

Oracle Exadata升级

公益讲座11:00准时开始, 请大家先浏览云技术微信公众号技术文章。资料会在各群同步发布, 已入群客户请勿重复入群!



20-22

数据库和云讲座群



甲骨文云技术公众号



B站专家系列课程





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基于 Oracle 数据库 免费企业数据健康检查

- 及时了解数据库健康状况，发现并解决潜在问题
- 维护数据库系统良好状态，保护数据资产的安全
- 提升数据库性能、稳定性和安全性，降低业务风险

免费咨询热线：
400-699-8888

Agenda

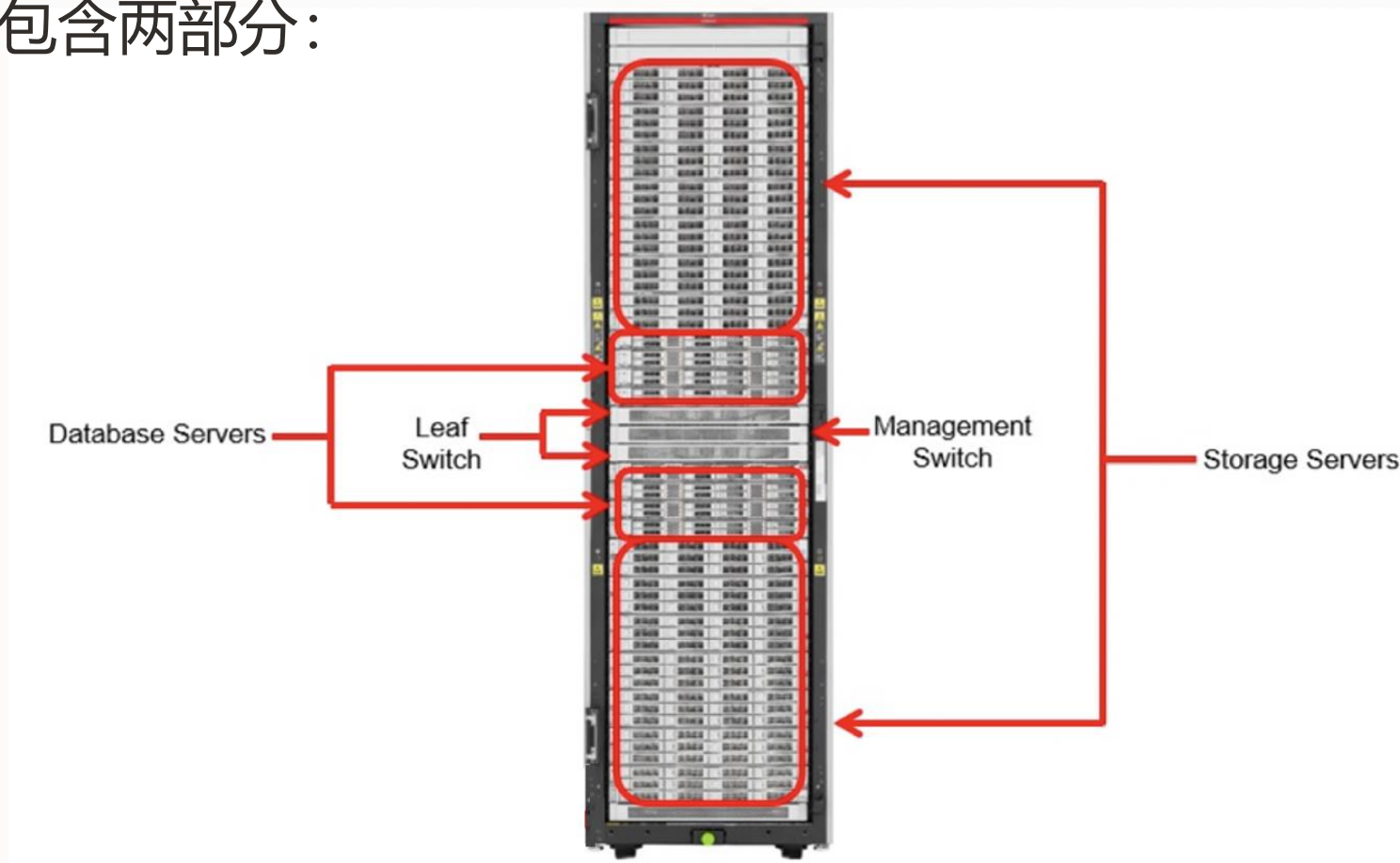
- 1 升级简介
- 2 升级前准备
- 3 升级CELL、DB、IB/RoCE
- 4 数据库版本升级



升级简介

通常意义上讲 Exadata 升级包含两部分：

- 操作系统和固件的升级
(image升级)
- 数据库版本升级
(GI+DB升级)



升级简介

image 升级方式

- 标准服务期间，采用白金服务升级；
(不仅可以升级image，还可以对GI与DB升级)
- Oracle高级服务（ACS）；
- 客户自行完成；
- 使用第三方服务公司完成；

...

升级简介

image 升级方式对比

| 对比项目 | 白金服务 | 高级服务 | 客户自行完成 | 第三方... |
|-----------|------------------------------|----------|--------|--------|
| 费用 | 无需增加 | 另购买 | 不用 | 另购买 |
| 技术责任 | Oracle负责 | Oracle负责 | 客户自己 | 第三方 |
| 工期 | 共同协商(全球性) | 共同协商 | 自行确定 | 共同协商 |
| 技术工程师操作方式 | 远程 | 现场 | 现场 | 现场 |
| 技能水平 | 最高 | 高 | 中 | 中 |
| 技术方案 | 有(模板化) | 有(定制化) | 自定义 | 有 |
| 沟通方式 | 通过MOS上SR /zoom/电话 | 现场 | 现场 | 现场 |
| 沟通语言 | 英文/部分中文 | 中文 | 中文 | 中文 |
| 实施时间 | 提前2月预约 | 现场协商 | 自行确定 | 现场协商 |

注意：下面主要介绍一下白金服务和客户自行升级。

白金服务——image升级

- 升级前要开一个专门的SR
 - SR中会确认升级时间
 - 升级流程
 - 升级时长
- 升级过程必须有人在现场配合，工作内容如下：
 - 停/启 业务应用
 - 停/启 数据库
- 升级可以选择滚动升级

SR的主要内容及要求

- SR必须使用英文
- 现有环境检查与确认
- 预约升级工作内容
 - image升级到的版本
 - 是否给GI/DB打补丁
- 升级前的预检查
- 预约升级时间
 - 按日历时间
 - 全球客户统一考虑
- 升级技术方案（英文）
- 升级前技术问题处理

技术方案——在SR中的附件

一般为excel文件： patch-plan-V1.xlsm

统一的模板

1
2 ORACLE
3
4 PLATINUM SERVICES
5 Patch Overview
6 Customer Name: [REDACTED]
7 SR Number: [REDACTED]
8 Change Request Number: 243473
9 Event Start Date (US Eastern TZ): 06-Jan-2021 09:00 AM
10 Event Window (HH:MM): 21:45
11 Rack Name: dbm0
12 Rack Type: Exadata Physical (BareMetal)
13 Gateway: [REDACTED]
14
16 OS Type: Linux
19 Compute Nodes Patch Method: Rolling
20 Number of Compute Nodes: 3
21 Compute Node Names: #NAME?
22 Current Exadata Version: 19.2.4.0.0
23 Target Exadata Version: 20.1.5.0.0.201209
55 Cell Nodes Patch Method: Rolling
56 Number of Cell Nodes: 3
57 Cell Node Names: #NAME?
58 Current Exadata Version: 19.2.4.0.0
59 Target Exadata Version: 20.1.5.0.0.201209
60 Switch Type: ib
61 Number of Switches: 3
62 Switch Names: #NAME?
63 Current Switch Version: 2.2.13-2
64 Target Switch Version: 2.2.16-1
109
110
111
112
113 Components to be Patched

Plan History Customer Checklist Overview Comm Plan

Plan History Customer Checklist Overview Comm Plan Special Instructions patch.conf Pre-Patch Checklist Pre-Patch Activities Compute Plan EMDP



升级——准备

- 补丁下载

路漫漫——提升带宽

- 下载方式
 - 远程下载
 - 自己下载、机房上传
 - 下载后，远程上传

```
----- Current Status Update -----
```

- Schedule Patch Event - Completed
- Patch Assessment (min 4 weeks in advance) - Work in progress
- Patch Planning (about 2 weeks in advance) - Work in progress
- Patch downloads and Pre-checks (about 1 week in advance) - Pending
- Patching - Pending
- Verify and close (1 business day after) - Pending

Joanna
Platinum Patch Coordinator

```
tail nohup9.out
8850K ..... 0% 2.16K 6d8h
8900K ..... 0% 697 6d17h
8950K ..... 0% 3.74K 6d8h
9000K ..... 0% 4.71K 6d9h
9050K ..... 0% 14.3K 6d8h
9100K ..... 0% 8.72K 6d8h
9150K ..... 0% 7.25K 6d8h
9200K ..... 0% 12.3K 6d8h
9250K ..... 0% 20.0K 6d7h
9300K .....[root@██████████_19.2.8]#
10:44
9300K .....[root@██████████_19.2.8]# tail nohup8.out
8450K ..... 0% 1.38K 41h46m
8500K ..... 0% 3.26K 42h2m
8550K ..... 0% 10.4K 41h57m
8600K ..... 0% 10.7K 41h52m
8650K ..... 0% 16.1K 41h44m
8700K ..... 0% 7.68K 41h42m
8750K ..... 0% 5.58K 41h45m
8800K ..... 0% 6.39K 41h46m
8850K ..... 0% 2.52K 42h11m
8900K .....[root@██████████_19.2.8]#
```



升级过程

Dear Customer,

Thank you for the confirmation.

Please find below the upgrade status
DBs

=====

dbadm01 – In Progress

dbadm02

CELLs :: Pending

=====

celadm01

celadm02

celadm03

IBs :: Pending

====

asw-iba01

asw-ibb01

Dear Customer,

Thank you for the confirmation.

Please find below the upgrade status
DBs

=====

dbadm01 – Completed

dbadm02 -- In Progress

CELLs :: Pending

=====

celadm01

celadm02

celadm03

IBs :: Pending

====

asw-iba01

asw-ibb01

Dear Customer,

Please find below the upgrade status
DBs

=====

dbadm01 – Completed

dbadm02 – Completed

CELLs

=====

celadm01 – Completed

celadm02 – In Progress

celadm03

IBs :: Pending

====

asw-iba01

asw-ibb01

Dear Customer,

Node1 patching completed.

Request you to validate and confirm for next node.

升级——完成

Dear Customer,

IB switch upgrade got completed. We conclude the patching for all the components.
Kindly validate and let us know if you have any issues.

----- InfiniBand switch update process ended 2020-02-16 09:08:25 +0000 -----
2020-02-16 09:08:25 +0000 1 of 1 :SUCCESS: DONE: Upgrade InfiniBand switch(es) to 2.2.14-1.

DBs

=====

████████ dbadm01 – Completed
████████ dbadm02 – Completed

CELLs

=====

████████ celadm01 – Completed
████████ celadm02 – Completed
████████ celadm03 – Completed

IBs :: Completed

====

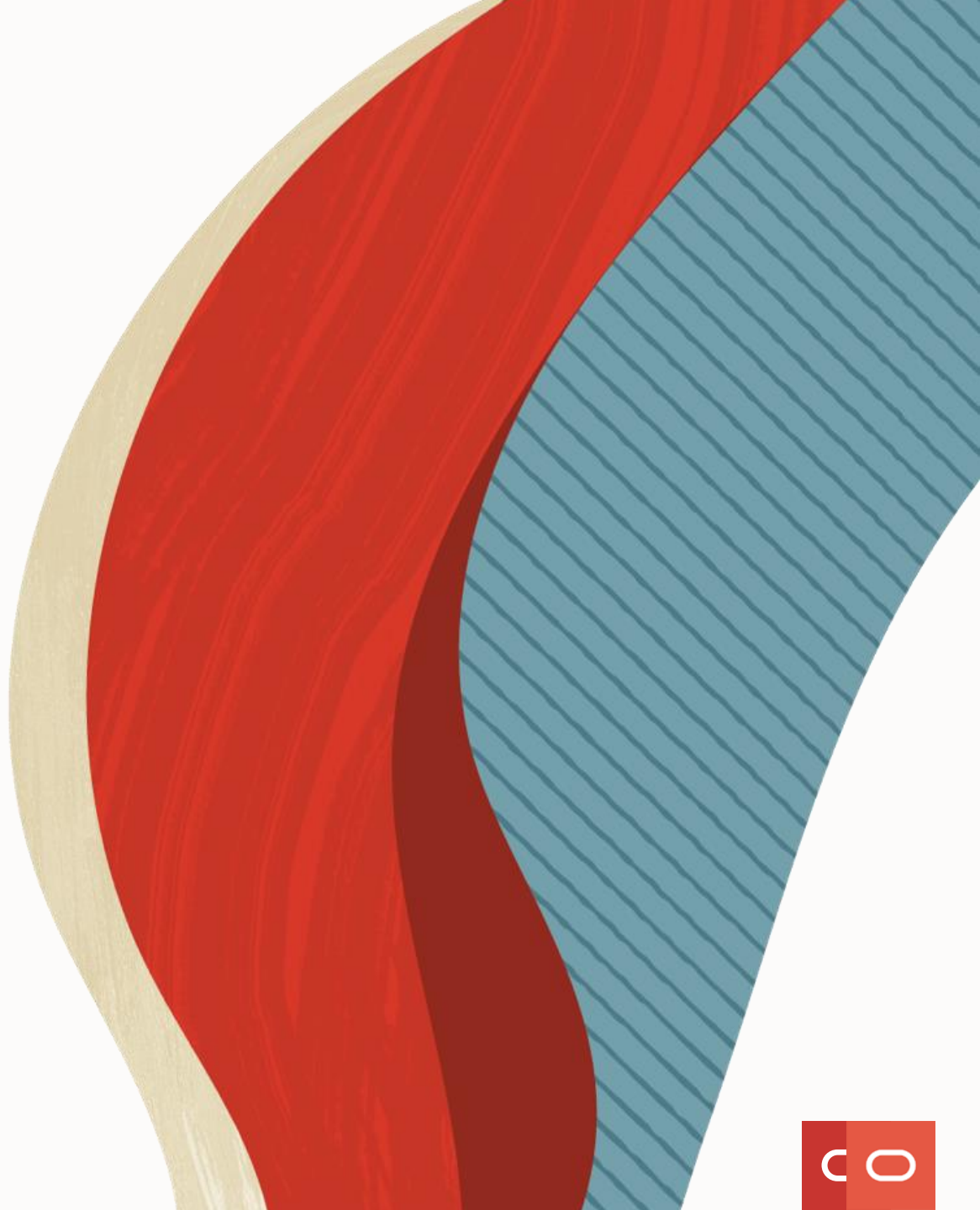
████████ xasw-iba01
████████ xasw-ibb01

Dear customer,

Post exachk has been reviewed and no major issues found after patching.
SR will be kept under monitor for next 24 hours before closing it.

Agenda

- 1 升级简介
- 2 升级前准备
- 3 升级CELL、DB、IB/RoCE
- 4 数据库版本升级



升级前准备

8 Updating Exadata Software

- ▶ 8.1 About Updating Exadata Software
- ▶ 8.2 Planning for Software Maintenance
- ▶ 8.3 Overview of Performing Exadata Software Updates
- ▶ 8.4 Exadata Patchmgr Update Utility
- ▶ 8.5 Updating Oracle Exadata Database Servers
- ▶ 8.6 Updating Database Servers Running Oracle Exadata System Software Release 11.2.2.4.2
- ▶ 8.7 Updating Software on Oracle Exadata Storage Servers
- ▶ 8.8 Upgrading and Downgrading RoCE Network Fabric Switch Firmware
- ▶ 8.9 Updating InfiniBand Network Fabric Switch Firmware
- ▶ 8.10 Upgrading Oracle Java SE on Oracle Linux
- ▶ 8.11 Setting up SSH Equivalence
- ▶ 8.12 Troubleshooting Software Updates on Oracle Exadata

8 Updating Exadata Software

There are different types of software used on an Oracle Exadata that need be updated regularly.

- [About Updating Exadata Software](#)
- [Planning for Software Maintenance](#)
Before starting a software update, you should review best practices, determine the version to which you will upgrade, and obtain the proper patching software.
- [Overview of Performing Exadata Software Updates](#)
For each software update of the Exadata components, there are various actions required to complete the software update.
- [Exadata Patchmgr Update Utility](#)
Patchmgr is the utility used to update software for Exadata infrastructure components.
- [Updating Oracle Exadata Database Servers](#)
Use the following information and procedures when updating database servers within Oracle Exadata.
- [Updating Database Servers Running Oracle Exadata System Software Release 11.2.2.4.2](#)
Updates for database servers running Oracle Exadata System Software release 11.2.2.4.2 include an update that prepares the servers to use yum.
- [Updating Software on Oracle Exadata Storage Servers](#)
Use the following information and procedures when updating storage servers within Oracle Exadata.

参考文档: <https://docs.oracle.com/en/engineered-systems/exadata-database-machine/dbmmn/updating-exadata-software.html#GUID-60051AF9-3514-4760-8D58-364943E58A08>

升级前准备

☆ Exadata Database Machine and Exadata Storage Server Supported Versions (Doc ID 888828.1) Exadata 23

In this Document

- [Purpose](#)
- [Scope](#)
- [Details](#)

- [Latest Releases and Software Maintenance News](#)
- [Exadata Software and Hardware Maintenance Planning](#)
 - [Software Certification, Release Frequency, and End Date](#)
 - [Recommended Versions](#)
 - [Policy to Obtain Older Exadata System Software](#)
 - [Critical Issues and Important Issues](#)
 - [Security-Related Guidance](#)
- [Latest Releases](#)
 - [Guidelines for Related Products and Features](#)
- [Version Compatibility and Requirements](#)
 - [Exadata System Software Requirements for Exadata Database Machine Hardware](#)
 - [Oracle Database](#)
 - [Minimum Exadata, Grid Infrastructure, and Database Requirements for Exadata Feature Usage](#)
- [Database Server Operating System](#)
 - [Oracle Linux x86-64 on 2-socket and 8-socket Intel x86-64 Database Servers](#)
- [Patch Release History for Exadata Database Machine Components](#)
 - [Quarterly Full Stack Download Patch \(QFSDP\)](#)
 - [Exadata Software](#)
 - [Image Version and Date Code](#)
 - [Exadata 23](#)
 - [Exadata 22](#)
 - [Exadata 21](#)
 - [Exadata 20](#)
 - [Exadata 19.3](#)
 - [Exadata 19.2, 19.1](#)
 - [Exadata 18](#)
 - [Exadata 12.2](#)

Before updating to Exadata 23 review the following in the Supplemental README:

- Verify compatibility of custom-installed software with Oracle Linux 8 (OL8) and UEK6 before updating to this release. Refer to the "New Features for Oracle Exadata System Software Release 23.x" section in [Exadata Database Machine System Overview](#) for details.
- Minimum Grid Infrastructure and Database version requirements
- Exadata Release 23.1 Virtualized Database Server Version Requirements for Upgrade and Mixed Version Compatibility

| Version | Software | Notes |
|--|--|--|
| | | See Note 1270094.1 for additional fixes that address critical issues. |
| 23.1.7.0.0 | Patch 35869021 - Storage server software (23.1.7.0.0.231012) Patch 35780532 - Admin/RDMA network switch (10.2(4)) and InfiniBand network switch (2.2.16-7) software Patch 35780530 - Database server bare metal / KVM / Xen domU ULN exadata_dbserver_23.1.7.0.0_x86_64_base OL8 channel ISO image (23.1.7.0.0.231012) Patch 35780531 - Database server Xen dom0 ULN exadata_dbserver_dom0_23.1.7.0.0_x86_64_base OVM channel ISO image (23.1.7.0.0.231012) | Recommended for all systems to get the latest functionality. Supplemental README Note 2970832.1 CVE Release Matrix Note 2981686.1 |
| 23.1.6.0.0 Superseded by 23.1.7.0.0 | Patch 35769189 - Storage server software (23.1.6.0.0.230901.1) Patch 35667566 - Admin/RDMA network switch (10.2(4)) and InfiniBand network switch (2.2.16-7) software Patch 35667564 - Database server bare metal / KVM / Xen domU ULN exadata_dbserver_23.1.6.0.0_x86_64_base OL8 channel ISO image (23.1.6.0.0.230901.1) Patch 35667565 - Database server Xen dom0 ULN exadata_dbserver_dom0_23.1.6.0.0_x86_64_base OVM channel ISO image (23.1.6.0.0.230901.1) | Supplemental README Note 2964919.1 CVE Release Matrix Note 2973067.1 |
| 23.1.5.0.0 Superseded by 23.1.6.0.0 | Patch 35662548 - Storage server software (23.1.5.0.0.230818) Patch 35595741 - Admin/RDMA network switch (10.2(4)) and InfiniBand network switch (2.2.16-7) software Patch 35595739 - Database server bare metal / KVM / Xen domU ULN exadata_dbserver_23.1.5.0.0_x86_64_base OL8 channel ISO image (23.1.5.0.0.230818) Patch 35595740 - Database server Xen dom0 ULN exadata_dbserver_dom0_23.1.5.0.0_x86_64_base OVM channel ISO image (23.1.5.0.0.230818) | Supplemental README Note 2960810.1 CVE Release Matrix Note 2966714.1 |
| 23.1.4.0.0 Superseded by 23.1.5.0.0 | Patch 35594004 - Storage server software (23.1.4.0.0.230714.1) Patch 35469356 - Admin/RDMA network switch (10.2(4)) and InfiniBand network switch (2.2.16-7) software Patch 35469354 - Database server bare metal / KVM / Xen domU ULN exadata_dbserver_23.1.4.0.0_x86_64_base OL8 channel ISO image (23.1.4.0.0.230714.1) Patch 35469355 - Database server Xen dom0 ULN exadata_dbserver_dom0_23.1.4.0.0_x86_64_base OVM channel ISO image (23.1.4.0.0.230714.1) | Supplemental README Note 2953120.1 CVE Release Matrix Note 2962321.1 |

介质下载:

MOS: Exadata Database Machine and Exadata Storage Server Supported Versions (文档 ID 888828.1)



升级顺序建议

8.2.2.6 Ordering of Updates

In general, when performing software updates, the updates may be applied to components in any order based on business needs and maintenance window requirements.

The recommended order for applying software updates is:

1. Oracle Grid Infrastructure and Oracle Database software
2. Oracle Exadata Database Machine database server software
3. Oracle Exadata Database Machine storage server software
4. RDMA Network Fabric switch software

注意：最好按官方推荐来执行升级，此PPT只是一个升级过程的演示示例，仅供大家参考！

升级Image的版本编号

完整的image版本编号，例如： **23.1.6.0.0.230901.1**

由3部分组成： <产品版本号>， <日期编码>， <Oracle内部编译号(可选)>

产品版本号，例如： **23.1.6.0.0**（完整版本号的红色部分）

日期编码，采用YYMMDD方式，例如： **230901**

(可选) Oracle内部编译号，例如： **1**

使用imageinfo -ver查看：

```
# imageinfo -ver  
23.1.7.0.0.231012
```

Image Requirements 信息

Expand

Title and Copyright Information

- Preface
- 1 Introduction to Oracle Exadata Database Machine and Oracle Exadata Storage Expansion Rack
- Part I What's New in Oracle Exadata Database Machine
 - 2 New Features for Oracle Exadata System Software Release 23.x
 - 3 New Features for Oracle Exadata System Software Release 22.x
 - 4 New Features for Oracle Exadata System Software Release 21.x
 - 5 New Features for Oracle Exadata System Software Release 20.x
 - 6 New Features for Oracle Exadata System Software Release 19.x
 - 7 New Features for Oracle Exadata System Software Release 18
 - 8 New Features for Oracle Exadata System Software Release 12.x
 - 9 New Features for Oracle Exadata System Software Release 11.x
- Part II Hardware Components
- Part III Cabling information for Oracle Exadata Database Machine
- A Components of Oracle Exadata

Part I What's New in Oracle Exadata Database Machine

These topics describe the new features included in each release of Oracle Exadata Database Machine and Oracle Exadata System Software.

- New Features for Oracle Exadata System Software Release 23.x
This section describes the new features introduced in Oracle Exadata System Software release 23.x.
- New Features for Oracle Exadata System Software Release 22.x
This section describes the new features introduced in Oracle Exadata System Software release 22.x.
- New Features for Oracle Exadata System Software Release 21.x
This section describes the new features introduced in Oracle Exadata System Software release 21.x.
- New Features for Oracle Exadata System Software Release 20.x
Several new features were introduced for Oracle Exadata System Software release 20.x.
- New Features for Oracle Exadata System Software Release 19.x
Several new features were introduced for the various versions of Oracle Exadata System Software Release 19.x.
- New Features for Oracle Exadata System Software Release 18
Several new features were introduced for Oracle Exadata System Software Release 18.
- New Features for Oracle Exadata System Software Release 12.x
Several new features were introduced for the various versions of Oracle Exadata System Software Release 12.x.
- New Features for Oracle Exadata System Software Release 11.x
Several new features were introduced for the various versions of Oracle Exadata System Software Release 11.x.

< Previous Page Next Page >

1 Introduction to Oracle Exadata Database Machine and Oracle Exadata Storage Expansion Rack

Part I What's New in Oracle Exadata Database Machine

- 2 New Features for Oracle Exadata System Software Release 23.x
 - 2.1 What's New in Oracle Exadata System Software Release 23.1
 - 2.1.1 Oracle Exadata X10M Support
 - 2.1.2 Exadata RDMA Memory
 - 2.1.3 Higher Compression for Storage Server Columnar Compression
 - 2.1.4 Oracle Linux 8 Support
 - 2.1.5 Centralized Identification and Authentication of OS Users
 - 2.1.6 Minimum Versions and Other Requirements

2.1.6 Minimum Versions and Other Requirements

The following list outlines the minimum versions and other requirements that apply to Oracle Exadata System Software 23.1.0:

- Minimum supported Oracle Database and Oracle Grid Infrastructure (GI) releases:
 - Release 19c: Version 19.15 April 2022 Release Update (RU)
 - Release 21c: Version 21.6 April 2022 Release Update (RU)
- Minimum system hardware version: Oracle Exadata X5-2
- Minimum Oracle Exadata System Software version required on an existing system before updating to release 23.1.0: Oracle Exadata System Software 21.2.10 (March 2022)

Note: On systems configured with virtual machines (VMs) on the database servers, you can upgrade the hypervisor (Oracle VM Server or Oracle Linux KVM) before or after the guest VMs. However, each VM guest must meet the minimum Oracle Exadata System Software requirement before being upgraded. Likewise, the hypervisor must meet the minimum Oracle Exadata System Software requirement before being upgraded.

Related Topics

2 New Features for Oracle Exadata System Software Release 23.x

This section describes the new features introduced in Oracle Exadata System Software release 23.x.

- What's New in Oracle Exadata System Software Release 23.1

Parent topic: What's New in Oracle Exadata Database Machine

2.1 What's New in Oracle Exadata System Software Release 23.1

- Oracle Exadata X10M Support
- Exadata RDMA Memory
- Higher Compression for Storage Server Columnar Compression
- Oracle Linux 8 Support
- Centralized Identification and Authentication of OS Users
- Minimum Versions and Other Requirements
- Desupported Features in Oracle Exadata System Software Release 23.1.0

Parent topic: New Features for Oracle Exadata System Software Release 23.x

参考文档:

<https://docs.oracle.com/en/engineered-systems/exadata-database-machine/dbms0/new-features.html#GUID-45D4D12A-C249-46B3-B698-FE176601674B>



Image Requirements 信息

Exadata 23

Before updating to Exadata 23 review the following in the Supplemental README:

- Verify compatibility of custom-installed software with Oracle Linux 8 (OL8) and UEK6 before updating to this release. Refer to the "New Features for Oracle Exadata System Software Release 23.x" section in [Exadata Database Machine System Overview](#) for details.
- Minimum Grid Infrastructure and Database version requirements
- Exadata Release 23.1 Virtualized Database Server Version Requirements for Upgrade and Mixed Version Compatibility

| Version | Software | Notes |
|--|--|--|
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| 23.1.6.0.0 Superseded by 23.1.7.0.0 | Patch 35769189 - Storage server software (23.1.6.0.0.230901.1) Patch 35667566 - Admin/RDMA network switch (10.2(4)) and InfiniBand network switch (2.2.16-7) software Patch 35667564 - Database server bare metal / KVM / Xen domU ULN exadata_dbserver_23.1.6.0.0_x86_64_base OL8 channel ISO image (23.1.6.0.0.230901.1) Patch 35667565 - Database server Xen dom0 ULN exadata_dbserver_dom0_23.1.6.0.0_x86_64_base OVM channel ISO image (23.1.6.0.0.230901.1) | <p>Supplemental README Note 2964919.1</p> <p>CVE Release Matrix Note 2973067.1</p> |
| 23.1.5.0.0 Superseded by 23.1.6.0.0 | Patch 35662548 - Storage server software (23.1.5.0.0.230818) Patch 35595741 - Admin/RDMA network switch (10.2(4)) and InfiniBand network switch (2.2.16-7) software Patch 35595739 - Database server bare metal / KVM / Xen domU ULN exadata_dbserver_23.1.5.0.0_x86_64_base OL8 channel ISO image (23.1.5.0.0.230818) Patch 35595740 - Database server Xen dom0 ULN exadata_dbserver_dom0_23.1.5.0.0_x86_64_base OVM channel ISO image (23.1.5.0.0.230818) | <p>Supplemental README Note 2960810.1</p> <p>CVE Release Matrix Note 2966714.1</p> |
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Software Release Requirements

Exadata Storage Server Software 23.1.7.0.0 supports the following Oracle Database software releases:

- **Oracle Grid Infrastructure:**
 - Long Term Release 19c, GI Release Update (RU) 19.15.0.0.220419 and later (Recommended)
 - Innovation Release 21c, GI Release Update (RU) 21.6.0.0.220419 and later
- **Oracle Database:**
 - Long Term Release 19c, GI Release Update (RU) 19.15.0.0.220419 and later (Recommended)
 - Innovation Release 21c, GI Release Update (RU) 21.6.0.0.220419 and later
 - Additional supported releases under Market Driven Support or Quarterly Updates exception approval
 - Release 18c, GI RU 18.14.0.0.210420 and later
 - Release 12.2.0.1, GI RU 12.2.0.1.220118 and later
 - Release 12.1.0.2*, Database Proactive Bundle Patch 12.1.0.2.220719 and later
 - Release 11.2.0.4*, Quarterly Database Patch for Exadata 11.2.0.4.210119 and later

* The minimum releases require additional interim patches. See [Document 888828.1](#) for details.

Exadata 23.1.7.0.0 compatibility

- Exadata 23.1 uses **Oracle Linux 8 (OL8) with the UEK6 kernel** as the server operating system for all storage servers, bare-metal database servers, KVM hosts, KVM guests, and Oracle VM (OVM) guests (Xen domU). Verify compatibility of custom-installed software with OL8 before updating to this release.
- **Version Requirements for Upgrade**
 - **Minimum Exadata version required** on an existing system before updating to Exadata 23.1 is **Exadata 21.2.10**
- Virtualized Database Server Mixed Version Compatibility
 - Host (KVM host, Xen dom0) and all guests (KVM guest, Xen domU) on a virtualized database server must be running Exadata 21.2.10 before updating host or any guest to Exadata 23.1.
 - Host and guests may be updated to Exadata 23.1 in any order provided the minimum version requirement is met.
 - Host and guests may run a mix of Exadata 23.1, 22.1, and 21.2 provided the minimum version requirement is met.

Refer to [Note 888828.1](#) for additional details relating to the following:

- Patch-level requirements and recommendations for Oracle Database and Grid Infrastructure releases and patch sets
- Minimum version requirements to support specific Exadata features and patching methods
- References to guidelines for products related to Exadata (e.g. Oracle SuperCluster, Oracle Enterprise Manager, Oracle ZFS Storage Appliance)

参考MOS:

Exadata Database Machine and Exadata Storage Server Supported Versions (文档 ID 888828.1)



升级前准备

升级包包含

p35780530_231000_Linux-x86-64.zip --DB升级包

p35869021_231000_Linux-x86-64.zip --Cell升级包

p35780532_231000_Linux-x86-64.zip --交换机升级包

DB的patchmgr升级工具需要单独下载: p21634633_231700_Linux-x86-64.zip

Maintenance Guide for Exadata Database Machine

7.2.5.2 Obtaining Patchmgr

You can download the patchmgr utility from My Oracle Support.

Prior to Oracle Exadata System Software release 19.3.0, the storage server and RDMA Network Fabric switch updates use the version of patchmgr that is bundled with the Oracle Exadata System Software release to which you are updating. Starting with Oracle Exadata System Software release 19.3.0, there is a separate download for patchmgr for the RDMA Network Fabric switches and the storage servers, for example:

- 19.3.0.0.0.190910.switch.patch.zip for both InfiniBand Transport Layer systems based on an InfiniBand Network Layer and InfiniBand Transport Layer systems based on a RoCE Network Layer switches.
- 19.3.0.0.0.190910.patch.zip for cells

Patchmgr for database server is packaged in `dbserver.patch.zip` and is available as a separate download from My Oracle Support note 1553103.1 or patch 21634633.

It is recommended to *always* use the latest patchmgr from My Oracle Support when updating Oracle Exadata Database Machine database servers. The patchmgr utility is updated frequently to address known issues and best practices, and to support new hardware.

Quick link to the download

- dbnodeupdate.zip standalone (patch 16486998) cannot be downloaded anymore but can still be found inside dbserver.patch.zip
- Download dbserver.patch.zip as p21634633_12*_Linux-x86-64.zip, which contains dbnodeupdate.zip and patchmgr for dbnodeupdate orchestration via [patch 21634633](#)
- Find the Oracle Exadata update bits for the release you need in [note 888828.1](#)

| 补丁程序名 | 说明 | 发行版 | 平台 (语言) | 分类 | 产品 | 更新时间 | 大小 | 下载 |
|----------|--|------------|---------------------------------|----|--|----------|----------|----|
| 21634633 | DBSERVER.PATCH.ZIP ORCHESTRATOR PLUS DBNU - ARU PLACEHOLDER (补丁程序) | 19.3.2.0.0 | Linux x86-64 (American English) | 一般 | Oracle Exadata Storage Server Software (更多...) | 早于 1 个月前 | 418.5 MB | 软件 |

文件下载

单击各个文件名可下载所选文件。
提示: 使用下载管理器 [了解详细信息...](#)

包括先决条件

DBSERVER.PATCH.ZIP ORCHESTRATOR PLUS DBNU - ARU PLACEHOLDER (补丁程序)
[p21634633_193200_Linux-x86-64.zip](#) 418.5 MB

共 1 个文件 (1 个补丁程序) 大约 6 分钟以上 (1024 KB/秒) 418.5 MB

注: 单个补丁程序或产品包可以包含多个文件。



升级前准备

- 检查DNS配置、NTP同步
- 处理ALERTHISTORY

- CELL节点查看及清理

```
CellCLI> LIST ALERTHISTORY  
CellCLI> DROP ALERTHISTORY all
```

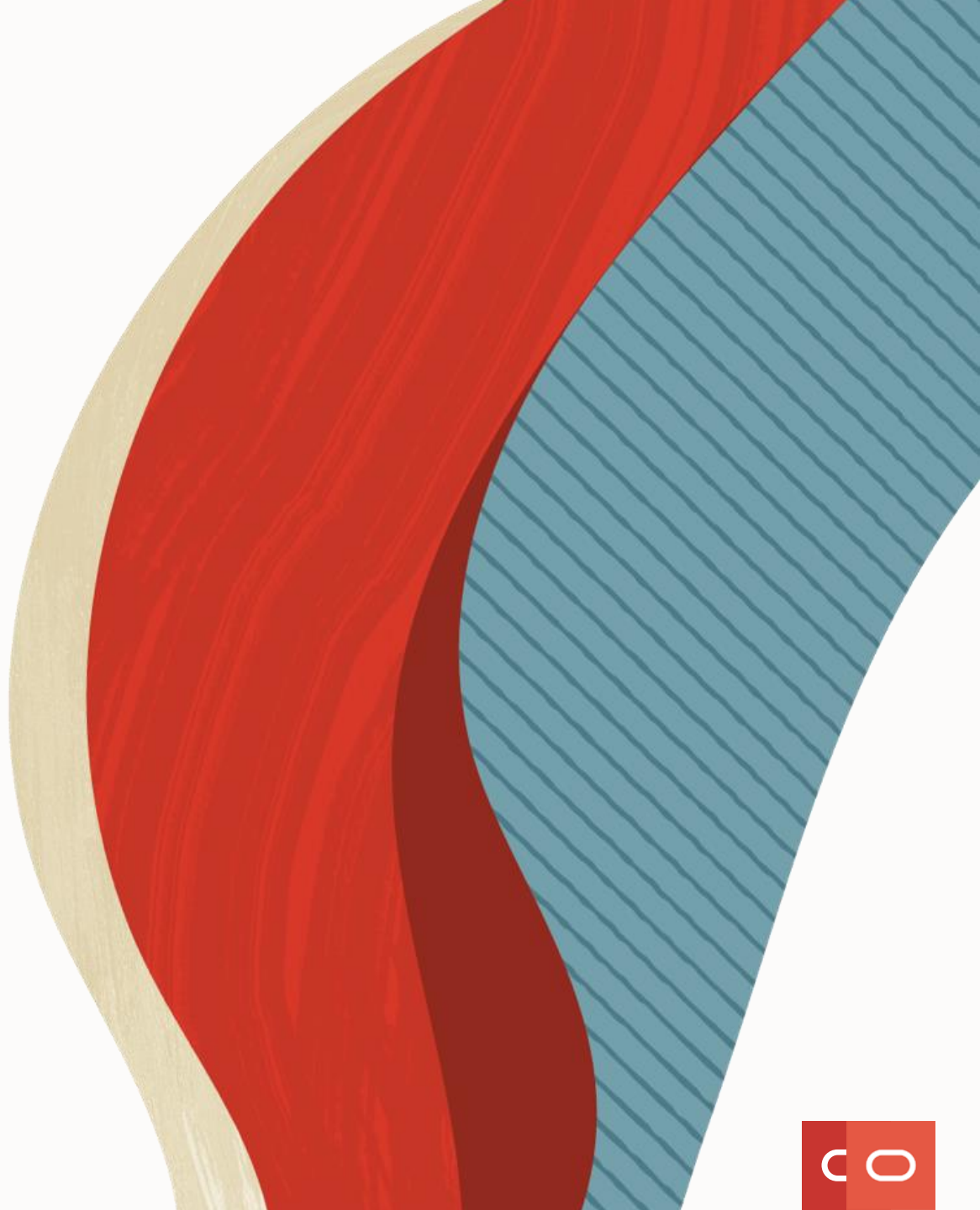
- DB节点查看及清理

```
DBMCLI> LIST ALERTHISTORY  
DBMCLI> DROP ALERTHISTORY all
```

- 准备至少一台安装Oracle Linux的操作机，用于升级使用

Agenda

- 1 升级简介
- 2 升级前准备
- 3 **升级CELL、DB、IB/RoCE**
- 4 数据库版本升级



升级CELL节点

升级CELL时，可以在线方式滚动升级CELL节点，也可以采用离线方式同时升级CELL节点。

- 先建立操作机到所有CELL节点之间用户的信任关系
- 编辑cell_group文件

```
#vi cell_group
192.168.2.13
192.168.2.14 ... (输入CELL节点的IP或主机名，一行一个)
```

- 运行升级前检查命令

```
#./patchmgr -cells cell_group -patch_check_prereq
```

- 如果precheck检查有问题，需要重新检查，检查前需要先cleanup:

```
# ./patchmgr -cells cell_group -cleanup
```

- 检查通过后，执行升级操作

```
#./patchmgr -cells cell_group -patch
```

- 升级成功后检查版本信息

```
#imageinfo
#imagehistory
```

说明：升级时间约半小时。

升级DB节点

升级DB节点需要把本DB节点上的集群及数据库都正常关闭，可以在线滚动升级DB节点，也可以离线同时升级DB节点。

- 先建立好相互之间的信任关系：
- 编辑dbs_group文件：

```
#vi dbs_group  
192.168.2.12  
... .. (输入DB节点的IP或主机名，一行一个)
```

- 执行检查

```
# ./patchmgr -dbnodes dbs_group -precheck -log_dir auto -target_version 19.2.22.0.0.210113  
-iso_repo /oracle/soft/p32247966_192000_Linux-x86-64.zip
```

- 执行升级

```
#./patchmgr -dbnodes dbs_group -upgrade -log_dir auto -target_version 19.2.22.0.0.210113 -  
iso_repo /oracle/soft/p32247966_192000_Linux-x86-64.zip
```

- 升级成功后检查版本信息

说明：升级时间约1小时。

```
#imageinfo  
#imagehistory
```


IB交换机升级路线

| From | To | | | | | |
|---------------|----------------------|----------------------|---|---|---|---|
| | 1.0.x | 1.1.x | 1.3.x | 2.0.x | 2.1.2 - 2.1.6 | 2.1.7 - 2.1.9 |
| 1.0.x | Upgrade or Downgrade | Upgrade or Downgrade | | | | |
| 1.1.x | Upgrade or Downgrade | Upgrade or Downgrade | Upgrade or Downgrade | | | |
| 1.3.x | | Upgrade or Downgrade | Upgrade or Downgrade | Upgrade or Downgrade | Upgrade or Downgrade | <ul style="list-style-type: none"> • Upgrade • Downgrade to 2.1.6 first |
| 2.0.x | | | Upgrade or Downgrade | Upgrade or Downgrade | Upgrade or Downgrade | <ul style="list-style-type: none"> • Upgrade • Downgrade to 2.1.6 first |
| 2.1.2 - 2.1.6 | | | Upgrade or Downgrade | Upgrade or Downgrade | Upgrade or Downgrade | <ul style="list-style-type: none"> • Upgrade • Downgrade to 2.1.6 first |
| 2.1.7 - 2.1.9 | | | <ul style="list-style-type: none"> • Upgrade • Downgrade to 2.1.6 first | <ul style="list-style-type: none"> • Upgrade • Downgrade to 2.1.6 first | <ul style="list-style-type: none"> • Upgrade • Downgrade to 2.1.6 first | Upgrade or Downgrade |

```
[root@dbm01-ibs0 ~]# version
```

```
SUN DCS 36p version: 2.1.8-1
Build time: Sep 18 2015 10:26:47
SP board info:
Manufacturing Date: 2015.07.01
Serial Number: "NCDLD0049"
Hardware Revision: 0x0200
Firmware Revision: 0x0000
BIOS version: SUN0R100
BIOS date: 06/22/2010
```

For example, upgrading from firmware version 1.1.2 to 1.3.5 is supported. However, upgrading from firmware version 1.1.2 to 2.1.5 is not. You must first upgrade from firmware version 1.1.2 to 1.3.x, and from firmware version 1.3.x to 2.1.5.

Similarly, downgrading from firmware version 2.1.6 to 2.0.7 is supported. However, downgrading from firmware version 2.1.9 to 2.0.7 is not. You must first downgrade from firmware version 2.1.9 to 2.1.6 using the downgrade version of firmware 2.1.6. Then you can downgrade from 2.1.6 to 2.0.7.

| From | To | | | |
|-----------------|--|--------------------------------|---|--|
| | 2.1.2 - 2.1.6 | 2.1.7 - 2.1.9 | 2.2.2 - 2.2.7 | 2.2.9 and later |
| 2.1.2 - 2.1.6 | Upgrade or Downgrade | Upgrade | Upgrade | |
| 2.1.7 - 2.1.9 | Must downgrade to 2.1.6 first, and management controller must support. | Upgrade or Downgrade | Upgrade | |
| 2.2.2 - 2.2.7 | Must downgrade to 2.1.6 first, and management controller must support. | Must downgrade to 2.1.8 first. | Upgrade or Downgrade | Must first upgrade to 2.2.7-2 using the 2.2.7_2.pkg file. Then downgrade to required firmware version. |
| 2.2.9 and later | | | Must first downgrade to 2.2.7-2 using the 2.2.7_2_signed.pkg file. Then downgrade to required firmware version. | Upgrade and Downgrade |

For example, downgrading from firmware version 2.2.7 to 2.1.6 is supported, if the switch is configured with an older management controller. However, downgrading directly from firmware version 2.2.7 to 2.1.2 is not supported. If the switch is configured with an older management controller, you must first downgrade from firmware version 2.2.7 to 2.1.6 using the downgrade version of firmware 2.1.6. Then you can downgrade from 2.1.6 to 2.1.2.

参考文档:

https://docs.oracle.com/cd/E36265_01/html/E36267/z4000bef2256469.html#scrolltoc
https://docs.oracle.com/cd/E76424_01/html/E76431/z40000082256469.html#scrolltoc



升级IB交换机-patchmgr

升级InfiniBand交换机，可以在不影响数据库运行的情况下逐个升级IB交换机，也可以把整个集群及数据库都停止后同时升级IB交换机。

- 先建立操作机到所有IB交换机之间的信任关系
- 编辑ibs文件

```
#vi ibswitches.lst  
192.168.2.16  
... .. (输入IB交换机的IP或主机名，一行一个)
```

- 执行检查

```
#./patchmgr --ibswitches ibswitches.lst -upgrade -ibswitch_precheck
```

- 执行升级

```
# ./patchmgr --ibswitches ibswitches.lst -upgrade
```

- 升级成功后检查

```
#version
```

说明：升级时间约20分钟。

注意：有时版本跨度比较大，升级前需要先升级到中间版本，再升级到最终版本，具体查看ReadMe文档。

升级IB交换机-ILOM CLI

The minimum switch firmware release that can use the `patchmgr` utility is release 1.3.3-2. The switch firmware is upgraded in a rolling manner.

```
% ssh -l ilom-admin switch_name  
-> load -source http://123.45.67.89/sundcs_36p_repository_2.2.16_7.pkg
```

```
-r-xr-x---@ 1 yulsun staff 61733 Sep 1 17:23 exadata.img.hw  
-r--r--r--@ 1 yulsun staff 11482 Sep 1 17:23 exadata.img.env  
-r--r--r--@ 1 yulsun staff 48746 Sep 1 17:23 imageLogger  
-r--r-----@ 1 yulsun staff 54967 Sep 1 17:23 exadata_img_pylogger.py  
-r--r-----@ 1 yulsun staff 6133 Sep 1 17:23 ExaXMLNode.pm  
-rw-r--r--@ 1 yulsun staff 218205180 Sep 1 17:23 n9000-epld.10.2.4.M.img  
-r-xr-xr-x@ 1 yulsun staff 17482 Sep 1 17:23 libxcp.so.1  
-r-xr-xr-x@ 1 yulsun staff 4385 Sep 1 17:23 kernelupgrade_oldbios.sh  
-r-xr-xr-x@ 1 yulsun staff 176994 Sep 1 17:23 installfw_exadata_ssh  
-r-xr-xr-x@ 1 yulsun staff 426 Sep 1 17:23 fwverify  
-r-xr-xr-x@ 1 yulsun staff 57173 Sep 1 17:23 dcli  
-r-xr-xr-x@ 1 yulsun staff 1570 Sep 1 17:23 ExadataSendNotification.pm  
-r-xr-xr-x@ 1 yulsun staff 63754 Sep 1 17:23 ExadataImageNotification.pl  
-rw-r--r--@ 1 yulsun staff 37616 Sep 1 17:23 nxos64-cs.CSCwd00653-1.0.0-10.2.4.lib32_64_n9000.rpm  
-rw-r--r--@ 1 yulsun staff 16147568 Sep 1 17:23 nxos64-cs.CSCwb75174-1.0.0-10.2.4.lib32_64_n9000.rpm  
-rw-r--r--@ 1 yulsun staff 2007928832 Sep 1 17:23 nxos64-cs.10.2.4.M.bin  
-r-xr-xr-x@ 1 yulsun staff 169515236 Sep 1 17:23 sundcs_36p_repository_2.2.16_6.pkg  
-r-xr-xr-x@ 1 yulsun staff 16763 Sep 1 17:23 patchmgr_functions  
-rwxr-xr-x@ 1 yulsun staff 11600 Sep 1 17:23 patch_bug_26678971  
-rw-r--r--@ 1 yulsun staff 982694912 Sep 1 17:23 nxos.7.0.3.I7.9.bin  
-r-xr-xr-x@ 1 yulsun staff 15001 Sep 1 17:23 xcp  
-rwxr-xr-x@ 1 yulsun staff 184111553 Sep 1 17:23 sundcs_36p_repository_upgrade_2.1_to_2.2.7_2.pkg  
-rwxr-xr-x@ 1 yulsun staff 172947929 Sep 1 17:23 sundcs_36p_repository_2.2.7_2_signed.pkg  
-rwxr-xr-x@ 1 yulsun staff 172946493 Sep 1 17:23 sundcs_36p_repository_2.2.7_2.pkg  
-r-xr-xr-x@ 1 yulsun staff 173776244 Sep 1 17:23 sundcs_36p_repository_2.2.16_7.pkg  
-rw-rw-r--@ 1 yulsun staff 34274 Sep 1 17:38 asr-v1.1.18.tar.gz  
-r-xr-xr-x@ 1 yulsun staff 190564 Sep 1 17:38 upgradeIBSwitch.sh  
drwxrwxr-x@ 14 yulsun staff 448 Sep 1 17:39 roce_switch_templates  
drwxrwxr-x@ 5 yulsun staff 160 Sep 1 17:39 roce_switch_api  
-r-xr-xr-x@ 1 yulsun staff 545907 Sep 1 17:39 patchmgr  
-rw-rw-r--@ 1 yulsun staff 6792 Sep 1 17:39 md5sum_files.lst  
-rwxrwxrwx@ 1 yulsun staff 955 Sep 1 17:58 README.txt  
drwxrwxr-x@ 29 yulsun staff 928 Oct 13 12:43 ibdiagtools
```



升级RoCE交换机

- 编辑switches.lst文件

```
#vi switches.lst  
192.168.18.52:leaf (输入ROCE交换机的IP或主机名, 一行一个)
```

- 先决检查

```
# ./patchmgr --roceswitches reco1 --upgrade --roceswitch-precheck  
--检查过程会自动创建到RoCE交换机的信任关系
```

- 执行升级

```
./patchmgr --roceswitches switches.lst --upgrade
```

- 升级成功后检查

```
#show version
```

说明：升级时间约30分钟。

注意：有时版本跨度比较大，升级前可能需要先升级到中间版本，再升级到最终版本，具体可以查看ReadMe文档。

升级后检查

```
[root@dbm1dbadm01 ~]# imageinfo

Kernel version: 4.14.35-1902.5.1.4.el7uek.x86_64 #2 SMP Wed Oct 9 19:29:16 PDT 2019 x86_64
Image kernel version: 4.14.35-1902.5.1.4.el7uek
Image version: 19.3.3.0.0.191211.1
Image activated: 2019-12-27 14:42:23 +0800
Image status: success
Node type: COMPUTE
System partition on device: /dev/mapper/VGExaDb-LVDbSys1

[root@dbm1dbadm01 ~]# imagehistory

Version                : 19.3.0.0.0.190915
Image activation date   : 2019-10-24 14:35:52 +0800
Imaging mode           : fresh
Imaging status         : success

Version                : 19.3.3.0.0.191211.1
Image activation date   : 2019-12-27 14:42:23 +0800
Imaging mode           : patch
Imaging status         : success

[root@dbm1dbadm01 ~]#
```

```
[root@dbm1sw-iba0 ~]# version
SUN DCS 36p version: 2.2.14-1
Build time: Aug 14 2019 08:48:04
SP board info:
Manufacturing Date: 2015.09.26
Serial Number: "NCDLJ0310"
Hardware Revision: 0x0200
Firmware Revision: 0x0000
BIOS version: SUN0R100
BIOS date: 06/22/2010
[root@dbm1sw-iba0 ~]#
```

```
[root@dbm1celadm01 ~]# imageinfo

Kernel version: 4.14.35-1902.5.1.4.el7uek.x86_64 #2 SMP Wed Oct 9 19:29:16 PDT 2019 x86_64
Cell version: OSS_19.3.3.0.0_LINUX.X64_191211.1
Cell rpm version: cell-19.3.3.0.0_LINUX.X64_191211.1-1.x86_64

Active image version: 19.3.3.0.0.191211.1
Active image kernel version: 4.14.35-1902.5.1.4.el7uek
Active image activated: 2019-12-26 17:01:30 +0800
Active image status: success
Active node type: STORAGE
Active system partition on device: /dev/md6
Active software partition on device: /dev/md8

Cell boot usb partition: /dev/sda1
Cell boot usb version: 19.3.3.0.0.191211.1

Inactive image version: 19.3.0.0.0.190915
Inactive image activated: 2019-10-24 14:02:39 +0800
Inactive image status: success
Inactive node type: STORAGE
Inactive system partition on device: /dev/md5
Inactive software partition on device: /dev/md7
```

```
Inactive marker for the rollback: /boot/I_am_hd_boot.inactive
Inactive grub config for the rollback: /boot/grub2/grub.cfg.inactive
Inactive usb grub config for the rollback: /boot/grub2/grub.cfg.usb.inactive
Inactive kernel version for the rollback: 4.14.35-1902.5.1.2.el7uek.x86_64
Rollback to the inactive partitions: Possible
[root@dbm1celadm01 ~]# imagehistory

Version                : 19.3.0.0.0.190915
Image activation date   : 2019-10-24 14:02:39 +0800
Imaging mode           : fresh
Imaging status         : success

Version                : 19.3.3.0.0.191211.1
Image activation date   : 2019-12-26 17:01:30 +0800
Imaging mode           : out of partition upgrade
Imaging status         : success
```

```
[root@dbm1celadm01 ~]#
```

```
# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (C) 2002-2019, Cisco and/or its affiliates.
All rights reserved.
...

Software
  BIOS: version 05.33
  NXOS: version 7.0(3)I8(1)
  BIOS compile time: 09/08/2018
  NXOS image file is: bootflash:///nxos.7.0.3.I8.1.bin
  NXOS compile time: 3/5/2019 13:00:00 [03/05/2019 22:04:55]

Hardware
  cisco Nexus9000 C9336C-FX2 Chassis
  Intel(R) Xeon(R) CPU D-1526 @ 1.80GHz with 24571632 kB of memory.
  Processor Board ID FD023040CS1

  Device name: dbm01sw-rocea0
  bootflash: 115805356 kB
  Kernel uptime is 17 day(s), 20 hour(s), 50 minute(s), 25 second(s)

Last reset at 188268 usecs after Mon Aug 12 17:14:40 2019
  Reason: Module PowerCycled
  System version:
  Service: HW check by card-client

plugin
  Core Plugin, Ethernet Plugin

Active Package(s):
```

升级后检查

```
[root@dm02dbadm01 ~]# /u01/app/19.5.0.0/grid/bin/crsctl stat res -t
```

| Name | Target | State | Server | State details |
|-------------------|---------|---------|-------------|---------------|
| Local Resources | | | | |
| ora.LISTENER.lsnr | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.chad | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.net1.network | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.ons | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.proxy_advm | | | | |
| | OFFLINE | OFFLINE | dm02dbadm01 | STABLE |
| | OFFLINE | OFFLINE | dm02dbadm02 | STABLE |
| | OFFLINE | OFFLINE | dm02dbadm03 | STABLE |
| | OFFLINE | OFFLINE | dm02dbadm04 | STABLE |

```
Cluster Resources
```

| | | | | |
|--|--------|--------|-------------|----------------|
| ora.ASMNET1LSNR_ASM.lsnr(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.DATAAC1.dg(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.DBFSC1.dg(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.LISTENER_SCAN1.lsnr | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| ora.LISTENER_SCAN2.lsnr | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| ora.LISTENER_SCAN3.lsnr | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| ora.RECO1.dg(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.asm(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | Started,STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | Started,STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | Started,STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | Started,STABLE |
| ora.asmnet1.asmnetwork(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |

```
ora.cvu
```

| | | | | |
|-----------------------------|---------|---------|-------------|--|
| 1 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.dm02dbadm01.vip | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| ora.dm02dbadm02.vip | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| ora.dm02dbadm03.vip | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| ora.dm02dbadm04.vip | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.qosmsserver | | | | |
| 1 | OFFLINE | OFFLINE | | STABLE |
| ora.rtdemo.db | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | Open,HOME=/u01/app/oracle/product/12.1.0.2/dbhome_1,STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | Open,HOME=/u01/app/oracle/product/12.1.0.2/dbhome_1,STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | Open,HOME=/u01/app/oracle/product/12.1.0.2/dbhome_1,STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | Open,HOME=/u01/app/oracle/product/12.1.0.2/dbhome_1,STABLE |
| ora.rtdemo.rtdemo2nodes.svc | | | | |
| 2 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| ora.scan1.vip | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| ora.scan2.vip | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| ora.scan3.vip | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |

```
[grid@x9mdbadm01 ~]$ crsctl query css votedisk
```

| ## | STATE | File Universal Id | File Name | Disk group |
|----|--------|----------------------------------|--|------------|
| 1. | ONLINE | e507f2ddbc644fb2bf33a9a629144cbc | (o/192.168.1.7;192.168.1.8/RECO1_CD_02_x9mceladm02) | [RECO1] |
| 2. | ONLINE | b58658469ffb4ff7bf1e141c1340449c | (o/192.168.1.9;192.168.1.10/RECO1_CD_02_x9mceladm03) | [RECO1] |
| 3. | ONLINE | f4c5f53d2c764f34bf717931e0fbf1ff | (o/192.168.1.5;192.168.1.6/RECO1_CD_02_x9mceladm01) | [RECO1] |
| 4. | ONLINE | b6f15400dc5a4f5fbf6e2371b305d5b7 | (/dev/exadata_quorum/QD_RECO1_X9MDBADM02) | [RECO1] |
| 5. | ONLINE | 91693111111111111111111111111111 | (/dev/exadata_quorum/QD_RECO1_X9MDBADM01) | [RECO1] |

Located 5 voting disk(s).

```
[grid@x9mdbadm01 ~]$ asmcmd lsdg
```

| State | Type | Rebal | Sector | Logical_Sector | Block | AU | Total_MB | Free_MB | Req_mir_free_MB | Usable_file_MB | Offline_disks | Voting_files | Name |
|---------|------|-------|--------|----------------|-------|---------|-----------|----------|-----------------|----------------|---------------|--------------|----------|
| MOUNTED | HIGH | N | 512 | 512 | 4096 | 4194304 | 484245504 | 63985656 | 26902528 | 12361042 | 0 | N | DATAAC1/ |
| MOUNTED | HIGH | N | 512 | 512 | 4096 | 4194304 | 121133376 | 22654404 | 6729632 | 5308257 | 0 | Y | RECO1/ |

无 offline disks



Precheck检查可能遇到的问题

Grid和DB版本不满足要求

```
2023-07-18 16:04:21 +0800      :ERROR   : dbnodeupdate.sh precheck failed on one or more nodes

SUMMARY OF WARNINGS AND ERRORS FOR x6hcdbadm01:

x6hcdbadm01: ERROR: Detected open hardware alert(s) on the Exadata Database Server. Alerts should be resolved before proceeding the update. Optionally use
-ignore_alerts if running from patchmgr.
x6hcdbadm01: ERROR: Grid Infrastructure currently on 12.1.0.2.180717. Minimum required: 12.1.0.2.180831.
x6hcdbadm01: ERROR: Database home /u01/app/oracle/product/11.2.0.4/dbhome_1 is at 11.2.0.4.180717 and needs to be at level 11.2.0.4.180717 or later in comb
ination with a certified Grid Infrastructure before proceeding the update. See MOS 888828.1 for requirements. Optionally use flag to skip Oracle Home validatio
ns: dbnodeupdate.sh -S or patchmgr --skip_gi_db_validation option.
x6hcdbadm01: WARNING: This Exadata update includes an Oracle Linux 6 to Oracle Linux 7 update.
x6hcdbadm01: WARNING: After updating to another major OS it may be necessary to update any script used for mounting DBFS so that it can correctly determine
whether or not DBFS has been successfully mounted since the expected output from the 'stat' command, which is used to determine the status of the DBFS mount p
oint, has changed. If an early version of mount-dbfsc.sh from Note 1054431.1 has been used or extended, download and use/extend the new version that checks for
'fuseblk' as the output of the 'stat' command. Failure to update the script will lead to incorrect status being returned for DBFS, with the script reporting th
at DBFS has not been mounted successfully when it has. Any CRS resource that makes use of such a script will also show the incorrect status!
x6hcdbadm01: The following minimum Grid Infrastructure versions are supported to proceed the upgrade:
x6hcdbadm01: The following minimum Database versions are supported to proceed the upgrade:

2023-07-18 16:04:29 +0800      :ERROR   : dbnodeupdate.sh precheck on x6hcdbadm01
2023-07-18 16:04:34 +0800      :INFO    : SUMMARY FOR ALL NODES:
2023-07-18 16:04:30 +0800      :ERROR   : x6hcdbadm01 has state: FAILED
2023-07-18 16:04:35 +0800      :FAILED  : Initiate precheck on node(s).

2023-07-18 16:04:37 +0800      :ERROR   : FAILED run of command:./patchmgr -dbnodes dbs_group -precheck -log_dir auto -target_version 19.2.22.0.0.210113 -yum_
repo http://100.100.1.250:8080/
2023-07-18 16:04:37 +0800      :INFO    : Precheck performed on dbnode(s) in file dbs_group: [x6hcdbadm01]
2023-07-18 16:04:37 +0800      :INFO    : Current image version on dbnode(s) is:
2023-07-18 16:04:37 +0800      :INFO    : x6hcdbadm01: 18.1.9.0.0.181006
2023-07-18 16:04:37 +0800      :INFO    : For details, check the following files in /u01/dbserver_patch_230615/log/x6hcdbadm01_a59012d8:
2023-07-18 16:04:37 +0800      :INFO    : - <dbnode_name>_dbnodeupdate.log
2023-07-18 16:04:38 +0800      :INFO    : - patchmgr.log
2023-07-18 16:04:38 +0800      :INFO    : - patchmgr.trc
2023-07-18 16:04:39 +0800      :INFO    : Collected dbnodeupdate diag in file: Diag_patchmgr_dbnode_precheck_180723155801.tbz

2023-07-18 16:04:39 +0800      :INFO    : Exit status:1
2023-07-18 16:04:39 +0800      :INFO    : Exiting.
[root@oradb dbserver_patch_230615]#
```



Precheck检查可能遇到的问题

系统层面存在用户定制化安装的RPM包

```
[root@exacel01 dbserver_patch_19.190411]# (root)# ./patchmgr -dbnodes dbs_group -precheck -log_dir auto -target_version 19.2.22.0.0.210113 -iso_repo /oracle/soft/p32247966_192000_Linux-x86-64.zip
*****
NOTE patchmgr release: 19.190411 (always check MOS 1553103.1 for the latest release of dbserver.patch.zip)
NOTE
WARNING Do not interrupt the patchmgr session.
WARNING Do not resize the screen. It may disturb the screen layout.
WARNING Do not reboot database nodes during update or rollback.
WARNING Do not open logfiles in write mode and do not try to alter them.
*****
2023-05-07 19:49:41 -0500 :Working: D0: Initiate precheck on 4 node(s)
2023-05-07 19:50:33 -0500 :Working: D0: Check free space and verify SSH equivalence for the root user to node(s)
2023-05-07 19:50:46 -0500 :SUCCESS: DONE: Check free space and verify SSH equivalence for the root user to node(s)
2023-05-07 19:52:02 -0500 :Working: D0: dbnodeupdate.sh running a precheck on node(s).
2023-05-07 19:57:29 -0500 :ERROR : dbnodeupdate.sh precheck failed on one or more nodes
SUMMARY OF WARNINGS AND ERRORS FOR exadb01:
exadb01: ERROR: Custom packages found on hosts that require removal before update. Details of packages available here: exadb01:/var/log/cellos/unkown_packages-rpt.230507194937.txt for more details.
exadb01: WARNING: This Exadata update includes an Oracle Linux 6 to Oracle Linux 7 update.
exadb01: WARNING: Although the system was analyzed for custom rpms, any other custom installed software (such as tar-balls) cannot be detected.
exadb01: WARNING: After updating to another major OS it may be necessary to update any script used for mounting DBFS so that it can correctly determine whether or not DBFS has been successfully mounted since the expected output from the 'stat' command, which is used to determine the status of the DBFS mount point, has changed. If an early version of mount-dbfsh from Note 1054431.1 has been used or extended, download and use/extend the new version that checks for 'fuseblk' as the output of the 'stat' command. Failure to update the script will lead to incorrect status being returned for DBFS, with the script reporting that DBFS has not been mounted successfully when it has. Any CRS resource that makes use of such a script will also show the incorrect status!
```

提示存在用户定制化安装的RPM包

```
[root@exadb01]# cat /var/log/cellos/unkown_packages-rpt.230507194937.txt
#####
# File initialized at 230507_194937 (runid :230507194937) by dbnodeupdate.sh 19.190411
# NOTE: This list contains rpms which are seen as custom rpms
#####
ftp.x86_64
xterm.x86_64
#####
# ALERT : Custom packages found (see above)
# These custom packages MUST be removed before proceeding a major Oracle Linux upgrade.
# Run dbnodeupdate.sh with additional -R flag at update time to have these packages automatically removed - OR -
# Run /var/log/cellos/remove_unkown_packages.230507194937.sh manually as root before re-running prereq check.
#
# RECOMMENDED : Let dbnodeupdate.sh remove the packages right after the mandatory backup by using the -R flag
# WARNING : Removing custom packages may impact functionality
# NOTE : When removed functionality is still required after the update, reinstall the rpm after the update
#####
```

升级前要卸载的rpm包

- 系统层面存在用户定制化安装的RPM包，如第三方备份软件客户端，FTP等。如Image升级后，操作系统版本发生变化，需确认升级后需要的RPM包可正常安装到更高版本操作系统。
- **不建议**在Exadata上安装各种用户定制化软件



升级可能遇到的问题

griddisk无法正常offline

```
[root@vncchadm01 patch_19.2.22.0.0.210113]# ./patchmgr -cells cell_group -patch
*****
NOTE Cells will reboot during the patch or rollback process.
NOTE For non-rolling patch or rollback, ensure all ASM instances using
NOTE the cells are shut down for the duration of the patch or rollback.
NOTE For rolling patch or rollback, ensure all ASM instances using
NOTE the cells are up for the duration of the patch or rollback.

WARNING: Do not interrupt the patchmgr session.
WARNING: Do not alter state of ASM instances during patch or rollback.
WARNING: Do not resize the screen. It may disturb the screen layout.
WARNING: Do not reboot cells or alter cell services during patch or rollback.
WARNING: Do not open log files in editor in write mode or try to alter them.

NOTE All time estimates are approximate.
*****

2023-07-19 14:05:06 +0800 :Working: DO: Check cells have ssh equivalence for root user. Up to 10 seconds per cell ...
2023-07-19 14:05:06 +0800 :SUCCESS: DONE: Check cells have ssh equivalence for root user.
2023-07-19 14:05:09 +0800 :Working: DO: Initialize files. Up to 1 minute ...
2023-07-19 14:05:10 +0800 :Working: DO: Setup work directory
2023-07-19 14:05:24 +0800 :SUCCESS: DONE: Setup work directory
2023-07-19 14:05:27 +0800 :SUCCESS: DONE: Initialize files.
2023-07-19 14:05:27 +0800 :Working: DO: Copy, extract prerequisite check archive to cells. If required start mdll mismatched partner size correction. Up to 40 minutes ...
2023-07-19 14:05:41 +0800 :INFO : Wait correction of degraded mdll due to md partner size mismatch. Up to 30 minutes.
2023-07-19 14:05:42 +0800 :SUCCESS: DONE: Copy, extract prerequisite check archive to cells. If required start mdll mismatched partner size correction.
2023-07-19 14:05:42 +0800 :Working: DO: Check space and state of cell services. Up to 20 minutes ...
2023-07-19 14:06:26 +0800 :SUCCESS: DONE: Check space and state of cell services.
2023-07-19 14:06:26 +0800 :Working: DO: Check prerequisites on all cells. Up to 2 minutes ...
2023-07-19 14:06:28 +0800 :SUCCESS: DONE: Check prerequisites on all cells.
2023-07-19 14:06:28 +0800 :Working: DO: Copy the patch to all cells. Up to 3 minutes ...
2023-07-19 14:06:49 +0800 :SUCCESS: DONE: Copy the patch to all cells.
2023-07-19 14:06:51 +0800 :Working: DO: Execute plugin check for Patch Check Prereq ...
2023-07-19 14:06:51 +0800 :INFO : Patchmgr plugin start: Prereq check for exposure to bug 22089764 v1.0.
2023-07-19 14:06:51 +0800 :INFO : Details in logfile /u01/soft/patch_19.2.22.0.0.210113/patchmgr_stdout.
2023-07-19 14:06:51 +0800 :INFO : Patchmgr plugin start: Prereq check for exposure to bug 17854520 v1.1.
2023-07-19 14:06:51 +0800 :INFO : Details in logfile /u01/soft/patch_19.2.22.0.0.210113/patchmgr_stdout.
2023-07-19 14:06:51 +0800 :SUCCESS: No exposure to bug 17854520 with non-rolling patching.
2023-07-19 14:06:51 +0800 :INFO : Patchmgr plugin start: Prereq check for exposure to bug 22468216 v1.0.
2023-07-19 14:06:51 +0800 :INFO : Details in logfile /u01/soft/patch_19.2.22.0.0.210113/patchmgr_stdout.
2023-07-19 14:06:51 +0800 :SUCCESS: Patchmgr plugin complete: Prereq check passed for the bug 22468216.
2023-07-19 14:06:51 +0800 :INFO : Patchmgr plugin start: Prereq check for exposure to bug 24625612 v1.0.
2023-07-19 14:06:51 +0800 :INFO : Details in logfile /u01/soft/patch_19.2.22.0.0.210113/patchmgr_stdout.
2023-07-19 14:06:51 +0800 :SUCCESS: Patchmgr plugin complete: Prereq check passed for the bug 24625612.
2023-07-19 14:06:51 +0800 :SUCCESS: No exposure to bug 22896791 with non-rolling patching.
2023-07-19 14:06:51 +0800 :INFO : Patchmgr plugin start: Prereq check for exposure to bug 22651315 v1.0.
2023-07-19 14:06:51 +0800 :INFO : Details in logfile /u01/soft/patch_19.2.22.0.0.210113/patchmgr_stdout.
2023-07-19 14:06:54 +0800 :SUCCESS: Patchmgr plugin complete: Prereq check passed for the bug 22651315.
2023-07-19 14:06:54 +0800 :SUCCESS: DONE: Execute plugin check for Patch Check Prereq.
2023-07-19 14:06:56 +0800 :ERROR : Some griddisk(s) are still online.
2023-07-19 14:06:56 +0800 :ERROR : Patching in non-rolling mode in this situation can cause database(s) to crash.
2023-07-19 14:06:56 +0800 :ERROR : The command: LIST GRIDDISK ATTRIBUTES NAME WHERE ASMMODESTATUS='ONLINE' can be used to find the disks that are online.
2023-07-19 14:06:56 +0800 :ERROR : Cells(s) have disk(s) in status ONLINE.
2023-07-19 14:06:56 +0800 :ERROR : Patch failed. Please run cleanup before retrying.
2023-07-19 14:06:57 +0800 :ERROR : FAILED run of command:./patchmgr -cells cell_group -patch
2023-07-19 14:06:57 +0800 :INFO : patch attempt on nodes in file cell_group: [x6hcceladm01]
2023-07-19 14:06:57 +0800 :INFO : Current image version on cell(s) is:
```

```
[CellCLI> alter griddisk all inactive
GridDisk DATA1_CD_00_x6hcceladm01 successfully altered
GridDisk DATA1_CD_01_x6hcceladm01 successfully altered
GridDisk DATA1_CD_02_x6hcceladm01 successfully altered
GridDisk DATA1_CD_03_x6hcceladm01 successfully altered
GridDisk DATA1_CD_04_x6hcceladm01 successfully altered
GridDisk DATA1_CD_05_x6hcceladm01 successfully altered
GridDisk DATA1_CD_06_x6hcceladm01 successfully altered
GridDisk DATA1_CD_07_x6hcceladm01 successfully altered
GridDisk DATA1_CD_08_x6hcceladm01 successfully altered
GridDisk DATA1_CD_09_x6hcceladm01 successfully altered
GridDisk DATA1_CD_10_x6hcceladm01 successfully altered
GridDisk DATA1_CD_11_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_02_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_03_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_04_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_05_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_06_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_07_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_08_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_09_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_10_x6hcceladm01 successfully altered
GridDisk DBFSC1_CD_11_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_00_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_01_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_02_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_03_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_04_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_05_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_06_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_07_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_08_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_09_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_10_x6hcceladm01 successfully altered
GridDisk RECOC1_CD_11_x6hcceladm01 successfully altered
```

```
[CellCLI> LIST GRIDDISK ATTRIBUTES NAME,ASMMODESTATUS
DATA1_CD_00_x6hcceladm01 OFFLINE
DATA1_CD_01_x6hcceladm01 OFFLINE
DATA1_CD_02_x6hcceladm01 OFFLINE
DATA1_CD_03_x6hcceladm01 OFFLINE
DATA1_CD_04_x6hcceladm01 OFFLINE
DATA1_CD_05_x6hcceladm01 OFFLINE
DATA1_CD_06_x6hcceladm01 OFFLINE
DATA1_CD_07_x6hcceladm01 OFFLINE
DATA1_CD_08_x6hcceladm01 OFFLINE
DATA1_CD_09_x6hcceladm01 OFFLINE
DATA1_CD_10_x6hcceladm01 OFFLINE
DATA1_CD_11_x6hcceladm01 OFFLINE
DBFSC1_CD_02_x6hcceladm01 OFFLINE
DBFSC1_CD_03_x6hcceladm01 OFFLINE
DBFSC1_CD_04_x6hcceladm01 OFFLINE
DBFSC1_CD_05_x6hcceladm01 OFFLINE
DBFSC1_CD_06_x6hcceladm01 OFFLINE
DBFSC1_CD_07_x6hcceladm01 OFFLINE
DBFSC1_CD_08_x6hcceladm01 OFFLINE
DBFSC1_CD_09_x6hcceladm01 OFFLINE
DBFSC1_CD_10_x6hcceladm01 OFFLINE
DBFSC1_CD_11_x6hcceladm01 OFFLINE
RECOC1_CD_00_x6hcceladm01 OFFLINE
RECOC1_CD_01_x6hcceladm01 OFFLINE
RECOC1_CD_02_x6hcceladm01 OFFLINE
RECOC1_CD_03_x6hcceladm01 OFFLINE
RECOC1_CD_04_x6hcceladm01 OFFLINE
RECOC1_CD_05_x6hcceladm01 OFFLINE
RECOC1_CD_06_x6hcceladm01 OFFLINE
RECOC1_CD_07_x6hcceladm01 OFFLINE
RECOC1_CD_08_x6hcceladm01 OFFLINE
RECOC1_CD_09_x6hcceladm01 OFFLINE
RECOC1_CD_10_x6hcceladm01 OFFLINE
RECOC1_CD_11_x6hcceladm01 OFFLINE
```

原因: 由于默认升级模式为non-rolling模式, 在数据库和集群启动状态下griddisk被ASM实例使用, 无法自动offline griddisk。

- 解决方案:**
- 1.使用-rolling参数, 或者手工将需要升级的cell节点的griddisk的ASMMODESTATUS置为offline后再进行升级。
 - 2.可以手工关闭数据库和CRS集群,然后再采用non-rolling方式升级。



升级可能遇到的问题

Quorum disk离线

```
[grid@x9mdbadm01 ~]$ crsctl query css votedisk
## STATE File Universal Id File Name Disk group
--  -----
 1. ONLINE e507f2ddbc644fb2bf33a9a629144cbc (o/192.168.1.7;192.168.1.8/RECOC1_CD_02_x9mceladm02) [RECOC1]
 2. ONLINE b58658469ffb4ff7bf1e141c1340449c (o/192.168.1.9;192.168.1.10/RECOC1_CD_02_x9mceladm03) [RECOC1]
 3. ONLINE f4c5f53d2c764f34bf717931e0fbf1ff (o/192.168.1.5;192.168.1.6/RECOC1_CD_02_x9mceladm01) [RECOC1]
 4. OFFLINE b65b5400dc5a4f5fbf6e2371b305d5b7 /dev/exadata_quorum/QD_RECOC1_X9MDBADM02 [RECOC1]
 5. OFFLINE 916f95ffd89d4f33bf42a80ba6931953 /dev/exadata_quorum/QD_RECOC1_X9MDBADM01 [RECOC1]
Located 5 voting disk(s).
```

Q6: How do I reconfigure the quorum disk after upgrading to Oracle Linux 7?

A6: The instructions here apply situations where at least one of the quorum-disks on at least one of the nodes that was configured with Quorum Disk Manager after the upgrade to Oracle Linux 7 (on all database nodes) is in an offline state. If this happens, this does not mean that Oracle Grid Infrastructure will still not start, but it may mean redundancy of the voting files is reduced resulting in limited coverage for optimal high availability. Arriving at this step may mean an attempt to upgrade the Quorum Disk Manager has failed and the goal is to reconfigure the quorum disks at this point. The below steps will reconfigure the quorum disks from an operating system perspective, if the quorum disks voting files are still not in an ONLINE state after successful configuration, then see "Grid Infrastructure (CRS) shows my voting devices are offline and/or missing - what should I do?" Perform each of the following steps below on all nodes at the same time:

Step 1. Delete all quorumdisk devices on each node: `/opt/oracle.SupportTools/quorumdiskmgr --delete --device`

Note that the above command will remove *all* quorum devices on the node where it is executed, use additional flags to limit scope when needed. Repeat this command on each node before proceeding

Step 2. Delete the quorumdisk target(s) on each node: `/opt/oracle.SupportTools/quorumdiskmgr --delete --target`

Note that the above will remove *all* quorum targets on the node where it is executed, use additional flags to limit scope when needed. Repeat this command on each node before proceeding

Step 3. Delete the quorumdisk configuration on each node: `/opt/oracle.SupportTools/quorumdiskmgr --delete --config`

Repeat this command on each node before proceeding

Step 4. Re-create the quorumdisk configuration on each node: `/opt/oracle.SupportTools/quorumdiskmgr --create --config --owner=oracle --group=oinstall --network-iface-list="ib0,ib1"`

Note that values specified in the above command is an example - administrators need to replace these for their own. Repeat this command on each node before proceeding

Step 5. Re-create the quorumdisk target(s) on each node: `/opt/oracle.SupportTools/quorumdiskmgr --create --target --asm-disk-group=datac1 --visible-to="192.xxx.xx.80,192.xxx.xx.81,192.xxx.xx.82,192.xxx.xx.83"`

Note that values specified in the above command is an example - administrators need to replace these for their own. Repeat this command on each node before proceeding. The given addresses here are the IB interface addresses.

Perform the following steps first on one node, then on the other:

Step 6. Re-create the quorum disk devices: `/opt/oracle.SupportTools/quorumdiskmgr --create --device --target-ip-list="192.xxx.xx.80,192.xxx.xx.81,192.xxx.xx.82,192.xxx.xx.83"`

Note that the values specified in the above command are an example - administrators need to replace these for their own.

The documentation should be consulted for more details on possible options. See Chapter 2 of the Oracle Exadata Database Machine Maintenance Guide.

Step 1. Login to the ASM instance (as sysasm):

```
[oracle@DBM#####VM01 ~]$ . oraenv
ORACLE_SID = [oracle] ? +ASM1
ORACLE_HOME = [/home/oracle] ? /u01/app/18.0.0.0/grid
The Oracle base has been set to /u01/app/oracle
[oracle@DBM#####VM01 ~]$ sqlplus / as sysasm

SQL*Plus: Release 18.0.0.0.0 Production on Mon Aug 27 17:52:35 2018
Version 18.1.0.0.0

Copyright (c) 1982, 2017, Oracle. All rights reserved.

Connected to:
Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.1.0.0.0

SQL>
```

Step 2. Query ASM for the voting disks name and fail group.

Below is an example of how things are supposed to look like:

```
SQL> set line 200
SQL> col LABEL for a25
SQL> col path for a55
SQL> col mode_status for a6
SQL> col header_status for a10
SQL> select label, path, mode_status, header_status, mount_status, failgroup from v$asm_disk where path like '/dev/%';

LABEL PATH MODE_STATU HEADER_STA MOUNT_S FAILGROUP
-----
QD_DATA1_DBM#####VM01 /dev/exadata_quorum/QD_DATA1_DBM#####VM01 ONLINE MEMBER CACHED DBM#####VM01
QD_DATA1_DBM#####VM01 /dev/exadata_quorum/QD_DATA1_DBM#####VM01 ONLINE MEMBER CACHED DBM#####VM01
```

Step 3. If the quorum voting disks are not online or do not show up as a member, then forcefully drop the OFFLINE or missing voting disks:

```
SQL> alter diskgroup DATA1 drop quorum disk 'QD_DATA1_DBM#####VM01' force;
SQL> alter diskgroup DATA1 drop quorum disk 'QD_DATA1_DBM#####VM01' force;
```

Step 4. Add the quorum voting disks back:

```
SQL> alter diskgroup DATA1 add quorum failgroup DBM#####VM01 disk '/dev/exadata_quorum/QD_DATA1_DBM#####VM01' quorum failgroup DBM#####VM01
disk '/dev/exadata_quorum/QD_DATA1_DBM#####VM01';
```

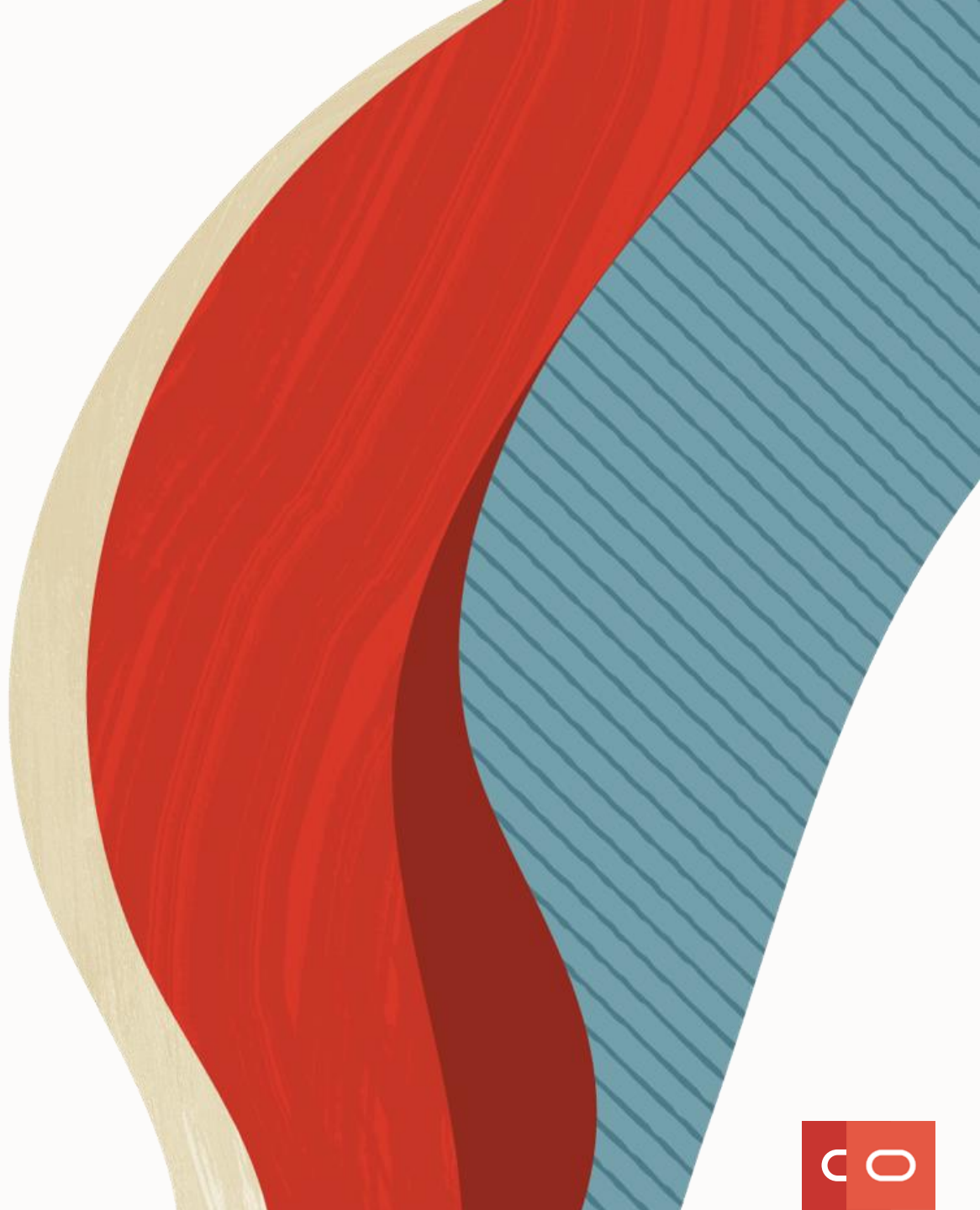
Step 5 - Verify the quorum voting disks are now online and appear as a member. (see step 2)

参考MOS: Exadata Oracle Linux 6 to Oracle Linux 7 Quorumdisk Migration FAQ (Doc ID 2453054.1)



Agenda

- 1 升级简介
- 2 升级前准备
- 3 升级CELL、DB、IB/RoCE
- 4 **数据库版本升级**



Oracle数据库版本升级

数据库版本升级包括两部分：

- 数据库集群GI升级

参考文档： Clusterware Administration and Deployment Guid

<https://docs.oracle.com/en/database/oracle/oracle-database/19/cwadd/index.html>

- 数据库DB升级

参考文档： Database Upgrade Guide

<https://docs.oracle.com/en/database/oracle/oracle-database/19/upgrd/index.html>

Oracle数据库版本升级

下载需要升级的RU，下载文件名如下：

p30116789_190000_Linux-x86-64.zip --GI补丁(包含DB)

p6880880_190000_Linux-x86-64.zip --Opatch补丁

V982063-01.zip --DB软件包

V982068-01.zip --GI软件包

参考MOS: Primary Note for Database Proactive Patch Program (文档 ID 888.1)

Oracle数据库集群GI升级

- 创建GI软件安装目录

```
# mkdir -p /u01/app/19.5.0.0/grid  
# mv V982068-01.zip /u01/app/19.5.0.0/grid/  
(一定要把软件包直接放到ORACLE_HOME所定义的目录)  
# chown -R grid:oinstall /u01/app/19.5.0.0  
# su - grid  
$ cd /u01/app/19.5.0.0/grid/
```

- 解压GI安装软件

```
$ unzip V982068-01.zip
```

Oracle数据库集群GI升级

- 创建grid用户的等效性

```
#su - grid  
$dcli -g dbs -l grid -k (dbs文件中包括所有db节点)  
必须都验证一下, 第一次登录需要输入yes才行:  
$ssh dbm1dbadm02 hostname  
$ssh dbm1dbadm01 hostname
```

- 升级前检查

```
/u01/app/19.5.0.0/grid/runcluvfy.sh stage -pre crsinst -upgrade -rolling -src_crshome  
/u01/app/12.2.0.1/grid -dest_crshome /u01/app/19.5.0.0/grid -dest_version 19.0.0.0.0
```

Oracle数据库集群GI升级

升级GI同时应用RU补丁

把GI的RU包p30116789_190000_Linux-x86-64.zip放到指定目录下并解压，这样在升级GI时可以连接RU一并执行。

这里通过启动图形界面来升级GI，执行如下命令：

```
(grid)$ /u01/app/19.5.0.0/grid/gridSetup.sh -applyRU /u01/app/19.5.0.0/30116789 -J-Doracle.install.mgmtDB=false -J-Doracle.install.mgmtDB.CDB=false -J-Doracle.install.crs.enableRemoteGIMR=false
```

说明：应用RU时建议查看ReadMe文档，按要求下载合适的OPatch（p6880880），然后替换安装目录下的OPatch。

```
$/u01/app/19.5.0.0/grid/OPatch/opatch version
```


Oracle数据库集群GI升级

The image displays the Oracle Grid Infrastructure 19c installer interface. On the left, a terminal window shows the execution of the installer script with various options. The main window shows the 'Select Configuration Option' screen, where the 'Upgrade Oracle Grid Infrastructure' option is selected. Below this, the 'Grid Infrastructure Node Selection' screen is visible, showing a table of nodes to be upgraded.

```
[root@x4170m2-103050 ~]# ssh -X grid@192.168.2.11
grid@192.168.2.11's password:
Last login: Fri Jan 3 14:50:31 CST 2020 on pts/1
Last login: Fri Jan 3 14:54:00 2020 from x4170m2-103050admin.oscbj.com
/usr/bin/xauth: file /home/grid/.Xauthority does not exist
[grid@dm02dbadm01 ~]$ cd /u01/app/19.5.0.0/grid
[grid@dm02dbadm01 grid]$ ls
addnode      diagnostics  jdbc         ords         rhp          tomcat
assistants   dmu          jdk         oss         root.sh     ucp
bin          env.ora     jlib        oui         root.sh.old usm
cha         evm         ldap        owm         root.sh.old.1 utl
clone       ggnp       lib         perl        rootupgrade.sh v982068-01.zip
crs         gridSetup.sh md          plsql       runcluvfy.sh welcome.html
css         has         network    precomp     sdk         wlm
cv          hs          nls        OPatch      sqlpatch    xag
dbjava     install    OPatch     qos         sqlplus     xdk
dbs        instantclient opmn       racg        sqlplus     xdk
deinstall  inventory  oraclere  rdbms      srvn

[grid@dm02dbadm01 grid]$ ./gridSetup.sh -applyRU /u01/app/19.5.0.0/30116789 -J-Doracle.install.mgmtDB=false -J-Doracle.install.mgmtDB.CDB=false -J-Doracle.install.crs.enableRemoteGIMR=false
Preparing the home to patch...
Applying the patch /u01/app/19.5.0.0/30116789
Successfully applied the patch.
The log can be found at: /u01/app/orainventory/logs/GridSetupActions2020-01-03_03-00-40PM/installerPatchActions_2020-01-03_03-00-40PM.log
Launching Oracle Grid Infrastructure Setup Wizard...
```

Oracle Grid Infrastructure 19c Installer - Step 1 of 9 (on dm02dbadm01.oscbj.com)

Select Configuration Option

Select an option to configure the software. The wizard will register the home in the central inventory and then perform the selected configuration.

- Configure Oracle Grid Infrastructure for a New Cluster
- Configure Oracle Grid Infrastructure for a Standalone Server (Oracle Restart)
- Upgrade Oracle Grid Infrastructure
- Set Up Software Only

Grid Infrastructure Node Selection

Select the Cluster nodes (in addition to the local node) in the hardware cluster where the Installer should upgrade Grid Infrastructure.

| Node Name | Oracle Grid Infrastructure Home |
|---|---------------------------------|
| <input checked="" type="checkbox"/> dm02dbad... | /u01/app/12.2.0.1/grid |
| <input checked="" type="checkbox"/> dm02dbad... | /u01/app/12.2.0.1/grid |
| <input checked="" type="checkbox"/> dm02dbad... | /u01/app/12.2.0.1/grid |
| <input checked="" type="checkbox"/> dm02dbad... | /u01/app/12.2.0.1/grid |

SSH connectivity...

Skip upgrade on unreachable nodes



Oracle数据库集群GI升级

The screenshots show the following steps:

- Step 3 of 9 (Specify Management Options):** Shows the 'Specify Management Options' screen with the 'Register with Enterprise Manager (EM) Cloud Control' checkbox.
- Step 4 of 9 (Specify Installation Location):** Shows the 'Specify Installation Location' screen where the Oracle base is set to `/u01/app/grid`.
- Step 5 of 9 (Root script execution configuration):** Shows the 'Root script execution configuration' screen with 'Automatically run configuration scripts' checked and 'Use "root" user credential' selected.
- Step 6 of 10 (Select batches for nodes):** Shows the 'Select batches for nodes' screen with a table for assigning batches to nodes.

| Node Name | Type | Batch |
|-------------|------|---------|
| dm02dbadm01 | HUB | Batch 1 |
| dm02dbadm02 | HUB | Batch 1 |
| dm02dbadm03 | HUB | Batch 2 |
| dm02dbadm04 | HUB | Batch 2 |

Note: Root script execution on the local node must be in Batch 1.



Oracle数据库集群GI升级

The image displays a series of overlapping screenshots from the Oracle Grid Infrastructure 19c Installer, illustrating the upgrade process for a cluster. The windows are titled "Oracle Grid Infrastructure 19c Installer - Step X of 10 (on dm02dbadm01.oscbj.com)".

- Step 7: Perform Prerequisite Checks** (100% progress). The main area shows "Verifying that the target environment meets minimum installation and configuration requirements you have selected. This can take time. Please wait."
- Step 8: Summary**. Shows a tree view of configuration options and a list of selected nodes: dm02dbadm01, dm02dbadm02, dm02dbadm03, dm02dbadm04.
- Step 9: Install Product** (5% and 32% progress). The main area shows a progress bar and a status table for various tasks. A warning dialog box is overlaid on the 32% progress view, stating: "Configuration scripts generated by the Installer need to be run as a privileged user (root). Installer will run these scripts using the privileged user credentials provided earlier. Are you sure you want to continue?" with "Yes" and "No" buttons.
- Step 10: Finish** (32% progress). The main area shows a status table with all tasks completed successfully. The final message reads: "The upgrade of Oracle Grid Infrastructure for a Cluster was successful."

| Task | Status |
|--|-------------|
| Configure Local Node | In Progress |
| • Prepare | Succeeded |
| • Link binaries | In Progress |
| • Setup | Pending |
| Copy Files to Remote Nodes | Pending |
| Configure Remote Nodes | Pending |
| • Prepare | Pending |
| • Setup | Pending |
| Setup Oracle Base | Pending |
| Execute Root Scripts | Pending |
| Configure Oracle Grid Infrastructure for a Cluster | Pending |

| Task | Status |
|--|-----------|
| Configure Local Node | Completed |
| • Prepare | Completed |
| • Link binaries | Completed |
| • Setup | Completed |
| Copy Files to Remote Nodes | Completed |
| Configure Remote Nodes | Completed |
| • Prepare | Completed |
| • Setup | Completed |
| Setup Oracle Base | Completed |
| Execute Root Scripts | Completed |
| • Execute root script on nodes of Batch 1 | Completed |
| Configure Oracle Grid Infrastructure for a Cluster | Completed |



Oracle集群GI检查

```
[root@dm02dbadm01 ~]# /u01/app/19.5.0.0/grid/bin/crsctl query crs activeversion
Oracle Clusterware active version on the cluster is [19.0.0.0.0]
[root@dm02dbadm01 ~]#
[root@dm02dbadm01 ~]# /u01/app/19.5.0.0/grid/bin/crsctl stat res -t
```

| Name | Target | State | Server | State details |
|-------------------|---------|---------|-------------|---------------|
| Local Resources | | | | |
| ora.LISTENER.lsnr | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.chad | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.net1.network | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.ons | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.proxy_advm | | | | |
| | OFFLINE | OFFLINE | dm02dbadm01 | STABLE |
| | OFFLINE | OFFLINE | dm02dbadm02 | STABLE |
| | OFFLINE | OFFLINE | dm02dbadm03 | STABLE |
| | OFFLINE | OFFLINE | dm02dbadm04 | STABLE |

| Cluster Resources | | | | |
|--|--------|--------|-------------|----------------|
| ora.ASMNET1LSNR_ASM.lsnr(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.DATAC1.dg(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.DBFSC1.dg(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.LISTENER_SCAN1.lsnr | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| ora.LISTENER_SCAN2.lsnr | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| ora.LISTENER_SCAN3.lsnr | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| ora.RECO1.dg(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.asm(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | Started,STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | Started,STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | Started,STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | Started,STABLE |
| ora.asmnet1.asmnetwork(ora.asmgroup) | | | | |
| 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| 2 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| 3 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| 4 | ONLINE | ONLINE | dm02dbadm04 | STABLE |

| | | | | | |
|-----------------------------|---|---------|---------|-------------|--|
| ora.cvu | 1 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.dm02dbadm01.vip | 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| ora.dm02dbadm02.vip | 1 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| ora.dm02dbadm03.vip | 1 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| ora.dm02dbadm04.vip | 1 | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.gosmsserver | 1 | OFFLINE | OFFLINE | | STABLE |
| ora.rtdemo.db | 1 | ONLINE | ONLINE | dm02dbadm01 | Open,HOME=/u01/app/oracle/product/12.1.0.2/dbhome_1,STABLE |
| | 2 | ONLINE | ONLINE | dm02dbadm02 | Open,HOME=/u01/app/oracle/product/12.1.0.2/dbhome_1,STABLE |
| | 3 | ONLINE | ONLINE | dm02dbadm03 | Open,HOME=/u01/app/oracle/product/12.1.0.2/dbhome_1,STABLE |
| | 4 | ONLINE | ONLINE | dm02dbadm04 | Open,HOME=/u01/app/oracle/product/12.1.0.2/dbhome_1,STABLE |
| ora.rtdemo.rtdemo2nodes.svc | 2 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | 3 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| ora.scan1.vip | 1 | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| ora.scan2.vip | 1 | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| ora.scan3.vip | 1 | ONLINE | ONLINE | dm02dbadm01 | STABLE |



Oracle数据库安装DB软件

- DB节点升级需要先安装新版本数据库软件
- 所有DB节点上都创建好新的DBHOME

```
(root)# mkdir -p /u01/app/oracle/product/19.5.0.0/dbhome_1
```

```
(root)# chown -R oracle:oinstall /u01/app/oracle/product/19.5.0.0
```

```
(oracle)$ mv /tmp/V982063-01.zip /u01/app/oracle/product/19.5.0.0/dbhome_1
```

```
(oracle)$ cd /u01/app/oracle/product/19.5.0.0/dbhome_1
```

注意（一定要把软件包直接放到ORACLE_HOME所定义的目录）

Oracle数据库安装DB软件

The image shows a terminal window and two installer windows for Oracle Database 19c. The terminal window shows the user logging in via SSH and running the installer. The first installer window, titled "Oracle Database 19c Installer - Step 1 of 9", shows the "Select Configuration Option" screen. The "Set Up Software Only" option is selected and highlighted with a red box and an arrow. The second installer window, titled "Oracle Database 19c Installer - Step 2 of 9", shows the "Select Database Installation Option" screen. The "Oracle Real Application Clusters database installation" option is selected.

```
root@x4170m2-103050:~# ssh -X oracle@192.168.2.11
Last login: Fri Jan 3 21:52:29 CST 2020 from x4170m2-103050admin.oscbj.com on pts/0
Last login: Fri Jan 3 21:54:28 2020 from x4170m2-103050admin.oscbj.com
[oracle@dm02dbadm01 ~]$ cd /u01/app/oracle/product/19.5.0.0/dbhome_1
[oracle@dm02dbadm01 dbhome_1]$ ./runInstaller
Launching Oracle Database Setup Wiza
```

Oracle Database 19c Installer - Step 1 of 9 (on dm02dbadm01.oscbj.com)

Select Configuration Option

Configuration Option

- Database Installation Options
- Install Type
- Typical Installation
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

Select any of the following install options.

Create and configure a single instance data
This option creates a starter database.

Set Up Software Only

Note 1: For RAC install, do 'Set Up Software Only Assistant) from the oracle home.
Note 2: To upgrade an Oracle Database, do 'Set Upgrade Assistant) from the oracle home.

Oracle Database 19c Installer - Step 2 of 9 (on dm02dbadm01.oscbj.com)

Select Database Installation Option

19c ORACLE Database

Select the type of database installation you want to perform.

Single instance database installation

Oracle Real Application Clusters database installation

Configuration Option

- Database Installation Options
- Install Type
- Typical Installation
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

Help

< Back Next > Install Cancel



Oracle数据库安装DB软件

Oracle Database 19c Installer - Step 3 of 10 (on dm02dbadm01.oscbj.com)

Select List of Nodes

19c ORACLE Database

Select nodes (in addition to the local node) in the cluster where the installer should install Oracle RAC or Oracle RAC One.

| | Node name |
|-------------------------------------|---------------|
| <input checked="" type="checkbox"/> | 1 dm02dbadm01 |
| <input checked="" type="checkbox"/> | 2 dm02dbadm02 |
| <input checked="" type="checkbox"/> | 3 dm02dbadm03 |
| <input checked="" type="checkbox"/> | 4 dm02dbadm04 |

SSH connectivity...

Help < Back Next > Install Cancel

Oracle Database 19c Installer - Step 4 of 11 (on dm02dbadm01.oscbj.com)

Select Database Edition

19c ORACLE Database

Which database edition do you want to install?

Enterprise Edition
Oracle Database 19c Enterprise Edition is a self-managing database that has the scalability, performance, high availability, and security features required to run the most demanding, mission-critical applications.

Standard Edition 2
Oracle Database 19c Standard Edition 2 is a full-featured data management solution ideally suited to the needs of medium-sized businesses.

Help < Back Next > Install Cancel

Oracle Database 19c Installer - Step 5 of 11 (on dm02dbadm01.oscbj.com)

Specify Installation Location

19c ORACLE Database

Specify a path to place all Oracle software and configuration-related files installed by this installation owner. This location is the Oracle base directory for the installation owner.

Oracle base: /u01/app/oracle

This software directory is the Oracle Database home directory.

Software location: /u01/app/oracle/product/19.5.0.0/dbhome_1

Help < Back Next > Install Cancel

Oracle Database 19c Installer - Step 6 of 11 (on dm02dbadm01.oscbj.com)

Privileged Operating System groups

19c ORACLE Database

SYS privileges are required to create a database using operating system (OS) authentication. Membership in OS Groups grants the corresponding SYS privilege, eg. membership in OSDBA grants the SYSDBA privilege.

Database Administrator (OSDBA) group: dba

Database Operator (OSOPER) group (Optional): dba

Database Backup and Recovery (OSBACKUPDBA) group: dba

Data Guard administrative (OSDGDBA) group: dba

Encryption Key Management administrative (OSKMDBA) group: dba

Real Application Cluster administrative (OSRACDBA) group: dba

Help < Back Next > Install Cancel

Oracle Database 19c Installer - Step 7 of 11 (on dm02dbadm01.oscbj.com)

Root script execution configuration

19c ORACLE Database

During the software configuration, certain operations have to be performed as "root" user. You can choose to have the installer perform these operations automatically by specifying inputs for one of the options below. The input specified will also be used by the installer to perform additional prerequisite checks.

Automatically run configuration scripts

Use "root" user credential

Password: *****

Use gudo

Program path: /usr/bin/sudo

User name: oracle

Password:

Help < Back Next > Install Cancel

Oracle Database 19c Installer - Step 8 of 11 (on dm02dbadm01.oscbj.com)

Perform Prerequisite Checks

19c ORACLE Database

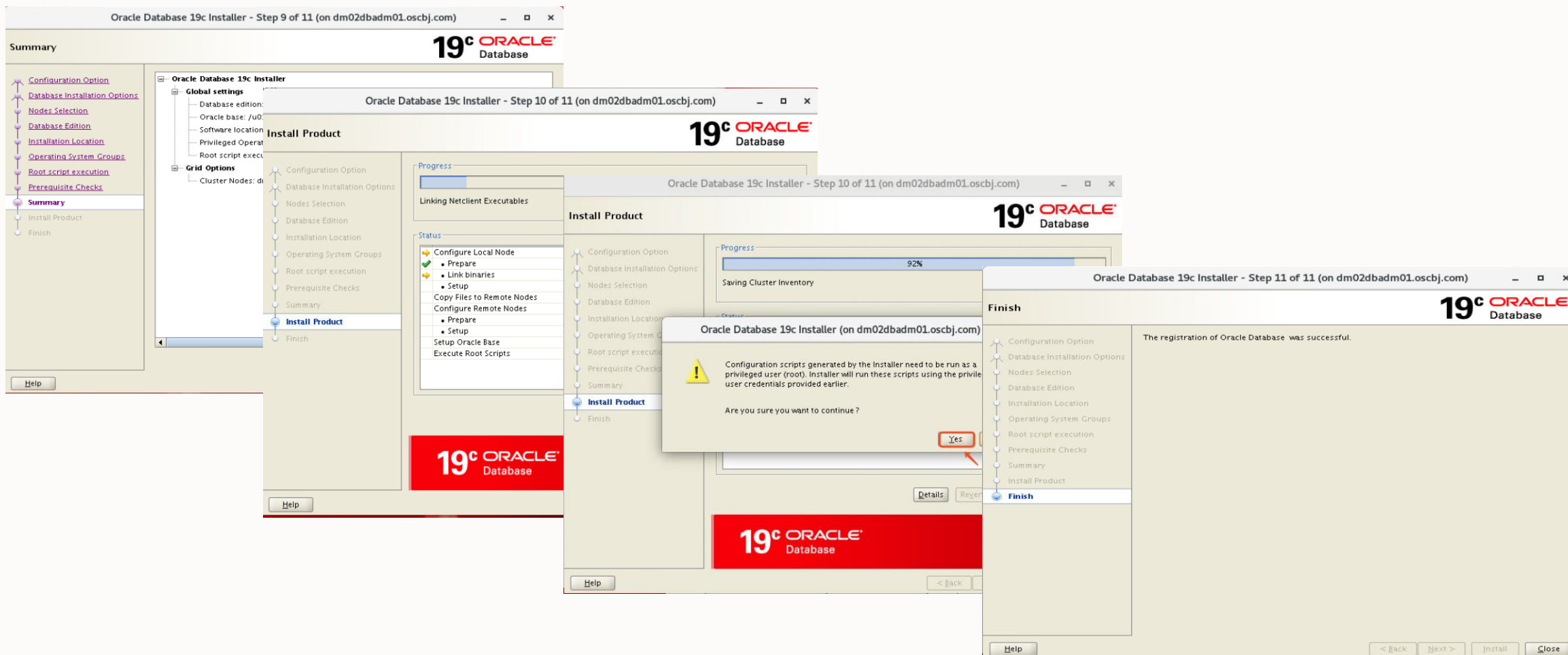
Verifying that the target environment meets minimum installation and configuration requirements for products you have selected. This can take time. Please wait.

Checking Multicast or broadcast check ... 51%

Help < Back Next > Install Cancel



Oracle数据库安装DB软件



Oracle数据库应用RU软件

- 给新版本数据库软件应用最新的RU
 - 先在第一个DB节点上应用DB的RU
 - p30116789_190000_Linux-x86-64.zip --GI补丁 (包含DB的30125133)

- 设置环境变量

```
export ORACLE_BASE=/u01/app/oracle
export ORACLE_HOME=/u01/app/oracle/product/19.5.0.0/dbhome_1
export PATH=$ORACLE_HOME/bin:$PATH
```

- 应用前检查

```
$/u01/app/oracle/product/19.5.0.0/dbhome_1/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -ph ./
```

- 应用RU

```
$/u01/app/oracle/product/19.5.0.0/dbhome_1/OPatch/opatch apply
```

- 应用后检查

```
$/u01/app/oracle/product/19.5.0.0/dbhome_1/OPatch/opatch lsinventory
```

- 用同样的方法去逐个的应用其它DB节点的DB RU

Oracle数据库升级DB软件

- 升级前数据库准备

可以使用DBUA或autoupgrade来升级DB)

此次采用DBUA，使用DBUA要求数据库是启动的，否则DBUA会尝试去启动数据库：

- 修改环境变量

```
export ORACLE_BASE=/u01/app/oracle
export ORACLE_HOME=/u01/app/oracle/product/12.2.0.1/dbhome_1
export PATH=$ORACLE_HOME/bin:$PATH
select log_mode,flashback_on from v$database;
```

- 开启确保数据库归档及闪回，并创建一个保证还原点

```
shutdown immedaite;
startup mount;
alter database archivelog;
alter database open;
alter system set db_recovery_file_dest_size=2T;
alter system set db_recovery_file_dest='+RECO1';
alter database flashback on;
select * from v$restore_point;
create restore point upgrade19 guarantee flashback database;
```

Oracle数据库升级DB软件

- 使用原始数据库的JAVA及环境变量来运行升级后新数据库软件中的preupgrade.jar程序:

```
$export ORACLE_HOME=/u01/app/oracle/product/12.2.0.1/dbhome_1
$export ORACLE_BASE=/u01/app/oracle
$export ORACLE_SID=rtdemo1
$export PATH=.:$ORACLE_HOME/bin:$PATH
$/u01/app/oracle/product/12.2.0.1/dbhome_1/jdk/bin/java -jar
/u01/app/oracle/product/19.5.0.0/dbhome_1/rdbms/admin/preupgrade.jar TERMINAL TEXT
```

- 检查后会产生两个修复脚本，分别是升级前修复和升级后修复

```
preupgrade_fixups.sql和postupgrade_fixups.sql
```

- 先执行一下升级前的修复脚本（有的操作需要手动修改）

```
SQL>/u01/app/oracle/cfgtoollogs/rtdemo/preupgrade/preupgrade_fixups.sql
```

- 在新版本Oracle软件目录下执行dbua命令

```
$/u01/app/oracle/product/19.5.0.0/dbhome_1/bin/dbua
```

Oracle数据库升级DB软件

The image displays the Oracle Database Upgrade Assistant (DBUA) process. It includes a terminal window showing the execution of an SSH command and the setting of environment variables for the Oracle user on the target host. The DBUA wizard is shown in three stages: 1. 'Select Database' where the 'rtdemo' database is selected. 2. 'Prerequisite Checks' where the user 'sys' is specified. 3. A detailed 'Prerequisite Checks' window showing validation results for 'Checks to be fixed...', 'Pre Upgrade Recommendations', and 'Post Upgrade Recommendations'.

```
[root@x4170m2-103050 ~]# ssh -X oracle@192.168.2.11
Last login: Sat Jan 4 18:26:37 CST 2020
Last login: Sat Jan 4 18:27:43 2020 from x4170m2-103050admin.oscbj.com
[oracle@dm02dbadm01 ~]$ export ORACLE_HOME=/u01/app/oracle/product/12.2.0.1/dbhome_1
[oracle@dm02dbadm01 ~]$ export ORACLE_BASE=/u01/app/oracle
[oracle@dm02dbadm01 ~]$ export ORACLE_SID=rtdemo1
[oracle@dm02dbadm01 ~]$ export PATH=.:$ORACLE_HOME/bin:$PATH
[oracle@dm02dbadm01 ~]$ env|grep ORACLE
ORACLE_SID=rtdemo1
ORACLE_BASE=/u01/app/oracle
ORACLE_HOME=/u01/app/oracle/product/12.2.0.1/dbhome_1
[oracle@dm02dbadm01 ~]$ /u01/app/oracle/product/19.5.0.0/dbhome_1/bin/dbua
Logs directory: /u01/app/oracle/cfgtoollogs/dbua/upgrade2020-01-04_06-28-15PM
```

Database Upgrade Assistant - Step 1 of 8 (on dm02dbadm01.oscbj.com)

Select Database

| Source Database | Version | Type | Oracle Home |
|-----------------|------------|------|---|
| rtdemo | 12.2.0.1.0 | RAC | /u01/app/oracle/product/12.2.0.1/dbh... |

Database Upgrade Assistant - Step 2 of 8 (on dm02dbadm01.oscbj.com)

Prerequisite Checks

Database Upgrade Assistant will collect the information of the selected database by connecting to it using OS based authentication. Database credentials may be needed if OS based authentication is disabled.

YSDBA Username: sys
Password:

| Validation | Severity | Fixable |
|---|----------|---------|
| Checks to be fixed ... | | |
| There should be no INVALID objects in SYS/SYSTEM or user schemas before database upgrade. | Warni... | Manual |
| Pre Upgrade Recommendations | | |
| Remove hidden parameters before database upgrade unless your application vendors and/or Oracle Support state differently. Changes ... | | |
| Post Upgrade Recommendations | | |
| Dictionary statistics provide essential information to the Oracle optimizer to help it find efficient SQL execution plans. After a database u... | | |
| Fixed object statistics provide essential information to the Oracle optimizer to help it find efficient SQL execution plans. Those statistics ... | | |



Oracle数据库升级DB软件

Database Upgrade Assistant - Step 3 of 8 (on dm02dbadm01.oscbj.com)

19c ORACLE Database

Select Upgrade Options

- Select Database
- Prerequisite Checks
- Select Upgrade Options
- Select Recovery Options
- Configure Management
- Summary
- Progress
- Results

Enable Parallel Upgrade
 Recompile Invalid Objects During Post Upgrade
 Upgrade Timezone Data

Specify the Custom SQL Scripts to be executed

Before Upgrade: Browse...

After Upgrade: Browse...

Help < Back Next > Finish Cancel

Database Upgrade Assistant - Step 4 of 8 (on dm02dbadm01.oscbj.com)

19c ORACLE Database

Select Recovery Options

- Select Database
- Prerequisite Checks
- Select Upgrade Options
- Select Recovery Options
- Configure Management
- Summary
- Progress
- Results

Select an option to recover the database in case of upgrade failure.

Use Flashback and Guaranteed Restore Point
 Create a New Guaranteed Restore Point
 Use Available Guaranteed Restore Point **UPGRADE19**
 Use RMAN Backup
 Create a New Offline RMAN Backup
 Backup Location: app/oracle/admin/rtdemo/backup_2020-01-06_09-32-42AM Browse...
 Create a New Partial Offline RMAN Backup with User Tablespaces set to R/O
 Use Latest Available Full RMAN Backup
 Latest RMAN Backup Timestamp: N/A View/Edit Restore Script
 I have my own backup and restore strategy

Help < Back Next > Finish Cancel

Database Upgrade Assistant - Step 5 of 8 (on dm02dbadm01.oscbj.com)

19c ORACLE Database

Configure Management

- Select Database
- Prerequisite Checks
- Select Upgrade Options
- Select Recovery Options
- Configure Management
- Summary
- Progress
- Results

Specify the management options for the database.

Configure Enterprise Manager (EM) database express
 EM database express port: 9500
 Configure EM database express port as global port
 Register with Enterprise Manager (EM) cloud control
 @MS host:
 @MS port:
 EM admin username:
 EM admin password:
 DBSNMP user password:
 ASMSNMP user password:

Help < Back Next > Finish Cancel

Database Upgrade Assistant - Step 6 of 8 (on dm02dbadm01.oscbj.com)

19c ORACLE Database

Summary

- Select Database
- Prerequisite Checks
- Select Upgrade Options
- Select Recovery Options
- Configure Management
- Summary
- Progress
- Results

Database Upgrade Summary

Source Database

Name: rtdemo
Release: 12.2.0.1.0
Oracle Home: /u01/app/oracle/product/12.2.0.1/dbhome_1

Target Database

Name: rtdemo
Release: 19.0.0.0.0
Oracle Home: /u01/app/oracle/product/19.0.0.0/dbhome_1

The following cluster database instances will be upgraded:

- Instance Name: rtdemo1, Node Name: dm02dbadm01
- Instance Name: rtdemo2, Node Name: dm02dbadm02
- Instance Name: rtdemo3, Node Name: dm02dbadm03
- Instance Name: rtdemo4, Node Name: dm02dbadm04

Pre-Upgrade Checks

INFO: It is good practice to have the catalog schema the same or higher version than the RMAN client version you are using. [rtdemo]
 INFO: Dictionary statistics help the Oracle optimizer find efficient SQL execution plans and are essential for proper upgrade timing. Oracle recommends that you run the dictionary statistics before the upgrade. [rtdemo]
 INFO: Minimum tablespace sizes for upgrade are estimates. [rtdemo]
 RECOMMEND: Remove hidden parameters before database upgrade unless your application vendors and/or Oracle Support state differently. [rtdemo]
 RECOMMEND: Dictionary statistics provide essential information to the Oracle optimizer to help it find efficient SQL execution plans. After a successful upgrade, you should run the dictionary statistics. [rtdemo]
 RECOMMEND: Fixed object statistics provide essential information to the Oracle optimizer to help it find efficient SQL execution plans. Those statistics should be run before the upgrade. [rtdemo]
 WARNING: There should be no INVALID objects in SYS/SYSTEM or user schemas before database upgrade. [rtdemo]
 WARNING: Starting in Release 18c, symbolic links are not allowed in directory object paths used with BFILE data types, the UTL_FILE package, or the UTL_SMTP package. [rtdemo]

Target Initialization Parameters

The following initialization parameters will be used to perform the operation on the database.

Help < Back Next > Finish Cancel

Database Upgrade Assistant - Step 7 of 8 (on dm02dbadm01.oscbj.com)

19c ORACLE Database

Progress

- Select Database
- Prerequisite Checks
- Select Upgrade Options
- Select Recovery Options
- Configure Management
- Summary
- Progress
- Results

Oracle Database upgrade in progress... 45%

Upgrading database rtdemo from Oracle Database release 12.2.0.1.0 (/u01/app/oracle/product/12.2.0.1/dbhome_1) to Oracle Database release 19.0.0.0.0 (/u01/app/oracle/product/19.0.0.0/dbhome_1).

| Steps | Time | Status |
|--|---------|-------------|
| Pre Upgrade Steps | 0:03:07 | Finished |
| Database Backup | 0:00:04 | Finished |
| Pre Upgrade Step | 0:03:02 | Finished |
| Database Upgrade Steps | 0:01:08 | In Progress |
| Configure Database in 19.0.0.0.0 Oracle Home | 0:01:08 | In Progress |
| Database Components Upgrade | | |
| Oracle Server | 0:09:35 | Finished |
| OLAP Analytic Workspace | 0:00:10 | Finished |
| Oracle Database Java Packages | 0:00:09 | Finished |
| Oracle Text | 0:00:25 | Finished |
| Oracle Database Vault | 0:01:15 | Finished |
| JServer JAVA Virtual Machine | 0:01:15 | Finished |
| Oracle Label Security | 0:00:04 | Finished |
| Oracle Multimedia | | |
| Oracle Workspace Manager | | In Progress |
| Oracle Real Application Clusters | | |
| Spatial | | |
| Oracle XML Database | | |
| Oracle XDK | 0:00:49 | Finished |
| Oracle OLAP ARI | | |
| Finalizing Database Components Upgrade | | |
| Performing Sanity Checks and Cleanup | | |
| Restarting Database | | |

Alert Log Progress Log

Errors: 0

Help < Back Next > Finish Cancel

Database Upgrade Assistant - Step 8 of 8 (on dm02dbadm01.oscbj.com)

19c ORACLE Database

Results

- Select Database
- Prerequisite Checks
- Select Upgrade Options
- Select Recovery Options
- Configure Management
- Summary
- Progress
- Results

Database upgrade has been completed successfully, and the database is ready to use.

| Source Database | Target Database |
|--|---|
| Name: rtdemo | rtdemo |
| Release: 12.2.0.1.0 | 19.0.0.0.0 |
| Oracle Home: /u01/app/oracle/product/12.2.0.1/dbhome_1 | /u01/app/oracle/product/19.0.0.0/dbhome_1 |

Database Instances

The database instance(s) status after the upgrade is as follows:

| Instance Name | Node Name | Status |
|---------------|-------------|--------|
| rtdemo1 | dm02dbadm01 | Active |
| rtdemo2 | dm02dbadm02 | Active |
| rtdemo3 | dm02dbadm03 | Active |
| rtdemo4 | dm02dbadm04 | Active |

Upgrade Details

The following summary lists the steps performed during the upgrade process. Log files for all the steps, as well as this summary, are available at "/u01/app/oracle/cfgtoollogs/dba/upgrade2020-01-06_09-32-42AM/rtdemo".

| Step Name | Log File Name | Status | Time |
|--|-----------------|------------|---------|
| Database Backup | Backup.log | Successful | 0:00:04 |
| Pre Upgrade | PreUpgrade.log | Successful | 0:03:02 |
| Configure Database in 19.0.0.0.0 Oracle Home | Migrate_Sid.log | Successful | 0:01:08 |
| Database Components Upgrade | Oracle_Comp.log | Successful | 0:09:35 |

Help < Back Next > Finish Close



Oracle数据库升级后检查

```
[oracle@dm02dbadm01 ~]$ srvctl config database -d rtdemo
Database unique name: rtdemo
Database name: rtdemo
Oracle home: /u01/app/oracle/product/19.5.0.0/dbhome_1
Oracle user: oracle
Spfile: +DATAC1/RTDEMO/PARAMETERFILE/spfilertdemo.ora
Password file: +DATAC1/RTDEMO/PASSWORD/pwdrtdemo.261.1022412859
Domain: oscbj.com
Start options: open
Stop options: immediate
Database role: PRIMARY
Management policy: AUTOMATIC
Server pools:
Disk Groups: DATAC1
Mount point paths:
Services: rtdemo2nodes
Type: RAC
Start concurrency:
Stop concurrency:
OSDBA group: dba
OSOPER group: dba
Database instances: rtdemo1,rtdemo2,rtdemo3,rtdemo4
Configured nodes: dm02dbadm01,dm02dbadm02,dm02dbadm03,dm02dbadm04
CSS critical: no
CPU count: 0
Memory target: 0
Maximum memory: 0
Default network number for database services:
Database is administrator managed
[oracle@dm02dbadm01 ~]$
```

```
[root@dm02dbadm01 ~]# /u01/app/19.5.0.0/grid/bin/crsctl stat res -t
```

| Name | Target | State | Server | State details |
|--------------------------|---------|---------|-------------|---------------|
| Local Resources | | | | |
| ora.LISTENER.lsnr | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.chad | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.net1.network | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.ons | | | | |
| | ONLINE | ONLINE | dm02dbadm01 | STABLE |
| | ONLINE | ONLINE | dm02dbadm02 | STABLE |
| | ONLINE | ONLINE | dm02dbadm03 | STABLE |
| | ONLINE | ONLINE | dm02dbadm04 | STABLE |
| ora.proxy_advm | | | | |
| | OFFLINE | OFFLINE | dm02dbadm01 | STABLE |
| | OFFLINE | OFFLINE | dm02dbadm02 | STABLE |
| | OFFLINE | OFFLINE | dm02dbadm03 | STABLE |
| | OFFLINE | OFFLINE | dm02dbadm04 | STABLE |

```
ora.cvu
 1 ONLINE ONLINE dm02dbadm04 STABLE
ora.dm02dbadm01.vip
 1 ONLINE ONLINE dm02dbadm01 STABLE
ora.dm02dbadm02.vip
 1 ONLINE ONLINE dm02dbadm02 STABLE
ora.dm02dbadm03.vip
 1 ONLINE ONLINE dm02dbadm03 STABLE
ora.dm02dbadm04.vip
 1 ONLINE ONLINE dm02dbadm04 STABLE
ora.qosmserver
 1 OFFLINE OFFLINE STABLE
ora.rtdemo.db
 1 ONLINE ONLINE dm02dbadm01
 2 ONLINE ONLINE dm02dbadm02
 3 ONLINE ONLINE dm02dbadm03
 4 ONLINE ONLINE dm02dbadm04
ora.rtdemo.rtdemo2nodes.svc
 2 ONLINE ONLINE dm02dbadm03 STABLE
 3 ONLINE ONLINE dm02dbadm02 STABLE
ora.scan1.vip
 1 ONLINE ONLINE dm02dbadm02 STABLE
ora.scan2.vip
 1 ONLINE ONLINE dm02dbadm03 STABLE
ora.scan3.vip
 1 ONLINE ONLINE dm02dbadm01 STABLE
```

Open,HOME=/u01/app/oracle/product/19.5.0.0/dbhome_1,STABLE
 Open,HOME=/u01/app/oracle/product/19.5.0.0/dbhome_1,STABLE
 Open,HOME=/u01/app/oracle/product/19.5.0.0/dbhome_1,STABLE
 Open,HOME=/u01/app/oracle/product/19.5.0.0/dbhome_1,STABLE
 Open,HOME=/u01/app/oracle/product/19.5.0.0/dbhome_1,STABLE

```
[root@dm02dbadm01 ~]#
```



Oracle数据库升级后检查

- 检查各组件状态

```
SQL>select comp_id,status from dba_registry;
```

- 检查时区

```
SQL> select * from v$timezone_file;
```

- 升级成功后，删除还原点，并修改兼容参数compatible

```
SQL> select * from v$restore_point;
```

```
SQL> select NAME,TIME,RESTORE_POINT_TIME from v$restore_point;
```

```
SQL> drop restore point upgrade19;
```

- 查看当前的compatible

```
SQL> select name,value from v$parameter where name='compatible';
```

```
compatible 12.2.0
```

- 确认升级无问题后修改为compatible

```
SQL>alter system set compatible='19.0.0' scope=spfile;
```

```
$ srvctl stop database -d rtdemo
```

```
$ srvctl start database -d rtdemo
```

For More Information

support.oracle.com
oracle.com/Exadata
docs.oracle.com



ORACLE
甲骨文

Oracle GoldenGate 路线图和策略

甲骨文云与数据库公益讲座

周俊

- 资深解决方案工程师
- Oracle OCM认证工程师
- 20多年Oracle工作经验，专注于Oracle数据库，数据集成和Oracle Exadata等领域，在数据库运维管理，性能优化和故障诊断等方面有丰富经验



内容简介

- Oracle GoldenGate的发展方向和战略
- Oracle Cloud World上发布GoldenGate路线图和重要公告
- Oracle GoldenGate 23c的新功能介绍



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20-22



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