



Oracle Golden Gate: High Available Off-Box and HUB Configurations

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(Oracle Certified Master and Oracle ACE Director)

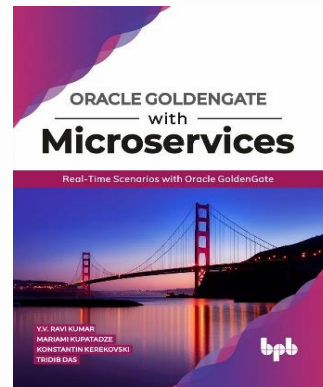
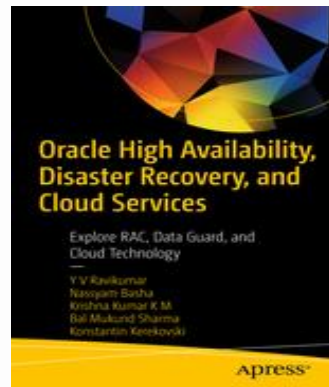
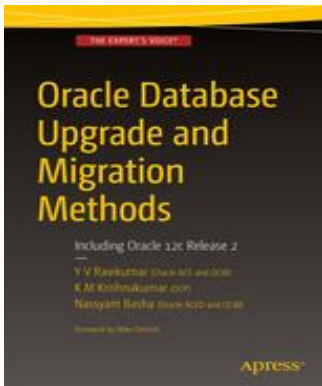


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- **Oracle** Certified Master (OCM)
- **Oracle** ACE Director
- Co-author - **Oracle** (3) books
 - **Oracle** Database Upgrade and Migration Methods (Includes 12cR2)
 - **Oracle** High Availability, Disaster Recovery, and Cloud Services
 - **Oracle** GoldenGate with MicroServices
- Co-Author - 100+ **Oracle** Technology Network (OTN) - English, Portuguese & Spanish
- Speaker 2x @ **Oracle** Open World | Independent Oracle User Group (IOUG), US
- Holding “Silver Badge” in **Oracle** Community (<https://community.oracle.com>)



500+ Technical Experts Helping Peers Globally



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ACE Associate

bit.ly/OracleACEProgram

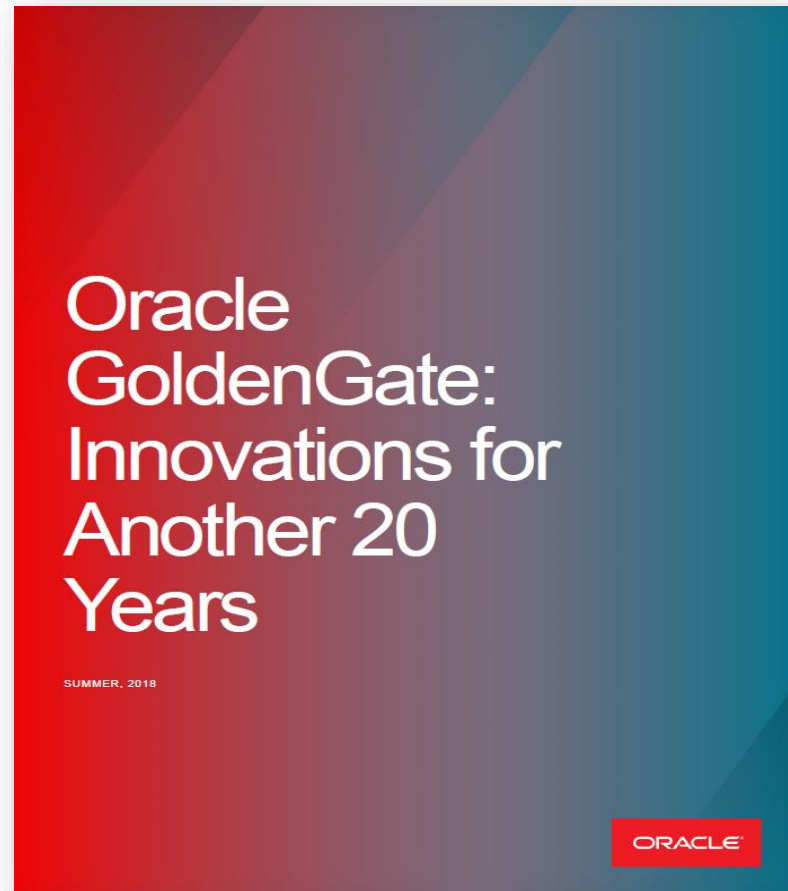
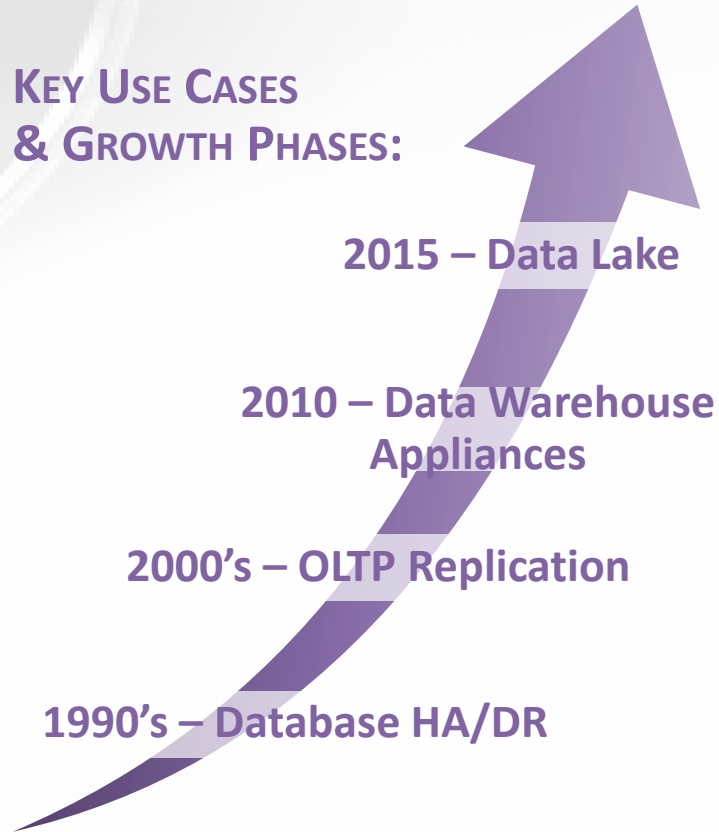
Nominate yourself or someone you know: acenomination.oracle.com

Oracle Golden Gate: High Available Off-Box and HUB Configurations



- 1** Oracle Golden Gate Architecture
- 2** Oracle Golden Gate Multi Cloud Capabilities
- 3** Oracle Golden Gate Improvements
- 4** Oracle Golden Gate HUB Architecture and Benefits
- 5** Oracle Golden Gate HUB Component Certifications
- 6** Oracle ACFS Architecture Overview
- 7** Oracle Grid Infrastructure Bundled Agent (XAG)
- 8** Oracle Golden Gate HUB combinations

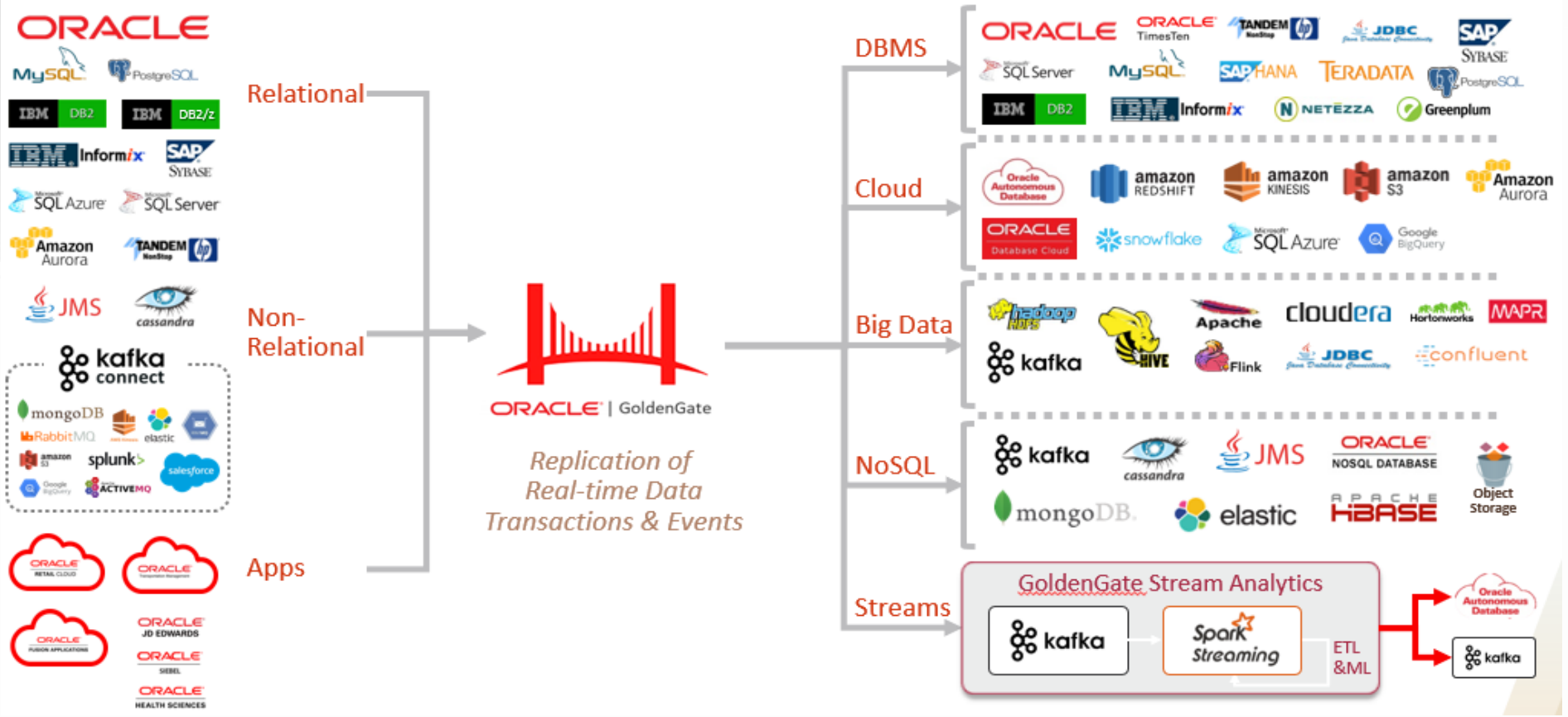
KEY USE CASES & GROWTH PHASES:



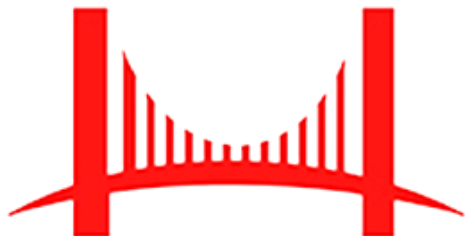
Oracle Golden Gate | Multi-Cloud Capabilities



Oracle Golden Gate | The Complete Platform



Oracle Golden Gate | Continuous Improvements



ORACLE | GoldenGate

GoldenGate 12.2

- Meta Data in Trail
- Automated Heartbeat Table
- Parameter File Validation
- HA Enhancements
- Extended Metrics
- Oracle Database Simplified Instantiation
- 9 Digit Trail File

12.2

GG for Big Data

GoldenGate 12.3

- Microservices Architecture
- Parallel Replicat
- Auto CDR
- Sharding Support
- Procedural Replication
- Expanded Database 12.2 Support

12.3

GG Cloud

GoldenGate 18.1

- Oracle Database 18c
- Support for ADW and ATP
- Support for identity columns
- Support for in-row archival
- Microservices Enhancements
- Auto CDR Enhancements

18c

Stream Processing

GoldenGate 19.1

- Oracle Database 19c
- Microservices Security and Manageability
- Performance and Scalability Improvements
- Simplifying the GoldenGate Experience

19c

GG OCI Market Place

- ✓ Oracle Golden Gate provides **low-impact capture, routing, transformation**, and delivery of database transactions across heterogeneous environments in near-real time.
- ✓ Oracle Golden Gate enables the exchange and manipulation of data at the transaction level among multiple, **heterogeneous platforms** across the enterprise.
- ✓ Oracle Golden Gate moves **committed transactions from redo logs** and maintains transaction integrity with sub-second latency.
- ✓ Oracle GG uses its own **Commit Sequence Number (CSN)** to identify a transaction which based on the **Oracle Database SCN (System Change Number)**.
- ✓ Complete data recoverability via trail files.

Oracle Golden Gate Topologies

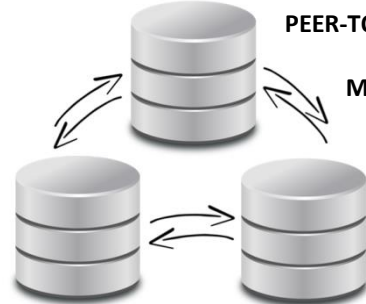
UNIDIRECTIONAL QUERY OFFLOADING



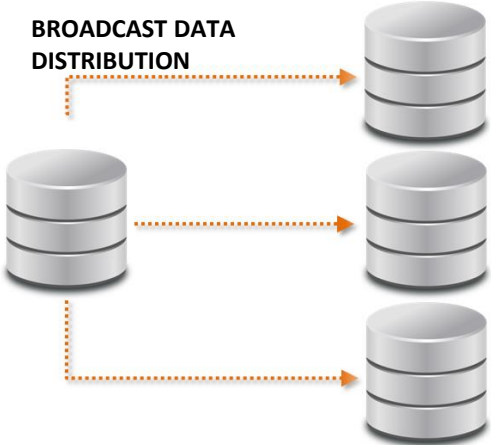
BIDIRECTIONAL STANDBY DB OR ACTIVE-ACTIVE FOR HIGH-AVAILABILITY



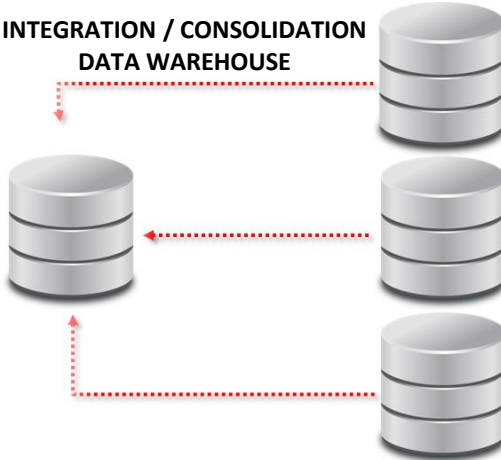
PEER-TO-PEER LOAD BALANCING, MULTIMASTER



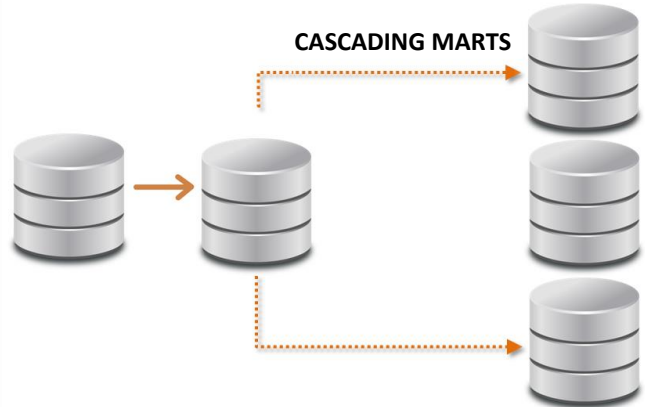
BROADCAST DATA DISTRIBUTION

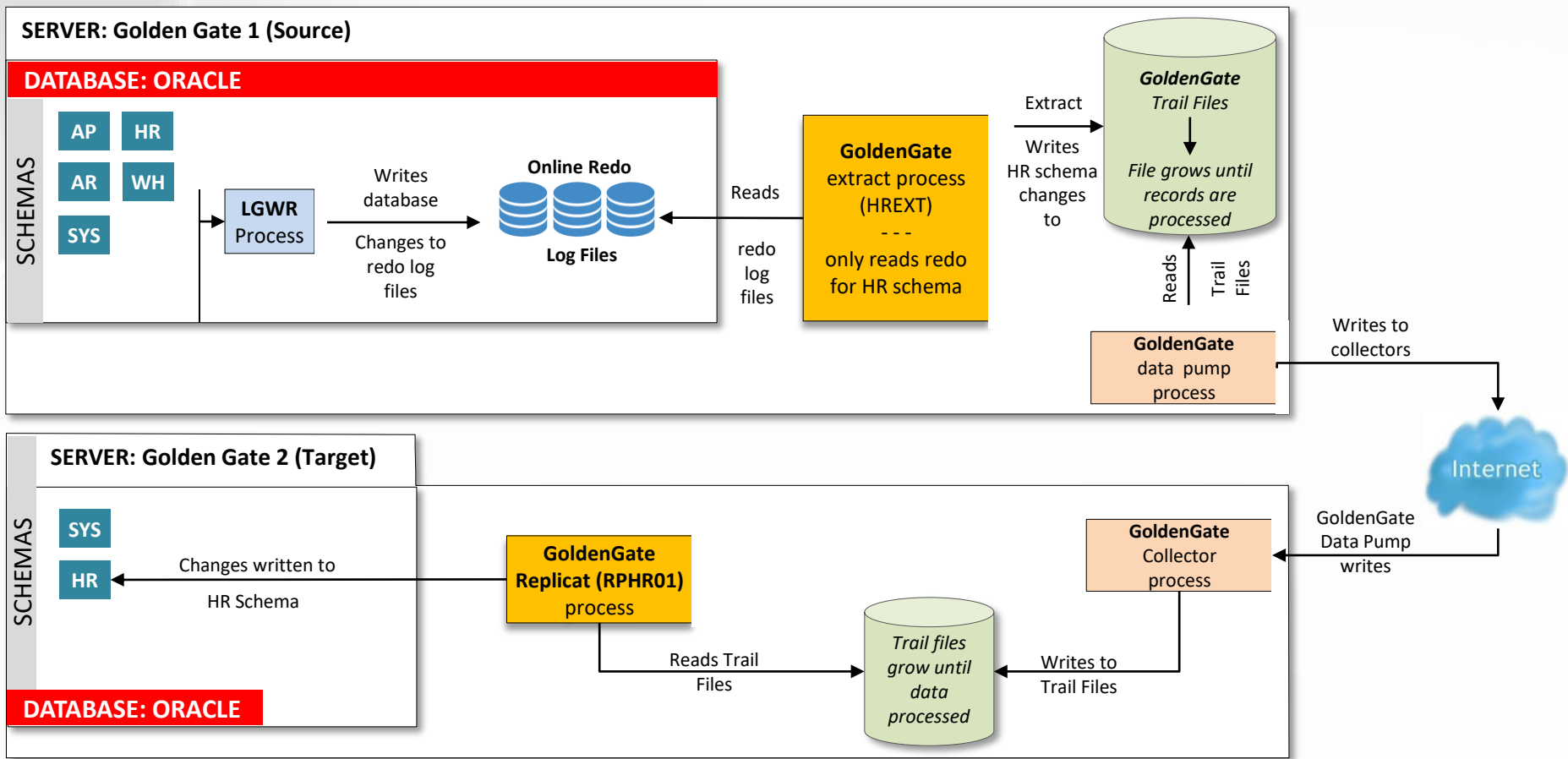


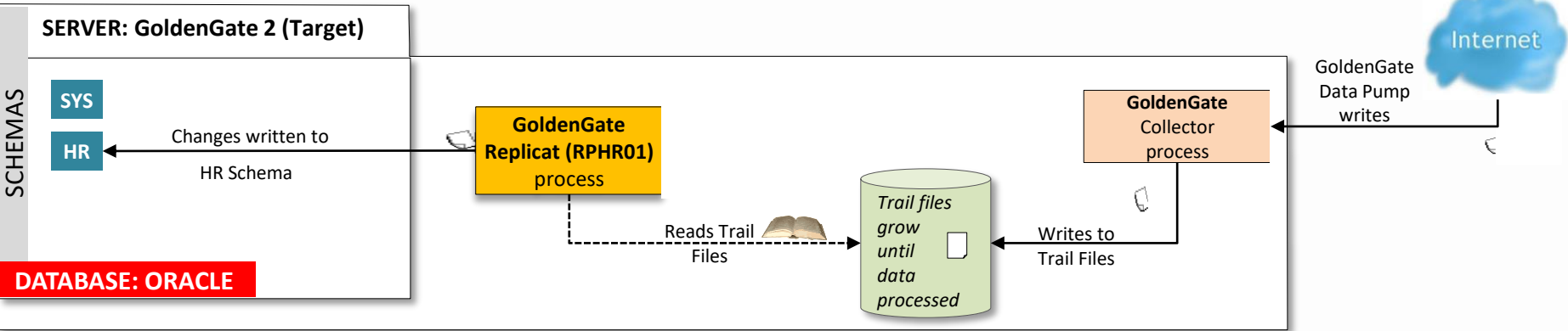
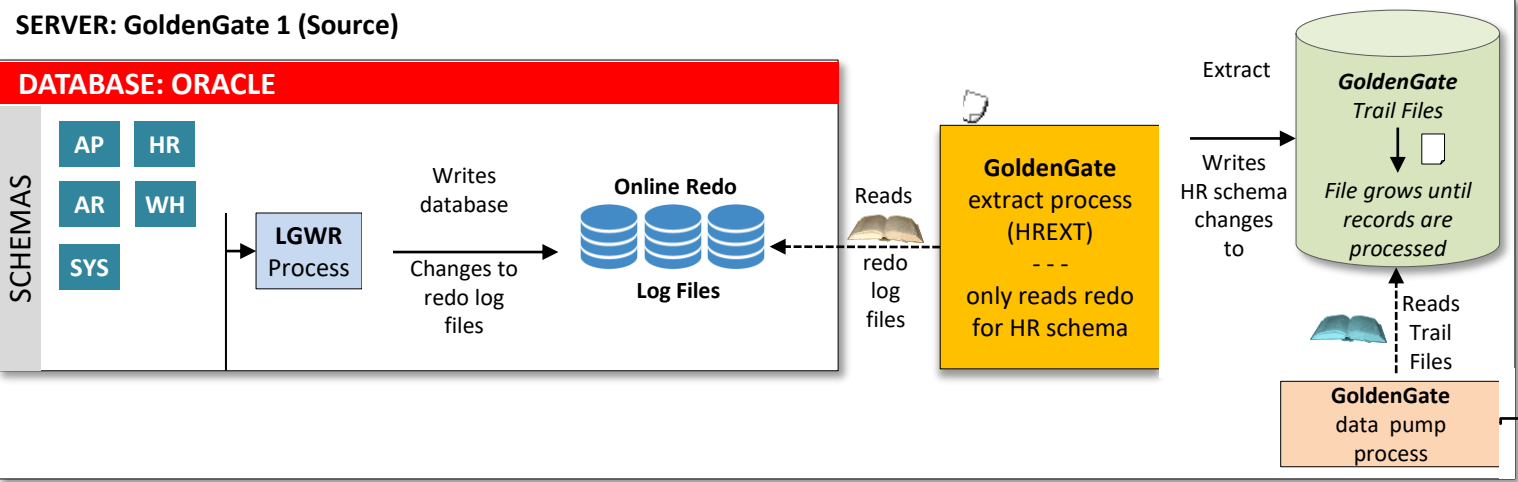
INTEGRATION / CONSOLIDATION DATA WAREHOUSE

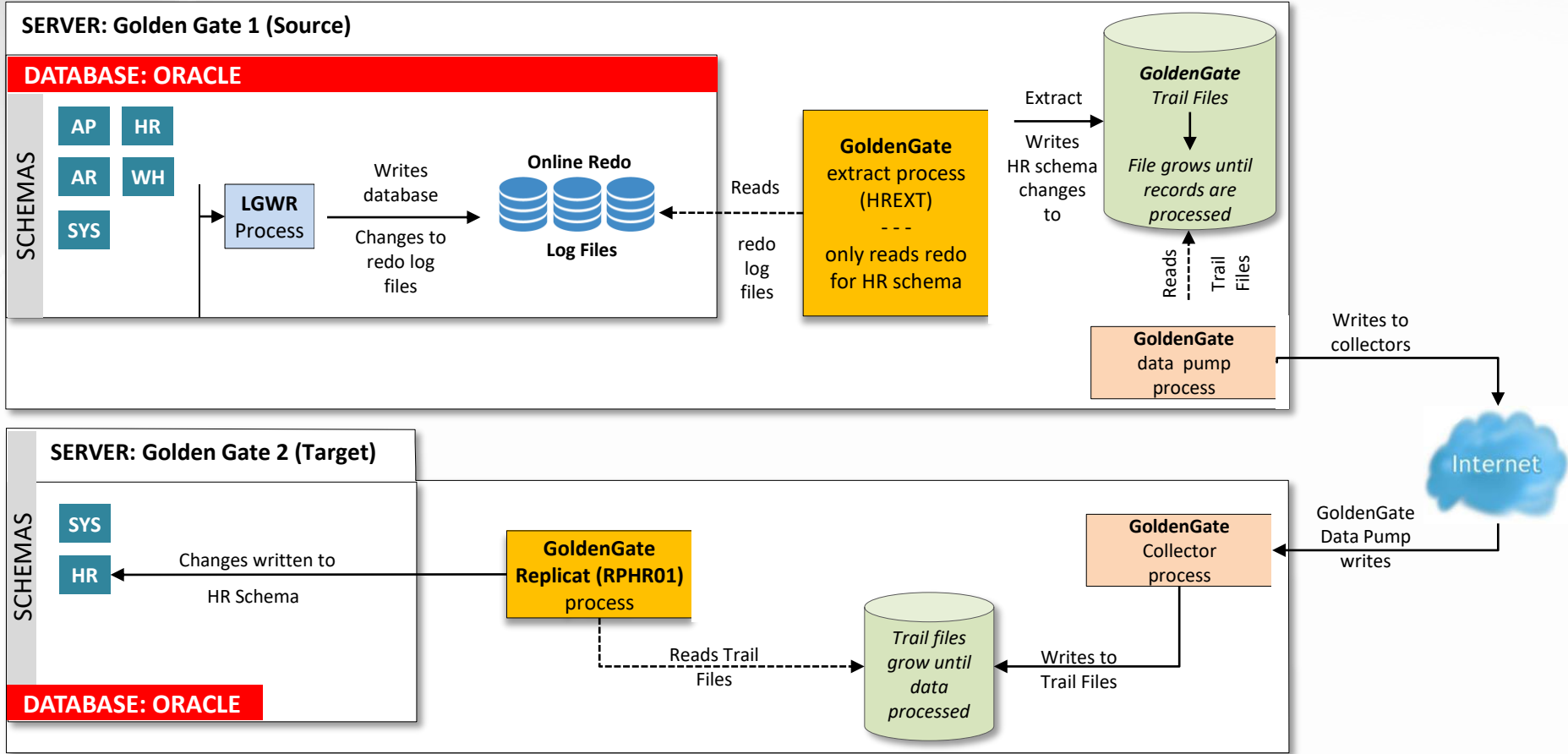


CASCADING MARTS

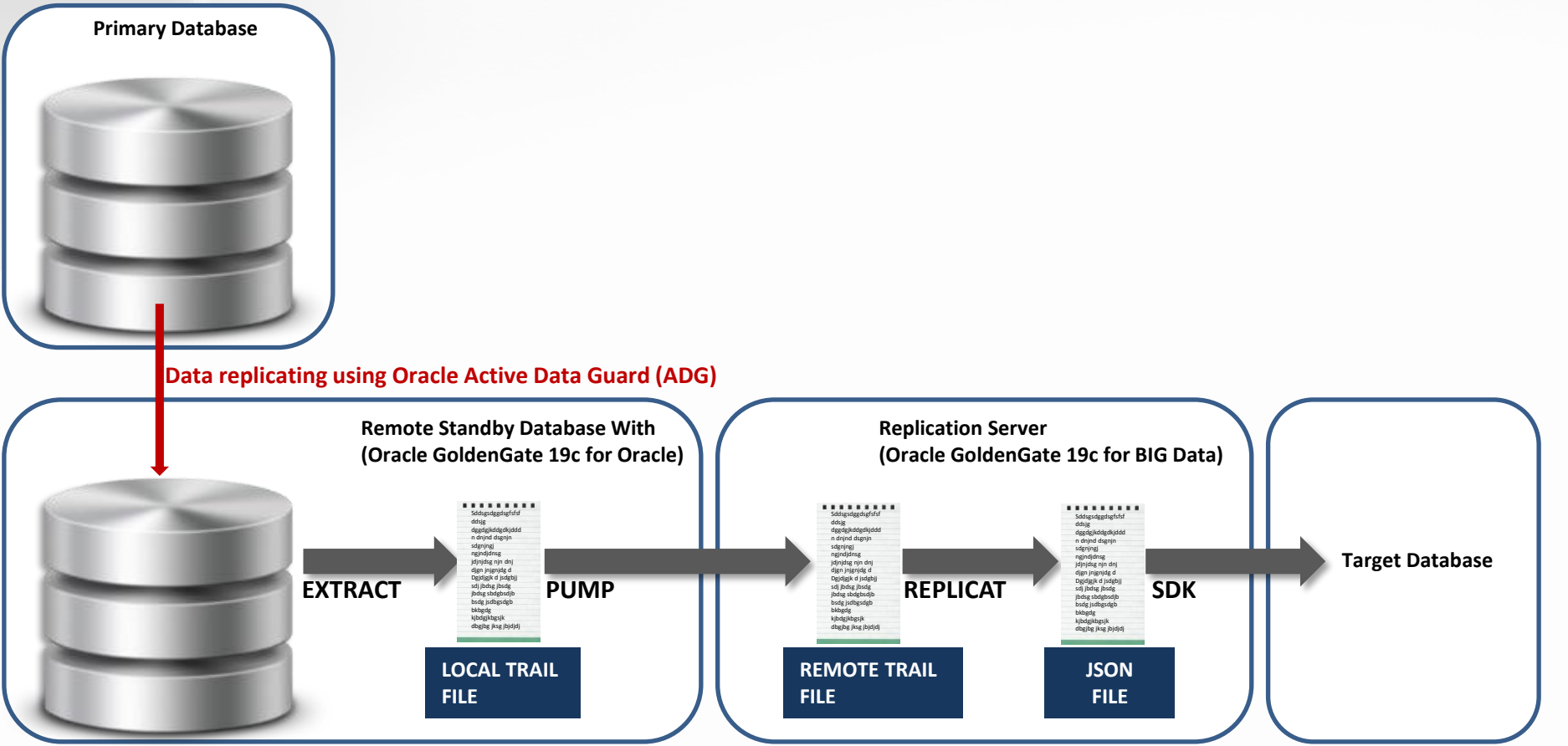








Oracle Golden Gate Architecture (Before HUB)



OGG Support Extracting Redo from Active Data Guard

GOAL

Does GoldenGate support extract reading redo from generated from an active data guard?

SOLUTION

Yes, this is supported in 12.1.2.1.0 (but not previous version) GoldenGate classic extract, with parameter:

`TRANLOGOPTIONS MINEFROMACTIVEDG`

For versions older than 12.1.2.1.0 the below error can occur:

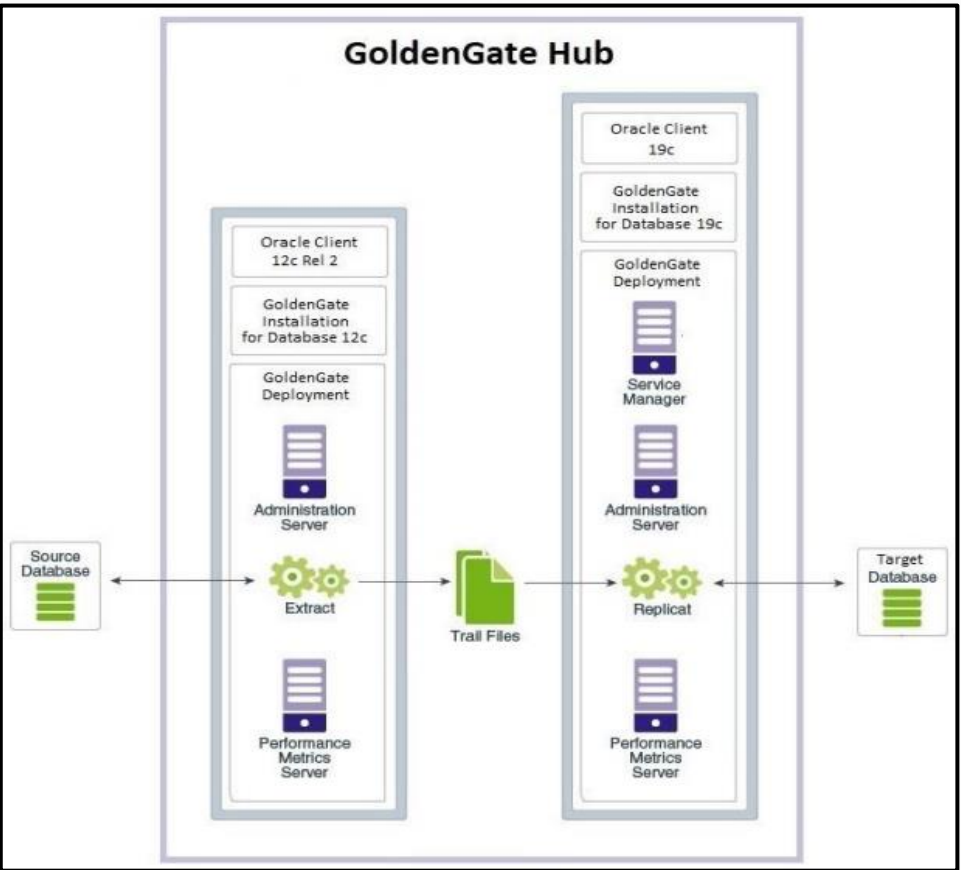
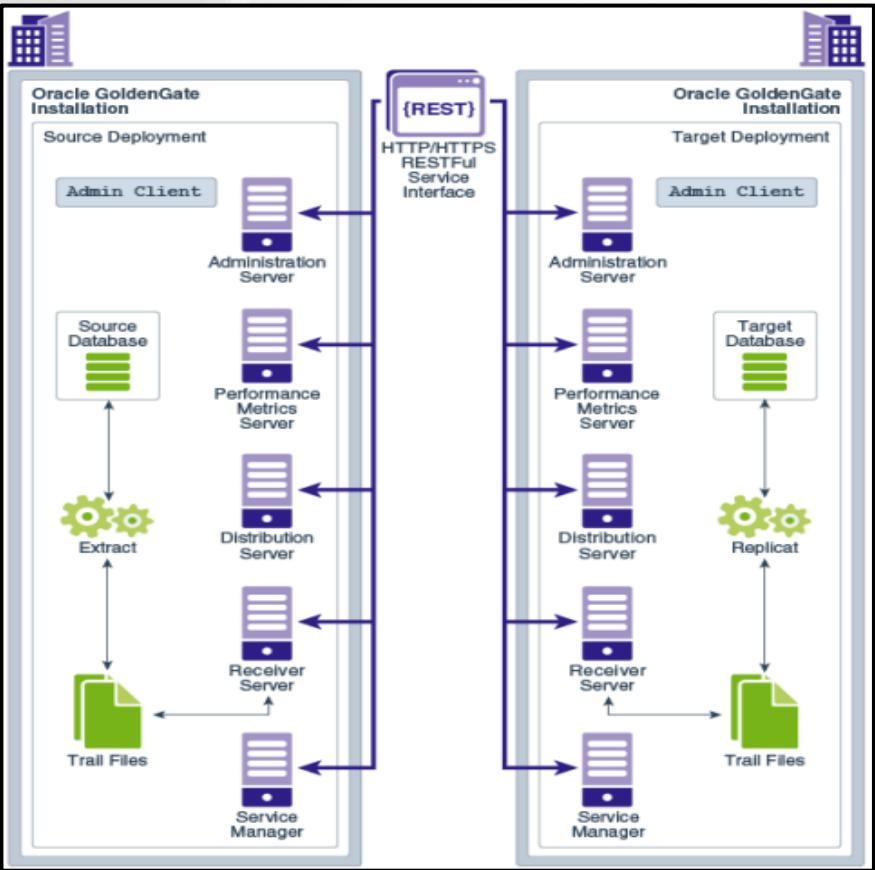
ERROR OGG-00303 Does Golden Gate Support Extracting Redo from Active Data Guard? (Doc ID 1299805.1)

So Goldengate must be u Golden Gate Cannot Register Extract At Standby database (Doc ID 217798.1)

```
GGSCI> view param escott
extract escott SETENV (ORACLE_SID="ORCL")
userid ogguser@orcls, password oracle
exttrail ./dirdat/orcls/u1
TRANLOGOPTIONS MINEFROMACTIVEDG
updaterecordformat compact
table scott.*;
```

- You cannot configure the integrated extract on a standby database and hence the issue.
- With integrated mode, the integrated extract has to update the seq for underlying capture which mean the database has to be open in read write mode.
- Alternatively, from OGG 12.1.2.1 we can use Classic Extract to capture from an Active Data Guard Standby database.





Oracle GoldenGate Local Vs Hub Configuration



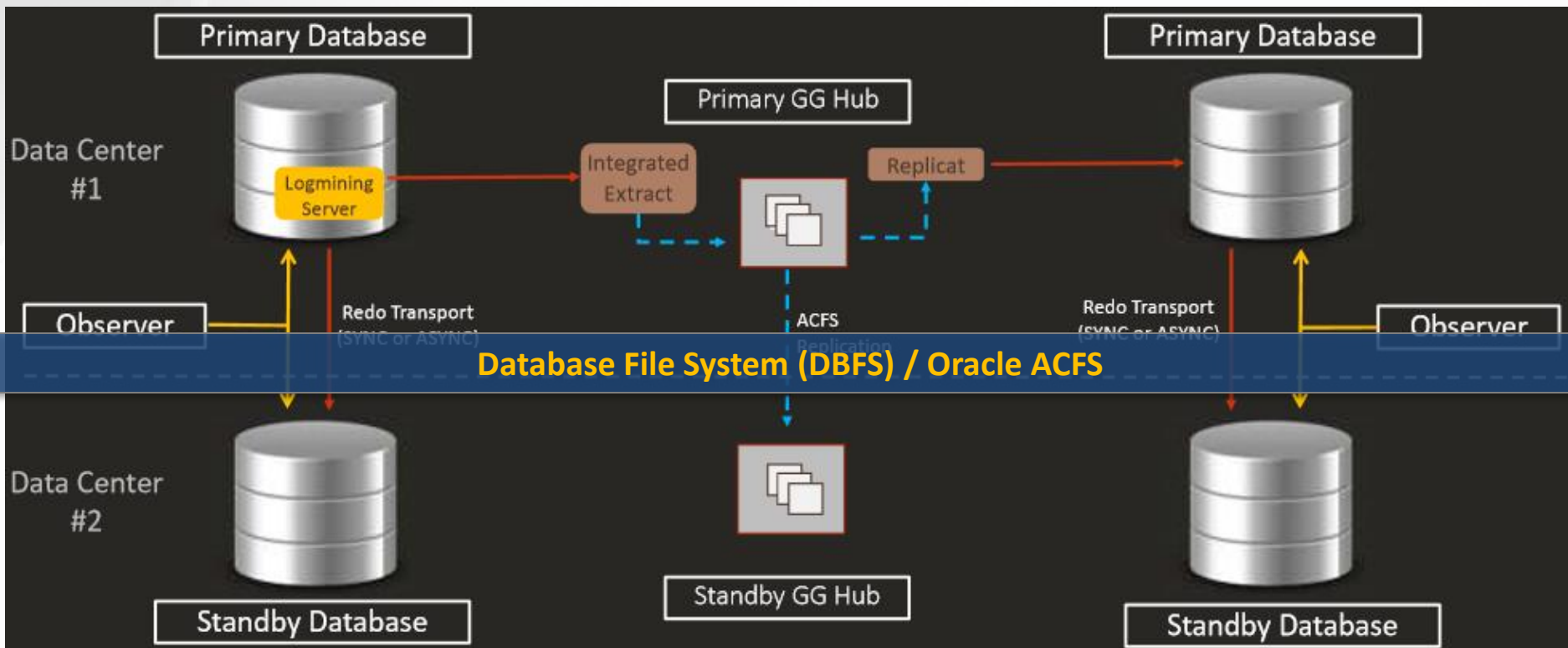
Local Configuration	HUB Configuration
Golden Gate software installed <i>on database servers</i>	Golden Gate software installed <i>on the Hub only</i>
Uses <i>RDBMS software</i> home for required libraries	Uses <i>Oracle Client software</i> for required libraries
Golden Gate processes run <i>on the database servers</i>	Golden Gate processes <i>only run on the Hub</i>
Logminer Server runs in the database	Logminer Server runs in the database
Distribution Path required to transfer trails from source to target database hosts	Distribution Path not needed, trail files local to both Extract (source) and Replicat (target)
<i>Higher resource</i> consumption on database server	<i>Lower resource</i> consumption on database server
Manage & monitor <i>on multiple database servers</i>	Manage & monitor <i>on a single server</i>

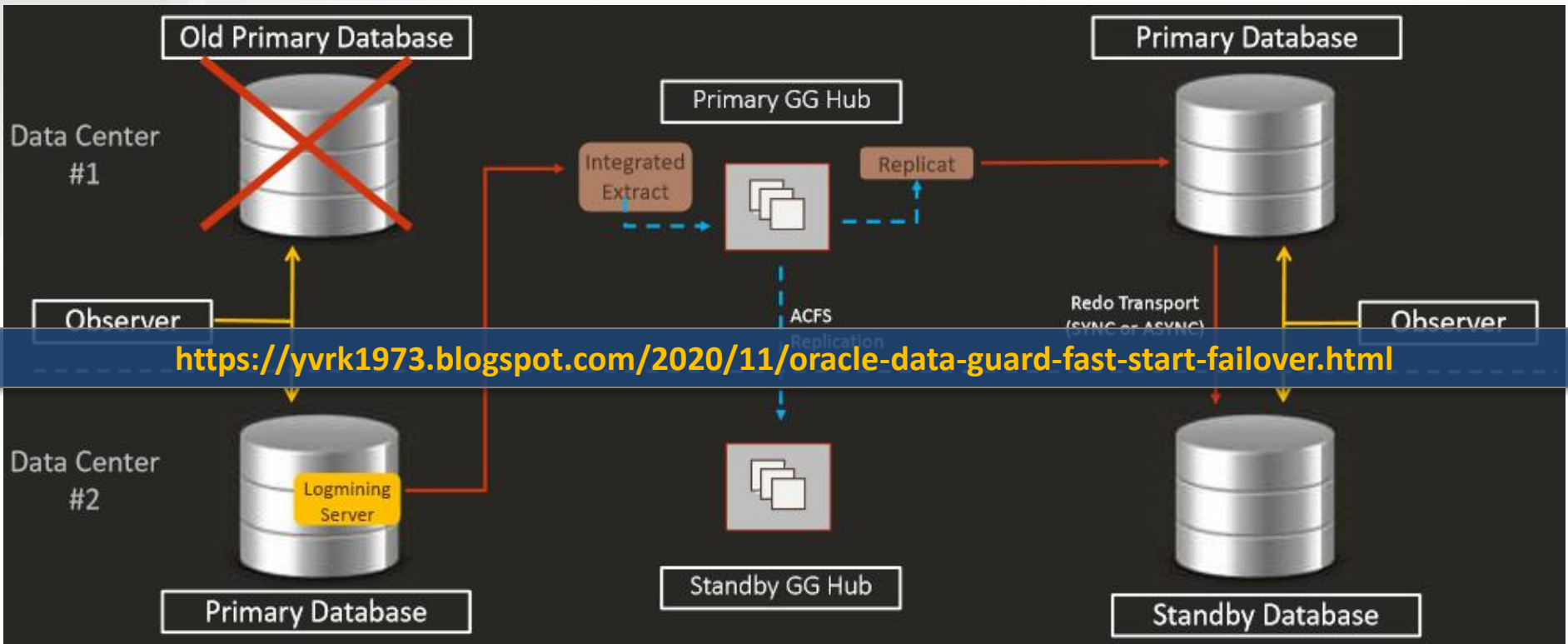
- ✓ Oracle GoldenGate Hub is an architectural concept that places the OGG software on a different host than the databases being operated against.
- ✓ The hub must be located close in network proximity to the target database.
- ✓ Apply latest database quarterly patchset/release update for optimized remote Extract Performance.
- ✓ Oracle Golden Gate software and processes run on a separate server.

191004_fbo_ggs_Linux_x64_services_shiphome.zip (736 M)
191004_fbo_ggs_Linux_x64_shiphome.zip (530 M)

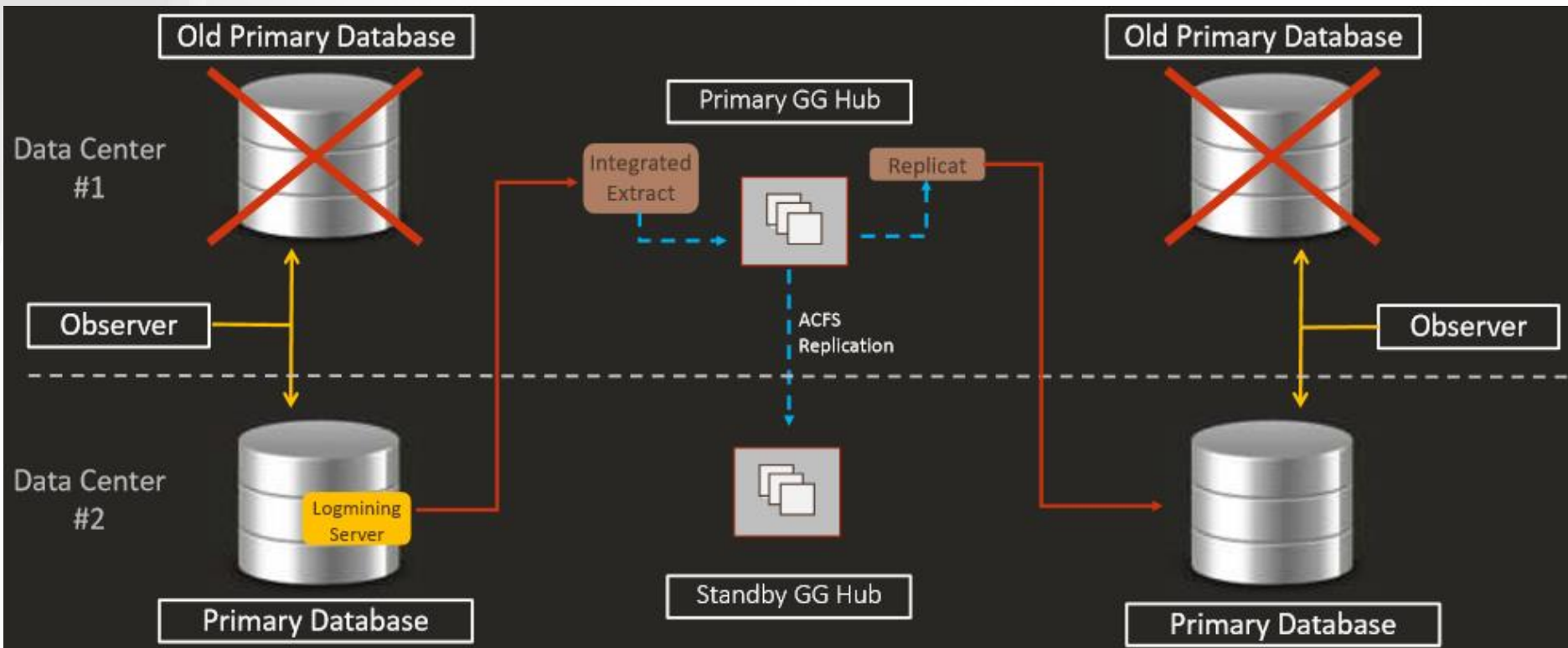
-  Oracle client software for both the source and target database versions are required on the Golden Gate hub.
-  Isolates a lot of the Golden Gate resource usage off of the source and target database servers.
-  Oracle Golden Gate Hub server is that it can be used for multiple database migrations.
-  OGG Hub requires additional server(s) needs allocating with sufficient memory, CPU, I/O and network bandwidth to handle all of the Golden Gate traffic.

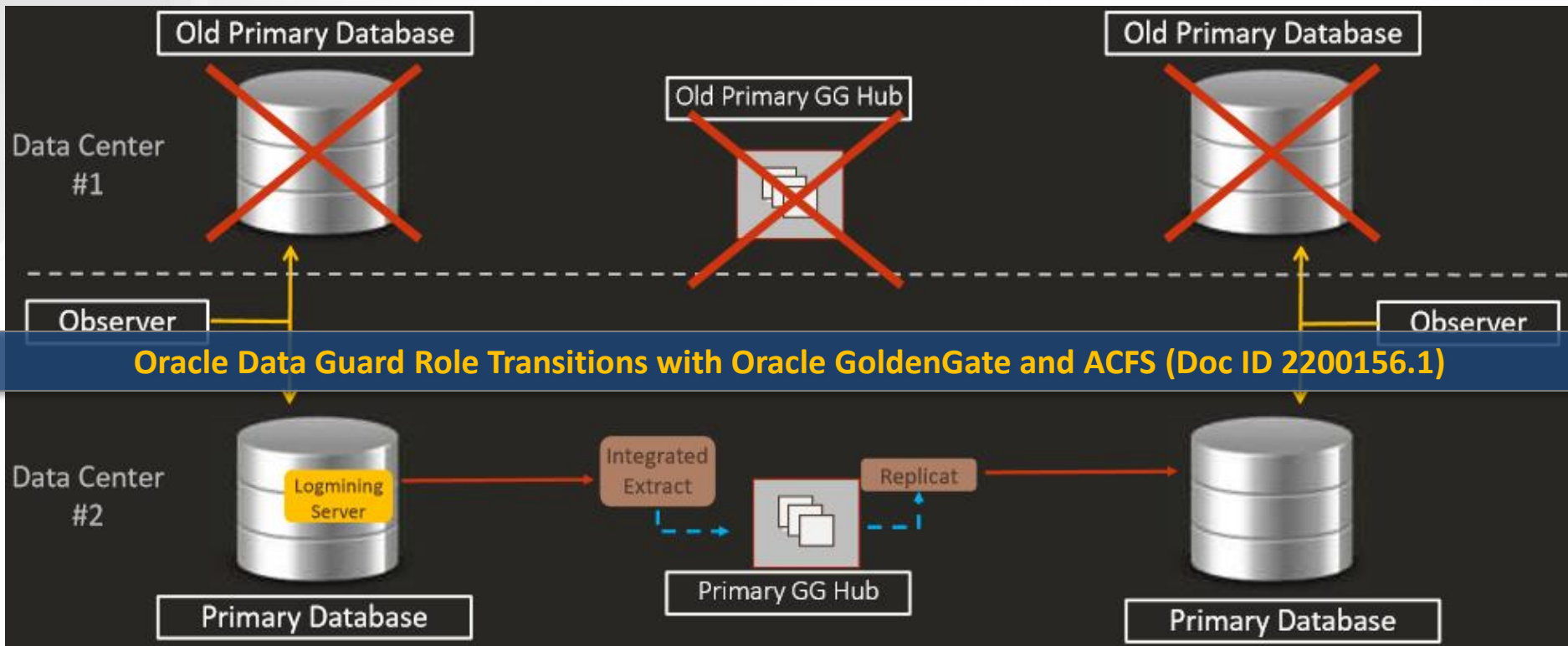
- ✓ Use latest version of Golden Gate (19c)
 - OGG 19c cross endian remote capture
- ✓ Source and target databases must both be enabled for Golden Gate replication
 - `ENABLE_GOLDENGATE_REPLICATION=TRUE`
- ✓ For Integrated Extract, Logminer Server runs inside the source database
Oracle Golden Gate 19.1.0.0.4 for Oracle & Oracle Golden Gate for Big Data 19.1.0.0.5
- ✓ For integrated parallel Replicator integrated Replicat
 - Requires `STREAMS_POOL_SIZE` allocation
- ✓ Connectivity from GoldenGate Hub to database controlled by TNS alias defined in `tnsnames.ora` or Oracle Easy Connect Plus* naming method



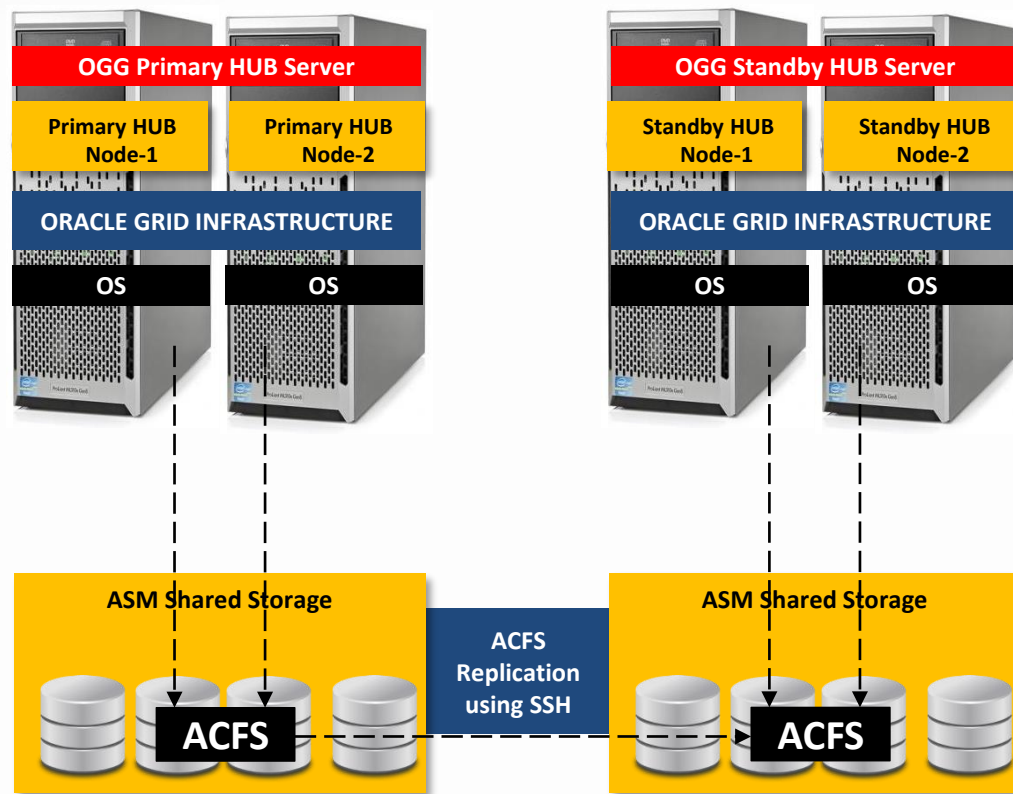


<https://yvrk1973.blogspot.com/2020/11/oracle-data-guard-fast-start-failover.html>





- Starting with Oracle 12cR2 (12.2), the method used to replicate ACFS has changed dramatically.
- The new method of replication is snapshot based, and data is transmitted over the Secure Shell (SSH) protocol.
- This new methodology gives the ASM administrator more granular control over replication.





Oracle Clusterware 19c supports both Oracle Linux (7.x) and Oracle Linux (8.x).

Certification Results

Operating System Certification

Oracle Clusterware 19.0.0.0.0 is certified on Linux x86-64 Oracle Linux 8.x
 See Certification Details for Notes and Support information.

Displaying Oracle Clusterware 19.0.0.0.0 Certifications (Filtered by Linux x86-64 Oracle Linux 8.x)

View Share Link

Certified With	Number of Releases / Versions
<ul style="list-style-type: none"> <ul style="list-style-type: none"> Linux x86-64 Other (1 Item) 	

Always check My Oracle Support (MOS) "Certifications" tab.

Certification Results

Operating System Certification

Oracle Clusterware 19.0.0.0.0 is certified on Linux x86-64 Oracle Linux 7
 See Certification Details for Notes and Support information.

Displaying Oracle Clusterware 19.0.0.0.0 Certifications (Filtered by Linux x86-64 Oracle Linux 7)

View Share Link

Certified With	Number of Releases / Versions
<ul style="list-style-type: none"> <ul style="list-style-type: none"> Linux x86-64 Other (1 Item) 	1 Version (Oracle Linux 7)



Oracle GoldenGate 19c supports both Oracle Linux (6.x) and Oracle Linux (7.x).

Certification Results

Operating System Certification

Oracle GoldenGate 19.1.0.0.4 is certified on Linux x86-64 Oracle Linux 7
 See Certification Details for Notes and Support information.

Displaying Oracle GoldenGate 19.1.0.0.4 Certifications (Filtered by Linux x86-64 Oracle Linux 7)

View Share Link

Certified With	Number of Releases / Versions
<ul style="list-style-type: none"> ▼ Operating Systems (1 Item) Linux x86-64 	1 Version (Oracle Linux 7)
<ul style="list-style-type: none"> ▶ Databases (9 Items) ▶ Middleware (2 Items) 	

Always check My Oracle Support (MOS) "Certifications" tab.

Certification Results

Operating System Certification

Oracle GoldenGate 19.1.0.0.4 is certified on Linux x86-64 Oracle Linux 6
 See Certification Details for Notes and Support information.

Displaying Oracle GoldenGate 19.1.0.0.4 Certifications (Filtered by Linux x86-64 Oracle Linux 6)

View Share Link

Certified With	Number of Releases / Versions
<ul style="list-style-type: none"> ▼ Operating Systems (1 Item) Linux x86-64 	1 Version (Oracle Linux 6)
<ul style="list-style-type: none"> ▶ Databases (9 Items) ▶ Middleware (2 Items) 	



Oracle Golden Gate 19c supports both Oracle Linux (6.x) and Oracle Linux (7.x).

Oracle GoldenGate (19.1.0.0.0) Certification Matrix

This document covers the following product releases for Oracle GoldenGate:

- Oracle GoldenGate 19.1.0.0.0
- Oracle GoldenGate 19.1.0.0.2
- Oracle GoldenGate 19.1.0.0.3
- Oracle GoldenGate 19.1.0.0.4
- Oracle GoldenGate 19.1.0.0.200414+
- Oracle GoldenGate 19.1.0.0.200714+
- Oracle GoldenGate 19.1.0.0.201013+

Oracle GoldenGate

Product	Release	Processor Type	OS Version	OS Update Type	OS Update Level	Run Mode 32/64 Bit	Database Name	Database Version
Oracle GoldenGate	https://www.oracle.com/middleware/technologies/fusion-certification.html							
Oracle GoldenGate	19.1.0.0.201013+	Linux x86-64	Oracle Linux 8 / RHEL 8	Update Level	0+	64	Oracle Database	11.2.0.4+; 12.1.0.2+; 12.2.0.1+; 18c
Oracle GoldenGate	19.1.0.0.0+	Linux x86-64	Oracle Linux 6 / RHEL 6	Update Level	4+	64	Oracle Database	11.2.0.4+; 12.1.0.1+; 12.1.0.2+; 12.2.0.1+; 18c
Oracle GoldenGate	19.1.0.0.0+	Linux x86-64	Oracle Linux 7 / RHEL 7	Update Level	0+	64	Oracle Database	11.2.0.4+; 12.1.0.2+; 12.2.0.1+; 18c; 19c

Product Area

Generally Available System Configurations

Oracle Fusion Middleware 19c Certifications

- [System Requirements and Supported Platforms for Oracle GoldenGate \(19.1.0.0.0\) \(xls\)](#)
- [System Requirements and Supported Platforms for Oracle GoldenGate \(18.1.0.0.0\) \(xls\)](#)
- [System Requirements and Supported Platforms for Oracle Stream Analytics \(19.1.0.0.0\) \(xls\)](#)
- [System Requirements and Supported Platforms for Oracle Stream Analytics \(18.1.0.0.0\) \(xls\)](#)



Oracle GoldenGate for Big Data 19c supports both Oracle Linux (6.x) and Oracle Linux (7.x).

Oracle GoldenGate Certification Matrix 19c (19.1.*)

This document covers the following product releases for Oracle GoldenGate: *

- Oracle GoldenGate for Big Data 19.1.0.0.0
- Oracle GoldenGate for Big Data 19.1.0.0.1
- Oracle GoldenGate for Big Data 19.1.0.0.2
- Oracle GoldenGate for Big Data 19.1.0.0.5

Oracle GoldenGate for Big Data

Product	Release	Processor Type	OS Version	OS Update Type	OS Update	Run Mode	Third Party Vendor	Version	Exceptions and Additional Information
Multiple Replicat Processes / Co-ordinated Delivery									
Oracle GoldenGate for Big Data	19.1.0.0.5+	Linux x86-64	Oracle Linux 6	Update Level	1+	64	Amazon S3	Current	Certified with AWS Java SDK 1.11.* Libraries
Oracle GoldenGate for Big Data	19.1.0.0.5+	Linux x86-64	Oracle Linux 7	Update Level	1+	64	Amazon S3	Current	Certified with AWS Java SDK 1.11.* Libraries
Oracle GoldenGate for Big Data	19.1.0.0.0+	Linux x86-64	Oracle Linux 6	Update Level	1+	64	Amazon S3	Current	Certified with AWS Java SDK 1.11.* Libraries
Oracle GoldenGate for Big Data	19.1.0.0.0+	Linux x86-64	Oracle Linux 7	Update Level	1+	64	Amazon S3	Current	Certified with AWS Java SDK 1.11.* Libraries



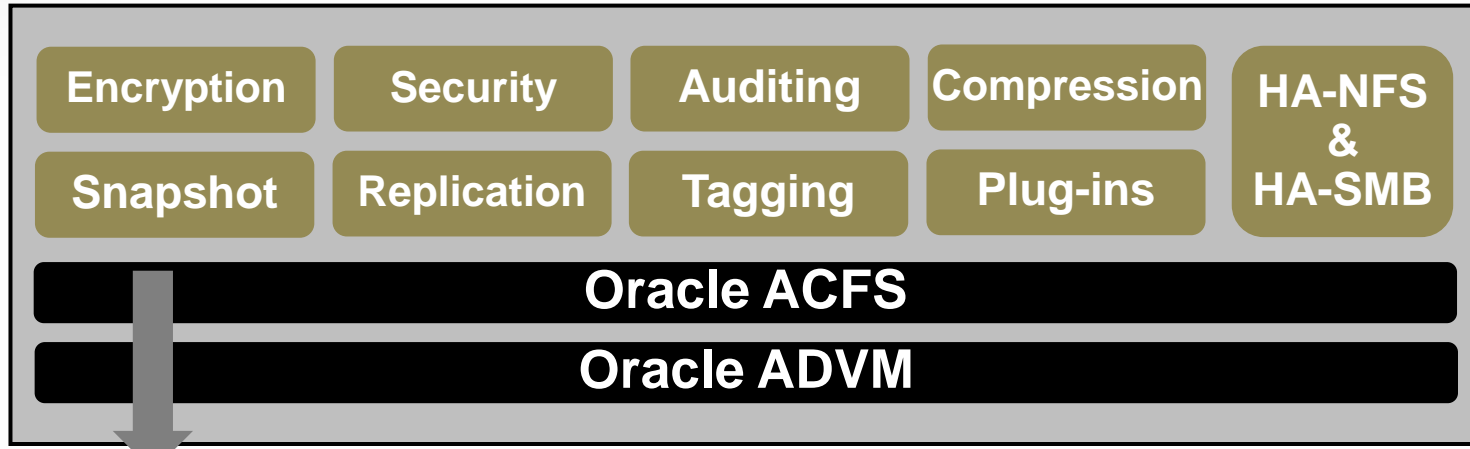
Oracle ACFS and AFD 19c supported platforms.

<i>ACFS and AFD 19c Supported Platforms</i>					
Vendor	Version	Update/Kernel	Architecture	ACFS Bug or RU/RUR	AFD Bug or RU/RUR
Oracle Linux – RedHat Compatible Kernel	7	Update 5 3.10.0-862	X86_64	Base	Base
Always check ACFS Support On OS Platforms (Certification Matrix). (Doc ID 1369107.1).					
Oracle Linux – RedHat Compatible Kernel		3.10.0 Red Hat Compatible kernels	X86_64	19.5.191015 (Base Bug 29963428)	19.5.191015 (Base Bug 29963428)
Oracle Linux - Unbreakable Enterprise Kernel	7	All Updates, 4.1.12-112.16.4 and later UEK 4.1.12 kernels	X86_64	Base	Base
Oracle Linux - Unbreakable Enterprise Kernel	7	All Updates, 4.14.35-1902 and later UEK 4.14.35 kernels	X86_64	19.4.190716 (Base Bug 27494830)	19.4.190716 (Base Bug 27494830)



Oracle Clusterware

Oracle ASM



ASM Disk Group



- ✓ Oracle ACFS, as part of Oracle Grid Infrastructure, is integrated with Oracle ASM, Oracle ADVM and Oracle Clusterware.
- ✓ Oracle Golden Gate deployments stored on ACFS with continuous snapshot replication.
- ✓ Starting with Oracle ACFS 12c R1, ACFS can be used to store Oracle Database files
Oracle ACFS offers support for multiple Operating Systems such as Oracle Linux, Redhat, Novell SLES, Solaris and IBM AIX.
- ✓ ACFS zero data loss role reversal for planned outages (18c)
- ✓ Acsutil repl commands can be run as non-root user (19c)
- ✓ The combination of RAC, Data Guard and ACFS Replication provides comprehensive site and Disaster Recovery policies for *all files inside and outside* of the database.

```
» acfsutil repl bg
» acfsutil repl compare
» acfsutil repl info (except with -c -u options)
» acfsutil repl init
» acfsutil repl pause
» acfsutil repl resume
» acfsutil repl reverse
» acfsutil repl sync
» acfsutil repl terminate
» acfsutil repl trace
» acfsutil repl update
» acfsutil repl upgrade
```

Oracle Grid Infrastructure Bundled Agent (XAG)

- Clusterware specific to managing Oracle GoldenGate resources
 - XAG allows you to register a Oracle GoldenGate instance with CRS to provide HA
- It solves the key process related issue of ensuring availability of the OGG instance in the face of failures.
 - Loss of instance (RAC node failover)
 - Loss of primary database (Data Guard Failover integration)

Use AGCTL for registering and starting/stopping the Service Manager

```
[oracle@rac1-12c xag]$ ./xagsetup.sh --install --directory /u01/app/xag --all_nodes
```

Installing Oracle Grid Infrastructure Agents on: rac1-12c

Installing Oracle Grid Infrastructure Agents on: rac2-12c

Done. MUST use XAG version 9.1 or 10.2 ([p31215432_19000200714_Linux-x86-64.zip](#)) for Microservices support.

- Install outside of Grid Infrastructure ORACLE_HOME
 - Make sure OS user PATH finds this XAG before the GI installed version

Patch Simple Search Results

Filters: Patch Name or Number is 31215432; Platform is Linux x86-64;

Table View Detach Share Link

Patch Name	Description	Platform (Language)	Release	Recommended	Updated	Size	Classification	Product	Download Access
31215432	XAG 10.2 BUG FIX MLR (Patch)	Generic Platform (American English)	19.0.0.0.0		4+ months ago	211.8 KB	General	Oracle Database - Enterprise Edition (More...)	Software
31215432	XAG 10.2 BUG FIX MLR (Patch)	Linux x86-64 (American English)	19.0.0.0.200714		6+ months ago	205.5 KB	General	Oracle Database - Enterprise Edition (More...)	Software

- Oracle Grid Infrastructure Agents provide an integrated HA solution for applications. The applications currently supported are listed in agctl command output:
- Manages the following applications as Oracle Clusterware Resources:
 - Apache Tomcat
 - Apache Webserver
 - E-Business Suite
 - Goldengate
 - JD Edwards Enterprise Server
 - MySQL Server
 - PeopleSoft Application Server
 - PeopleSoft Batch Server
 - PeopleSoft PIA Server
 - Siebel Gateway
 - Siebel Server
 - WebLogic Administration Server

```
[root@rac1-12c ~]# appvipcfg create
-network=1 \
-ip=192.168.2.150 \
-vipname=xag.gg_1-vip.vip \
-user=oracle
```

```
[oracle@rac1-12c bin]$ ./agctl add goldengate gg_1 \
--gg_home /vol1/app/gggate \
--instance_type source \
--nodes rac1-12c,rac2-12c \
--vip_name xag.gg_1-vip.vip \
--filesystems ora.acfs_dg.vol1.acfs \
--databases ora.orcl.db \
--oracle_home /u01/app/oracle/product/12.1.0.2/db_1
```

- **Check GoldenGate status**
 - `agctl status goldengate`
- **Start GoldenGate**
 - `agctl start goldengate ggprmy --node GGsourceNode1`
- **Stop GoldenGate**
 - `agctl stop goldengate ggprmy`
- **Relocate GoldenGate to another RAC node**
 - `agctl relocate goldengate ggprmy --node GGsourceNode2`
- **Register with XAG on the primary by creating the VIP (as root) using the agctl command**
 - `agctl add goldengate gg_1 \
--gg_home /vol1/app/gggate \
--instance_type source \
--nodes rac1-12c,rac2-12c \
--vip_name xag.gg_1-vip.vip \
--filesystems ora.acfs_dg.vol1.acfs \
--databases ora.orcl.db \
--oracle_home /u01/app/oracle/product/12.1.0.2/db_1`

- Oracle 19c GI (19.9) with ASMFD
- Oracle Linux 7.8
- Kernel 4.1.12

```
[oracle@rac1-19c ~]$ sqlplus / as sysasm
```

```
SQL*Plus: Release 19.0.0.0.0 - Production on Mon Nov 9 15:14:44 2020
Version 19.9.0.0.0
```

```
Copyright (c) 1982, 2020, Oracle. All rights reserved.
```

```
Connected to:
```

```
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.9.0.0.0
```

```
SQL> col name for a20
```

```
col path for a18
```

```
col library for a60
```

```
set lines 160
```

```
SQL> SQL> SQL> SQL>
```

```
SQL> select name, path, library from v$asm_disk where group_number <> 0;
```

NAME	PATH	LIBRARY
ACFSDG02	AFD:ACFSDG02	AFD Library - Generic , version 3 (KABI_V3)
ACFSDG01	AFD:ACFSDG01	AFD Library - Generic , version 3 (KABI_V3)
DATADG01	AFD:DATADG01	AFD Library - Generic , version 3 (KABI_V3)
DATADG02	AFD:DATADG02	AFD Library - Generic , version 3 (KABI_V3)

```
SQL> █
```

```
[root@rac1-19c ~]# . oraenv
ORACLE_SID = [+ASM1] ?
The Oracle base remains unchanged with value /u01/app/oracle
[root@rac1-19c ~]# export ORACLE_BASE=/u01/app/oracle
[root@rac1-19c ~]# export ORACLE_HOME=/u01/app/19.3.0/grid
[root@rac1-19c ~]# cd $ORACLE_HOME/bin
[root@rac1-19c bin]# ./afddriverstate supported
AFD-9200: Supported
[root@rac1-19c bin]#
[root@rac1-19c bin]# ./asmcmd afd_state
ASMCMD-9526: The AFD state is 'LOADED' and filtering is 'ENABLED' on host 'rac1-19c.localdomain'
[root@rac1-19c bin]#
[root@rac1-19c bin]# lsmod | grep acfs
oracleacfs 5607424 0
oracleoks 724992 2 oracleacfs,oracleadvm
[root@rac1-19c bin]#
[root@rac1-19c bin]# lsmod|grep oracle
oracleafd 217088 1
oracleacfs 5607424 0
oracleadvm 1241088 0
oracleoks 724992 2 oracleacfs,oracleadvm
[root@rac1-19c bin]#
[root@rac1-19c bin]# ./acfsdriverstate -orahome /u01/app/19.3.0/grid installed
ACFS-9203: true
[root@rac1-19c bin]# ./acfsdriverstate -orahome /u01/app/19.3.0/grid loaded
ACFS-9203: true
[root@rac1-19c bin]# ./acfsdriverstate -orahome /u01/app/19.3.0/grid supported
ACFS-9200: Supported
[root@rac1-19c bin]# ./acfsdriverstate -orahome /u01/app/19.3.0/grid version
ACFS-9325: Driver OS kernel version = 4.1.12-112.16.4.el7uek.x86_64.
ACFS-9326: Driver build number = 190222.
ACFS-9212: Driver build version = 19.0.0.0.0 (19.3.0.0.0).
ACFS-9547: Driver available build number = 190222.
ACFS-9548: Driver available build version = 19.0.0.0.0 (19.3.0.0.0).
[root@rac1-19c bin]#
[root@rac1-19c bin]# uname -r
4.1.12-124.41.5.el7uek.x86_64
[root@rac1-19c bin]#
[root@rac1-19c bin]# uname -a
Linux rac1-19c.localdomain 4.1.12-124.41.5.el7uek.x86_64 #2 SMP Fri Aug 28 09:37:38 PDT 2020 x86_64
[root@rac1-19c bin]#
[root@rac1-19c bin]# cat /etc/os-release
NAME="Oracle Linux Server"
VERSION="7.8"
ID="ol"
```

- **Oracle 19c GI (19.9) with ASMFD Driver**
- **Oracle Linux 8.2**
- **Kernel 5.4.17**

```
[oracle@19c-rac1 grid]$ ./gridSetup.sh -applyPSU /home/oracle/31305339/
Preparing the home to patch...
Applying the patch /home/oracle/31305339/
Successfully applied the patch.
The log can be found at: /tmp/GridSetupActions2020-11-12_09-01-20PM/installerPatchActions_2020-11-12_09-01-20PM.log
Launching Oracle Grid Infrastructure Setup Wizard...
The response file for this session can be found at:
/u01/app/19.3.0/grid/install/response/grid_2020-11-12_09-01-20PM.rsp
You can find the log of this install session at:
/tmp/GridSetupActions2020-11-12_09-01-20PM/gridSetupActions2020-11-12_09-01-20PM.log
Moved the install session logs to:
/u01/app/orainventory/logs/GridSetupActions2020-11-12_09-01-20PM
[oracle@19c-rac1 grid]$
```

Certification Information for Oracle Database on Linux x86-64 (Doc ID 1304727.2)

```
[oracle@19c-rac1 bin]$ afddriverstate installed
AFD-620: AFD is not supported on this operating system version: 'unknown'
AFD-9204: AFD device driver installed status: 'false'
[oracle@19c-rac1 bin]$
```

```
[oracle@19c-rac1 bin]$ afddriverstate loaded
AFD-620: AFD is not supported on this operating system version: 'unknown'
AFD-9206: AFD device driver loaded status: 'false'
[oracle@19c-rac1 bin]$
```

```
[oracle@19c-rac1 bin]$ afddriverstate version
AFD-642: AFD not installed
[oracle@19c-rac1 bin]$
```

```
[oracle@19c-rac1 bin]$ cat /etc/oracle-release
Oracle Linux Server release 8.2
[oracle@19c-rac1 bin]$
```

```
[oracle@19c-rac1 bin]$ uname -r
5.4.17-2036.100.6.1.el8uek.x86_64
[oracle@19c-rac1 bin]$
```

- Mounting ACFS Standby Filesystems ACFS standby filesystems may be mounted on only one node at a time. As such, ensure that it is not mounted on the second node of the cluster; otherwise, you will receive the following error when attempting to initialize the filesystem for replication.

```
[root@rac-s1 ~]# /sbin/acfsutil repl init standby -u oracle /acfs_vol  
acfsutil repl init: ACFS-05054: standby replication file system is mounted on more than one cluster node
```

```
[root@rac-s1 ~]# srvctl config filesystem -d /dev/asm/acfs_vol-269
```

```
Volume device: /dev/asm/acfs_vol-269  
Diskgroup name: acfs  
Volume name: acfs_vol  
Canonical volume device: /dev/asm/acfs_vol-269  
Accelerator volume devices:  
Mountpoint path: /acfs_vol  
Mount point owner:  
Mount users:  
Type: ACFS  
Mount options:  
Description:  
ACFS file system is enabled  
ACFS file system is individually enabled on nodes:  
ACFS file system is individually disabled on nodes:  
[root@rac-s1 ~]#
```

```
[root@rac-s1 ~]# srvctl stop filesystem -d /dev/asm/acfs_vol-269 -n rac-s2
```

```
[root@rac-s1 ~]# srvctl status filesystem -d /dev/asm/acfs_vol-269  
ACFS file system /acfs_vol is mounted on nodes rac-s1
```

- When you restart secondary RAC, ACFS Secondary Filesystems will be mounted on both the nodes automatically.
- Ensure it will be mounted on only one node.
- We have started replication from Primary ACFS Filesystems using one of the cluster node.

Secondary RAC:

```
[oracle@rac-s1 ~]$ df -h | grep acfs  
/dev/asm/acfs_vol-269      19G 267M  19G  2% /acfs_vol
```

```
[oracle@rac-s2 ~]$ df -h | grep acfs  
/dev/asm/acfs_vol-269      19G 267M  19G  2% /acfs_vol
```

```
[root@rac-s2 ~]# srvctl stop filesystem -d /dev/asm/acfs_vol-269 -n rac-s2
```

```
[root@rac-s2 ~]# df -h  
Filesystem                Size  Used Avail Use% Mounted on  
/dev/mapper/vg_racs2-lv_root 77G  44G  30G  61% /  
tmpfs                      4.9G  1.3G  3.7G  26% /dev/shm  
/dev/sda1                  477M   56M  396M  13% /boot  
/dev/mapper/vg_racs2-lv_home 27G  2.2G  23G   9% /home  
[root@rac-s2 ~]#
```

Primary RAC:

```
[root@rac-p1 ~]# /sbin/acfsutil repl init primary -C -s oracle@rac-s1 -m /acfs_vol/ /acfs_vol/  
[root@rac-p1 ~]#
```


- Oracle GoldenGate deployments stored on ACFS with continuous snapshot replication.
- Grid Infrastructure agent (XAG) manages hub dependencies between primary file system, VIP and GoldenGate deployments.
- Source and Target databases configured for Maximum Availability Architecture (MAA).
- RAC with application VIPs.

- Oracle GoldenGate Hub offers advantages over local configuration.
 - Reduced database server resource consumption
 - Ease of administration & monitoring

- Oracle GoldenGate Hub MAA makes use of:
 - Oracle Grid Infrastructure (CRS)
 - Standalone agent (XAG) with no license cost
 - ACFS and ACFS Replication

Thanks to NYOUG &
Viscosity NA



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