

The Oracle logo, consisting of the word "ORACLE" in a red, sans-serif font, is positioned in the upper left corner of the slide. It is partially overlaid by a decorative graphic of orange 'x' marks and a grey wavy line.

ORACLE

# One-Button Patching

Makes life easier for every Oracle DBA



Oracle

**DBAs**

run the world







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# Find Slides and Much More on Our Blogs



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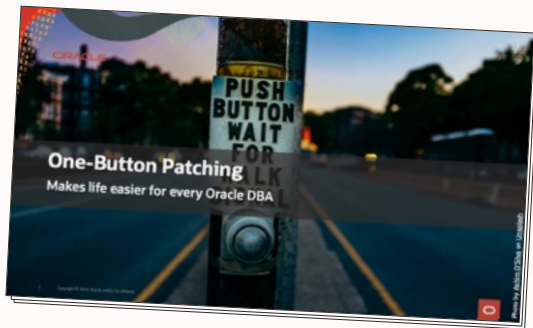
Alex.Zaballa@oracle.com



# Download the Slides

<https://dohdatabase.com/slides>

<https://MikeDietrichDE.com/slides>





## Web Seminar

### Episode 16

(replaces Episode 1 from Feb 2021)

Oracle Database Release and Patching Strategy for 19c and 23c

115 minutes – May 10, 2023

## Slides



### Episode 17

From SR to Patch – Insights into the Oracle Database Development process

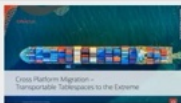
55 minutes – June 22, 2023



### \*NEW\* Episode 18

Cross Platform Migration – Transportable Tablespaces to the Extreme

145 min – February 22, 2024



### Episode 2

AutoUpgrade to Oracle Database 19c

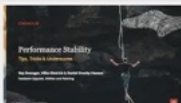
115 minutes – Feb 20, 2021



### Episode 3

Performance Stability, Tips and Tricks and Underscores

120 minutes – Mar 4, 2021



### Episode 4

Migration to Oracle Multitenant



# Recorded Web Seminars

<https://MikeDietrichDE.com/videos>



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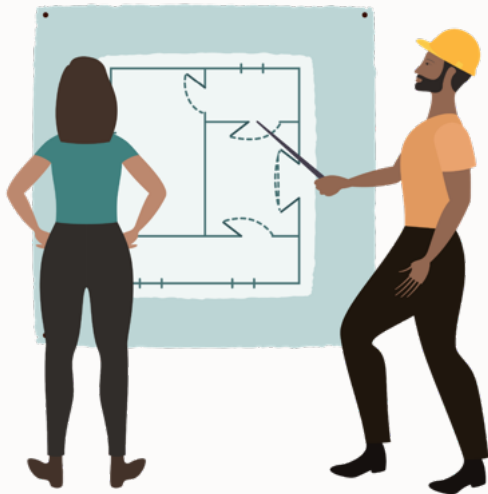


# The Foundation

<https://mikedietrichde.com/videos/>

| Virtual Classroom Seminars  | Slides  |
|---|---|
| <p><b>Episode 16</b></p> <p>(replaces Episode 1 from Feb 2021)</p> <p><u><a href="#">Oracle Database Release and Patching Strategy for 19c and 23c</a></u></p> <p><i>115 minutes – May 10, 2023</i></p> |  |
| <p><b>Episode 17</b></p> <p><u><a href="#">From SR to Patch – Insights into the Oracle Database Development process</a></u></p> <p><i>55 minutes – June 22, 2023</i></p>                                |  |





# Getting started



# We made upgrading easy. Now we make patching just as easy.

---

AutoUpgrade functionality extended to patching



# Why Patching?

**Security** is the most important topic these days

- Many customers are bound to regulations and audits
- Patching isn't always a true pleasure
- Plus, you need to **find the right patches**

<https://www.oracle.com/security-alerts/>

## Critical Patch Updates

Critical Patch Updates provide security patches for supported Oracle on-premises products. They are available to customers with valid support contracts. Starting in April 2022, Critical Patch Updates are released on the third Tuesday of January, April, July, and October (They were previously published on the Tuesday closest to the 17th day of January, April, July, and October). The next four dates are:

- 21 January 2025
- 15 April 2025
- 15 July 2025
- 21 October 2025

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

## Oracle Database Server Risk Matrix

This Critical Patch Update contains 6 new security patches, plus additional third party patches noted below, for Oracle Database Products. 2 of these vulnerabilities may be remotely exploitable without authentication, i.e., may be exploited over a network without requiring user credentials. 1 of these patches is applicable to client-only installations, i.e., installations that do not have the Oracle Database Server installed. The English text form of this Risk Matrix can be found [here](#).

| CVE ID         | Component   | Package and/or Privilege Required | Protocol   | Remote Exploit without Auth.? | Base Score | Attack Vector | CVSS VERSION 3.1 RISK (see <a href="#">Risk Matrix Definitions</a> ) |             |               |            |                 |           |              | Supported Versions Affected       | Notes |
|----------------|---|-----------------------------------|------------|-------------------------------|------------|---------------|--|-------------|---------------|------------|-----------------|-----------|--------------|-----------------------------------|-------|
|                |   |                                   |            |                               |            |               | Attack Complex   | Priv. Req'd | User Interact | Scope      | Confidentiality | Integrity | Availability |                                   |       |
| CVE-2024-4709  | Oracle Database Security (DBMS)                     | None                              | Multiple   | Yes                           | 5.5        | Network       | Low  | None        | None          | Un-changed | None            | None      | Low          | 23.4-25.5                         |       |
| CVE-2024-7064  | Oracle Spatial and Graph (RxCu2)                    | None                              | HTTP       | Yes                           | 5.5        | Network       | High   | None        | Required      | Un-changed | None            | None      | High         | 19.3-19.24, 21.5-21.15, 23.4-25.5 |       |
| CVE-2024-29025 | Fleet Patching and Provisioning - Microsoft (Netty) | Authenticated User                | HTTP       | No                            | 4.3        | Network       | Low  | Low         | None          | Un-changed | None            | None      | Low          | 23.4-25.5                         |       |
| CVE-2024-20235 | Oracle Database Core                                | Create Session                    | Oracle Net | No                            | 4.3        | Network       | Low  | Low         | None          | Un-changed | None            | Low       | None         | 19.3-19.24, 21.5-21.15, 23.4-25.5 |       |
| CVE-2024-20242 | XMS Database  | Create Session                    | HTTP       | No                            | 3.5        | Network       | Low  | Low         | Required      | Un-changed | None            | None      | Low          | 19.3-19.24, 21.5-21.15, 23.4-25.5 |       |
| CVE-2024-20251 | Java VM   | Create Session, Create Procedure  | Oracle Net | No                            | 3.1        | Network       | High   | Low         | None          | Un-changed | None            | Low       | None         | 19.3-19.24, 21.5-21.15, 23.4-25.5 |       |



# How often do you patch?

Quarterly?

Twice a year?

Once a year?

*Never??*



# Just as easy as patching your smartphone

---

Our mission for patching Oracle Database



# AutoUpgrade and Patching



## Download

- Find the right patch numbers
- For the right platform
- Get latest OPatch



## Install

- Install brand-new Oracle home
- Update OPatch
- Apply all patches



## Patch

- Datapatch Sanity Check
- Move instances and files
- Datapatch
- Recompilation
- Post-tasks



# AutoUpgrade and Patching



## Download

- Find the right patch numbers
- For the right platform
- Get latest OPatch



## Install

- Install brand-new Oracle home
- Update OPatch
- Apply all patches



## Patch

- Datapatch Sanity Check
- Move instances and files
- Datapatch
- Recompilation
- Post-tasks



```
$ cat DB19.cfg
```

```
global.keystore=/home/oracle/autoupgrade-patching/keystore  
patch1.source_home=/u01/app/oracle/product/19/dbhome_19_24_0  
patch1.target_home=/u01/app/oracle/product/19/dbhome_19_25_0  
patch1.sid=DB19  
patch1.folder=/home/oracle/autoupgrade-patching/patch  
patch1.patch=RU,OPATCH,OJVM,DPBP
```



```
$ cat DB19.cfg
```

```
global.keystore=/home/oracle/autoupgrade-patching/keystore  
patch1.source_home=/u01/app/oracle/product/19/dbhome_19_24_0  
patch1.target_home=/u01/app/oracle/product/19/dbhome_19_25_0  
patch1.sid=DB19  
patch1.folder=/home/oracle/autoupgrade-patching/patch  
patch1.patch=RU,OPATCH,OJVM,DPBP
```

```
$ java -jar autoupgrade.jar -config DB23.cfg -patch -mode deploy
```

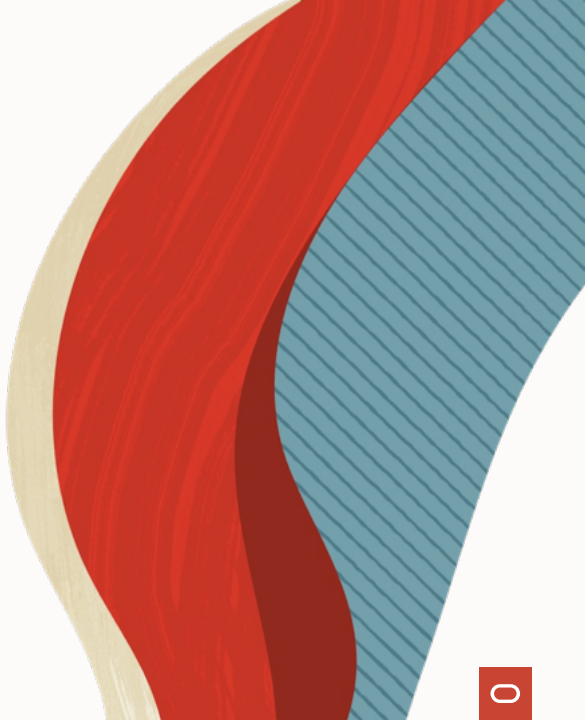


# Demo

## One-Button Patching

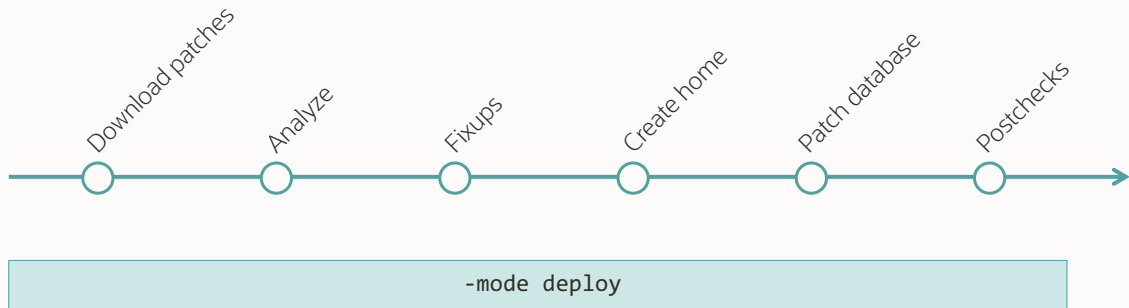
- Download patches
- Install Oracle home
- Patch database

Watch on [YouTube](#)



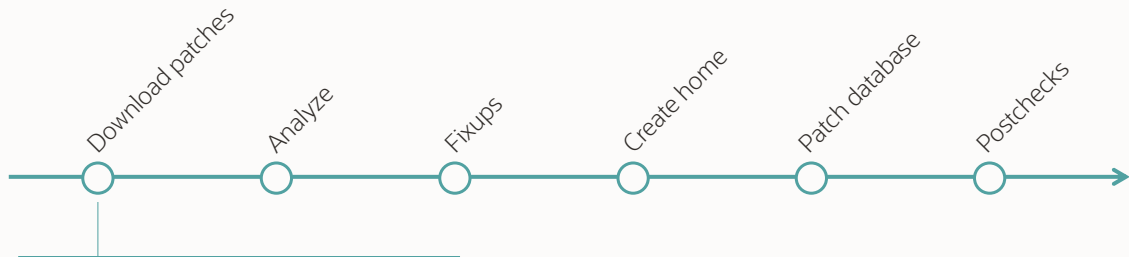


# AutoUpgrade Patching





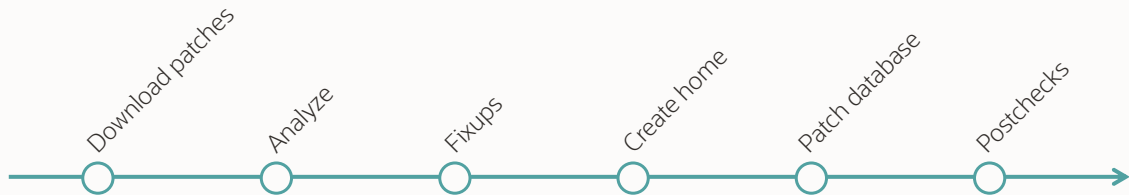
# AutoUpgrade Patching



- Finds and downloads patches
- Uses your MOS credentials
- Chooses the right platform
- Stores patches in local repository



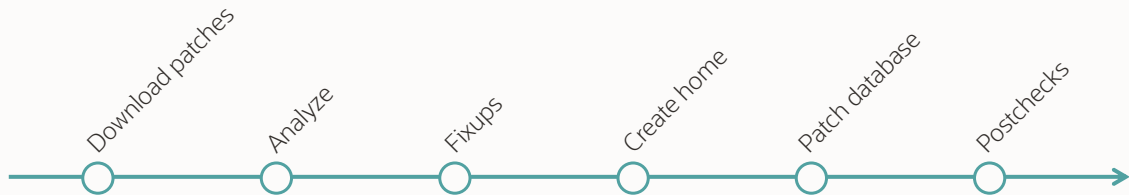
# AutoUpgrade Patching



- Analyzes database for patch readiness
- Datapatch Sanity Checks
- Lightweight
- Non-intrusive
- Recommended, not required



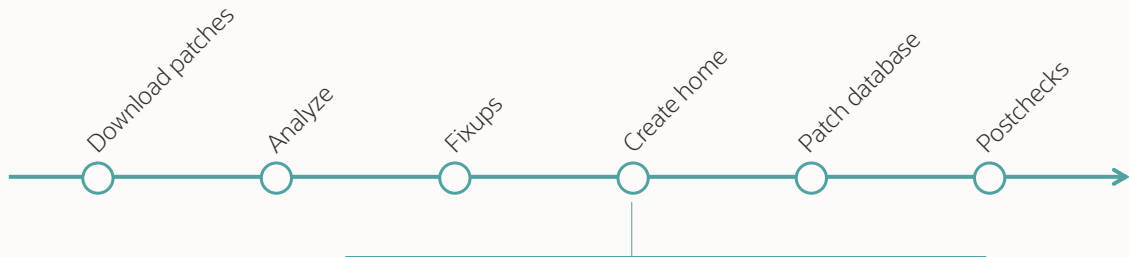
# AutoUpgrade Patching



- Gathers dictionary statistics if needed
- Recompiles Oracle-maintained objects if needed
- Executes checks - see Doc ID [2380601.1](#)



# AutoUpgrade Patching



- **Out-of-place** patching
- Creates a brand-new Oracle home
- Uses *runInstaller settings* from source Oracle home
- Does not execute **root.sh**

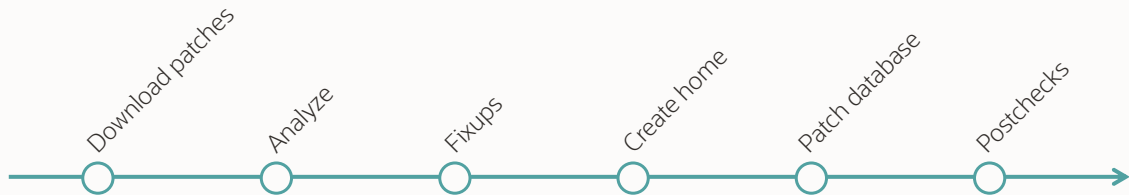


--You only need to run root.sh if your database uses external procedures  
--If the query returns no rows, you can skip root.sh

```
SELECT *  
FROM   CDB_SCHEDULER_JOBS  
WHERE  JOB_TYPE IN ('EXTERNAL_SCRIPT', 'EXECUTABLE', 'BACKUP_SCRIPT', 'SQL_SCRIPT');
```



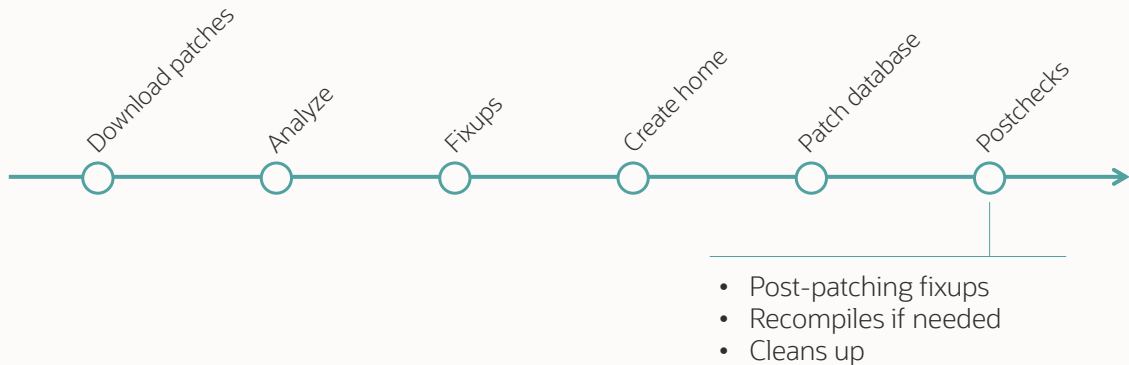
# AutoUpgrade Patching



- Moves database instance to new Oracle home
- Moves configuration files
- Executes Datapatch
- Updates system directories (`utlfixdirs.sql`)
- Updates `/etc/oratab`
- Supports read-only Oracle home

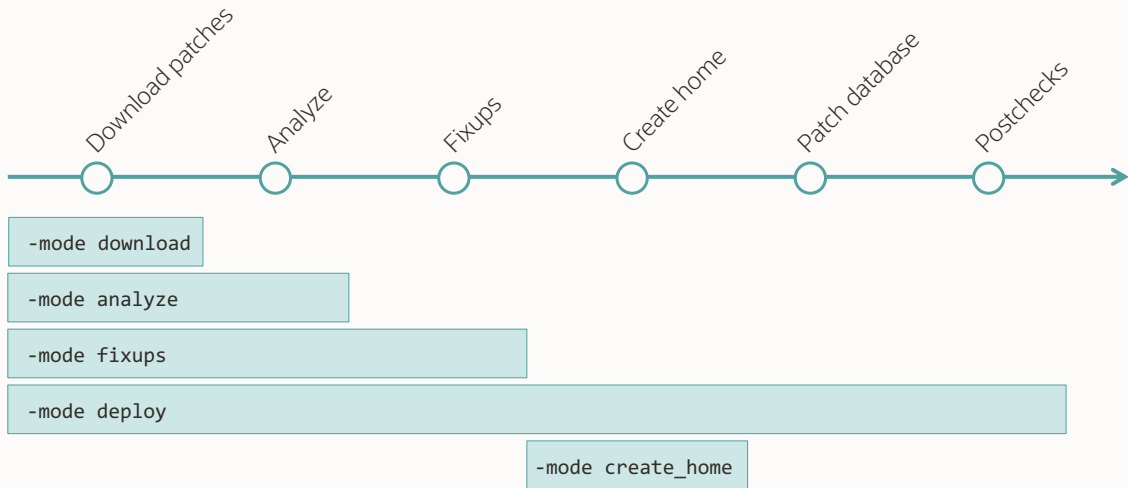


# AutoUpgrade Patching





# Patching Modes







# Requirements



# Current Requirements



Single instance



Linux x64

← windows platform support coming soon



Oracle Database 19c





## AutoUpgrade patches out-of-place

- Builds new Oracle home from base release



# Out-of-Place Patching

Oracle Home, 19.24.0



```
SQL> SHUTDOWN IMMEDIATE
```

AutoUpgrade executes all this for you



```
[oracle]$ $ORACLE_HOME/OPatch/datapatch -verbose
```

New Oracle Home  
Oracle Home, 19.25.0





## Patching still requires downtime

- For less downtime use standby-first patch apply
- For no downtime use RAC rolling patch apply





Always download  
the latest version of AutoUpgrade

- My Oracle Support Doc ID [24854571](#)





# MOS Note:2485457.1 – Download AU

## DETAILS

### Download

The most recent version of AutoUpgrade can be downloaded via this link: version [20240905](#).

To make use of AutoUpgrade Patching new extended functionality, download the documentation via this link: [AutoUpgrade Patching Reference](#)

Oracle strongly recommends that you always use the latest version of AutoUpgrade. AutoUpgrade is backward compatible and can upgrade older releases of Oracle Database as well



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

```
build.version 24.7.241021
```

```
build.date 2024/10/21 11:16:20 -0400
```

```
build.hash babf5a631
```

```
build.hash_date 2024/10/18 18:36:27 -0400
```

```
build.supported_target_versions 12.2,18,19,21,23
```

```
build.type production
```

```
build.label (HEAD, tag: v24.7, origin/stable_devel, stable_devel)
```

```
build.MOS_NOTE 2485457.1
```

```
build.MOS_LINK https://support.oracle.com/.../?id=2485457.1
```





# Patching

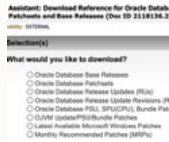




Which patches should you install?



## Important MOS Notes



## Download Assistant

MOS Note: 2118136.2

Download Release  
Update, OJVM, Bundles

| Ref                                 | Plant Part Used in the Recipe | Description   | Pathway   | RAI  | Other |
|-------------------------------------|-------------------------------|---|-----------|------|-------|
| 16172598<br>(reference)<br>16172599 | seed                          | 100 mg seed (100 mg seed) was crushed and extracted with 100 mL of 100% EtOH. The extract was concentrated on a rotary evaporator and the residue was dried under vacuum. | 100% EtOH | 100% | 100%  |
| 16172598<br>(reference)<br>16172599 | seed                          | 100 mg seed (100 mg seed) was crushed and extracted with 100 mL of 100% EtOH. The extract was concentrated on a rotary evaporator and the residue was dried under vacuum. | 100% EtOH | 100% | 100%  |
| 16172602                            | seed                          | 100 mg seed (100 mg seed) was crushed and extracted with 100 mL of 100% EtOH. The extract was concentrated on a rotary evaporator and the residue was dried under vacuum. | 100% EtOH | 100% | 100%  |
| 16172602                            | seed                          | 100 mg seed (100 mg seed) was crushed and extracted with 100 mL of 100% EtOH. The extract was concentrated on a rotary evaporator and the residue was dried under vacuum. | 100% EtOH | 100% | 100%  |

## Important One-Offs

MOS Note: 555.1

Add critical fixes on top  
for known issues



## Additional Fixes

MOS Note: 2781612.2

Important fixes such as GoldenGate, Spatial, Data Pump Bundle, Text and more



## SQL Performance

MOS Note: 2773715.1

Avoid SQL performance problems. Has links to "wrong results", "SPM" and more included



```
global.keystore=/home/oracle/autoupgrade-patching/keystore
patch1.source_home=/u01/app/oracle/product/19/dbhome_19_24_0
patch1.target_home=/u01/app/oracle/product/19/dbhome_19_25_0
patch1.sid=DB19
patch1.folder=/home/oracle/autoupgrade-patching/patch
patch1.patch=RECOMMENDED
```



# Config File Syntax

## FOLDER

- Directory containing the **base image** and the patch zip files
- Required
- When `download=YES`, it will use this folder to download files into it
- When `download=NO`, then it expects the zip files to be present



```
global.keystore=/home/oracle/autoupgrade-patching/keystore  
patch1.source_home=/u01/app/oracle/product/19/dbhome_19_24_0  
patch1.target_home=/u01/app/oracle/product/19/dbhome_19_25_0  
patch1.sid=DB19  
patch1.folder=/home/oracle/autoupgrade-patching/patch  
patch1.patch=RECOMMENDED
```





# Recommended Patches

patch1.patch=RECOMMENDED

OPATCH

The latest OPatch

RU

The latest Release Update

OJVM

OJVM bundle matching Release Update

DPBP

Data Pump bundle patch matching RU





You can also specify any specific Release Update

- You can even specify an OJVM bundle different than the Release Update



```
$ cat DB19.cfg
```

```
global.keystore=/home/oracle/autoupgrade-patching/keystore  
patch1.source_home=/u01/app/oracle/product/19/dbhome_19_24_0  
patch1.target_home=/u01/app/oracle/product/19/dbhome_19_25_0  
patch1.sid=DB19  
patch1.folder=/home/oracle/autoupgrade-patching/patch  
patch1.patch=RU:19.23,OJVM:19.22
```



Different





You can also add specific one-off fixes

- Get patches from Oracle Database 19c Important Recommended One-off Patches (Doc ID [555.1](#))



## ★ Oracle Database 19c Important Recommended One-off Patches (Doc ID 555.1)

**NOTE:** This document will be updated once a week on Tuesdays at 9AM EST if any new patch is identified.

Through our review of service requests, we often find that issues encountered are the result of customers being on an older Release Update (RU) or Release Update Revision (RUR). Many issues will have been fixed in the latest updates, which we always recommend.

As noted in the update-specific tables below, fixes for known issues are targeted for inclusion in the first available RU or RUR. You can always find the latest RUs, RURs, other patches, lists of fixed bugs and known issues in [Primary Note for Database Proactive Patch Program\(Doc ID 888.1\)](#). Identifying and installing the latest updates (patches) helps ensure you are using the most current content for security, functional, regression and bug fixes, as well as minor enhancements and any emergency one-offs.

### Note:

Beginning with the October 2022 patching cycle, 19c RURs will no longer be provided for 19.17.0 and above. No additional RURs will be delivered on any platform after the delivery of Oracle Database 19c RUR 19.16.2 in January, 2023.

Refer to [Sunsetting of 19c RURs and FAQ \(Doc ID 2898381.1\)](#) for further details.

To provide customers more frequent access to recommended and well-tested collections of patches, Oracle is pleased to introduce Monthly Recommended Patches (MRPs) starting Nov 2022. MRPs are supported only on Linux x86-64 platform.

Refer to [Introducing Monthly Recommended Patches \(MRPs\) and FAQ \(Doc ID 2898740.1\)](#) for further details.

In addition to the relevant patches listed below, you should apply patches based on the specific RU after reviewing the following My Oracle Support knowledge documents:

1. [Database PSU/BP/Update/Revision - Known Issues Primary Note\(Doc ID 1227443.1\)](#)
2. [Oracle Database Patches to Consider for 19c \(Doc ID 2781612.2\)](#) which contains patches to consider for specific areas such as Data Pump, Golden gate etc.

**NOTE:** Bug 32781163 is no longer recommended and this note will be updated when a replacement becomes available in the future

**NOTE:** Bug 31061145 was previously listed in this note but the fix was included in 19.21 in a disabled state. To enable the fix see Note 31061145.8 for instructions.

**NOTE:** If you are an Applications Unlimited (for example, EBS) customer, you should follow any directions given in your product-specific documentation on applicability of Release Updates (RUs) and Release Update Revisions (RURs).

The information below lists any additional patches (both rolling and non-rolling) that are recommended for installation on top of each RU. Click the relevant link for details.



```
$ cat DB19.cfg
```

```
global.keystore=/home/oracle/autoupgrade-patching/keystore  
patch1.source_home=/u01/app/oracle/product/19/dbhome_19_24_0  
patch1.target_home=/u01/app/oracle/product/19/dbhome_19_25_0  
patch1.sid=DB19  
patch1.folder=/home/oracle/autoupgrade-patching/patch  
patch1.patch=RECOMMENDED,36006910,36908826,35398148,36916250,  
36273767,34672698,34774667,29213893
```



# Config File Syntax

## PATCH

- Comma separated
- Default value: RECOMMENDED
- Supported values:
  - RECOMMENDED
  - RU or RU:x.y
  - OPATCH
  - OJVM or OJVM:x.y
  - DPBP
  - <#>

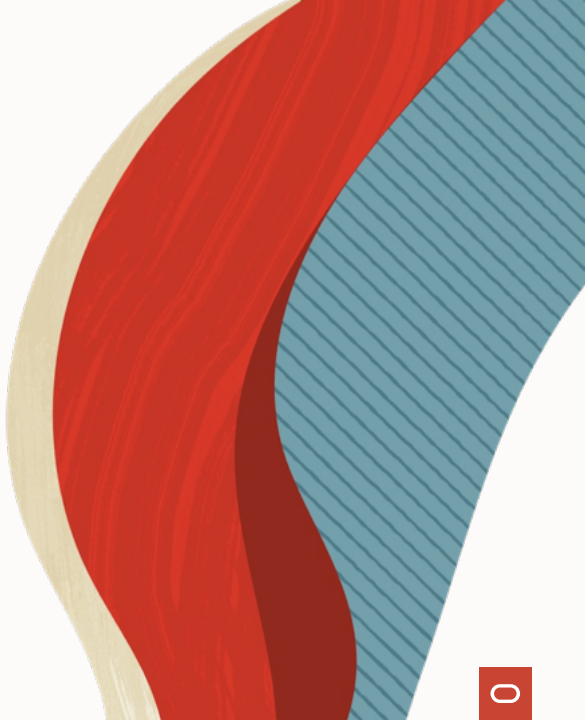


# Demo

## Applying recommended patches

- Specifying patches
- Patch database

Watch on [YouTube](#)





# Quarterly Release Updates

|      | 2023    |         |         |         | 2024    |         |         |         | 2025    |         |         |         | 2026    |         |         |
|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|      | January | April   | July    | October | January | April   | July    | October | January | April   | July    | October | January | April   | July    |
| 19c  | 19.18.0 | 19.19.0 | 19.20.0 | 19.21.0 | 19.22.0 | 19.23.0 | 19.24.0 | 19.25.0 | 19.26.0 | 19.27.0 | 19.28.0 | 19.29.0 | 19.30.0 | 19.31.0 | 19.32.0 |
| 21c  | 21.9.0  | 21.10.0 | 21.11.0 | 21.12.0 | 21.13.0 | 21.14.0 | 21.15.0 | 21.16.0 | 21.17.0 | 21.18.0 |         |         |         |         |         |
| 23ai |         |         |         |         |         |         | 23.5.0  | 23.6.0  | 23.7.0  | 23.8.0  | 23.9.0  | 23.10.0 | 23.11.0 | 23.12.0 | 23.13.0 |



# Monthly Recommended Patches

|         | 2023    |          |          | 2024    |          |       |         |      |      |         |        |           |         |          |
|---------|---------|----------|----------|---------|----------|-------|---------|------|------|---------|--------|-----------|---------|----------|
|         | October | November | December | January | February | March | April   | May  | June | July    | August | September | October | November |
| 19.21.0 | 19.21.0 | MRP1     | MRP2     | MRP3    | MRP4     | MRP5  | MRP6    |      |      |         |        |           |         |          |
| 19.22.0 |         |          |          | 19.22.0 | MRP1     | MRP2  | MRP3    | MRP4 | MRP5 | MRP6    |        |           |         |          |
| 19.23.0 |         |          |          |         |          |       | 19.23.0 | MRP1 | MRP2 | MRP3    | MRP4   | MRP5      | MRP6    |          |
| 19.24.0 |         |          |          |         |          |       |         |      |      | 19.24.0 | MRP1   | MRP2      | MRP3    | MRP4     |
| 19.25.0 |         |          |          |         |          |       |         |      |      |         |        |           | 19.25.0 | MRP1     |





An MRP is an **optional** collection of several **important** one-off patches

- Delivered as a merge patch
- Currently on Linux and for 19c only
- Cumulative





## AutoUpgrade does not support Monthly Recommended Patches (MRP)

- Coming in a later release
- Specify each patch individually instead





# Download





## How to download patches



# Network Connectivity

The download stage requires:

1. Internet access
2. My Oracle Support credentials



# Internet Access

AutoUpgrade connects to:

- `https://updates.oracle.com`
- `https://login-ext.identity.oraclecloud.com`
- `https://aru-akam.oracle.com`

URLs are part of a CDN, so expect changing IP addresses

- Use DNS names instead of IP addresses in your firewall

For connections via proxy use environment variables

- `https_proxy`



# MOS Credentials

## You must have:

- A valid My Oracle Support credential
- Connected to a Customer Support Identifier (CSI)
- Privilege to download patches using that CSI

## Failure to meet the requirements:

- `*Connection Failed - You entered an incorrect user name or password.*`



# MOS Credentials

For *download patches privilege* contact an MOS administrator in your organization.

- In *User Details*
- Select the appropriate *Support Identifier*
- Set the *Patches* drop-down to *Download*



# Keystore

AutoUpgrade stores MOS credentials in a keystore

- Config file parameter: `global.keystore`
- Governs directory of AutoUpgrade keystore
- Password protected software keystore
- Optionally, an auto-open keystore
- No additional license needed



```
$ java -jar autoupgrade.jar ... -patch -load_password
```

```
...
```

Create new AutoUpgrade Patching keystore - password required

Enter password:

Enter password again:



```
$ cat DB19.cfg
```

```
global.keystore=/home/oracle/autoupgrade-patching/keystore
```

```
...
```

```
$ ls -l /home/oracle/autoupgrade-patching/keystore
```

```
-rw-----. 1 oracle oinstall 720 Oct 11 14:56 ewallet.p12
```





You must enter keystore password  
every time you start AutoUpgrade





You can share the keystore  
between your database servers



MOS> add -user <MOS username>

Enter your secret/Password:

Re-enter your secret/Password:





The keystore can hold only one set of credentials

- Adding more overwrites the existing



```
MOS> add -user <MOS username>  
Enter your secret/Password:  
Re-enter your secret/Password:
```

```
MOS> save
```

```
Convert the AutoUpgrade Patching keystore to auto-login [YES|NO] ?
```



```
$ cat DB19.cfg
```

```
global.keystore=/home/oracle/autoupgrade-patching/keystore  
...
```

```
$ ls -l /home/oracle/autoupgrade-patching/keystore
```

```
-rw-----. 1 oracle oinstall 720 Oct 11 14:58 cwallet.sso  
-rw-----. 1 oracle oinstall 720 Oct 11 14:56 ewallet.p12
```





With an auto-login keystore, you no longer need to enter the keystore password

- Suitable for automation





An auto-login keystore  
is bound to just one server

- Not possible to share between servers





Protect the AutoUpgrade keystore  
like you protect any other keystore

- Apply restrictive file system permissions



# Demo

## Using keystore

- Creating keystore
- Loading credentials

Watch on [YouTube](#)

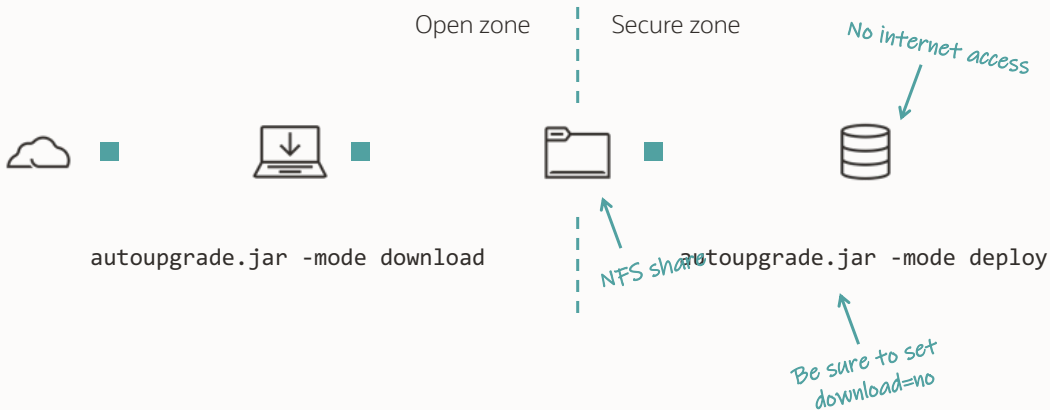




Your database host  
doesn't have internet access?



# Using Download Mode







Without internet, AutoUpgrade applies the recent-most RU found in *patch* folder

- Unless you explicit specify a different RU





You can download patches manually  
and place them in the *patch* folder

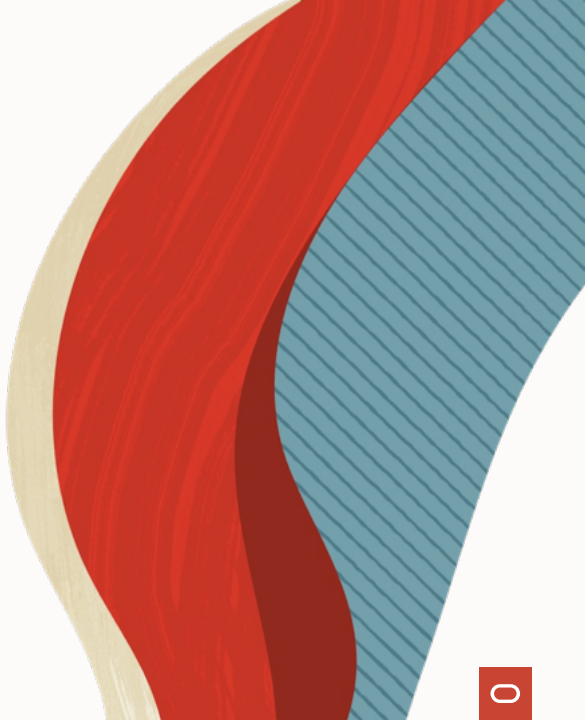


# Demo

## Download mode

- Download patches from open zone
- Patch database in secure zone

Watch on [YouTube](#)





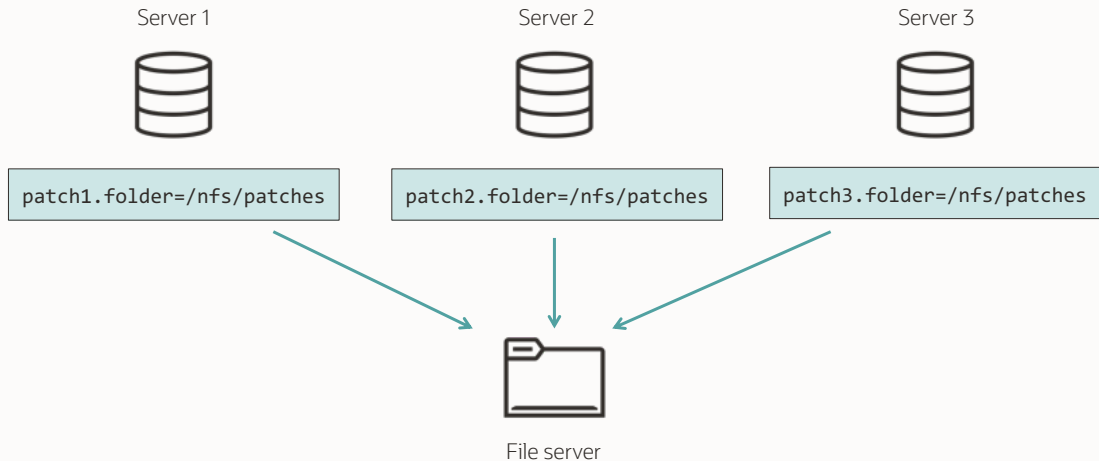


AutoUpgrade **only** downloads patch files if they are not found in *patch* folder

- Allow all servers to access a central *patch* folder



# Central Patch Folder







AutoUpgrade can't download  
the base release (right now)

- Manually download and place in *patch* folder



# Oracle Database Enterprise Edition

Use these downloads for de  
versions from the Oracle Sol

Database Version and Pla

Oracle Database 19c for M

Oracle Database 19c for Li

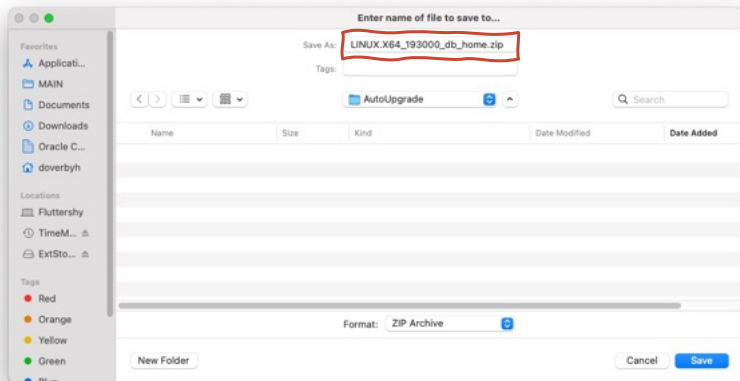
Oracle Database 19c for Li

you can download all supported

downloads

downloads

downloads



Oracle Database 19c for Oracle Solaris (x86 systems, 64-bit)

ZIP (2.8 GB)

[Installation Guide](#)

[Individual Component Downloads](#)





# What If





What about the TNS listener?



# TNS Listener

AutoUpgrade does not update the listener to start in the new Oracle home

Manually change your listener configuration when appropriate



# Listener Configuration

Oracle recommends using **dynamic listener** registration

If you have static listener entries:

- Manually update the Oracle home information
- Reload listener

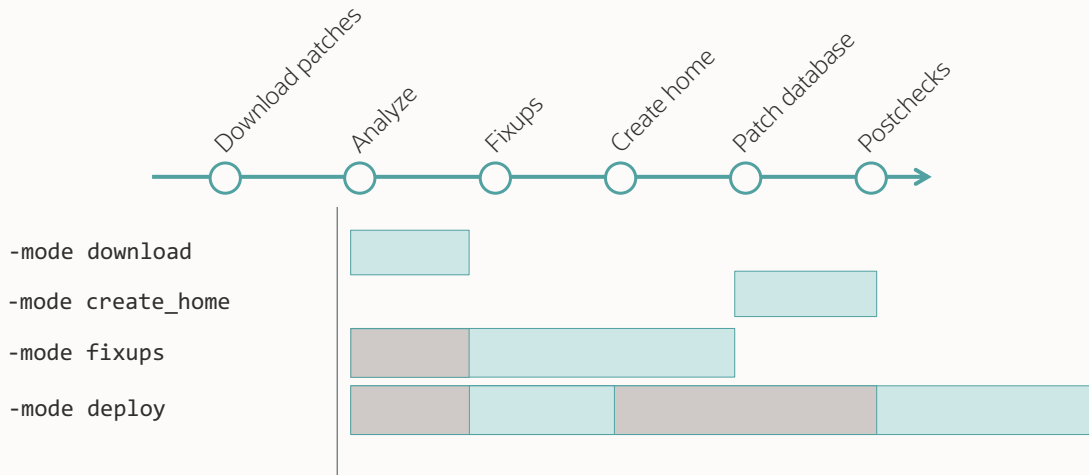




I want minimum downtime  
on Single Instance



# Minimize Patching Downtime







I want to patch multiple databases



# Multiple Databases

AutoUpgrade Patching supports:

- Multiple databases moving to a different Oracle home
- Each database will have a different prefix within the same config file



# Multiple Databases

AutoUpgrade Patching **does not support** yet:

- Multiple databases moving to the same Oracle home within one single config file
- Workaround:
  - First call "-mode create\_home"
  - Create one config file per database





I am using Oracle Restart



# Oracle Restart

AutoUpgrade **supports** Oracle Restart

- Updates Oracle Restart registration (srvct1)
- Does not patch Grid Infrastructure itself





I have a RAC database



# RAC Database

AutoUpgrade **supports:**

- Patching the database only
- All-node patching (downtime)



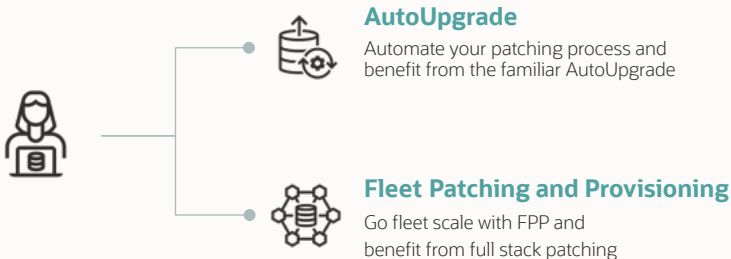
# RAC Database

AutoUpgrade **does not support** yet:

- Creating Oracle homes for RAC databases (planned)
- Rolling patching (planned)
- Patching Grid Infrastructure (not planned)



# Where does AutoUpgrade fit in?







I have an Exadata Database Machine



# Exadata

## Exadata Database Machine

- [Updating Exadata Infrastructure](#)
- [Fleet Patching and Provisioning](#)

## Exadata Cloud@Customer

- [Exadata Fleet Update](#)
- [MAA Blog Post](#)





I am using a database service in OCI



# Database Service

For databases services in OCI:

- Use the cloud tooling
- Use Exadata Fleet Update





I want to roll back



--Roll back to the previous Oracle home  
--and use Flashback Database to return to GRP  
--Specify the patch job ID that you want to undo

```
java -jar autoupgrade.jar -config DB19.cfg -restore -jobs <n>
```





AutoUpgrade flashes the database back to the guaranteed restore point

- Don't flashback to the GRP after go-live
- Doesn't work for Standard Edition 2



# Rollback

You can perform the rollback manually

- AutoUpgrade preserves the source Oracle home
- Move database [configuration files](#) back
- Run Datapatch to undo database patches





# Wrapping Up



# Cleaning up and more

You may need to clean up your old Oracle Homes

Out-of-place patching may require adjustments in your scripts

Drop the Guaranteed Restore Point (GRP)



# In The Plans



We're working to support

- All platforms
- Oracle Database 23ai
- Monthly Recommended Patches (MRP)
- Cloning Oracle homes





We want **you** to test it, please!!

- We are looking for reference customers
- Get in touch with us when you tested it



# Find Slides and Much More on Our Blogs



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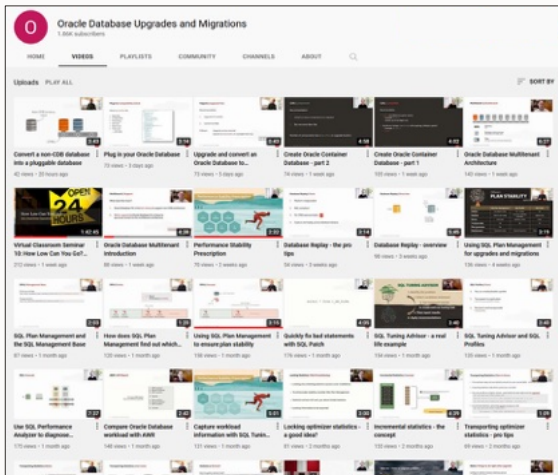




Help us shape the future



# YouTube | @UpgradeNow



[Link](#)

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





# Thank You

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- When patching two or more databases:
  - If target\_home exist, then AP checks the patches match or contain more patches. Proceed with patching.
  - DONE: ADDED SLIDES 84/85/86
- Our recommendation to minimize downtime:
  - Download, create\_home, (create golden image), Analyze, DOWNTIME, deploy (NEED ANIMATION or TIMELINE)
  - DONE: ADDED SLIDES 82/83
- Post-patch tasks:
  - You manually need to remove old Oracle homes (-deinstall) after a while (when you don't want to rollback)
  - Your own scripts (profile and other scripts) must be manually updated. Daniel's blog post
  - Remember to drop GRP after patching:
    - Drop GRP at your convenience once you consider it is no longer needed ----
    - Drop GRP from FTEX: drop restore point AU\_PATCHING\_9212\_FTEX1921000
    - Can you use drop\_grp\_after\_upgrade config file parm? YES
- How can you use this with Data Guard? Does download and create\_home work? Can you patch primary? Can AP handle mounted/open read only Data Guards?



# Demo

Download patches  
Install Oracle home  
Patch database

Watch on [YouTube](#)