升级到Oracle 19c:产品兼容性，性能和应用开发注意事项

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！

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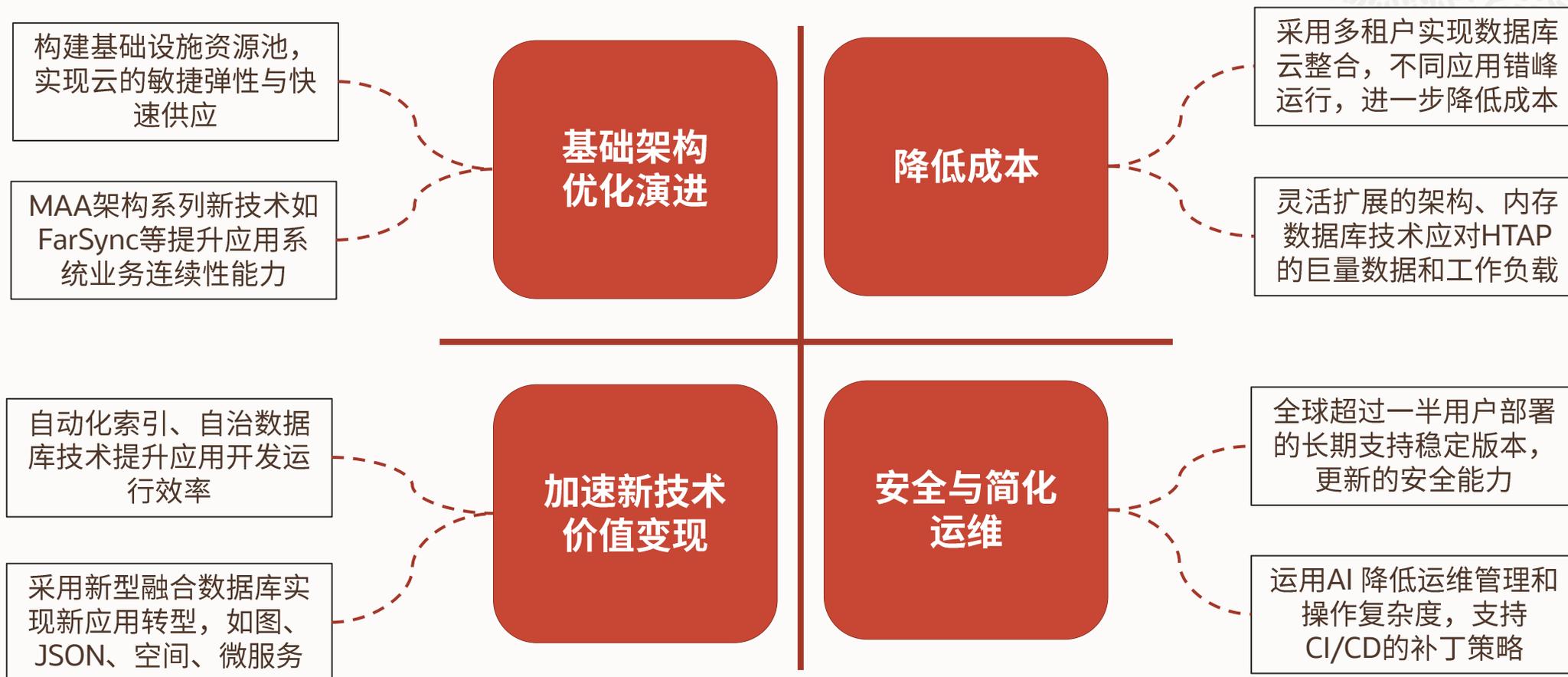
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升级到 Oracle 19c：产品兼容性、性能和应用开发注意事项

甲骨文技术公益课 – 数据库专场

2023 年 5 月 19 日 11:00

线上直播

赵靖宇（Alfred Zhao）

Oracle 19c 升级的价值

构建基础设施资源池，实现云的敏捷弹性与快速供应

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Oracle Database 19c:升级/迁移方法

下面是根据操作系统、字节序、版本、数据库大小和停机窗口的不同而采用的常用方法

方法	说明
Export / Import	适用所有版本和平台，要使用Data Pump需要10.1.0.2或更高版本，停机时间长
Transportable Tablespaces Sets(TTS) Cross-Platform Transportable Tablespace Sets(XTTS)	8i及以后：TTS（从8i开始），XTTS(从10g开始，支持跨平台） 相同的字符集和国家字符集，如果跨字节序（10g+)，需要配合RMAN's convert
RMAN's convert function for Transportable Tablespaces	10g及以后版本，可以跨endianness，字符集要兼容 转换动作可以在Source或Target完成，需要额外的临时工作空间，不支持SYSTEM/SYSAUX
Transportable Database（Data Pump Full Transportable）	11.2.0.3及以后版本,字符集要兼容，12c开始RMAN支持跨字节序转换
XTTS with RMAN Cross Platform Incremental Backups new	11.2.0.4及以后版本,字符集要兼容
Create Table As Select (CTAS)，SQL*Loader，Copy	需注意表属性、约束、数据类型的限制
Dataguard Heterogeneous Primary and Physical Standbys	Data Guard异构的限制
Oracle GoldenGate	支持异构或停机时间极小的场景
ZDM (零停机迁移)	自动工具，协助客户把本地数据库迁移到云端数据库或Exadata/ExaCC

参考：Migrating Oracle Databases to Database Cloud Service
      Transportable Tablespace (TTS) Restrictions and Limitations: Details, Reference, and Version Where Applicable [Document 1454872.1]
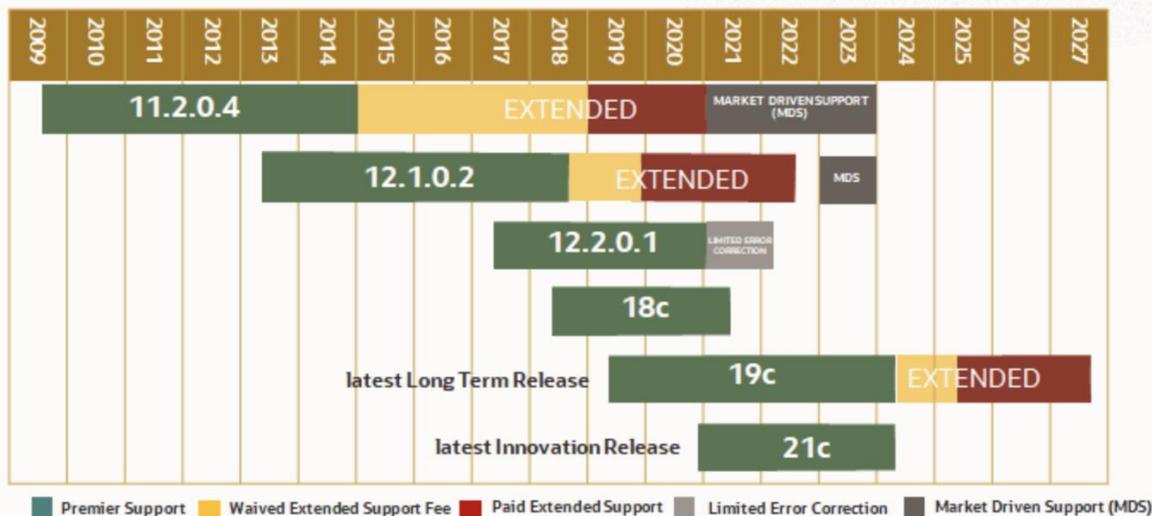   Best Practices for Using Transportable Tablespaces (TTS) [Document 1457876.1]

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Oracle数据库版本路线图
Release Schedule of Current Database Releases (Doc ID 742060.1)

Database Releases and Support Timelines

19c	2025年4月30日，没有ES/ULA	• Premier Support (PS)将于2024年4月30日结束；2024年5月1日至2025年4月30日之间的EXS费用将被免除。从2025年5月1日起至2027年4月30日期间，需要支付 Extended Support(ES)费用
Long Term Release	2027年4月30日，有ES/ULA	• 错误更正/补丁，付费的ES可到2027年4月30日；没有付费的ES，有效期到2025年4月30日
		• 从 2022 年 10 月的补丁周期开始，19.17.0 及更高版本将不再提供 19c RUR。在 2023 年 1 月交付 Oracle Database 19c RUR 19.16.2 之后，不会在任何平台上交付额外的 RUR。更多细节请参考文档 Sunsetting of 19c RURs and FAQ (Doc ID 2898381.1))
		• 为了让客户更频繁地访问推荐和经过良好测试的补丁集合，Oracle 从 2022 年 11 月开始推出 Monthly Recommended Patches (MRP)。 MRP 仅支持 Linux x86-64 平台。(更多细节请参考文档 Introducing Monthly Recommended Patches (MRPs) and FAQ (Doc ID 2898740.1))

19c是目前长期支持版本

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议程
Oracle 19c产品兼容性、性能和应用开发及注意事项

Oracle 19c 兼容性

Oracle 19c 性能差异

Oracle 19c 应用开发

Oracle 19c 新特性说明

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Oracle 19c 兼容性

低版本客户端兼容问题

12.2: ORA-28040 Followed by ORA-1017 When Client is Under Version 12. (Doc ID 2296947.1)

19C数据库默认不支持11G客户端访问也不支持12.1客户端访问，可以通过修改SQLNET.ORA设值相关参数后，方可连接。

SYMPTOMS

Following a recent database upgrade to 12.2, an 11gR2 client might suddenly start to fail to connect to the database with an error ORA-28040.

This is a common problem with 12c and newer instances. In this case, the ORA-28040 is easily resolved with the server side sqlnet.ora file setting for SQLNET.ALLOWED_LOGON_VERSION_SERVER=10 or 11.
It's important to note that the default setting for this parameter at the 12.2 server has been changed from 11 in version 12.1.
The default in version 12.2 is now '12'. So a client that might have been able to connect to 12.1 may start to fail after an upgrade to 12.2.

However, once the ORA-28040 error is cleared, the client still cannot connect and a persistent ORA-1017 is returned.
This is despite full confidence in the credentials being supplied by the user.

ORA-28040: No matching authentication protocol

ORA-01017: invalid username/password

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低版本客户端兼容问题

demo

模拟用户操作，知晓这个问题，去修改
sqlnet.ora文件，增加了
SQLNET.ALLOWED_LOGON_VERSION_SERVER=10

再次连接，依然报错ORA-28040？
然后说无法解决，大家想想这是为什么呢？

因为修改是grid用户下的此文件，而且用户理由很充分：分别查看grid和oracle用户，发现只有grid用户下的
$ORACLE_HOME/network/admin下有这个sqlnet.ora文件。

```
C:\Users\Alfred>sqlplus -v

SQL*Plus: Release 11.2.0.1.0 Production


C:\Users\Alfred>sqlplus test/test@192.168.1.11/jingyu

SQL*Plus: Release 11.2.0.1.0 Production on 星期二 5月 16 20:47:06 2023

Copyright (c) 1982, 2010, Oracle.  All rights reserved.

ERROR:
ORA-28040: No matching authentication protocol


请输入用户名：
C:\Users\Alfred>sqlplus test/test@192.168.1.11/jingyu

SQL*Plus: Release 11.2.0.1.0 Production on 星期二 5月 16 20:51:36 2023

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ERROR:
ORA-28040: No matching authentication protocol


请输入用户名：
```

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低版本客户端兼容问题
demo

正确在oracle用户下对应位置新增/修改
sqlnet.ora文件，增加设置：
SQLNET.ALLOWED_LOGON_VERSION_SERVER=10

再次连接，又有新报错ORA-01017？
这又是为什么呢？如何解决？

解决方案也很简单，只需要重新设置下用户密码，这样再次连接就正常了。

```
C:\Users\Alfred>sqlplus test/test@192.168.1.11/jingyu

SQL*Plus: Release 11.2.0.1.0 Production on 星期二 5月 16 20:56:43 2023

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ERROR:
ORA-01017: invalid username/password; logon denied

请输入用户名:
C:\Users\Alfred>sqlplus test/test@192.168.1.11/jingyu

SQL*Plus: Release 11.2.0.1.0 Production on 星期二 5月 16 20:58:58 2023

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连接到:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

SQL> _
```

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低版本客户端兼容问题
MOS文档已给出详细解决方案

SOLUTION

1) Set SQLNET.ALLOWED_LOGON_VERSION_SERVER at server side sqlnet.ora file to 10 for 11.2.0.1 client.
(11.2.0.3 client should be able to use a setting of 11)

The default location for the sqlnet.ora file that is referenced by the database is not GRID. It's RDBMS_HOME/network/admin.

2) Make sure the CASE_SENSITIVE_PASSWORD parameter is set to TRUE (FALSE is no longer allowed in 12.2)

SQL> alter system set SEC_CASE_SENSITIVE_LOGON=true;

3) Change password for the user AFTER this setting is in place. If userid/password was created PRIOR to this setting, changing it again may be necessary as this setting impacts the algorithm.

SQLNET.ALLOWED_LOGON_VERSION_SERVER=10
(11 if client version is 11.2.0.3 or newer)

 ***Important note: The information in this document does NOT supersede the Interoperability guide for **supported** versions:

Note: 207303.1 Client / Server Interoperability Support Matrix for Different Oracle Versions

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客户端和服务端版本兼容一览表

Client / Server Interoperability Support Matrix for Different Oracle Versions (Doc ID 207303.1)

Client Version	Server Version									
	21c	19c	18c	12.2.0	12.1.0	11.2.0	11.1.0	10.2.0	10.1.0	9.2.0
21c	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
19c	Yes	Yes	Yes	Yes	Yes	Yes[#9]	No	No	No[#3]	No[#3]
18c	Yes	Yes	Yes	Yes	Yes	Yes[#9]	No	No	No[#3]	No[#3]
12.2.0	Yes	Yes	Yes	Yes	Yes	Yes[#9]	No	No	No[#3]	No[#3]
12.1.0	Yes	Yes	Yes	Yes	Yes	Yes	Was	Was[#7]	No[#3]	No[#3]
11.2.0	No	Yes[#9]	Yes[#9]	Yes[#9]	Yes	Yes	Was	Was[#7]	No	Was[#5]
11.1.0	No	No	No	No	Was	Was	Was	Was[#7]	Was[#6]	Was[#5]
10.2.0	No	No[#10]	No[#10]	No[#10]	Was[#7]	Was[#7]	Was[#7]	Was	Was	Was[#5]
10.1.0[#4]	No	No	No	No	No	Was[#6]	Was[#6]	Was	Was	Was
9.2.0	No	No	No	No	No[#8]	Was[#5]	Was[#5]	Was[#5]	Was	Was

Yes	Supported
ES	Supported but fixes only possible for customers with Extended Support.
MDS	Supported, but fixes only possible for customer with a valid Market-Driven Support contract.
Was	Was a supported combination but one of the releases is no longer covered by any of Premier Support, Primary Error Correct support, Extended Support, nor Extended Maintenance Support. Fixes are no longer possible.
No	Has never been Supported

SCN算法兼容问题

ANNOUNCEMENT: Recommended patches and actions for Oracle databases versions 12.1.0.1, 11.2.0.3 and earlier – before June 2019 (Doc ID 2361478.1)

FAQ & Reference: Recommended patching and actions for Oracle database versions 12.1.0.1, 11.2.0.3 and earlier - before June 2019 (Doc ID 2335265.1)

SCN算法改变，需要特别注意与低版本SCN DBLINK访问导致SCN上限问题。

Oracle 在 2019 年 6 月 23 日后自动调整高版本的数据库 SCN COMPATIBILITY 为 3，调整之后，这些数据库内部的 SCN 上限增速会变成 96k, 从而可能出现超出低版本的 SCN 的情况，如果发生这种情况，将会导致低版本数据库无法与高版本通过 DB Link 进行连接。

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SCN算法兼容问题
解决方案

1. 无需关注

- 如果你的环境数据库版本有统一的基线，那就无需关注此问题
- 如果你的环境完全禁止使用dblink连接，也无需关注此问题

2. 禁用高版本的自动调整（不推荐）

- 如果你的环境绝大部分都是低版本，只有个别的高版本，可以考虑将高版本的SCN自动调整禁用

3. 低版本应用补丁或升级（推荐）

- 按照Oracle建议将所有数据库均升级到最新长期支持版本
- FYI: https://www.cnblogs.com/jyzhao/p/10184142.html

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物化视图和DBLINK的使用

Refresh of Materialized View With Joins Over Local and Remote Primary Tables is Taking Longer After Upgrading to 19c (Doc ID 2718349.1)

Scheduled Job to Refresh a Materialized View With DB Link fails with ORA-01017 (Doc ID 2648742.1)

➢ 升级19c后，通过dblink连接本地和远程主表上的物化视图刷新时间较慢。

➢ 通过dblink连接的远程物化视图可能无法刷新。

APPLIES TO:

Oracle Database - Enterprise Edition - Version 12.1.0.2 and later
Information in this document applies to any platform.

GOAL

Materialized view that uses a public db link. This materialized view works when manually refreshing it. You have created a scheduled job to refresh this materialized view. The job fails each time with "error occurred when looking up remote object" and "invalid username/password; logon denied". If you manually try to run it and choose "Do not use current session", it fails giving the same error. If you choose "Use current session", it works. You have also tested the dblink with the same user and can connect with no problem. Below are the complete errors you will see :-

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Catalog版本兼容问题

Upgrade Recovery Catalog fails with RMAN-07539: insufficient privileges (Doc ID 1915561.1)

Upgrade Catalog fails with RMAN-07539: insufficient privileges to upgrade the catalog schema When using 19c Rman executable (Doc ID 2558120.1)

How to upgrade RMAN catalog SCHEMA from 11g to 12.1.0.2 without upgrading the catalog database (Doc ID 1970049.1)

Catalog和数据库的兼容问题
如果备份使用到Catalog，建议新搭建全新的Catalog数据库，简化管理，避免麻烦。

如果近期只升级RMAN catalog，暂不升级catalog数据库，需要测试验证。

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密码版本兼容问题

Back And Restore Steps For Username And Password Along With PASSWORD_VERSIONS (Doc ID 2810477.1)

升级后用户密码版本会有变化，有些场景需要关注。

举例来说，典型场景是采用OGG升级迁移方案，由于用户较多且都是强密码，因此有很多做实施的工程师就会采用"复制"USER$中密码的方法创建用户。

而这种情况就尤其需要特别注意版本变化带来的差异，否则就会有用户无法连接的问题。

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密码版本兼容问题
demo

图中是19c数据库的查询结果示例：

可以发现user$中的password列已经为空，spare4列有存对应内容。

同时注意，如果你修改过 SQLNET.ALLOWED_LOGON_VERSION_SERVER，对应的密码版本也会随之变化。

```
SQL> select username, password_versions from dba_users
  2  where username = 'JINGYUADM';

USERNAME                            PASSWORD_VERSIONS
--------------------------------    -----------------
JINGYUADM                           11G 12C

SQL> select name, password, spare4 from user$ where name = 'JINGYUADM';

NAME                    PASSWORD    SPARE4
--------------------    --------    ------------------------------------------
JINGYUADM                           S:BA88F27C1ECDEBD77873EC9E0535ECF3E262A0
                                    C2CB444FEB24BE69566D77;T:693AFC13A86FB65
                                    6E0B7673DA93662DDFC48E2A96AA8E163995DE88
                                    1645FB520DE5ECFFC1EB5C64664407BAFF9830B2
                                    EF489271A2514435ADE3CCB1C592E3329145DC9E
                                    43B5834BA0963EA4BCB4E9E0A
```

```
SQL> select username, password_versions from dba_users
where username = 'TEST';  2

USERNAME                            PASSWORD_VERSIONS
--------------------------------    -----------------
TEST                                10G 11G 12C

SQL> select name, password, spare4 from user$ where name = 'TEST';

NAME                    PASSWORD    SPARE4
--------------------    --------    ------------------------------------------
TEST                    7A0F2B316C  S:EB377036CED9F0CC6B51BDC4F875B13D4E9772
                        212D67      68CE60A39E950A20A142BC;T:81B049A7414AD53
                                    496944E74FCC7A406219030C46C4F7C2BEB86B6B
                                    A6296E430AB0E5FC4BB9D5BB5ACC085314354E49
                                    FC880196C887E28A6DE13B68158C2478B023C0C5
                                    F6553F443000971F75A6CB205
```

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进程内存消耗问题

PGA memory size of Wnnn process is extremely increasing (Doc ID 2634588.1)

Server Process Memory Increased For 18.4 On AIX 7.2 Compared To 18.4 On AIX 7.1 (Doc ID 2570551.1)

需要注意观察升级19c后进程占用的内存情况，建议在规划时就需要注意下内存，尤其是连接数很多的场景，具体可参考实际压力测试结果。

实际不只数据库版本升级需要注意，OS版本升级等场景同样需要观察这个变化。

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升级到19c后不再支持的参数

https://docs.oracle.com/en/database/oracle/oracle-database/19/upgrd/behavior-changes-deprecated-desupport-oracle-database.html#GUID-1B92CC8E-B812-4D30-ACF4-A3050D12581E

Desupported Parameters in Oracle Database 19c

As part of your upgrade plan, review the initialization parameters that are not supported starting with this Oracle Database release.

EXAFUSION_ENABLED Initialization Parameter Desupported

The Oracle Exadata Database Machine initialization parameter `EXAFUSION_ENABLED` is desupported in Oracle Database 19c.

MAX_CONNECTIONS attribute of LOG_ARCHIVE_DEST_n Desupported

The `MAX_CONNECTIONS` attribute of the `LOG_ARCHIVE_DEST_n` parameters for Oracle Data Guard Redo Transport is obsolete. It is desupported in Oracle Database 19c.

Desupport of O7_DICTIONARY_ACCESS

The initialization parameter `O7_DICTIONARY_ACCESSIBILITY` is desupported in Oracle Database 19c.

Desupport of OPTIMIZE_PROGRESS_TABLE Parameter

`OPTIMIZE_PROGRESS_TABLE` for Oracle GoldenGate Integrated Replicat, XStream In, and Logical Standby, is desupported in Oracle Database 19c.

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升级到19c后不再支持的特性

https://docs.oracle.com/en/database/oracle/oracle-database/19/upgrd/behavior-changes-deprecated-desupport-oracle-database.html#GUID-4B922F38-109D-42DF-B2AD-698E9FD8A8DE

Desupported Features in Oracle Database 19c

As part of your upgrade plan, review the desupported features in this Oracle Database release.

Desupport of Oracle Data Provider for .NET Promotable Transaction Setting

The Oracle Data Provider for .NET `PromotableTransaction` setting is desupported because it is no longer necessary. All compatible database server versions support transaction promotion.

Desupport of Oracle Multimedia

Oracle Multimedia is desupported in Oracle Database 19c, and the implementation is removed.

Desupport of the CONTINUOUS_MINE feature of LogMiner

The `continuous_mine` option for the `dbms_logmnr.start_logmnr` package is desupported in Oracle Database 19c, and is no longer available.

Desupport of Extended Datatype Support (EDS)

The Extended Datatype Support (EDS) feature is desupported in Oracle Database 19c. All Data types that the EDS feature supported are now supported natively by both Logical Standby and Oracle GoldenGate.

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OS版本/DB版本/服务器硬件兼容性
案例

业务影响：
应用对数据库发起连接偶发TNS超时，对于跑批程序有影响（遇到超时需要人工干预）。

排查过程：
1.客户端ping数据库服务端，几百次没有丢包；telnet xx 数据库端口没有问题；
2.客户端tnsping数据库服务端，偶发TNS超时（基本tnsping xx 100，测试在100次中必然会出现超时情况），具体报错：
TNS-12535: TNS:operation timed out

3.客户端使用sqlplus直接登陆服务端，偶发超时（平均也是几十次会出现一次），具体报错:
ERROR:
ORA-12170: TNS:Connect timeout occurred

4.申请重启监听，故障现象没有变化；
5.了解客户端到服务端的网络，没有经过任何防火墙等设备，主机OS层面的防火墙也是关闭状态；
6.进一步检查监听相关配置、参数；
7.备份现有sqlnet.ora配置内容，尝试恢复默认设置测试，重启监听，故障现象没有变化；
8.调整sqlnet.ora配置，尝试设置SQLNET.INBOUND_CONNECT_TIMEOUT = 120（同时尝试过设置为0也不行），重启监听，故障现象均没有变化
9.开启监听的trace，客户端使用sqlplus直接登陆服务端，直到偶发超时，停止监听的trace；并申请获取，供后续深入分析；

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OS版本/DB版本/服务器硬件兼容性
案例

首先要求客户提交对应问题SR：

- 当客户提交某个具体问题的SR之后，只需将相关信息描述一遍，后续即使需要升级到售后部门其他工程师现场支持时，现场的工程师也都可以通过已提交的SR编号来检索看到具体问题详情，提升效率，也避免了问题前后沟通不一致的问题。

因为有SR相关信息，给解决问题带来了以下好处：

- 1. 现场支持时可以更高效的沟通，避免重复性工作；
- 2. 更快速的确认问题诊断方向；
- 3. 最终确认是L硬件和OS版本兼容性问题导致。

后续客户也通过这三项测试验证此结论：

- 1. D硬件上安装RHEL6.7，测试 tnsping 正常；
- 2. L硬件上安装RHEL6.7，测试 tnsping 问题复现；
- 3. L硬件将上面的OS升级为RHEL6.10，测试 tnsping 正常。

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OS版本/DB版本/服务器硬件兼容性
案例

是某个硬件天生就兼容性不好？
当然不是的！

从官网可以找到对应两款服务器硬件官
方支持认证的RHEL具体版本。
上面是L服务器，下面是D服务器。

原来L硬件本身就没有RHEL6.7的认证，
在RHEL6中只认证6.9及以上版本。

Supported Versions

Red Hat Enterprise Linux 6 (x86_64) (Certified)

Versions

Version Support

| 6.0 | 6.1 | 6.2 | 6.3 | 6.4 | 6.5 | 6.6 | 6.7 | 6.8 | 6.9 | 6.10 |

6.9+
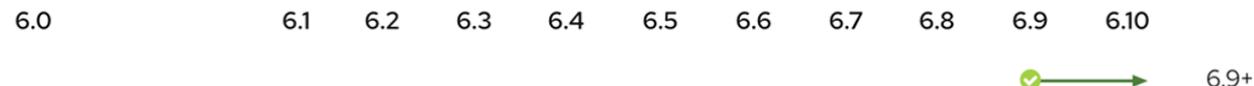
Supported Versions

Red Hat Enterprise Linux 6 (x86_64) (Certified)

Versions   Notes

Version Support

| 6.0 | 6.1 | 6.2 | 6.3 | 6.4 | 6.5 | 6.6 | 6.7 | 6.8 | 6.9 | 6.10 |

6.5+

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OS版本/DB版本/服务器硬件兼容性

MOS（support.oracle.com）首页那个认证（Certifications）的选项卡，可以查到操作系统os版本号和oracle数据库版本号是否官方认证支持。

FYI: https://www.cnblogs.com/jyzhao/p/16386494.html

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Oracle 19c 性能差异

SQL性能问题
FAQ: Database Upgrade Using Real Application Testing (Doc ID 1600574.1)

升级后，大部分SQL运行的更好了，部分SQL保持原样，可能存在少数SQL性能变差。
但只有少数变差的这部分SQL才被用户关注到，且很可能成为升级的"黑锅"。

为了预防升级后CBO新特性带来SQL性能突变所造成的业务影响，我们推荐通过RAT（SPA + DB replay）来评估预防。

Report Summary

Projected Workload Change Impact:

Overall Impact	: 7.32%
Improvement Impact	: 7.32%
Regression Impact	: 0%

SQL Statement Count

SQL Category	SQL Count	Plan Change Count
Overall	73	0
Improved	4	0
Unchanged	48	0
with Errors	3	0
Unsupported	18	0

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RAT推荐流程
SPA + DB Replay

```
┌─────────────────────────────────────────────────────┐
│           Step 1. Setup Test System                  │
└─────────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────────┐
│      Step 2. SQL response/unit testing: SPA*         │
└─────────────────────────────────────────────────────┘
                        │
                        ▼
                   < DONE? > ──No──→
                        │
                       Yes
                        │
                        ▼
┌─────────────────────────────────────────────────────┐
│      Step 3. Load Testing: Database Replay           │
└─────────────────────────────────────────────────────┘
                        │
                        ▼
                   < DONE? > ──No──→
                        │
                       Yes
                        │
                        ▼
┌─────────────────────────────────────────────────────┐
│            Deploy Change and Tuning                  │
└─────────────────────────────────────────────────────┘
```

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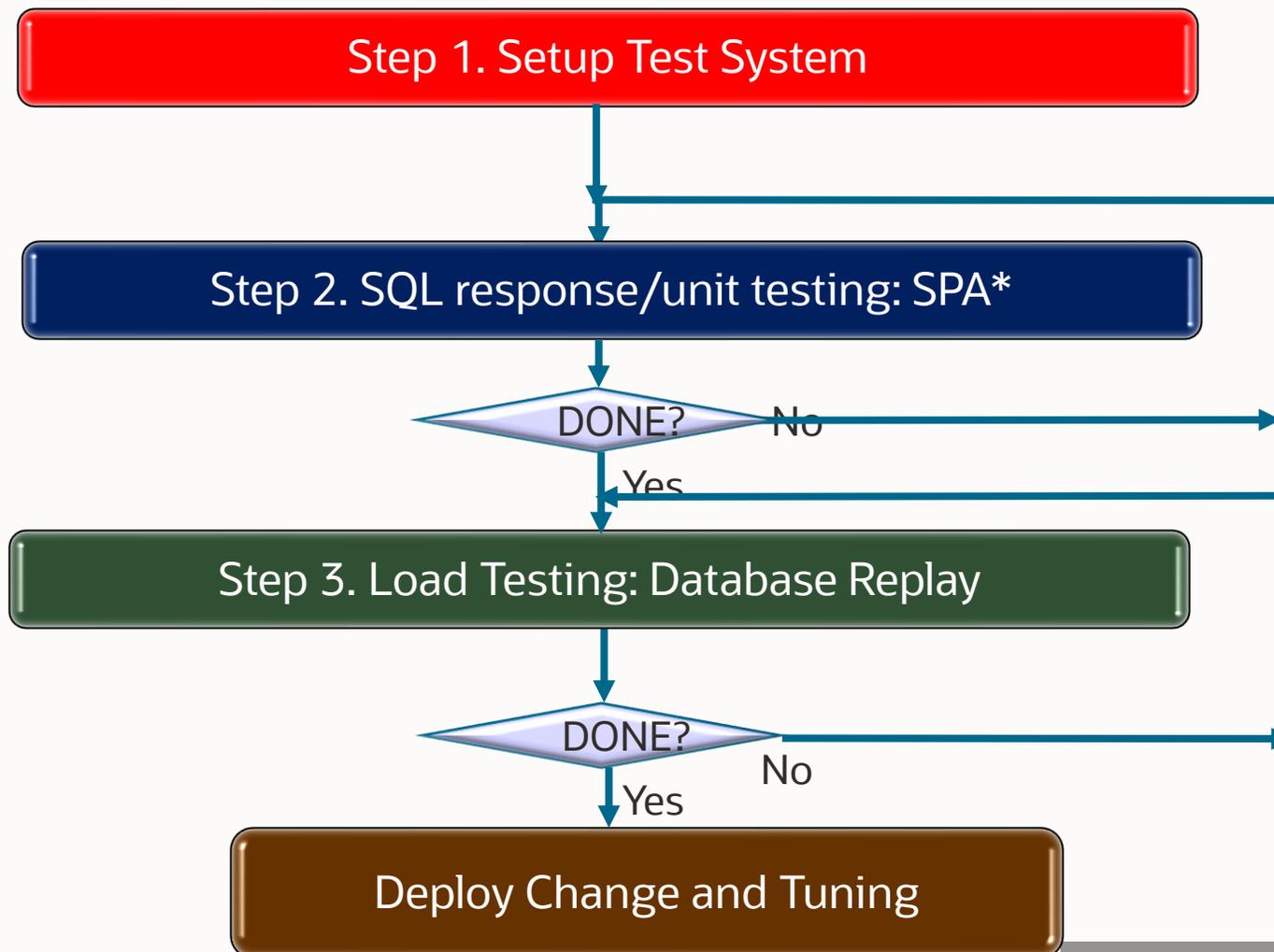
Oracle 19c 应用开发

JDBC版本兼容问题

JDBC Drivers To Be Used With Particular JDK Versions When Connecting to DB (Doc ID 2540148.1)

JDBC版本不匹配会导致应用连接报错/不稳定，需要使用和数据库版本匹配的ojdbc和jdk版本，防止使用不支持/有限支持版本的程序在连接数据库时出现各类问题。

针对这个风险点，需要提前规划，确保所有应用都及时升级到匹配的版本。

SCOPE

This document is applicable to WebLogic Server that uses the JDBC drivers to connect to Oracle Database.

DETAILS

 The Oracle JDBC driver is always compliant to the latest JDK version in each of the new releases. In some versions, JDBC drivers support multiple JDK versions. Use the table below to choose the correct JDBC driver based on your preferred JDK version.

Oracle Database version	JDBC Jar files specific to the release
19.3	ojdbc10.jar with JDK10, JDK11 ojdbc8.jar with JDK8, JDK9
18.3	ojdbc8.jar with JDK8, JDK9, JDK10, JDK11
12.2 or 12cR2	ojdbc8.jar with JDK 8
12.1 or 12cR1	ojdbc7.jar with JDK 7 and JDK 8 ojdbc6.jar with JDK 6
11.2 or 11gR2	ojdbc6.jar with JDK 6, JDK 7, and JDK 8 (Note: JDK7 and JDK8 are supported in 11.2.0.3 and 11.2.0.4 only) ojdbc5.jar with JDK 5

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WM_CONCAT函数

WMSYS.WM_CONCAT Should Not Be Used For Customer Applications, It Is An Internal Function (Doc ID 1336219.1)

12c之后已不支持该函数（行列转换函数，替代函数LISTAGG）。

SOLUTION

WMSYS.WM_CONCAT function is used internally and for this reason it is UN-documented.

Oracle Development uses internal procedure/functions like **WMSYS.WM_CONCAT** to support Oracle products.

Oracle suggests that customers do not use internal objects, procedures, data dictionary tables in their applications because they may be changed at any time.

If Oracle Development needs to change this function, to correct a bug or enhance performances, they make all the changes internally and the changes are NOT published.

Any non-Oracle document found on Internet referring to this function is not reliable. Anything Oracle does support, is documented in our guides and/or published documents searchable on MyOracle Support.

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某些古老的字符集在12c之后被整合
Can Not Find WE8ISO8859P1 Character Set In 12.2 DBCA (Doc ID 2299515.1)

创建数据库时候不能直接选择某些不推荐的字符集，比如WE8ISO8859P1。

这也是为什么建议大家规划时，尽量主流。

特别要说明的是，有时候开发人员对字符集的概念/要求不一定和DBA理解的完全一致，通常来说，目前Oracle选择默认的AL32UTF8即可。

历史有些客户选择的ZHS16GBK，可以继续使用，其余都不建议。
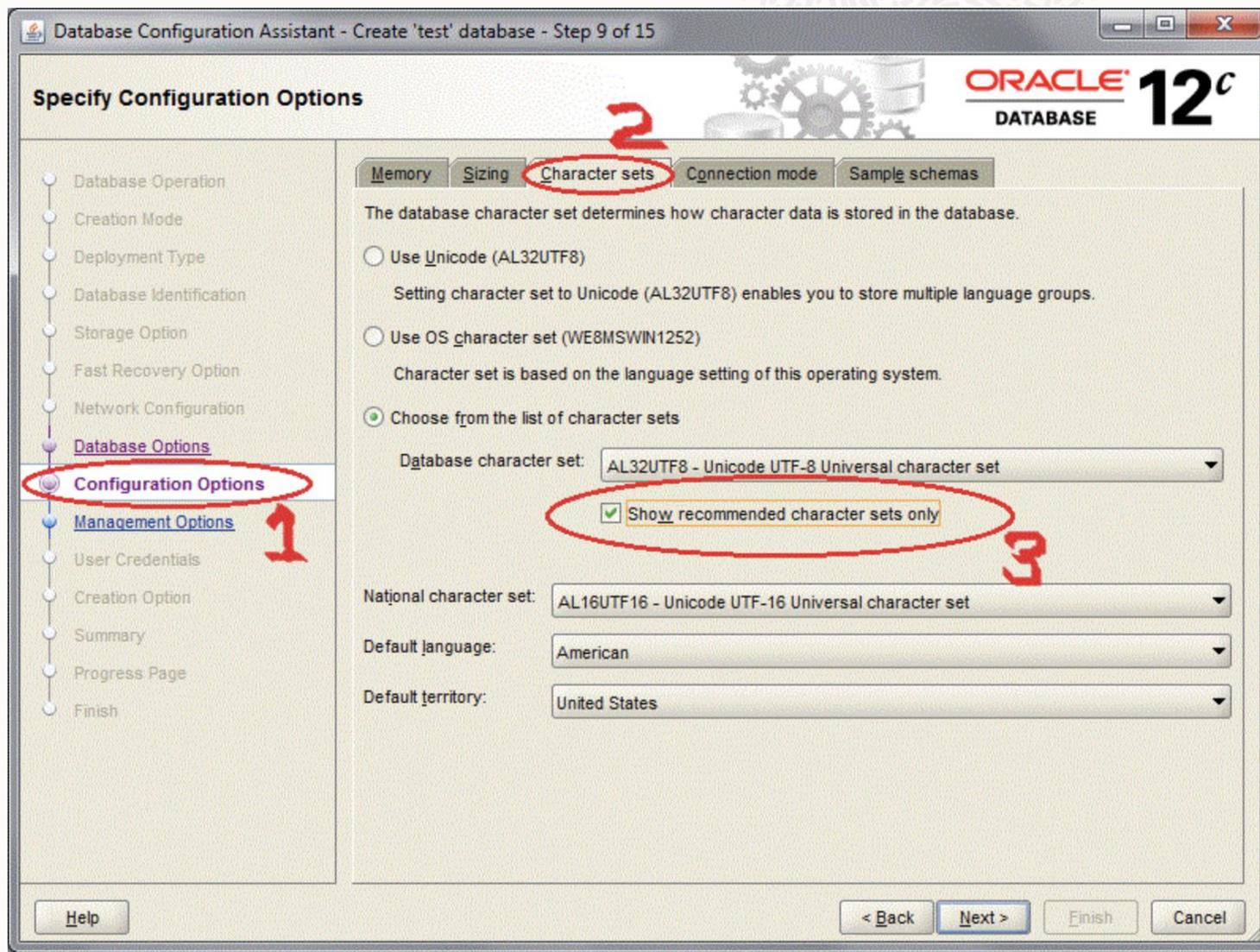
19C放开了对象名称长度限制

How to Increase the Maximum Size of VARCHAR2, NVARCHAR2, and RAW Columns in 12C Database using MAX_STRING_SIZE ? (Doc ID 1570297.1)

若你选择增加了VARCHAR2的最大长度，会导致19C的数据库数据无法导入到其他老版本数据库。

比如当生产库升级19C后，原OLAP相关分析库无法导入生产数据。

建议合理规划，慎重设置max_string_size参数。

SOLUTION

NOTE! As per note 2142799.1, E-Business Suite currently can only use the default value 'STANDARD' for max_string_size.

As `MAX_STRING_SIZE` controls the maximum size of `VARCHAR2`, `NVARCHAR2`, and `RAW` data types in SQL.

`MAX_STRING_SIZE = STANDARD` means that the length limits for Oracle Database releases prior to Oracle Database 12c apply (for example, 4000 bytes for `VARCHAR2` and `NVARCHAR2`, and 2000 bytes for `RAW`).

`MAX_STRING_SIZE = EXTENDED` means that the 32767 byte limit introduced in Oracle Database 12c applies.

You can change the value of `MAX_STRING_SIZE` from `STANDARD` to `EXTENDED`. However, you cannot change the value of `MAX_STRING_SIZE` from `EXTENDED` to `STANDARD`.

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APEX组件
Cannot Log in to APEX After Database Upgrade (Doc ID 434878.1)

APEX在数据库升级后可能会有一些问题，如使用该组件，需要测试验证其可用性。

SYMPTOMS

The database has been upgraded to a higher version. The APEX version has not changed for the installation. After the upgrade, the following error occurs when trying to login to APEX:

```
ORA-06550: line 1, column 35: PLS-00201: identifier 'SYS.DBMS_CRYPTO' must be declared ORA-06550:
line 1, column 7: PL/SQL: Statement ignored
```

CHANGES

Database has been upgraded.

CAUSE

'SYS.DBMS_CRYPTO' is a package for password management in APEX. As a part of the database upgrade, this package was recreated. As a result, the permissions to this procedure were lost. If the package gets re-created during the upgrade, then the permissions need to manually granted to the APEX user.

SOLUTION

To implement the solution, please execute the following steps:
1. Manually grant permission SYS.DBMS_CRYPTO to the APEX schema FLOWS_xxxxxx / APEX_xxxxxx where 'xxxxxx' represents the APEX version. For example, the command for APEX 2.2 would be:

```
grant execute on SYS.DBMS_CRYPTO to FLOWS_020200;
```

2. After that rerun the APEX URL.

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Oracle 19c 新特性说明

CDB架构
Oracle Support For Non-CDB Database (Doc ID 2808317.1)

19c还可以选择，用户要考虑是否使用CDB架构，Oracle建议使用，哪怕CDB上面只跑一个PDB；
在21c之后版本就没有选择了。

APPLIES TO:

Oracle Database - Enterprise Edition - Version 19.3.0.0.0 and later
Information in this document applies to any platform.

GOAL

Questions

Will oracle stop/close support for non-CDB[19c onwards] database?
Is there any timeline for that?

SOLUTION

You can still use non-CDB (regular architecture) in 12c and up to 19c, however, the non-CDB architecture is deprecated since Oracle Database 12c, and may be desupported and unavailable in a future release (21c - innovation release).

Starting in Oracle Database 21c, a multitenant container database is the only supported architecture. In previous releases, Oracle supported non-container databases (non-CDBs).

This means that from 21c you won't be able to install the "traditional" database. If you stay current with your database releases, i.e. you don't run any releases that are out of support, at some point in time you will have to move to the CDB/PDB architecture.

But you won't be forced to convert a traditionally set up database running on 12.1.0.2 or 19c to a CDB/PDB database.

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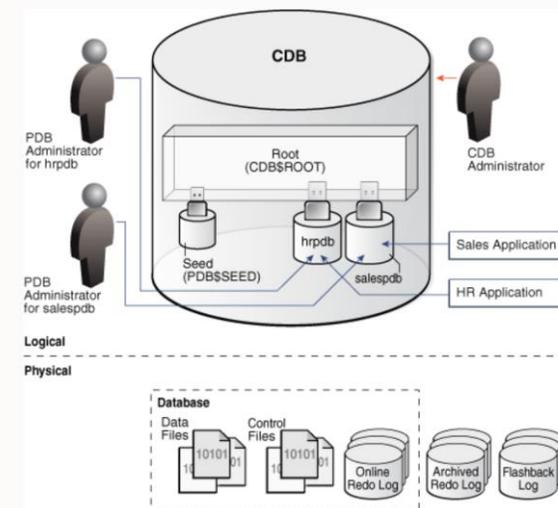
IN-Memory特性

Customer RecommendedOracle Database In-Memory Option (DBIM) Basics and Interaction with Data Warehousing Features (Doc ID 1903683.1)

要考虑是否预留IN-Memory的内存空间；

System Global Area (SGA)

Buffer Cache

Large Pool

In-Memory Area (Max 16GB)

Other

Shared Pool

Log Buffer

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Schema-Only Accounts特性
HOW TO CHECK EXPIRED PASSWORD ACCOUNTS BECAME SCHEMA-ONLY ACCOUNTS AFTER UPGRADE (Doc ID 2601465.1)

如果之前应用中有使用密码授权认证方式访问缺省的Oracle数据库账户，需要先将对应的Account切换到Normal Account。比如OEM等监控软件常会使用到DBSNMP用户。

```
Before Upgrade (11.2.0.4)

SQL> SELECT username,
  2         account_status,
  3         authentication_type
  4  FROM   dba_users
  5  WHERE ROWNUM < 10;

USERNAME                      ACCOUNT_STATUS       AUTHENTI
----------------------------- -------------------- --------
SYSTEM                        OPEN                 PASSWORD
SYS                           OPEN                 PASSWORD
SYSBACKUP                     EXPIRED & LOCKED     PASSWORD
SYSRAC                        EXPIRED & LOCKED     PASSWORD
OJVMSYS                       EXPIRED & LOCKED     PASSWORD
SYSKM                         EXPIRED & LOCKED     PASSWORD
OUTLN                         EXPIRED & LOCKED     PASSWORD
SYS$UMF                       EXPIRED & LOCKED     PASSWORD
SYSDG                         EXPIRED & LOCKED     PASSWORD

9 rows selected.


SQL>
```

```
After Upgrade (19.3.0.0)

SQL> SELECT username,
  2         account_status,
  3         authentication_type
  4  FROM   dba_users
  5  WHERE ROWNUM < 10;

USERNAME                      ACCOUNT_STATUS       AUTHENTI
----------------------------- -------------------- --------
SYSTEM                        OPEN                 PASSWORD
SYS                           OPEN                 PASSWORD
SYSBACKUP                     LOCKED               NONE
SYSRAC                        LOCKED               NONE
OJVMSYS                       LOCKED               NONE
SYSKM                         LOCKED               NONE
OUTLN                         LOCKED               NONE
SYS$UMF                       LOCKED               NONE
SYSDG                         LOCKED               NONE

9 rows selected.


SQL>
```

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Oracle 19c 数据库新特性指引

https://docs.oracle.com/en/database/oracle/oracle-database/19/newft/new-features.html

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总结

总结
遇事不决，以官方文档、MOS文档及具体SR回复为准！

1.产品兼容性"问题"?

- 选择正确的客户端、服务端版本；
- 确认不再支持的参数/特性并未使用过。

2.升级后性能"问题"?

- 通过RAT（SPA + DB Replay）进行分析报告，做到心中有数；
- 应用本身也要做好充分的测试。

3.应用开发"问题"?

- 选择正确的JDBC等版本；
- 不要使用O内置函数等未在文档中说明的功能；

4.新特性说明

- 多租户架构；
- In-Memory；

Help Center

https://docs.oracle.com/en/

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GoldenGate的现在与未来

GG 007再次来到中国，
这次他带着什么神秘任务？

- Oracle研发总部GoldenGate 产品管理团队高级总监
- 1998年加入GoldenGate公司成为第7号员工，人称GG 007
- 2009年随着被收购加入Oracle,领导全球信息集成支持团队到2015年
- 2015年加入初创公司Striim, 2017年重返Oracle
- 聚焦于GoldenGate云，与Oracle SaaS应用集成和客户成功案例

贺文玮

内容简介

- 高层次路线图
- 云和多云
- 微服务
- 大数据等多个维度

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扫描二维码进入直播
Zoom ID : 957 9669 6723
密码：20212023

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数据库和云讲座群

20-21

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