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.

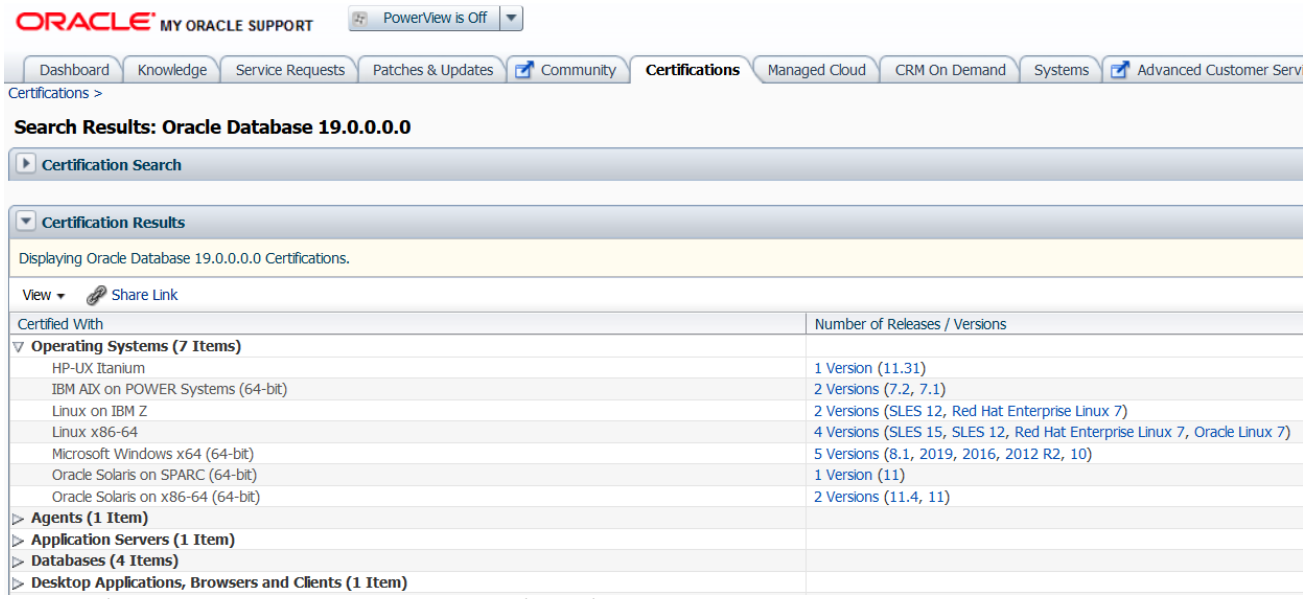
DISCLAIMER

INTRODUCTION

Oracle is investing in tools, techniques and procedures that simplify and increasingly automate the Oracle Database upgrade process, whether it's on-premises or in the cloud. The AutoUpgrade utility makes an Oracle Database upgrade easier and executable with just two commands. Although the database upgrade itself is simple to carry out, it is often part of a more extensive 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 that documents 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 review 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, one that does not overwrite your current Oracle Home. Although it is possible, Oracle does not recommend in-place upgrades because it increases downtime and complicates fallback operations.

Barring special circumstances, such as application compatibility, Oracle recommends applying the latest Release Update (RU.) Release Updates do occasionally contain fixes to the upgrade process itself. 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 recommends upgrading to the latest "Long-Term Support" release to ensure that patches, including security related bug fixes, are available. This is Oracle Database 19c. It will give you a much longer period of support than the innovation releases (12.2.0.1, 18 and 21.)

In case you need to upgrade to an innovation release, you must plan the next database release upgrade in due time to avoid 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 using them.

Oracle recommends that you use the AutoUpgrade utility to perform the 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 upgrades 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)". Newer versions of AutoUpgrade are fully backwards compatible. For instance, AutoUpgrade version 21 is capable of upgrading databases of earlier releases as well (in this case Oracle Database 19c, 18c, and 12.2.0.1.)
To use AutoUpgrade you must create a simple configuration file that specifies the database or databases to be upgraded:

```
global.autoupg_log_dir=/home/oracle/logs
upg1.source_home=/u01/app/oracle/product/12.2.0.1
upg1.target_home=/u01/app/oracle/product/19
upg1.sid=DB12
```

Next, analyze the database to identify any issues that could prevent a successful upgrade and get information on other 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 to the new release and ready to use. In the event of an error, the default configuration of AutoUpgrade will automatically revert the database to its pre-upgrade state using Flashback Database. The database can be used as if the upgrade did not happend. Note, this applies to Enterprise Edition only. For Standard Edition 2 databases, you must have your own fallback option in place.

Please refer to the Database Upgrade Guide documentation for complete information on AutoUpgrade and visit the Upgrade your database – Now! blog for valuable information, tips and recommendations. In addition, there are multiple on-demand webinars with additional information on upgrades.

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 to the amount of data being used and the workload being generated.

The Diagnostics and Tuning packs are helpful for 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 Automatic Workload Repository (AWR) snapshots to characterize and compare system performance before and after the upgrade.

Oracle Real Application Testing helps you assess the effect of the upgrade by running realistic workloads on the test system using Database Replay. SQL Perfomance Analyzer can help you identify regressed SQL statements.

SQL Plan Management can help you ensure plan stability by identifying key SQL statements and fixing their plans. Later, a potentially better plan can be verified by the database and put into use in a controlled manner.

Speaking of testing, please 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 to do it.

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