



ORACLE®

Best Practices for Upgrading to Oracle Database 11g Release 2

Carol Palmer

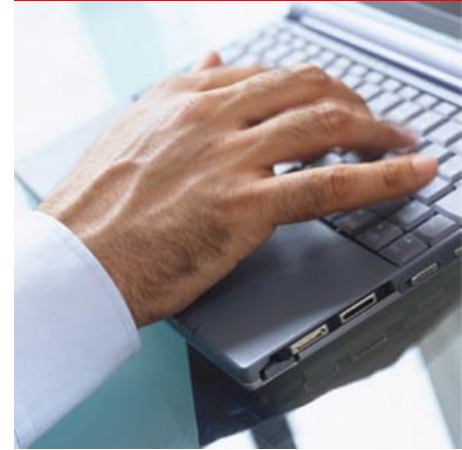
Principal Product Manager, Database Upgrade & Utilities

23-February-2012

ORACLE

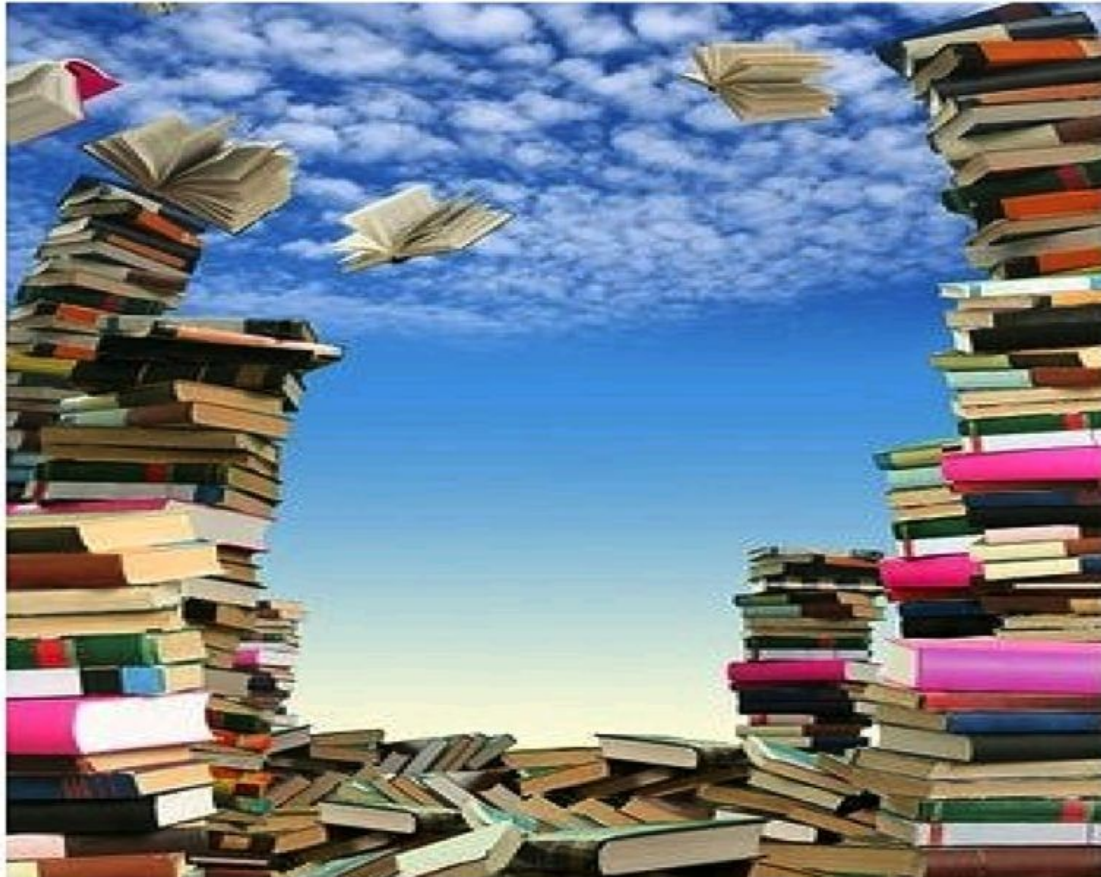
Agenda

- Best Practices
- FAQ
- Summary



Best Practice #1

- Read the **FRIENDLY** manuals!



Documentation

- Note:250.1 Upgrade Advisors

Upgrade Advisors

The following upgrade advisors are currently available. Please note that for each advisor there is a specific scope defined. If your environment does not match the listed conditions, please let us know so we can work on expanding our content.










[View All](#)[Oracle Database](#)[Fusion Middleware](#)[JD Edwards](#)[E-Business Suite](#)[PeopleSoft](#)[Siebel](#)

Upgrade Advisor	Description	Document
Database Upgrade from 10.2 to 11.2	This document is intended to guide customers on the path to plan for and execute an upgrade of their Oracle Database from Oracle Database 10g release 2 (10.2) to Oracle Database 11g release 2 (11.2). Customers wishing to upgrade from 9.2 Database version (up to 11.2) may consult the Database 9i release 2 (9.2) to Oracle Database 11g release 2 (11.2) Upgrade Advisor [264.1].	251.1
Database Upgrade from 9.2 to 11.2	This document is intended to guide customers on the path to plan for and execute an upgrade of their Oracle Database from Oracle Database 9i release 2 (9.2) to Oracle Database 11g release 2 (11.2).	264.1

Documentation

·Note: 251.1 Database Upgrades from 10.2 to 11.2

Database Upgrade from 10.2 to 11.2 > Evaluate


1. Evaluate	2. Plan	3. Configure	4. Test	5. Implement	6. Accept		
<p> Phase Overview</p> <p> Step by Step Guide </p> <ul style="list-style-type: none"><input type="checkbox"/> Learn about the value of upgrading<input type="checkbox"/> Review Product Enhancements<input type="checkbox"/> Consider Configuration Efficiencies<input type="checkbox"/> Learn about performance and scalability improvements.<input type="checkbox"/> Review Product Quality Improvements<input type="checkbox"/> Review Lifetime Support Policy<input type="checkbox"/> Review hardware and 3rd party software stack changes.<input type="checkbox"/> Review product certifications	<p>Overview:</p> <p>The goal of the UPGRADE - EVALUATE phase is to evaluate future and core business requirements and explore new possibilities for the enterprise to improve efficiency, effectiveness or competitive advantage. Emphasis on improving business through upgrading existing hardware/software in the current system.</p> <p>Areas of Focus:</p> <ul style="list-style-type: none">o Potential business improvements which can be achieved by upgrade. Examples:<ul style="list-style-type: none">o Performance and scalability improvementso Process improvementso Resource optimizationo Risk reductiono Upgrade strategieso Upgrade impact <p>Expected Outcome / Deliverables:</p> <ul style="list-style-type: none">o Documented GO/NO-GO decision for upgrading to a new and specified version				<p>News and Announcements</p> <ul style="list-style-type: none"> Why Upgrade to Oracle Database 11g? (.pdf) Lowering Your IT Costs with Oracle Database 11g Release 2 (.pdf)	<p>Multimedia Training</p> <ul style="list-style-type: none"> Why Upgrade to Oracle Database 11g? Oracle Customers Talk About DB 11.2	<p>Related Resources</p> <ul style="list-style-type: none"> Oracle Database Upgrade (OTN) DB 11.2 New Features Guide



Documentation

·Note: 264.1 Database Upgrades from 9.2 to 11.2

Database Upgrade Lifecycle Advisor from 9.2 to 11.2 > Evaluate

1. Evaluate	2. Plan	3. Configure	4. Test	5. Implement	6. Accept
-------------	---------	--------------	---------	--------------	-----------

 **Phase Overview**

 **Step by Step Guide** 

- Learn about the value of upgrading
- Review Product Enhancements
- Consider Configuration Efficiencies
- Learn about performance and scalability improvements.
- Review Product Quality Improvements
- Review Lifetime Support Policy
- Review hardware and 3rd party software stack changes.
- Review Product Certifications

Overview:

The goal of the UPGRADE - EVALUATE phase is to evaluate future and core business requirements and explore new possibilities for the enterprise to improve efficiency, effectiveness or competitive advantage. Emphasis on improving business through upgrading existing hardware/software in the current system.



Areas of Focus:

- o Potential business improvements which can be achieved by upgrade. Examples:
 - o Performance and scalability improvements
 - o Process improvements
 - o Resource optimization
 - o Risk reduction
- o Upgrade strategies
- o Upgrade impact



Expected Outcome / Deliverables:

- o Documented GO/NO-GO decision for upgrading to a new and specified version
- o Documented understanding of the impact for the business
 - o Expected benefits for the business
 - o Expected costs (people, other resources, time, impact on other systems)
- o Documented Risk Assessment




News and Announcements

-  [Why Upgrade to Oracle Database 11g? \(.pdf\)](#)
-  [Lowering Your IT Costs with Oracle Database 11g Release 2 \(.pdf\)](#)

Multimedia Training

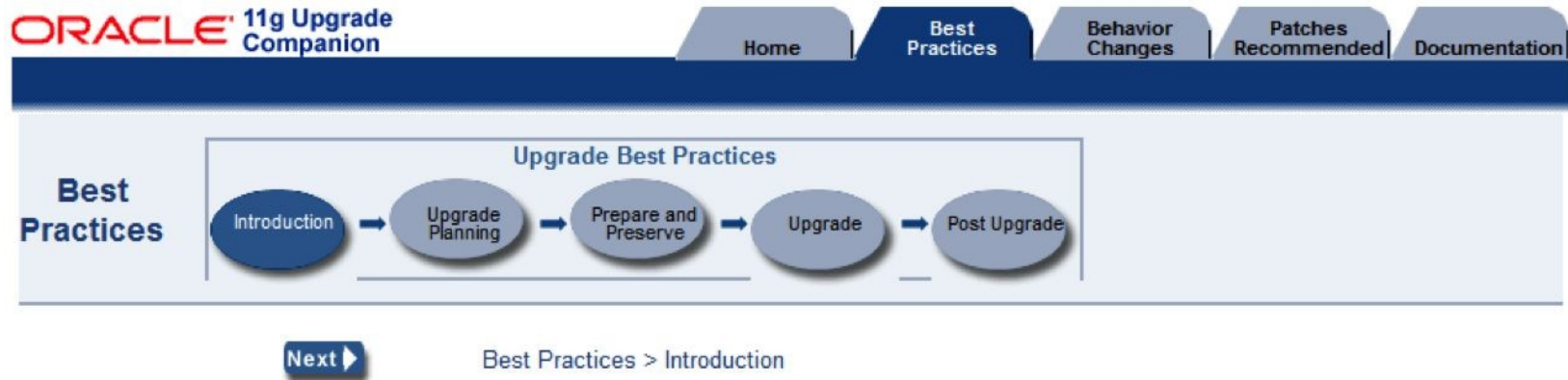
-  [Why Upgrade to Oracle Database 11g?](#)
-  [Oracle Customers Talk About DB 11.2](#)

Related Resources

-  [Oracle Database Upgrade \(OTN\)](#)
-  [DB 11.2 New Features Guide](#)
-  [Database 11.2 Value Propositions \(.ppt\)](#)

Documentation

- [Note:785351.1](#) Upgrade Companion 11g Release 2



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

- **Oracle® Database**

- Upgrade Guide

- 11g Release 2 (11.2)

- E10819-02**

http://download.oracle.com/docs/cd/E11882_01/server.112/e10819/toc.htm

- [Note:837570.1](#)

- Complete Checklist for Manual Upgrades to 11g Release 2

Documentation

- Important Database Upgrade Notes
 - Note: 1152016.1
Master Note For Oracle Database Upgrades and Migrations
 - Note: 1320966.1
Things to Consider Before Upgrade to 11.2.0.2/11.2.0.3 **Database Performance**
 - **Note:785351.1**
Upgrade Companion 11.2
 - Upgrading from 10g to 11g: What to expect from the Optimizer
<http://www.oracle.com/technetwork/database/focus-areas/bi-datawarehousing/twp-upgradin>

OTN Upgrade Page

·<http://www.oracle.com/technetwork/database/upgrade/index.html>

The screenshot shows the Oracle OTN Upgrade Page. At the top left is the Oracle logo. To its right is a navigation bar with links for 'Welcome Carol (Account | Help | Sign Out)', 'United States', 'Communities', 'I am a...', and 'I want to...'. A search box labeled 'Secure Search' is on the far right. Below this is a main navigation bar with tabs for 'Products and Services', 'Solutions', 'Downloads', 'Store', 'Support', 'Training', 'Partners', and 'About'. A dropdown menu for 'Oracle Technology Network' is on the right. The 'Products and Services' dropdown is open, showing a list of products and services. A red arrow points to the 'Oracle Database' link. Other items in the list include 'Engineered Systems', 'Enterprise Manager', 'Oracle Fusion Middleware', 'Oracle Applications', 'Server and Storage Systems', 'Development Tools', 'Oracle On Demand', 'Oracle CRM On Demand', and 'Products A-Z List'. Below the products list is a 'Services' section with links for 'Advanced Customer Support Services', 'Consulting', 'Financing', 'On Demand Support', and 'Oracle University'. To the right of the products list is a 'Spotlight' section with a red header and a list of items: 'Cloud Computing', 'Engineered Systems', 'Enterprise Manager', and 'Fusion Applications'. Below the spotlight is an 'ORACLE EXALOGIC' section with the text 'World's Best Foundation for Cloud Computing' and an image of a server rack. The main content area features a large image of server racks with a red background and a glowing red line. Below this image is a navigation bar with tabs for 'Operating Systems', 'Server and Storage Systems', 'Virtualization', and 'Services'. A 'Strategies' section is visible below the navigation bar, with the text 'Building a Better Cloud' and an image of two people talking. At the bottom of the page is a red bar with the Oracle logo.

OTN Upgrade Page

- <http://www.oracle.com/technetwork/database/upgrade/index.html>

Products and Services Downloads Store Support Education Partners About Oracle Technology Network

Products and Services > Oracle Database

Oracle Database

- Database Options
- Enterprise Edition
- Standard Edition
- Standard Edition One
- Express Edition
- Database Security
- TimesTen In-Memory Database
- Berkeley DB
- Database Lite Mobile Server
- MySQL
- Secure Backup
- Secure Enterprise Search
- Data Integration
- Exadata Database Machine
- Benchmarks
- Customers

Featured Videos Webcasts Demos Podcasts

Lowering the Cost of Oracle Applications Infrastructure

Register for the Feb 10th LIVE webcast Email

Oracle Database

WHY ORACLE?

The innovation continues with Oracle Database 11g to lower costs and deliver a higher quality of service by:

- [Clustering](#) and consolidating enterprise applications onto fast, reliable and scalable private clouds
- [Maximizing availability](#) and eliminating [idle data center redundancy](#)
- Accelerating performance by [compressing data](#) onto low-cost [storage partitions](#)
- [Securely](#) protecting information and enabling compliance
- Doubling [DBA productivity](#) and reducing the [risk of change](#)

ORACLE IS THE DATABASE LEADER

- [Oracle Exadata](#): The ideal private clouds database consolidation platform
- Gartner: [Oracle is #1 Database](#)
- IDC: Oracle is [#1 in Data Warehousing](#)
- Edison: Oracle is easier to manage than [DB2](#) and [SQL Server](#)
- IDC: [Exadata Exceeds Expectations](#)
- IDC: [Cost-Effective Data Leak Prevention Starts at the Source](#)
- Benchmarks: World record [performance](#) and [price/performance](#)

Oracle 1-800-633-0738

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- Sales Chat Live
- Follow us on Twitter
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- Oracle Database 11g Release 2 [Close](#)

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Events

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Customers

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Technical Information

- Oracle Database 11g
- Upgrading to Oracle Database 11g
- Migrating to Oracle Database 11g

ORACLE DATABASE EDITIONS AND OPTIONS

OTN Upgrade Page

- <http://www.oracle.com/technetwork/database/upgrade/index.html>

The screenshot shows the Oracle Technology Network (OTN) website's Database Upgrade page. At the top, there is a navigation bar with links for Products and Services, Solutions, Downloads, Store, Support, Training, Partners, and About. A dropdown menu for Oracle Technology Network is visible on the right. Below the navigation bar, the breadcrumb trail reads: Oracle Technology Network > Database > Database Upgrade.

On the left side, there is a vertical menu with the following items: Database 11g, Database Focus Areas, Database Options, Database Express Edition, Database Upgrade, Berkeley DB, NoSQL Database, TimesTen In-Memory Database, Exadata, Database Mobile Server, RDB, Audit Vault, Secure Backup, Real Application Clusters, Clusterware, Cloud Storage, Multimedia, and Windows.

The main content area features a large heading: **ORACLE DATABASE 11g Oracle Database Upgrade**. Below this heading, a paragraph describes the upgrade: "Upgrading to Oracle Database 11g Release 2 provides the latest in efficient, reliable, secure data management for mission-critical on-line 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."

Below the main heading, there is a section titled "Oracle Database Webcasts" with three entries:

- Database Upgrade Best Practices Presentation** Requires Flash (July 2011)
This webcast is about the best practices for a successful upgrade to Oracle Database 11g Release 2. Frequently Asked Questions are also discussed.
- Prepare, Install, and Patch Presentation** Requires Flash (July 2011)
This is a webcast of the preparation steps to facilitate a successful upgrade. Installation and patching are also covered.
- Oracle Database 11g Release 2 Upgrade: Upgrade Methods** Requires Flash (July 2011)
This is a webcast of the various methods available to upgrade to Oracle Database 11g Release 2.

Below the webcasts, there is a section titled "Always Relevant Topics" with three entries:

- Oracle Database Upgrade Discussion Forum**
Interactive forum containing Database Upgrade relevant information.
- Mike Dietrich's Upgrade BLOG**
Database Upgrade Team member Mike Dietrich maintains a BLOG relating to Database Upgrade presentation, events and topics.
- Oracle Database Pre-Upgrade Script** (My Oracle Support)

On the right side of the page, there are two promotional banners for Oracle Public Cloud, each with a "Learn More" button. Below these banners is a section titled "More Database Downloads" with a list of links: Database Express Edition, Database Instant Client, Database Mobile Server, and JDBC Drivers.

OTN Upgrade Forum

[Forum Home](#) » [Database](#) » [Database - Upgrade](#)

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](#)

Messages: 9,806 - Threads: 2,050 - Filter: Pages: 137 [[1](#) [2](#) [3](#) [4](#) [5](#) | [Next](#)]

	Thread	Author	Replies	Last Post
	OTN Database Upgrade Page Posted By: Brian.McCarthy -- Aug 4, 2008 2:44 PM			
	11.2.0.2 to 11.2.0.3	Y.Ramlet	3	Dec 30, 2011 7:59 AM Last Post By: Srini Chavali »
	ORA-29553: class in use: SYS./6381387c AQjmsEventListenerPo	Mohammed Abdul ...	3	Dec 30, 2011 5:47 AM Last Post By: Srini Chavali »
	How to 10gR2 from db 9.2.0.5 - 11i upgrade purpose	Suresh	2	Dec 29, 2011 4:17 PM Last Post By: Srini Chavali »
	Patch set and PSU	GarryB	4	Dec 29, 2011 5:42 AM Last Post By: GarryB »
	11gR2 Infrastructure Upgrade Question(s) from 10gR2	user10387007	2	Dec 28, 2011 11:27 PM Last Post By: Helios-Gunes E... »
	how to migrate the Database of Oracle 8i DB	904032	6	Dec 27, 2011 5:56 PM Last Post By: Srini Chavali »

Welcome, Guest

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- [Guest Settings](#)
- [Search](#)
- [FAQ](#)

Search Forum

Top Users in Forum

- [Srini Chavali](#) (1400)
- [ora_tech](#) (410)
- [Satish Kandi](#) (295)
- [Rajesh](#) (230)
- [oradba](#) (215)
- [Fiedi Z](#) (185)
- [PavanG](#) (170)
- [Mike Dietrich](#) (155)

Upgrade Blog: blogs.oracle.com/UPGRADE

Upgrade your Database - NOW!

Ease your Oracle Database upgrades - Best Practices, Workshops, Projects ...

ORACLE®

Recent Posts

Some impressions ...

New version of the slides "Upgrade & Migrate to Oracle Database 11.2" available for download now

Exclude DBMS_SCHEDULER Jobs from expdp?

Wrong statistics in AUX_STAT\$S might puzzle the optimizer

11.2.0.3 Pre-Upgrade Script Now Available!

DOAG Conference 2011: Seven Flavors of Database Upgrades

Upgrade & Migration Workshop in Singapore

Upgrade & Migration Workshop in KL

Are you still on Daylight Savings Time?

INFO: Bangkok/Thailand Upgrade Workshop postponed

http://blogs.oracle.com/UPGRADE/entry/new_version_of_the_upgrade

[Main](#) [Next page](#) »

Thursday Dec 22, 2011

Some impressions ...

By Mike Dietrich on Dec 22, 2011

Thanks again to our colleagues of Oracle Japan for the (as always) excellent organization of our journey to Japan in December 2011. And thanks to all the customers and colleagues we've met and which did visit the workshops 😊 We'll hope to meet you next time again!

And here are some impressions:

(you might click on the pictures to get a larger view)



About



Mike Dietrich

Consulting Member of Technical Staff -
Database Upgrade Development Group
- Oracle Corporation

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Best Practice #2

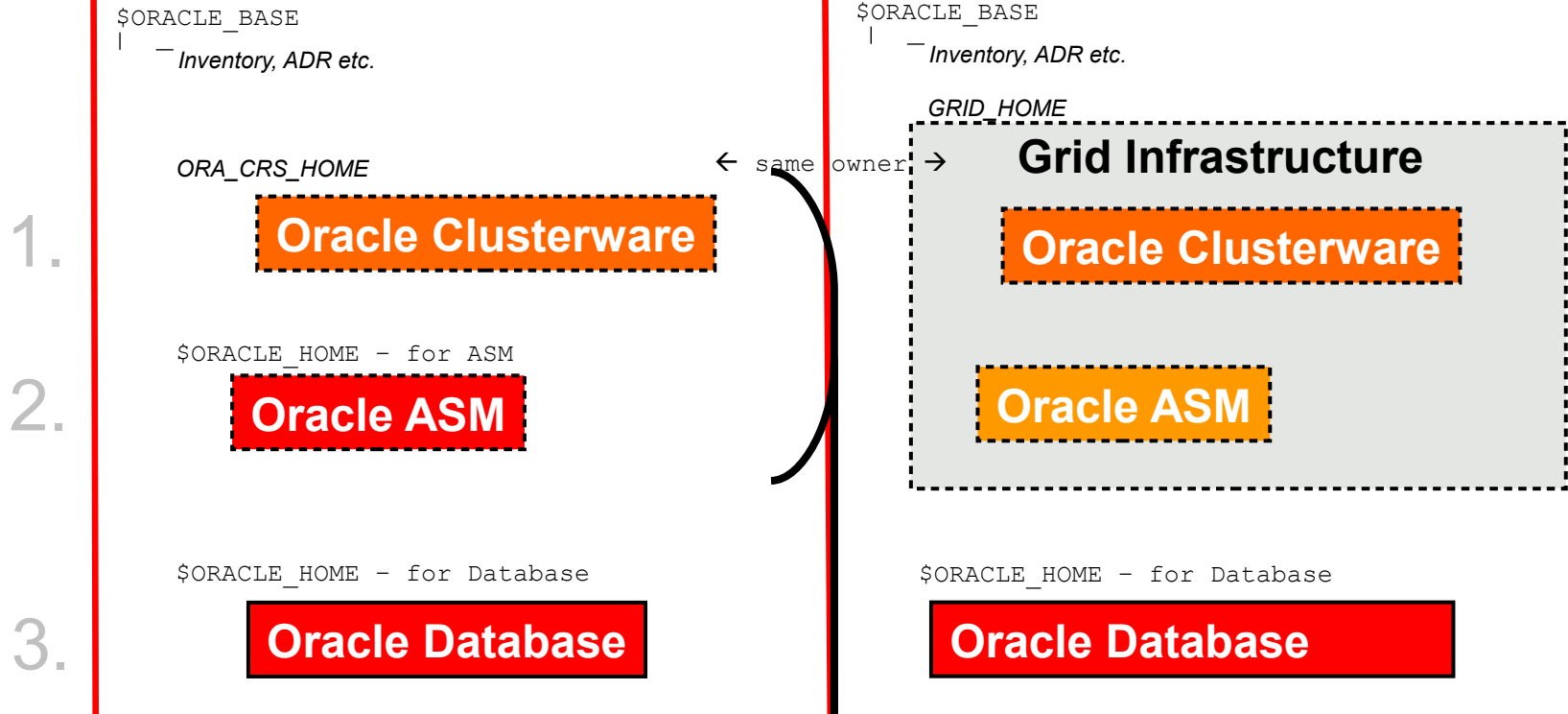
- Always upgrade Grid Infrastructure (Clusterware and ASM) First!



Grid Infrastructure Installation

11.1.0.7

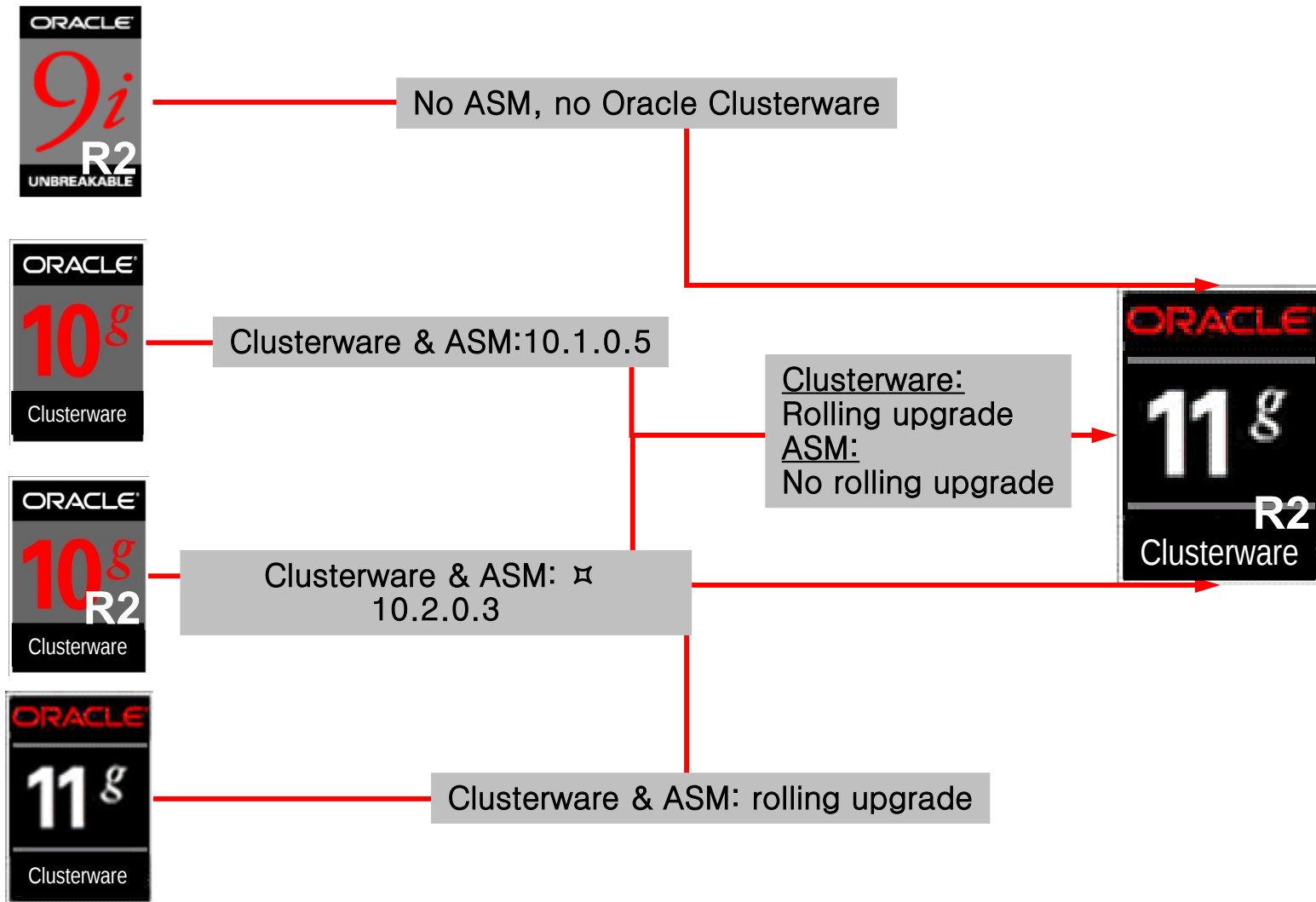
✧
11.2.0.1



Grid Infrastructure Upgrade **11g Release 2**

- **Always upgrade Oracle Clusterware first!!!**
- Upgrading to Oracle Clusterware 11g Release 2:
 - Install new software into new **Grid Infrastructure home**
 - **Out-of-place** software upgrade
 - Grid Infrastructure home is owned by 'root'
 - **Make sure** to check [Note:948456.1](#) for known issues
- On 32-bit Windows there'll be **no** 32-bit Grid Infrastructure and ASM available!

Grid Infrastructure Upgrade Paths



Oracle Grid Infrastructure 11.2.0.3

- Oracle Grid Infrastructure Patch Set 11.2.0.3:
 - Patch set is not the correct wording: it's a full release
 - Installation is out-of-place only into a separate home
 - To upgrade from GI 11.2.0.2 to GI 11.2.0.3:
 - Apply PSU 11.2.0.2.1 (or newer) in-place
 - RAC/Grid Infrastructure Upgrade Note:
 - [Note:810394.1](#): RAC Assurance Support Team: RAC and Oracle Clusterware Starter Kit and Best Practices (Generic)
 - Also see [platform-specific notes linked from the generic starter kit](#)
- **VERY IMPORTANT:**
 - Follow [all instructions](#) in Note:1212703.1
 - Make sure MULTICAST is setup correctly Note:1054902.1 – section D
 - Make sure to check
Oracle Database Readme 11g Release 2 Section 2.39 - "Open Bugs"
 - Then upgrade GI within OUI

Best Practice #3

- Use the **Upgrade Planner** in My Oracle Support



Upgrade Planner

ORACLE MY ORACLE SUPPORT PowerView is OFF Welcome, Roy | Contact Us

Dashboard | Knowledge | Service Requests | **Patches & Updates** | Community | Certifications | More...

Patches & Updates

Upgrade Planner

Plan Name *

Target ? *

Upgrade to

Release ? *

Requires collector version 10.3.2 or newer. [Learn More...](#)

Patch Search

Patch Name, Number or Sun CR ID | Product or Family (Advanced Search)

Patch Name or Number ? is

Platform ? is

* Required The Patch Search region is only for Oracle, Sun, Siebel and

Plans

Name	1 ▲	★	Status	Type	Planned Dep
GaylenOHPlan		★	Ready for Download	Patching	Not Specified
Harris		★	Ready for Download	Upgrade	Not Specified
John - repro bug 11727701		★	New	Patching	Not Specified
patchset-plan		★	Ready for Download	Patching	Not Specified
Troy		★	Ready for Download	Upgrade	Not Specified

Patching Quick Links

What are Recommended Patches?

Software and Patch Search Sites

- Updates by E-Delivery
- PeopleSoft
- JD Edwards
- Sun patchdiag.xref File
- Sun CHECKSUMS File
- Sun Temporary Patches

Oracle E-Business Suite

Upgrade Planner

ORACLE MY ORACLE SUPPORT PowerView is OFF Welcome, Carol | Contact Us | Sign Out | Help

Dashboard | Knowledge | Service Requests | Patches & Updates | Community | More... | Favorites | Search Knowledge Base | Advance

Patches & Updates Customize Page... | Last refreshed 2 hours, 24 minutes ago | Message Center (0)

Upgrade Planner

Plan Name * 11.2 Upgrade

Target * DEV10GR1 Find

Details Oracle Database 10.2.0.2 (Linux x86 Red Hat Enterprise Linux 3)
/oracle/products/db/10.2.0.2 (Oracle Home)
pserv56.us.oracle.com (Host)

Upgrade to

Release * Oracle 11.2.0.3.0

Patch Search

Search Saved Recent

Number/Name or Sun CR ID (Simple) | Product or Family (Advanced) | Recommended Patch Advisor

Patch Name or Number is * Type in comma separated values

and Platform is Oracle Solaris on x86-64 (64-bit)

Exclude all superseded patches

Clear Save Search

* Required For JD Edwards & PeopleSoft, see the Patching Quick Links region. Learn More...

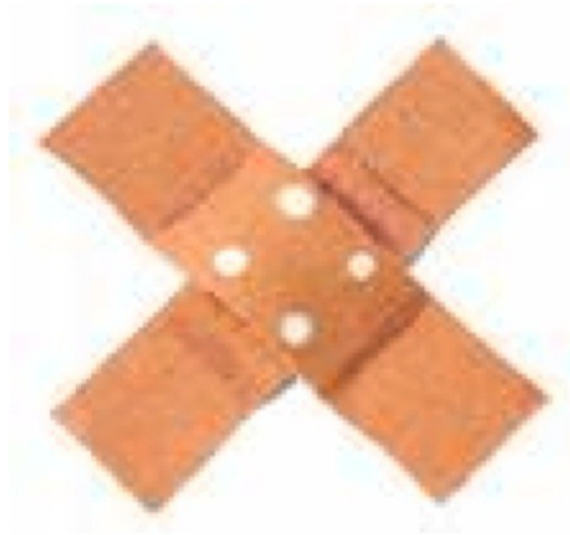
- Oracle 11.2.0.3.0 (New patch creation available [CPUs, PSUs, one-offs])
- Oracle 11.2.0.2.0 (New patch creation to end within the year)
- Oracle 11.1.0.7.0 (Terminal, New patch creation available [CPUs, PSUs, one-offs])

- Oracle 10.2.0.5 (Certified, Terminal, New patch creation available [CPUs, PSUs, one-offs])

Expecting another choice? Learn More...

Best Practice #4

- Patch your **new** \$ORACLE_HOME **before** you upgrade



Patch Set Installation 11.2.0.3

- Download patch set 11.2.0.3 from `support.oracle.com`:

ORACLE MY ORACLE SUPPORT PowerView is OFF Welcome

Dashboard | Knowledge | Service Requests | Patches & Updates | Community | Certifications | Systems | More...

Patches & Updates

Patching Quick Links

What are Recommended Patches?

Software and Patch Search Sites

Updates by E-Delivery JD Edwards
PeopleSoft Sun

Oracle E-Business Suite

Latest R12 Packs Recommended R12 Patches
Latest 11i Packs Recommended 11i Patches

Oracle Server and Tools

[Latest Patchsets](#)

All Quick Links open in a new window
Latest Patchsets will open in a new browser window

Patch Search

Search Saved Recent

Patch Name, Number or Sun CR ID | Product or Family (Advanced Search)

Patch Name or Number is * Type in comma separated values
and Platform is Linux x86

Clear Save

* Required The Patch Search region is only for Oracle, Sun,

Plans

Plans Patch Requests All Plan Types

Patch	Description	Release	Updated ▾	Size
10404530	Oracle Database Family: Patchset 11.2.0.3.0 PATCH SET FOR ORACLE DATABASE SERVER	11.2.0.3.0	23-SEP-2011	5.1G
Total: 1				

Patch Set Installation 11.2.0.3

- Default: **out-of-place patch** upgrade!!! It's a full release!!!
 - If you specify an in-place patch upgrade:



Patch Set Installation 11.2.0.3

- Patch set 11.2.0.3 is a full release
 - Therefore no need anymore to install 11.2.0.1 first!!!
- Only way to do an **in-place** patch set installation
 - Backup your `/dbs` and `/network/admin` files
 - `./runInstaller -detachHome ORACLE_HOME=<11.2.0.1-home>`

```
$ ./runInstaller -detachHome ORACLE_HOME=/u01/orahomes/11.2.0
Starting Oracle Universal Installer...
```

```
Checking swap space: must be greater than 500 MB.    Actual 10047 MB    Passed
The inventory pointer is located at /etc/oraInst.loc
The inventory is located at /u01/orabase
'DetachHome' was successful.
```

- Remove your 11.2.0.1 home contents
- Install 11.2.0.3 into the previous 11.2.0.1 home
- Restore `/dbs` and `/network/admin` files
- Upgrade your database with DBUA or `catupgrd.sql`

Recommended Patches

- Recommended Patches: Note:756388.1

Introduction to Oracle Recommended Patches

- [What are Recommended Patches?](#)
- [Benefits of Recommended Patches](#)
- [Common Questions](#)

What are Recommended Patches?

Oracle has introduced a set of Recommended Patches which make it easier for customers to obtain and deploy fixes for known critical issues encountered in targeted environments and configurations. As part of Oracle's overall maintenance strategy, these provide proactive patch recommendations to customers seeking to upgrade or to improve the stability of their current environments. Customers are advised to install Recommended Patches that apply to their environment.

Recommended Patches are available for products listed below. For details, please review the My Oracle Support notes.

Product	My Oracle Support Note
Oracle Database	Note:756671.1
Oracle Enterprise Manager	Note:822485.1
Oracle Fusion Middleware	Note:859115.1
Oracle Solaris Operating System	Note:1272947.1

This note will be updated as Oracle announces Recommended Patches for other Oracle products.

Benefits of Recommended Patches

Oracle Recommended Patches provide the following benefits:

- They fix a set of critical issues commonly encountered in targeted environments and configurations.
- They stabilize production environments because the patches address known critical issues.
- They help save time and cost by eliminating rediscovery of known issues.
- They are tested as a single combined unit, resulting in increased quality and eliminating the risk of combining patches that are only independently tested.
- They make it easier to identify patches applicable for a targeted environment/configuration.

Recommended Patches

- Recommended Database Patches: Note:756671.1

Oracle Recommended Patches -- Oracle Database [ID 756671.1]

Modified 18-OCT-2011 *Type* ANNOUNCEMENT *Status* PUBLISHED

Oracle Recommended Patches -- Oracle Database

- [Target Configurations](#)
- [Patch Availability](#)
- [Current Recommended Patches](#)
 - [11.2.0.3 Current Recommended Patches](#)
 - [11.2.0.2 Current Recommended Patches](#)
 - [11.2.0.1 Current Recommended Patches](#)
 - [11.1.0.7 Current Recommended Patches](#)
 - [11.1.0.6 Current Recommended Patches](#)
 - [10.2.0.5 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:756388.1](#).

Target Configurations

Recommended Patches are provided for the following target configurations:

- Generic
- Real Application Clusters
- Data Guard
- Exadata
- Ebusiness Suite Certification

Patch Set Update (PSU) Installation

- Install **PSUs**
 - Note:854428.1: Introduction to Database Patch Set Updates
 - Note:1227443.1: Patch Set Updates Known Issues
 - 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 **25-100 new bug fixes** per PSU – ***usually* cumulative**
 - Guaranteed to be **RAC rolling installable**
 - Will be released 4x per year on the same schedule as CPUs
 - 17-Jan-2012, 19-Apr-2012, 19-Jul-2012 and 17-Oct-2012
 - PSU check: `opatch lsinventory -bugs_fixed | grep -i 'DATABASE PSU'`

Important Alerts and One-Off-Patches?

- Check for important alerts: Note:161818.1

Oracle Database Releases Status Summary

Release <i>(Click to see Details)</i>	Current Patch Set	Next Patch Set	Premier Support Ends	Extended Support Ends	Notes
11.2.0.X	11.2.0.3	11.2.0.4	Jan-2015	Jan-2018 Extended Support fees are waived for the first year from Jan-2015 to Jan-2016	Base release is 11.2.0.1. 11.2 Patch Sets are full releases - see Note 1189783.1 Patching for 11.2.0.1 ended on 13/Sep/2011 - See Note 742060.1 .
11.1.0.X	11.1.0.7	None	Aug-2012	Aug-2015	Base release is 11.1.0.6 . 11.1.0.7 is the terminal 11.1 Patch Set
10.2.0.X	10.2.0.5	None	Jul-2010	Jul-2013	10.2.0.5 is the terminal 10.2 Patch Set. The Free Extended Support period ended on 31-Jul-2011. Patches will only be created for 10.2.0.5 on most platforms - See Note 742060.1 for platform specific end patching dates
10.1.0.X	10.1.0.5	None	Jan-2009	Jan-2012	10.1.0.5 is the terminal 10.1 Patch Set. 10.1 is now in Extended Support - see Note 761713.1



Upgrade Information / Alerts

- Known issues in 11.2.0.x? See [Note:880782.1](#)

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 .

- | Release | Comments |
|----------|--|
| | Oracle 11g Release 2 Patch Set 2 |
| 11.2.0.3 | Availability and Known issues for 11.2.0.3 Note:1348336.1
List of fixes included in 11.2.0.3 Note:1348303.1 |
| 11.2.0.2 | Oracle 11g Release 2 Patch Set 1
Availability and Known issues for 11.2.0.2 Note:1179474.1
List of fixes included in 11.2.0.2 Note:1179583.1 |
| 11.2.0.1 | Oracle 11g Release 2 Base Release.
Availability and Known issues for 11.2.0.1 Note:880707.1 |

Upgrade Information / Alerts

- Known issues in 11.2.0.3? See [Note:1348336.1](#)

11.2.0.3 Alerts / Issues

This section lists alerts and important issues relevant to 11.2.0.3 .

Notable fixes included in 11.2.0.3

This section lists fixes / enhancements in 11.2.0.3 which may cause a notable change in behaviour.

9832338	ORA-600 [15160] / ORA-7445 [kkogfp] from CONNECT BY and OUTER JOIN (+)
Note:1354793.1	Oracle Text Lexer Feature Changes introduced in 11.2.0.3

Issues introduced in 11.2.0.3

This section lists bugs **introduced** in 11.2.0.3 (if any). Such issues may be either serious or trivial but the aim is to list them all to help customers assess the risk of applying the Patch Set on top of 11.2.0.2

Bug/Doc	Description	Updated
13496250	Unexpected ORA-976 using LEVEL / PRIOR / ROWNUM in an ANSI "ON" filter predicate	20/Dec/2011
13384182	ORA-600 [delrow:iot1] from DELETE or MERGE..DELETE with an IOT	24/Nov/2011
13365021	SDO_NN query fails with ORA-22165 "given index [32767] must be in the range"	29/Nov/2011
13117043	ORA-600 [13009] Raised for SELECT FOR UPDATE on Hierarchical Query	23/Nov/2011

Recommended OS patches

- OS Installation and Configuration See [Note:169706.1](#)

Oracle Database on Unix AIX,HP-UX,Linux,Mac OS X,Solaris,Tru64 Unix Operating Systems Installation and Configuration Requirements Quick Reference (8.0.5 to 11.2) [ID 169706.1]

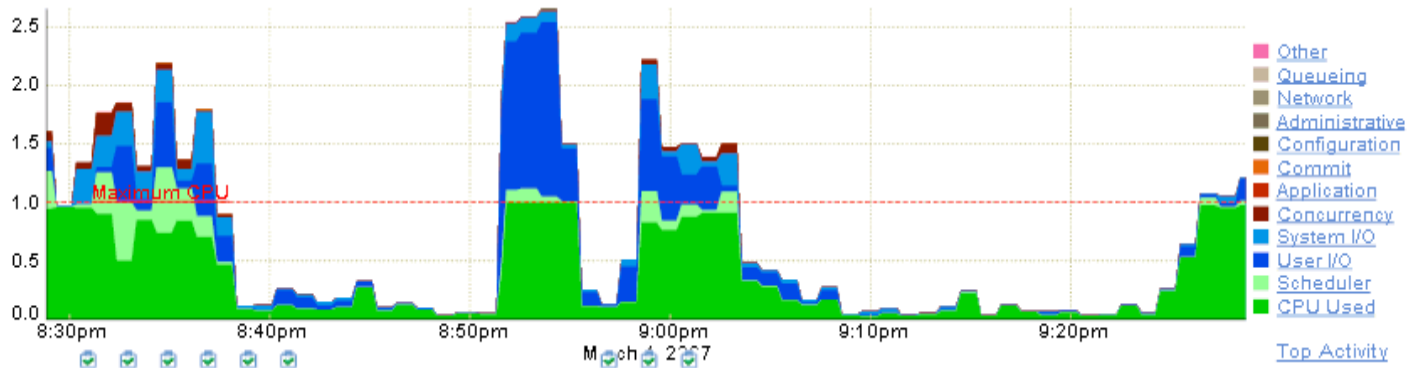
Modified 13-DEC-2011 *Type* BULLETIN *Status* PUBLISHED

Jump to:

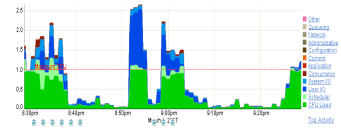
[AIX](#)
[HP-UX \(PA-RISC and Itanium\)](#)
[Linux x86](#)
[Linux x86-64](#)
[Linux Itanium](#)
[Linux on Power](#)
[Linux on zSeries](#)
[Mac OS X \(PowerPC and x86-64\)](#)
[Solaris \(SPARC and x86-64\)](#)
[Tru64](#)
[Pre-Installation Scripts](#)
[OPatch](#)
[Related Documents](#)
[OS Specific Commands](#)
[Change History](#)
[Note 43208.1](#) Certified Compilers

Best Practice #5

- Preserve performance statistics

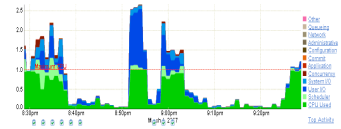


Preparation - Testing



- Test the upgrade itself
 - Functional testing – does the upgrade complete successfully?
 - Performance testing – how long will the upgrade take?
- Test Post-Upgrade Performance
 - Functional testing
 - Will your applications run correctly?
 - Performance testing
 - Gather performance data **before** you upgrade
 - Time important queries, reports, and batch jobs
 - Tune your init.ora parameters, OS parameters
 - Use real life loads!
 - Real Application Testing
 - SQL Performance Analyzer
 - Database Replay

Preparation – Performance



- Collecting sufficient performance data prior to the upgrade is of vital importance
 - Sufficient means: Starting at least 31 days before the upgrade
 - Gather accurate performance statistics from production
 - 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**
 - Take snapshots every 30-60 minutes – retention: >30 days
 - Extract the AWR with: `SQL> @$/rdbms/admin/awrxt.sql`
 - => For 10.1 only use: `DBMS_SWRF_INTERNAL.EXTRACT_AWR`
 - Use AWR DIFF reports to compare before & after upgrade performance:
`DBMS_WORKLOAD_REPOSITORY.AWR_DIFF_REPORT_HTML`
 - Managing Optimizer/CBO stats during upgrade: Note:465787.1

Best Practice #6

- Pre-upgrade **Sanity** operations



Sanity Operations: Invalid Objects

- Always check for **INVALID** objects
- SQL>

```
select unique OBJECT_NAME, OBJECT_TYPE, OWNER from DBA_OBJECTS where STATUS='INVALID';
```
- Fix all **INVALID** objects **BEFORE** the upgrade/migration
- There should be no invalid objects in SYS and SYSTEM user schema
 - Recompile invalid objects with `utl1rp.sql` before the upgrade

Sanity Operations: Duplicate Objects

- Always check for **DUPLICATE objects** in SYS/SYSTEM

```
SQL> select OBJECT_NAME, OBJECT_TYPE from
DBA_OBJECTS where OBJECT_NAME||OBJECT_TYPE
in (select OBJECT_NAME||OBJECT_TYPE from
DBA_OBJECTS where OWNER='SYS') and
OWNER='SYSTEM' and OBJECT_NAME not in
('AQ$_SCHEDULES_PRIMARY', 'AQ$_SCHEDULES',
'DBMS_REPCAT_AUTH');
```

- **Fix DUPLICATE objects in SYS/SYSTEM BEFORE upgrade**
- Note:1030426.6 How to Clean Up Duplicate Objects Owned by SYS and SYSTEM Schema

Sanity Operations: Invalid Components

- Always check for **NON VALID** components:

```
SQL> select substr(COMP_ID, 1,10) compid,  
       substr(COMP_NAME,1,24) compname, STATUS,  
       VERSION from DBA_REGISTRY where  
       STATUS<>'VALID';
```

- Try to fix all **NON VALID** components **BEFORE** the upgrade
- If recompilation with utlrp.sql does not correct component status further diagnosis might be required:
 - Note:472937.1 Information On Installed Database Components
 - Note:753041.1 How to diagnose Components with NON VALID status

Sanity Operations



- If upgrading from 10g or 11g, purge the **recyclebin**

```
SQL> purge DBA_RECYCLEBIN;
```



Best Practice #7

- **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
```

```
[..]
```

Command Line Upgrade

Get the current version of [utlu_{nm}i.sql](#)

Download Note: 884522.1

Coming From Version	Script Build/Date	Upgrade Target Version
9.2.0 (9.2.0.8 and above), 10.1.0, 10.2.0, 11.1.0, 11.2.0.1 11.2.0.2	Build 1 November 2011	11gR2 (11.2.0.3) - utlu112i_3.sql
9.2.0 (9.2.0.8 and above), 10.1.0, 10.2.0, 11.1.0, 11.2.0.1	Build 4 December 2010	11gR2 (11.2.0.2) - utlu112i_2.sql
Use the above script when your target upgrade is 11.2.0.2. If you are planning to upgrade to 11.2.0.1, use the utlu112_1.sql script below.		
9.2.0 (9.2.0.8 and above), 10.1.0, 10.2.0, 11.1.0	Build 4 December 2010	11gR2 (11.2.0.1) - utlu112i_1.sql
9.2.0 (9.2.0.4 and above), 10.1.0,10.2.0	Build 2 December 2010	11gR1- utlu111i.sql
8.1.7, 9.0.1, 9.2.0 (9.2.0.4 and above), 10.1.0	Build 2 December 2010	10gR2 - utlu102i.sql

Best Practice #8

- 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"  
<...>
```

Sanity Operations – Real World

- Upgrade of ORDIM component only from 9.2.0.8 to 11.2.
 - These underscore parameters and events were set:

```
_complex_view_merging = FALSE
_multi_join_key_table_lookup = FALSE
_library_cache_advice = FALSE
_index_join_enabled = FALSE
_push_join_union_view = FALSE
_push_join_predicate = FALSE
_always_semi_join = OFF
_pred_move_around = FALSE
_unnest_subquery = FALSE
_predicate_elimination_enabled = FALSE
_eliminate_common_subexpr = FALSE
_no_or_expansion = FALSE
event = '600 trace name systemstate level 10'
event = '600 trace name errorstack level 10'
event = '942 trace name errorstack level 10'
event = '54 trace name systemstate level 10'
event = '54 trace name errorstack level 10'
event = '7445 trace name systemstate level 10'
event = '7445 trace name errorstack level 10'
event = '10195 trace name context forever, level 1'
event = '10778 trace name context forever, level 1'
```

**Upgrade time:
49 minutes**

Unset
underscores
and events

**Upgrade time:
7 minutes!!**

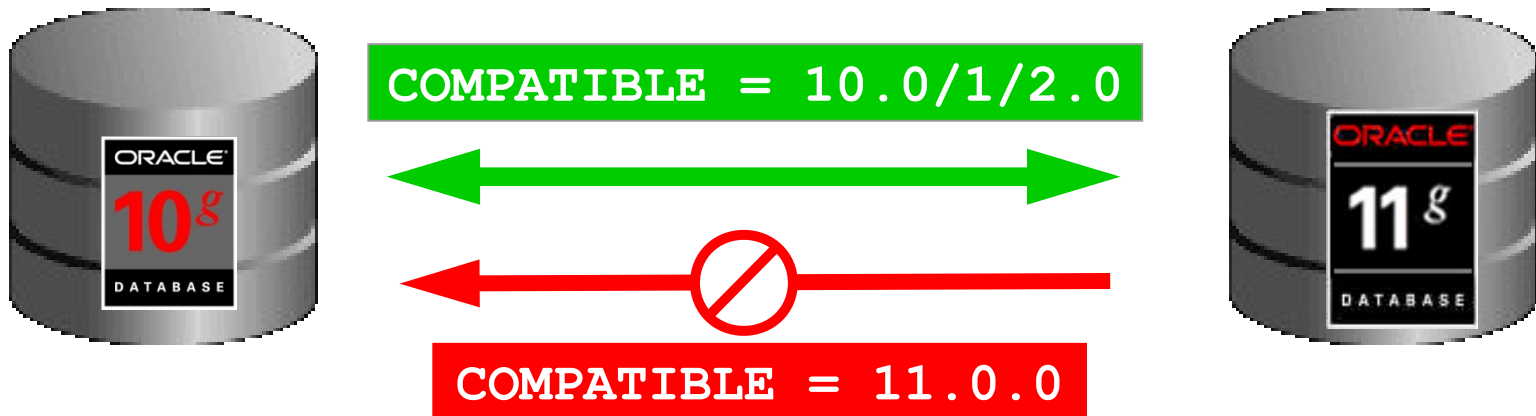
Best Practice #9

- 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 \sphericalangle 11.1.0 has been enabled
 - Supported release downgrade to 10.1.0.5, \sphericalangle 10.2.0.2, \sphericalangle 11.1.0.6
 - Flashback database to \sphericalangle 10.2.0.2
 - No **ALTER DATABASE RESET COMPATIBILITY** command anymore



Parameter COMPATIBLE

- DBUA raises COMPATIBLE only for 9i databases
- To enable new features after the upgrade:

- 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 #10

- Test your **fallback strategy!**



Fallback Strategy

- In any case: Take a backup!!!
- Make sure your fallback strategy covers both cases:
 - Problems encountered during the upgrade
 - Problems found days, weeks *after* the upgrade
- If anything unforeseen happens and you 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, Oracle Streams, Oracle Golden Gate

Best Practice #11

- **After** the upgrade ...



Post Upgrade

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

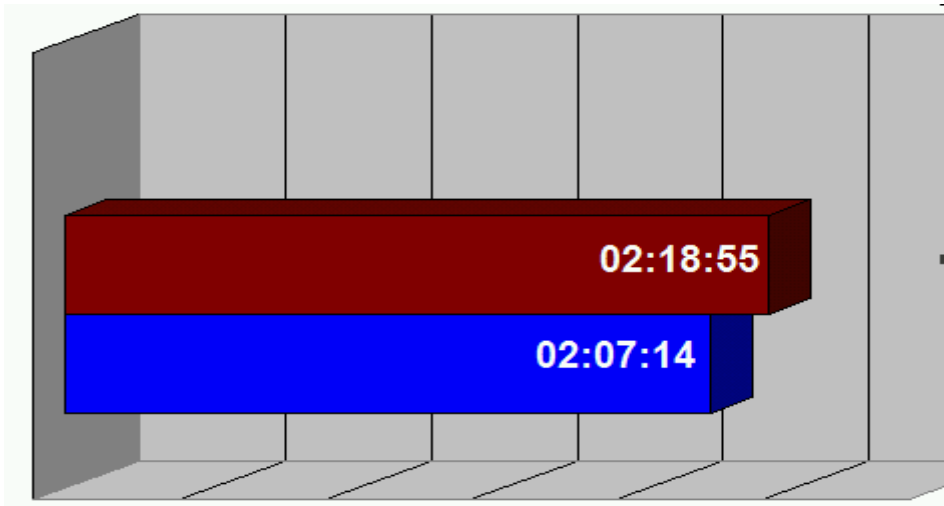
```
SQL> exec DBMS_STATS.GATHER_SYSTEM_STATS('start');  
... - gather statistics while running a typical workload  
SQL> exec DBMS_STATS.GATHER_SYSTEM_STATS('stop');
```

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

NAME	VALUE	INFO
-----	-----	-----
STATUS		COMPLETED
DSTART		04-03-2009 12:30
DSTOP		05-03-2009 12:30
FLAGS	1	
CPUSPEEDNW	1392.39	
IOSEEKTIM	8.405	
IOTFRSPEED	255945.605	
...		

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

```
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

Post Upgrade - SPFILE

- Always **create an editable init.ora** from the current SPFILE after the upgrade has been finished
- Prevents rewrite in case of setting wrong parameters or forced edit
- Keep in mind:
 - The SPFILE is binary file!!! Don't edit it!! Default since Oracle 9.0
 - It simply will exist after using DBUA or DBCA

```
SQL> create pfile='/tmp/initDB.ora' from
spfile;
```

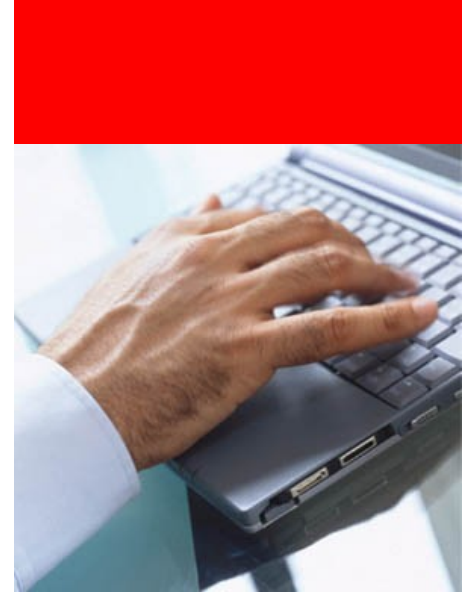
<< Now edit init.ora with any editor >>

```
SQL> startup force pfile=/tmp/initDB.ora
SQL> create spfile from pfile;
```

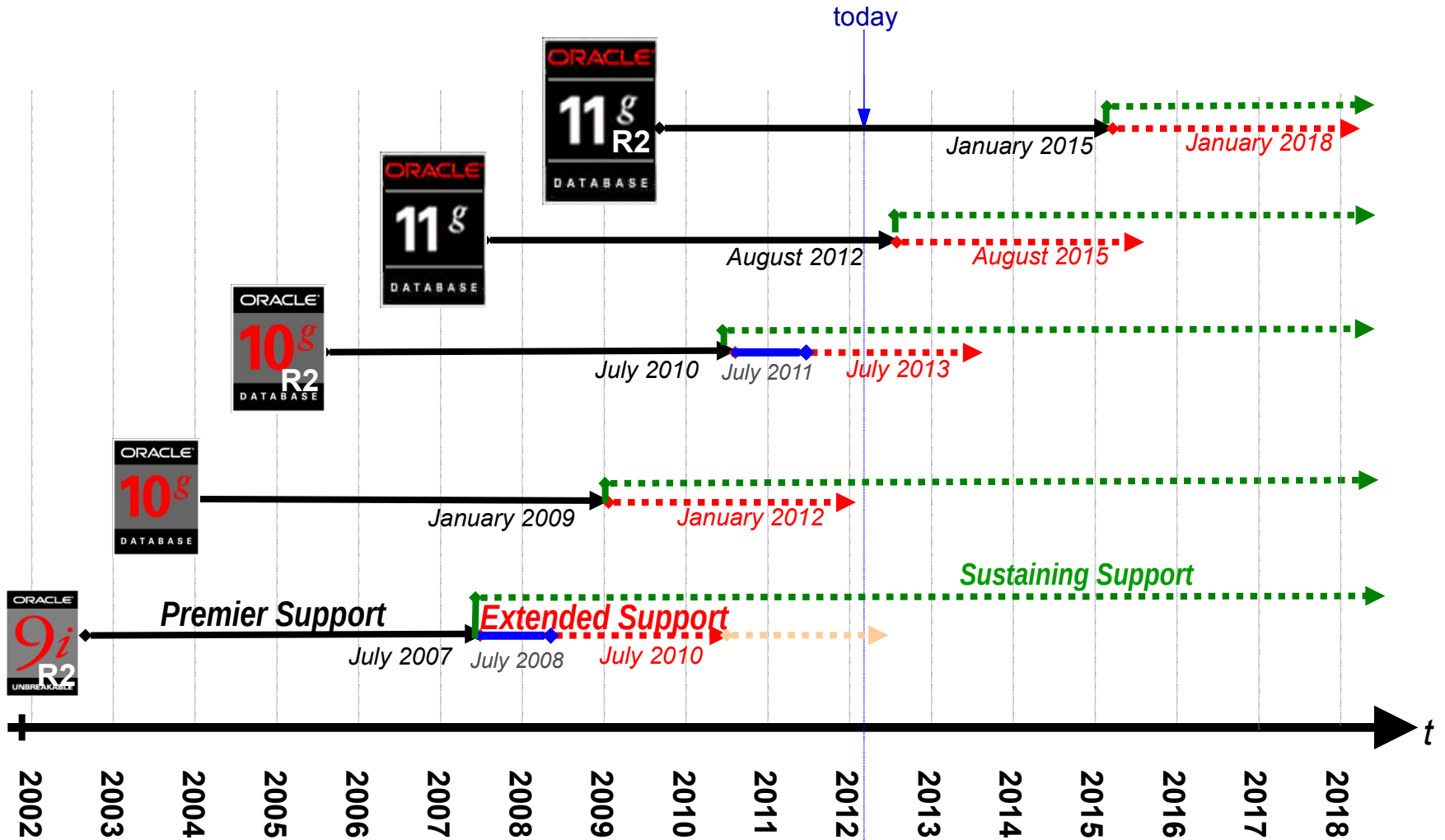
```
SQL> alter system set PARAMETER=VALUE scope=both;
```

Agenda

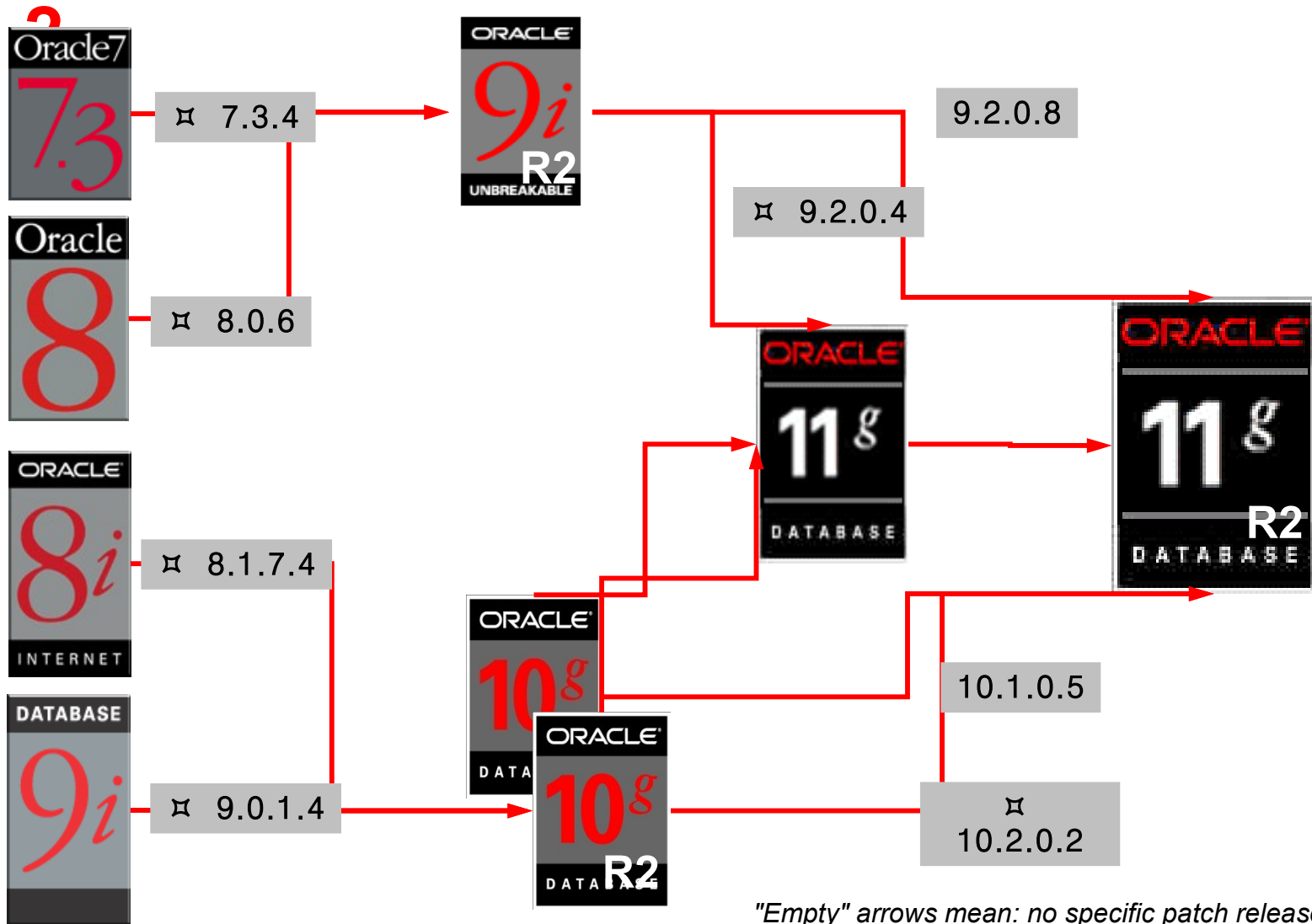
- Best Practices
- FAQ
- Summary



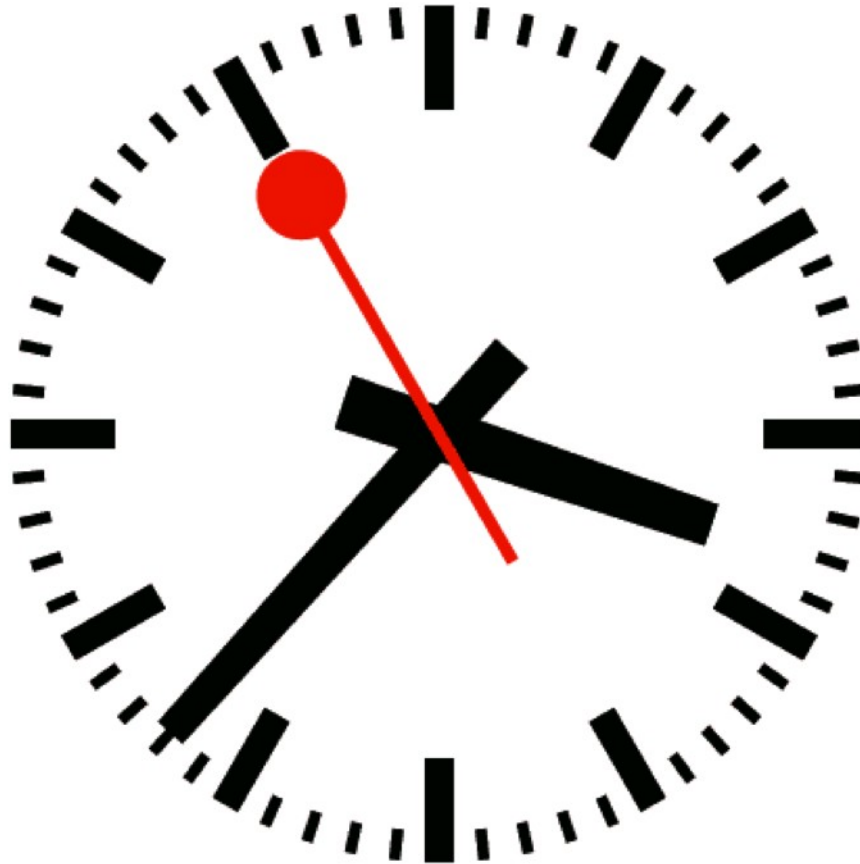
Lifetime Support Policy



Upgrade to Oracle Database 11g Release

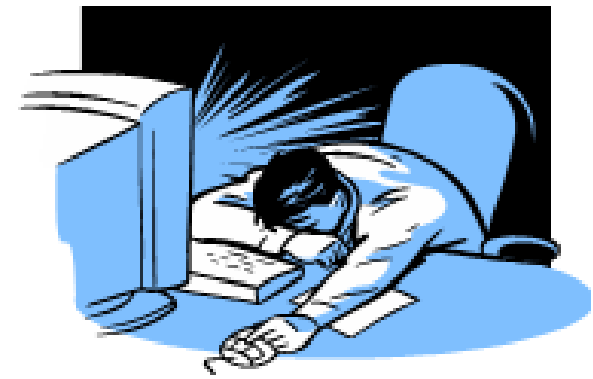


FAQ: How long will the upgrade take?



Upgrade Length

- How long will the upgrade take to complete?
 - **Independent** of:
 - Size of the database
 - Used data types
 - **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...

Component	HH:MM:SS
Oracle Server	00:16:17
JServer JAVA Virtual Machine	00:05:19
Oracle Workspace Manager	00:01:01
Oracle Enterprise Manager	00:10:13
Oracle XDK	00:00:48
Oracle Text	00:00:58
Oracle XML Database	00:04:09
Oracle Database Java Packages	00:00:33
Oracle Multimedia	00:07:43
Oracle Expression Filter	00:00:18
Oracle Rule Manager	00:00:12
Gathering Statistics	00:04:53

Total Upgrade Time: 00:52:31

Upgrade Length

- Speed up your upgrade performance by:
 - Possibly switch off archiving
 - Make sure this will comply with your business rules
 - Do **NOT** do this if you are using Standby Database or Golden Gate!

- **Creating dictionary statistics** the night before the upgrade

- Oracle 9i:

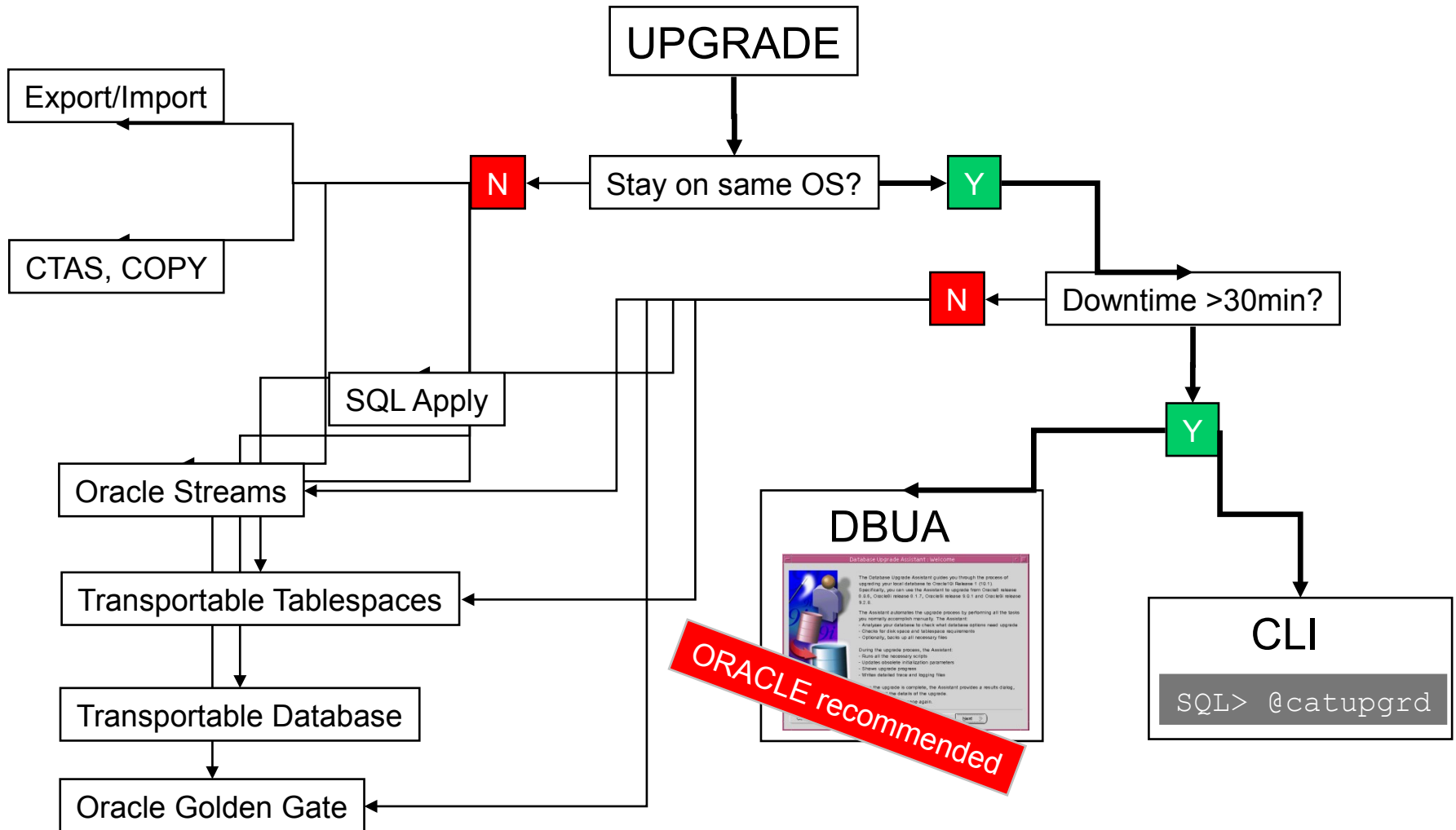
```
SQL> exec DBMS_STATS.GATHER_SCHEMA_STATS('SYS,,  
options => 'GATHER',estimate_percent =>  
DBMS_STATS.AUTO_SAMPLE_SIZE, method_opt => 'FOR  
ALL COLUMNS SIZE AUTO', cascade => TRUE);
```

(Be aware: EXECUTE command does not allow line breaks!!)

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

- Oracle 10g/11g:

FAQ: Which Method Should I Use?



When to Choose Command-Line

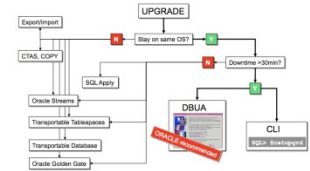
```
SQL> spool upgrade.log  
SQL> @catupgrd.sql
```

- 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

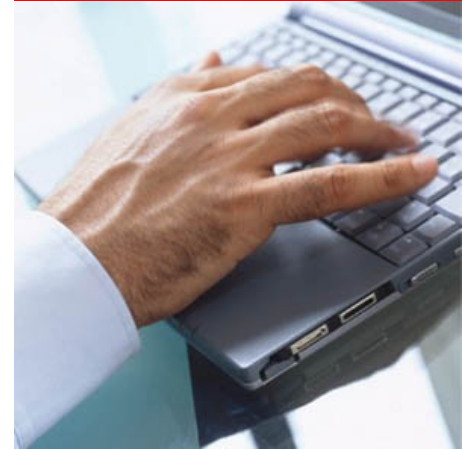
Method

- Alternative methods include
 - Original exp/imp or Data Pump expdp/impdp)
 - Oracle Streams or Oracle Golden Gate
 - Data Guard (SQL Apply)
 - Transportable Tablespaces, Transportable 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



Agenda

- Best Practices
- FAQ
- Summary



Summary

- Preparation and planning are they keys to a successful upgrade
- The DBUA is the recommended method for simplicity and ease-of-use
- Take advantage of the Oracle Database Upgrade Advisor and Database Upgrade Planner
- Have a fallback strategy and test it
- Oracle Database 11g Release 2 is a stable release with lots of great features, so go for it!

Hardware and Software Engineered to Work Together