

ORACLE®

Oracle Database 12c への アップグレード / 移行 とデータベース統合 PART 1

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Database Upgrade and Utilities
Oracle Corporation

Updated: 17-JUL-2013

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はじめに & 概要

一般的な準備手順

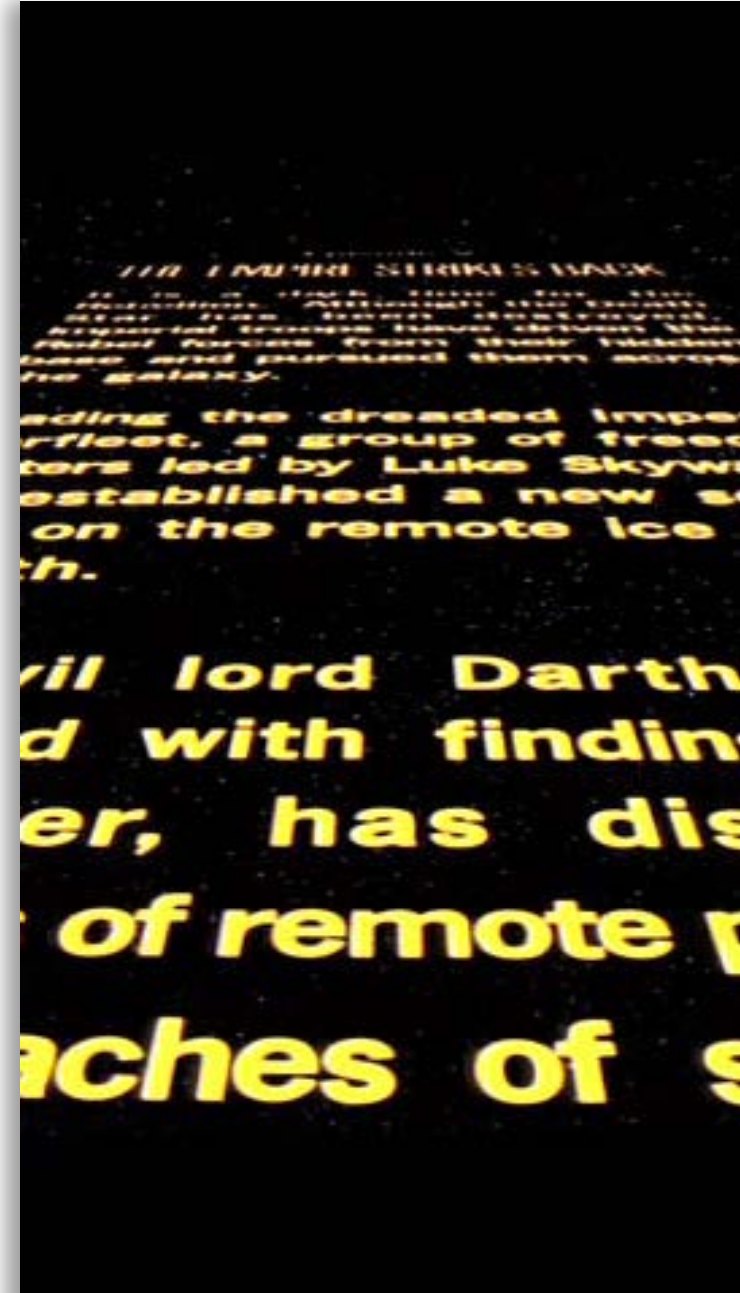
アップグレード & 移行事例

フォールバックストラテジー

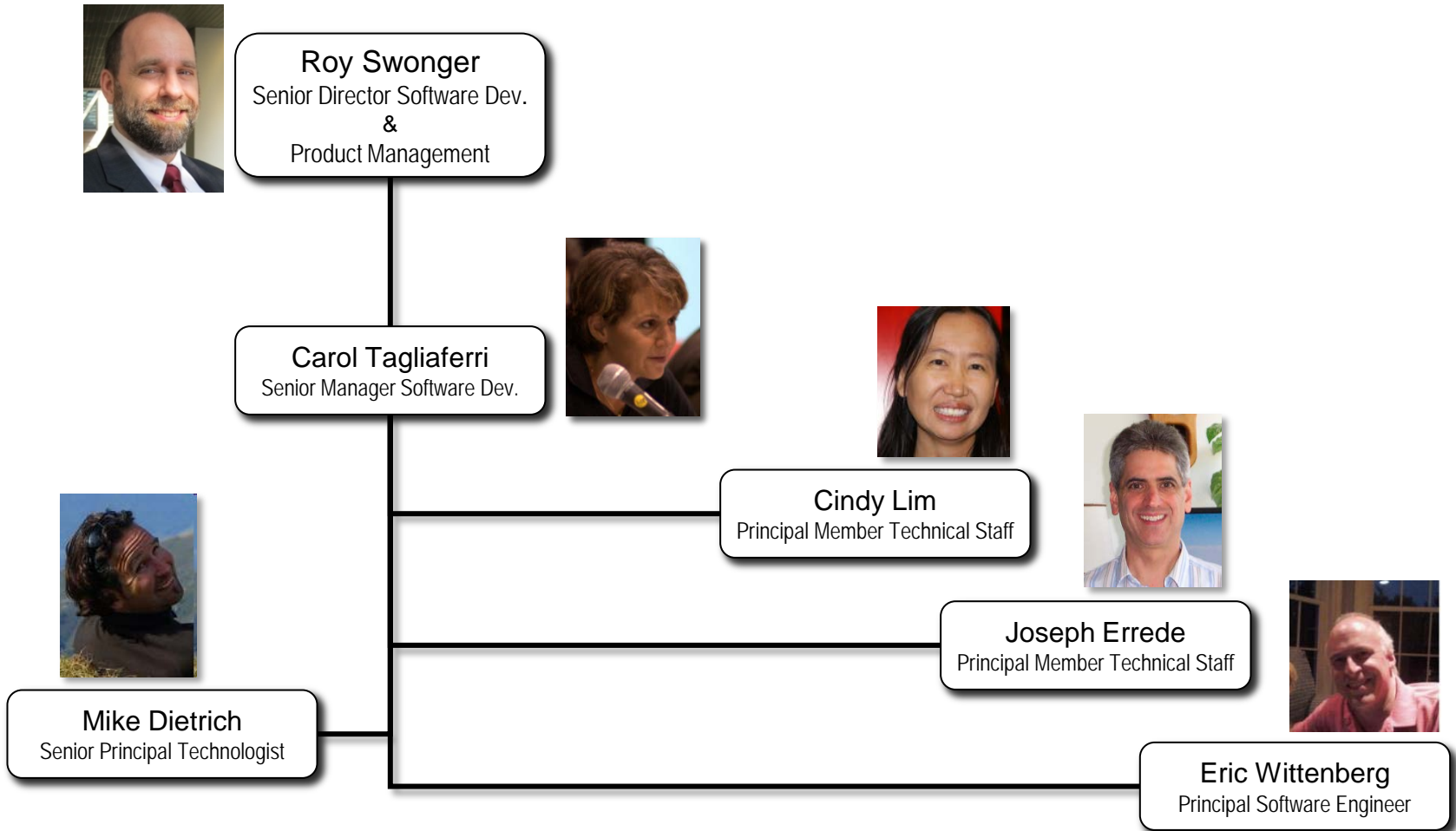
Oracle 12c 新機能

パフォーマンス管理

ラップアップ



Database Upgrade Development Group



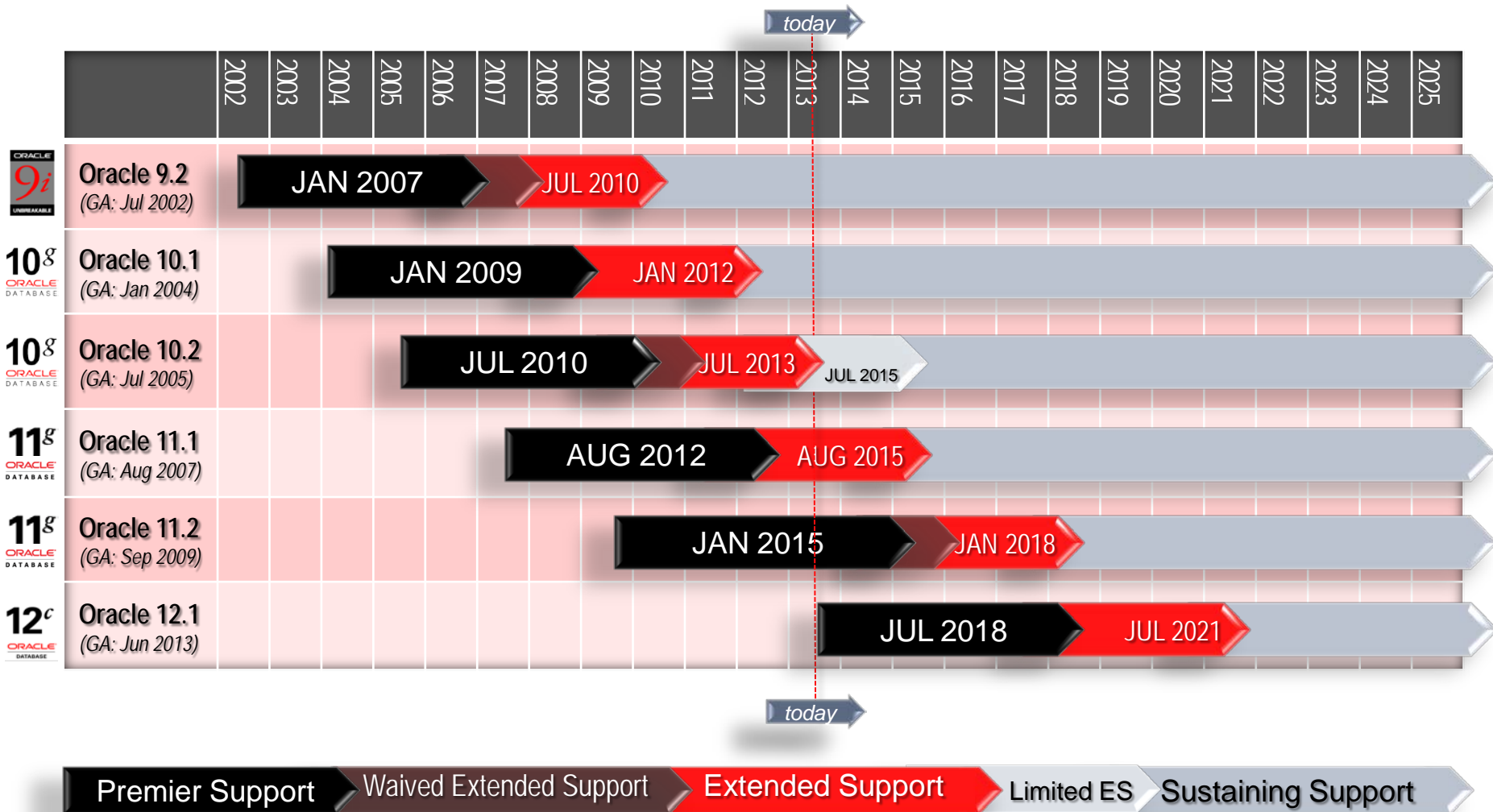
アップグレード時に確認すること

| Question? | Answer |
|---------------------------------|--------|
| 新規ハードウェアへの移行をお考えですか？ | |
| オペレーティング・システムを変更する予定はありますか？ | |
| キャラクター・セットを変更しますか？ | |
| DB統合(スキーマ/インスタンス)を計画していますか？ | |
| いくつのデータベースをアップグレードしますか？ | |
| アップグレード・移行するデータベースの容量はどれくらいですか？ | |
| 移行元と移行先のOracle の正確なバージョンは？ | |
| 許容できるダウンタイムはどの程度ですか？ | |
| 切り戻しの要件は何ですか？ | |
| テスト環境とテストツールは？ | |
| パフォーマンスの基準値はありますか？ | |
| 新機能を有効化しますか？ | |



- データベース・アップグレード
 - データ・ディクショナリーを新しいバージョンにアップグレードすることをデータベースのアップグレードとする
 - JAVAVM, SDO などのオラクルのコンポーネントも含まれる
 - データへの接触や変更、移動はない
- 移行
 - データベースを新しい環境（ハードウェア、オペレーティング・システム/プラットフォーム、キャラクター・セット）へ移動すること
- ソフトウェア・アップグレード
 - In-Place
 - 既存のソフトウェアの格納先に新規ソフトウェアをインストール
 - Out-Of-Place
 - 既存ソフトウェアとは別の新規ソフトウェア用の格納先にインストール

ライフタイム・サポート・ポリシー



ライフタイム・サポート・ポリシー

- <http://www.oracle.com/us/support/lifetime-support/index.html>
- [Note: 209768.1](#) for Support Policy Explanation and details

■ Support does not follow the Lifetime Support Policy.
Unless otherwise noted, each stage of support is provided through the last day of the month noted on the included charts.

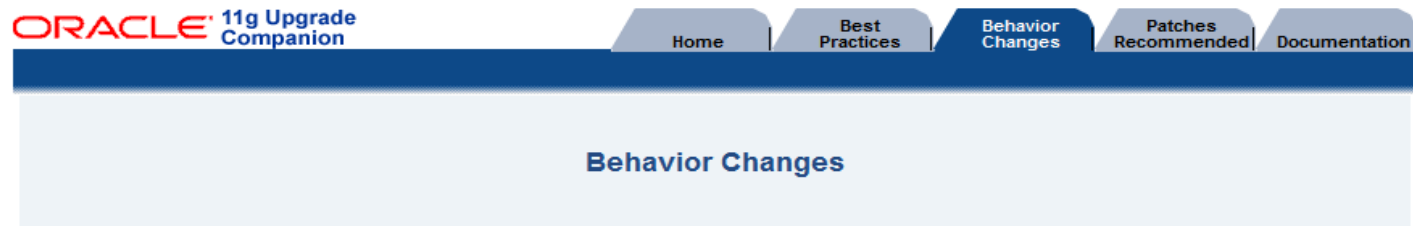
Oracle Database Releases

| Release | GA Date | Premier Support Ends | Extended Support Ends | Sustaining Support Ends |
|---------|----------|----------------------|-----------------------|-------------------------|
| 8.1.7 | Sep 2000 | Dec 2004 | Dec 2006 | Indefinite |
| 9.2 | Jul 2002 | Jul 2007 | Jul 2010 | Indefinite |
| 10.1 | Jan 2004 | Jan 2009 | Jan 2012 | Indefinite |
| 10.2 | Jul 2005 | Jul 2010 | Jul 2013 | Indefinite |
| 11.1 | Aug 2007 | Aug 2012 | Aug 2015 | Indefinite |
| 11.2 | Sep 2009 | Jan 2015 | Jan 2018 | Indefinite |

For Oracle Database 10.2 a limited service providing Severity 1 fixes will be available after July 2013. For details please refer to the Technical Support Policies.-For more-detailed information on bug fix and patch release policies, please refer to the "Error Correction Support Policy" on [MyOracle Support](#).

Upgrade Companion

- [Note:1462240.1](#) Upgrade Companion 12c (coming soon)
 - [Note:785351.1](#) Upgrade Companion 11.2



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

Upgrade OTN Page

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

Products and Services Solutions Downloads Store Support Training Partners About Oracle Technology Network

Oracle Technology Network > Products > Database Upgrade

Real Application Clusters
Secure Backup
RDB
Audit Vault
TimesTen In-Memory Database
Database Mobile Server
NoSQL Database
Berkeley DB
Database Upgrade
Database Express Edition

ORACLE 11g Oracle Database 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.

Oracle Database Webcasts

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 (January 2012)
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.

Always Relevant Topics

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

Upgrade and Migration to Oracle Database 11.2 - Workshop Presentation (~30M)
This presentation covers a full day database upgrade and migration workshop with plenty of background information from installation and patching to various upgrade and migration techniques covering also fallback strategies, performance managements and application upgrades.

Technical Resources Upgrade Services Oracle OpenWorld Documentation Questions & Prior Releases

More Database Downloads

- Database Express Edition
- Database Instant Client
- Database Mobile Server
- JDBC Drivers
- SQL Developer Data Modeler
- TimesTen In-Memory Database
- VM Templates for Database
- .NET Data Access Components

Popular Downloads

- Berkeley DB
- Enterprise Manager
- Database EE and XE
- Developer VMs
- Enterprise Pack for Eclipse
- Java

Maximum Availability Architecture OTN

- <http://otn.oracle.com/goto/maa>
- <http://www.oracle.com/technetwork/database/features/availability/maa-090890.html>

Oracle Maximum Availability Architecture - MAA

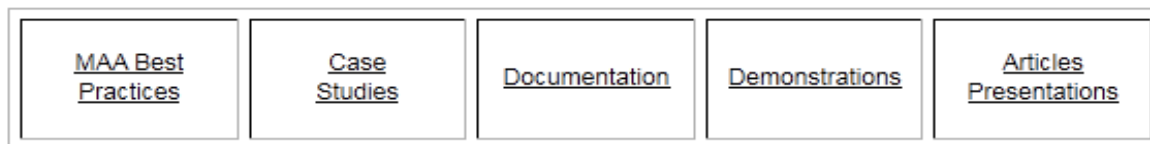
Oracle Maximum Availability Architecture (MAA) is Oracle's best practices blueprint based on Oracle high availability (HA) technologies, extensive validation performed by the Oracle MAA development team, and the accumulated production experience of customers who have successfully deployed business critical applications on Oracle.

The goal of MAA is to achieve the optimal HA architecture at the lowest cost and complexity:

- MAA best practices span the Exadata Database Machine, Oracle Database, Oracle Fusion Middleware, Oracle Applications, Grid Control and Oracle Partners.
- MAA accommodates a range of business requirements to make these best practices as widely applicable as possible.
- MAA leverages lower-cost servers and storage.
- MAA evolves with new Oracle versions and features.
- MAA is hardware and OS independent.

Oracle Database HA capabilities are described in detail in the technical white paper [Oracle Database 11g Release 2 High Availability](#).

For MAA Best Practices and other technical information see:



Upgrade Blog: blogs.oracle.com/UPGRADE

Upgrade your Database - NOW!

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

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Recent Posts

The MAGIC Questions
Back Home ...
Oracle Exadata at Thomson Reuters
AIB - Allied Irish Banks - Upgrade Success
Mile High ... Collaborate 2013 in Denver
Long time no update ...
Potential check for corruptions
New version of the huge *Upgrade to 11.2* slides uploaded
Happy New Year!! And my top ten 2012 songs ...
Creating ASM for test purposes in the file system

[Main](#) | [Next page](#) »

Monday May 27, 2013

The MAGIC Questions

By Mike Dietrich on May 27, 2013

Almost every week Roy, Carol and I receive one or more emails in the following style:

"Hey, we (or my customer) plan(s) an upgrade to Oracle 11g. We (or the customer) wants zero downtime. Currently we (or they) are on AIX with Oracle 10g (and some old 9i) databases. Can we get an advice please?"

or another one here ...

"Upgrade from 8i to 11g. The customer's database is 28 TB (quite big!). Downtime is 5-6 hours. It's on AIX. And it's an Oracle EBS database"

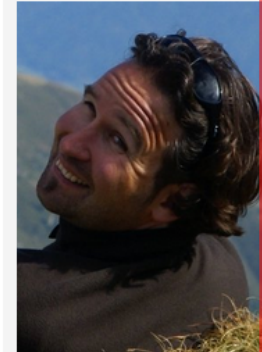
Well, in both cases we lack a lot of useful information - or sometimes things are almost impossible or simply wishful thinking. So we have a collection of (we call them) The Magic Questions. Once those are answered upfront it is way easier to give a helpful advice.

- Will you exchange the hardware?
- Will you change to a new OS version?
- Will you change to an entire new OS architecture?
- Will you change the database characterset?
- Do you plan to consolidate (schema/database...)?
- Number of databases you plan to upgrade or migrate?
- Size of database(s)?
- Exact source and target Oracle versions?
- Maximum allowed downtime per database?
- Fallback requirements?
- Test environment available? Testing tools?
- Does a performance baseline exist?
- Changes required to enable new features?
- RAC/Grid Infrastructure already in use or planned?

Once we get the answer and (even more helpful) a sheet describing the entire landscape in



About



Mike Dietrich

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

Based near Munich in Germany and **spending plenty of time in airplanes** to run either upgrade workshops or work onsite with reference customers. Acting as interlink between customers and the Upgrade Development.

You'd like to contact me?

Choose either [XING](#) or [LinkedIn](#)

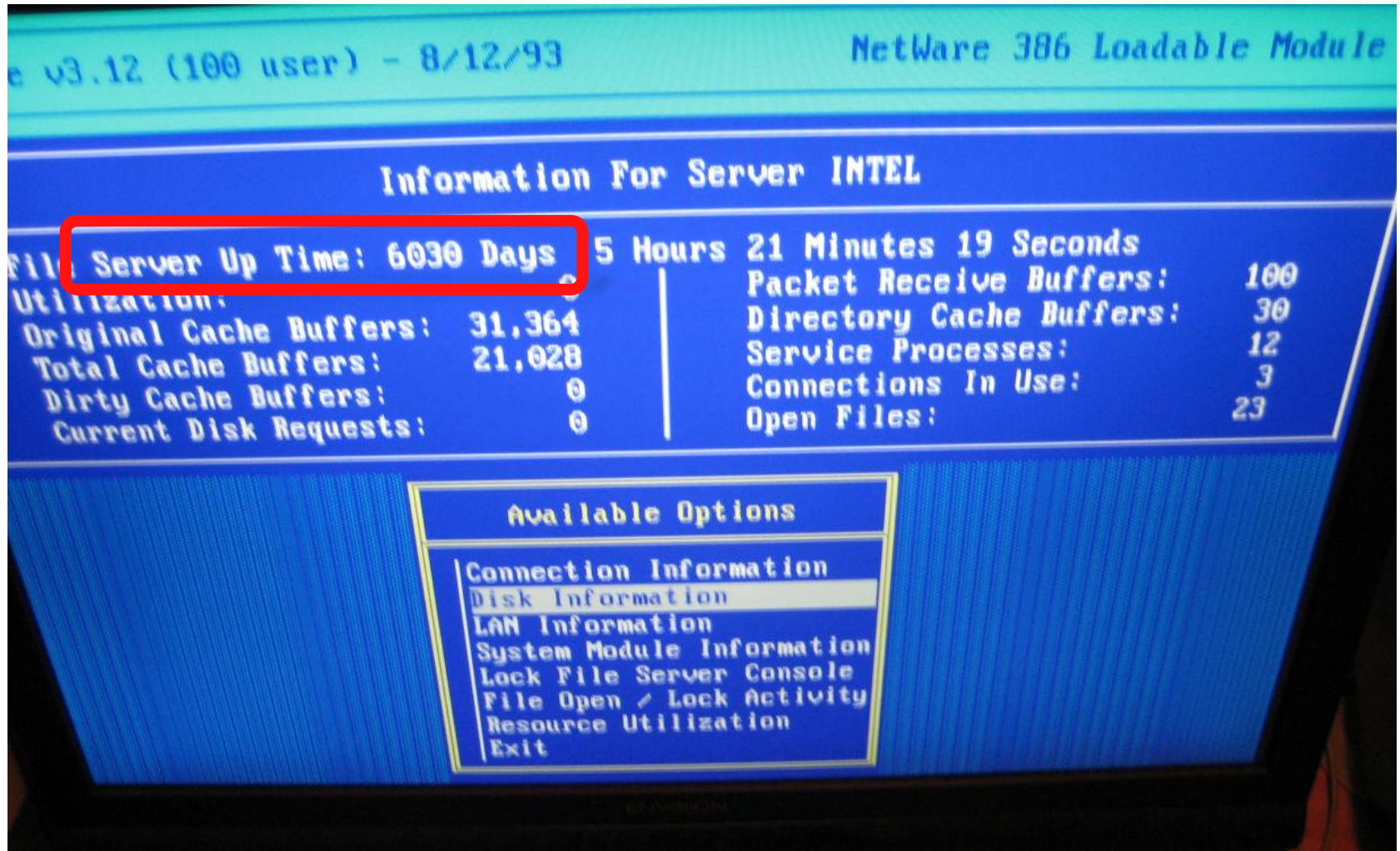
Slides Download Center

Upgrade, Migrate & Consolidate to Oracle Database 12c

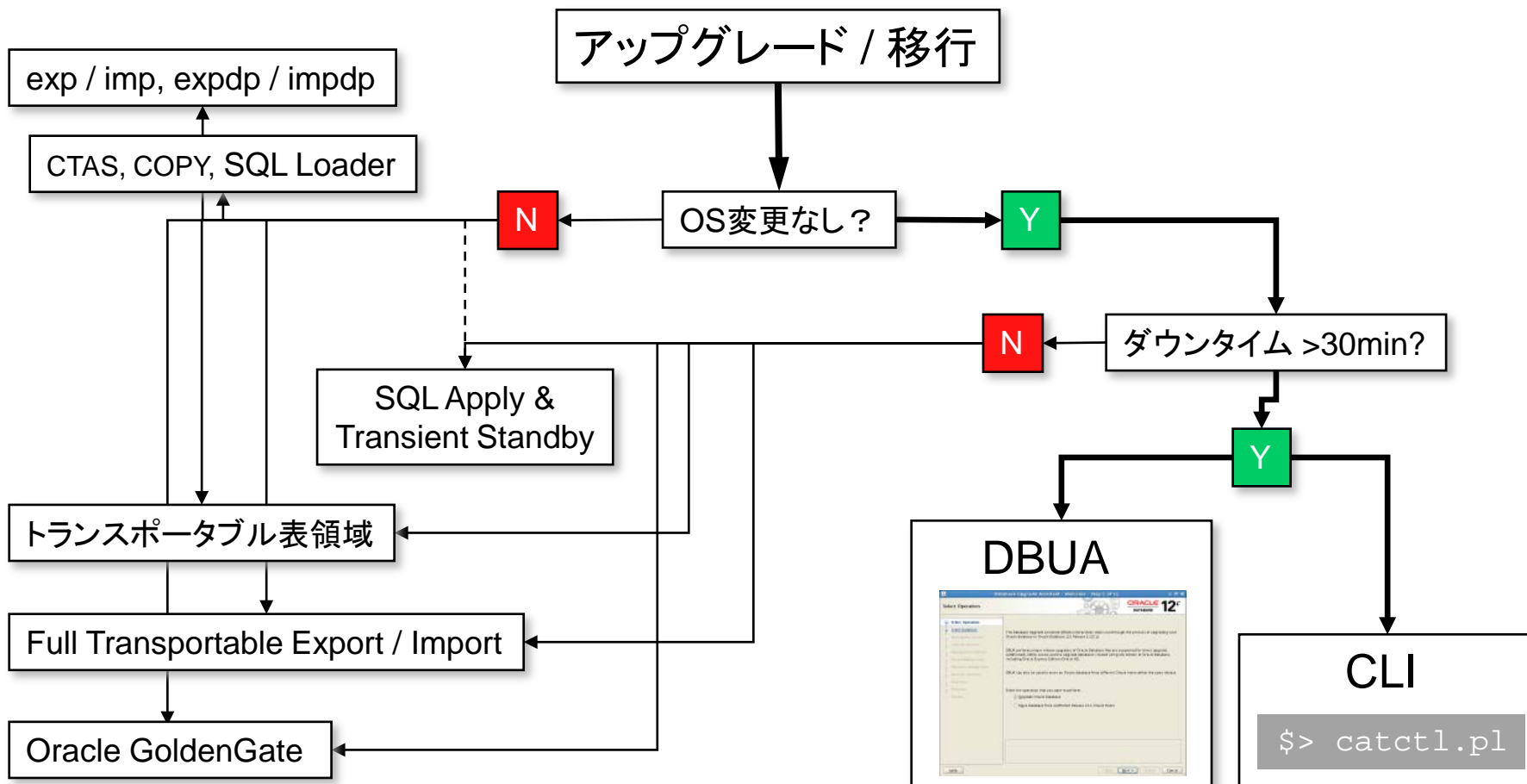
Scroll down to go to the slides

ORACLE®

アップグレードする時では？



アップグレード / 移行パス



戦略は？

- 段階的に **VS** 一気に
 - 十分な長い期間をとって段階的にアップグレード / 移行
 - リスク低減と考えられる
 - 一度に全てを停止してアップグレード / 移行
 - システムの依存関係によっては必要な場合もある
- 一番目に: 最も重要ではないシステム **VS** 最も重要なシステム
 - 手順を段階的により詳しく学ぶ
 - VS**
 - 最初からほとんど全てを学ぶ



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一般的な準備手順

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フォールバックストラテジー

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ラップアップ



全てがうまくいっていることを確認

- 脱線しないように！



準備 チェックリスト

・移行元 環境で実施

クリーンナップ

- リサイクル・ビンをパージ
- SYS / SYSTEM のINVALID オブジェクトをチェック
- SYS / SYSTEM の重複オブジェクトをチェック
- 古いパラメータを削除

コンポーネント

- INVALID コンポーネントをチェック
- 必要なコンポーネントをチェック
- 廃止されたコンポーネントを削除

パフォーマンス

- パフォーマンス統計を保存
- ネットワーク・パフォーマンスをチェック

オプション

- 整合性チェックを実施

クリーンナップ リサイクル・ビン



- 特にアップグレードの前は、リサイクル・ビンをパーズする

– SQL> `purge DBA_RECYCLEBIN;`

- 推奨事項

- 少なくとも週に一度、オフピークの時間帯に自動化ジョブでリサイクル・ビンをパーズする

クリーンナップ **Invalid** オブジェクト

- **INVALID** オブジェクトをチェック

- SQL>

```
select unique OBJECT_NAME, OBJECT_TYPE,
OWNER from DBA_OBJECTS where
STATUS='INVALID' order by OWNER;
```

- SYS およびSYSTEM ユーザーのスキーマにはinvalid なオブジェクトは存在してはならない

- アップグレード/移行前に **\$ORACLE_HOME/rdbms/admin/utlirp.sql** で **INVALID** なオブジェクトを再コンパイルする

クリーンナップ 重複オブジェクト

- SYS / SYSTEM の重複オブジェクトをチェック

- 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');
```

- [MOS Note:1030426.6](#) *How to Clean Up Duplicate Objects Owned by SYS and SYSTEM Schema*

クリーンナップ パラメータ

- 古いパラメータ、隠しパラメータおよびイベント設定をinit.ora / spfile から削除

- 例

```
_always_semi_join=off
_unnest_subquery=false
optimizer_features_enable=10.2.0.4
event="10061 trace name context forever, level
```



- **重要**

EBS interoperability notes のようなアプリケーションのアップグレード・インストールに準じて実施 – それらは一般的な推奨事項に優先する

クリーンナップ パラメータ

Real World Crosscheck

- Oracle 内部の本番データベース

- Multimedia (ORDIM) コンポーネントのアップグレードは長い時間を要する

```
_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 = '10195 trace name context forever, level 1'
event = '10778 trace name context forever, level 1'
```

Upgrade time
for ORDIM:
49 minutes

*Remove all
underscores
and events*

Upgrade time
for ORDIM:
7 minutes

Factor
x7



コンポーネント **VALID**確認

- アップグレード前に全てのコンポーネントがVALIDかどうか確認
 - SQL>

```
select substr(COMP_ID, 1,10) compid,  
       substr(COMP_NAME,1,24) compname, STATUS,  
       VERSION from DBA_REGISTRY where  
       STATUS<>'VALID' ;
```
 - INVALID なコンポーネントはutlrp.sql で再コンパイル
 - utlrp.sql での再コンパイルでコンポーネントのステータスが修正されない場合、追加の診断が必要
 - [Note:472937.1](#) Information On Installed Database Components
 - [Note:753041.1](#) How to diagnose Components with NON VALID status

コンポーネント 必要なものか

- 一般的な推奨事項

- システム全体でインストールされているデータベース・コンポーネントを標準化

- XDB コンポーネントはOracle Database 12c から必須

- 統合

- 全てのコンポーネントはCDB にインストールされる必要がある

コンポーネント 削除

- コンポーネントを削除する3つの理由
 - Oracle Database 12c 以降存在しないコンポーネント
 - EM Database Control Repository
 - Oracle UltraSearch
 - Rules Manager and Expression Filter
 - OLAP AMD
 - アップグレード処理の高速化
 - コンポーネントが少ないほど、より早くデータベースをアップグレードできる
 - 古いコンポーネント
 - 典型例: 11g のEM DB Control Repository は、そのリポジトリと共に EM Cloud Control へ移行
 - 詳細情報
 - “Database Components Cleanup” presentation on our [Blog](#)
 - http://apex.oracle.com/pls/apex/f?p=202202:2:::P2_SUCHWORT:components

パフォーマンス 統計を保存

- 本番システムから正確なパフォーマンス統計を取得
 - 「正確な」とは **少なくともアップグレードの1ヶ月前から取得**
 - **これが極めて重要！**
 - Automatic Workload Repository (AWR) を使用
 - 30-60 分毎にスナップショットを取得 – 保存 >31 日
 - AWR を取得 SQL> `@?/rdbms/admin/awrextr.sql`
 - AWR DIFF レポートを使用してパフォーマンス・スナップショットの比較
SQL>

```
select * from table(
DBMS_WORKLOAD_REPOSITORY.AWR_DIFF_REPORT_HTML(
<DBID>, 1, 101, 121, <DBID>, 1, 201, 221));
```
 - *Please note: AWR を使用するには Diagnostic Pack license が必要*
 - 代替手段: STATSPACK [MOS Note:466350.1](#)
 - 時間的要件の高いクエリ、レポーティング処理およびバッチジョブ
- 参照
[MOS Note:1477599.1](#) Best Practices Around Data Collection For Performance Issues

パフォーマンス ネットワーク帯域

■ 理論値 vs Real World ネットワーク転送率

| Interface | Data Volume | Theoretical Transfer Speed | Real World Transfer Speed |
|---------------------|-------------|----------------------------|---------------------------|
| 100 Mbit Ethernet | 11MB/sec | 40 GB/hour | <30 GB/hour |
| 1 Gbit Ethernet | 110MB/sec | 400 GB/hour | <300 GB/hour |
| 10 Gbit Ethernet | 1.1GB/sec | 4 TB/hour | <3 TB/hour |
| Infiniband IB 4xQDR | 4GB/sec | 14 .4TB/hour | <11 TB/hour |

■ 典型的な問題

- 転送プロトコル: ftp, scp, NFS はすべてデフォルトでシングルスレッド
- 異なるネットワークセグメント: リピーターやスイッチがスローダウンの原因
- セキュリティ設定: ファイア・ウォールがすべての性能向上を無効化
- 外部のネットワーク・プロバイダ、長距離、etc...

パフォーマンス ネットワーク戦略

- 事前に履歴データを移動
- データ・ファイルに空き容量が多い場合、export / import は空のブロックコピーすることなく抽出
- 転送プロトコル
 - パラレルコピーで実施
- 遅いハードウェア
 - 複数のネットワーク・カードでインストール、古いスイッチやリピータの取り替え
- Data Guard やGoldenGate の機能を使用
- “スニーカー・ネット”



オプション 整合性チェック

- ヘルス・チェック (hcheck.sql)
 - [MOS Note:136697.1](#) からhcheck.sql をダウンロード
 - このスクリプトは、Oracle8i, Oracle9i, Oracle10g, Oracle 11g での既知の問題をチェック
 - [MOS Note:101468.1](#) hOut Helper Package (hout.sql) が必要
- RMAN Validation チェック
 - RMAN> backup check logical validate database;
 - 詳細: [MOS Note:836658.1](#)
 - 高速化のためのパラレル実行が可能

準備 チェックリスト

・移行先環境で

チェック

- ソフトウェア・サーティフィケーション情報
- インストール要件

ダウンロード

- ソフトウェアとPatch Sets
- CPUs, PSUs, バンドルパッチ (BP)
- 個別パッチ

設定

- 推奨パラメータ

Certification Check

- My Oracle Support のプラットフォーム・サーティフィケーションを確認
 - [Note: 964664.1](#) 及び [Note:431578.1](#): Middleware and Application Server product group assignments の説明

The screenshot displays the Oracle My Oracle Support website's 'Certifications' page. At the top, the Oracle logo and 'MY ORACLE SUPPORT' are visible, along with user navigation links like 'Welcome, Mike', 'Contact Us', 'Sign Out', and 'Help'. A navigation menu includes 'Dashboard', 'Knowledge', 'Service Requests', 'Patches & Updates', 'Community', and 'Certifications'. A search bar for the Knowledge Base is present, along with a 'Last refreshed 5 minutes ago' indicator and a 'Customize Page...' link.

The main content area features a 'New Certification Search' section with a megaphone icon. It provides instructions on how to search for certifications in three steps:

- 1 Find your product:** Use the auto suggest field to easily find your product. A screenshot shows a search box with 'Dat' entered, and a dropdown list showing 'Database Vault (DB Vault)', 'Oracle Database (RDBMS, 10G, 9i, DB, Oracle Server - Ent)', and 'Oracle Database (RAC) (RDBMS, Real Application Cluster)'. A 'Hide' button is located below the dropdown.
- 2 Pick a product release:** Select the release of your chosen product in the dropdown list. A screenshot shows a search box with a dropdown list containing '11.2.0.1.0', '11.1.0.7.0', and '11.1.0.6.0'. A mouse cursor is pointing at the first option.
- 3 Click Search!** Find all certified products and platforms. A screenshot shows a 'Search' button being clicked.

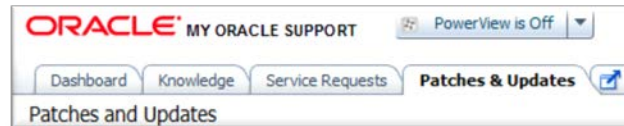
Below the search instructions, there are two panels: 'Quick Links' and 'Certification Search'. The 'Quick Links' panel includes links for 'Latest updates on Certifications', 'Tips for Finding Certifications', 'Fusion Middleware Certifications', 'Enterprise Manager Certification Checker', 'Watch a Video Tutorial', and 'Classic Certify & Product Roadmap'. The 'Certification Search' panel has tabs for 'Search', 'Saved', and 'Recent'. It contains three dropdown menus: 'Product' (with a search prompt '* Type name or select from list'), 'Release' (with a search prompt '* Select a release'), and 'Platform' (with 'Any' selected). There is a checkbox for 'Check certifications with another product' and buttons for 'Clear', 'Save', and 'Search'. A note at the bottom states '* Required' and 'Can't find your product? Use the Classic interface.'

ソフトウェア・ダウンロード

■ ソフトウェアへのアクセス方法は？

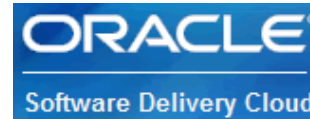
– 最新のパッチセットを取得(利用可能なものがあれば)！

- <http://support.oracle.com> はパッチとパッチセットをダウンロードできる唯一のサイト



– パッチセットはOTN やeDelivery からダウンロードできない
– ベース・リリースのダウンロード方法

- <http://edelivery.oracle.com/>



- Software Delivery Cloud(以前のeDelivery)が推奨ダウンロードサイト
- ソフトの改修があった場合、自動的にemail でユーザーに通知

– もしくは、OTN からダウンロード

<http://otn.oracle.com/indexes/downloads/index.html>

新規ソフトウェアのインストール

Patch Set /
ベースリリース

- 最新の**PATCH SET** をインストール
(11.2 以降はフルインストール)
- or
- 新規Oracle Home へベースリリースをインストール
(*patch setがない場合*)

PSU/BP

- 最新の**Patch Set Update (PSU)** を適用
- or
- 推奨されるバンドル・パッチ (BP) を適用

個別パッチ

- 既知の問題に対する**個別パッチ**を適用

アップグレード

- Now:** データベースのアップグレード/移行を開始

例: Patch Set 11.2.0.3

- support.oracle.com からPatch Set 11.2.0.3 をダウンロード

ORACLE MY ORACLE SUPPORT PowerView is OFF Welcome

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

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 11.2.0.3 のインストール

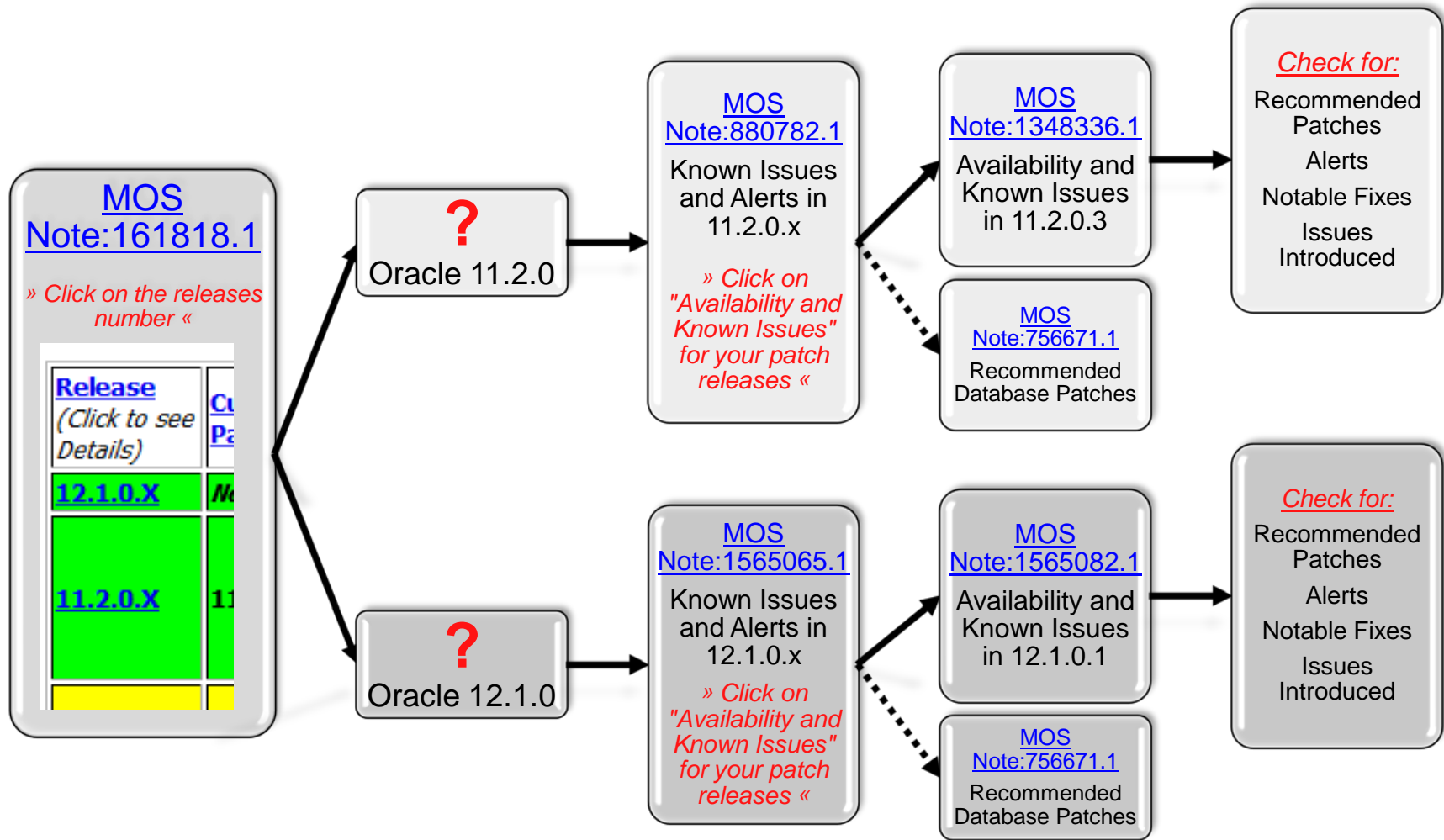
- Patch Set 11.2.0.2 / 3 はフルインストール
 - 11.2.0.1 の初期リリースのインストールは不要
- in-place インストールを行う唯一の方法
 - /dbs と/network/admin ファイルのバックアップを取得
 - `./runInstaller -detachHome ORACLE_HOME=<11.2.0.1-home>`

```
$ ./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.
```

- 11.2.0.1 Home の中身を移動
- 11.2.0.3 を11.2.0.1 のOracle ホームにインストール
- /dbs と/network/admin ファイルをリストア
- DBUA またはcatupgrd.sql でデータベースのアップグレード


MOS: Patch Note フロー



重要なアラートと個別パッチ

- 重要なアラートをチェック [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 |
|---|-----------------------------------|--------------------------------|--------------------------------------|---|--|
| 12.1.0.X | None | 12.1.0.2 | - | - | Base release is 12.1.0.1 . |
|  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 Limited Extended Support is available from August-2013 to July-2015 inclusive. See " Oracle Software Technical Support Policies " Extended Support section. | 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 Extended Support has ended - see Note:761713.1 |
| 9.2.0.X | 9.2.0.8 | None | Jul-2007 | Jul-2010 Limited Extended Support was available from July 2010 to July 2012 on selected platforms. See the 9.2 Extended Support details here | 9.2.0.8 is terminal 9.2 Patch Set. The Free Extended Support period ended on 31-Jul-2008. See Note:392222.1 |

アップグレード情報 / アラート

- 11.2.0.x の既知の問題 [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 |
| | Oracle 11g Release 2 Patch Set 1 |
| 11.2.0.2 | Availability and Known issues for 11.2.0.2 Note:1179474.1 List of fixes included in 11.2.0.2 Note:1179583.1 |
| | Oracle 11g Release 2 Base Release. |
| 11.2.0.1 | Availability and Known issues for 11.2.0.1 Note:880707.1 |

アップグレード情報 / アラート

- 11.2.0.3 の推奨パッチ [Note:1348336.1](#)
 - 推奨データベース・パッチ [Note:756671.1](#)

Current Recommended Patches

For information about Recommended Patches for the RDBMS see [Note:756671.1](#) .

Patch Set Updates

| Document | Description | Rolling RAC | Patch Download |
|---------------------------------|---|-------------|--------------------------------|
| Note:16056266.8 | 11.2.0.3.6 (Apr 2013) Database Patch Set Update (PSU) | Yes | Patch:16056266 |

Grid Infrastructure

| Document | Description | Rolling RAC | Patch Download |
|---------------------------------|---|-------------|--------------------------------|
| Note:16083653.8 | 11.2.0.3.6 (Apr 2013) Grid Infrastructure Patch Set Update (GI PSU) | Yes | Patch:16083653 |

Exadata

| Document | Description | Rolling RAC | Patch Download |
|-------------------------------|--|-------------|----------------|
| Note:888828.1 | Recommended Patch Information for Database Machine and Exadata Storage Server 11g Release 2 (11.2) | - | - |

EBusiness Suite R11i Certification

| Document | Description | Rolling RAC | Patch Download |
|-------------------------------|--|-------------|----------------|
| Note:881505.1 | Interoperability Notes for Oracle E-Business Suite Release 11i with Oracle Database 11.2.0.3 | - | - |

EBusiness Suite R12 Certification

| Document | Description | Rolling RAC | Patch Download |
|--------------------------------|---|-------------|----------------|
| Note:1058763.1 | Interoperability Notes for Oracle E-Business Suite Release 12 with Oracle Database 11.2.0.3 | - | - |

推奨パッチ: PSU_s

■ 最新のPSU を適用

- [Note:854428.1](#): Introduction to Database Patch Set Updates
- [Note:1227443.1](#): Patch Set Updates Known Issues
- Database PSU に含まれる修正
 - 多くのユーザに影響する、現場で実証済みの重篤な問題
 - Critical Patch Update (CPU) に含まれる修正
- Database PSU に含まれない修正
 - 再サーティファイが必要な変更
 - 構成変更が必要になる修正
- PSU には、25-100 の新規バグ修正が含まれる
- RAC ローリング・アップグレードで適用可能
- CPU と同じスケジュールで、四半期ごとにリリース
 - 16-APR-2013, 16-JUL-2013, 15-OCT-2013 & 14-JAN-2014
- PSU のチェック `opatch lsinventory -bugs_fixed | grep -I 'DATABASE PSU'`

アップグレード情報 / アラート

■ 11.2.0.3 のアラートと新規の問題 [Note:1348336.1](#)

11.2.0.3 Alerts / Issues

This section lists alerts and important issues relevant to 11.2.0.3 .

General Alerts / Issues

| Bug/Doc | Fixed in PSU/Bundle | Description | Updated |
|----------------------------------|---------------------|--|-------------|
| Note:1561271.1P* | | Solaris / HP: ORA-29701 raised in ASM i/o path | 17/Jun/2013 |
| Note:1527740.1* | | ORA-600 [ktbsdp1] ORA-600 [kgfrempty:ds]. Corruption in Rollback with Clusterwide Global Transactions in RAC | 17/Jun/2013 |
| Note:1260095.1P+ | | AIX: Excess "work USLA heap" process memory use in 11.2 on AIX | 07/Mar/2012 |
| 16299065+ | | ORA-1206 in SOURCE database after RMAN duplicate | 17/Jun/2013 |
| 10194190P+ | | Solaris: Process spin and/or ASM and DB crash if RAC instance up for > 248 days | 06/Jun/2013 |
| 14540423+ | 11.2.0.3.BP16 | Memory corruption / wrong results / ORA-7445 for particular type of chained row with Exadata | 06/Mar/2013 |
| 14668670+ | 11.2.0.3.BP14 | wrong results the first time a query is executed | 17/Jun/2013 |
| 13384397+ | 11.2.0.3.BP05 | wrong results / OERI:[kkoqb: bsj not used] with star transformation | 17/Jun/2013 |
| 13786142+ | 11.2.0.3.6 | Cannot drop/replace trigger in editioning environment | 16/Apr/2013 |
| 13645917+ | 11.2.0.3.5 | PMON block recovery loop - instance hang | 17/Jun/2013 |
| 13550185+ | 11.2.0.3.4 | Hang / SGA memory corruption / ORA-7445 [kglic0] when using multiple shared pool subpools | 08/Mar/2013 |
| Note:1390632.1* | 11.2.0.3.3 | Dictionary corruption / ORA-959 due to DROP TABLESPACE | 03/May/2013 |
| 13467683+ | 11.2.0.3.3 | Join of temp and permanent tables in RAC might cause corruption of permanent table. Regression by bug 10352368 | 17/Jun/2013 |

Upgrade Issues

| Bug/Doc | Fixed in PSU/Bundle | Description | Updated |
|---------------------------------|---------------------|--|-------------|
| Note:1363369.1+ | | Essential Steps to take before Upgrading to 11.2.0.3 Grid Infrastructure/ASM/Exadata | 06/Mar/2012 |
| Note:1427855.1P | | AIX: Recommendations for 11.2 GI/RAC on AIX | 07/Mar/2012 |
| Note:1386945.1 | | Oracle Text Release 11.2.0.3 mandatory Patches | 18/Apr/2012 |
| 13460353+ | 11.2.0.3.GIPSU04 | Registration of 11.2 database fails against 12.1 CRS stack (required fix for 11g DB with 12c GI) | 17/Jun/2013 |
| 9873405 | 11.2.0.3.1 | ORA-600 [21028] during fast refresh after upgrade | 14/Jan/2013 |

アップグレード情報 / アラート

■ 11.2.0.3 のアラートと新規の問題 [Note:1348336.1](#)

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.

| | |
|--------------------------------|---|
| 15853478 | CreateXML with object schematic changed in 11.2.0.3 compared to 11.2.0.2 |
| 9832338 | ORA-600 [15160] / ORA-7445 [kkogfp] from CONNECT BY and OUTER JOIN (+) |
| 9438890 | DBMS_AUDIT_MGMT.CLEAN_AUDIT_TRAIL does not work for AUDIT_TRAIL=OS (or XML)with uppercase ORACLE_SID - superseded |
| 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 | Fixed in PSU/ Bundle | Description | Updated |
|-----------------------------------|----------------------|--|-------------|
| 16893548 | | OCI direct path load fails with ORA-942 | 07/Jun/2013 |
| 16717701 | | Active Dataguard Hangs waiting for library cache lock on DBINSTANCE namespace with possible deadlock | 22/May/2013 |
| 16368639 | | Stored outline does not produce same plan in 11.2.0.3 | 17/Jun/2013 |
| 14656906 | | Lots of "knalsCopyRowidExtraAttribute: no rowid attribute in source LCR" messages | 21/Jan/2013 |
| 14577881 P | | Solaris: ASM 11.2.0.3 on solaris discovers slices that start on cylinder 0 | 12/Apr/2013 |
| 14559731 | | ORA-1779 on updatetable view | 16/Nov/2012 |
| 14488943 | | ORA-9925 can occur writing audit if ORACLE_PATH is set | 08/Mar/2013 |
| 14467202 | | Suboptimal execution plan with fix of bug 11814428 active for some SQL | 08/Mar/2013 |

重要なオプティマイザの問題と修正

- Oracle Database 11.2.0.3 にアップグレードする前にパフォーマンス劣化や結果不正を回避するための考慮事項 [MOS Note:1392633.1](#)

Patches relevant for all platforms

For best results, install the latest PSU 11.2.0.3 as described in [Document:756671.1](#), as it fixes many issues not listed in this note. Install the patches listed here for the relevant PSU:




| No PSU | PSU 1 | PSU 2 | PSU 3 | PSU 4 | PSU 5 | PSU 6 | Bugs Fixed |
|---|---|-------|--|---|---|------------------------------------|--|
| Patch:14019600 for 11.2.0.3.0 | | | Patch:14267798 for 11.2.0.3.3 | | Patch:16084707 for 11.2.0.3.5 | | Document:13004894.8 Wrong results with SQL_TRACE / 10046 |
| | | | <i>Included in PSU 3 and above</i> | | | | Document:13743357.8 Wrong results on first execution |
| | | | | | | | Document:13370330.8 ORA-600 [qkeIsExprReferenced1] From Query With Virtual Column |
| | Patch:14472647 for 11.2.0.3.0 | | | Patch:14472647 for 11.2.0.3.4 | | <i>Included in PSU 6 and above</i> | Document:14472647.8 Wrong results on IOT secondary index after DML |
| | Patch:13705338 for 11.2.0.3.0 | | <i>Included in PSU 4 and above</i> | | | | Document:13705338.8 Wrong results on iot secondary index through join |
| | Patch:14668670 for 11.2.0.3.0 | | | | | | Document:14668670.8 Wrong results the first time a query is executed |
| | Patch:11072246 for 11.2.0.3.0 | | | | | | Document:11072246.8 Poor Cardinality estimations for columns with DESC indexes |
| Patch:16297289 for 11.2.0.3.0 | Patch:16478959 for 11.2.0.3.2 | | Patch:14644185 for 11.2.0.3.3, 11.2.0.3.4, or 11.2.0.3.5 (match PSU version) | | | <i>Included in PSU 6 and above</i> | Document:14644185.8 Part of fix 12531263 missing from 11.2.0.3 - disabled deadlock detection for Cursor build locks (on \$BUILD\$) |
| | | | <i>Included in PSU 3 and above</i> | | | | Document:12797420.8 "library cache: mutex X" waits on DB instance handle with CURSOR_SHARING |
| | | | | | | | Document:13588248.8 Library cache mutex contention for objects with very many library cache locks |

推奨のOSパッチ

■ [MOS Note:169706.1](#): OS Installation and Configuration

☆ **Oracle Database (RDBMS) 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: Jun 17, 2013 Type: BULLETIN Status: PUBLISHED Priority: 1

 Comments (0)  

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 \(PowerPC and x86-64\)](#)

[Oracle Solaris \(SPARC and x86-64\)](#)

[Tru64](#)

[Pre-Installation Scripts](#)

[OPatch](#)

[Related Documents](#)

[OS Specific Commands](#)

[Change History](#)

[Note 43208.1](#) Certified Compilers

Standby-First-Patching

- Oracle Data Guard **Standby-First Patch Apply**
 - [MOS Note:1265700.1 - Data Guard Standby-First Patch Apply](#)
 - 最初にフィジカル・スタンバイサイトへパッチを適用
 - プライマリ側とスタンバイ側で異なるリリースを許容
 - ローリング・アップグレードのロール変換用に許容
 - サポート対象
 - **Patch Set Update (PSU)**, Critical Patch Update (CPU) and PSE
 - Oracle Grid Infrastructure Patches or Software Updates
 - **One-off patches**
 - Oracle Exadata Database Machine bundled patches (BP), Quarter Database Patches, Storage Server Software patches (Cell), hardware/network changes
 - Operating System software changes that do not have any dependencies on Oracle database software
 - Oracle Database 11.2.0.1 から利用可能
 - RDBMS COMPATIBLE パラメータは同じ値である必要あり
 - ASM COMPATIBLE パラメータは異なっても可能

パラメータに関する推奨事項



■ 一般指針

- spfile で指定しているパラメータが少ない方ほどよい
- 古いパラメータ、隠しパラメータおよびイベント設定を削除
 - アプリケーションが設定するように指定しているものを除いて
(例: E-Business Suite, Siebel, SAP etc.)
- **テスト**、ドキュメント、ホワイトペーパーに基づいてパラメータの値を調整
 - チューニングの達人の言葉などを信用しないこと



パラメータに関する推奨事項 - 情報

■ June 6, 2012

https://www.pcworld.com/article/257045/6_5m_linkedin_passwords_posted_online_after_apparent_hack.html

SECURITY social networks, security

Update: LinkedIn Confirms Account Passwords Hacked

UPDATED 2:15 p.m. PT

LinkedIn Wednesday confirmed that at least some passwords compromised in a major security breach correspond to LinkedIn accounts.



Vicente Silveira, Director at LinkedIn, confirmed the breach on the company's blog

Wednesday afternoon and outlined steps that users should take. He wrote that those with compromised passwords should change their password as soon as possible as their password is no longer valid.

Silveira added that owners of compromised accounts should be contacted with instructions on how to reset their passwords.

Background

LinkedIn Security professionals suspected that the business-focused social network LinkedIn suffered a major breach of its password database. Recently, a file containing 6.5 million unique hashed passwords appeared in an online forum based in Russia. More than 200,000 of these passwords have reportedly been cracked so far.

The file only contains passwords hashed using the SHA-1 algorithm and does not include user names or any other data, security researchers say. However, the breach is so serious that security professionals advise people to change their LinkedIn passwords immediately.

It's unknown at this point how the file ended up on a public forum or exactly which site the passwords originate from; however, signs indicated this is indeed a breach of LinkedIn.

パラメータに関する推奨事項 - 情報

■ March 3, 2013

http://www.huffingtonpost.com/2013/03/03/evernote-hacked-50-million-passwords-reset_n_2801108.html

Evernote Hacked: All 50 Million Users' Passwords Reset

03/03/13 07:30 AM ET EST AP



LONDON -- Online note-taking service Evernote Corp. says it has been hacked and is resetting all its 50 million users' passwords as a precaution.

The Redwood City, California-based company said in a post published late Saturday that an attacker had been able to access sensitive customer information and that every user would have their account reset "in an abundance of caution."

Evernote says the attacker was able to access an unspecified number of customers' encrypted passwords. Decoding such passwords can be difficult but is far from impossible.

The company says it has seen no evidence that any customer data had been tampered with or that any payment information had been compromised.

パラメータに関する推奨事項

- SEC_CASE_SENSITIVE_LOGON=TRUE
 - パスワードの大/小文字区別の有効/無効を切り替える
 - Oracle Database 11g からのデフォルトは TRUE
 - Oracle Database 12c からは**非推奨**
 - 推奨事項
 - PASSWORD_VERSIONS<11G であるパスワードを再設定する
 - パスワード再設定時に "salt" アルゴリズムが使用される
 - パスワードが変更済みであるかをチェックする

```
- SQL> select USERNAME, PASSWORD_VERSIONS from DBA_USERS;
USERNAME      PASSWORD_VERSIONS
-----
APP_USER      10G 11G 12C
HR_USER       10G 11G 12C
BOSS          10G
```

パラメータに関する推奨事項

sqlnet.ora

- SQLNET.ALLOWED_LOGON_VERSION_SERVER
 - インスタンス接続時における最低限の認証プロトコルを設定する
 - デフォルト: 11
 - 値
 - 12a Oracle Database 12c の認証プロトコル(最も強力な保護)
 - 12 Critical Patch Update CPUOct2012 およびOracle Database 11g以降の認証プロトコル(推奨)
 - 11 Oracle Database 11g の認証プロトコル(デフォルト)
 - 10 Oracle Database 10g の認証プロトコル
 - 8 Oracle9i Database の認証プロトコル
 - Oracle Database 12c への接続に11g 以前のクライアントを使用する場合、sqlnet.ora ファイルの内容を再設定する必要がある

パラメータに関する推奨事項

■ AUDIT_TRAIL

– データベース監査を有効または無効にする

– 注意

Unified Auditing (統合監査) は Oracle 実行ファイルにリンクされている

■ 統合監査はデフォルトでは無効

– 推奨事項

■ 統合監査へ移行する

■ 機能がインストールされているかをチェックする

```
– SQL> select VALUE from V$OPTION where  
  PARAMETER='Unified Auditing';
```

■ 統合監査を *on* にする

```
– make -f ins_rdbms.mk uniaud_on ioracle ORACLE_HOME=$ORACLE_HOME
```

■ AUDIT_TRAIL=NONE に設定する

– 補足

Label Security (OLS) がインストールされている場合、AUD\$ 表はSYS スキーマとして格納される

パラメータに関する推奨事項

- DEFERRED_SEGMENT_CREATION
 - 新たに作成された表は、行が挿入された時にはじめてセグメントを割り当てる
 - 表領域はローカル管理である必要あり
 - COMPATIBLE ≥ 11.2.0
 - Oracle Database 11.2 からのデフォルトはTRUE
 - 推奨事項
 - データを挿入せず、多数の空の表を作成する場合を除き、FALSE に設定する
 - 補足
 - 最初の行を挿入する時に、新しいセグメントを作成するため、多少のパフォーマンス劣化あり。
 - Data Pump のワーカー・プロセスを多数使用している場合は、競合が発生する可能性がある。
 - 参照: [Note 1216282.1](#)

パラメータに関する推奨事項

■ `_OPTIMIZER_COST_BASED_TRANSFORMATION`

– CBQT の詳細は [Note: 1082127.1](#) を参照

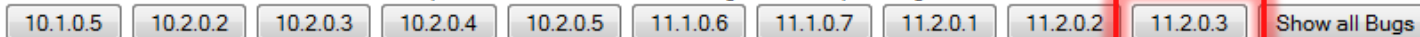
- CBQT はパース時のオーバーヘッドを高める可能性があります。より適切なプランを生成できるという利点があります。

– 推奨事項

- 限定利用や既知の問題によって OFF に設定することがある
- 既知の問題と修正については [Note: 567354.1](#) を参照

Known Bugs

You can restrict the list below to issues likely to affect one of the following versions by clicking the relevant button.



The list below is restricted to show only bugs believed to affect version 11.2.0.3.
Other bugs may affect this version but have not been confirmed as being relevant yet.

There are 7 bugs listed.

| NB | Bug | Fixed | Description |
|----|--------------------------|--|--|
| | 14602250 | 12.1.0.0 | ORA-600 [12327] with correlated aggregation |
| | 14593548 | 12.1.0.0 | ORA-600 [qctcte1] from a query |
| | 12537316 | 12.1.0.0 | ORA-600 / ORA-7445 for SQL with merged subquery |
| | 14561651 | 11.2.0.2.BP19, 11.2.0.3.BP13, 11.2.0.4 | Wrong result for query with NULL augmented lateral OUTER join |
| | 11728984 | 12.1.0.0 | ORA-600 [qctcte1] on query with select list subquery and GROUP BY |
| | 10013899 | 11.2.0.4, 12.1.0.0 | Allow CBQT for some DML / DDL |
| | 9765175 | 12.1.0.0 | ORA-932 from query with CASE expression containing a subquery in the THEN clause |

パラメータに関する推奨事項

- SESSION_CACHED_CURSORS
 - デフォルト: 50
 - 10.2.0.4 よりカーソル・キャッシュのメカニズムを変更
 - 推奨事項
 - 明示的にSESSION_CACHED_CURSORS を調整する
 - 特にPL/SQL 使用時は、デフォルトの50 では低すぎる可能性があるため
 - 値が大きすぎると共有プールの断片化を発生させる可能性がある
 - [SCRIPT: 208857.1](#) を参照の上、SESSION_CACHED_CURSORS と OPEN_CURSORS の使用率を基に調整する
 - 詳細: [Note: 30804.1](#)

パラメータに関する推奨事項

- MAX_STRING_SIZE
 - 値: STANDARD, EXTENDED
 - SQL における VARCHAR2, NVARCHAR2, および RAW データ型の最大サイズを制御
 - STANDARD (デフォルト)
 - 12c より以前の長さ制限を適用
 - VARCHAR2/NVARCHAR2: 4000 バイト
 - RAW: 2000 バイト
 - EXTENDED
 - 12c で導入された 32767 バイトの上限を適用
 - COMPATIBLE ≥ 12.0.0 が必要
 - STANDARD から EXTENDED への変更は可能だが、逆は不可
 - UPGRADE モードにおいて実行 `@?/rdbms/admin/utl32k.sql`

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