Upgrade to Oracle 19c and 21c

AutoUpgrade – Bootcamp

Mike Dietrich

Distinguished Product Manager
Database Upgrade and Migrations

Daniel Overby Hansen

Senior Principal Product Manager
Database Cloud Migrations

ORACLE

Photo by Marc Rafanell López on Unsplash

Mike Dietrich

Distinguished Product Manager
Database Upgrade and Migrations

🅱 https://MikeDietrichDE.com

in MikeDietrich

🐦 @MikeDietrichDE

Daniel Overby Hansen

Senior Principal Product Manager
Database Cloud Migrations

🅱 https://dohdatabase.com

in dohdatabase

🐦 @dohdatabase

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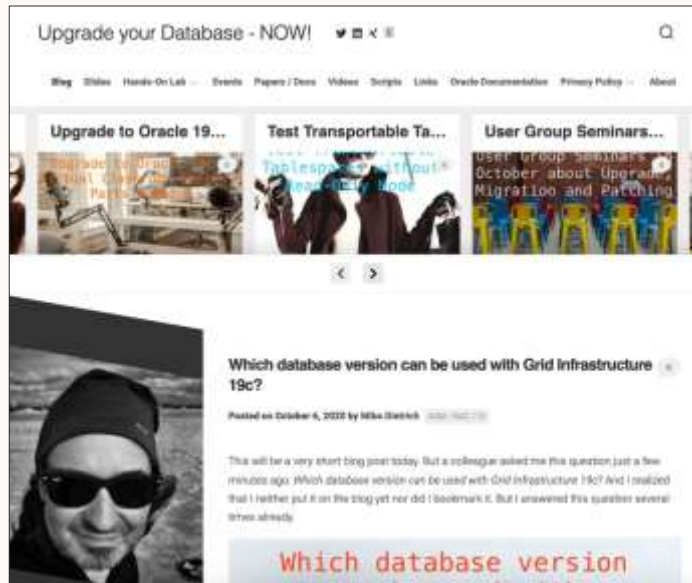https://MikeDietrichDE.com

https://www.dbarj.com.br/en/

https://DOHdatabase.com
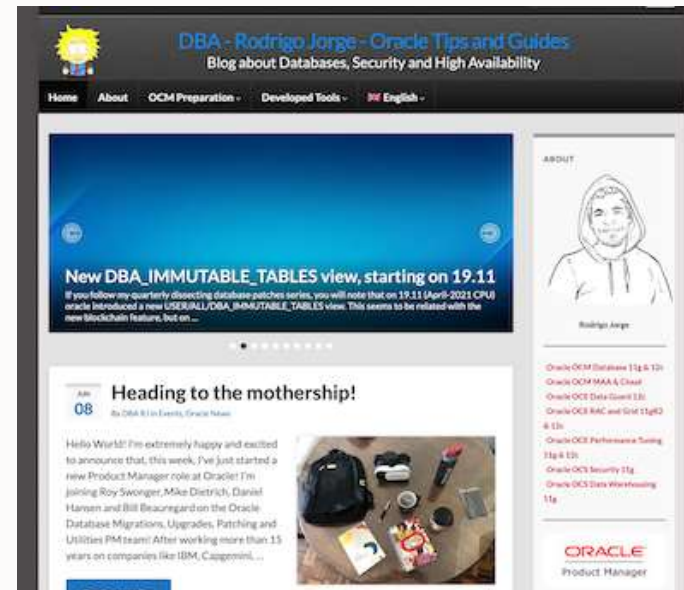
NEW Episode 1
Release and Patching Strategy
105 minutes – Feb 4, 2021

NEW Episode 2
AutoUpgrade to Oracle Database 19c
115 minutes – Feb 20, 2021

NEW Episode 3
Performance Stability, Tips and Tricks and Underscores
120 minutes – Mar 4, 2021

NEW Episode 4
Migration to Oracle Multitenant
120 minutes – Mar 16, 2021

NEW Seminar 5
Migration Strategies – Insights, Tips and Secrets
120 minutes – Mar 25, 2021

NEW Seminar 6
Move to the Cloud – Not only for techies
115 minutes – Apr 8, 2021

NEW Episode 7
Cool Features – Not only for DBAs
110 minutes – Jan 14, 2021

NEW Episode 8
Database Upgrade Internals – and so much more

Recorded Web Seminars

https://MikeDietrichDE.com/videos/

https://dohdatabase.com/webinars/

Chapter 1
Release and Patching Strategy

Photo by Joel Rivera-Camacho on Unsplash

Release Types | Long Term Support vs Innovation Releases

Long Term Support Release

- 5 years of Premier Support followed by 3 years of Extended Support

Innovation Release

- 2 years of Premier Support, but there is no Extended Support

Innovation												
	Long Term Support		EXTENDED									
		Innovation										
			Long Term Support		EXTENDED							

■ Premier Support   ■ Paid Extended Support
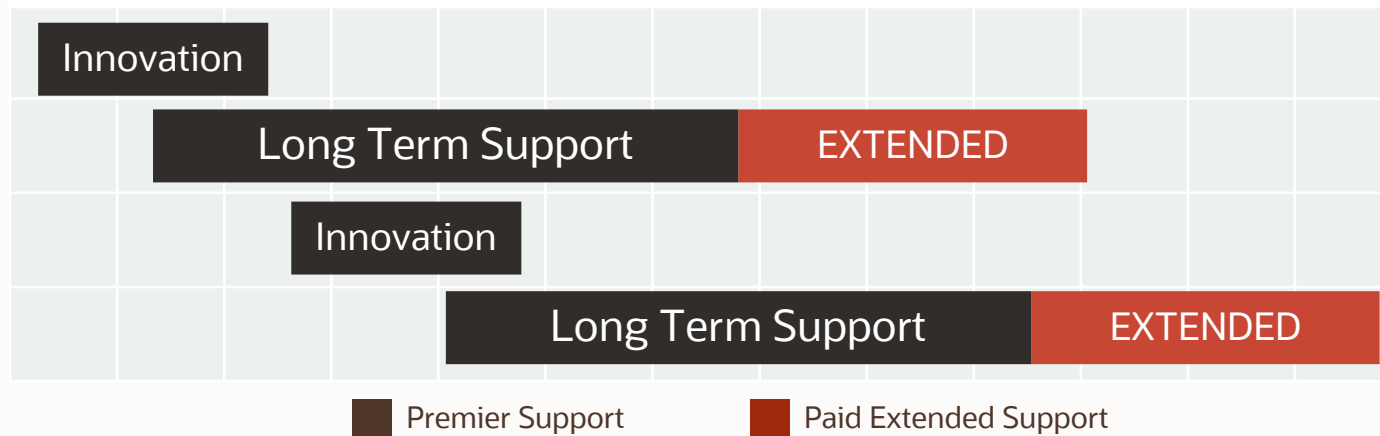
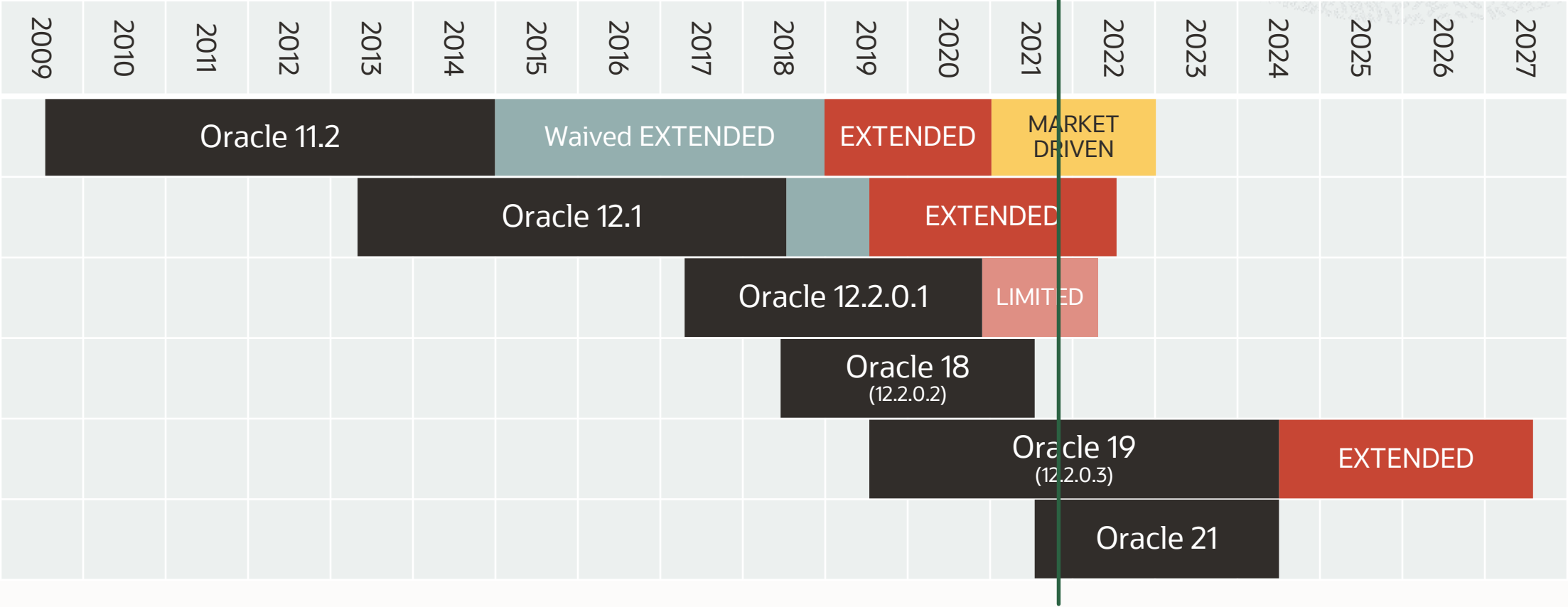Recommendation: Production environments should go from LTS to LTS

Release Types | Long Term vs Innovation

Pro Tip
Move production databases
from one Long Term Support release to the next

Lifetime Support Policy

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027

Oracle 11.2 — Premier Support (2009–2015), Waived EXTENDED (2015–2019), EXTENDED (2019–2021), MARKET DRIVEN (2021–2022)

Oracle 12.1 — Premier Support (2013–2018), Waived Extended (2018–2019), EXTENDED (2019–2022)

Oracle 12.2.0.1 — Premier Support (2017–2021), LIMITED (2021–2022)

Oracle 18 (12.2.0.2) — Premier Support (2018–2021)

Oracle 19 (12.2.0.3) — Premier Support (2019–2024), EXTENDED (2024–2027)

Oracle 21 — Premier Support (2021–2023)

Legend:
- Premier Support
- Waived Extended Support
- Paid Extended Support
- Market Driven Support
- Limited Error Correction

Lifetime Support Policy

Different Support Periods

■ Premier Support

■ Paid Extended Support

■ Waived Extended Support

■ Market Driven Support

■ Limited Error Correction

■ Sustaining Support

Bug fixing support regardless of severity

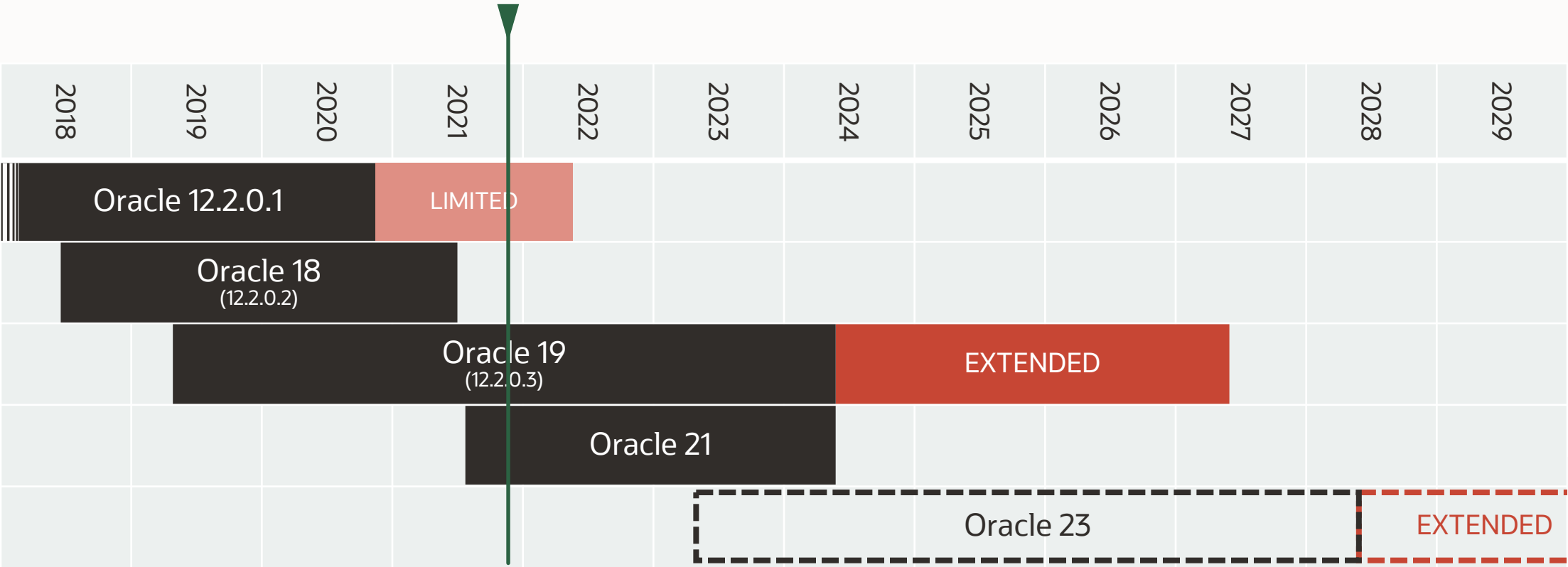Extra cost extension, 10% / 20% extra cost
Included in ULA/PULA contracts

Extended support gets waived to everybody
having a valid Support contract for the product

Extra cost extension after Extended Support
Fixes done only for critical and security issues

Extension for Oracle 12.2.0.1 at no extra cost
Only applicable for Sev.1 and security issues

Oracle Support assists as long as the customer
is using the product – but no new fixes will be delivered

Oracle Database 12.2 and beyond

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029

Oracle 12.2.0.1 — LIMITED

Oracle 18 (12.2.0.2)

Oracle 19 (12.2.0.3) — EXTENDED

Oracle 21

Oracle 23 — EXTENDED

- MOS Note:742060.1 – The Single Source of Truth
- MOS Note:161818.1 – Releases Support Status Summary

Security

The most important reason
to upgrade and patch

Security | Do We Really Need To Say This?

Source: https://www.nytimes.com/2019/07/22/business/equifax-settlement.html?module=inline

nytimes.com

Equifax to Pay at Least $650 Million in Largest-Ever Data Breach Settlement

By Stacy Cowley

"My database is not facing the internet"

Photo by Ben White on Unsplash

92%
of malware gets
delivered via email

Photo by Clint Patterson on Unsplash

Check | OJVM

Is OJVM installed?

```
Select comp_id, comp_name, version from DBA_REGISTRY order by 1;


COMP_ID        COMP_NAME                                VERSION
---------      -------------------------------          ----------------
CATALOG        Oracle Database Catalog Views            19.9.0.0.0

CATJAVA        Oracle Database Java Packages            19.9.0.0.0

CATPROC        Oracle Database Packages and Types       19.9.0.0.0

JAVAVM         JServer JAVA Virtual Machine             19.9.0.0.0

OLS            Oracle Label Security                    19.9.0.0.0

ORDIM          Oracle Multimedia                        19.9.0.0.0

OWM            Oracle Workspace Manager                 19.9.0.0.0

XDB            Oracle XML Database                      19.9.0.0.0

XML            Oracle XDK                               19.9.0.0.0
```

Oracle Java Virtual Machine | OJVM

OJVM Security Fixes in Quarterly Patches: ∅ 7.9

Highest single OJVM Base Score per Security Alert since January 2015

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Chapter 2

Upgrade to Oracle Database 19c

your key to
Successful Database Upgrades

Step 1
Download and
install Oracle 19c

eDelivery.oracle.com

Step 2
Download and
install newest RU

MOS Note: 2118136.2

Step 3
Download and use
AutoUpgrade

MOS Note: 2485457.1

Step 4
Performance Stability
with SPM, STA and RAT

Get started | Quick Start Guide

Simple overview
Read it, try it
Download from oracle.com

Oracle Database Upgrade:
Quick Start Guide

A quick reference to a successful Oracle Database upgrade
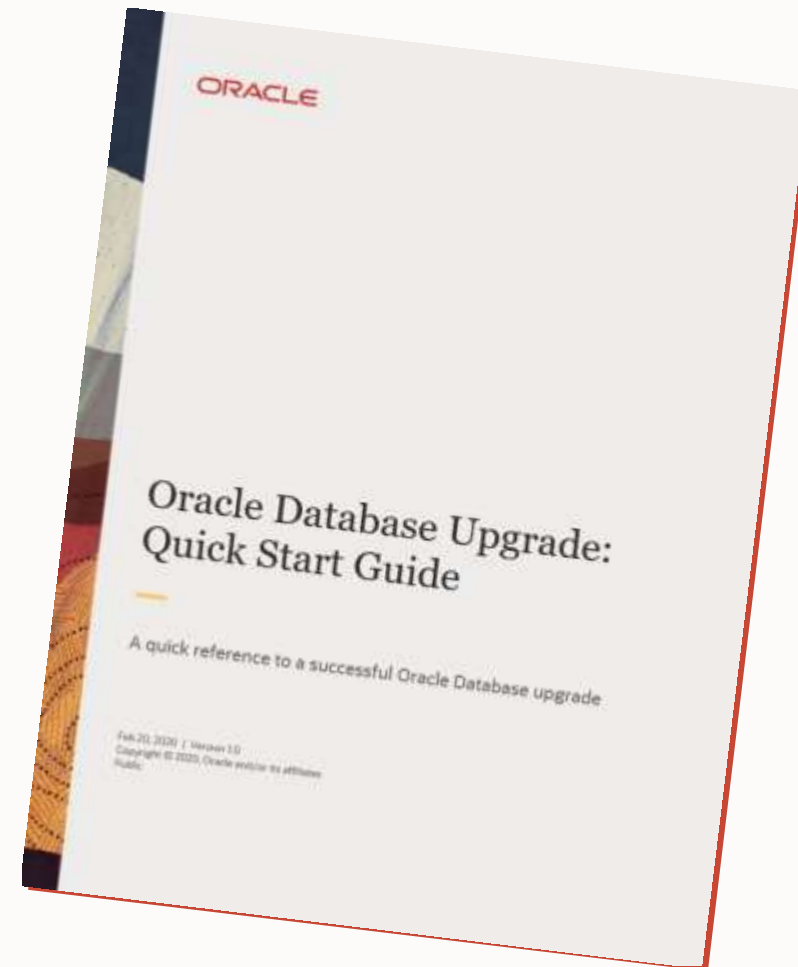
Basic Facts | Upgrade vs Migration vs Patching

Database Upgrade
- AutoUpgrade
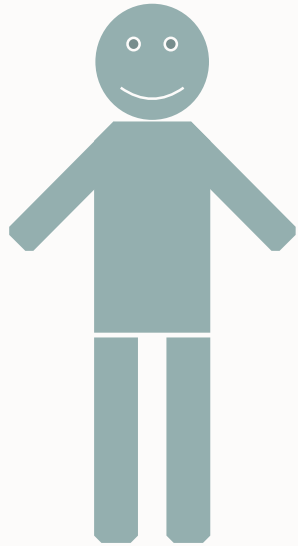
Oracle **18**.6.0 → Oracle **19**.12.0

Database Migration
- Data Pump, TTS, FTEX
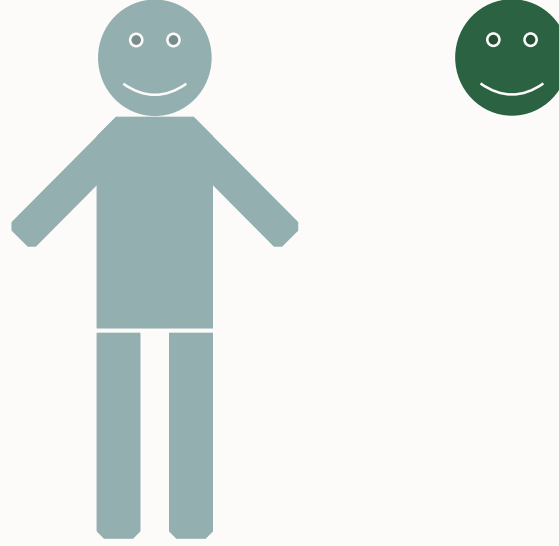
Oracle 11.2.0.3 → Oracle 19.12.0

Database Patching
- opatch
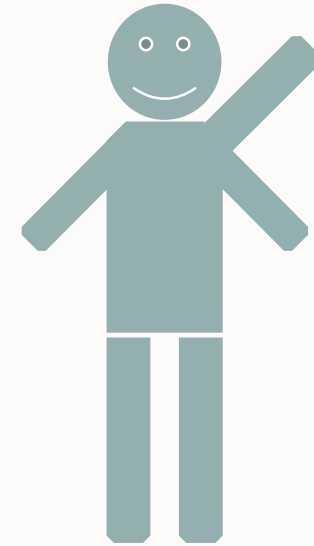
Oracle 19.**3**.0 → Oracle 19.**12**.0

Basic Facts | Upgrade vs Migration vs Patching

Database Upgrade

- AutoUpgrade

  - New binaries
  - Same OS family
  - Same or new hardware

  - Requires always downtime
  - Amount of data irrelevant

Database Migration

- Data Pump, TTS, FTEX

  - New binaries
  - Often different OS
  - Often different HW
  - Upgrade happens implicitly

  - Requires always downtime
  - Amount of data very relevant

Database Patching

- opatch

  - New binaries
  - Ideally a new home
  - Same hardware
  - No upgrade, patching only

  - No downtime only with RAC
  - Amount of data irrelevant

Patch Download Assistant | Find the newest RU

Always use the Patch Download Assistant note MOS Note: 2118136.2

Most Important Fixes | Apply on top of the RU

Important recommended one-off patches: MOS Note: 555.1

Recommended Patches for 19.12 DB Home

Below is the list of important patches to consider applying on top of 19.12

Bug	Fixed in RU	Description	Patches	Added
33121934		Library cache lock / load lock / mutex x during connection storm	[list-patches]	24/Sep/21
32651063		Rebalance / Resync Takes a Long Time Due to Working on One Disk At a Time	[list-patches]	02/Sep/21
29213893		DBMS_STATS Failing With Error Ora-1422 When Gathering Stats for User$ Table	[list-patches]	01/Sep/21
33027539		ogg integrated extract abends with ORA-600 [krvxfixupcolinfo20]	[list-patches]	01/Sep/21
32544464		ExaData Flash Failure Test Causes Control File Extent Set Corruption - ORA-700 [kffscrubdumpextentset_onsuspiciousblks]	[list-patches]	20/Aug/21
33009224		FBDA Process Consuming CPU, After Patching DB With 19.11RU	[list-patches]	18/Aug/21
31002346		ASM Stuck At resync For More Than 7 Hours	[list-patches]	18/Aug/21
33144001		RMAN: Restore operations of any kind fail with an ORA-7445 [_intel_avx_rep_memcpy] / [SIGSEGV] [Address not mapped to object] with "krbipIntLocalize" in call stack.	[list-patches]	06/Aug/21
30978304		ORA-20000 During Data Pump Import While Importing Statistics	[list-patches]	03/Aug/21
32530202		Wrong Results from Subquery Execution due to regression of 27864047	[list-patches]	29/Jul/21
32662165		ORA-12801 & ORA-22922: nonexistent lob value on Exadata RAC When Creating Index in Parallel	[list-patches]	29/May/21
31602782		Contention on "CURSOR: PIN S WAIT ON X" when PQ slave's execution plan does not match with QC	[list-patches]	02/Dec/20

Recommended Patches for 19.12 GI Home

Below is the list of important patches to consider applying on top of 19.12
Only one OCW (Oracle Clusterware) patch should be applied to GI homes. Ensure you apply the patch starting with X8M if you are on an X8M system

Bug	Fixed in RU	Description	Patches	Added
32651063		Rebalance / Resync Takes a Long Time Due to Working on One Disk At a Time	[list-patches]	02/Sep/21
31002346		ASM Stuck At resync For More Than 7 Hours	[list-patches]	18/Aug/21

Basic Facts | Upgrade happens mostly parallel

A number of parallel processes

- Minimum 1

- Maximum 8

- Default 4

Basic Facts | How long does an upgrade take?

Things that matter a lot
- Number of installed components
- Size & complexity of data dictionary

Things that matter a little
- CPU and disk speed
- SGA/PGA

Things that don't matter
- Amount of user data

```
Component                             HH:MM:SS
Oracle Server                         00:16:17
JServer JAVA Virtual Machine          00:05:19
Oracle Workspace Manager              00:01:01
Oracle Enterprise Manager             00:10:13
Oracle XDK                            00:00:48
Oracle Text                           00:00:58
Oracle XML Database                   00:04:09
Oracle Database Java Packages         00:00:33
Oracle Multimedia                     00:07:43
Gathering Statistics                  00:04:53


Total Upgrade Time: 00:52:01
```

```
Component                             HH:MM:SS
Oracle Server                         00:16:17
JServer JAVA Virtual Machine          00:05:19
Oracle XDK                            00:00:48
Oracle Text                           00:00:58
Oracle XML Database                   00:04:09
Oracle Database Java Packages         00:00:33
Gathering Statistics                  00:02:43



Total Upgrade Time: 00:30:47
```

Check

Before Upgrade

Database Upgrade | Supported Releases

Older → → 19c

11.2.0.4 → 19c

12.1.0.2 → 19c

12.2.0.1 → 19c

18c → 19c
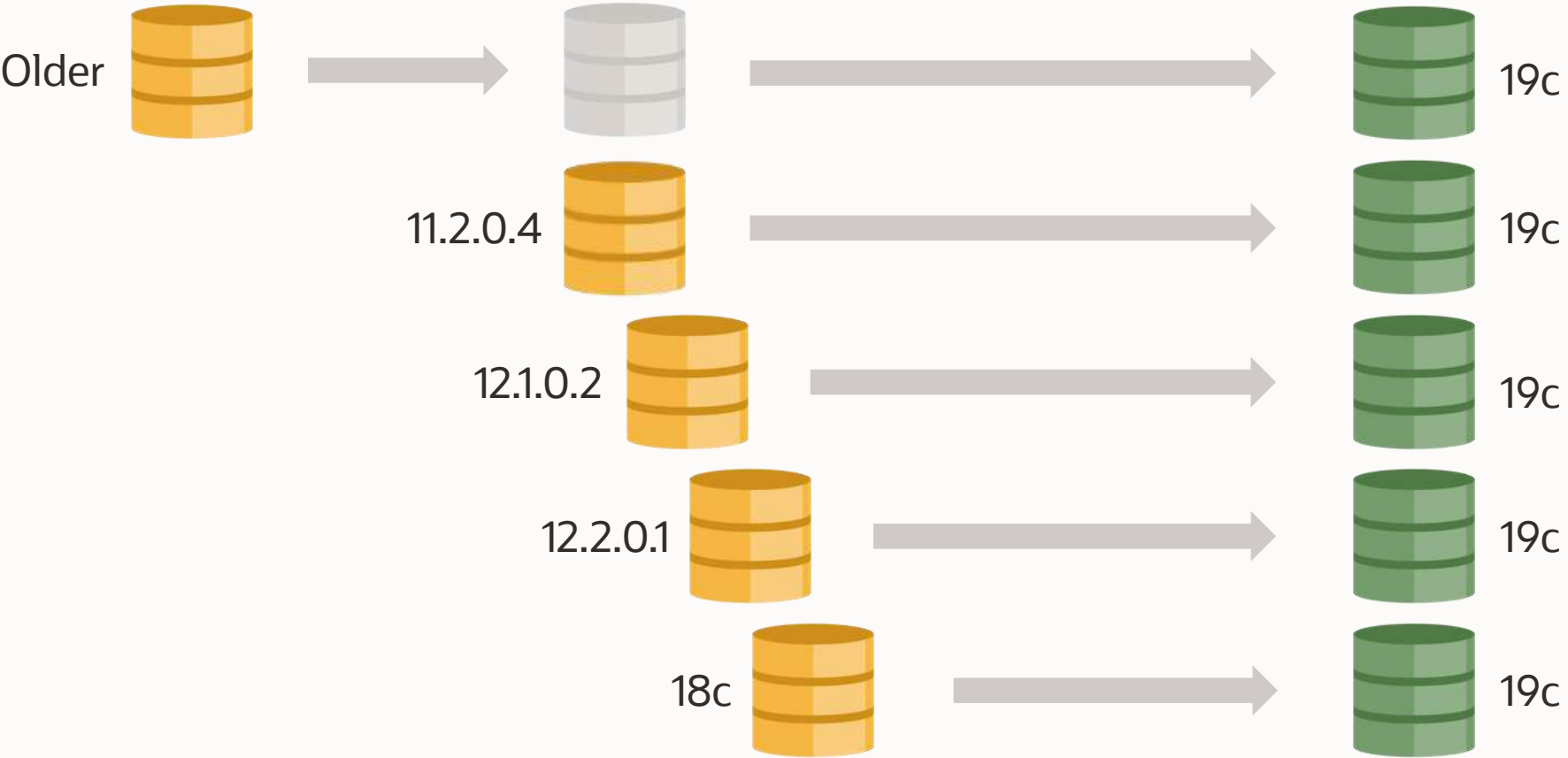
Database Upgrade | Supported Releases
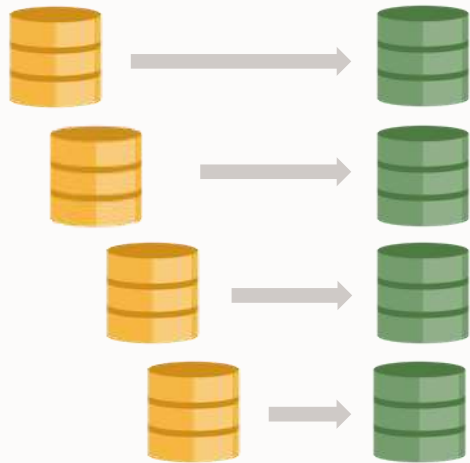
Database / Oracle / Oracle Database / Release 19

Database Upgrade Guide

Oracle Database Releases That Support Direct Upgrade

Review the supported options for direct upgrades to the latest Oracle Database release.

You can perform a direct upgrade to the new release from the following releases:

- 11.2.0.4
- 12.1.0.2
- 12.2.0.1
- 18

Database Upgrade Guide

Database Upgrade | Intermediate Upgrades

Older ➡ 🗄 ➡ 19c

- Ideally - upgrade as far as possible in the intermediate upgrade

- But often there is a platform upgrades as well

- So - it depends

APEX | Upgrade APEX upfront

APEX upgrade

- Not part of the database upgrade
- MOS Note: 1088970.1 - Master Note APEX Upgrades

APEX certification

- Minimum APEX Version for Oracle 19c: APEX 18.2
- MOS Note: 1344948.1 - APEX Database and Web Server Certification

Download the newest APEX

- https://www.oracle.com/tools/downloads/apex-v191-downloads.html
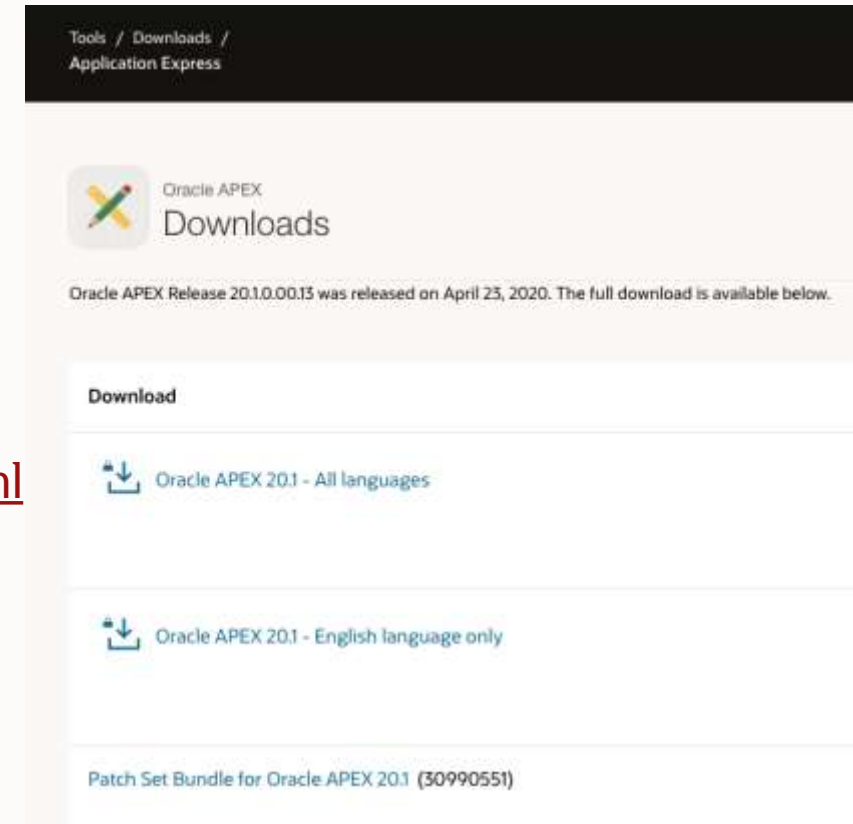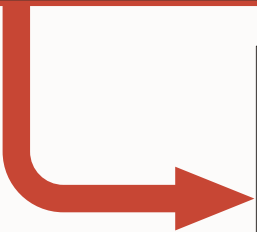
Upgrade 19c | Speed it up

Check when dictionary stats have been gathered the last time

```sql
SELECT
    to_char(max(end_time),'dd-mon-yy hh24:mi') latest, operation
FROM
    dba_optstat_operations
WHERE
    operation in ('gather_dictionary_stats', 'gather_fixed_objects_stats')
GROUP BY
    operation;
```

```
LATEST                      OPERATION
-------------------------   ------------------------------
13-SEP-19 11:52             gather_fixed_objects_stats
18-APR-19 23:59             gather_dictionary_stats
```

Refresh stats a day before the upgrade

Upgrade 19c | Gather Stats In Advance
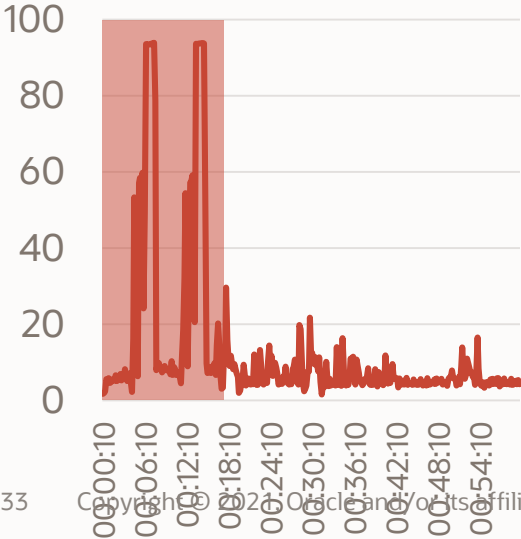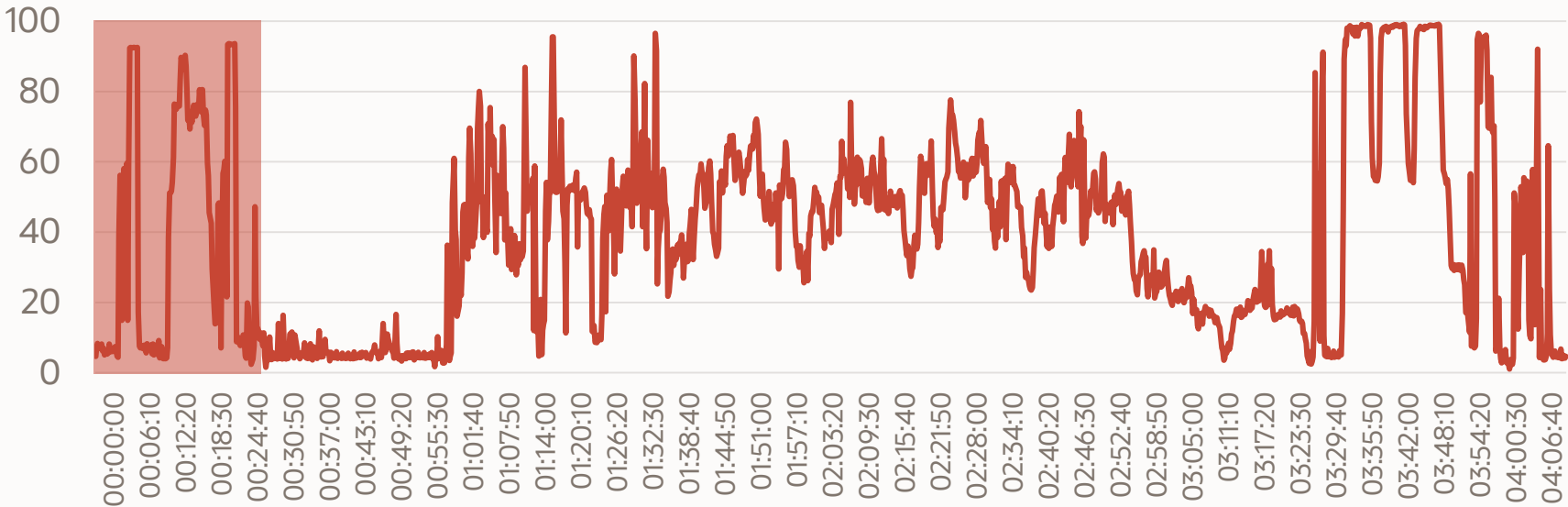
Gathering stats in advance saves 12 minutes

Health Check | hcheck.sql

If your database is highly important, do a health check

- Lightweight, non-intrusive script
- Checks consistency of selected dictionary relationships
- hcheck.sql – Script to Check for Known Problems (MOS Note: 136697.1)

```
SQL> @/tmp/hcheck
H.Check Version 4.4 on 01-MAR-2018 23:46:27
--------------------------------------------
Catalog Version 11.2.0.4.0 (1102000400)
db_name: UPGR


                                Catalog      Fixed
Procedure Name                  Version   Vs Release     Timestamp
Result
----------------------------  ...  ----------  --  ----------  ---------------
------
.- LobNotInObj                ...  1102000400  <=  *All Rel*  03/01 23:46:27 PASS
.- MissingOIDOnObjCol          ...  1102000400  <=  *All Rel*  03/01 23:46:27 PASS
.- SourceNotInObj             ...  1102000400  <=  *All Rel*  03/01 23:46:27 FAIL

HCKE-0003: SOURCE$ for OBJ# not in OBJ$ (Doc ID 1360233.1)
SOURCE$ has 4 rows for 1 OBJ# values not in OBJ$

.- OversizedFiles             ...  1102000400  <=  *All Rel*  03/01 23:46:27 PASS
```

AutoUpgrade

The ONLY recommended way to upgrade databases

Upgrade | AutoUpgrade - As Easy As 1-2-3

START	1. DOWNLOAD	2. CONFIG	3. DEPLOY	SUCCESS

Supported source releases

- 11.2.0.4
- 12.1.0.2
- 12.2.0.1
- 18
- 19

All architectures (CDB and non-CDB)
All supported operating systems
All editions (SE2, EE)
All types (single instance and RAC)

Upgrade | AutoUpgrade - As Easy As 1-2-3

START	1. DOWNLOAD	2. CONFIG	3. DEPLOY	SUCCESS

Download from My Oracle Support ID 2485457.1

Upgrade | AutoUpgrade - As Easy As 1-2-3

START	1. DOWNLOAD	2. CONFIG	3. DEPLOY	SUCCESS

Simple text file

```
upg1.source_home=/u01/app/oracle/product/12.2.0.1
upg1.target_home=/u01/app/oracle/product/19
upg1.sid=CDB1
```

Upgrade | AutoUpgrade - As Easy As 1-2-3

START	1. DOWNLOAD	2. CONFIG	3. DEPLOY	SUCCESS

One command

```
$ java -jar autoupgrade.jar -config cdb1.cfg -mode deploy
```

Advanced monitoring and logging

Upgrade | AutoUpgrade - As Easy As 1-2-3

START	1. DOWNLOAD	2. CONFIG	3. DEPLOY	SUCCESS

Supported target releases
- 12.2.0.1
- 18
- 19
- 21
- Any future release

AutoUpgrade | Need And Don't Need

JAVA	JAR FILE	AGENTS	ENTERPRISE MANAGER	DBUA	EXTRA LICENSE
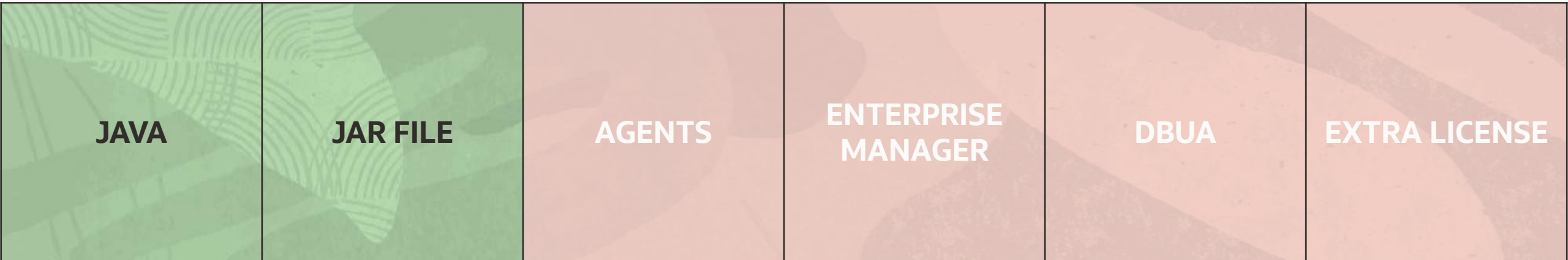
- Java 8 required
  - Part of Oracle Home since 12.1.0.2

- 3 MB jar file

AutoUpgrade | Need And Don't Need

JAVA	JAR FILE	AGENTS	ENTERPRISE MANAGER	DBUA	EXTRA LICENSE

- No agents to install

- Enterprise Manager not needed

- AutoUpgrade offers superior functionality

- No extra license

AutoUpgrade Essentials

AutoUpgrade | Essentials

Download
Configure
Analyze
Check
Upgrade

Always download <u>latest version</u> from MOS

AutoUpgrade | Essentials

Download

Configure

Analyze

Check

Upgrade

Check your version

```
$ java -jar autoupgrade.jar -version

build.hash 57ab246
build.version 21.1.3
build.date 2021/04/21 13:32:13
build.max_target_version 21
build.supported_target_versions 12.2,18,19,21
build.type production
```

Compare to latest version on MOS

Download

The most recent version of AutoUpgrade can be downloaded via this link: version 20210421.

AutoUpgrade | Essentials

Download

Configure

Analyze

Check

Upgrade

Shortest possible config file version

```
upg1.source_home=/u01/app/oracle/product/12.2.0.1
upg1.target_home=/u01/app/oracle/product/19
upg1.sid=CDB1
```

Or, generate a sample config file

```
$ java -jar autoupgrade.jar -create_sample_file config

Created sample configuration file /home/oracle/sample_config.cfg
```

Pro tip: *upg1* is a prefix that you decide.
Use it to define multiple databases

AutoUpgrade | Essentials

Download

Configure

Analyze

Check

Upgrade

Analyze your database

```
$ java -jar autoupgrade.jar -config CDB1.cfg -mode analyze

...

upg> Job 100 completed

Please check the summary report at:
/u01/app/oracle/cfgtoollogs/autoupgrade/cfgtoollogs/upgrade/auto/status/status.html
/u01/app/oracle/cfgtoollogs/autoupgrade/cfgtoollogs/upgrade/auto/status/status.log
```

Pro tip: Analyze is similar to running `preupgrade.jar`

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AutoUpgrade | Essentials

Download
Configure
Analyze
Check
Upgrade

Summary report - text

```
===========================================
          Autoupgrade Summary Report
===========================================
[Date]              Tue Jan 12 10:26:19 CET 2021
[Number of Jobs] 1
===========================================
[Job ID] 100
===========================================

[DB Name]                  CDB1
[Version Before Upgrade] 12.2.0.1.0
[Version After Upgrade]  19.9.0.0.0
-------------------------------------------
[Stage Name]     PRECHECKS
[Status]         SUCCESS
[Start Time]     2021-01-12 10:25:58
[Duration]       0:00:20
[Log Directory] /u01/app/oracle/upg/CDB1/100/prechecks
[Detail]         /u01/app/oracle/upg/CDB1/100/prechecks/cdb1_preupgrade.log
                 Precheck passed and no manual intervention needed
-------------------------------------------
```

AutoUpgrade | Essentials

Download
Configure
Analyze
Check
Upgrade

Summary report - HTML

AutoUpgrade | Essentials

Download

Configure

Analyze

Check

Upgrade

AutoUpgrade | Essentials

Download
Configure
Analyze
Check
Upgrade

Preupgrade report comes in:

- HTML
- Text
- JSON

AutoUpgrade | **Essentials**

Download
Configure
Analyze
Check
Upgrade

Upgrade

```
$ java -jar autoupgrade.jar -config CDB1.cfg -mode deploy
```

Have a cup of coffee and wait, or …

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AutoUpgrade | Essentials

Download

Configure

Analyze

Check

Upgrade

Monitor

```
upg> lsj

+----+-------+--------+--------+------+------------+------+-----------+
|Job#|DB_NAME|   STAGE|OPERATION| STATUS|  START_TIME| UPDATED|    MESSAGE|
+----+-------+--------+--------+------+------------+------+-----------+
| 101|   CDB1|PREFIXUPS|EXECUTING|RUNNING|20/11/24 13:38|13:39:26|Remaining 12/13|
+----+-------+--------+--------+------+------------+------+-----------+
```

AutoUpgrade | Essentials

Download

Configure

Analyze

Check

Upgrade

All the details

```
upg> status -job 101

Progress
------------------------------------
Start time:        20/11/24 13:38
Elapsed (min):     13
Last update:       2020-11-24T13:48:52.139
Stage:             DBUPGRADE
Operation:         EXECUTING
Status:            RUNNING
Stage summary:
    SETUP               <1 min
    GRP                 <1 min
    PREUPGRADE          <1 min
    PRECHECKS           <1 min
    PREFIXUPS           8 min
    DRAIN               <1 min
    DBUPGRADE           3 min (IN PROGRESS)


Job Logs Locations
------------------------------------
Logs Base:     /home/oracle/autoupg_default/CDB1/CDB1
Job logs:      /home/oracle/autoupg_default/CDB1/CDB1/101
Stage logs:    /home/oracle/autoupg_default/CDB1/CDB1/101/dbupgrade
TimeZone:      /home/oracle/autoupg_default/CDB1/CDB1/temp
```

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AutoUpgrade | Essentials

Download
Configure
Analyze
Check
Upgrade

All the details - continued

```
...

Additional information
-----------------------------------
Details:
[Upgrading] is [0%] completed for [cdb1-cdb$root]
                 +---------+---------------+
                 |CONTAINER|     PERCENTAGE|
                 +---------+---------------+
                 | CDB$ROOT|    UPGRADE[12%]|
                 | PDB$SEED|UPGRADE PENDING|
                 |     PDB3|UPGRADE PENDING|
                 +---------+---------------+


Error Details:
None
```

AutoUpgrade | Essentials

Download
Configure
Analyze
Check
Upgrade

Success

```
upg> Job 101 completed
------------------- Final Summary --------------------
Number of databases             [ 1 ]

Jobs finished successfully      [1]
Jobs failed                     [0]
Jobs pending                    [0]
------------- JOBS FINISHED SUCCESSFULLY -------------
Job 101 for CDB1

---- Drop GRP at your convenience once you consider it is no longer needed ----
Drop GRP from CDB1: drop restore point AUTOUPGRADE_9212_CDB1122010
```

And it includes:

- Recompilation (utlrp.sql)
- Time zone file upgrade
- Postupgrade fixups
- … and so much more

AutoUpgrade | **Essentials**

Download

Configure

Analyze

Check
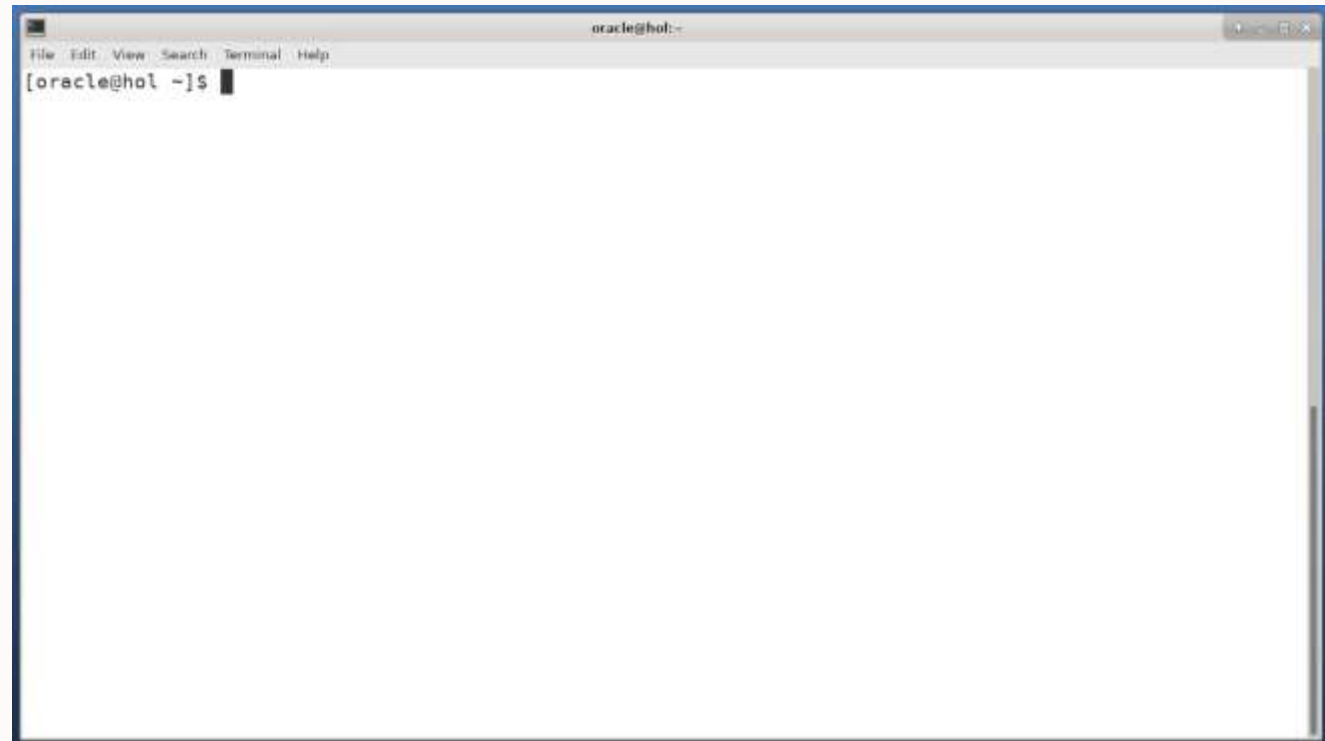
Upgrade

Case by Case

AutoUpgrade to a New Server

Upgrade to a new server | Overview

Source System

Target System

autoupgrade.jar

autoupgrade.jar

-analyze   -fixups

-upgrade

```
$ java -jar autoupgrade.jar -mode analyze ...

$ java -jar autoupgrade.jar -mode fixups ...

                                              $ java -jar autoupgrade.jar -mode upgrade ...
```

Upgrade to a new server | Details

Source Server

```
upg1.source_home=/u01/app/oracle/product/12
upg1.target_home=/u01/app/oracle/product/19
upg1.sid=DB12
```

- `-mode analyze`
- `-mode fixups`
- `shutdown immediate`

Target Server

- Update `/etc/oratab`
- Prepare `?/network/admin` files

Copy database including redo logs, control files, SPFILE, password file

- `STARTUP UPGRADE`

```
upg1.source_home=/tmp
upg1.target_home=/u01/app/oracle/product/19
upg1.sid=DB12
```

- `-mode upgrade`

Pro tip: Find more details in blog post
Oracle AutoUpgrade between two servers

Unplug – Plug – Upgrade ... and even more

Upgrade | Unplug – Plug - Upgrade

CDB$ROOT

PDB$SEED

PDB1

Higher release
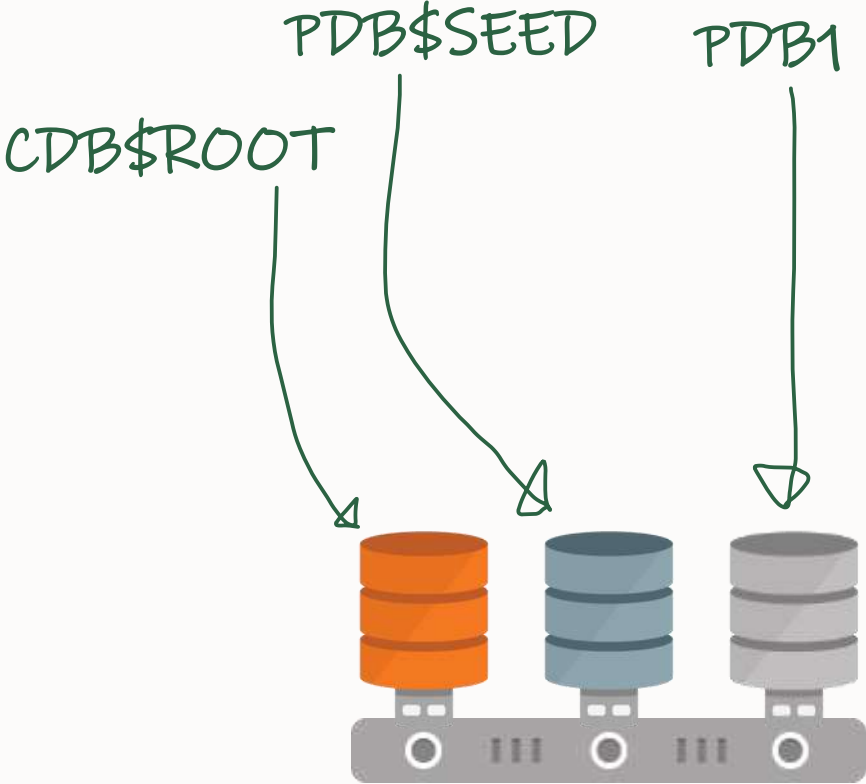
Unplug - Plug - Upgrade | **Preparation**

Clone User

```
CREATE USER c##borg
IDENTIFIED BY s3cr3t
DEFAULT TABLESPACE users
TEMPORARY TABLESPACE temp
CONTAINER=ALL;
```

```
GRANT
 CREATE SESSION,
 CREATE PLUGGABLE DATABASE,
 SELECT_ANY_CATALOG
TO c##borg
CONTAINER = ALL;
```
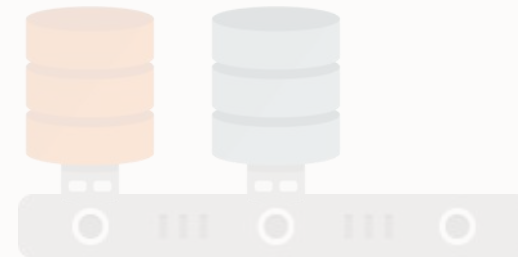
# Unplug / Plug / Upgrade | Preparation

Database link into source PDB

```
CREATE DATABASE LINK clonePDB1
CONNECT TO c##borg
IDENTIFIED BY s3cr3t
USING 'tns-or-ezconnect';
```
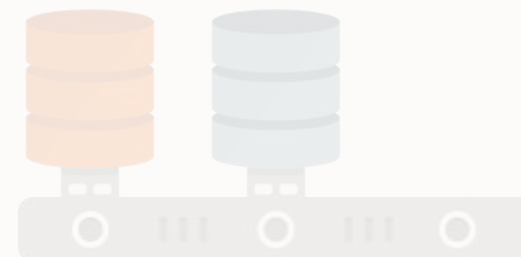
Unplug / Plug / Upgrade | AutoUpgrade

Fully automated relocation with upgrade

```
upg1.source_home=/u01/app/oracle/prod/19
upg1.target_home=/u01/app/oracle/prod/21
upg1.sid=CDB19
upg1.pdbs=pdb1
upg1.target_cdb=CDB21
upg1.source_dblink.pdb1=clonePDB1
```
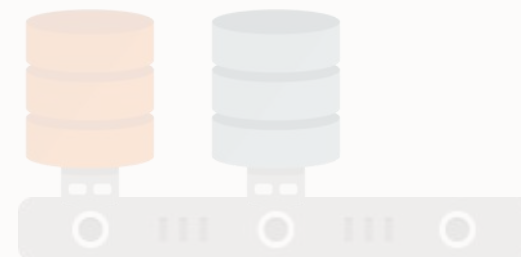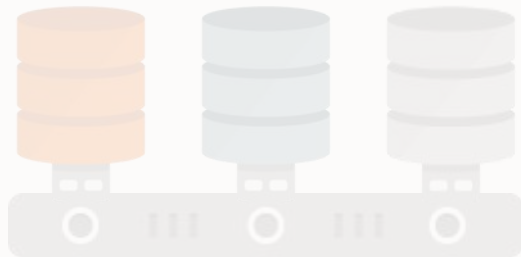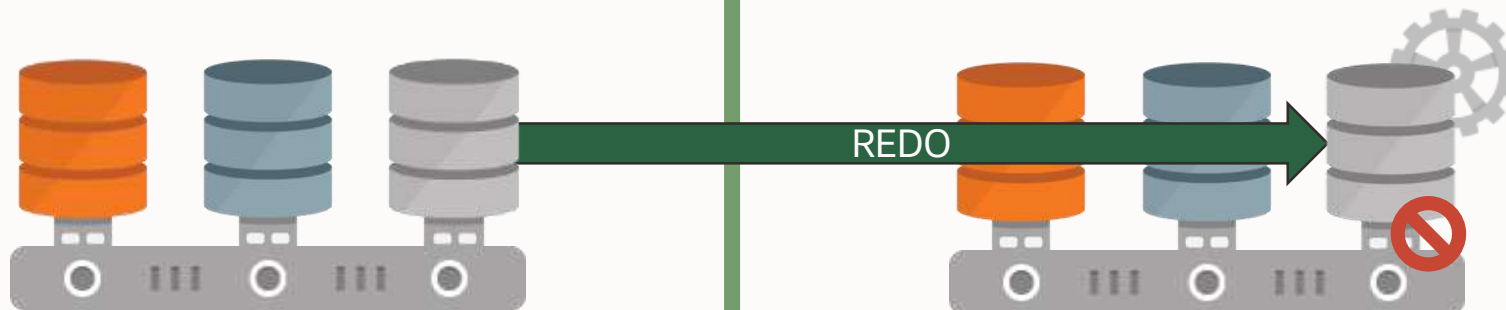
AutoUpgrade | Unplug-plug via Refreshable Clone PDB

Refreshable clone

```
upg1.source_home=/u01/app/oracle/prod/19
upg1.target_home=/u01/app/oracle/prod/21
upg1.sid=CDB19
upg1.pdbs=pdb1
upg1.target_cdb=CDB21
upg1.source_dblink.pdb1=clonePDB1 600
```

REDO

Photo by Philipp Katzenberger on Unsplash

Grid Infrastructure, Upgrade and Patching

AutoUpgrade | RAC

How to upgrade a RAC database

1. Upgrade Grid Infrastructure
   - Not covered by AutoUpgrade
   - Recommended to upgrade in advance

2. Upgrade Database
   - Upgrade with AutoUpgrade
   - Everything handled by AutoUpgrade

Recommendation: Keep GI and database patch level in sync

What if …

Tips and Tricks and Workarounds

AutoUpgrade | What if ... AutoUpgrade fails

1. Create zip file

```
$ java -jar autoupgrade.jar -config config.cfg -zip
```

2. Optionally, add `opatch lsinventory`

```
$ $ORACLE_HOME/OPatch/opatch lsinventory > opatch.txt
$ zip -r AUPG_210419_0735_461.zip opatch.txt
```

3. Upload it to My Oracle Support

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"We upgraded 735 databases to 19c, and the task was mostly relatively relaxed.
Start the AutoUpgrade tool and monitor the progress from time to time.

Sitting in front of the screen the whole time is not necessary."

Alain Fuhrer

(Former) Head IT Database Services

La Mobilière

Bern, Switzerland

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Thank you!

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