Best Practices for Upgrading to Oracle Database 11g Release 2
Agenda

- Best Practices
- FAQ
- Summary
Best Practice #1

• Read the FRIENDLY manuals!
Introduction

The Best Practices section is not a replacement for the Oracle Database Upgrade Guide but rather a companion document that emphasizes and elaborates on database upgrade recommendations and requirements. The Best Practices are derived by Oracle technical staff and offer an accumulation of real-world knowledge and experience obtained while working with our customers.

Usage

The Best Practices tab is organized by the following major steps in the Upgrade Methodology:

- **Upgrade Planning**: Important information related to planning the DB configuration, and testing
- **Prepare and Preserve**: Information related to preserving and preparing the source environment for the Oracle Database 11g Upgrade
- **Upgrade**: Final reminders and information required for the actual upgrade
- **Post Upgrade**: Testing and analysis which should be performed after upgrading your test and production databases to Oracle Database 11g
Documentation

• Note:785351.1 Upgrade Companion 11g Release 2

Behavior Changes

This section documents important changes in behavior between Oracle9i Release 2 (9.2)/Oracle Database 10g and Oracle Database 11g. This section focuses on behavior changes that require a DBA to make an informed decision to minimize the risks that may be introduced by the changes. This section does not describe all changed behavior or new features in Oracle Database 11g. For a complete list of all new features introduced in Oracle Database 11g, see the Oracle Database New Features Guide 11g.

This page is an accumulation of real-world knowledge and experience obtained from Support and Development engineers and working with Oracle customers on different upgrade scenarios. Pay careful attention to these Behavior Changes to avoid the most common issues when upgrading from Oracle9i Release 2/Oracle Database 10g to Oracle Database 11g.

Architecture
Optimizer
Initialization Parameters
Performance and Monitoring
Administration
Streams
Security
Documentation

• Upgrade Guides
  • [Image of Upgrade Guide]
  • [Link to Upgrade Guide]
  • Note: 837570.1
    Complete Checklist for Manual Upgrades to 11g Release 2
  • Note: 421191.1
    Complete checklist for manual upgrades from X to Y
OTN Upgrade Page

OTN Upgrade Page


Oracle Database Upgrade
Upgrading to Oracle Database 11g Release 2 provides the latest in efficient, reliable, secure data management for mission-critical online transaction processing applications, query-intensive data warehouses, and content management and Web2.0 applications. The right planning, preparation, and upgrade steps will make the upgrade process simpler, faster, and more predictable from start to finish.

Always Relevant Topics

Database Upgrade Customer Forum
Interactive forum containing Database Upgrade relevant information.
Oracle Database Upgrade Discussion Forum

Is your Database Ready for an Upgrade?
Find out by visiting My Oracle Support and downloading the latest Pre-Upgrade script.
Oracle Database Pre-Upgrade Script (My Oracle Support)

Upgrade Workshop
The Database Upgrade Team has been busy traveling and presenting an Upgrade Workshop to customers. The two-day presentation includes over 100 slides.
11g Release 2 Upgrade Workshop Presentation (2.16MB)
Mike Dietrich's Upgrade BLOG includes information about past and upcoming Upgrade Workshops.

Upgrade Methods
Get a quick overview of various Upgrade Methods that may be used to upgrade to Oracle Database 11.2 Release 2.
Upgrading to Oracle Database 11g Release 2

Best Practices
Review Oracle's Best Practices for upgrading your Oracle Database.
Best Practices - Upgrading to Oracle Database 11g Release 2 (Sept 2010)

Manual Upgrade
This document provides a checklist to review prior to performing a manual Upgrade.
Checklist for Manual Upgrades (My Oracle Support)

DBUA Upgrade
If you plan on using the Database Upgrade Assistant to perform your upgrade, this document provides a checklist you should review first.
Checklist for DBUA Upgrade (My Oracle Support)
OTN Upgrade Forum


## Forum: Database - Upgrade

Discuss all aspects of database upgrade from planning and testing through execution and troubleshooting. Also, information about helpful tools and utilities, documentation, and other information to make your database upgrade easier, faster, and less risky.

**Post New Thread**  ➙  **Back to Category**

<table>
<thead>
<tr>
<th>Messages: 4,711 - Threads: 1,069 - Filter: All Threads - Pages: 72 [1 2 3 4 5] <strong>Next</strong></th>
<th></th>
</tr>
</thead>
</table>

### thread

<table>
<thead>
<tr>
<th>Thread</th>
<th>Author</th>
<th>Views</th>
<th>Replies</th>
<th>Last Post</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OTN Database Upgrade Page</strong>&lt;br&gt;Posted By: Brian McCarthy -- Aug 4, 2008 2:44 PM</td>
<td>S. Garewal</td>
<td>253</td>
<td>13</td>
<td>May 18, 2010 6:10 AM Last Post By: schanvi »</td>
</tr>
<tr>
<td>** Upgrade from SE 10g to EE 10g -- hp-ux --Confused on a step**</td>
<td>user11902835</td>
<td>11</td>
<td>0</td>
<td>May 18, 2010 5:38 AM Last Post By: user11902835 »</td>
</tr>
<tr>
<td>** seconf.sql , Will it be executed for upgrades or only for new Databases?**</td>
<td>user988772</td>
<td>36</td>
<td>3</td>
<td>May 18, 2010 2:17 AM Last Post By: Ragesh Lathwai »</td>
</tr>
<tr>
<td>** 11.1.0.7 upgrade on windows 2003 server 32-bit**</td>
<td>user564785</td>
<td>41</td>
<td>1</td>
<td>May 18, 2010 12:09 AM Last Post By: Satish Kand»</td>
</tr>
<tr>
<td>** insufficent memory for string storage Context is:**</td>
<td>user10274248</td>
<td>50</td>
<td>1</td>
<td>May 17, 2010 10:56 PM Last Post By: Ragesh Lathwai »</td>
</tr>
<tr>
<td>** Document Needed for Upgrading a database from 11.1.0.6.0 to 11.2.0.1**</td>
<td>user577554</td>
<td>37</td>
<td>1</td>
<td>May 17, 2010 7:14 AM Last Post By: caswong »</td>
</tr>
<tr>
<td>** change db_block_size duplicating a DB with RMAN**</td>
<td>user10970286</td>
<td>72</td>
<td>1</td>
<td>May 15, 2010 1:33 PM Last Post By: schanvi »</td>
</tr>
</tbody>
</table>

### Top Users in Forum

- schanvi (465)
- Satish Kand (270)
- oradba (160)
- Mike Dietrich (155)
- ora_tech (145)
- damoian (105)
- Bobcatalog (90)
- Laura Gajdla (70)
- P. Forstmann (65)
- roy.stonberg (65)
Upgrade your Database - NOW!
Ease your Oracle Database upgrades - Best Practices, Workshops, Projects...

OOOW 2010: Hands-On-Lab ... Donuts and more
By Mike Dietrich on September 29, 2010 7:28 PM

Thanks to everybody who made it this early morning from the HOL session in Marriott even though last night was a party long one with Ben Harper, the Black Eyed Peas and Steel Miller Band.

And thanks a lot to Play for organizing the healthy/typical American breakfast ;)

You could download the HOL slides from here - use the keyword "half"
And in case you'd like to get the full upgrade two hundred something slideset please download it from here and use the keyword "upgrade112".
CU next year - and happy upgrades ;)

OOOW 2010: Most common Upgrade mistakes Slides
Best Practice #2

• Patch your new `$ORACLE_HOME` before you upgrade
Recommended Patches

Oracle Recommended Patches -- Oracle Database

- Target Configurations
- Patch Availability
- Current Recommended Patches
  - 11.2.0.1 Current Recommended Patches
  - 11.1.0.7 Current Recommended Patches
  - 11.1.0.6 Current Recommended Patches
  - 10.2.0.4 Current Recommended Patches
  - 10.2.0.3 Current Recommended Patches
- Conflict Resolution
- On Request
- Known Issues
- References

Beginning with release 10.2.0.3, Oracle releases Recommended Patches for Oracle Database. For an introduction to Recommended Patches, see Note.756386.1.
Patch Set Update (PSU) Installation

• Install **PSUs** as well
  • *Note:854428.1*: Introduction to Database Patch Set Updates

• Database PSUs include:
  • Fixes for critical issues that may affect a large number of customers and that are already proven in the field
  • Critical Patch Update (CPU) fixes

• Database PSUs do not include:
  • Changes that require re-certification
  • Fixes that require configuration changes

• Typically **50-100 new bug fixes - cumulative**
• Guaranteed to be **RAC rolling installable**
• Will be released 4x per year such as CPUs on the same schedule
  • Platforms:
    Solaris SPARC64, Linux x86 and x86-64, HP-UX PA-RISC, HP Itanium, IBM AIX
## Important Alerts?

- **Note 161818.1**

### Oracle Server Releases Status Summary

<table>
<thead>
<tr>
<th>Release (Click to see Details)</th>
<th>Current Patch Set</th>
<th>Next Patch Set</th>
<th>Premier Support Ends</th>
<th>Extended Support Ends</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.2.0.X</td>
<td>11.2.0.1</td>
<td>11.2.0.2</td>
<td>-</td>
<td>-</td>
<td>Base release is 11.2.0.1</td>
</tr>
<tr>
<td>11.1.0.X</td>
<td>11.1.0.7</td>
<td>None</td>
<td>Aug-2012</td>
<td>Aug-2015</td>
<td>Base release is 11.1.0.6</td>
</tr>
<tr>
<td>10.2.0.X</td>
<td>10.2.0.4</td>
<td>10.2.0.5</td>
<td>Jul-2010</td>
<td>First year of Extended Support to be free of charge.</td>
<td></td>
</tr>
<tr>
<td>10.1.0.X</td>
<td>10.1.0.5</td>
<td>None</td>
<td>Jan-2009</td>
<td>Jan-2012</td>
<td>10.1.0.5 is the terminal 10.1 Patch Set. 10.1 is now in Extended Support - see &lt;<a href="">Note:761713.1</a>&gt;</td>
</tr>
<tr>
<td>9.2.0.X</td>
<td>9.2.0.8</td>
<td>None</td>
<td>Jul-2007</td>
<td>Jul-2010</td>
<td>First year Extended Support was free for 9.2 9.2.0.8 is terminal 9.2 Patch Set. The Free Extended Support period ended on 31-Jul-2008. See &lt;<a href="">Note:392222.1</a>&gt;</td>
</tr>
</tbody>
</table>

### Key to coloring of above table:

- **Premier Support**
- **Extended Support**
Upgrade Information / Alerts

- **Note:880782.1** Support Status and Alerts for Oracle 11g Release 2 (11.1.0.X)

**Patch Sets**

This section gives a summary of the patch sets available for Oracle 11g Release 2. Note that the BASE release of Oracle 11g Release 2 is 11.2.0.1.

<table>
<thead>
<tr>
<th>Release</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.2.0.1</td>
<td>Oracle 11g Release 2 Base Release. Availability and Known issues for 11.2.0.1 [Note:880707.1]</td>
</tr>
</tbody>
</table>
Upgrade Information / Alerts

• Note 880707.1 Known Issues specific to the 11.2.0.1 Base Release

11.2 Alerts / Issues

This section lists alerts and important issues relevant to 11.2.

General Alerts / Issues

| Note 1066229.1 | OERI[25027]/OERI[4057]/OERI[4000] in plugged datafile after CREATE CONTROLFILE in 11g |
| Note 1078406.1 | Corrupt blocks in 11.2 in table with unique key. OERI[kdBlkCheckError] by block check |

Latest Critical Patch Update

For information about Critical Patch Updates see the Oracle Technology Network page here: Critical Patch Updates and Security Alerts

<table>
<thead>
<tr>
<th>Document</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note:457091.1</td>
<td>Critical Patch Update Advisory (Apr 2010)</td>
</tr>
<tr>
<td>Note:1060969.1</td>
<td>Critical Patch Update for Database Products (Apr 2010)</td>
</tr>
</tbody>
</table>

Current Recommended Patches

For information about Recommended Patches for the RDBMS see Note:756671.1.

Patch Set Updates

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
<th>Rolling RAC</th>
<th>Patch Download</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note:9352237.1</td>
<td>Patch Set</td>
<td>Yes</td>
<td>Patch:9352237</td>
</tr>
</tbody>
</table>
Upgrade Information / Alerts

- **Note 880707.1** Known Issues specific to the 11.2.0.1 Base Release

**Notable fixes included in 11.2**

This section lists fixes / enhancements in 11.2 which may cause a notable change in behaviour.

**Issues introduced in 11.2**

This section lists bugs *introduced* in 11.2 (if any). As this is a base release only notable regressions in behaviour are listed.

<table>
<thead>
<tr>
<th>Note</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1078406.1*</td>
<td>Corrupt blocks in 11.2 in table with unique key. OERI[kdBlkCheckError] by block check</td>
</tr>
<tr>
<td>9382101</td>
<td>Unnecessary trigger traces &quot;Dumping Sorted Master Trigger List&quot;</td>
</tr>
<tr>
<td>9217629</td>
<td>Dump / wrong results with fix for bug 6467270 and encryption</td>
</tr>
<tr>
<td>9052506</td>
<td>Null-Aware Anti Join (NAAJ) is not used on DML</td>
</tr>
</tbody>
</table>

**11.2.0.1 Availability**

The following 11.2.0.1 Base Releases are currently available:

- **HPUX Itanium 64bit**
  - 11.2.0.1 » Available
Recommended OS patches

• **Note169706.1 OS Installation and Configuration**

*Oracle Database on Unix AIX, HP-UX, Linux, Mac OS X, Solaris, Tru64 Unix Operating Systems Installation and Configuration*

Jump to:
- AIX
- HP-UX (PA-RISC and Itanium)
- Linux x86
- Linux x86-64
- Linux on Power
- Linux on zSeries
- Mac OS X (PowerPC and x86-64)
- Solaris (SPARC and x86-64)
- Tru64
- Pre-Installation Scripts
- OPatch
- Related Documents
- OS Specific Commands
- Change History
- Note 4308.1 Certified Compilers
- Note 223718.1 Oracle Server Availability and Certification MATRIX
- @Linux Project Group - Browse The Contents of Linux Brands ISOs

**PURPOSE**

This bulletin is produced to provide a central source for all the primary installation settings for the various mainstream unix platforms, e.g. IBM AIX, HP-UX, Sun Solaris, Tru64. Careful comparison of the Installation Guide and the applicable release note for an OS/Oracle version has been done to ensure that this bulletin provides the most complete details. Keeping the OS kernel current helps stabilize the system. Production systems should never run an out dated OS kernel version. As a best practice, Oracle recommends:

**NOTE**: Pre-compilers requirements are no longer addressed in this note, for a single source note that addresses Pre-compiler/Compiler requirements, please refer to:
- **Note 43208.1 Certified Compilers**
Best Practice #3

- Preserve performance statistics
Performance Statistics

• Preserve performance statistics
  • Get accurate performance statistics
    • Comparison: before ↔ after
    • Time specific queries and batches
  • Test upgrade of the database
    • Functional tests
    • Performance tests with real life loads!!!
      • Real Application Testing
        • SQL Performance Analyzer
        • Database Replay
Performance Statistics

• Collecting sufficient performance data prior to the upgrade is of vital importance
  • Sufficient means: Starting at least 4 weeks before the upgrade
  • Gather accurate performance statistics
  • In Oracle 8i/9i:
    • Use STATSPACK
    • Export the PERFSTAT user right before the upgrade
    • Note:466350.1 STATSPACK before/after upgrade
  • In Oracle 10g/11g:
    • Use AWR
    • Snapshots every 30-60 minutes – retention: >30 days
    • Export the AWR with DBMS_SWRF_INTERNAL.AWR_EXTRACT
    • Use ADR DIFF reports to compare before & after upgrade performance:
      DBMS_WORKLOAD_REPOSITORY.AWR_DIFF_REPORT_HTML
Best Practice #4

• Pre-upgrade *Sanity* operations
Invalid Objects

• Always check for INVALID objects:

```
SQL> SELECT UNIQUE object_name, object_type, owner
    FROM dba_objects WHERE status='INVALID';
```

• There should be no invalid objects in SYS and SYSTEM user schema
  • Recompile invalid objects with utlrp.sql
  • Compare invalid objects from before and after the upgrade
    • Beginning with 11.1.0.7 the comparison has been automated
    • Find invalid objects in registry$sys_inv_objs and registry$nonsys_inv_objs
    • Compare before-after: utluiobj.sql
    • The view dba_invalid_objs contains a list of invalid objects after the upgrade
Recycle bin

• If upgrading from 10g or 11g, purge the recycle bin before the upgrade.

SQL> purge DBA_RECYCLEBIN;
Best Practice #5

- **Always** run the pre-upgrade script:
  - Upgrade to Oracle Database 11.2: `utlu112i.sql`
Pre-Upgrade Check

- Run `utlu112i.sql` in your current environment

Oracle Database 11.2 Pre-Upgrade Information Tool 09-21-2009 22:33:20

**********************************************************************
Database:
**********************************************************************
--> name: ORCL
--> version: 10.2.0.3.0
--> compatible: 10.2.0.3.0
--> blocksize: 8192
--> platform: Linux IA (32-bit)
--> timezone file: V4

[..]

**********************************************************************
Update Parameters: [Update Oracle Database 11.2 init.ora or spfile]
**********************************************************************
WARNING: --> "java_pool_size" needs to be increased to at least 64 MB
[..]

**********************************************************************
Miscellaneous Warnings
**********************************************************************
WARNING: --> Database is using a timezone file older than version 11.
.... After the release migration, it is recommended that DBMS_DST package
.... be used to upgrade the 10.2.0.3.0 database timezone version
.... to the latest version which comes with the new release.
Pre-Upgrade Check

• Get the latest version of utlu1\textit{nmi}.sql
• Download it
• \textbf{Note:884522.1}

\begin{table}
\centering
\begin{tabular}{|l|l|}
\hline
\textbf{Coming From Version} & \textbf{Upgrade Target Version} \\
\hline
9.2.0 (9.2.0.8 and beyond), 10.1.0, 10.2.0, 11.1.0 & 11gR2 - utlu112i.sql \\
\hline
9.2.0 (9.2.0.4 and beyond), 10.1.0, 10.2.0 & 11gR1 - utlu111i.sql \\
\hline
8.1.7, 9.0.1, 9.2.0 (9.2.0.4 and beyond), 10.1.0 & 10gR2 - utlu102i.sql \\
\hline
\end{tabular}
\end{table}
Best Practice #6

- Remove "old" parameters, underscores and events from your init.ora/spfile
  - Examples:

```init.ora:
<...>
_always_semi_join=off
_unnest_subquery=false
<...>
optimizer_features_enable=9.0.1
<...>
event = "10061 trace name context forever, level 10"
<...>
```
Remove Old Parameters

• Example: customer workload

• Conclusion:
  • It is recommended to remove relics from previous releases and start with the 11g defaults
Best Practice #7

• Leave COMPATIBLE at the original value for a week before changing to 11.2.
Parameter COMPATIBLE

- COMPATIBLE has to be at least 10.1.0 for an 11g database
- No way back once $\geq 11.1.0$ has been enabled
  - Supported release downgrade to 10.1.0.5, $\geq 10.2.0.2$, $\geq 11.1.0.6$
  - No `ALTER DATABASE RESET COMPATIBILITY` command anymore
Parameter COMPATIBLE

• DBUA raises COMPATIBLE only for 9i databases

• To enable new features after the upgrade:
  • 11.1:
    SQL> alter system
    set compatible='11.1.0' scope=spfile;

  • 11.2:
    SQL> alter system
    set compatible='11.2.0' scope=spfile;

• Afterwards: restart the database
  • New features will be enabled
  • Datafile headers will be adjusted
  • Redologfiles will be adjusted during first access
Best Practice #8

• Test your fallback strategy!
Fallback Strategy

• In any case: Take a backup!!!
• Then decide:
  • If anything unforeseen happens and you'll have to step back, will you be allowed to lose data? (i.e. changes done to the data in the system after the upgrade): YES or NO?
    • If YES: restore a backup, flashback (since 10g)
    • If NO: export/import, downgrade
Fallback Strategy: catdwgrd.sql

• Downgrade with catdwgrd.sql
  
  • Note: 443890.1
  
  • Downgrade to the release you've upgraded from
    • 10.1.0.5
    • 10.2.0.2/3/4
    • 11.1.0.6/7
  
  • Only possible if COMPATIBLE hasn't been raised!!!
    • Please note:
      A downgrade will only be possible to the release you've upgraded from - so if a patch set has been applied always apply it before the upgrade starts - otherwise you'll only be able to downgrade to the release you've patched
Fallback Strategy: catdwgrd.sql

- Downgrade with `catdwgrd.sql` to 10g
  - Task in 11g environment:
    ```sql
    SQL> SPOOL /tmp/downgrade.log
    SQL> STARTUP DOWNGRADE
    SQL> @catdwgrd.sql
    SQL> SPOOL OFF
    ```
  - Switch to your pre-upgrade 10g environment:
    ```sql
    SQL> STARTUP UPGRADE
    SQL> SPOOL /tmp/reload.log
    SQL> @catrelod.sql
    -- The catrelod.sql script reloads the appropriate version of
    -- all of the database components in the downgraded database.
    SQL> SPOOL OFF
    ```
- Please note: additional steps are required if EM repository resides in the database - please see chapter 6 *Downgrading a Database* in the Oracle 11g Upgrade Guide
Best Practice #9

• After the upgrade ...
Post Upgrade

• Create **system statistics** during a regular workload period - otherwise non-appropriate values for the CBO will be used:

```sql
SQL> exec DBMS_STATS.GATHER_SYSTEM_STATS('start');
... -- gather statistics while running a typical workload
SQL> exec DBMS_STATS.GATHER_SYSTEM_STATS('stop');
```

```sql
SQL> select pname NAME, pval1 VALUE, pval2 INFO from aux_stats$;
```

<table>
<thead>
<tr>
<th>NAME</th>
<th>VALUE</th>
<th>INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATUS</td>
<td>COMPLETED</td>
<td></td>
</tr>
<tr>
<td>DSTART</td>
<td>04-03-2009 12:30</td>
<td></td>
</tr>
<tr>
<td>DSTOP</td>
<td>05-03-2009 12:30</td>
<td></td>
</tr>
<tr>
<td>FLAGS</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CPUSPEEDNW</td>
<td>1392.39</td>
<td></td>
</tr>
<tr>
<td>IOSEEKTIM</td>
<td>8.405</td>
<td></td>
</tr>
<tr>
<td>IOTFRSPEED</td>
<td>255945.605</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>
Post Upgrade

- Example: customer OLTP workload
  - Runtime *without* system statistics: 2:19h
  - Runtime *with* system statistics: 2:07h
    - => 9% faster
Post Upgrade

• Create **fixed table statistics**
  • Directly after `catupgrd.sql` has been completed
  • This will speed up processing for recompilation with `utlrp.sql`

```sql
SQL> exec DBMS_STATS.GATHER_FIXED_OBJECTS_STATS;
```

• Create fixed table statistics again after a week with regular production workload
• This task should be done only a few times per year
Agenda

- Best Practices
- FAQ
- Summary
FAQ: Which Version Should I Upgrade To?

- 11g R2 (July 2007)
- 10g R2 (July 2008)
- 9i R2 (July 2007)

Premier Support:
- 9i R2 (July 2007)
- 10g R2 (July 2008)
- 11g R2 (July 2009)

Extended Support:
- 9i R2 (July 2008)
- 10g R2 (July 2009)
- 11g R2 (July 2010)

Sustaining Support:
- 9i R2 (July 2009)
- 10g R2 (July 2010)
- 11g R2 (July 2011)

- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018

Support End Dates:
- 9i R2: January 2009
- 10g R2: January 2012
- 11g R2: January 2015

Release Dates:
- 9i R2: July 2002
- 10g R2: July 2005
- 11g R2: July 2007

Today:
- 11g R2 (July 2010)
- 10g R2 (July 2010)
- 9i R2 (July 2010)
Upgrade to Oracle Database 11g Release 2

Oracle 7.3
≥ 7.3.4

Oracle 8
≥ 8.0.6

Oracle 8i
≥ 8.1.7.4

Oracle 9i
≥ 9.0.1.4

Oracle 10g
≥ 9.0.1.4

Oracle 10g R2
≥ 10.2.0.2

Oracle 11g
≥ 9.2.0.4

"Empty" arrows mean: no specific patch release required
FAQ: How long will the upgrade take?
Upgrade Length

• How long will the upgrade take to complete?

  • Independent of:
    • Size of the database
    • Used datatypes

  • Dependent mainly on:
    • The number of installed components and options
    • Valid and non-stale data dictionary statistics
    • Number of synonyms – they'll get recompiled (upgrade from 9i)
    • Number of objects in XDB
    • At a very low rate, if COMPATIBLE is increased:
      • Number of datafiles
      • Size of redo logs
Example: Database Upgrade Time

• Usually between ~30 and ~90 minutes
  • Dependent mainly on installed options and components
  • *Actual times may vary…

<table>
<thead>
<tr>
<th>Component</th>
<th>Time</th>
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**Total Upgrade Time:** 00:52:31
Upgrade Length

• Speed up your upgrade performance by:
  • Truncating the auditing table SYS.AUD$

```sql
SQL> truncate SYS.AUD$;
```

• Note: If you must preserve auditing records, move them temporarily to a user tablespace before truncating. Then move the records back after the upgrade.

• Creating dictionary statistics right before the upgrade
  • Oracle 9i:

```sql
SQL> exec DBMS_STATS.GATHER_SCHEMA_STATS ('SYS', options => 'GATHER', estimate_percent => DBMS_STATS.AUTO_SAMPLE_SIZE, method_opt => 'FOR ALL COLUMNS SIZE AUTO', cascade => TRUE);
```

• Oracle 10g/11g:

```sql
SQL> exec DBMS_STATS.GATHER_DICTIONARY_STATS;
```

• Switching off archiving, if business rules allow
FAQ: Which Method Should I Use?

- Export/Import
- CTAS, COPY
- Stay on same OS?
  - Y
  - UPGRADE
    - Downtime >30min?
      - N
        - SQL Apply
        - Oracle Streams
        - Transportable Tablespaces
        - Transportable Database
        - Oracle Golden Gate
      - Y
        - DBUA
          - ORACLE recommended
        - CLI
          - SQL> @catupgrd
  - N

When to Choose the DBUA

• Can afford 30 – 90 minutes average downtime
• Operating system remains the same
• GUI is preferred over manual command line interface
  • Automatically performs useful pre-upgrade checks
  • Less error-prone / less manual effort
• Existing database is at least 9.2.0.8
• Note: especially useful for RAC databases
• Consideration:
  • Source and target Oracle Homes must be on the same system
  • Cannot be re-run if an error is encountered mid-upgrade
When to Choose Command-Line

• Can afford 30-90 minutes average downtime
• Manual command-line interface is preferred over GUI
• Existing database is at least 9.2.0.8
• Migrating to a new hardware platform with same OS

• Consideration
  • Cannot upgrade to a system with a different operating system architecture
  • More manual steps required
  • Potential for errors due to typos, missed details
When to Choose an Alternative Method

- Alternative methods include
  - Original exp/imp or Data Pump expdp/impdp)
  - Oracle Streams or Oracle Golden Gate
  - Data Guard (SQL Apply)
  - Transportable Tablespaces, Tansportable Database
  - Moving data via CREATE TABLE AS SELECT or other techniques

- Alternative methods **must** be used when
  - Moving to a different operating system platform (32- and 64-bit versions of an OS are considered “the same platform” in this case
  - Upgrading from a release older than 9.2.0.8

- Alternative methods **may** be a good option when
  - Minimal downtime (<30 minutes) required or desired
  - Re-organizing database storage or schemas
FAQ: Is anybody really live on 11.2?
# 26 External 11.2 References (1/2)

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Agenda

- Best Practices
- FAQ
- Summary
Summary

• Preparation and Planning are the keys to a successful upgrade
• Choose the right upgrade method for your technical scenario and business requirements
• Have a fallback strategy, and please test it
• Oracle Database 11.2 is a stable release with lots of great features. Let’s go!

• FAQ: Where can I get a copy of these slides?
  • http://blogs.oracle.com/UPGRADE