ORACLE

Huh? It is fixed in Oracle 23c! Seriously?

Insights into database development at Oracle

AOUG Anwenderkonferenz 2022 - *Back to live*

Mike Dietrich

Distinguished Product Manager

Database Upgrade
and Migrations

https://MikeDietrichDE.com

@MikeDietrichDE

mikedietrich

Daniel Overby Hansen

Senior Principal Product Manager
Cloud Migration

 https://dohdatabase.com

 @dohdatabase

 dohdatabase

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/

https://MikeDietrichDE.com   https://DOHdatabase.com

Warm-Up
Release and Patching Strategy

Photo by Reid Naaykens 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

Premier Support   Paid Extended Support
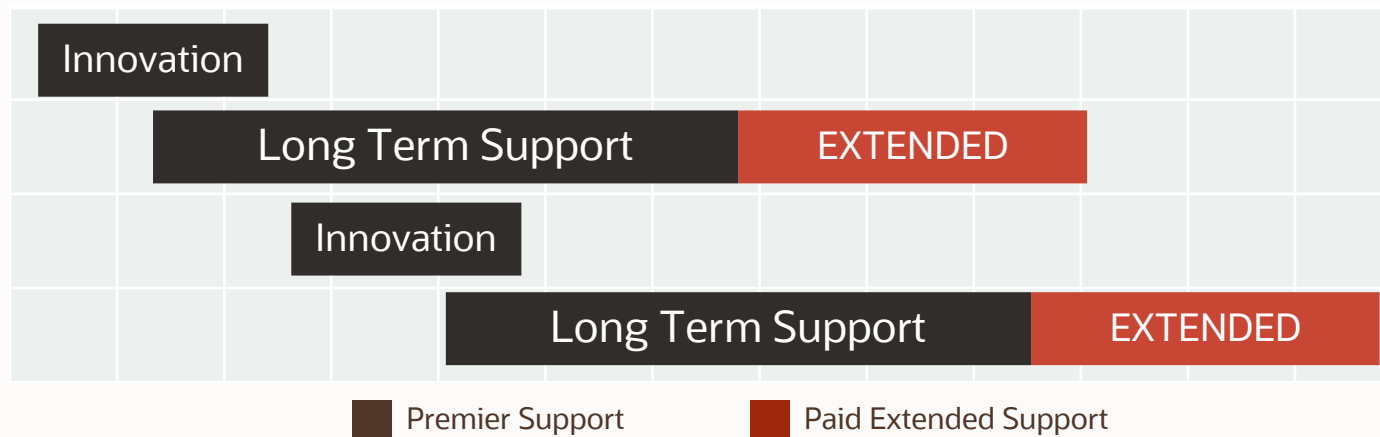
Pro Tip
Production databases should go from
one Long Term Support Release to the next

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 — Waived EXTENDED — EXTENDED — MARKET DRIVEN
- Oracle 12.1 — EXTENDED
- Oracle 12.2.0.1 — LIMITED
- Oracle 18 (12.2.0.2)
- Oracle 19 (12.2.0.3) — EXTENDED
- Oracle 21
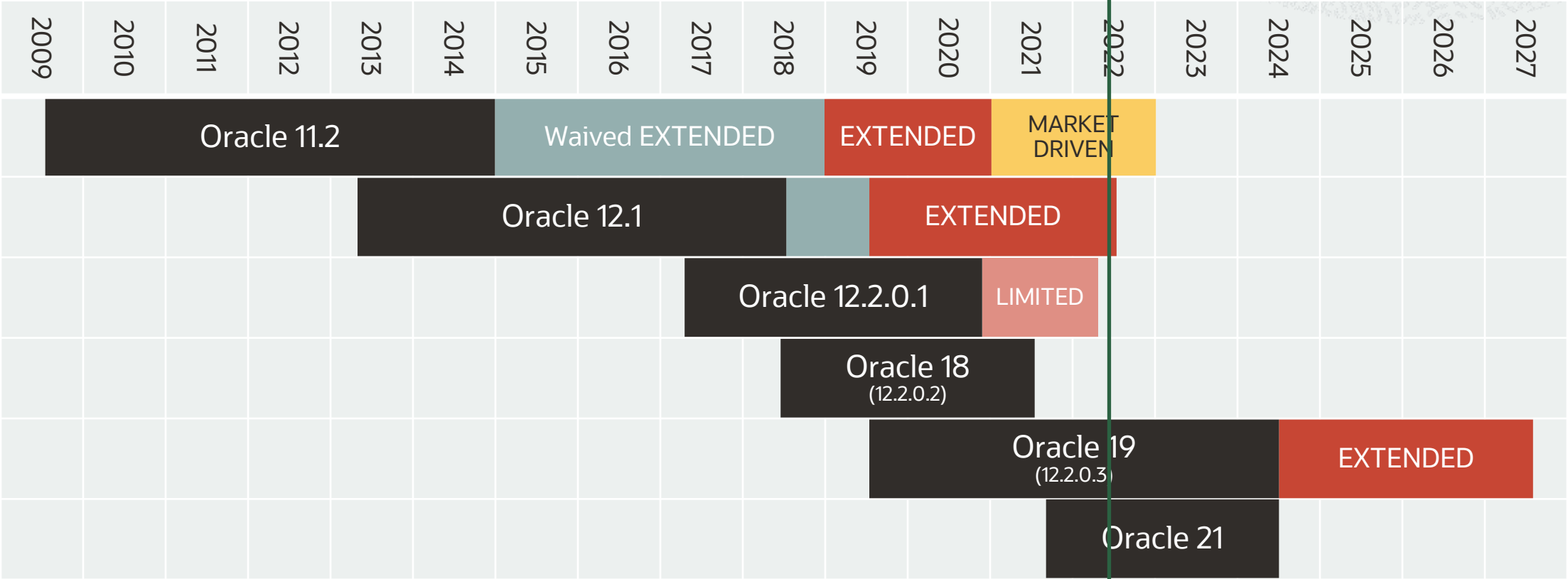
Legend:
- Premier Support
- Waived Extended Support
- Paid Extended Support
- Market Driven Support
- Limited Error Correction

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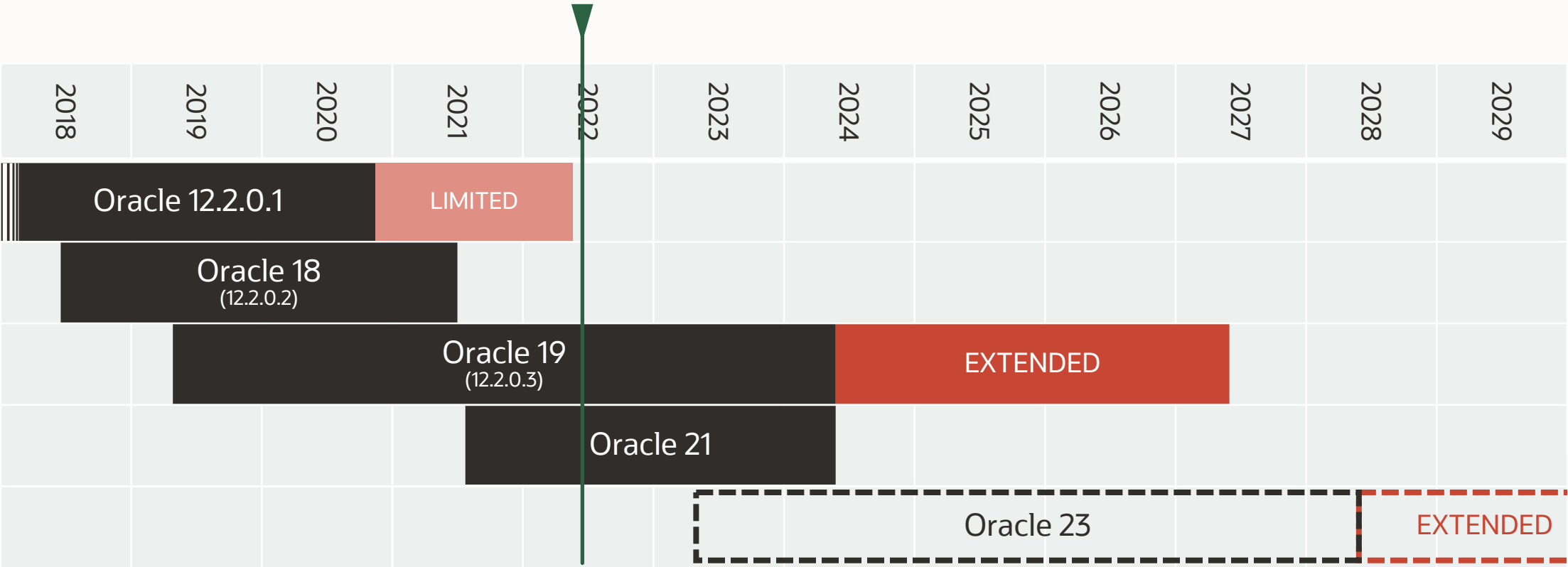
- MOS Note:742060.1 – The Single Source of Truth
- MOS Note:161818.1 – Releases Support Status Summary

Patching since Oracle Database 12.2
—

Updates (RU) and Revisions (RUR)

Patching | Release Update 1 (RU)

Base Release

Release Update 1

| Optimizer / off | Functional Fixes |
| Security Fixes | Regression Fixes |

Patching | Release Update 2 (RU)

Base Release

Release Update 1

Optimizer / off	Functional Fixes
Security Fixes	Regression Fixes

Release Update 2

Optimizer / off	Functional Fixes
Security Fixes	Regression Fixes

Patching | Release Update Revision 1 (RUR)

Base Release

Release Update 1

Optimizer / off	Functional Fixes
Security Fixes	Regression Fixes

Release Update 1

Optimizer / off	Functional Fixes
Security Fixes	Regression Fixes

Release Update Revision 1

Release Update 2

Optimizer / off	Functional Fixes
Security Fixes	Regression Fixes

At the same date

Patching | Release Update Revision 2 (RUR)

REALITY CHECK

A true customer story

Photo by Tobias Bjerknes on Unsplash

BIG PROBLEM!!

**You open an SR
You work with Oracle Support
And at worst case...**

Photo by Sebastian Herrmann on Unsplash

… you hit a bug!!

But ... don't worry!

It is fixed! In Oracle 23c!

Photo by Viktor Forgacs on Unsplash

What??

You mean in 2023?

Photo by Andre Hunter on Unsplash

THREE PARTIES

- **You**
- **Oracle Support**
- **Oracle Development**

Photo by Joris Berthelot on Unsplash

Insights into the Patching Process | Error

Error	Fix	Backport	Inclusion

- Report via My Oracle Support

- Service Request inspected by automation

Insights into the Patching Process | Bug

Poll
How many Service Requests are solved by automation within one day?

Insights into the Patching Process | Bug

Pro Tip
60 % of Service Requests are solved
by automation within one day

Insights into the Patching Process | Bug

Error	Fix	Backport	Inclusion

- Support Engineer creates a bug

- Help us help you:
  - Clear description
  - Reproducible test case
  - Logs, traces, dumps
  - Various release tests

Insights into the Patching Process | Bug

Pro Tip
When your case needs further attention,
ask for management attention <u>the right way</u>

Insights into the Patching Process | Fix

Error   Fix   Backport   Inclusion

- Developer creates a fix

- Always in MAIN branch first

Insights into the Patching Process | Regression Tests

Error	Fix	Backport	Inclusion

- Developer verifies the fix

- Regression tests on *Farm* in OCI
  - Subset of tests before merge
  - All tests run daily, ~1 million functional tests (runtime ~ 25.000 hours)

Insights into the Patching Process | Ok?

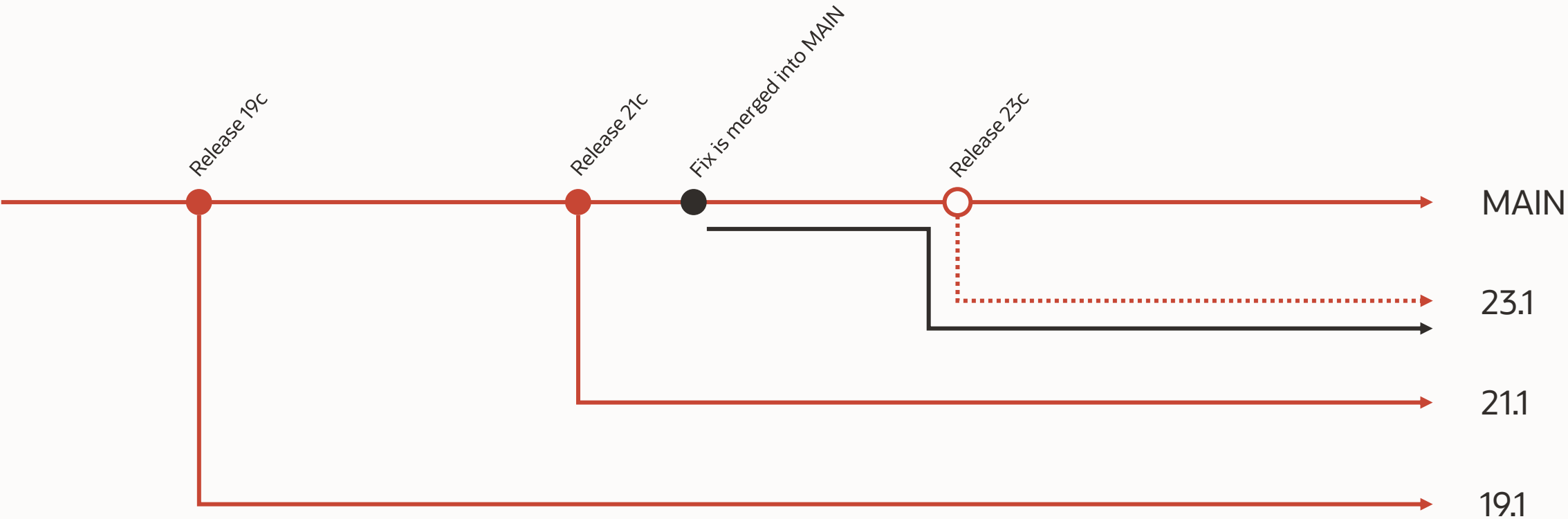| Error	Fix	Backport	Inclusion

- In case, fix isn't working as expected?
  - Fix the fix
  - Regression tests again

- Fix is ok?
  - Merge into MAIN
  - Merge can only happen with no failing tests

Insights into the Patching Process | Fixed in 23c

Release 19c

Release 21c

Fix is merged into MAIN

Release 23c

MAIN

23.1

21.1

19.1

Insights into the Patching Process | Fixed in 23c

Bug 31886745 : DURING ROCE SWITCH REBOOT BOTH X8M-8 NODES EVICTED DUE TO GIPCD DECLARING NODE UNREACHABLE

Bug Attributes

Type	B - Defect	**Fixed in Product Version**	**23.1**
Severity	2 - Severe Loss of Service		
Status	80 - Development to QA/Fix Delivered Internal	Platform	226 - Linux x86-64
Created	Sep 14, 2020	Platform Version	ORACLE LINUX 7
Updated	Feb 1, 2021	Base Bug	N/A
Database Version	19.8.0.0.0	Affects Platforms	Generic
Product Source	Oracle	Knowledge, Patches, Service Requests and Bugs related to this bug	

Related Products

Line	Oracle Database Products	Family	Oracle Database Suite
Area	Oracle Database	Product	5 - Oracle Database - Enterprise Edition

Do I need to upgrade to Oracle 23c now?

But there is no Oracle 23c yet, right ...?!

Photo by Andre Hunter on Unsplash

Insights into the Patching Process | Backport

Error	Fix	**Backport**	Inclusion

- Backport created on request

- Backports are specific for a release and usually also for a patch level, e.g., on top of 19.15.0

- `opatch lsinventory`

Insights into the Patching Process | Backport

Release 19c

Fix is merged into MAIN

Release 23c

MAIN

23.1

Release Update 15

Backport to 19.15

19.1

19.15
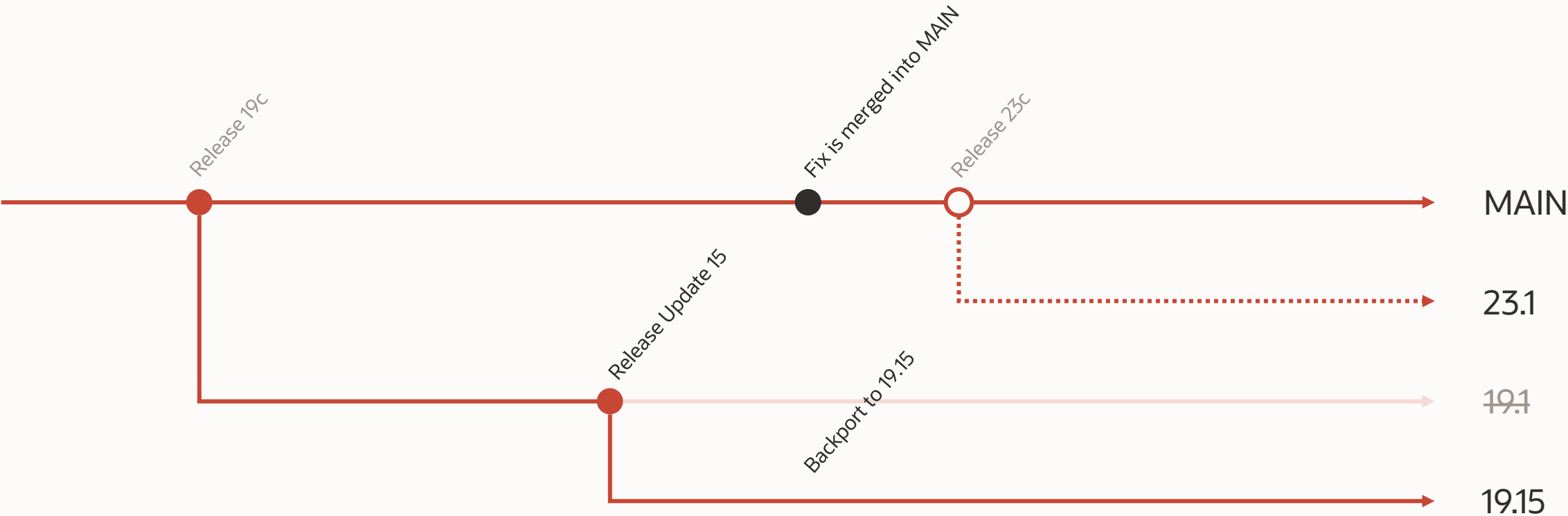
Insights into the Patching Process | Automation

Error	Fix	Backport	Inclusion

- Automated flow, manual handling might be required
  - Some conflicts
  - Dependencies

- Manual handling may postpone patch delivery

Insights into the Patching Process | One-Off Patch / Backport

Patch Simple Search Results

Filters: Patch Name or Number is 31517417;   Edit Search

Table ▼   View ▼   📷 Detach   🔗 Share Link

Patch Name	Description	Release	Platform	Recommended	Classification	Product	🔧	Updated	Size	▲▽	Download Access
31517417	ORA-22308: OPERATION NOT ALLOWED ON EVOLVED TYP (Patch)	19.4.0.0.0DBRU	Generic Platform (American English)		General	Oracle Spatial and Graph	🔧	1+ year ago	29.6 KB		Software
31517417	ORA-22308: OPERATION NOT ALLOWED ON EVOLVED TYP (Patch)	19.6.0.0.0DBRU	Generic Platform (American English)		General	Oracle Spatial and Graph	🔧	10+ months ago	29.8 KB		Software
31517417	ORA-22308: OPERATION NOT ALLOWED ON EVOLVED TYP (Patch)	19.8.0.0.0DBRU	Generic Platform (American English)		General	Oracle Spatial and Graph	🔧	10+ months ago	29.9 KB		Software
31517417	ORA-22308: OPERATION NOT ALLOWED ON EVOLVED TYP (Patch)	19.9.0.0.0DBRU	Generic Platform (American English)		General	Oracle Spatial and Graph	🔧	8+ months ago	29.9 KB		Software
31517417	ORA-22308: OPERATION NOT ALLOWED ON EVOLVED TYP (Patch)	19.11.0.0.0DBRU	Generic Platform (American English)		General	Oracle Database - Enterprise Edition (More...)		3+ months ago	29.9 KB		Software
31517417	ORA-22308: OPERATION NOT ALLOWED ON EVOLVED TYP (Patch)	19.10.0.0.0DBRU	Generic Platform (American English)		General	Oracle Spatial and Graph	🔧	6+ months ago	30.0 KB		Software
31517417	ORA-22308: OPERATION NOT ALLOWED ON EVOLVED TYP (Patch)	19.12.0.0.0DBRU	Generic Platform (American English)		General	Oracle Spatial and Graph	🔧	11+ hours ago	59.9 KB		Software

Wait a minute ...

Why is this patch not in the next RU?

Photo by Alfons Morales on Unsplash

Insights into the Patching Process | Request for Inclusion

Error	Fix	Backport	Inclusion

- What goes into a Release Update?

- Screening and monitoring for candidates

- Support can request inclusion via base bug

Insights into the Patching Process | Request for Inclusion

⭐ **Oracle Database 19c Important Recommended One-off Patches (Doc ID 555.1)**

Oracle recommends installing the latest RU. As noted in the tables below, these fixes will be targeted for inclusion in the first possible RU. Refer to "Master Note for Database Proactive Patch Program" ([Document ID 888.1](#)) for the latest RU patch, Bugs Fixed List and Known Issues. This helps you to get the most current content for security, functional, regression and bug fixes as well as minor enhancements and emergency one-offs.
In addition to below patches, review ([Database PSU/BP/Update/Revision - Known Issues Primary Note(Doc ID 1227443.1)](#))and apply patches based on the RU.

The information below lists additional patches(includes both rolling and non-rolling) recommended to be installed on top of each RU.
Select the relevant link for details. Note that this document only shows patches for the latest 4 RU's.

- Recommended Patches for 19.12 DB Home
- Recommended Patches for 19.12 GI Home
- Recommended Patches for 19.11 DB Home
- Recommended Patches for 19.11 GI Home
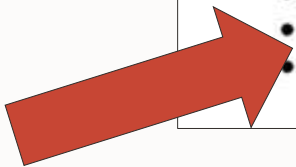
Insights into the Patching Process | Request for Inclusion

Recommended Patches for 19.11 DB Home

Below is the list of important patches to consider applying on top of 19.11

Bug	Fixed in RU	Description	Patches	Added
32996071	19.12	ORA-600 [kglpnlt] Reported When Shutting Down Standby Database	[list-patches]	11/Aug/21
32480419	19.12	"ksipc sga allocation parent latch" contention during concurrent logouts	[list-patches]	06/Aug/21
33144001		RMAN: Restore operations of any kind fail with an ORA-7445 [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
32765738	19.12	ORA-7445[kewssysvf_1] Or Other Internal Errors	[list-patches]	29/Jul/21
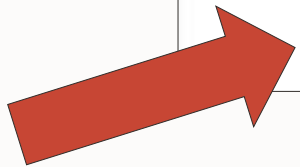
Insights into the Patching Process | Request for Inclusion

BUG 32765738 - AIM:ORA-7445 [KEWSSYSVF_1] - KEWSSYSVF_1

Edit this bug Bug Tree ARU Report

Bug No:	32765738 (Bug)
Filed By:	██████████
Updated By:	██████████
Sup Rep:	██████████
Customer:	██████████
Status:	80 - Development to QA/Fix Delivered Internal

Automatic **I**ncident **M**anagement

Automatic Incident Management

- Monitors shared autonomous databases

- Scans for incidents

- Automatically creates bugs

Insights into the Patching Process | Request for Inclusion

Pro Tip
Ensure your Service Request is associated with the corresponding bug

Insights into the Patching Process | Inclusion Evaluation and Criteria

Error	Fix	Backport	Inclusion

- Evaluated for Release Update inclusion

- Strict requirements apply
  - RAC Rolling
  - Standby-First

Insights into the Patching Process | Inclusion Evaluation and Criteria

Oracle Database 19 Release 19.12.0.0.210720DBRU

ORACLE DATABASE Patch for Bug# 30978304 for Generic Platforms

This patch is non-RAC Rolling Installable.

This patch is non-Data Guard Standby-First Installable - Please read My Oracle Support Note
1265700.1 https://support.us.oracle.com/oip/faces/secure/km/DocumentDisplay.jspx?id=1265700.1
Oracle Patch Assurance - Data Guard Standby-First Patch Apply for details on how to remove risk
and reduce downtime when applying this patch.

NEVER INCLUDED

(1) Prerequisites

Before you install or deinstall the patch, ensure that you meet the following requirements:

Insights into the Patching Process | Limitation

Error	Fix	Backport	Inclusion

- Limited number of fixes per Release Update

- Release Updates and Revisions regression tests

Insights into the Patching Process | Limitation
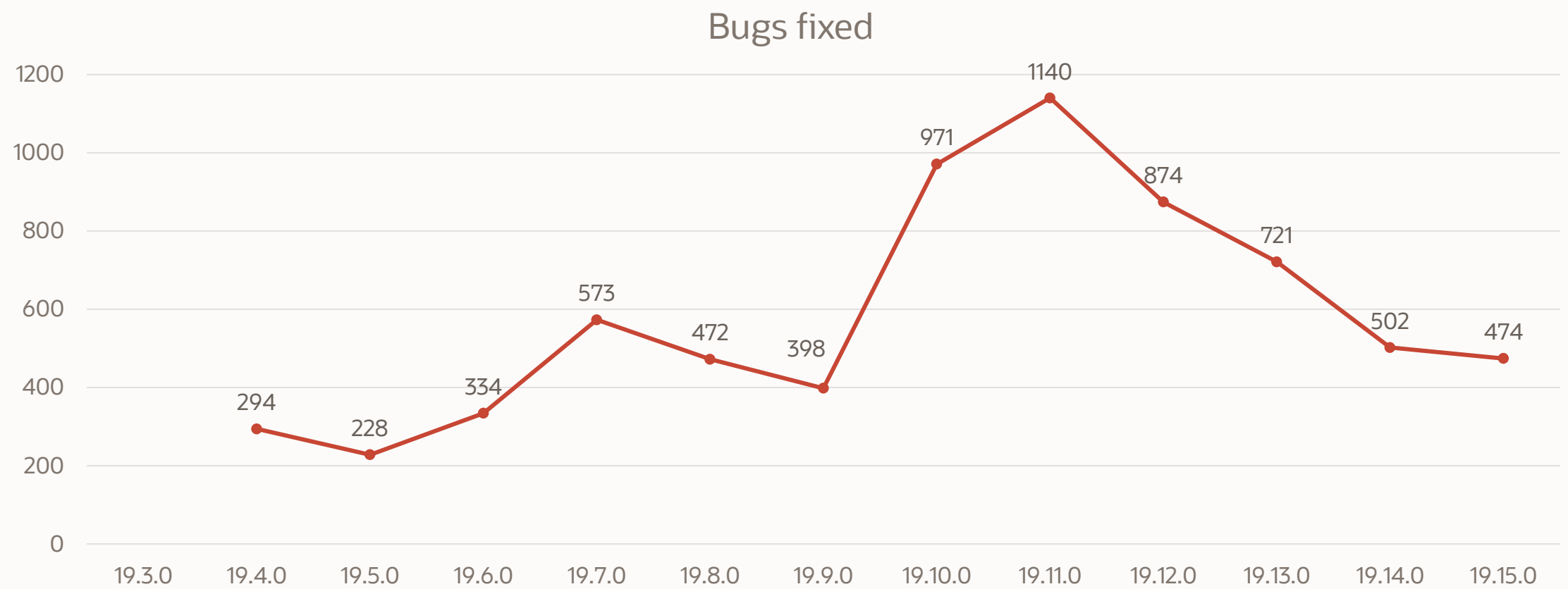
Bugs fixed

Database 19 Release Updates and Revisions Bugs Fixed Lists (Doc ID 2523220.1)

Insights into the Patching Process | Limitation

6-12 weeks

Release 19c

Release 23c

MAIN

23.1

Freeze Date

Release Update 15

19.1

Regression test

19.15
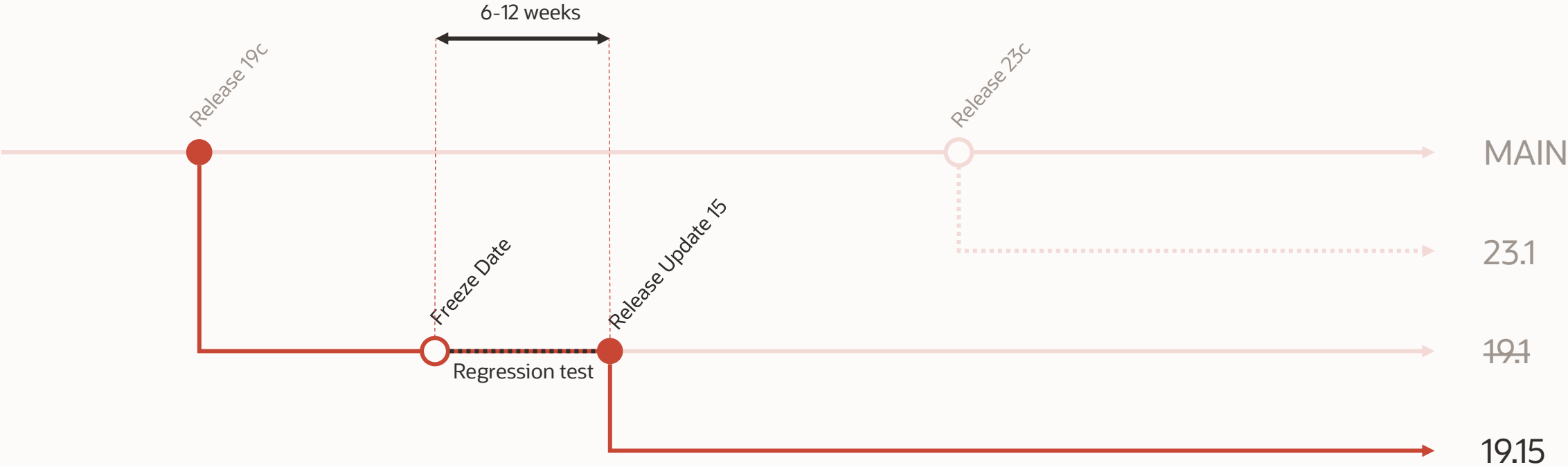
Insights into the Patching Process | Release Test

Info

Release Update testing includes
more than 1.000.000 functional tests
running for more than 25.000 hours daily

Insights into the Patching Process | Release Test

TYPE	DESCRIPTION	RU
Accessibility, User Acceptance Testing	User Experience Testing	
Install, Upgrade, Patching, Porting, Cert Testing	Usability, OS certs, Platform Testing	(X)
Ethical Hacking Testing	Penetration Testing by multiple Ethical Hacking teams	
ADB, Customer workload and Applications Testing	1000s of hours of testing ADB config/scale as well as testing specific customer workloads and Oracle internal apps	X
Performance Testing	Atomics and Benchmark Testing on the Cloud and Exadata	X
Stress and Destructive Testing	1000s of hours of long running tests that stress memory/cpu/io and destructive tests	X
Cloud Scale, Concurrency and Availability Testing	1000s of hours of testing on the Cloud and Exadatas	
Security Testing	Static code analysis on every code merge. Memory, SQL Injection, Resource Injection and PL/SQL Security testing on every code merge.	
Cross Functional Testing	5 – 7 Million hours of feature combinations, interoperability & common configs and parameter settings tests	
Functional Testing	> 1 million tests that run for ~25k hours daily on the Cloud	X

And that's it?

Or is there more to know?

Basic Facts | Patch Types

One-Off
Single bug fix on top of the base release or a patch bundle
Sometimes called interim-patch

Backport
Fix made for a newer code line, now created on top of the base release or a patch bundle

Merge
Multiple one-off fixes combined into a single fix
Required to resolve conflicts

Bundle
Many fixes together on top of the base release or another bundle
Usually available on a quarterly schedule
Cumulative
Always RAC Rolling and Standby-First
PSU, BP, RU, RUR

Oracle Database - Overview
of Database Patch Delivery Methods for
12.2.0.1 and later   MOS Note: 2337415.1

Basic Facts | What Is In A Patch

Files

New or changed executables, libs or files
```
bin/oracle
bin/srvctl
oracore/zoneinfo/timezone_37.dat
```

SQL *or* PL/SQL

New or changed tables, indexes, packages
```
ALTER TABLE SYS.TAB$ ...
CREATE INDEX SYS.I_TAB1 ...
CREATE OR REPLACE PACKAGE SYS.DBMS_SCHEDULER ...
```

Basic Facts | How To Apply A Patch

$ORACLE_HOME/OPatch

```
[oracle@hol ~]$ cd $ORACLE_HOME/OPatch
[oracle@hol OPatch]$ ls -l
total 164
drwxr-x---. 6 oracle dba     68 Apr 22  2020 auto
drwxr-x---. 2 oracle dba     31 Apr 22  2020 config
-rwxr-x---. 1 oracle dba    589 Apr 22  2020 datapatch
-rwxr-x---. 1 oracle dba    627 Apr 22  2020 datapatch.bat
drwxr-x---. 2 oracle dba     90 Apr 22  2020 docs
-rwxr-x---. 1 oracle dba  23550 Apr 22  2020 emdpatch.pl
drwxr-x---. 2 oracle dba   4096 Apr 22  2020 jlib
drwxr-x---. 5 oracle dba   4096 Mar 26  2020 jre
drwxr-x---. 9 oracle dba   4096 Apr 22  2020 modules
drwxr-x---. 5 oracle dba     58 Apr 22  2020 ocm
-rwxr-x---. 1 oracle dba  49462 Apr 22  2020 opatch
-rwxr-x---. 1 oracle dba   1442 Apr 22  2020 opatchauto
-rwxr-x---. 1 oracle dba    393 Apr 22  2020 opatchauto.cmd
-rwxr-x---. 1 oracle dba  16412 Apr 22  2020 opatch.bat
-rwxr-x---. 1 oracle dba   4290 Apr 22  2020 opatch_env.sh
-rw-r-----. 1 oracle dba   2551 Apr 22  2020 opatch.pl
drwxr-x---. 4 oracle dba     62 Apr 22  2020 opatchprereqs
-rwxr-x---. 1 oracle dba   3159 Apr 22  2020 operr
-rwxr-x---. 1 oracle dba   4218 Apr 22  2020 operr.bat
-rw-r-----. 1 oracle dba   3177 Apr 22  2020 operr_readme.txt
drwxr-x---. 2 oracle dba     19 Apr 22  2020 oplan
drwxr-x---. 3 oracle dba     21 Apr 22  2020 oracle_common
drwxr-x---. 3 oracle dba     24 Apr 22  2020 plugins
-rw-r-----. 1 oracle dba   2980 Apr 22  2020 README.txt
drwxr-x---. 2 oracle dba   4096 Apr 22  2020 scripts
-rw-r-----. 1 oracle dba     27 Apr 22  2020 version.txt
```

Basic Facts | How To Apply A Patch

`opatch`   Applies binaries to an   All instances are down
                       Oracle Home

`datapatch`   Applies SQL and PL/SQL   Database is up
                       changes to a database   (normal, not upgrade)

Pro tip: Use `opatchauto` on
RAC environments

Basic Facts | Platform

Generic

A patch that works for all platforms

Changes files that are platform independent

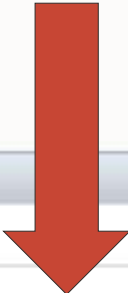Example: scripts in `rdbms/admin` and other PL/SQL

Port Specific

A patch that works for one specific platform

Changes port specific files

Example: oracle.exe on Windows

Basic Facts | Platform

Generic

Patch Simple Search Results

Filters: Patch Name or Number is 30978304;

Table ▾   View ▾   📄 Detach   🔗 Share Link

Patch Name	Description	Release	Platform (Language)	Recommended	Classification
30978304	ORA-20000 DURING IMPDP WITH STATS AND THE UNIQUE INDEX FOR THE PK IS NOT CREATED (Patch)	19.9.0.0.201020WIN	Generic Platform (American English)		General

Port Specific

Patch Simple Search Results

Filters: Patch Name or Number is 32164034;

Table ▾   View ▾   📄 Detach   🔗 Share Link

Patch Name	Description	Release	Platform (Language)	Recommended	Classification
32164034	INTRODUCE UNDERSCORE PARAMETER TO DISABLE RECORDING OF LAST SUCCESSFUL LOGIN TIME (LSLT) (Patch)	19.9.0.0.0DBRU	HP-UX Itanium (American English)		General

WHY DO YOU ALWAYS ASK FOR

OPATCH

TO AVOID
CONFLICTS

Photo by Glomad Marketing on Unsplash

Basic Facts | Conflicts

Base Release

One-off # 1

One-off # 2

Merge patch

19c

dpload.sql

dpload.sql

CONFLICT

dpload.sql

dpload.sql
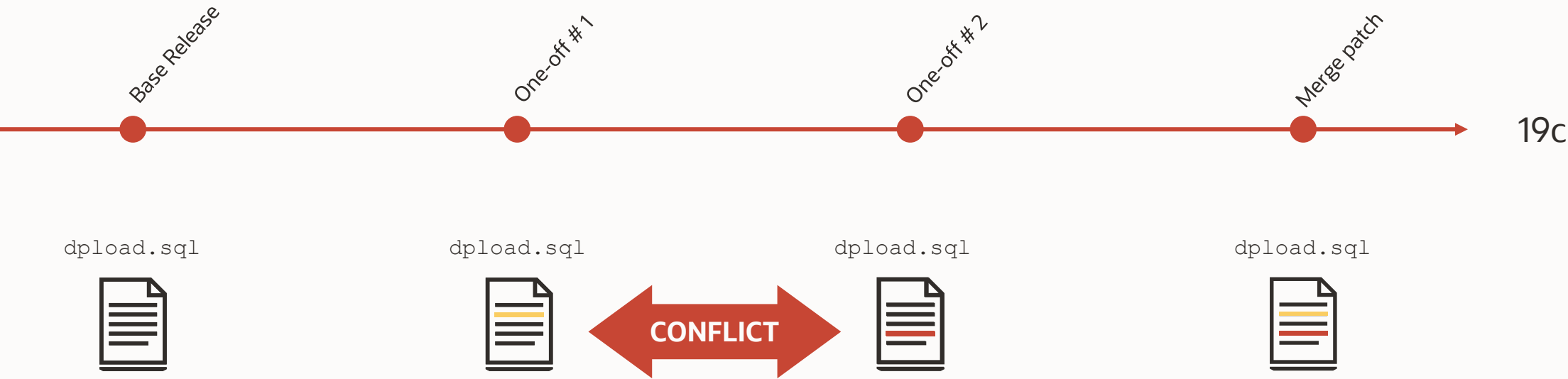
Insights into the Patching Process | Request for Inclusion

Pro Tip
Always attach the output of `opatch lsinventory`
to your Service Request

Pro Tip
And give it a meaningful name, such
as *opatch_lsinventory.txt*

Bad Tip
Don't name it
- *optch_lsinvt.txt*
- *tekst_fra_opatch.txt*
- *alle_meine_patches.txt*
- *wyjście_łata.txt*

PLEASE ...

Photo by Izabelly Marques on Unsplash

But … I am on MS Windows …

Windows is different …

Please wait while we install a system update

Copyright © 2022, Oracle and/or its affiliates

Photo by Clint Patterson on Unsplash

Basic Facts | Patch Types on MS Windows

One-Off   Rarely created

Backport   Rarely created, preferably delivered in bundle patches

Merge   Rarely created

Bundle   Still called Bundle Patch (BP) and not RU
- Quarterly, usually with delay
- RAC Rolling and Standby-First
- Cumulative

Basic Facts | Bundle Patch Contents

Pro Tip
A Windows Bundle Patch and a Release Update from the same quarter, e.g., April 2022, does not contain the same patches

? Where do I find
the bundle patches for Windows?

☆ **Assistant: Download Reference for Oracle Database/GI Update, Revision, PSU, SPU(CPU), Bundle Patches, Patchsets and Base Releases (Doc ID 2118136.2)** ☑ T

⊕⊖ ✉ ▣

Selection(s)

Solution(s)

What would you like to download?

Possible Solutions will appear on
you make your selection.

○ Oracle Database Base Releases
○ Oracle Database Patchsets
○ Oracle Database Updates (Versions 12.2 & higher)
○ Oracle Database Update Revisions (Versions 12.2 & higher)
○ Oracle Database PSU, SPU(CPU), Bundle Patches (Versions 12.1 & lower)
○ OJVM Update/PSU/Bundle Patches
○ Latest Available Microsoft Windows Patches
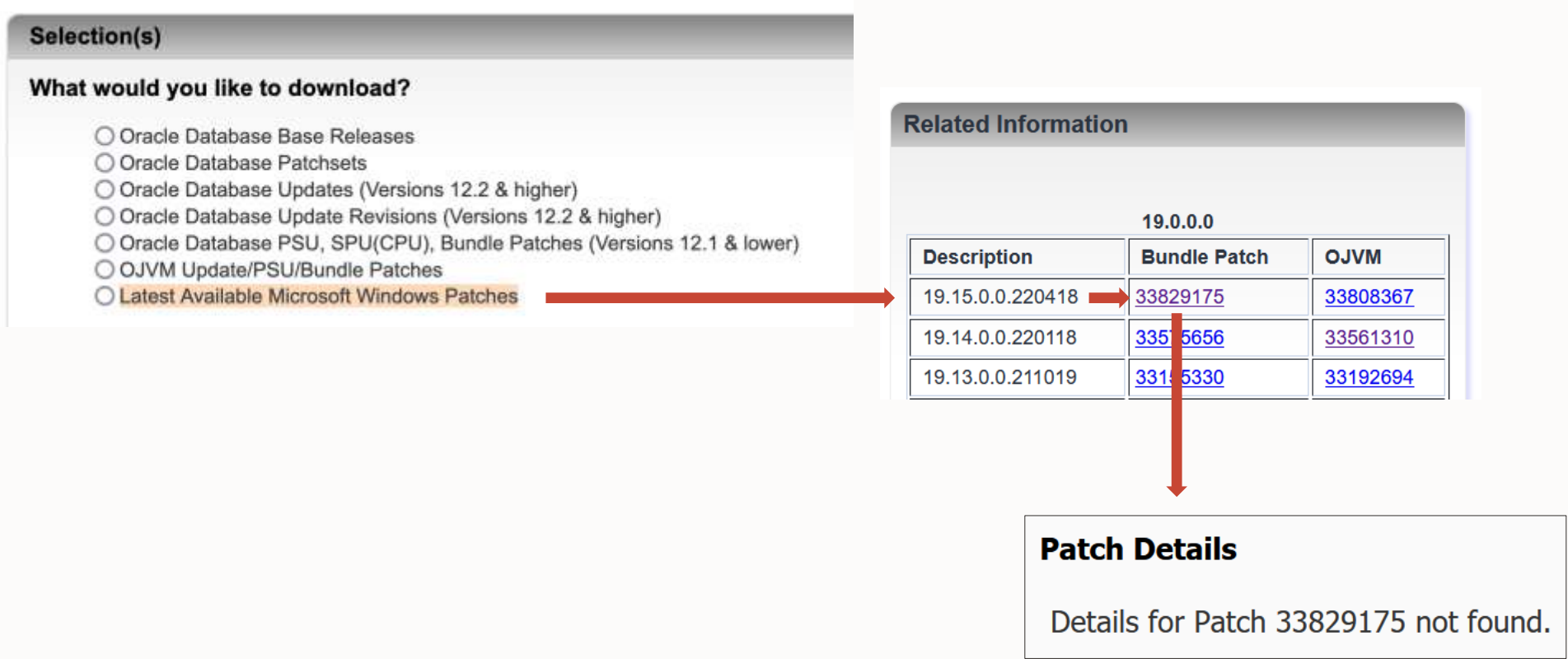
Additional Clarification

Please select an option above to begin clarifying the issue you are experiencing.

Basic Facts | Patch Availability

[MOS Note: 2118136.2 - Assistant: Download Reference for DB and GI Patch Bundles](#)

Copyright © 2022, Oracle and/or its affiliates

Basic Facts | Patch Availability

MOS Note: 2844795.1 - Apr 2022 Patch Availability Document (DB-only) (Doc ID 2844795.1)

Released April 19, 2022

This document contains the following sections:

- Critical Patch Update April 2022 Patch Availability Document (PAD)
  - 1 Overview
    - 1.1 How To Use This Document
    - 1.2 Terminology in the Tables
    - 1.3 On-Request Patches
    - 1.4 CPU Program and My Oracle Support Patch Recommendations
    - 1.5 My Oracle Support (MOS) Conflict Checker Tool
  - 2 What's New in April 2022
    - 2.1 "Final CPU Information (Error Correction Policies)"
    - 2.2 "Post Release Patches"
    - 2.3 "Separate PADs for Separate Products"

Patch Details

Details for Patch 33829175 not found.

| Microsoft Windows BP 21.x.0.0.220419 | Patch 33829143 | MS-Windows | 14-Jun-2022 |
| Microsoft Windows BP 19.15.0.0.220419 | Patch 33829175 | MS-Windows | 17-May-2022 |

?

How do I find the
Patch Availability Document?

Search for:
"Apr 2022 Patch Availability Document (PAD)"

Dashboard | **Knowledge** | Service Requests | Patches & Updates | Community | Certifications | Managed Cloud | More... ▼   ⭐▼

Dashboard >

Give Feedback...   There are no Knowledge Base results found. Expandi

KM Search Results

✔ Knowledge Base | ✔ Archive | ✔ Community | ✔ Documentation | ✔ Bug | Patch | System Handbook

▼ "Apr 2022 Patch Availability Document"   🔍 ❓

Start typing to select Product   Any Product Version ▼   Any Platform   Last updated

Results: Knowledge Base | Archive | Community | Documentation | Bug

Tips

Try searching without using quotes or only quote the "important words" in your search.

▼ **Recommended Links**

Why Can't I Download This Patch? - How Patches and Updates Entitlement Works (Doc ID 1369860.1)

Oracle Support Lifecycle Advisors (Doc ID 250.2)

▼ **Knowledge Base Search Results**

⭐ Critical Patch Update (CPU) Program Apr 2022 Patch Availability Document (DB-only) (Doc ID 2844795.1)
Apr 22, 2022   Refine to All > Oracle Cloud > Oracle Infrastructure Cloud > Oracle Cloud at Customer > Gen 1 Exadata Cloud at Customer (Oracle Exadata Database

⭐ Critical Patch Update (CPU) Program Apr 2022 Patch Availability Document (EM-only) (Doc ID 2844807.1)
Refine to All > Enterprise Management > Enterprise Manager Products > Managing Databases using Enterprise Manager > Enterprise Manager for Or

... Oracle on Windows is different

**Oracle Linux
Development Platform**

Photo by Danielle Barnes on Unsplash

Development Platform | Porting

Oracle Linux x86-64

Porting

- MS Windows
- SPARC Solaris
- Intel Solaris x86-64
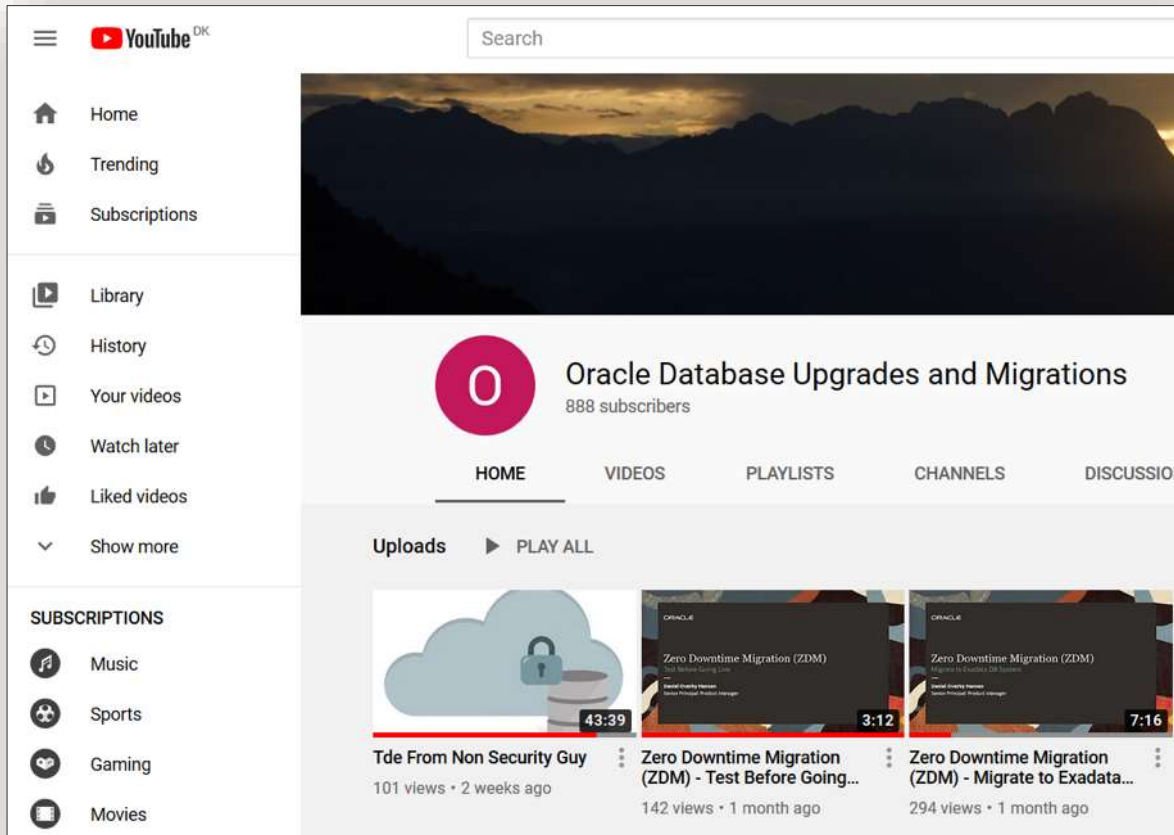- IBM AIX
- IBM zLinux
- HP UX Itanium

Some of the platforms from our bug tracking system

Blast from the Past? | Platforms

Microsoft Windows Phone	Tekelec	Netra X3-2 for Acme Packet	Novell NetWare
Oracle JRockit Virtual Edition x86	Qualcomm Brew MP	Oracle Solaris on SPARC (64-bit)	Linux on IBM Z
SunOS	Netra Server X5-2 for Communications	IBM S/390 Based Linux (31-bit)	Data General
Monta Vista x86	HP NonStop S-series (Guardian)	Acme Packet 3900	Pyramid
Acme Packet 1100	HP OpenVMS Itanium	SPARC	Talari
iTron	Monta Vista x86-64	Fujitsu MSP-EX	Palm Computing
Embedded Linux on cnMIPS	OpenSolaris	Trusted Solaris	HP NonStop (OSS) on x86
Embedded Linux SH4	SCO Unix	Net-Net 4250	Unisys OS 2200
HP NonStop Itanium (OSS)	Net-Net 9200	HP OpenVMS VAX	HP OpenVMS Alpha
QNX Unix	Symbian EPOC	HP-UX PA-RISC (32-bit)	Acme Packet 3820
Acme Packet 6100	Linux ARM 32-bit VFP HardFP ABI	Acme Packet 6300	FreeBSDx86
Linux MIPS 64-bit	SGI Irix	Microsoft Windows CE	Oracle Solaris Express
Fujitsu BS2000/OSD (SQ series)	ia64	IBM z/OS on System z	VxWorks
Mediatek MTZ	Linux SPARC	StorageTek Hardware	Microsoft Windows (32-bit)
HP NonStop (Guardian) on x86	Oracle Solaris on SPARC (32-bit)	Oracle Solaris on x86 (32-bit)	Sequent
Fujitsu BS2000	HP NonStop Itanium (Guardian)	Fujitsu BS2000/OSD (SX series)	Windows NT
HP Tru64 UNIX	RIM BlackBerry	Linux ARM 64-bit	nCube

YouTube | Oracle Database Upgrades and Migrations

YouTube Channel

Thank you!