

The New AutoUpgrade for Oracle Database



Hector Vieyra
Software Development Manager
Database Upgrade
Oracle Corporation



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ORACLE

A little bit about us



Software Development Manager at Oracle

- An Oracle senior level DBA with more than 15 years of experience
- Contributing as software engineer for Database Upgrade & Installer and Assistants team(DBUA,DBCA,ASMCA)
- Broad range of experience in architecting, designing, implementing, managing and supporting complex business critical databases and related server infrastructure on transnational companies like Bank Of America Merrill Lynch, General Electric and Cadbury Adams.
- Ample experience in different Oracle database technologies like data guard, rac and Exadata



Principal Member of Technical Staff at Oracle, Database Upgrade Development Team

- From Guatemala
- 15+ years of experience as DBA and as a Software developer.
- OCP and OCE GI & RAC
- Software architect.
- Consultant for companies such as Banco Santander, InterAmerican Development Bank, Bank of America, etc.
- Upgrade/downgrade and migrations specialist, RAC, high availability and Exadata.
- SME Oracle on Windows.
- Preupgrade developer at Database Upgrade Development team

Where we come from?



Slides and more | <https://MikeDietrichDE.com>

Upgrade your Database – NOW!

Mike Dietrich's Blog About Oracle Database Upgrades... Mostly



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- Installing Oracle Database 18c June 20, 2018
- Deinstalling Oracle Database 12.2.0.1 June 19, 2018
- Upgrade Oracle 12.2.0.1 to Oracle Database 18c on-premises June 18,



Upgrade your Database – NOW!

Mike Dietrich's Oracle Database Upgrade Blog



The new AutoUpgrade

Hands-Free Upgrades to Oracle Database 19c

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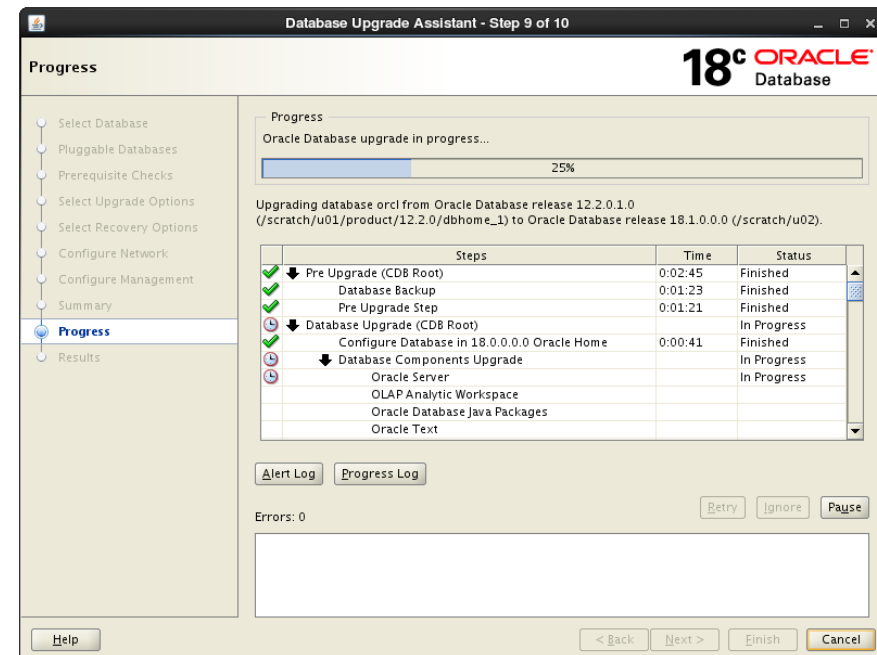
Yesterday ...

AutoUpgrade Tool | Database Upgrade until 2018

- Command Line: dbupgrade

```
-----
Phases [0-108]          Start Time:[2018_07_26 08:37:32]
-----
***** Executing Change Scripts *****
Serial  Phase #:0      [UPGR] Files:1    Time: 105s
***** Catalog Core SQL *****
Serial  Phase #:1      [UPGR] Files:5    Time: 73s
Restart Phase #:2      [UPGR] Files:1    Time: 0s
***** Catalog Tables and Views *****
Parallel Phase #:3     [UPGR] Files:19   Time: 27s
Restart Phase #:4      [UPGR] Files:1    Time: 0s
***** Catalog Final Scripts *****
Serial  Phase #:5      [UPGR] Files:7    Time: 24s
***** Catproc Start *****
Serial  Phase #:6      [UPGR] Files:1    Time: 15s
***** Catproc Types *****
Serial  Phase #:7      [UPGR] Files:2
```

- Graphical Tool: DBUA





Tomorrow ...

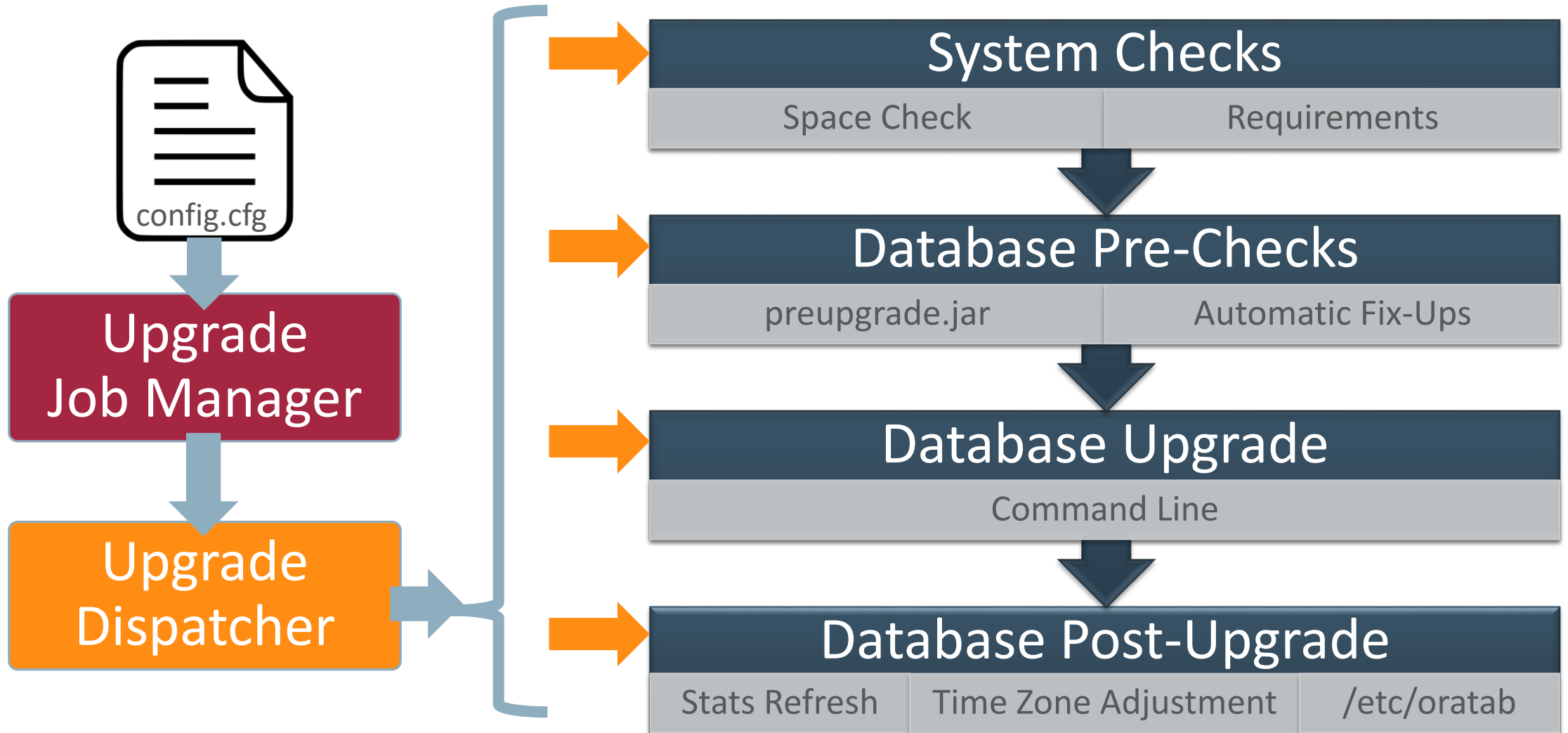
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Copyright © 2019, Oracle and/or its affiliates. All rights reserved. | Upgrade / Migrate / Consolidate to Oracle 19c

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```
$ /u01/app/oracle/product/18/jdk/bin/java -jar autoupgrade.jar -config config.txt -mode deploy
```

AutoUpgrade Tool | Architecture



AutoUpgrade Tool | What do you need?

- Java 8 or newer
 - Default in your `$ORACLE_HOME` since 12.1.0.2
 - Check: `$ORACLE_HOME/jdk/bin/java -version`
- Oracle databases to upgrade
 - Minimum database version is 11.2.0.4
- The AutoUpgrade package
 - A `jar` file of <4 MB in size
- `ARCHIVELOG mode ON`

AutoUpgrade Tool | What we support

- Non-CDB and CDB upgrades
- All operating systems running Oracle Database servers
- Standard Edition 2 and Enterprise Edition
- Upgrades to version:
 - 12.2.0.1 with Jan 2019 Update or newer
 - 18.5.0 (includes Jan 2019 Update) or newer
 - 19.3.0 (includes April 2019 Update) or newer

AutoUpgrade Tool | Get the newest version of the tool

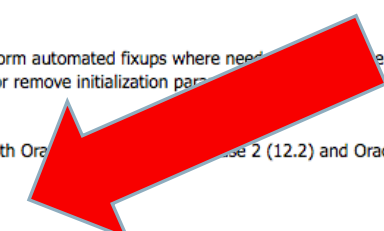
- [MOS Note: 2485457.1](#)

Benefits

AutoUpgrade enables customers to upgrade one or many Oracle databases at the command-line with a single command and a single configuration file. AutoUpgrade will run the preupgrade tasks, perform automated fixups where needed, complete the database upgrade, and finish by taking care of post-upgrade tasks. It includes automatic retry and fallback, the possibility to schedule upgrades for future points in time, and the ability to set, change or remove initialization parameters. This saves time and money by upgrading hundreds of databases with one command and replacing bespoke high maintenance upgrade solutions.

As of the January 2019 Release Updates (DBJAN2019RU) and beyond, AutoUpgrade Support is available for Oracle Database 12c Release 2 (12.2) and Oracle Database 18c (18.5) target homes. For both Oracle Database 12c Release 2 (12.2) and Oracle Database 18c (18.5) target homes, you must download the [AutoUpgrade Tool](#) and place it under \$ORACLE_HOME/rdbms/admin.

In Oracle Database 19c (19.3) and later target Oracle homes, the autoupgrade.jar file exists by default. However, before you use AutoUpgrade, Oracle recommends that you download the [latest version](#) and replace the one already existing under \$ORACLE_HOME/rdbms/admin.



Target versions supported

AutoUpgrade Tool can be used on upgrading to below Oracle Database releases:

- Oracle Database 19c (19.3)
- Oracle Database 18c (18.5)
- Oracle Database 12c Release 2 (12.2 + DBJAN2019RU)

For supported source Oracle Databases releases to be upgraded to above target releases, refer to Database Server Upgrade/Downgrade Compatibility Matrix (Doc ID 551141.1)

AutoUpgrade documentation

Refer to [Oracle Upgrade Guide](#) for complete documentation about how to use AutoUpgrade tool.

AutoUpgrade Tool | What do you need to do?



11.2.0.4



12.1.0.2



12.2.0.1 / 18c



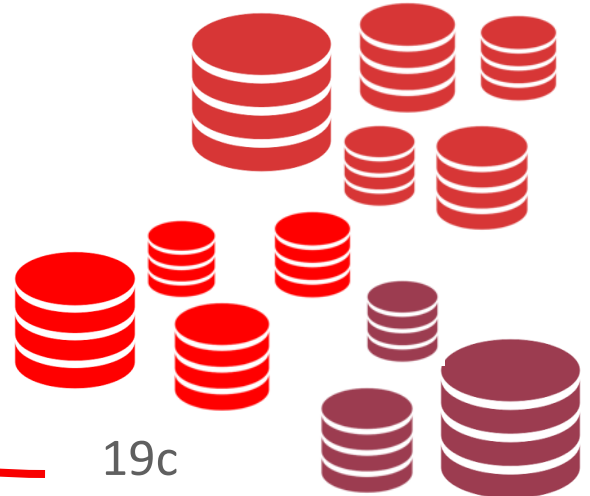
```
# Global logging directory pertains to all jobs
#
# Global logging directory (Required)
# Global logging directory (Required)
# Top level logging directory (Required)
#
# Database 1
# Database Name (Required)
# Source Home (Required)
# Target Home (Required)
# Target Name (Required)
# Oracle Sid (Required)
# Start time of the operation (Required)
# Container Database (Required)
# Local logging directory
# Upgrade mode that operation will run on
#
# Database 2
# Database Name (Required)
# Source Home (Required)
# Target Home (Required)
# Target Name (Required)
# Oracle Sid (Required)
# Start time of the operation (Required)
# Container Database (Required)
# Local logging directory
# Upgrade mode that operation will run on
```

config.cfg

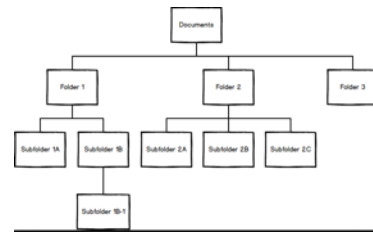


upg>
Job Console

autoupgrade.jar



19c



AutoUpgrade Tool | What do you don't need?

- Agents
- EM Cloud Control
- Extra license

AutoUpgrade Tool | Create a configuration file

```
upg1.dbname=DB12
upg1.start_time=NOW
upg1.source_home=/u01/app/oracle/product/12.1.0.2
upg1.target_home=/u01/app/oracle/product/18.3.0
upg1.sid=DB12
upg1.log_dir=/home/oracle/aux/DB12
upg1.upgrade_node=localhost
upg1.target_version=18.3
```

```
upg2.dbname=UPGR
upg2.start_time=NOW
upg2.source_home=/u01/app/oracle/product/11.2.0.4
upg2.target_home=/u01/app/oracle/product/18.3.0
upg2.sid=UPGR
upg2.log_dir=/home/oracle/aux/UPGR
upg2.upgrade_node=localhost ...
```


AutoUpgrade Tool | But there are more options ...

```
#
#   Example global pfile configuration entries
#
global.del_during_upgrade_pfile=/database/pfiles/global_during_delinit.ora
global.add_during_upgrade_pfile=/database/pfiles/global_during_addinit.ora
global.del_after_upgrade_pfile=/database/pfiles/global_after_delinit.ora
global.add_after_upgrade_pfile=/database/pfiles/global_after_addinit.ora

#
#   Example local pfile configuration entries
#
upg2.del_during_upgrade_pfile=/database/pfiles/hr_during_delinit.ora
upg2.add_during_upgrade_pfile=/database/pfiles/hr_during_addinit.ora
upg2.del_after_upgrade_pfile=/database/pfiles/hr_after_delinit.ora
upg2.add_after_upgrade_pfile=/database/pfiles/hr_after_addinit.ora
```

AutoUpgrade Tool | Even more options ...

```
#
#   Example global script execution
#
global.before_action=/database/scripts/run_this_before.sh
global.after_action=/database/scripts/run_this_after.sh

#
#   Example local script execution
#
upg2.before_action=/database/scripts/run_this_on_UPG2_before.sh
upg2.after_action=/database/scripts/run_this_on_UPG2_after.sh
```

- Permitted extension options:
 - Unix shell (.sh)
 - Microsoft Windows batch (.bat, .cmd)
 - Microsoft Windows PowerShell (.ps1)

AutoUpgrade Tool | Ok, there's still more ...

```
#  
#   Example global directive  
#  
global.remove_underscore_parameters  
  
#  
#   By default a GRP will be created. This option overwrites the default.  
#  
upgr2.restoration=no  
  
#  
#   If unset, utlrp.sql won't be run  
#  
upgr2.run_utlrp=no  
  
#  
#   If unset, time zone upgrade won't be performed  
#  
upgr2.timezone_upg=no
```

AutoUpgrade Tool | `START_TIME`

- VALID values

- now
- 30/12/2018 15:30:00
- 01/11/2019 01:30:15
- 2/5/2019 3:30:50

- INVALID values

- 30-12-2018 15:30:00
- 01/11/2019 3:30:15pm
- 2019/06/01 01:30:15

AutoUpgrade Tool | Before you start ...

```
sqlplus / as sysdba
shutdown immediate;
startup mount;
alter system set db_recovery_file_dest_size=50G scope=both
sid='*';
alter system set db_recovery_file_dest='/u02/fra' scope=both
sid='*';
alter database archivelog;
alter database open;
alter pluggable database all open;
```

AutoUpgrade Tool | AutoUpgrade - 4 modes

autoupgrade.jar

-analyze

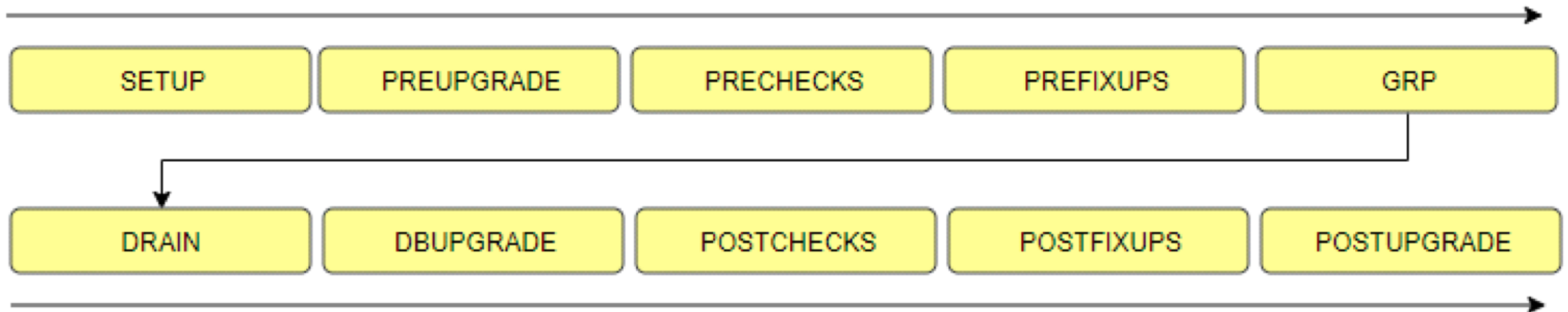
-fixups

-upgrade

-deploy

AutoUpgrade Tool | Deploy Mode

```
$ORACLE_HOME/jdk8/bin/java -jar autoupgrade.jar -config config.txt -mode deploy
```



AutoUpgrade Tool | Recommendation



autoupgrade.jar

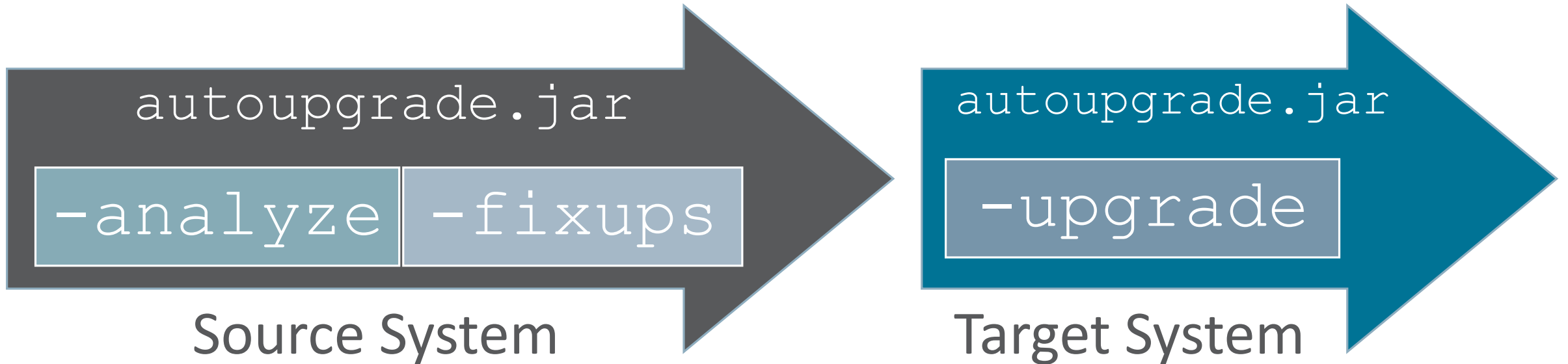
-analyze

-deploy

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

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


AutoUpgrade Tool | When you move to new hardware



```
$ java -jar autoupgrade.jar -config config.cfg -mode analyze
$ java -jar autoupgrade.jar -config config.cfg -mode fixups
$ java -jar autoupgrade.jar -config config.cfg -mode upgrade
```

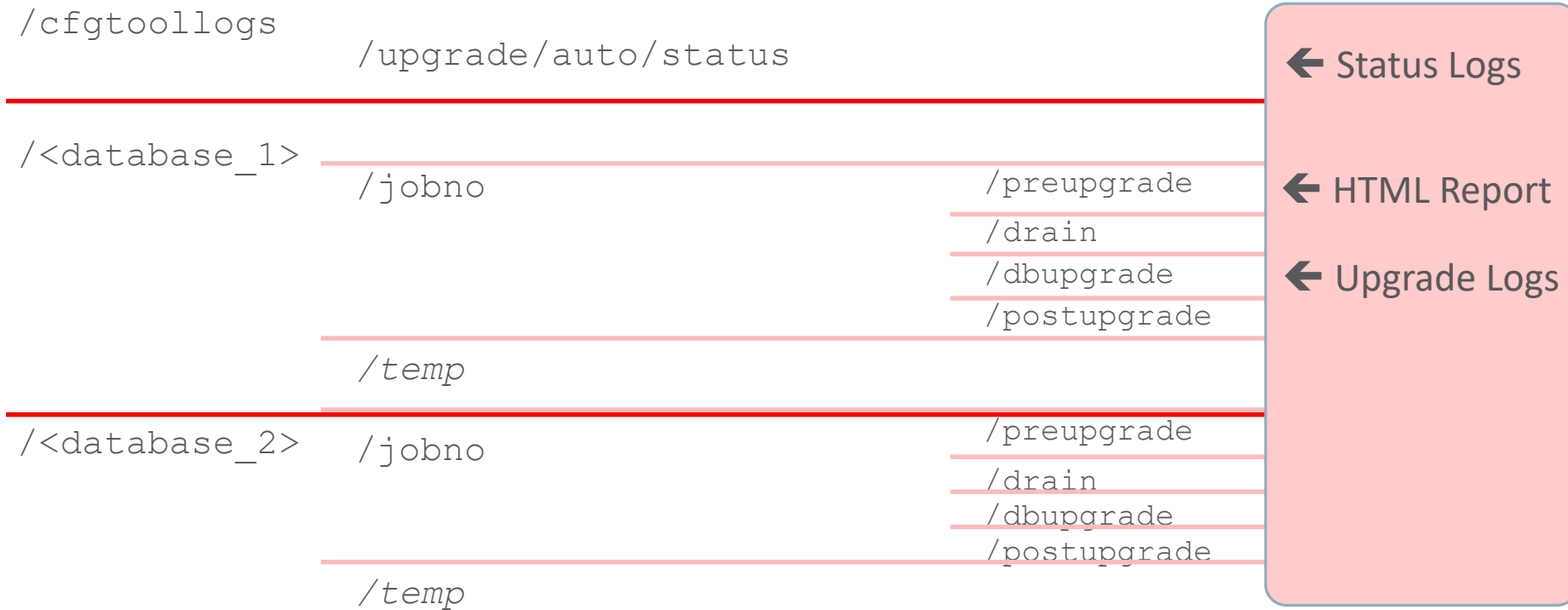
AutoUpgrade Tool | Job Control - Most Important Commands

```
upg>
```

```
lsj                                // List jobs
resume -job <number>              // Restarts a job
status [-job <number>]           // Show job status
restore -job <number>             // Restores database from GRP
abort -job <number>               // Aborts the specified job
```

AutoUpgrade Tool | Logging

- Text and JSON format
- Directory structure



```
global.autoupg_log_dir=/home/oracle/aux

upg1.dbname=FTEX
upg1.start_time=NOW
upg1.source_home=/u01/app/oracle/product/11.2.0.4
upg1.target_home=/u01/app/oracle/product/18
upg1.target_version=18.3
upg1.sid=FTEX
upg1.log_dir=/home/oracle/aux/ftex
upg1.upgrade_node=localhost

upg2.dbname=UPGR
upg2.start_time=NOW
upg2.source_home=/u01/app/oracle/product/11.2.0.4
upg2.target_home=/u01/app/oracle/product/18
upg2.target_version=18.3
upg2.sid=UPGR
upg2.log_dir=/home/oracle/aux/upgr
upg2.upgrade_node=localhost

~
~
~
```

AutoUpgrade Tool | Preupgrade HTML Report

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Date: Thu Oct 11 23:22:01 CEST 2018 | DB Compatible: 11.2.0.4.0 | DB Version: 11.2.0.4.0 | Operating System: Linux

UPGR

Database

UPGR

UPGR

CheckName: OLS_SYS_MOVE FixUp Available: YES Severity: ERROR Stage: PRECHECKS

Logged in AS SYSDBA, run \$ORACLE_HOME/rdbms/admin/olspreupgrade.sql from the new Oracle Database 18.0.0.0.0 home.

As part of the upgrade to 18.0.0.0.0, records in the 11.2.0.4.0 audit table SYSTEM.AUD\$ are moved to SYS.AUD\$. This step can be manually performed before the upgrade to reduce downtime. Refer to the 18.0.0.0.0 Oracle Label Security Administrator's Guide, or to Oracle Database Upgrade Guide for further details.

olspreupgrade.sql has not been run on this database. To view the number of records that olspreupgrade.sql moves, use the following command:

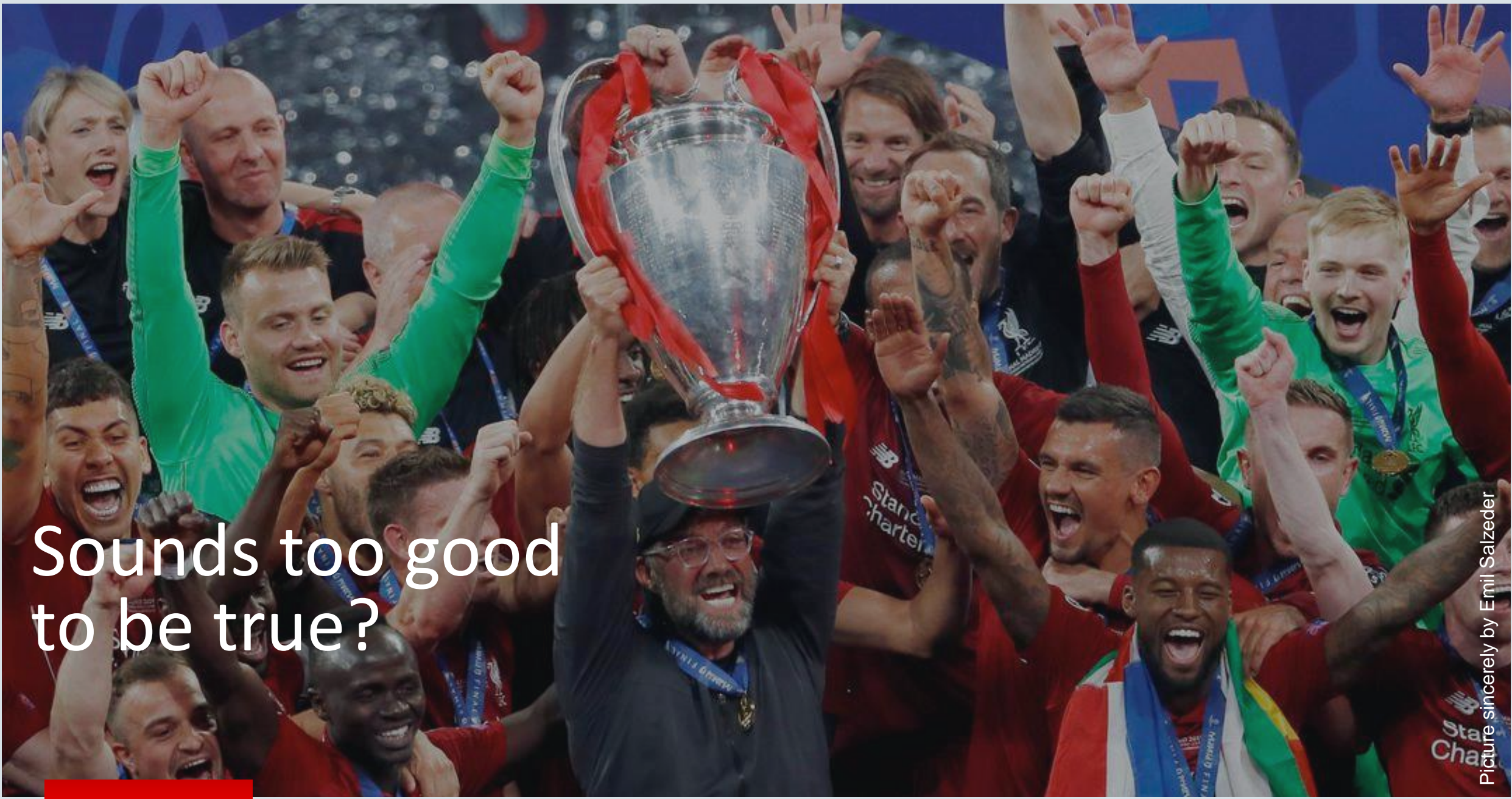
```
SELECT count(*) FROM system.aud$;
```

CheckName: POST_DICTIONARY FixUp Available: YES Severity: RECOMMEND Stage: POSTCHECKS

Gather dictionary statistics after the upgrade using the command:

```
EXECUTE DBMS_STATS.GATHER_DICTIONARY_STATS;
```

Dictionary statistics provide essential information to the Oracle optimizer to help it find efficient SQL execution plans. After a database upgrade, statistics need to be re-gathered as there can now be tables that have



Sounds too good to be true?

Picture sincerely by Emil Salzedo



AUTO-UPGRADE

FIRST IMPRESSION

DANIEL OVERBY HANSEN, LEAD DEVELOPER

Presented at OOW 2018



AutoUpgrade Tool | Customer Experience

- For the full slides please see:
<https://mikedietchde.com/slides/#OOW18>



More Information | www.oracle.com/goto/upgrade

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hector.vieyra@oracle.com

byron.motta@oracle.com

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