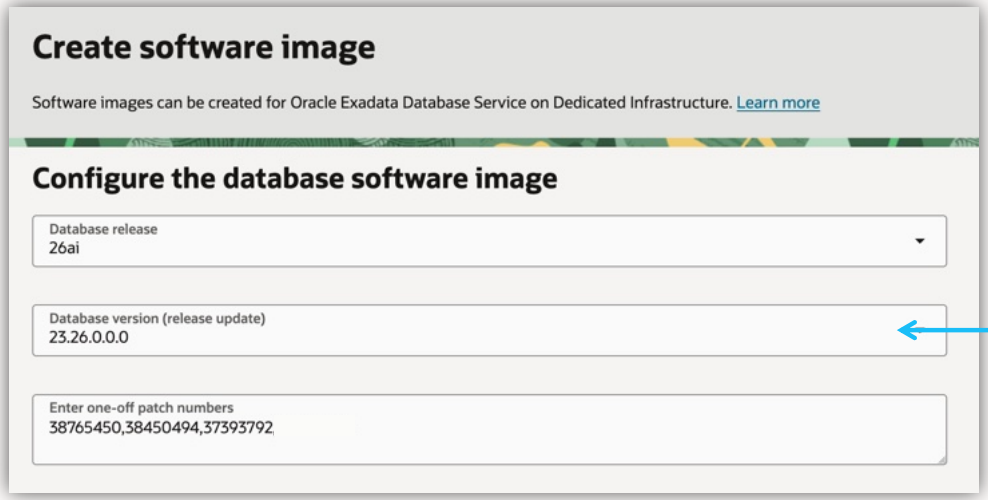

Latest Release Update

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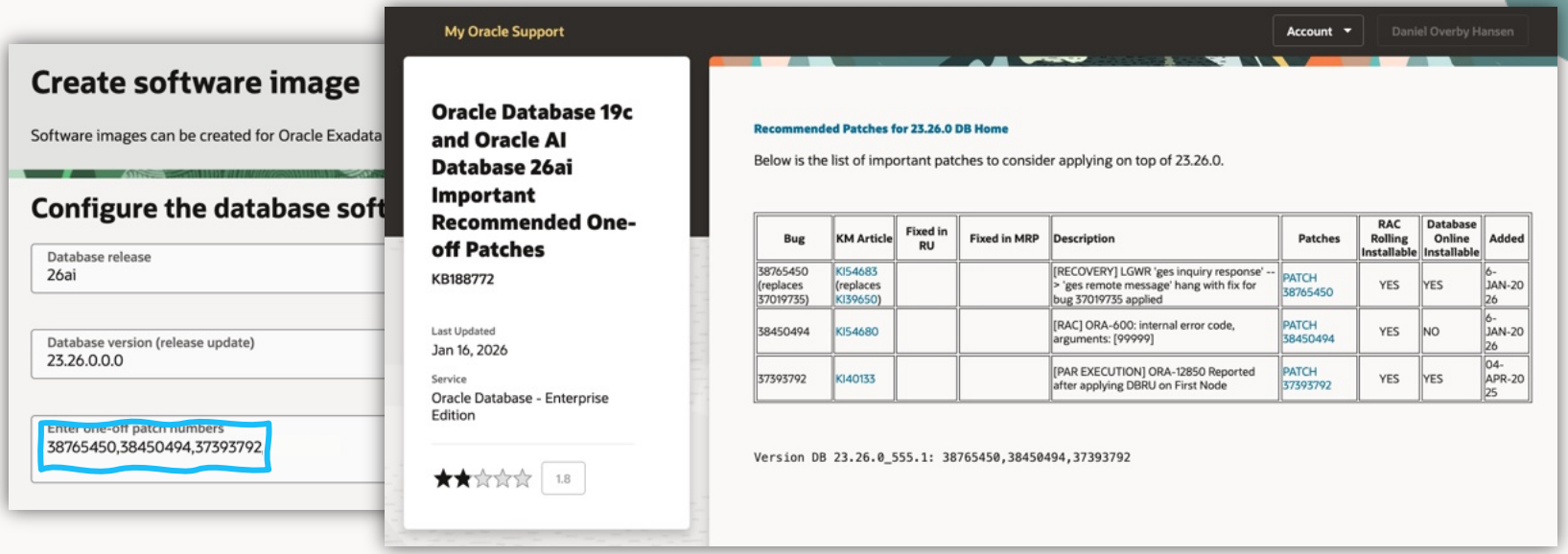

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OJVM is embedded in Release Updates

- No separate download
- Complete RAC Rolling patching support

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Gather dictionary and fixed objects statistics

- Up to 7 days in advance

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Perform a precheck

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```
-- Check the detailed output of the pre-upgrade analysis
-- This also highlights any required post-upgrade tasks

cd /u01/app/oracle/cfgtoollogs/dbua/$ORACLE_UNQNAME/$ORACLE_SID/100/prechecks
cat *_preupgrade.log
```


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Back up your database

- Disable automatic backups

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Upgrade

Cloud Automation and Refreshable Clone PDBs

In the cloud, upgrading Oracle databases is as easy as pressing a button

```
-- Monitor the database upgrade using DBUA log files

cd /u01/app/oracle/cfgtoollogs/dbua/<job-id>
tail -100f silent.log
```


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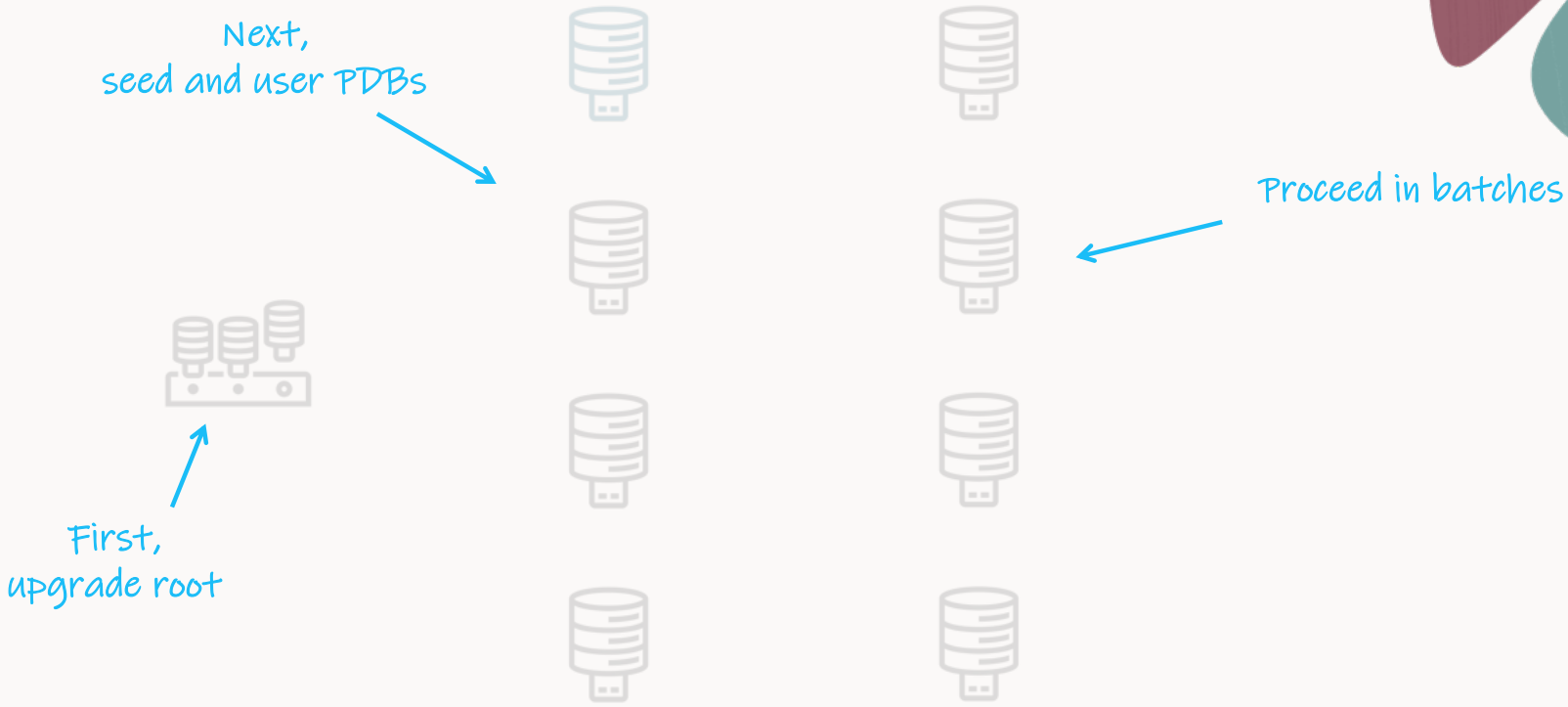

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Cloud tooling uses default settings

- Include an upgrade of timezone file

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Refreshable Clone PDBs

Upgrade individual PDBs

Upgrade via Refreshable Clone PDB

CREATE

Create new DB System on Oracle AI Database 26ai

BUILD+REFRESH

Create copy of PDB and apply redo from source to keep PDB up-to-date

OUTAGE

Disconnect users and refresh PDB for the last time

UPGRADE

Upgrade PDB to Oracle AI Database 26ai

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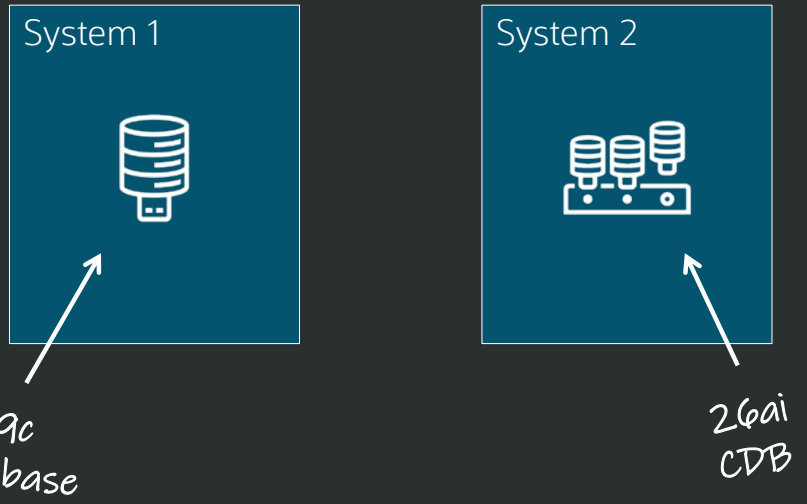
Upgrade via Refreshable Clone PDB

```
system01.dbf
sysaux01.dbf
users01.dbf
undo01.dbf
...
```



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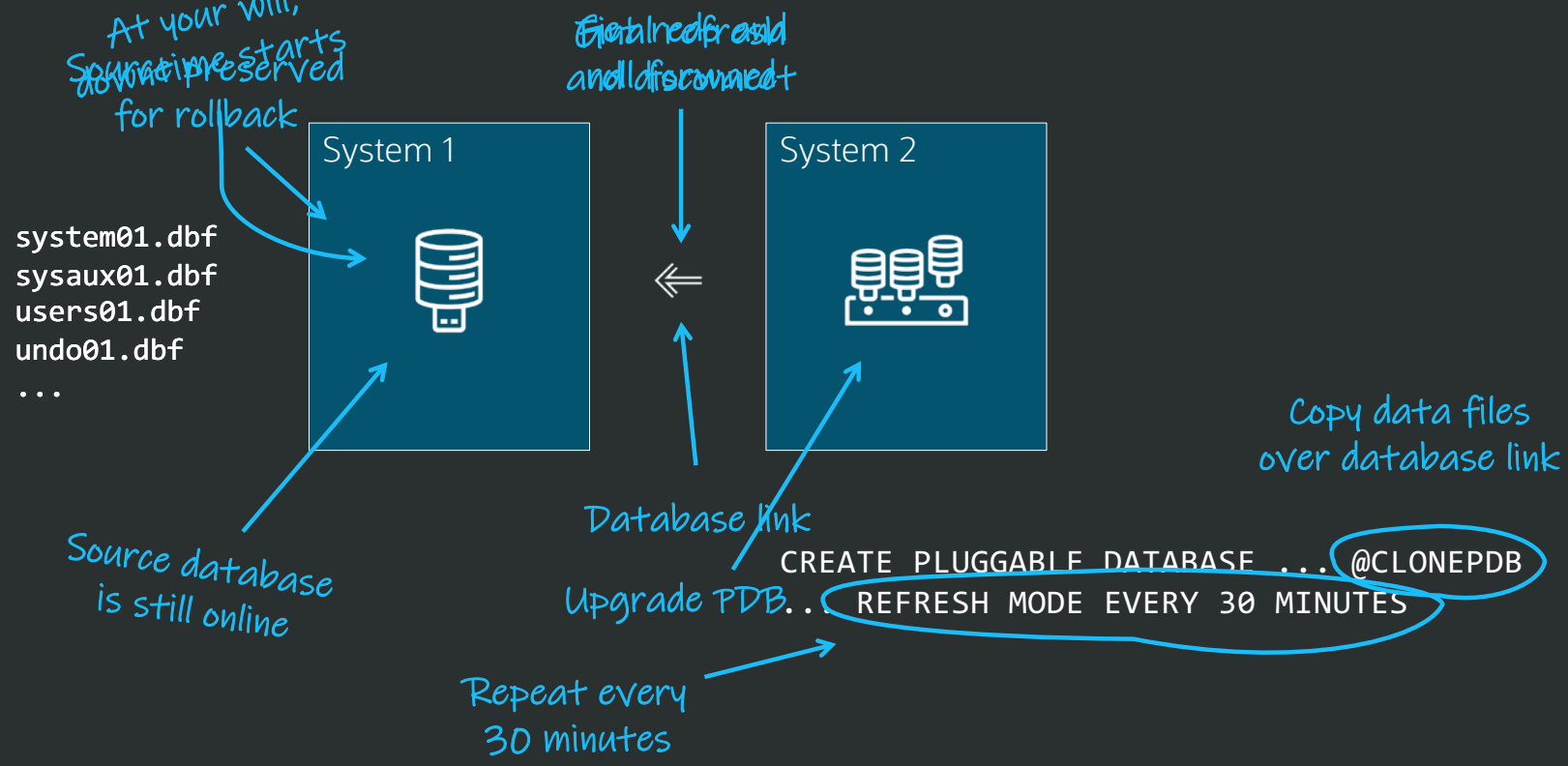
Upgrade via Refreshable Clone PDB



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Upgrade via Refreshable Clone PDB

```
autoupgrade.jar ... –mode deploy
```

```
upg> proceed -job n
```


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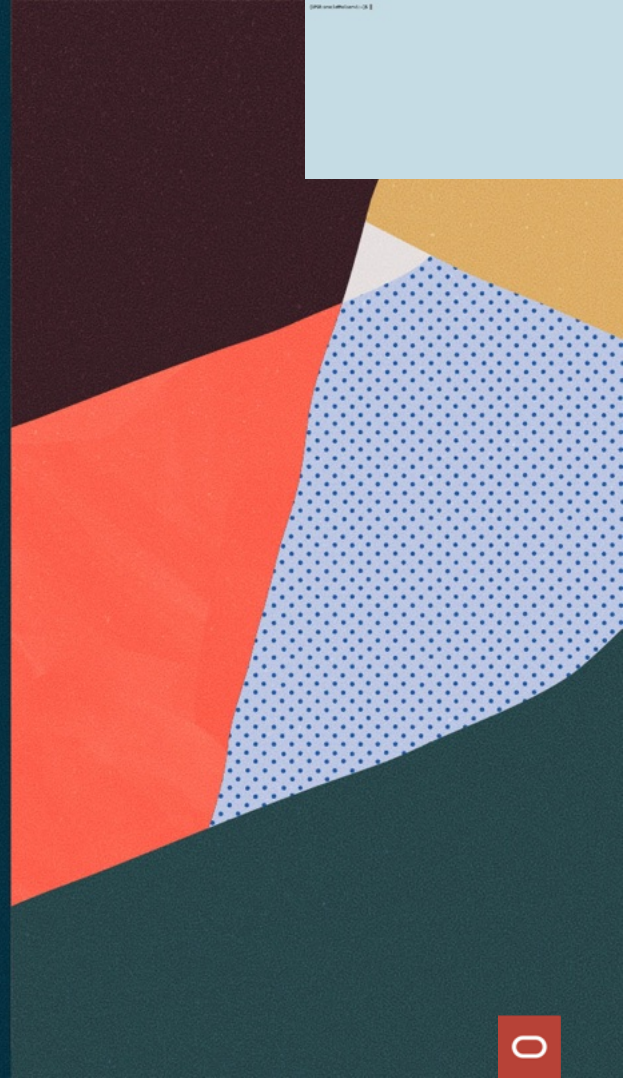
DEMO

Upgrade to Oracle AI Database 26ai



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Key Benefits of Upgrade via Refreshable Clone PDB

1. Less downtime
2. Excellent rollback option
3. Full flexibility

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We used AutoUpgrade and refreshable clone to move a mission-critical 76 TB database to Oracle Database 23ai in less than 45 minutes - while preserving the source as rollback option

Portuguese Government Agency

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Works everywhere

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Works everywhere

- Base Database Service
- Exadata Database Service
- Exadata Cloud@Customer
- On-prem and other clouds
- Exascale migration
- Non-CDB to PDB migration
- PDB upgrade
- On-prem to cloud migration

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You must restore the PDB on standby database after upgrade

- Refreshable clone works only with deferred recovery on standby database

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The easy approach ⇒ Upgrade entire CDB, including all PDBs

The fast approach ⇒ Upgrade single PDB

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You can also migrate with Data Pump or Transportable Tablespaces

- Suitable when direct upgrade is not possible
- Smaller databases
- Reorganizing data

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Upgrading in the cloud

Blog post:
Upgrade Encrypted PDB in Cloud to Oracle AI Database 26ai

Blog post:
Upgrade Oracle Base Database Service to Oracle AI Database 26ai

Blog post:
Upgrade from 19c to 23ai using AutoUpgrade –ExaDB-D or ExaC@C – Part 1

Blog post:
When A Refreshable Clone Takes Over The Service

Blog post:
Upgrade to Oracle AI Database 26ai

Documentation: Proceed command

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Go-Live

Considerations and parameter recommendations

Back up your database

- Re-enable automatic backups

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Check your standby databases

- Check our webinar for details

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```
--Gather fixed objects statistics after the upgrade
--The database must be warmed up and subjected to a representative workload

exec dbms_stats.gather_fixed_objects_stats;
```


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```
BEGIN
   DBMS_SCHEDULER.CREATE_JOB (
       job_name => '"SYS"."GATHER_FIXED_OBJECTS_STATS_ONE_TIME"',
          job_type => 'PLSQL_BLOCK',
          job_action => 'BEGIN DBMS_STATS.GATHER_FIXED_OBJECTS_STATS; END;',
          start_date => SYSDATE+7,
          auto_drop => TRUE,
          comments => 'Gather fixed objects stats after upgrade - one time',
           enabled => TRUE
    );
END;
/
```


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```
BEGIN
   DBMS_SCHEDULER.CREATE_JOB (
      job_name => '"SYS"."GATHER_FIXED_OBJECTS_STATS_ONE_TIME"',
         job_type => 'PLSQL_BLOCK',
         job_action => 'BEGIN DBMS_STATS.GATHER_FIXED_OBJECTS_STATS; END;',
         start_date => SYSDATE+7,
         auto_drop => TRUE,
         comments => 'Gather fixed objects stats after upgrade - one time',
          enabled => TRUE
   );
END;
/
```


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```
BEGIN
   DBMS_SCHEDULER.CREATE_JOB (
      job_name => '"SYS"."GATHER_FIXED_OBJECTS_STATS_ONE_TIME"',
         job_type => 'PLSQL_BLOCK',
         job_action => 'BEGIN DBMS_STATS.GATHER_FIXED_OBJECTS_STATS; END;',
         start_date => SYSDATE+7,
         auto_drop => TRUE,
         comments => 'Gather fixed objects stats after upgrade - one time',
          enabled => TRUE
   );
END;
/
```


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```
BEGIN
   DBMS_SCHEDULER.CREATE_JOB (
      job_name => '"SYS"."GATHER_FIXED_OBJECTS_STATS_ONE_TIME"',
         job_type => 'PLSQL_BLOCK',
         job_action => 'BEGIN DBMS_STATS.GATHER_FIXED_OBJECTS_STATS; END;',
         start_date => SYSDATE+7,
         auto_drop => TRUE,
         comments => 'Gather fixed objects stats after upgrade - one time',
          enabled => TRUE
   );
END;
/
```


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```
-- Update the compatible parameter to benefit from latest database features
-- Update standbys first, then primary

alter system set compatible = '23.6.0' scope=spfile;


shutdown immediate
startup
```


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```
--Default value is for CDBs with many PDBs
--Other places, it leads to concurrency issues
--Reset back to 12.1 default as described in MOS 2431353.1

alter system set "_cursor_obsolete_threshold"=1024;
```


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```
--Default value is for CDBs with many PDBs
--Other places, it leads to concurrency issues
--Reset back to 12.1 default as described in MOS KB147694

alter system set "_cursor_obsolete_threshold"=1024
comment="Added 2026-02-15 - Advice from MOS Note: KB147694";
```


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```
SQL> select con$name, comp_id, status from cdb_registry;

CON$NAME COMP_ID   STATUS
-------- --------- -----------
CDB$ROOT CATALOG   VALID
CDB$ROOT CATPROC   VALID
CDB$ROOT XDB       VALID
RED      CATALOG   VALID
RED      CATPROC   VALID
RED      XDB       VALID
```

No information on PDB$SEED

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```
alter system set "_exclude_seed_cdb_view"=false;
```


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```
alter system set "_exclude_seed_cdb_view"=false;

SQL> select con$name, comp_id, status from cdb_registry;

CON$NAME COMP_ID   STATUS
-------- --------- -----------
CDB$ROOT CATALOG   VALID
CDB$ROOT CATPROC   VALID
CDB$ROOT XDB       VALID
PDB$SEED CATALOG   VALID
PDB$SEED CATPROC   VALID
PDB$SEED XDB       VALID
RED      CATALOG   VALID
RED      CATPROC   VALID
RED      XDB       VALID
```


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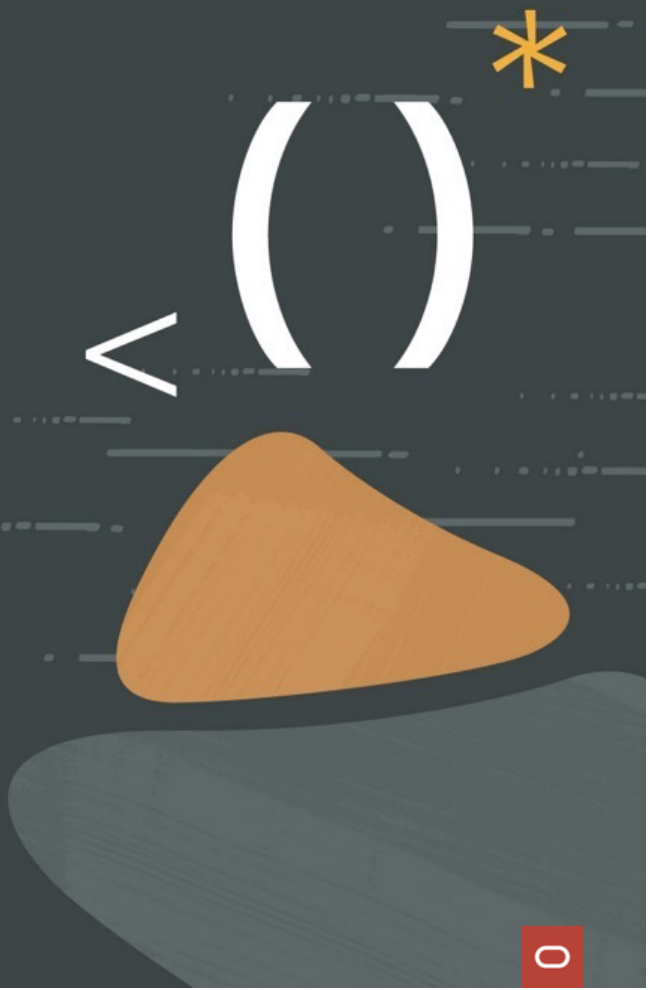
Real World Customer Cases



Techniker Krankenkasse

Move hundreds of Oracle Database19c PDBs to Oracle Database 23ai with ExaScale-only

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Customer Case | Techniker Krankenkasse

Customer

Project

Constraints

Preparation

Upgrade

Success?

Remarks

Large German Public Health Insurance

- **Founded**: 1884
- **Legal Form**: Public Corporation
- **Headquarters**: Hamburg, Germany
- **Members**: 11.9 million
- **Employees**: approx. 19,000
- **Customer Service**: 174 service centers
- **Budget 2024**: €62.5 billion

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Customer Case | Techniker Krankenkasse

Customer

Project

Constraints

Preparation

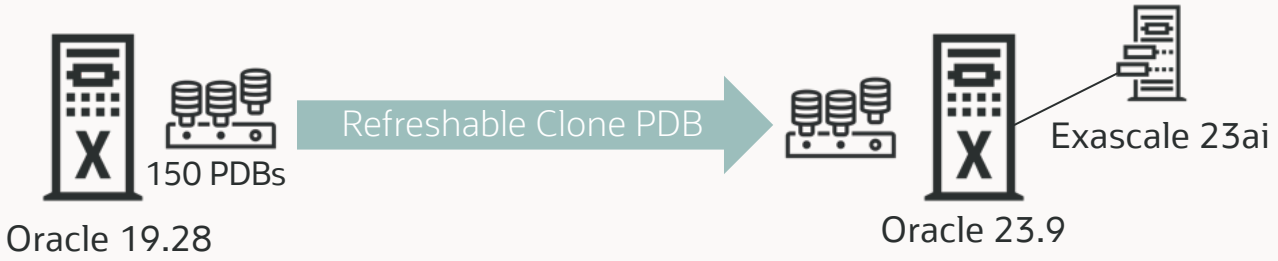
Upgrade

Success?

Remarks

Move to Oracle Database 23ai with ExaScale

- No ASM, no Oracle Database 19c anymore



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Customer Case | Techniker Krankenkasse

Customer

Project

Constraints

Preparation

Upgrade

Success?

Remarks

`COMPATIBLE=23.0.0`

No ASM, no Oracle Database 19c anymore

Data Pump as rollback

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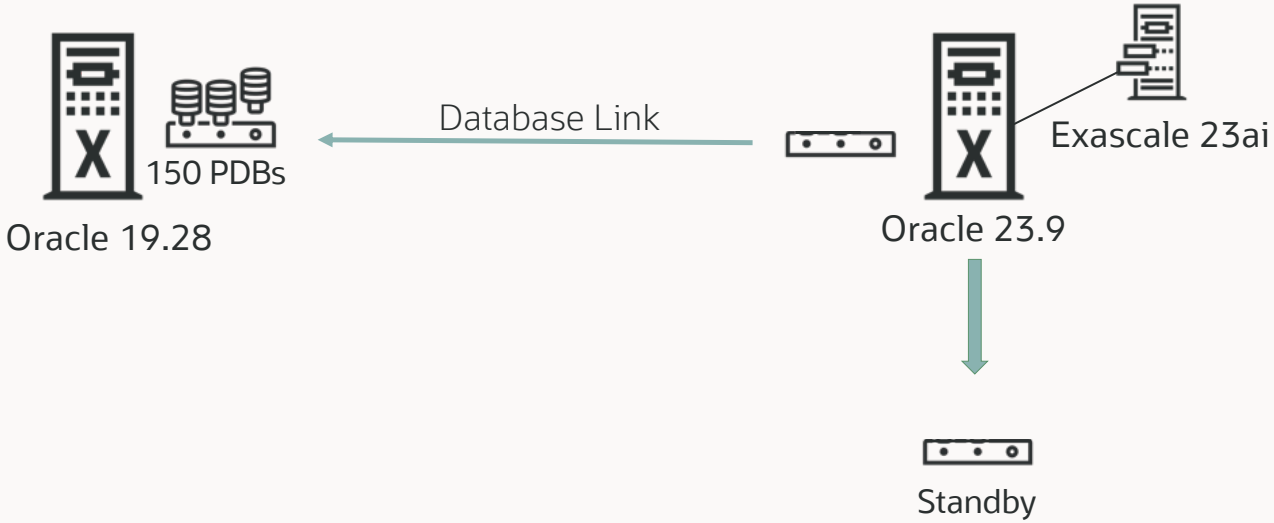

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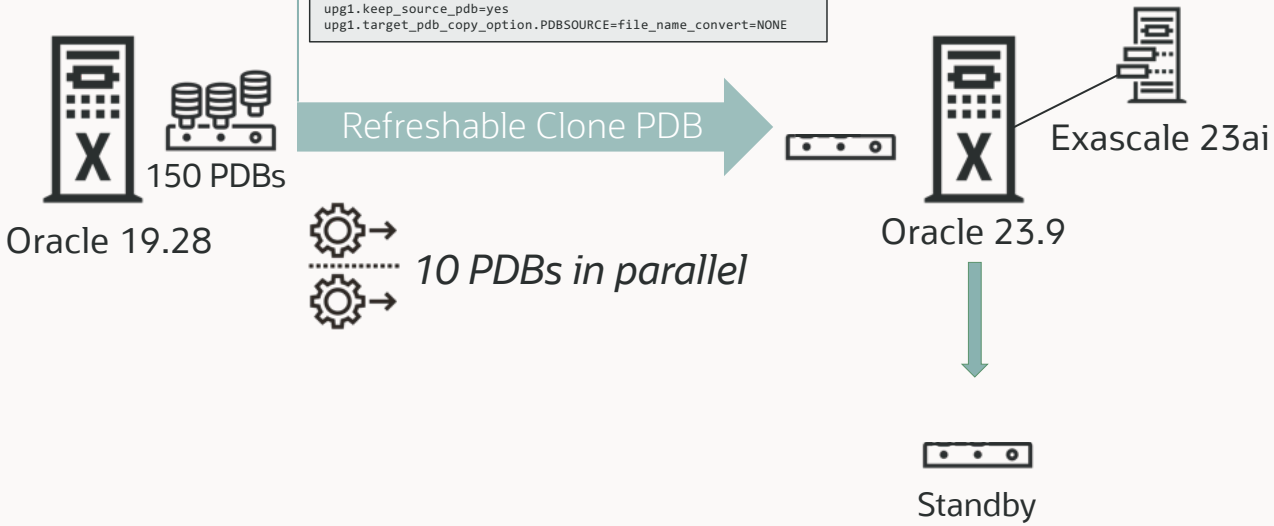
- Customer
- Project
- Constraints
- Preparation
- **Upgrade**
- Success?
- Remarks

AutoUpgrade:

```
global.autoupg_log_dir=/home/oracle/autoupgrade_logs
upg1.source_home=/u01/app/oracle/product/19.0.0.0/dbhome_1
upg1.target_home=/u01/app/oracle/product/23.0.0.0/dbhome_1
upg1.sid=CDB19
upg1.pdbs=PDBSOURCE
upg1.target_cdb=CDB23
upg1.target_pdb_name.PDBSOURCE=PDB23
upg1.source_dblink.PDBSOURCE=COPYPDB_PDB23_PREPARE 60
upg1.timezone_upg=NO
upg1.close_source=NO
upg1.keep_source_pdb=yes
upg1.target_pdb_copy_option.PDBSOURCE=file_name_convert=NONE
```



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- Customer
- Project
- Constraints
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- **Upgrade**
- Success?
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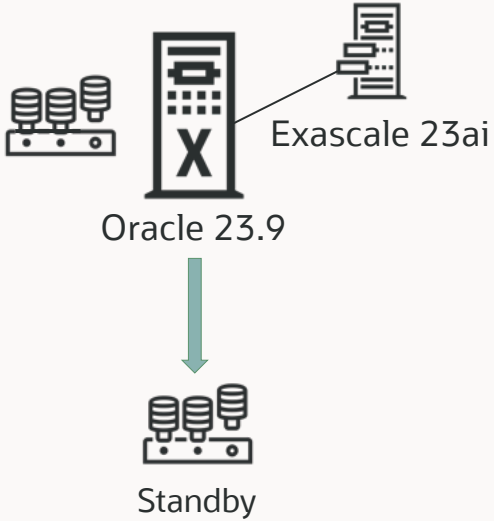

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Remarks

Yes!!

- Migrated 150 PDBs from TEST & DEV within less than 4 weeks
- Migrated larger environments already
- ExaScale snapshots are super-fast

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Customer

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Upgrade

Success?

Remarks

Standby building

- There were some issues
- Refreshable Clones don't propagate
- PDB recovery isolation doesn't work as expected

A number of SRs had to be opened for various areas

Optimizer works very well

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It's better to fail in our lab, than in production

Oracle LiveLabs:
Hitchhiker's Guide for Upgrading to Oracle AI Database

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Key Learnings

1. Start preparing today
2. Go easy or go fast
3. Remember the final touches

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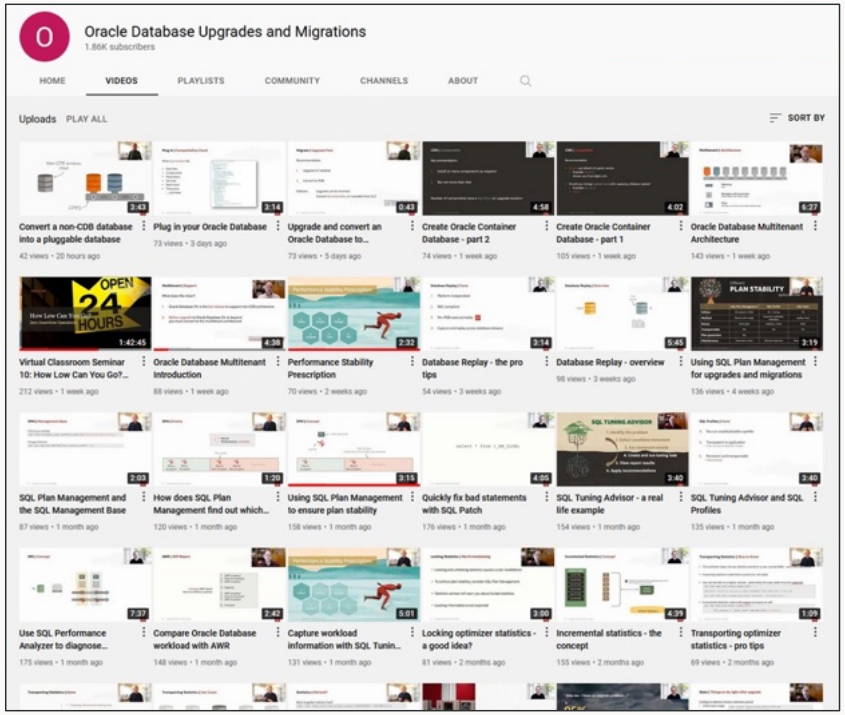
YouTube | Oracle Database Upgrades and Migrations



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SCAN ME

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MULTICLOUD AI WORLD

HYDERABAD & BENGALURU

Conference Session:

Upgrade to Oracle AI Database 26ai Multicloud Edition

Your Voice Matters
Let Me Know
How I Did

Daniel Overby Hansen

Distinguished Product Manager

Oracle Denmark

ORACLE