ORACLE

Oracle Database Upgrade: Quick Start Guide

A quick reference to a successful Oracle Database upgrade

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PURPOSE STATEMENT

This document provides a quick guide to the steps, tools, and techniques that will ensure a successful upgrade for your Oracle database. This means an upgrade that not only completes without errors, but that delivers a post-upgrade environment with predictable, good performance.

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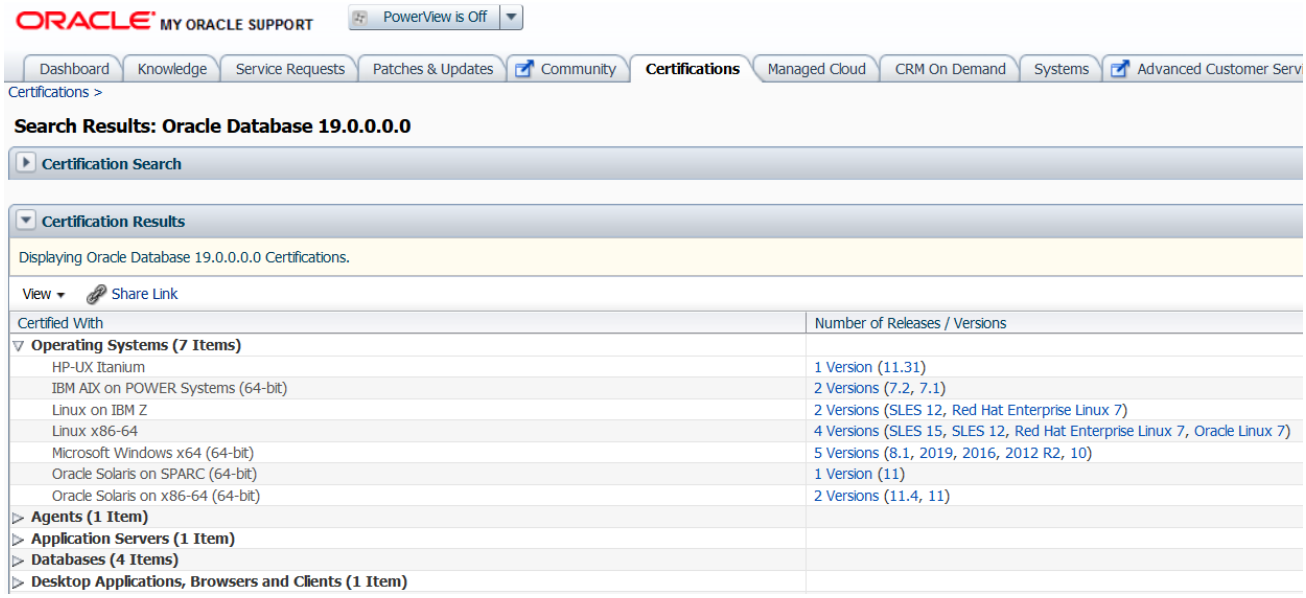
INTRODUCTION

Oracle is investing in tools, techniques and procedures that simplify and increasingly automate the upgrade process, whether it's on-premises or in the cloud. With the recent introduction of the AutoUpgrade utility an Oracle Database upgrade is now even easier, and you can in fact do an upgrade with just two commands. Although, the database upgrade itself is very simple to carry out, it is often part of a bigger process that includes other tasks and involves many parts of an organization. This quick start guide discusses the four recommended steps in the upgrade process.

STEP 1: VERIFY YOUR DATABASE AND APPLICATION CERTIFICATION

Familiarize yourself with the new release by reading the Database Upgrade Guide and pay special attention to the chapter on behavior changes, deprecated and desupported features. You can also find the hardware and software requirements for the new release in the platform specific installation guides. For up-to-date information on software certifications and requirements, you should visit My Oracle Support and use the "Certifications" tab to search for the new database release.



Screenshot from My Oracle Support showing the current certification for Oracle Database 19c

In addition, you should verify the certifications for any third-party application that is using the database. Ensure that the new database release is supported and pay attention to any database release specific information.

STEP 2: INSTALL ORACLE DATABASE WITH THE LATEST RELEASE UPDATE

Follow the instructions in the platform specific installation guides to install the newest database release. Install the software in a new location to allow for an out-of-place upgrade. Although possible, Oracle does not recommend that you do in-place upgrades because it increases downtime and complicates fallback operations.

In addition, you should apply the latest Release Update to the new Oracle Home. Release Updates do occasionally contain fixes to the upgrade process itself. It is generally recommended to use the latest Release Update. You can find the latest Release Update for your database version by using the My Oracle Suport note, "Assistant: Download Reference for Oracle Database/GI Update, Revision, PSU, SPU(CPU), Bundle Patches, Patchsets and Base Releases (Doc ID 2118136.2)."

Oracle recommend that you upgrade to the latest so-called "Long-Term Support" release to ensure that patches, including security related bug fixes, are available. At time of writing, this applies to Oracle Database 19c, and this will give you a much longer period of support compared to the interim releases (in this case 12.2.0.1 and 18c).

In case you need to upgrade to an interim release, you must plan the next database release upgrade in due time to avoid ending up in a situation where the database release is no longer supported. Consult My Oracle Support note, "Release Schedule of Current Database Releases (Doc ID 742060.1)" for further information.

STEP 3: UPGRADE USING THE AUTOUPGRADE FEATURE

Before starting the upgrade, you must ensure that you have a viable fallback option such as a backup or a restore point. Familiarize yourself with these options and ensure that you have adequate experience in using them.

Oracle recommends that you use the AutoUpgrade utility to perform the actual database upgrade. Although other options are available, AutoUpgrade offers the best balance between configurability, control and ease-of-use. Plus, it automatically employs the latest best practices and recommendations, does extensive logging and has the capability of performing multiple upgrade simultaneously.

AutoUpgrade is deployed as part of the database Oracle Home, however, we strongly encourage you to always download the latest version from My Oracle Support: "AutoUpgrade Tool (Doc ID 2485457.1)".
To use AutoUpgrade you must create a simple configuration file detailing the database (or databases) to be upgraded:

```
global.autoupg_log_dir=/home/oracle/logs
upg1.dbname=DB12
upg1.start_time=NOW
upg1.source_home=/u01/app/oracle/product/12.2.0.1
upg1.target_home=/u01/app/oracle/product/19
upg1.sid=DB12
upg1.log_dir=/home/oracle/logs/DB12
upg1.upgrade_node=localhost
upg1.target_version=19
```

Next, you analyze the database to identify any potential showstoppers and get information on issues you should consider resolving. Be sure that the parameter "config" points to the name of your configuration file:

```
java -jar $ORACLE_HOME/rdbms/admin/autoupgrade.jar -config config.cfg -mode analyze
```

Finally, the deploy phase will conduct the actual upgrade:

```
java -jar $ORACLE_HOME/rdbms/admin/autoupgrade.jar -config config.cfg -mode deploy
```

Following these simple steps your database is now upgraded and ready to use in a new release.
In the event of an error, the default configuration of AutoUpgrade will automatically revert the database using Flashback Database to its pre-upgrade state, and it can be used as if nothing has happened. Note, this applies for Enterprise Edition only. For Standard Edition 2 databases you must have your own fallback option in place.

Please refer to the documentation for complete information on AutoUpgrade and also please visit the Upgrade your database – Now! blog for valuable information, tips and recommendations.

STEP 4: TEST USING THE RIGHT FEATURES, OPTIONS AND PACKS

When testing a database before the actual production upgrade, it is important to have a comparable test system to ensure that your tests are as realistic as possible. This applies not only to the underlying hardware, but also for the amount of data being used and the workload being generated.

The Diagnostics and Tuning packs are very helpful in gathering performance baselines from your production system prior to making any major change including for database upgrades. Oracle recommends that you retain at least 31 days of AWR snapshots to characterize and compare system performance before and after the upgrade.

Oracle Real Application Testing helps you to fully assess the effect of the upgrade by running realistic workloads on the test system using Database Replay. Even more important, SQL Perfomance Analyzer can help you identifying regressed SQLs.

In addition, you should use SQL Plan Management to ensure plan stability by identifying key SQLs and fixing their plan. Later, a potential better plan can be verified by the database and put into use in a controlled manner.

Speaking of testing, please also ensure that you have tested your fallback options in a test system. It is important to verify, for example, that a backup can – in fact – be restored in the required service window, and that you have the necessary experience and training in doing so.

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